

Usability Engineering

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SWE 632

User Interface Design and Development

The Usability Engineering Life Cycle.

Jakob Nielsen, IEEE Computer, March 1992

The Obstacles and Myths of Usability and Software Engineering

Ahmed Seffah and Eduard Metzker, CACM, November 2004

Usability Engineering

- Incorporate usability into the entire development process
- A number of usability “stages” that correspond to software development stages
- Best practices for ensuring usability

Three Stages

1. Pre Design
2. Design
3. Post Design

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Pre-Design Stage (1)

A. Know the user

- Work experience
- Age
- Education
- Previous computer experience
- Reading skills
- Language skills
- Work environment
- Frequency of task

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Pre-Design Stage (2)

B. User's tasks

- Goals of task
- Whether software is a major part
- How task was done previously
- Weaknesses in previous method

C. Evolution of users

- What will they learn?
- How will they transition?
- Offer customization and shortcuts

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Pre-Design Stage (3)

D. Competitive analysis

- Look at competing products (our evaluations)
- Prototypes

E. Set usability goals

- 5 criteria (**learn, speed, errors, ss, retention**)
- Worst acceptable level
- Planned usability level
- Current level (competitive systems)
- Best possible

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Design Stage (1)

A. Participatory design

- Consult users during design
- They will not create, but will react
- Show them prototypes!

B. Coordinated design (consistency)

- Centralized authority
- Floating usability expert
- Interface standards
- Product identity
- Template

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Design Stage (2)

C. Guidelines

- General guidelines (all interfaces)
- Category-specific (eg, command languages)
- Product-specific (eg, Office PPT)
- Examples:
 - Use users' language
 - Minimize memory load
 - Effective error messages

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Design Stage (3)

D. Prototyping

E. Empirical testing

- Test each function and semantically meaningful sequences
- Have users think aloud during use
- Use constructive interaction – two people together
- Give attitude questionnaires
- Test users' knowledge before and after
- Automatically log actions
- Observe users

F. Iterative design

- Retest after each iteration

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Post Design

After product release, gather data for future versions and products:

- User mistakes
- Questions from users
- How often is each feature used ?

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Top Methods for Interface Design

Top 5 in use

1. Visit customer site
2. Iterative design
3. Participatory design
4. Prototype
5. Competitive analysis

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Top Methods for Interface Design

Top 5 in use

1. Visit customer site
2. Iterative design
3. Participatory design
4. Prototype
5. Competitive analysis

Top 6 in impact

1. Iterative design
2. Task analysis
3. Empirical testing
4. Participatory design
5. Visit customer side
6. Maintenance visit

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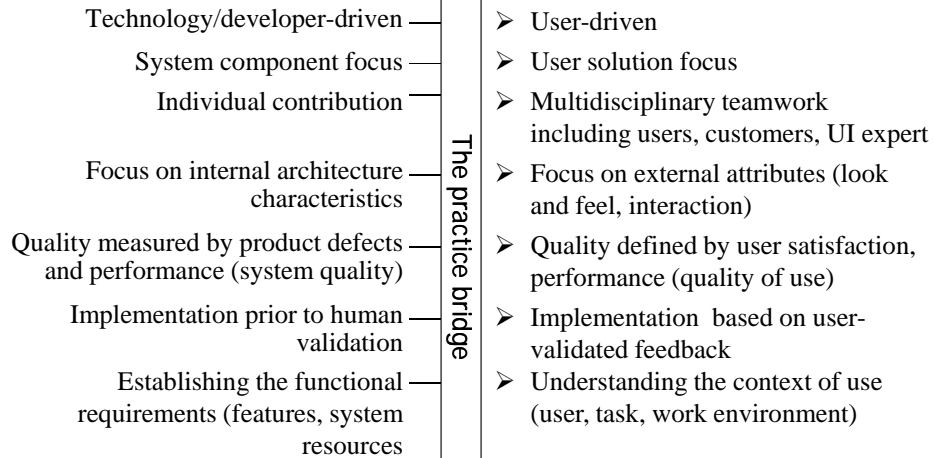
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Human-Centered Development

Traditional practices in software development

Best practices in human-centered development

Versus



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Summary

**one of the hardest things to change is
process
but it's necessary if you want usable software**

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