

METHODS FOR DEVELOPMENT OF THE USER INTERFACE IN A DANISH E-HEALTH SYSTEM



Create User Profile

Profile Name

Standard Values

*Staff

*Team

OK Cancel



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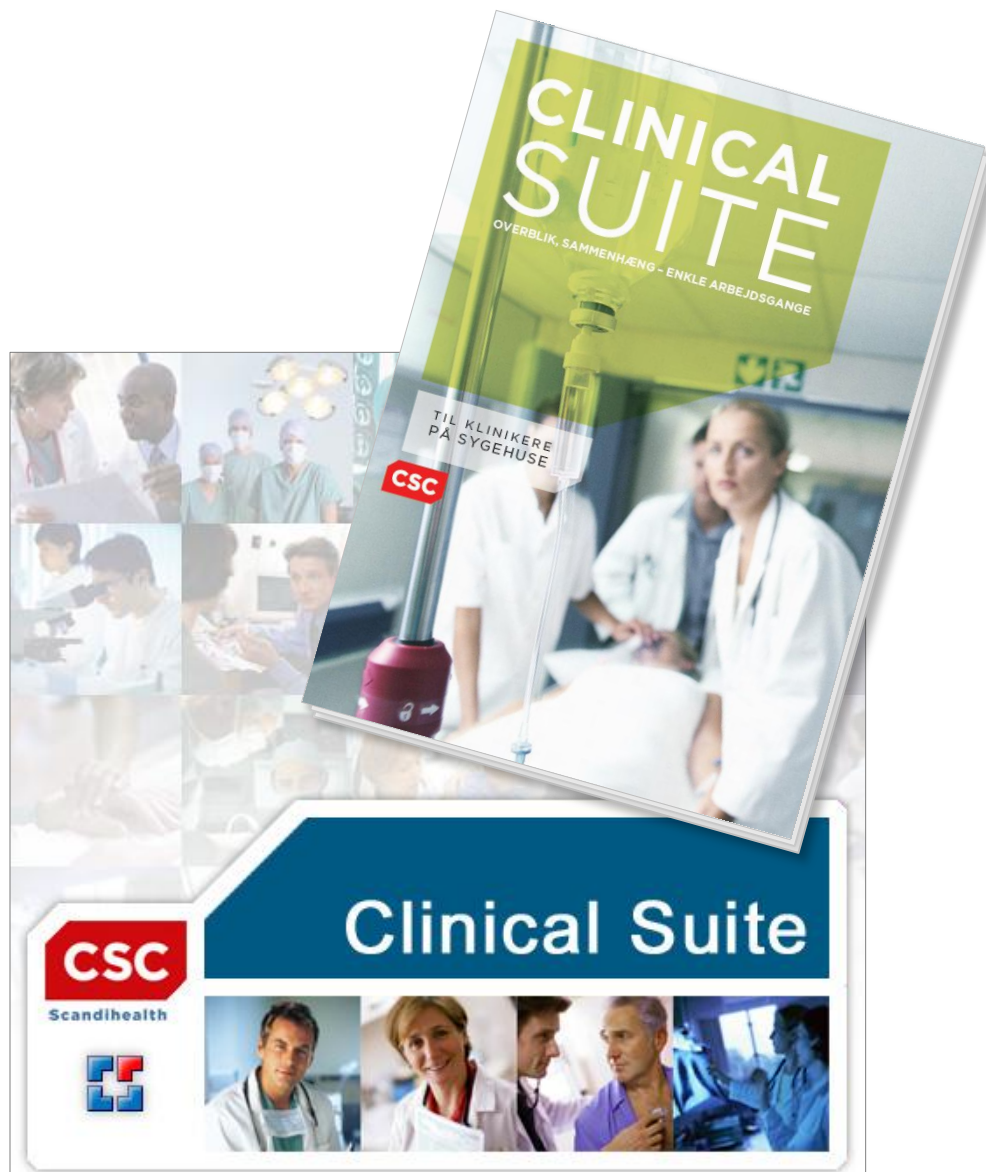
Agenda

