Paperful to Paperless Office
Forms Integration Framework

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Outline

- Introduction
- Requirement
- Implementation
- Usability Tests
- Conclusion
- Questions
Introduction

- Forms on the web --- surveys, online trading, purchasing
- HTML
- More reliable and independent technology called XForms
- Framework – create, edit, merge forms --- integrated into other applications
Limitations of HTML Forms

- The GUI is embedded in the data.
- Searching for information in the data is tough.
- The data is tied to the logic and language of HTML.
An Example

- John Fisher
  - Company: Ebay
  - Email: john@ebay.com
  - State: Arizona

- Mitchell Miller
  - Company: Intel
  - Email: miller@intel.org
  - State: Iowa

- How to change list-based to table based presentation?
- How to get a quick list of clients in IA?
- What if you want to use a Java Applet?
Overcome The Limitations

<ul>
<li>John Fisher</li>
<li>Company: Ebay</li>
<li>Email: john@ebay.com</li>
<li>State: Arizona</li>
<li>Mitchell Miller</li>
<li>Company: Intel</li>
<li>Email: miller@intel.org</li>
<li>State: Iowa</li>
</ul>
XForms

- Next generation of HTML Forms
- Richer data presentation
- Separate the data from presentation
- Device independent – PDA, mobile phone
- Form data is described using XML – routed to various workstations
contd...

- How does it separate the data from presentation?
  XML - describes the data, XSLT - displays it
- What is XSLT?
  XSLT transforms XML documents
XForms Model

- XForms Model
- XForms User Interface
- XForms Submit Protocol
- `<XML>` Instance Data
An Example XForm

```xml
<head>
  <xforms:model>
  <xforms:instance><name>John</name></xforms:instance>
  </xforms:model>
</head>
<body>
  <xforms:input ref="name">
    <xforms:label>First Name</xforms:label>
  </xforms:input>
</body>
```
Goal Of This Project

- Implement a framework --- create, edit, design, merge Forms --- XForms
  That can be integrated into other web applications
  That can also maintain the revision history of the forms
Prerequisites To Run This Project

- Application Server – Tomcat
- Oracle 9i
- Browser
 Requirement

- Create new XForms
- Edit, Merge, Design Forms
- Implement Revision Control System
- Store forms in Oracle database
- Extensions to XForms – style information
Design

- Usability Patterns
  - History Logging, System Feedback, User Modes, Workflow model

- Application Security
  - Single Access Point, Check Point, Sessions
Usability Patterns

- History Logging – log all the actions of the user --- Version Control System
- User Modes – each user has their own preferences -- user can design their own form
- Workflow Model – follow specific steps
Application Security

- Single Access Point – single gateway for the entire application
- Checkpoint – prevent hackers
- Sessions – session object
Implementation

- Forms were created using – XForms, JSP, JavaScript, XSLT
- DOM and SAX Parser
- Stored in Oracle database
Process Of Creating Forms

- Framework displays the form
- XSLT - that can be used to transform any of these instances (formstylesheet.xsl)
- XForm Documents - testacc.xml, labform.xml -- many instances of our kind of forms
- Framework is used to create, merge, edit XForms
- Stored in Oracle database
Overview Of The Framework

- Create forms
- Design forms
- Merge forms
- Edit forms

Revision Control System

Display Using Framework
Create New Forms

Logical grouping

Displayed using XSLT
Edit Forms

Click and drag above items to the box below to add a new textfield or combobox.

To delete an item check the box next to the item and click on Delete Items.

Add new textfields, labels, checkbox, comboboxes.
Merge Forms

Select a form from each list

Result

Select the names of the forms:

form1.xml
form3.xml
info.xml
info2.xml

Merged Form

name

dep
- chem
- bio

submit

name

dep
- bio
- chem

submit

isform3form1.xml
Version Control System

- Ability to create new branches of existing forms as well as to create new forms.
- Ability to merge existing branches and to unify form data from two branches.
- Ability to examine change histories along a given form branch.
Existing Systems

- Revision Control System (RCS)
  - different versions of the text, does not let two users open the same file at the same time.

- Concurrent Versions System (CVS)
  - maintain a history of all the changes made to a set of files and lets two users open the same file at the same time.
Usability Testing

- Were the users able to figure out how to use the framework on their own?
- What were the common mistakes made?
- How long does each user take to learn about the framework?
- Is the user satisfied with the product?
- What were the recommendations made to improve it?
Results

Time taken by users

Time

0 10 20 30 40 50 60 70

user 1 user 2 user 3 user 4 user 5

Users
Challenges

- XForms and extensions
- Implementing Version Control System
- Integration of XForms, Oracle and XML
Conclusion

- XForms -- richer and more flexible than HTML forms -- separate data and logic from presentation

- As everything is being stored in the Oracle database it reduces disk space making it more efficient.

- Platform independent – XML describes data and XSLT displays data
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- Version Control System

- Integrated into other web applications
Questions