NUR- Formal description/models of user interfaces

Task models, Sketching, Design studio
Topics introduced in last lecture

- UCD & development process
- Usability
- Design heuristics
- Goal & Task & Action
- Scenarios, use-cases
- Storyboards
Designing Interactive System

USER NEEDS & BEHAVIOR
- Interview transcriptions
- Scenarios & Use-cases
- Storyboards
- User models
- HTA

Source: Buxton 2007

NUR - Formal description/models of user interfaces (Task models, Sketching, Design studio)

DCGI
Hierarchical Task Analysis (HTA)
Task analysis

- Determines in certain way performance of the user during execution of task

- What we need to know
  - what the users are doing
  - what they need for their activity (tools etc.)
  - what they need to know

- It is necessary to divide the task into subtasks (hierarchically) and to analyze single steps

- Method: HTA (Hierarchical Task Analysis)
Hierarchical Task Analysis (HTA)

- **Hierarchy = decomposition**
  - forms a tree
  - goal -> tasks -> subtasks -> steps

- **Plans = execution**
  - sequences of steps to be performed
  - only leafs of the tree take place in plans

Plan A: 1.1.1 – 1.2.1 – 1.2.3
Plan B: 1.1.2 – 1.2.2 OR 1.2.3
HTA: Building a tree

- Pay attention to the level of decomposition

Questions
- Can we continue in decomposition?
- Do we know in which order to execute single subtasks?
- Is it (always) important?
Diagrammatic HTA

- Line under box means no further expansion
- Plans shown on diagram or written elsewhere

Plan 0.
- Make a cup of tea

Plan 1.
- Boil water
- Empty pot
- Put tea leaves in pot
- Pour in boiling water
- Wait 4 or 5 minutes

Plan 1.1
- Fill kettle

Plan 1.2
- Put kettle on stove

Plan 1.3
- Wait for kettle to boil

Plan 1.4
- Turn off gas

Plan 2
- Wait 4 or 5 minutes

Plan 3
- Pour tea

Plan 4
- Fill kettle

Plan 5
- Put kettle on stove

Plan 6
- Wait 4 or 5 minutes

Plan 7
- Pour tea
Redefined HTA For Making Tea

0. make cups of tea

plan 0.
do plan 1 at the same time, if the pot is full 2 then plan 3 - 4 after 4/5 minutes do plan 5

1. boil water
2. empty pot
3. make pot
4. wait 4 or 5 minutes
5. pour tea

plan 1.
1.1 - 1.2 - 1.3 - 1.4 when kettle boils 1.5

plan 3.
3.1 - 3.2 - 3.3

plan 5.
5.1 - 5.2 empty cups? NO for each guest plan 5.3

5.1. put milk in cup
5.2. fill cup with tea
5.3. do sugar

plan 5.3.
5.3.1 - if wanted 5.3.2

5.3.1. ask guest about sugar
5.3.2. add sugar to taste

3.1. warm pot
3.2. put tea leaves in pot
3.3. pour in boiling water

1.1. fill kettle
1.2. put kettle on stove
1.3. turn on and light gas
1.4. wait for kettle to boil
1.5. turn off gas

NUR- Formal description/models of user interfaces (Task models, Sketching, Design studio)
Weather forecast HTA

1. Manage settings
   1.1 set favorite places
   1.2 set units

2. Select place
   2.1 select country
   2.2 select region

3. Select date range

4. View weather forecast
   4.1 chose wind forecast
   4.2 chose temp. forecast
   4.3 chose precip. forecast

Plan 1: 2.1 – 2.2 – 3 – 4.2
Plan 2: 2.3 – 3 – 1.1 – {4.1, 4.2, 4.3}
HTA – what we have gained when using it

- Idea about the **structure of tasks** we need to execute to reach the desired goal

- Idea about the **sequence of individual steps** that brings us to the desired goal
**Alternative description of HTA**

- Besides graphical form it is possible to use textual (structured) form
- It is more compact
- It is harder to read

- Example: how to borrow a book from library
Alternative description of HTA

0. In order to borrow a book from the library
   1. go to the library
   2. find the required book
      2.1 access library catalogue
      2.2 access the search screen
      2.3 enter search criteria
      2.4 identify required book
      2.5 note location
   3. go to correct shelf and retrieve book
   4. take book to checkout counter

■ plan 0:
   1. do 1 – 3 - 4.
   2. If book isn’t on the shelf expected, do plan 2 – 3 - 4.