- Our design method
 - Design workshops
 - Usability testing
 - Prototyping

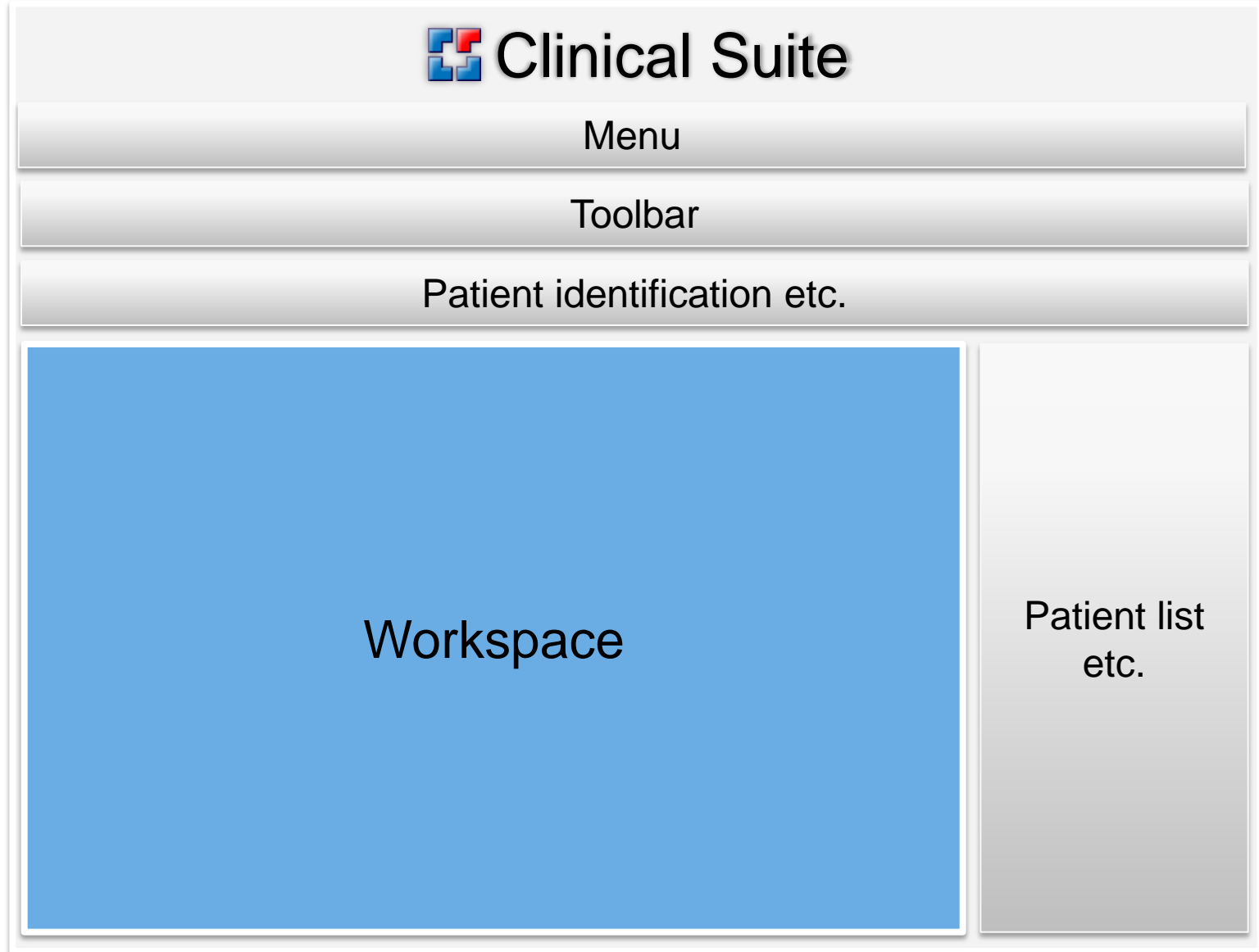


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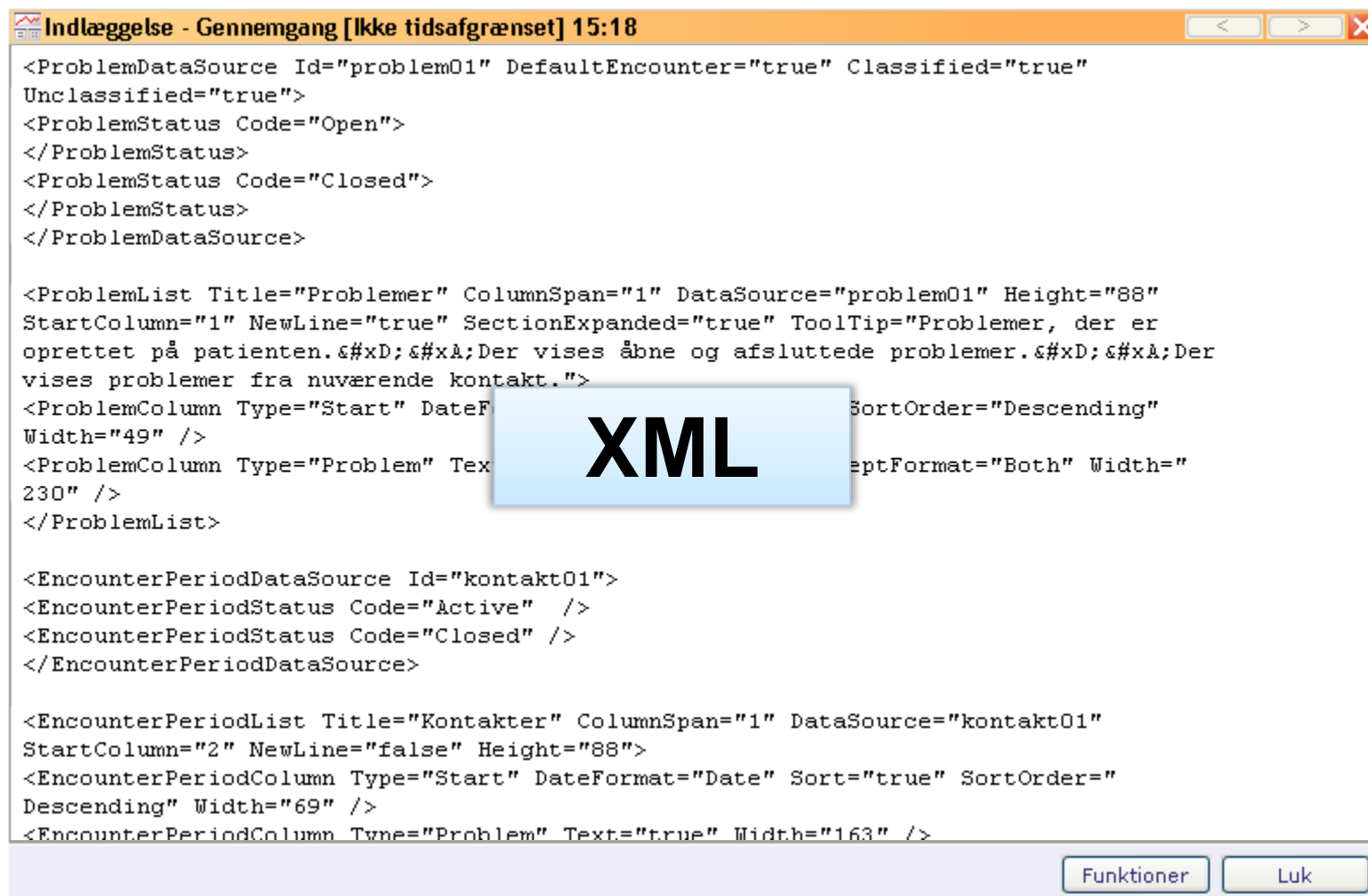
- Electronic Patient Record
 - Diagnoses and problems
 - Interventions
 - Notes
 - Medicine
 - Lab results
 - Radiology
 - Microbiology
 - Pathology
 - Highly configurable



