Agenda

1. What's XForms?
2. A Demo with FormFaces
3. Advantages & Disadvantages
4. Multimodality with XFormsMM (according to M. Honkala & M Pohja, 2006)
5. References
6. Discussion
What's XForms?

a quick overview
What's XForms?

- an XML-based language to create (web-) forms
- an abstract language according to the MVC-pattern
- a smart way to get rid of scripting
- a W3C standard (version 1.0 is from 2003), which was supposed to be part of XHTML 2.0
- a client-side technology
- a server-side technology
What XForms is not!

- a standalone markup-language (like HTML)
- widely used today
What's a form?
What's a form?

A glimpse in the HTML source of the Google search form:

```html
<form id=gbqf name=gbqf method=get action="/search" ...>
  ...
  <input id=gbqfq class=gbqfif name=q type=text ...>
  ...
  <button id=gbqfba aria-label="Google-Suche" name=btnK .../>
  ...
  <button id=gbqfbb aria-label="Auf gut Glück!" name=btnI .../>
  ...
</form>
```
### Different types of form elements

<table>
<thead>
<tr>
<th>HTML Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;input type=&quot;text&quot; name=&quot;name&quot; value=&quot;Dubinko, Micah&quot;/&gt;</code></td>
<td>Dubinko, Micah</td>
</tr>
<tr>
<td><code>&lt;input type=&quot;password&quot; name=&quot;pass&quot;/&gt;</code></td>
<td>password</td>
</tr>
<tr>
<td><code>&lt;input type=&quot;button&quot; value=&quot;Calculate&quot;/&gt;</code></td>
<td>Calculate</td>
</tr>
<tr>
<td><code>&lt;select name=&quot;searchtype&quot;&gt;</code></td>
<td>all words</td>
</tr>
<tr>
<td><code>&lt;option selected=&quot;selected&quot; value=&quot;all&quot;&gt;all...&lt;/option&gt;</code></td>
<td></td>
</tr>
<tr>
<td><code>&lt;option value=&quot;any&quot;&gt;any words&lt;/option&gt;</code></td>
<td></td>
</tr>
<tr>
<td><code>&lt;/select&gt;</code></td>
<td></td>
</tr>
<tr>
<td><code>&lt;input type=&quot;file&quot; name=&quot;attachment&quot;/&gt;</code></td>
<td>attachment</td>
</tr>
</tbody>
</table>

**XForms**

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The typical form processing

01: type in data
02: validation via JavaScript
03: send data
04: get data
05: responds with a new form

HTML page
(e.g.) Java Web-Server
DB / Store

XForms
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The typical problems

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That's where XForms comes into play!
What XForms does differently

Lessons learned from HTML:

- complete separation of (visual) form and data
- in-built validations and simple calculations (so called bindings)
- completely based on XML

...we will have a look at this points in the demo!
How XForms address these issues

```html
<html>
<head>
  <xf:model id="model">
    <xf:instance id="default" src="questionnaire.xml" />
    <xf:bind ... />
  </xf:model>
</head>
<body>
  <xf:message level="modal" ev:event="xforms-invalid">
    ERROR!
  </xf:message>

  <xf:select ref="location">
    <xf:label>Europe</xf:label>
    <xf:value>europa</xf:value>
  </xf:select>

  <xf:submit submission="submit">
    Submit
  </xf:submit>
</body>
</html>
```
## Form Controls in XForms

<table>
<thead>
<tr>
<th>Form Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;input ref=&quot;string&quot;&gt;</code></td>
<td>xsd:string&lt;br&gt;<code>123 Maple Street</code></td>
</tr>
<tr>
<td><code>&lt;secret ref=&quot;/session/password&quot;&gt;</code></td>
<td>Password&lt;br&gt;*********</td>
</tr>
<tr>
<td><code>&lt;submit submission=&quot;formdata&quot;&gt;</code></td>
<td>Buy</td>
</tr>
<tr>
<td><code>&lt;select ref=&quot;cctype&quot;&gt;</code></td>
<td>List For Specifying All Card Types&lt;br&gt;Master card&lt;br&gt;Visa card&lt;br&gt;American Express&lt;br&gt;Diners Club</td>
</tr>
</tbody>
</table>
| `<range start="0" end="10" step="1" ref="quan" model="po">` | Quantity
Containers in XForms

Containers are special controls in XForms. They enable you to handle a set of nested controls in a similar way. Here are some examples:

- `<xf:group ref='...'/>` enables you to apply properties (like 'required') and namespaces on all nested elements.