■ plan 2:
   1. do 2.1 - 2.4 - 2.5.
   2. If book not identified do 2.2 - 2.3 - 2.4.
Alternative description of HTA (diagrammatic)

Borrow a book from the library

plan 0:
do 1-3-4.
If book isn’t on the shelf expected, do plan 2-3-4.

- go to the library
- find required book
- retrieve book from shelf
- take book to counter

plan 2:
do 2.1-2.4-2.5.
If book not identified from information available, do 2.2-2.3-2.4-2.5

- access catalogue
- access search screen
- enter search criteria
- identify required book
- note location
How can be HTA useful?

- **Capture requirements and system design**
  - Models how the user would use the system
  - Based on existing system
    - What should be added? Where do new features fit?
    - What can be left out?
    - What’s most critical? What’s most frequently done?
  - May help you choose a high-level interaction style or think about a conceptual model

- **Detailed interface design**
  - Plans are mapped to paths through dialogs
  - Menu design based on task decomposition

- **Scenarios for user evaluation tests**

- **Manuals, training, help systems**
SKETCHES
Sketch

- describes ideas
- brings questions
- provokes inventions

- hand drawings

- not necessarily by designer
- **NO** explicit & detail solutions
Sketch: Weather forecast for windsurfers
Sketch: Weather forecast for windsurfers
GRAFOOSHA

Design process
GraFooSha: “Hidden electronics”
GraFooSha: Scenario / Storyboard
GraFooSha: Sketches

SKICÍ
Daším krokom bylo skicování, které mne navedlo na výsledný tvar.

PRACOVNÍ MODELY
Na základě skic jsem si vytvořila několik pracovních modelů, které jsem dávala "testovat" seniorkám a sledovala, jak s nimi zacházejí, očekávající jejich cítit na tomu jsem optimalizovala tvar a rozměry.
GraFooSha: Paper mockup
GraFooSha: Prototype
## Sketch vs. Prototype

<table>
<thead>
<tr>
<th>SKETCH</th>
<th>PROTOTYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evocative</td>
<td>Didactic</td>
</tr>
<tr>
<td>Suggest</td>
<td>Describe</td>
</tr>
<tr>
<td>Explore</td>
<td>Refine</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>Propose</td>
<td>Test</td>
</tr>
<tr>
<td>Provoke</td>
<td>Resolve</td>
</tr>
<tr>
<td>Tentative</td>
<td>Specific</td>
</tr>
<tr>
<td>Noncommittal</td>
<td>Depiction</td>
</tr>
</tbody>
</table>

Source: Buxton 2007
## Mockup vs. Prototype

<table>
<thead>
<tr>
<th>MOCKUP</th>
<th>PROTOTYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>- describes UI</td>
<td>- describes UI</td>
</tr>
<tr>
<td>- <em>important</em> application states <em>only</em></td>
<td>- <em>all</em> states (of selected part of application)</td>
</tr>
<tr>
<td>- <em>not all</em> UI elements explicitly depicted</td>
<td>- explicit depiction of <em>all</em> UI elements (of selected part of application)</td>
</tr>
<tr>
<td>- <em>not</em> intended for user testing</td>
<td>- intended for user testing</td>
</tr>
</tbody>
</table>
DESIGN STUDIO
Design studio: What is it good for

- involve all stakeholders into design process at one time
  - NOT only designers
  - ideally 10+ members (divided into small groups)