CSC Clinical Suite™ | Highly Configurable



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```
<ProblemDataSource Id="problem01" DefaultEncounter="true" Classified="true"
Unclassified="true">
<ProblemStatus Code="Open">
</ProblemStatus>
<ProblemStatus Code="Closed">
</ProblemStatus>
</ProblemDataSource>

<ProblemList Title="Problemer" ColumnSpan="1" DataSource="problem01" Height="88"
StartColumn="1" NewLine="true" SectionExpanded="true" ToolTip="Problemer, der er
oprettet på patienten.␣;␣;Der vises åbne og afsluttede problemer.␣;␣;Der
vises problemer fra nuværende kontakt.">
<ProblemColumn Type="Start" DateFormat="Date" SortOrder="Descending"
Width="49" />
<ProblemColumn Type="Problem" Text="true" DateFormat="Both" Width="
230" />
</ProblemList>

<EncounterPeriodDataSource Id="kontakt01">
<EncounterPeriodStatus Code="Active" />
<EncounterPeriodStatus Code="Closed" />
</EncounterPeriodDataSource>

<EncounterPeriodList Title="Kontakter" ColumnSpan="1" DataSource="kontakt01"
StartColumn="2" NewLine="false" Height="88">
<EncounterPeriodColumn Type="Start" DateFormat="Date" Sort="true" SortOrder="
Descending" Width="69" />
<EncounterPeriodColumn Type="Problem" Text="true" Width="163" />
```

XML

Funktioner Luk

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The screenshot shows a software window titled "Registrer udførelse (u/ord.)". It contains several input fields and a large text area for XML configuration. The fields include:

- *Starttidspunkt: 21.09.2010 10:00
- Indikation: (empty)
- *Intervention (Sæt): Vitale værdier
- *Kontakt: 15.3 Medicinsk afde...
- Dokumentationsstatus: GODKENDT

The XML configuration area is titled "Resultat" and contains the following code:

```
<Block ColumnSpan="1" NewLine="true">
  <Block NewLine="true" BorderStyle="Line" ColumnSpan="1" Title="Temperatur/Puls">
    <Field Mandatory="false" ColumnSpan="1" Title="Temperatur">
      <Data Code="RNRET_TEMP"/>
    </Field>
    <Field Mandatory="false" ColumnSpan="1" Title="Puls">
      <Data Code="RNRET_PULS"/>
    </Field>
    <Field Mandatory="false" ColumnSpan="1" StartColumn="2" NewLine="true" Title="
Regelmæssig puls" GUIType="RadioButtonGroup" ShowVertical="true" ShowLabel="false">
```

A blue box with the text "XML" is overlaid on the XML code. At the bottom of the window are four buttons: "Flere oplysninger", "Gem og vis ny", "OK", and "Annuller".

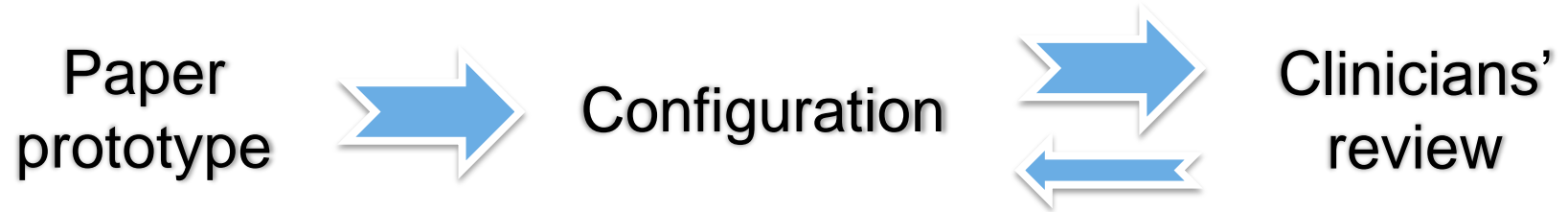
- Not dependent on developers
- Changes can be made instantly

Design Workshops

- Scandinavian tradition of “Participatory Design”
 - Involve different stakeholders
- Participants
