How Ajax Changes the Game for SVG

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IBM and OpenAjax Alliance
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Desktop RIA Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>IE1</th>
<th>IE2</th>
<th>IE3</th>
<th>IE4</th>
<th>IE5</th>
<th>IE5.5</th>
<th>IE6</th>
<th>FF1</th>
<th>FF2/IE7</th>
<th>FF3/IE8?</th>
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**Browsers**

- IE1
- IE2
- IE3
- IE4
- IE5
- IE5.5
- IE6
- FF1
- FF2/IE7
- FF3/IE8?

**SVG**

- ASV1
- ASV2
- ASV3

**DHTML,Ajax**

- Ajax explosion
- Jesse James Garrett: “AJAX”

**Flash/FLEX**

- Flash4 (ActionScript)
- Laszlo LZX
- FLEX/1.0

**XAML/Silverlight**

- XAML
- SVL1
- SVL2

**OpenAjax Alliance**

- Prep
- Kick-off meeting with 30 companies
Agenda

- SVG from Jon’s perspective
- Ajax (and OpenAjax)
- How Ajax Changes the Game
Conception

- Many saw that the browser needed 2D graphics
- Jonathan Gay and FutureSplash launched in 1993
  - Subsequently purchased by MACR and renamed to Flash
- Various other proprietary formats
- WebCGM
- PDF = PostScript as a viewable document
- Chris Lilley
  - 1994 – First pronouncements? (earliest date I found)
  - 1996/1997 – Requirements for “scalable vector graphics”
Formation of the SVG WG

- By early 1998, several big companies concluded:
  - 2D vector graphics in browser was next big thing
  - Must be expressed in XML
  - Must be developed at W3C

- As a result:
  - PGML Submission: Adobe, IBM, Netscape, Sun
  - VML Submission: Microsoft, Autodesk, HP, MACR, Visio
  - WebCGM Submission: Bob Hopgood and colleagues

- W3C formed Scalable Vector Graphics WG
Birth

- **SVG WG kick-off meeting on Aug 31, 1998**
  - ~40 companies, including the PGML and VML companies
- **SVG 1.0 was a huge effort**
  - Tricky politics
  - Technical complexities around graphics
  - Technical complexities around integration issues with other W3C initiatives (XML, XML Namespaces, DOM, DOM Events, CSS, SMIL, XLink, XPointer, …)
  - W3C changed its rules a couple of times
- **W3C approves the SVG 1.0 Rec on Sept. 4, 2001**
Adobe: the main early driver behind SVG

- Adobe’s SVG strategy
  - Strong involvement in SVG WG
  - Ubiquitous browser plugin
  - Monetize via SVG tools, such as Adobe Illustrator

- For Ferraiolo, SVG was just the first phase of a broader strategy
All of the ingredients for success

- Everything set up for SVG success
  - Spring 2001 – Acrobat Reader 5 released
    - ASV2 bundled inside, installed automatically
    - ASV2 had auto-update logic (therefore, would update to ASV3)
    - Acrobat Reader 5 pre-installed on most desktop PCs
  - 4 September 2001 – SVG 1.0 is a W3C Recommendation
  - Fall 2001 – ASV3 and Adobe Illustrator 10 released
- Adobe puts SVG into maintenance
Childhood

- Strong adoption of SVG/ASV on desktop in 2002-2003
  - Favorite technology for many Enterprise developers
    - Rich feature set
    - Relatively easy programming (declarative XML plus JavaScript)
    - Integrates very nicely with back-end XML servers
    - Standards-based
    - Backed by big company (or so it appeared)
    - Nearly every major Enterprise product had an ASV dependency
  - Favorite technology for visionary developers
    - Allowed rich web features that were only possible at the time in Flash
    - But Flash was proprietary and required developers to program within an animation tool with all logic in frame zero

- But with no future releases of ASV, and other alternatives emerging, many desktop developers moved away from ASV (and desktop SVG)
Early Adulthood

- As desktop SVG declined, mobile SVG grew
- SVG Mobile becomes a W3C Recommendation in Jan. 2003
  - SVG Tiny 1.1 designed by mobile industry to fit on volume phones
    - *Could be built with a ~100K footprint*
- Other mobile standards organizations adopt SVG Tiny
  - MMS, OMA browser standards, J2ME/JSR226, MPEG LASeR, 3GPP DIMS
  - J2ME/JSR 226 (and JSR 248) probably the most significant
- Multiple reliable suppliers of SVG Tiny
  - Particularly Bitflash and Ikivo
- As a result, SVG Tiny now is deployed on hundreds of millions of phones
SVG Tiny – Mixed Success

- **Good news**
  - Checklist requirement on various mobile standards
  - Deployed on hundreds of millions of phones
  - Real commercial applications based on SVG, such as mobile video

