RIA and AJAX
How to evaluate Products/Technologies?

Janak Mulani
Canoo Engineering AG

e-mail: janak.mulani@canoo.com
url: www.canoo.com
RIA and AJAX
How to evaluate Products/Technologies?

- RIA and AJAX
- Decision Tree
- JavaScript / AJAX
- Java
- Flash
Definitions

• Rich Internet Applications (RIA)
  • Rich GUI
  • JEE-Server (here .NET is excluded)
  • No application installation on Client

• AJAX
  • Asynchronous JavaScript And XML
  • All JavaScript based solutions
Architecture

Rich Fat

Rich Thin

HTML Thin

Client

Rich UI Execution Environment

Presentation Logic

Presentation Logic

Rich UI Engine

Business Logic

Browser

Server

Presentation Logic

Presentation Logic

Presentation Logic

Business Logic

Business Logic

Business Logic

Data

Data

Data

IndicThreads.com Conference On Java Technology 2006
Why RIA?

- Usability of Web-Applications
- Consolidation of Applications
- Software as a Service for standard applications
- On-line and Off-line operation
- Globalisation of Business Processes
Usability: RIA Webmail

RIA solution provides usability of a Rich Fat Application
Usability: HTML Webmail

HTML Solution: Poor usability and slow
Consolidation: Financial Application

RIA solution combines HTML Apps and Rich Fat Apps
Consolidation: Port Management System

RIA solution replaces Rich Fat App and HTML Apps and available on handheld device
Software as a Service (SaaS): ERP System

RIA solution enables online pluggable applications
On/Off-line: Insurance Application

RIA combined with SOA
Globalization: Supply Chain Mgmt.

RIA enables global processes
Product Evaluation: Hundreds of Products & Criteria

• How to search?
  • Criteria tables
  • Weightage for criteria
    => Leads to complexity, loss of big picture
    => Results in misjudged priorities

• Solution:
  • Questions about requirements
  • Hierarchically structured
    => Decision Tree
Most Important question

Simple User Interface?

Y
HTML

N
RIA Technology

= simple enough for HTML
GUI Deficiencies of HTML (A user’s view)

- Interactivity
  - partial screen updates
  - asynchronous Fetch & Push
- High-End Widgets (Tree, …)
- Direct Manipulation
- Menus
- Multiple Windows
  - modal and non-modal
- Keyboard Navigation
Technical Deficiencies of HTML (A developer’s view)

- Event-Model, Object-Model
- Heterogeneous Technologies: Java, Servlets, CSS, XSLT, Struts, JSF, proprietary XML languages, ...

⇒ Development costs rise exponentially with the GUI-requirements

![Diagram showing exponential increase in development costs for HTML and RIA](attachment:image.png)

Factor 2 for typical Business Application
Technical Deficiencies of HTML (Operational view)

- Page oriented
  - Numerous server Roundtrips with much data exchange (typical 100-250k)
  - High Network Bandwidth and Latency requirements

**Diagram**

Network bandwidth

GUI-Requirements

HTML

RIA

**Factor 10** for typical Business Application
Simple enough for HTML?

- Simple Forms
- Simple Tables
- Tabs
- Tables with Sort and Navigation
- Trees
- Multilevel Navigation
- Partial Screen Updates
- Asynchronous Fetch
- High-End Widgets
- Direct Manipulation
- Menus
- Multiple windows
- Keyboard-Navigation

Development Costs
Network bandwidth

HTML

GUI-Requirements

RIA
Questions for RIA

Simple User Interface?

Y

HTML

N

RIA-Technology

Ubiquity, Industrial strength quality, or Multimedia?

Ubiquity

JavaScript/AJAX

Industrial strength quality

Java

Multimedia

Flash
Ubiquity?

= Unconditional end-user access via Browser

**Pros JavaScript/AJAX**
- Integrates (fast) in all Browser, Plug-in not required

**Cons JavaScript/AJAX**
- Complexity / Heterogeneity of Technology (Java, HTML, CSS, JSF, ...)
- GUI-libraries are less mature and functionally weak
- JavaScript-Implementations vary across Browsers and OSs
## Industrial strength quality?