 - Specialists in Structured Clinical Content (SFI)
 - Clinicians working at the hospital
 - Project managers
- Paper prototypes
- Whiteboard sketches



Design Workshops



Usability Testing

- 1 usability test/year
- We are testing before coding
- We test prototypes
- "Think-aloud test"
 - Preparation
 - Conducting the test
 - Analysis and reporting



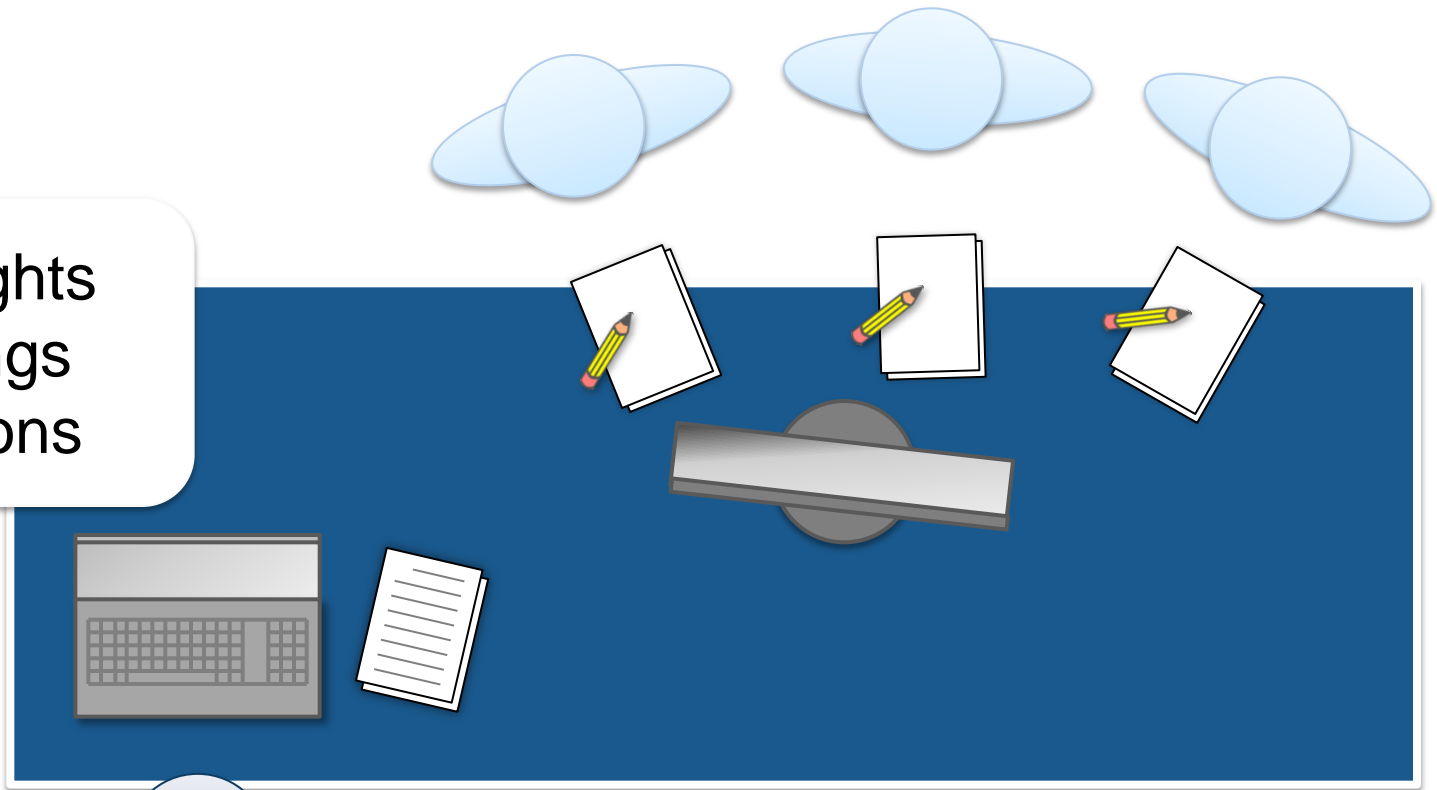
Usability Testing | Think-aloud Test

- 6 users
 - 1 user at a time
 - 1 test leader
 - 1 or more observers
-
- 1-2 hours per user
 - Usability test in total: ~300 hours

Usability Testing | Think-aloud Test

Observers

Thoughts
Feelings
Opinions

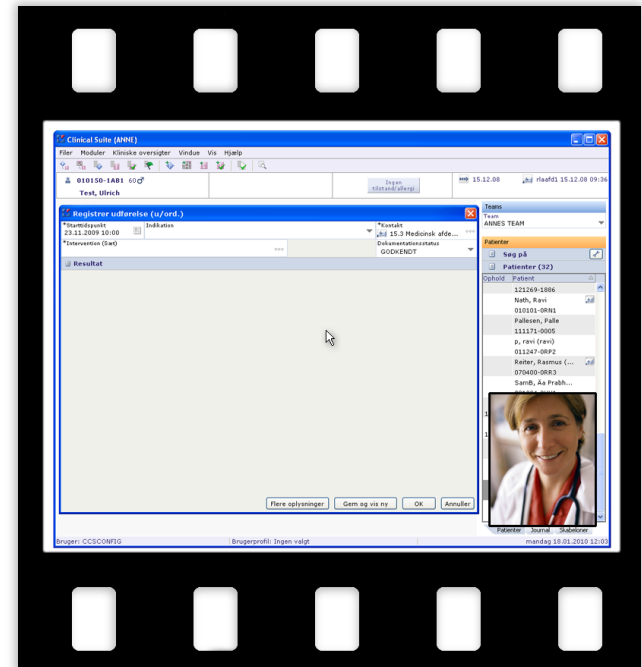


User

Test leader

Usability Testing | Think-aloud Test

- Technical setup
 - Laptop with a webcam
 - Camtasia records the screen and the user



Usability Testing | Think-aloud Test

- Preparation