- **Bad news**
  - SVG Tiny is available on a large percentage of cell phones, but only some phones view SVG from the Web (i.e., limited browser integration)
  - SVG Tiny 1.2 (with scripting) not yet approved
  - Marketing shortcomings: little awareness of SVG Tiny as an option
  - Desktop technologies (e.g., full Web browsers) are displacing the mobile standards (e.g., OMA browser standards) that have checklist requirements for SVG Tiny
Maturity

- Starting with 2005, major changes in the industry

- RIA platforms
  - Macromedia coins the term RIA, then says RIA=Flash
  - AJAX “discovered” in Feb. 2005
  - (Later) Microsoft adapts XAML into the Silverlight browser plugin
Desktop RIA Timeline

Browsers
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SVG
ASV1 ASV2 ASV3

DHTML,Ajax
Jesse James Garrett: “AJAX”
Flash4 (ActionScript) Laszlo LZX FLEX/1.0 2.0 3.0: (AIR1.0)

Flash/FLEX
XAML

XAML/Silverlight

OpenAjax Alliance

Prep
Kick-off meeting with 30 companies

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- How Ajax Changes the Game
Quick background on Ajax

- Originally “AJAX” (Jesse James Garrett, Feb. 2005)
  - “Asynchronous JavaScript and XML”
  - Leveraging XMLHttpRequest to talk to server in background
  - Incremental screen updates (POST) instead of full page updates (GET)

- At first, AJAX seemed too difficult for average programmer
  - Yes, Google’s geniuses could achieve Google Suggest and Google Maps
  - But how could others achieve the engineering power and deep pockets to use these techniques

- Almost immediately, countless AJAX toolkits appeared
  - Commercial and open source
  - Provided nice JavaScript APIs. Took care of browser differences under the hood.
The broader meaning of “Ajax”

- **Ajax definition:**
  - A set of programming techniques that deliver
  - Desktop-like user interfaces
  - Within the browser
  - Using open standards formats
    - Natively implemented in the browser
    - Without plugins (i.e., no Flash, Silverlight, or Java)

- **Key technology piece is AJAX (XMLHttpRequest)**
- **But also includes many other techniques**
  - Widget libraries
  - Animation effects
  - Layout managers
  - Data binding, web services, local storage, server push, …

- **In a nutshell - rich user interfaces using HTML and JavaScript**
The Ajax explosion (2005-2007)

- Huge amount of hype
- ~200 Ajax toolkits appear almost instantly
  - Microsoft Atlas (now called ASP.NET AJAX)
    - *Helped to contribute to legitimacy*
  - Several other major “proprietary” Ajax frameworks
    - Adobe/Spry, Backbase, ICEsoft, Nexaweb, Sun/jMaki, TIBCO, …
  - Several major open source projects
    - Prototype/Scriptaculous, Dojo, Yahoo, DWR, Google GWT, jQuery, …
  - Why so many so quickly? Simply rebrand DHTML to Ajax
Why OpenAjax Alliance?

- A rich but fragile ecosystem
  - Interoperability shortcomings
  - Educational/marketing shortcomings
  - Dependence on browsers companies for technical advances

- Ajax vendors motivated to work together from fear of Adobe and Microsoft platform dominance in Web 2.0

- Ajax technology layer not addressed by other industry groups
Membership

- **Members**
  - 109 members
  - Big guys: Cisco, ESRI, Google, Oracle, SAP
  - Ajax toolkits: Backbase, Dojo, DWR, jMaki, jQuery, Laszlo, Nexaweb
  - Tools: Adobe, Eclipse, Microsoft, Sun, Tibco, WaveMaker
  - Mobile: FranceTelecom/Orange, Openwave, Opera, Vodafone, Volantis
  - Other standards organizations: Eclipse, HR-XML, W3C
  - Ajax “users”: American Greetings, Fidelity, Gemini Systems, MITRE
OpenAjax Alliance Areas of Focus

- **Interoperability**
  - Ajax runtime libraries
  - Ajax IDEs
  - Mashups and widgets
  - Mobile Ajax

- **Marketing, education and evangelism**

- **Future browsers**
IDE Interoperability

- IDEs = Developer tools (code assist, debug, visual layout)
- Problem
  - NxM permutation problem (~200 Ajax toolkits, ~15 Ajax IDEs)
  - Each Ajax toolkit documents their APIs and widgets in their own way
- Key deliverable: OpenAjax Metadata
  - Industry standard XML for:
    - JavaScript APIs
    - UI controls
- OpenAjax Alliance’s IDE WG members
  - Adobe Dreamweaver
  - Eclipse (Aptana, JSDT, ATF)
  - Microsoft Visual Studio
Mashup and Widget Interoperability