= Maintainability, Stability, Availability, Scalability, Performance and Security

<table>
<thead>
<tr>
<th>Pros Java</th>
<th>Cons Java</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homogeneous, object-oriented Technology</td>
<td>Plug-in necessary (except for old Version 1.1)</td>
</tr>
<tr>
<td>Mature, robust GUI-libraries with higher functionality</td>
<td>Integration in HTML</td>
</tr>
<tr>
<td>JRE-Implementations hardly vary across Browsers and OSs</td>
<td></td>
</tr>
</tbody>
</table>
Multimedia?

= Integration of Animations, Audio, Video, ...

Pros Flash

- Very good Multimedia-Functions
- Flash-Implementations hardly vary across Browsers and OSs

Cons Flash

- Plug-in necessary
- Complexity / Heterogeneity of Technology (Java, ActionScipt, SWF, ...)
- GUI-libraries not mature, in early development stage
Questions for JavaScript/AJAX Products

Simple User Interface?

Y
HTML

N
RIA-Technology

Ubiquity, Industrial strength quality, or Multimedia?

Ubiquity

Industrial strength quality

Multimedia

JavaScript/AJAX

Java

Flash

???

???

???
Questions for JavaScript/AJAX Products

Pros JavaScript/AJAX
- Integrates (fast) in all Browsers, Plug-in not required
- RIA Functions?
- Industrial strength quality?

Cons JavaScript/AJAX
- Complexity / Heterogeneity of Technology (Java, HTML, CSS, JSF, ...)
- GUI-Libraries not mature and functionally weak
- JavaScript-Implementations vary across Browsers and OSs
- Supports Browser and OS?
JavaScript/AJAX : Supports Browser and OS?

- Benchmarks are Google Maps, Google Suggest:
  - IE 6.0+ on Windows
  - Firefox 0.8+ on Windows, Mac, Linux
  - Safari 1.2.3+ on Mac (Google Suggest 1.2.2 oder später)
  - Netscape 7.1+ on Windows, Mac Linux
  - Mozilla 1.4+ on Windows, Mac, Linux
  - Opera 8+ on Windows, Mac, Linux (Google Suggest 7.5.4+)

Java

Flash
JavaScript/AJAX: RIA Functions?

- How do the components compare themselves with “correct” Desktop components like those from Java Swing?
- API for the development of additional and third-party components?
- Market for third-party Components?
- Accessability support?
- Can the Look&Feel be adapted?
JavaScript/AJAX: Industrial strength quality?

Rich Fat  RIA  Rich Thin  HTML Thin

Client

Rich UI Execution Environment

Browser

Rich UI

Logic

Presentations

Logic

Rich UI

Engine

HTML

Engine

Business

Logic

Presentations

Logic

Data

Server

Business

Logic

Presentations

Logic

Data

Business

Logic

Presentations

Logic

Data

IndicThreads.com Conference On Java Technology 2006
JavaScript/AJAX: Industrial strength quality?

- Architecture: thin, fat or hybrid?
- Programming model: Server-side or distributed?
- Application code purely in Java or a heterogeneous mixture?
- How much of the product code is JavaScript?
- How is the security problem of Client-side Scripting solved?
Questions for JAVA Products

Simple User Interface?

Y: HTML
N: RIA-Technology

- Ubiquity, Industrial strength quality, or Multimedia?

- Industrial strength quality

JavaScript/AJAX
Supports Browser and OS?
RIA Functions?
Industrial strength quality?

Java

Flash

???
Questions for JAVA Products

Pros Java
- Homogeneous, object-oriented Technology
- Mature, robust GUI-libraries with higher functionality
- JRE-Implementations hardly vary across Browsers and Os

Cons Java
- Plug-in required (except for old Version 1.1)
- Integration in HTML

Supports JREs?
UI Libraries Employed?
Leverages Standards?
JAVA: Supports JREs?

- Which are the intended end-user devices/environments?
- Which JREs are available for those devices?
- On which JREs does the product run?
- Which JRE is the smallest common denominator for the Product?
- Can the product leverage new features of newer JRE versions?
JAVA: UI Libraries Employed?

- Based on low-level (AWT, SWT) or high-level (Swing, JFace) libraries?
- Proprietary API or Server-side Proxy approach?
- Proprietary foot print of UI technology?
- API for the development of additional and third-party components?
- Market for third-party Components?
- Accessability support?
- Can the Look&Feel be adapted?

