Towards a Framework for the Design of Tailorable User Interfaces

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Project funded by FAPESP and Informatics Research Centre
Summary

- Being together

- Introduction
  - Context and motivation
  - Objectives
  - Research methodology

- Activities already developed

- Planned activities – IRC / University of Reading
Visiting IRC in 2007
InterHAD
Human – Digital Artifacts Interaction group

14/11/2008
Context of diversity

- Brazil
  - 29% below the poverty line
  - 26% functional illiterates
  - 14.5% have impairment

- UK
  - 15% mixed cultures and ethnicities
  - 18.2% long-term illness, health problem or disability
  - 18% elderly

- User interfaces do not enable interaction for all
  - do not consider the different interaction needs present in population
Motivation

- Grand Challenges in Computer Science Research in Brazil 2006-2016 (Brazilian Computer Society)
  - Participative and universal access to knowledge for Brazilian citizen
    - “extending computational systems to all Brazilians, respecting their diversity”
    - “access must be universal and participative”
    - “flexible and adjustable interfaces are state of the art research topics in the area of Human-Computer Interaction”

- Design for all
  - “simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost” (CDU – North Caroline State University)
Design for All

accessible  universal
General Objective

- Search for solutions that support the development of user interfaces which provide access and make sense to users, under the Design for All

- One approach >> interfaces that can be adjusted

- Tailoring
  - activity of changing a computer application according to its context of use (Kahler et al., 2000)
Specific objective

- Formulate and validate a framework* to support the design of tailor-able interfaces considering different interaction requirements from users with different skills.

* structure consisting of guidelines, mechanisms, artifacts and systems used for planning and design decision-making.
Methodological and Theoretical References

- Organizational Semiotics (OS) (Liu, 2000, Stamper et al., 1988, 2000; Stamper, 1993)
  - end-user tailorable applications should communicate the possibility of change
    - communication flows in a shared system of signs
    - OS gives us methods and artifacts to work with the signs of interest
  - current tailorable systems demand abilities that unsophisticated users may not have
    - OS approach clarifies notion of human responsibility and possibility of delegation of functions to a computer system
Methodological and Theoretical References

- Participatory Design  
  (Schüler and Namioka, 1993)

- Inclusive Design  
  (Melo and Baranauskas, 2006; Connel at al. 1997)
  - mutual construction
  - mutual respect

- Capturing diversity
Research strategy and scenarios

- Experimenting design of tailororable interfaces
- Framework formalization and validation
- 2 study cases:
  - Case 1: STID
    - CPqD – NIED
  - Case 2: e-Cidadania
    - FAPESP – Microsoft Research
Case 1: STID

Design Rationale

Semio-participatory workshops

Participatory practices

Design group
Case 1: STID

Conceptual model

Intelligibility
Procedure visibility
Flexibility
Redundancy
Case 1: Tailorable solution

- Infra-structure (Bonacin and Baranauskas, 2005)
  - Norms
    - Behavior patterns
  - Webservices

- Specifying and implementing different scenarios

Whenever cintia then system (?Z) should use libras
Case 2: e-Cidadania

Problem Articulation Method - PAM
Case 2: e-Cidadania

Semantic Articulation Method - SAM

1st – Problem definition

2nd – Affordances definition

3rd – Candidates grouping

4th – Ontology Diagram
Case 2: e-Cidadania

PACFILMO

“Who shares what with whom, when, how, where, using what and why?”

<table>
<thead>
<tr>
<th>Whenever &lt;condition&gt;</th>
<th>If &lt;state&gt;</th>
<th>Then &lt;agent&gt;</th>
<th>is &lt;deontic operator&gt;</th>
<th>To &lt;action&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>before using someone else’s knowledge</td>
<td>a person</td>
<td>must</td>
<td>ask permission to that person</td>
</tr>
<tr>
<td>During events or daily at CRJ</td>
<td>there are young people interested</td>
<td>teachers</td>
<td>may</td>
<td>offer Manga class using paper, pen and posters</td>
</tr>
<tr>
<td>Always</td>
<td>there is an event</td>
<td>CIDARTE coordinator</td>
<td>must</td>
<td>share with the group information about the event. S/He may use posters, face-to-face communication and also email.</td>
</tr>
</tbody>
</table>
Case 2: e-Cidadania

Different navigation structures

Different positions for interaction areas

awareness
Case 2: e-Cidadania

Norms editor

ICE

NBIC

Tailoring Development Framework

e-Cidadania Flexible User Interface

designer

end users
Planned activities for IRC
Validating STID approach

- Refine the design approach (based on OS methods and artifacts and Participatory Design techniques)
  - inspection of the process deliverables
  - potential of reusing the process (UK context)

- Deliverables:
  - Technical report describing STID process
  - Journal paper
Planned activities – IRC
Norms and tailoring

● Formulate the relations between norms and tailorable behavior

● Validate it within another context (UK)
  ● norms from a different diversity context

● Deliverables:
  ● Technical report
  ● Conference paper considering two cases (e-Cidadania and UK)
Publications so far


- 5 technical reports
Acknowledgements and Contact

- IC/UNICAMP
- FAPESP
- Informatics Research Centre/University of Reading
- InterHAD
- NIED
- CRJ/Casa Brasil
- Microsoft Research – FAPESP Institute for IT Research

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e-Cidadania website
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