Studying emotions and non-instrumental qualities as parts of the user experience

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Background
Research framework
Methodological aspects
Empirical research
Consequences and application
Evaluation of quality in use
(Bevan, 1995; ISO 9241-11, 1998)

- Interaction-centred components
  - Effectiveness
  - Efficiency

- User-centred components
  - Satisfaction
New concepts regarding user-centred components

- fun of use (Carrol & Thomas, 1988)
- emotional usability (Logan, 1994; Kim & Moon, 1998)
- ludic products (Gaver & Martin, 2000)
- pleasurable products (Jordan, 2000)
- hedonic quality (Hassenzahl, 2001)
- product emotions (Desmet & Hekkert, 2002)
- visual aesthetics (Lavie & Tracstinsky, 2004)
- affective quality (Zhang & Li, 2005)
User-centred perspective on product quality gets more important!

A lot of new components, but ...
  - ... which are important?
  - ... how do they interact?
  - ... how to use them to evaluate user experiences with interactive systems?
Research framework

System properties
- Input, Output, Interaction Style, Product Design, ...

Perception of instrumental qualities
- Usefulness, Usability, ...

Perception of non-instrumental qualities
- Hedonic quality
  - Stimulation
  - Identification
  - Aesthetics
  - Haptic quality, ...

Emotional experience
- Excitement, pleasure & joy
- Satisfaction
- Anger & disgust
- Frustration
- Boredom, ...

User experience processes

Consequences of user experience
- Judgements
- Behavioral consequences
Better understand the components of user experience and their connections to ...

- ... investigate the effects of quality assessments on emotional experiences,
- ... research their influence on overall judgments and usage behaviour and
- ... question which system qualities affect the components of user experience.
Emotional reactions as multifaceted phenomena

- Studying the relationship between different components of emotions (Process Model; Scherer, 1984)
  - cognitive: appraisal questionnaire
  - physiological: skin conductivity, heart rate
  - facial action: electromyographic (zygomaticus, corrugator)
  - subjective feelings: SAM (self-assessment manikin)
  - behavioural: accuracy and speed during working tasks

- Aim: understand which methods are best applicable to study emotional consequences as part of the user experience
Methodological aspects

Perception of non-instrumental qualities

- Aesthetic and symbolic dimensions
  - Visual aesthetic
  - Haptic quality
  - Identification
  - Acoustic quality
  - Stimulation
  - ...

- Aim: understand which components are important and which methods are best applicable to study non-instrumental qualities as part of user experience
User experience evaluation approach

- Studying *instrumental and non-instrumental qualities* as well as *emotional user reactions* ...
- ... in the domain of consumer electronics (digital audio players).
Case study

- 30 participants
- Questionnaires to survey the components of user experience
  - Task-related qualities: perceived usefulness & ease of use (Davis, 1989)
  - Non task-related qualities: hedonic quality (Hassenzahl, 2004), visual aesthetics (Lavie & Tractinsky, 2004), haptic quality (Jordan, 2000)
  - Emotional consequences: self-assessment manikin (Morris, 1995)
  - Judgements: ranking, overall acceptance
## Empirical research

<table>
<thead>
<tr>
<th>Task-related qualities</th>
<th>Non task-related qualities</th>
<th>Emotional consequences</th>
<th>Overall judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>higher ratings regarding haptic and hedonic quality as well as visual aesthetics</td>
<td>more pleasurable and arousing</td>
<td>higher ranking, better acceptance ratings</td>
</tr>
</tbody>
</table>
Empirical research

Experimental approach

- First study finished
  - Controlled variation of usability and visual aesthetics of a digital audio player prototype
  - How do these influence emotional experiences during system use (questionnaires & physiological data)?
  - In which way are overall judgements founded?
  - 48 participants, first results
- Second study in planning ...
Empirical research

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- Second study in planning
The presented work provides
- theoretical foundations,
- methodological knowledge and
- empirical results.

How to prepare these contributions for the application in
- evaluation and
- design of interactive systems?
Thank you!

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