

Introduction to Human Centered Requirements and Design

SWEN444

Selected material from *The UX Book*, Hartson & Pyla

Difficult to Use Products?

- Think about a product that you have found to be difficult to use:
 - What was the difficulty and the consequences of the product being difficult?
 - What do you think contributes to or causes the difficulty?
- Now think of a product you really like to use!

“It is easy to write software that is hard to use and hard to write software that is easy to use.”

Why Study Human-Computer Interfaces (HCI) as Software Engineers?

- Virtually all **digital systems have a HCI**
 - Graphical user interfaces (GUI) on desktops, laptops, web applications
 - Embedded “smart” devices, non-traditional interfaces
- Interface **design** and **implementation** may be a **big part** of system **development**
- **Bad UI’s cost:**
 - Reduced ROI – lose user participation
 - Safety ethics (vehicles crash, medical equipment mis-used)

HCI is Multidisciplinary:

- **Software Engineering / Computer Science**
- **Psychology / Cognitive Science**
 - Knowledge of user's perceptual, cognitive, problem-solving skills
- **Ergonomics**
 - Knowledge of design to accommodate the user's physical and cognitive abilities
- **Sociology**
 - Helps to understand the wider context of the interaction
- **Business**
 - Markets the system, determines the value
- **Graphic Design**
 - Designs the user interface (element) presentations - aesthetics
- **Communications**
 - Technical writing to produces training materials, manuals, etc.
 - Effective information interaction

Psychology and Cognitive Science

- **HCI design principles** based on **psychology** and **cognitive science** principles

“Usability **guidelines live for a long time**; usability **methods live even longer**. **Human behavior changes much more slowly** than the technology we all find so fascinating, and the best approaches to studying this behavior hardly change at all.”

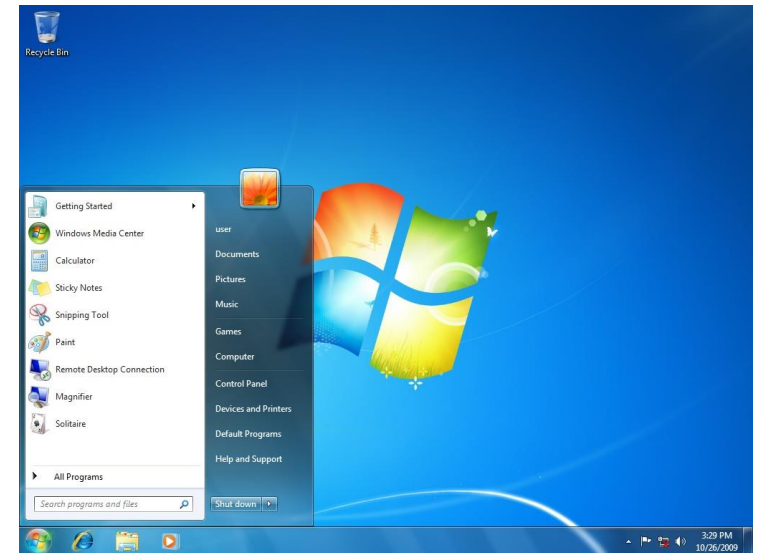
Jakob Nielsen

Who Builds Interfaces?

- Ideally: A multidisciplinary team of specialists
 - Graphic designers
 - UX interaction designers
 - Ergonomic specialists
 - Technical writers
 - Marketers
 - Software engineers
 - Customers and users

Changing Concept of Computing and Interaction

- **“Traditional” computing** – graphical user interfaces (GUI) on desktops, laptops, the web
 - User **interaction** is **doing** computing **tasks**
- **Design for usability performance ...**
 - Help **novices** become **experts**
 - Help experts be highly **productive**
 - Readily **measureable**



From Usability To User Experience (UX)

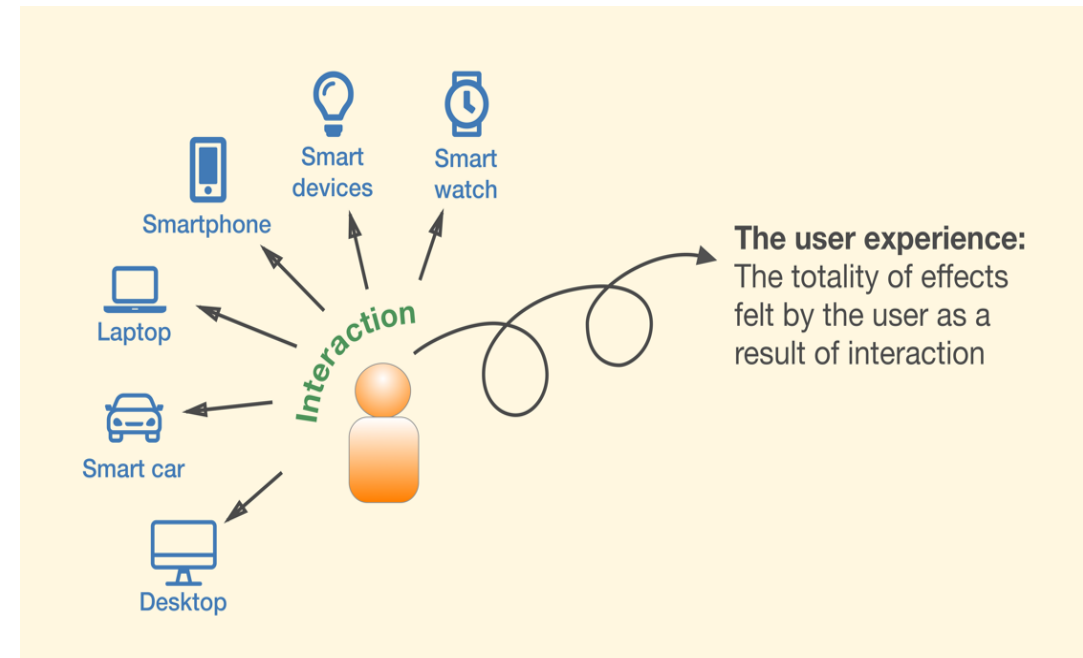
- Progression from **narrow** focus on task performance to **totality of effects** felt by the user
 - Personal connection - emotion, social, political, and cultural implications
 - Fun, style, art
 - Branding, reputation