 - Recruiting users
 - Scenarios
 - Prototypes

Usability Testing | Think-aloud Test

- Analysis and reporting
 - Observer's notes
 - Possible video analysis
 - A short report describing the observations
 - Prioritize and add observations to the development plans

Usability Testing | Think-aloud Test

- Are there no drawbacks?
- Unnatural situation:
 - Solving specified tasks
 - Thinking aloud
 - Unfamiliar surroundings
 - Being observed and recorded on video
- Pragmatic solution
- We have had good experiences

Usability Testing | In-Situ Tests

- In the beginning of November:
 - "In-situ tests" in the North Denmark Region
 - Department of obstetrics and gynogology
 - Maternity record
- Real patients
- Real tasks
- Real surroundings

Prototypes

- Prototypes are evaluated in usability tests
- First step in the design process
 - From ideas to requirements
 - Bridges the gap between developer and designer



Prototypes

- Whiteboard and paper sketches
- Paper prototypes
- HTML prototypes

Prototypes | Paper Prototypes

- The paper emphasizes that the design has not been settled on
- Can be difficult to keep track of the bits and pieces
- Short life

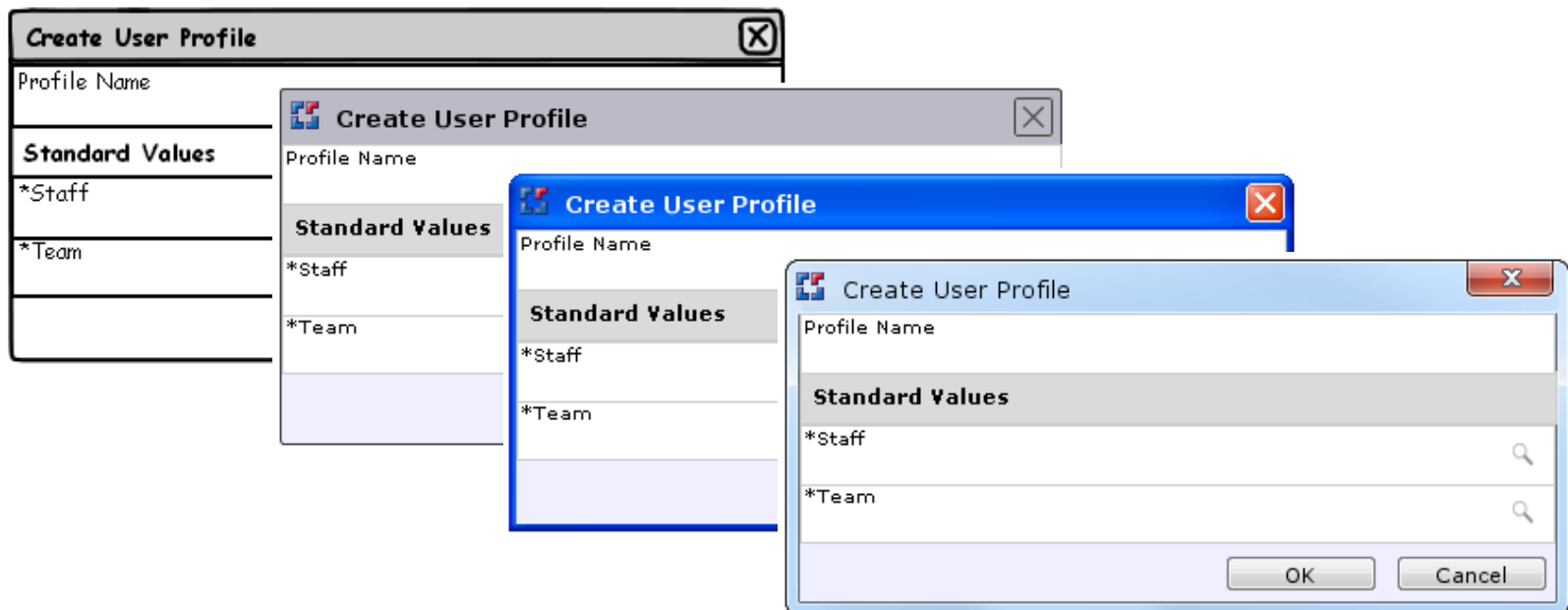


Prototypes | HTML Prototypes

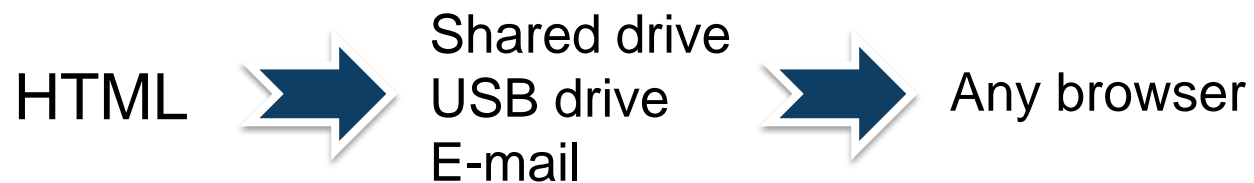
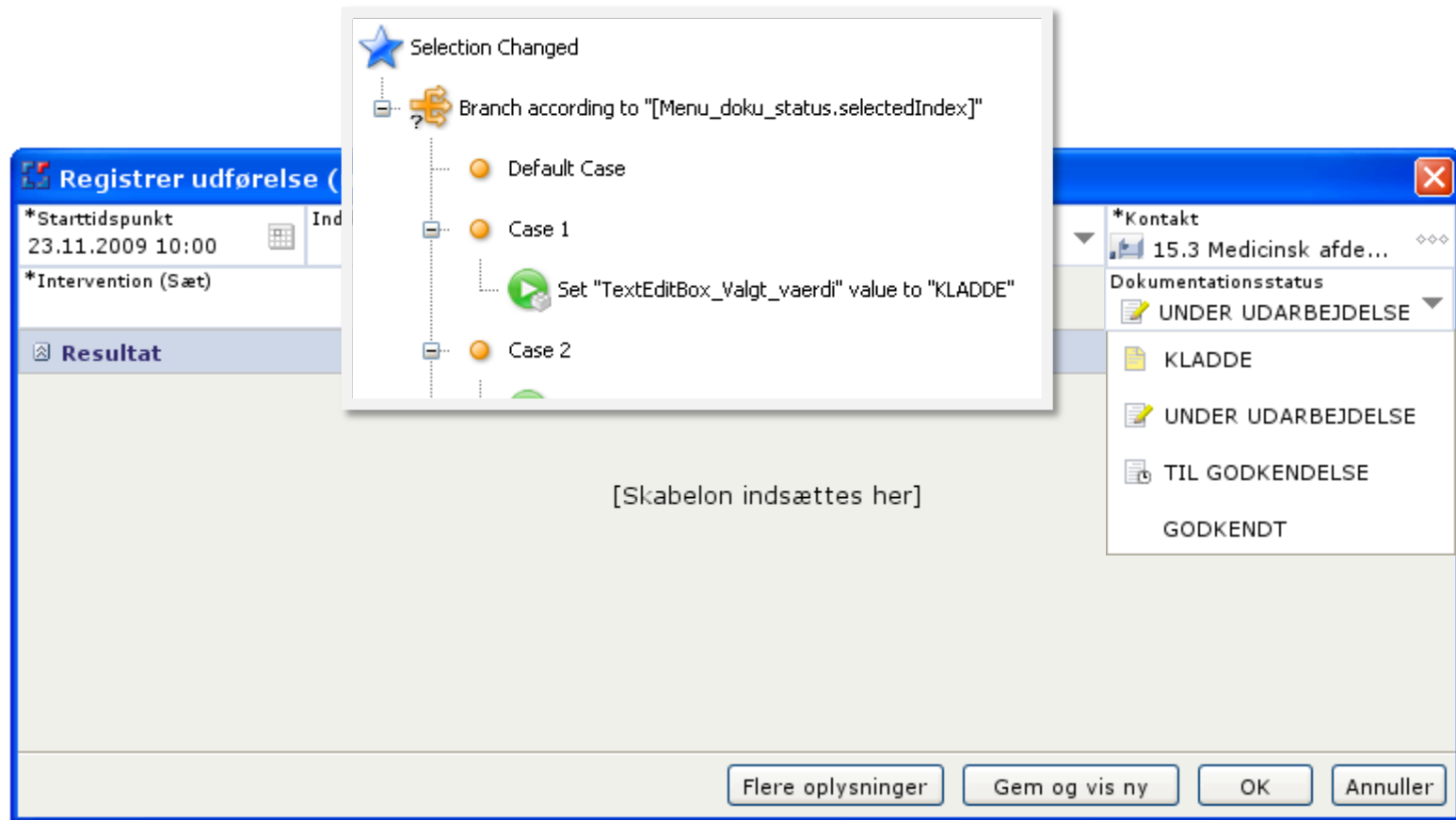
- Stable
- Re-usable
- Easily distributed
- Software: ForeUI

Prototypes | HTML Prototypes in ForeUI

- Includes many standard elements
- Build and reuse your own elements
- The look and feel can be easily changed
- Build interactive prototypes



Prototypes | HTML Prototypes in ForeUI



Summary

- We design clinical overviews and templates in design workshops
- We evaluate our designs in think-aloud tests
- Prototypes are an integral part of our design process