<table>
<thead>
<tr>
<th>JavaScript/AJAX</th>
<th>Java</th>
<th>Flash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports Browser and OS?</td>
<td>Supports JREs?</td>
<td>???</td>
</tr>
<tr>
<td>RIA Functions?</td>
<td>UI Libraries Employed?</td>
<td></td>
</tr>
<tr>
<td>Industrial strength quality?</td>
<td>Leverages Standards?</td>
<td></td>
</tr>
</tbody>
</table>
JAVA: Leverages Standards?

- Is Session Handling delegated to the JEE-Container?
- Is Clustering supported and delegated to JEE-Platform?
- Does the Communication protocol compliant with JEE standards?
- Is the runtime-deployment configurable (i.e. Servlet- or EJB-Container)?
- Is the deployment as Portlet as per JSR 168 possible?
- Are the Java-VM standards used to enable Stand-alone offline deployment?
Questions for Flash

Simple User Interface?

Y

N

HTML

RIA-Technology

Ubiquity, Industrial strength quality, or Multimedia?

Ubiquity

Industrial strength quality

JavaScript/AJAX

Supports Browser and OS? RIA Functions? Industrial strength quality?

Java

Supports JREs? UI Libraries Employed? Leverages Standards?

Multimedia

Flash

???
Questions for Flash

Pros Flash

- Very good Multimedia-Functions
- Flash-Implementations hardly vary across Browsers and OSs

Cons Flash

- Plug-in required
- Complexity / Heterogeneity of Technology (Java, ActionScript, SWF, ...)
- GUI-Libraries are not mature, in early development stage

Supports Flash-Versions?
RIA Functions?
Industrial Strength quality?
Flash: Supports Flash versions?

- Which are the intended end-user devices/environments?
- Which Flash-players are available on those devices?
- On which Flash-players does the product run?
- Which Flash-player is the smallest common denominator for the Product?
- Can the product leverage new features of newer Flash-player versions?
Flash: RIA Functions?

- How do the components compare themselves with “correct” Desktop components like those from Java Swing?
- Proprietary footprint?
- API for the development of additional and third-party components?
- Market for third-party Components?
- Accessibility support?
- Can the Look&Feel be adapted?

<table>
<thead>
<tr>
<th>JavaScript/AJAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports Browser and OS?</td>
</tr>
<tr>
<td>RIA Functions?</td>
</tr>
<tr>
<td>Industrial strength quality?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Java</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports JREs?</td>
</tr>
<tr>
<td>UI Libraries Employed?</td>
</tr>
<tr>
<td>Leverages Standards?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports Flash versions?</td>
</tr>
<tr>
<td>RIA Functions?</td>
</tr>
<tr>
<td>Industrial strength quality?</td>
</tr>
</tbody>
</table>
Flash: Industrial strength quality?

- Architecture: thin, fat or hybrid?
- Programming model: Server-side or distributed?
- Application code purely in Java or a heterogeneous mixture?
- How many, how powerful and how proprietary are the development Tools?
- Is the use of ActionScript and proprietary Tools limited to Multimedia-Functionality?
- How is the security problem of Client-side Scripting solved?

<table>
<thead>
<tr>
<th>JavaScript/AJAX</th>
<th>Java</th>
<th>Flash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports Browser and OS?</td>
<td>Supports JREs?</td>
<td>Supports Flash versions?</td>
</tr>
<tr>
<td>RIA Functions?</td>
<td>UI Libraries Employed?</td>
<td>RIA Functions?</td>
</tr>
<tr>
<td>Industrial strength quality?</td>
<td>Leverages Standards?</td>
<td>Industrial strength quality?</td>
</tr>
</tbody>
</table>
Summary

Simple User Interface?

Y
HTML

N
RIA-Technology

Ubiquity, Industrial strength quality, or Multimedia?

Ubiquity
JavaScript/AJAX
Supports Browser and OS? RIA Functions? Industrial strength quality?

Industrial strength quality
Java
Supports JREs? UI Libraries Employed? Leverages Standards?

Multimedia
Flash
Supports Flash versions? RIA Functions? Industrial strength quality?
Thank you

Contact: janak.mulani@canoo.com