- come up with shared design ideas
  - contribution from all team members

- focus on main content/functions
  - not an application design
  - hand drawings

http://blog.dobryweb.cz/navrhovani-webu-s-vyuzitim-metody-design-studio
https://www.nngroup.com/articles/facilitating-design-studio-workshop/
Design studio: Results

- better understanding and involvement of the whole team

- sketches

- not directly usable for design

- real designer must create the description for design
Design studio: procedure

before start
- specify application goals and main content/functions
- analyze information from existing application(s)
- user research (usage of existing app, user behavior)
- user group identification

4 stages
- 2 within-team iterations (5-10 minutes each)
- 2 between-team iterations (5-10 minutes each)

3 activities
- sketching
- presenting
- critique
Design studio: practice
Tickets for Prague public transport
# Tickets for Prague public transport

<table>
<thead>
<tr>
<th>Jízdenky</th>
<th>Dospělý (*)</th>
<th>Dítě (**)</th>
<th>Senior (**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 min.</td>
<td>32 Kč</td>
<td>16 Kč</td>
<td>16 Kč</td>
</tr>
<tr>
<td>30 min.</td>
<td>24 Kč</td>
<td>12 Kč</td>
<td>12 Kč</td>
</tr>
<tr>
<td>24 hod.</td>
<td>110 Kč</td>
<td>55 Kč</td>
<td>55 Kč</td>
</tr>
<tr>
<td>72 hod.</td>
<td>310 Kč</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

(*) Dospělý / Od 15 do 70 let
Dítě / Od 6 do 15 let. Od 10 let je potřeba prokázat věk dítěte (vice informaci...)
Senior / Od 60 do 70 let. Pouze s průkazkou PID „Senior 60-70“ (vice informaci...)

### Kdo cestuje za 0 Kč?

<table>
<thead>
<tr>
<th>Kategorie</th>
<th>Podmínky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dítě do 6 let</td>
<td>Doprovod osobou starší 10 let.</td>
</tr>
<tr>
<td>Dítě od 6 do 10 let</td>
<td>Prokázání věku dítěte (vice informaci...)</td>
</tr>
<tr>
<td>Dítě od 10 do 15 let</td>
<td>Speciální aplikace na čipovou kartu nebo Průkaz PID (vice informaci...)</td>
</tr>
<tr>
<td>Senior od 65 do 70 let</td>
<td>Speciální aplikace na čipovou kartu nebo Průkaz PID (vice informaci...)</td>
</tr>
<tr>
<td>Senior od 70 let</td>
<td>Občanský průkaz členské země EU (vice informaci...)</td>
</tr>
<tr>
<td>Osoba ZTP</td>
<td>Český průkaz ZTP nebo ZTP/P. S průkazem ZTP/P je přeprava zdarma i pro průvodce.</td>
</tr>
<tr>
<td>Doprovod dítěte do 3 let</td>
<td>Průkaz PID. Dítě do 3 let (vice informaci...)</td>
</tr>
<tr>
<td></td>
<td>Maximálně i osoba/i dítě.</td>
</tr>
</tbody>
</table>

### Kolik stojí přeprava zavazadel a psů?

<table>
<thead>
<tr>
<th>Zavazadlo</th>
<th>Jízdní kolo</th>
<th>Kočárek s dítětem</th>
<th>Pes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Kč</td>
<td>0 Kč</td>
<td>0 Kč</td>
<td>0 Kč</td>
</tr>
</tbody>
</table>
Designing Interactive System

USER NEEDS&BEHAVIOR
- Interview transcriptions
- Scenarios & Use-cases
- Storyboards
- User models
- HTA

Designing Interactive System

IDEAS & CONCEPTS
- Sketching
- Design studio

Source: Buxton 2007

NUR- Formal description/models of user interfaces (Task models, Sketching, Design studio)
Example question for examination

- How can you describe HTA method for analysis of future application?
- What is the result of Design studio technique?
- Describe sketches with respect to prototypes.
- What is the difference between Mockup and Prototype?
Thank you for attention