Main design problems – Mobile Web, Exploiting context
Web browsing

Design of mobile web portals
Users are not browsing on PDAs

- **User strategies on the web (Nielsen, 1993)**
  - 20% just browsing (without goal)
  - 50% clear goal and searching
  - 30% mix

- **What happens on the mobile device**
  - very much scrolling
  - very limited time
  - very often interruption of activities
  - bad design of the web pages
    - visibility, navigation, readability
  - STM and forgetting (4 items, 30 s)

almost nobody is browsing the web
How to find something on the web?

- Visibility of the content
  - Where I am?
  - Where can I go?
  - Where I was?
  - What is near me?

- Navigation in the content
  - Where am I?
  - Where can I go?
  - Where was I?
  - What is near me?

- Reading the content
  - speed
  - overview
How to find something on the web?

- Visibility of the content
- Navigation in the content – Where I am? Where can I go? Where I was?
- What is near me?
- Reading the content – speed, overview

PDA: Main design problems – Mobile Web, Exploiting context

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How to find something on the web?

- Visibility of the content
- Navigation in the content
  - Where am I?
  - Where can I go?
  - Where was I?
  - What is near me?
- Reading the content
  - Speed
  - Overview
How to find something on the web?

- **Visibility**
  - Where?
  - When?
  - What?

- **Navigation**
  - Where am I?
  - Where can I go?
  - Where was I?
  - What is near me?

- **Reading**
  - Speed
  - Overview
How to find something on the web?

- Visibility of the content
- Navigation in the content
- Reading the content

How to solve these problems?

- Information packing
- Fast navigation (searching, landmarks)
- Changes indication (live areas)
- Offer an overview (new visualization methods)
- Different web structure

user must know, that we have done everything possible
Reading the web

- **screen orientation**
  - 1/3 width => 25% slow down
  - 1/5 height => 9% slow down
Reading the web

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- **skim reading**
  - 79% user of the web (Nielsen)
Exploiting context
Main design problems of mobile UI

1. Usage of the screen space
   1a. Small screen space
   1b. Flexible user interfaces

2. User interaction
   2a. Handling the user input
   2b. Direct pointing (stylus/hand)

3. Design generally
   3a. Guidelines
   3b. Strange behavior

4. Exploiting context
   4a. frequent changes
   4b. variety of parameters
   4c. context driven UI
4. Exploiting user context
4. Exploiting user context

- **domain**
- **environment**
- **physical location**
- **end-device capabilities**
- **tasks**
- **application knowledge**
- **user preferences**

Inspector

Knowledge Management System

network status

PDA: Main design problems – Mobile Web, Exploiting context
(14)
4. Exploiting user context: Launcher+
4. Exploiting user context: Launcher+
4. Exploiting user context
4. Exploiting user context: Site inspection

- Voice communication necessary

- Dialogue approaches
  - directed dialogue
  - mixed initiative
  - natural language

- When to speak
  - push to speak
  - push to activate
  - always speak

- Problems?
  - on user side
  - on system side

- Solutions?
  - utilization of the context
    - environment
    - tasks
4. Exploiting user context: Voice UI approaches

Problems of current solutions

- not robust enough, because: low notion of conversation context
  - sensor fusion

- good results only with constrained dialog (constrained language) or lab environment (silence, etc.)

- language defined statically
4. Exploiting user context: Site inspection

H1: What is the content of the store?
C1: It contains 2 barrels.

H2: What are their colors and volumes?
C2: Barrel one.
   Its color is yellow and volume is 50 liters.
   
   Barrel two.
   Its color is blue and volume is 80 liters.

H3: Add annotation to barrel one!
   This barrel seems to contain hazardous liquid.
   I took a sample.

C3: You have recorded: ...

H4: What rooms are next to this room?
C4: An office room is next to this room.
   
 Inspector moves to office room.

H5: Who is the producer of the brown table?
C5: The producer is company XY.
4. Exploiting user context: Site inspection

- Warehouse
- Store
- Office
- Barrel
- Color: yellow, volume: 50l
- Color: blue, volume: 80l
- Has area: 500m²

Conv. language 1

Conv. language 2
4. Exploiting user context: Site inspection

What do you want to do?

lobby

PDA: Main design problems – Mobile Web, Exploiting context (22)
4. Exploiting user context: Site inspection

You have added a chair. Do you want to assign the inventory number?
### 4. Exploiting user context: Site inspection

<table>
<thead>
<tr>
<th></th>
<th>One context</th>
<th>More contexts</th>
<th>More contexts + scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability of scenarios</td>
<td>N/A</td>
<td>N/A</td>
<td>😊</td>
</tr>
<tr>
<td>Usability of contexts</td>
<td>😞</td>
<td>😊</td>
<td>😊</td>
</tr>
</tbody>
</table>

(😊) ... users would appreciate
4. Exploiting user context - conclusions

- adapt the UI according to current context
  - increase intuitiveness
  - increase the speed

- eliminate errors of the user and miscommunication
  - automatic error correction
  - reducing system misunderstanding of the user commands

- predict next steps
  - help the user to solve the task
  - better mapping of the user task to the system functionality
Strange behavior
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PDA: Main design problems – Mobile Web, Exploiting context

(27)
3b. Strange behavior

- What is the strange behavior on mobile devices and why?
  - new user groups
    - authentication
  - new technical problems
    - synchronization
    - slow response
    - offline/online status
    - read/write conflicts

- How to solve it?
  - make it invisible to the user
  - use different mechanism (with different metaphor)
  - make it unnoticeable
    - pre-fetching
    - caching
Thank you for attention