- Mashups = Ability to assemble pre-built components into a composite application
- Problems
  - Security
  - Widget interoperability
- Key deliverables:
  - OpenAjax Hub 1.1
  - OpenAjax Metadata for Widgets
  - Open source widget transcoders
  - Open source mini-mashup tool
Mobile Ajax

- Mobile Ajax = Full Ajax running on mobile phones
- Problems
  - Special challenges (screen size, latency, keypad, battery, …)
  - Special opportunities (portability, GPS, camera, voice, …)
- White paper: Introduction to Mobile Ajax for Developers
- Mobile Device APIs
  - Open source JavaScript to access CPS, camera, address book, SMS, …
  - Targets both existing proprietary, system-dependent APIs (via plugins) and emerging industry standards
  - Collaborating with OMTP, tracking W3C (e.g., geolocation)
Shaping the Future of Ajax Ecosystem

- **Ajax industry browser wishlist initiative**
  - April – July, 2008
  - 222 participants, including many industry leaders
  - 55 separate feature requests described and discussed on wiki

- **Top feature requests**
  - 2D Graphics
  - Security (better prevention of XSS and CSRF)
  - Improved low-level DOM hooks for visual layout
  - DOM performance
  - Rich text editing
  - Server push (Comet)
  - Video and audio
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Resurrection of SVG on the desktop

- Native SVG support in Mozilla, WebKit and Opera
  - Opera: all of SVG 1.1, some of SVG Tiny 1.2, passes Acid3
  - WebKit: nearly all of SVG 1.1, passes Acid3
  - Mozilla: nearly all of static SVG 1.1, working hard to add animation and fonts, should soon pass Acid3
    - Also adding SVG video and leveraging SVG features within HTML

- However, IE still holds veto power
  - IE8 doesn’t include SVG support

- Ajax community has stepped up, particularly Dojo
  - dojo.gfx implements static SVG model in JavaScript
  - Renders to SVG on most browsers, but on IE uses either VML or Silverlight, and Canvas on iPhone (some dojo.gfx features disabled)
Ajax is the horse to ride

- SVG can’t compete in the platform wars by itself
- Ajax solves many problems SVG has faced
  - Ubiquitous distribution
  - Industry momentum
  - Flowable text streams
  - Native UI elements
  - Grid layout
- Ajax is, in fact, the only horse to ride
  - Ajax is the only major RIA platform that embraces open standards
  - 3 out of 4 browsers already implement SVG natively
  - Acid3 test is strong leverage
JavaScript vs XML

- Ajax guys continually explore what works best in today’s browsers
- **JSON** – data subset of JavaScript
  - Datatypes: Strings, Numbers, Booleans, Arrays, Objects
  - Executable logic disallowed: no assignments, no functions
  - Root of a JSON object is either an array [] or an object {}
  - Faster than XML
- **Most Ajax toolkits use JSON notation as their “declarative markup”**
  - var myData = [
    ['Apple',29.89,0.24,0.81,'9/1 12:00am'],
    ['Ext',83.81,0.28,0.34,'9/12 12:00am'],
    ['Google',71.72,0.02,0.03,'10/1 12:00am'],
    ['Microsoft',52.55,0.01,0.02,'7/4 12:00am'],
    ['Yahoo!',29.01,0.42,1.47,'5/22 12:00am']
  ];
How to increase synergy with Ajax (1)

Higher-level goals
- PostScript-like vector graphics in the browser (paths, text, images, transformations, etc.)
- Open standards based
- Support for interactivity, scripting, animation, effects
- Don’t fall victim to “Marketing Myopia”, where it has to be one particular technology (i.e., SVG as it stands today); instead, remember the higher-level goals

Constraints
- Microsoft still holds the SVG trump card
- Even if they ship SVG in IE9, there will still be a lot of desktops still running IE6 (36% today)
How to increase synergy with Ajax (2)

- **Possible high-level strategies**
  - Ubiquitous SVG plugin for IE
  - Wait for WebKit, Opera, Mozilla, etc. to make SVG happen on mobile:
    - *SVG will gain marketplace momentum and MS will finally surrender*
  - Double-down on Ajax techniques like dojo.gfx
    - *Jon’s favorite*

- **Proposed shorter-term tactics**
  - Give top priority to HTML/SVG integration
    - *SVG WG needs to work closely with SVG people on Mozilla/WebKit/Opera*
    - *Make sure the HTML5 guys look at SVG as theirs*
    - *If possible, refocus SVG WG on HTML/SVG integration questions*
  - Double-down on the Ajax toolkit front
    - *We need a next-generation graphics toolkit beyond what is in dojo.gfx*
    - *280 North’s Cappucino showcases some interesting ideas*
Thank you!