Evaluation of the Virtual Turkish Chess Player Installation at TMW

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Evaluation Design
Evaluation Context (1/2)

- context of museum multimedia: usability and visitor orientation
  - quality of use of applications by end-users
  - educational role of the museum, knowledge provision
    ICOM Code of Ethics for Museums (2001)

Evaluation Context (2/2)

Sketch based on Bevan, Nigel (1995): Usability is Quality of Use
Sources for Evaluation Methods

- ISO (ed.) (1996/98): Ergonomic requirements for office work with visual display terminals (VDTs)

„Standardized“ Evaluation Criteria

- effectiveness
  - degree of interaction success
- efficiency
  - time it takes to perform interaction
- subjective acceptance
  - user satisfaction

→ ISO-standardized criteria, but not directly measureable for VS.
Areas for Quality Assessment

• general information
• previous experience
• visual representation quality
• degree of immersion
• interaction quality
• (degree of) control of chess game
• quality of historical texts
• visitor acceptance

Methods applied

• visitor observation →
• semi-structured, guided interviews (hand-out)
Evaluation setup

Chess Player Setup (1/2)
Chess Player Setup (2/2)

projection source  head tracker  hand tracker  ceiling light:
contrast enhancement for hand tracker

Visitor Interaction
Evaluation Results

gained from 30 qualitative interviews

General Information (1/3)

- gender distribution:
  - women: 40%
  - men: 60%

- average age: approx. 33 years.
- duration of interaction: avg. 15 mins.
General Information (2/3)

- Group visitors: 10 out of 30
- TMW already visited: 20 out of 30

General Information (3/3)

- Visitors coming to the medien.welten for the first time: 25 out of 30
- Persons already informed about VS project: 3 out of 30
Previous Experience (1/2)

**Previous experience with digital media**

- Installations in museums: 57%
- Interactive virtual exhibitions: 30%
- Virtual Reality: 32%
- Online communities: 20%
- Computer games: 53%
- Computer-animated films: 41%

**Visitors’ familiarity of digital media types**

- Experience with Virtual Reality: 11 out of 30

Experience with VR technology

Frequency distribution of museum visits

- More often: 17%
- Every month: 20%
- Every two months: 13%
- Quarterly: 23%
- One to two times a year: 27%
- More often: 17%

Amount of chess knowledge

- Good: 43%
- Average: 10%
- Few: 17%
- None: 17%
Usability Evaluation Results (1/3)

<table>
<thead>
<tr>
<th>Usability Evaluation</th>
<th>Average</th>
<th>Good</th>
<th>Very Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic aesthetics</td>
<td>65%</td>
<td>77%</td>
<td>90%</td>
</tr>
<tr>
<td>Object placement</td>
<td>65%</td>
<td>77%</td>
<td>100%</td>
</tr>
<tr>
<td>Wearing comfort</td>
<td>65%</td>
<td>77%</td>
<td>100%</td>
</tr>
<tr>
<td>Nativecy of virtual scenery</td>
<td>70%</td>
<td>77%</td>
<td>88%</td>
</tr>
<tr>
<td>Interaction comprehensibility</td>
<td>70%</td>
<td>77%</td>
<td>88%</td>
</tr>
<tr>
<td>Status and orientation</td>
<td>70%</td>
<td>77%</td>
<td>88%</td>
</tr>
<tr>
<td>Scene familiarity</td>
<td>46%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Problmes with navigation and control</td>
<td>46%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Comprehensibility of historical texts</td>
<td>46%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Length of historical texts</td>
<td>46%</td>
<td>88%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Usability Evaluation Results (2/3)

- graphic aesthetics: judged generally as good
- polarization glasses: wearing comfort, problems of sight
- nativeness and immediateness of the virtual scenery: quite good
- mode of interaction: not comprehensible instantly for all test persons
- visitors did not feel lost during the interaction at any time
Usability Evaluation Results (3/3)

• ‘ideal’ hand gesture difficult for visitors to achieve immediately:
  – hand-tracking: critical point in VS setup
    • 2-dimensional optical tracking, therefore optimal for one single hand gesture
  – further explanation needed

Visitor Acceptance (1/2)

Level of visitor eagerness to try VS technology again

Level of visitor suitability judgement for VS technology

Willingness to pay higher entrance fees
Visitor Acceptance (2/2)

Visitor Feedback

- “The installation is very remarkable regarding its technological novelty.”
- “A unique experience for visitors.”
- “Exciting, entertaining, funny!”

Expected Maintenance

- exchange of projection lamps
- renewal of polarization glasses
- in case of hardware defect:
  - repair by IT company w/ support contract
- no content update needed
VS in practice

• Tips for further equally successful implementations of virtual or hybrid showcases:
  – unique installation that conveys a clear PUS message
  – functional division between physical and virtual presentation media and layer
  – sufficient content (neither too few nor too much)
  – attractive design for all user groups
  – clear and simple mode of interaction
  – cost-effective presentation design

Thank you for your attention!

Any questions or further remarks?