Talk
Approaches and Solutions for Cross-Cultural Usability Engineering

Christian Sturm, University of Joensuu, 08. March 2006

Overview

- Background
- Culture
- TLCC – a model for the internationalization of products
- International Usability Engineering
- Cross-cultural usability for mobile devices
- Discussion
Background

- **Education**
  - Dipl.-Inf. (FH), University of Applied Sciences Furtwangen
  - Focus: Computer graphics, 3D Animation, Visual effects
  - PhD candidate University of Freiburg
  - Cognitive Science, Cultural Anthropology, Telematics

- **Mexico (2+ years)**
  - Tec de Monterrey, Mexico City
  - fiction digital imaging S.A. de C.V., Mexico City
  - Universidad Tecnológica de la Mixteca, Oaxaca, Mexico
  - Fieldwork, Usability testing and software development

- **Freelancing Consultant (4+ years)**

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**Facial animation**

**Television trailer**

**Architectural visualization**
Background

Siemens Mobile / BenQ Mobile

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Culture – a definition

“Culture is an integrated system of learned behavior patterns that are characteristic of members of any given society. Culture refers to the total way of life of particular groups of people. It includes everything that a group of people thinks, says, does, and makes—its systems of attitudes and feelings. Culture is learned and transmitted from generation to generation.”

(Kohls, 1996)
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TLCC

- Are we all equal?
Are we all different?

The truth lies in the middle!
The truth lies in the middle!

- Global product
  - One product for all

- Internationalized product
  - Identification of common base
  - Remove cultural sensitive parts
  - Prepare product for localization

- Localized product
  - Identification of local requirements
  - Cultural sensitive parts are replaced by local components
**Technology**

- technical Infrastructure
- Mobile networks: GSM, TDMA, CDMA, UMTS
- Electric: 110/220V, 50/60Hz
- plugs
- Video standards: PAL, NTSC, SECAM
- Coding standards (Unicode)
Linguistics
- Translation of Interface
- Use of words
- Spelling of words
- Vocabulary
- Grammatical structure (perf. compuesto vs. pret. indefinido)
Why language and culture is separated?
- Neutral Spanish
- Mid-Atlantic Spanish
- International Spanish
- Universal Spanish
- Spanish for Spain, Mexico, Chile, Argentina etc.
- Examples: Movies, Webpages etc.
Culture
- Meanings/Interpretations
  - colours, symbols, melodies
  - metaphors
- Context of use
  - function of technology in society
  - functions in device that make sense in context
- Questioning things you take for granted
TLCC

- Technology
- Linguistics
- Culture
- Cognition

Infrastructure
Translation
Funcionality
Interaction

TLCC

- Cognition – Menus
  - Menu structures (taxonomies)
  - Priorities of functionalities
  - Naming of functionalities
  - Search strategies

Menu

Functions
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### International Usability Engineering

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<th>Other</th>
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<td>Participants</td>
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<td>Methods</td>
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<td>Tasks</td>
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Example 1: »Thinking Aloud« in Malaysia (Yeo, 2001)
- Methods not efficient
- Malaysia: collectivistic culture
- Two important concepts
  - conservation of harmony
  - "saving face"
- Solutions:
  - develop confidence
  - Participants with a lot of experience in technology
International Usability Engineering

- Example 2: “SAPEN”
  - “Sistema de Administración de Proyectos en línea”
  - Mexico-City based post production facility
  - Initial question: How can a new network of worldwide facilities collaborate?
  - Timeframe: 6 months
  - Method:
    - 2 months participant observation
    - 1 months in-depth interviews
    - 1,5 months implementation
    - 0,5 month introduction and final testing
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Cross-cultural usability for mobile devices

- Technology
- Linguistics
- Culture
- Cognition
Cross-cultural usability for mobile devices

- **cultural level**
  - 8-months ethnographic fieldwork in Mexico
  - Exploration of how mobile phones are used, what they mean for the young people (16-24 years)
  - Mexico City and Huajuapan de León, Oaxaca
  - Interviews, participant observation, visual methods
  - All social classes
  - Example: Mobile phone cheaper than fixed line

- **cognitive level**
  - Test of 4 different menu versions
  - Hierarchy (strong, flat), Structure (verb-, object oriented)
  - Relation to field-dependence, formal schooling, computer experience
  - 72 participants, Mexico and Germany

- **object-oriented menu**
  - Phone book.
    - Show entry.
    - ...
  - Call records.
    - Missed calls
    - ...