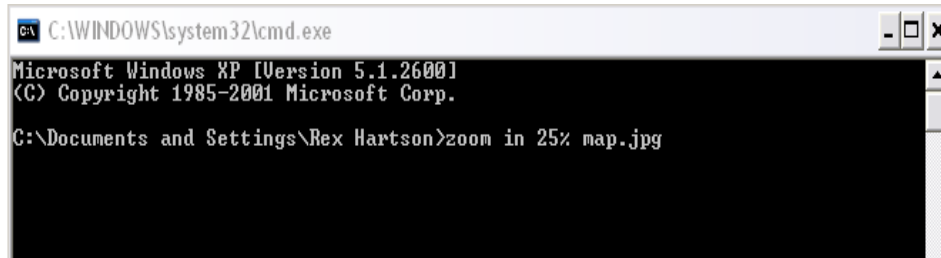
“The world is not a desktop” — Tscheligi, 2005 (paraphrasing Mark Weiser)

From Usability to User Experience

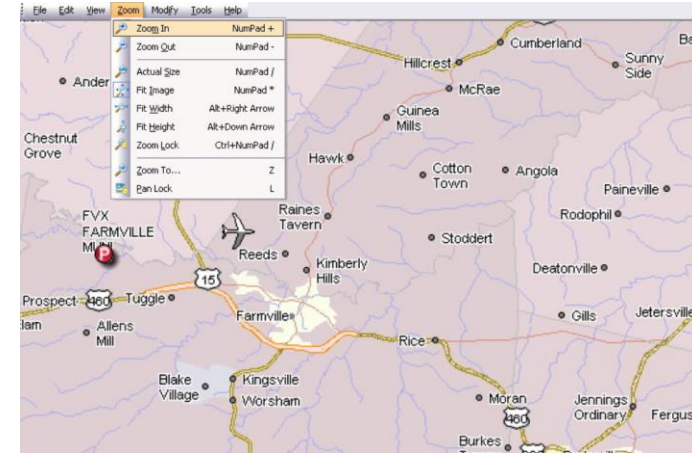
- Interaction in the **UX context** is broad ...
 - **Seeing, touching, and thinking** about system or product
 - **Admiration and anticipation before** ...
 - **Entire experience during** ...
 - **Savoring memory after** ... interaction



An example: User to zoom in on map image



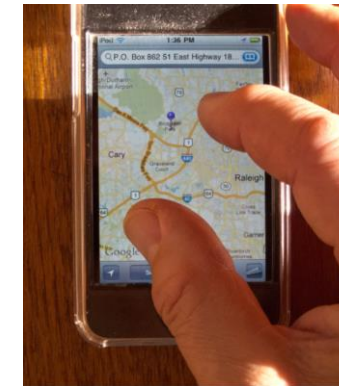
1. Command line



2. Command, via pull\down menu



3. Direct manipulation, click on “+” or “-” icon



4. Direct manipulation finger touch

UX Components

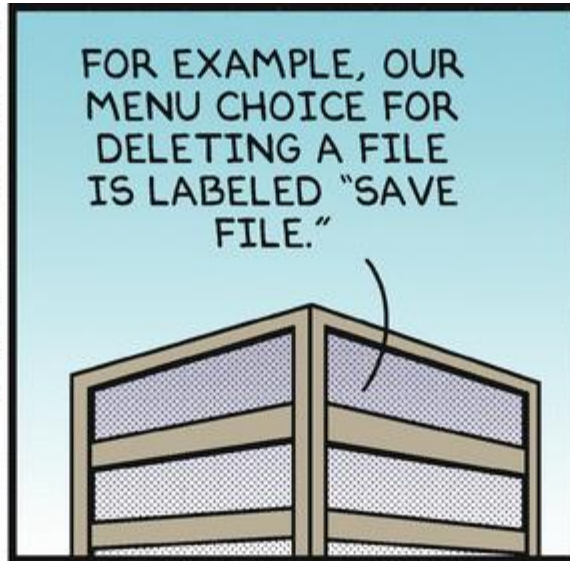
- Usability
 - Learnability, memorability, productivity/efficiency, understandability, user satisfaction
 - Still essential as pragmatic **quality measures**
- Usefulness
 - System functionality
 - The ability to **accomplish work (or play) goals**
- Emotional impact
 - About user **feelings**: engagement, self identity, aesthetics, “coolness” factor, fun, joy of use
 - (Relates to user satisfaction)

Measuring UX

- **Hard to measure** directly
- **Usability** and **usefulness** evaluation – generally quantifiable
- **Emotional impact** more **challenging**
 - Estimate UX via qualitative and quantitative indicators
 - Qualitative **interviews, surveys, observation** to understand before, during, after experience



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