User Experience in Machinery Automation — from Concepts and Context to Design Implications

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Overview

• **Context: What is machinery automation?**
• One definition of User eXperience (UX)
• How UX differs from usability?
• What UX means for machinery automation design
• Quick look at one possible future
• Conclusions & discussion
Examples of machinery automation
Characteristics

- Systems are mixed combination of desktop applications and embedded systems

- Tasks include
  - controlling and monitoring the process
  - solving problems (breakdowns, quality or efficiency problems)
  - collecting and analyzing statistics
  - using the information in other systems, e.g. production details
Characteristics

• User’s main goal is in productivity, not in the software application
• Hands, thoughts and attention occupied
• Complicated parameterized systems
• User population: illiteracy vs. 3 years of training
Usability is *use quality*

- The effectiveness, efficiency and satisfaction of using a product
  - Depends on a context: who, where, when and what

**User experience (UX) is *hedonic quality***

- The goal is to make products more than useful – attractive (enjoyable) to use
  - Personal relationship with the product
  -Peer recommendations, customer loyalty, brand value
Usefulness vs. pleasurability in products

**Usefulness**
- Focus on productivity
- User tries to achieve a practical goal, use is minimized
- Product supports user’s tasks

**Pleasurability**
- Focus on satisfaction and product bonding
- Use is a goal in itself, even addiction created
- Product supports users personal goals and needs
Hassenzahl’s User Experience definition

Hassenzahl’s User Experience definition

The Joys of Rock Crushing
Hedonism in here?

apparent product character
pragmatic attributes
manipulation
hedonic attributes
stimulation
Identification
evocation

situation
Heat/cold
Dust
Noise
Vibration
Flying stones
On site traffic
Hedonism

- Happiness, joy, satisfaction
- Definitions of happiness :)  
  a) euforic most of the time  
  b) pleasantly satisfied  
  c) absence of serious problems and pains
Happiness, option c) Absence of serious problems & pains?

- Solitude…
- Users are afraid of harming the system
  - This stress can be relieved by
    - better communication,
    - support for maintenance,
    - support for understanding the system status
    - feedback about the user’s actions in high level
Relevant dimensions of UX

• **Individual’s personal development**
  – Challenging one self, control & completion
  – Support for personal development
  – Support for analysis of achievements
  – **Flow, PLEX**

• **Social issues**
  – Sharing data/achievements
  – Sharing tips & hints, feelings, fellowship
  – Communication with maintenance, colleagues, customers
    • or ”the ones we care for”?
  – Expression
More hedonism

• Stimulation
  – Monotonous & repetitious tasks should be counterbalanced without risking efficiency

• Identity & self expression (professionalism)
  – Simplicity <-> Impressive system & tailorability

• Both extremes are necessary to serve
The third element of UX

- Consequences
  - Luring the user to spend more time w. system
    - learn more about optimising the system/process
    - learn new ways to do things
  - Impressive system -> better sales
Long term trends & UX

“A possible vision of future harvester work”
(published by permission from the author)
Conclusions

- In machinery automation & work systems in general:
  - So far user’s personal development or sociability has not been a design goal
  - When the systems become more complicated, it will be necessary to offer hedonistic lures

- Consider also personal needs – aspirations, fears etc.

- When necessary, let the users show off with your system, so that they can be proud of it

- UX offers new ideas applicable even in field like this – but there is a strong need for conservatism too
Possible discussion?

• To what (if any?) extent can good UX compensate for poor usability?

• In the extreme cases, are there realistic ways to offer any hedonistic lures?
  – If not, how to circumvent the extremity?
  – Can you make the extreme desirable?
• Plex: Hannu Korhonen et al: Understanding playful user experience through digital games, DPPI2009