- **verb-oriented menu**
  - Send
    - New SMS…
  - Look up
    - Phone number…
Cross-cultural usability for mobile devices

- The software

- The tasks
  - “You want to search the dialed calls”
  - “You want to change the volume of the ringer tone for normal calls”
  - “You want to use the alarm clock”
  - “You want to read again a SMS that you have recently received”
Cross-cultural usability for mobile devices

- **Test design**
  - A: groups, B: menus, C: tasks
  - 24 different ways to order menus

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<tr>
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<th>b1</th>
<th>b2</th>
<th>b3</th>
<th>b4</th>
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<td>c1</td>
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<td>a3</td>
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- **Geographic focus (Mexico)**

  - Huajuapan de León
  - Mexico City
Cross-cultural usability for mobile devices

- Geographic focus (Germany)

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<thead>
<tr>
<th>Place</th>
<th>Group 1 (MX1)</th>
<th>Group 2 (MX2)</th>
<th>Group 3 (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 non-students Mexico</td>
<td>24 students Mexico</td>
<td>24 students Germany</td>
</tr>
<tr>
<td><strong>Place</strong></td>
<td>Huajuapan de León, Oaxaca, Mexico</td>
<td>Huajuapan de León, Oaxaca, Mexico</td>
<td>Munich, Freiburg, Furtwangen, Kiel</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>17-25 (mean: 20.3, SD: 2.44)</td>
<td>19-25 (mean: 19.8, SD: 1.86)</td>
<td>18-25 (mean: 22.4, SD: 1.95)</td>
</tr>
<tr>
<td><strong>Mobile phone ownership</strong></td>
<td>0.26 years (mean) SD: 0.46</td>
<td>0.50 years (mean) SD: 0.33</td>
<td>0.30 years (mean) SD: 0.75</td>
</tr>
<tr>
<td><strong>Computer experience</strong></td>
<td>0.82 years (mean) SD: 0.84</td>
<td>0.25 years (mean) SD: 0.25</td>
<td>11.25 years (mean) SD: 4.04</td>
</tr>
<tr>
<td><strong>Formal education</strong></td>
<td>9.25 years (mean) SD: 1.15</td>
<td>13.58 (mean) SD: 1.25</td>
<td>15.42 years (mean) SD: 1.76</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>12 male 12 female</td>
<td>12 male (6 tec, 6 non-tec)</td>
<td>12 male (6 tec, 6 non-tec)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 fem. (5 tec, 6 non-tec)</td>
<td>12 fem. (5 tec, 6 non-tec)</td>
</tr>
<tr>
<td><strong>Native language</strong></td>
<td>22 Spanish, 1 Mixteco (fluent in Spanish)</td>
<td>24 Spanish</td>
<td>22 German, 1 Spanish, 1 Russian (fluent German)</td>
</tr>
</tbody>
</table>
## Cross-cultural usability for mobile devices

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<thead>
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<th>Group 1 (MX1) 24 non-students Mexico</th>
<th>Group 2 (MX2) 24 students Mexico</th>
<th>Group 3 (D) 26 students Germany</th>
</tr>
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<tbody>
<tr>
<td>Strong hierarchy</td>
<td>21.24</td>
<td>10.00</td>
<td>4.87</td>
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<tr>
<td>Flat hierarchy</td>
<td>14.44</td>
<td>5.89</td>
<td>3.42</td>
</tr>
<tr>
<td></td>
<td>$F = 23.21^{**}$</td>
<td>$F = 20.61^{***}$</td>
<td>$F = 9.40^{***}$</td>
</tr>
<tr>
<td>Object-oriented</td>
<td>17.33</td>
<td>6.72</td>
<td>3.70</td>
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<tr>
<td>Verb-oriented</td>
<td>14.39</td>
<td>8.02</td>
<td>4.67</td>
</tr>
<tr>
<td></td>
<td>$F = 3.66^*$</td>
<td>$F = 2.36$ n.s.</td>
<td>$F = 3.44^*$</td>
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*p<.10 **p<.05 ***p<.01

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### Quote

„Every tool carries with it the spirit by which it has been created“

Werner Karl Heisenberg
Thank you for your attention!

Christian Sturm
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