- `<xf:repeat nodeset='...'/>` enables you to repeat a nested set of controls for every selected element in the instance data dynamically.

- `<xf:switch><case id='...'>...</case></xf:switch>` enables you to switch dynamically between nested controls.
The XForms processing chain

01: type in data
02: validation via XForms
03: send data as XML
04: get data as XML
05: responds with a new instance data

And what about your XML environment, e.g. a XML database?
A demo
with FormFaces
We need a XForms processors, because current browsers don't understand XForms natively. There are many XForms processors, such as:

- FormFaces (client-side, JavaScript)
- betterForms (server-side)
- Orbeon Forms (server-side, Java)
- Nokia's xfolite (server-side, Java)

and many more under: [http://www.w3.org/community/xformsusers/wiki/XForms_Implementations](http://www.w3.org/community/xformsusers/wiki/XForms_Implementations)
XForms on the client

- a client-side library translates the XForms document into common HTML forms and (e.g.) JavaScript functions
- possible with every server
- But: a client-side library is needed!

The formFaces library is one approach for this. This approach is used in the demo.
XForms on the server

- the server translates the XForms document into common HTML forms
- no need for client-side libraries or special processing
- fits nicely in an XML-environment (e.g. XML databases)

The betterForms server is one approach for this which I have tested. If we have time, we can have a quick look at it in the end...
Advantages & Disadvantages

with some comments on solutions, consequences and other aspects
(+) Advantages of XForms

- separation between data model and visualisation
  
  **Consequence:** Static form with dynamic data.

  **Consequence:** Easier working in teams.

- no need for scripting (e.g. in JavaScript)

  **But:** You still must write "scripts" in XForm (e.g. for constraints)

  **But:** You can remain in one language (But XForms is another technology, isn't it?)

- perfect XML handling

  **You can:** load XML, send XML, use XML technologies like XPath.
(-) Disadvantages of XForms

- complicated XPath expressions
  
  **Solution:** Structure the data model similar to the interface

- XForms was supposed to part of XHTML 2.0

  **But:** XHTML 2.0 never became a final standard due to HTML5

- the major browsers don't implement XForms currently

  **So:** XForms is rarely used today
(-) Disadvantages of XForms

Google Trends doesn't look too good for XForms...
Multimodality with XFormsMM

according to M. Honkala & M. Pohja, 2006
What is multimodality?

- Data can be **entered and presented** with several mediums/modalities.
  
  For example in a visual or in a auditive form.

- Multimodality can be important for...

  - disabled people
  - mobile devices
  - uncommon tasks
Why is XForms a good basis for it?

- separation of data and model
  - This means we can either change the data or the view on it

- hierarchical structure (with grouping)
  - Especially important for sequential output (e.g. in speech)

- abstract controls
  - e.g. select-lists
The idea of Honkala & Pohja

The idea is to extend XForms (data & model) with modality-dependent style-sheets, that could be interpreted by different rendering engines.
The idea of Honkala & Pohja

This idea leads to the following points:

- you must only write a single document for different modalities
- you have to provide a special CSS for each modality
- you can use this single CSS for many XForms documents
- the adaptation is done on runtime
The idea of Honkala & Pohja

They built a **Speech Rendering engine** and an **Interaction Manager** to connect it with a common GUI engine (e.g. the one from the browser).
Just to bad...

...that the reference implementation from M. Honkala & M. Pohja was for the XSmiles browser (http://www.xsmiles.org), which isn't available any more.
References

additional reading and software
References

O'Reilly XForms Essentials (a good book ;)
http://xformsinstitute.com/essentials

XForms 1.1 (official specification)
http://www.w3.org/TR/xforms/

Google Trends (for "XForms")
http://www.google.de/trends/?q=xforms

Multimodal Interaction with XForms, M. Honkala & M. Pohja, 2006
References

FormFaces (client-site framework)
http://sourceforge.net/projects/formfaces

betterForms (server-site framework)
Discussion

and questions, of course...
What's your opinion?

- Why didn't XForms become a real used standard today?
- Would you use XForms anyway? Why? Why not?
- Would you use a server-side or a client-side implementation?
The Discussion Cloud

sequential output HTML scripting
future dynamic data XHTML 2.0 XML
XSmiles on the client multimodality
JavaScript FormFaces HTML5
pros & cons MVC forms W3C validation
betterForms XMLSchema
on the server XPath Google Trends

XForms

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