

Introduction to Ajax/Dojo

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What is Ajax



Topics

- High level overview of Ajax
- Technical overview of Ajax
- Ajax advantages and problems
- PPP and Ajax
- Quick Dojo primer
- Conclusion

Ajax Demo (Web OS)

The screenshot displays a web-based operating system interface (eyeOS) running in a browser window. The browser's address bar shows the URL `http://demo.eyeos.org/`. The interface features a blue background and several key components:

- eyeFiles (File Manager):** A window showing a file browser with a sidebar for "Home" and "Trash", an "Actions" panel with options like "Upload file", "Download", and "Create folder", and a "Places" panel listing "Home", "Desktop", "Documents", and "Music". The main area displays folders for "Desktop", "Documents", "Music", and "Videos".
- eyeProcess (Process Monitor):** A window displaying a table of running processes. Below the table is a "Kill Process" button.
- Calculator:** A floating window with a numeric keypad and mathematical symbols.
- System Menu:** A floating menu with options: "System preferences", "Applications", "About eyeOS", "Launch App", and "Close session".
- Taskbar:** Located at the bottom, it shows active windows for "eyeFiles", "eyeProcess", and "eyeCalc".
- Status Bar:** In the bottom right corner, it displays the date and time: "29/10 13:54".

Pid	Process Name	Username
46742	eyeX	demo9
63679	eyeDesk	demo9
60702	eyeDock	demo9
19510	eyeBar	demo9
71460	eyeDesk_extras	demo9
34261	eyeFiles	demo9
65022	eyeProcess	demo9
42627	eyeCalc	demo9

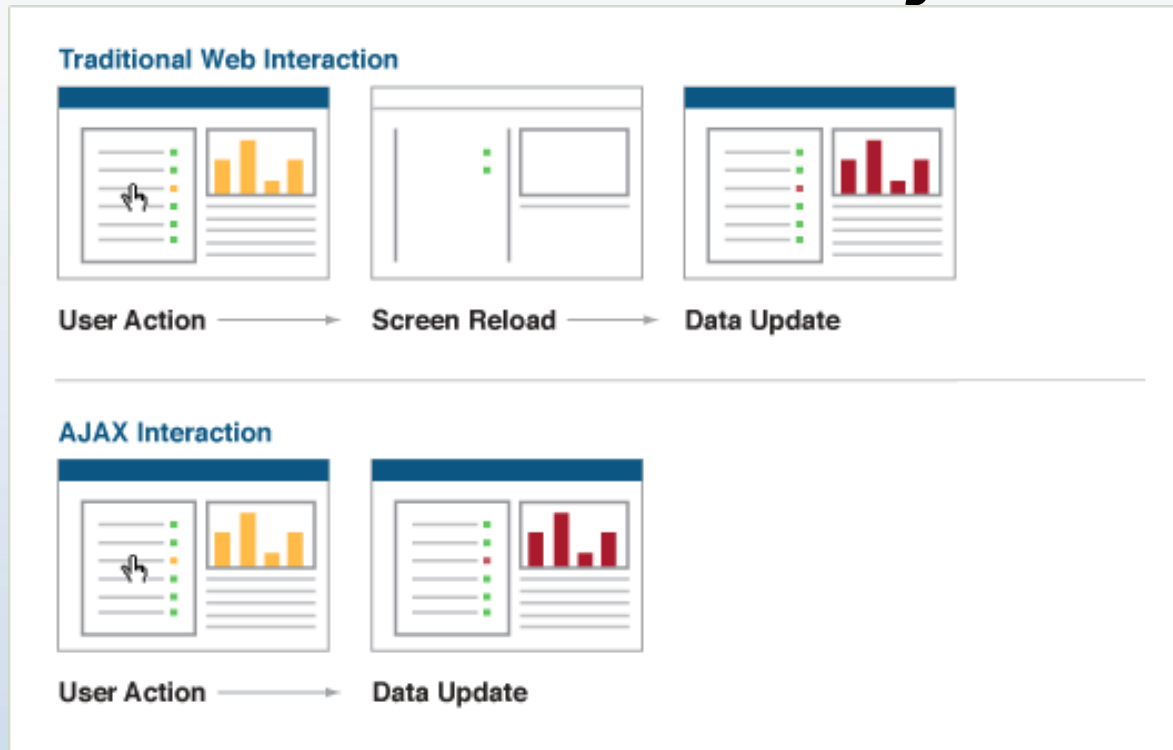
Other Ajax Pages

- Google Mail
- Google Maps
- Google Documents
- Zibra (bought by Yahoo)
- All products by 37Signals
- Used in Flickr, Twitter and others
- Adobe, Sun, Microsoft are in the game.

What is Ajax

- Ajax is a browser hack (originally undocumented)
- It breaks the HTTP model.
- Technology available since 2001
- It is immature
- Ajax is behind web2.0
- Ajax makes Web pages look like normal applications
- Ajax seems to be the future
- Can be used with Java,PHP,Ruby, Python, e.t.c.

The need of Ajax



- Ajax allows a data update without reloading the whole page (Web developer's dream)

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Technology Behind Ajax

- A means Asynchronous. It describes the communication method.
- J means Javascript. It describes how the data gets into the page.
- A means AND
- X means XML which describes the format of data. It can also be text, HTML, json or anything else the programmer wants.

Ajax versus HTTP/JSP

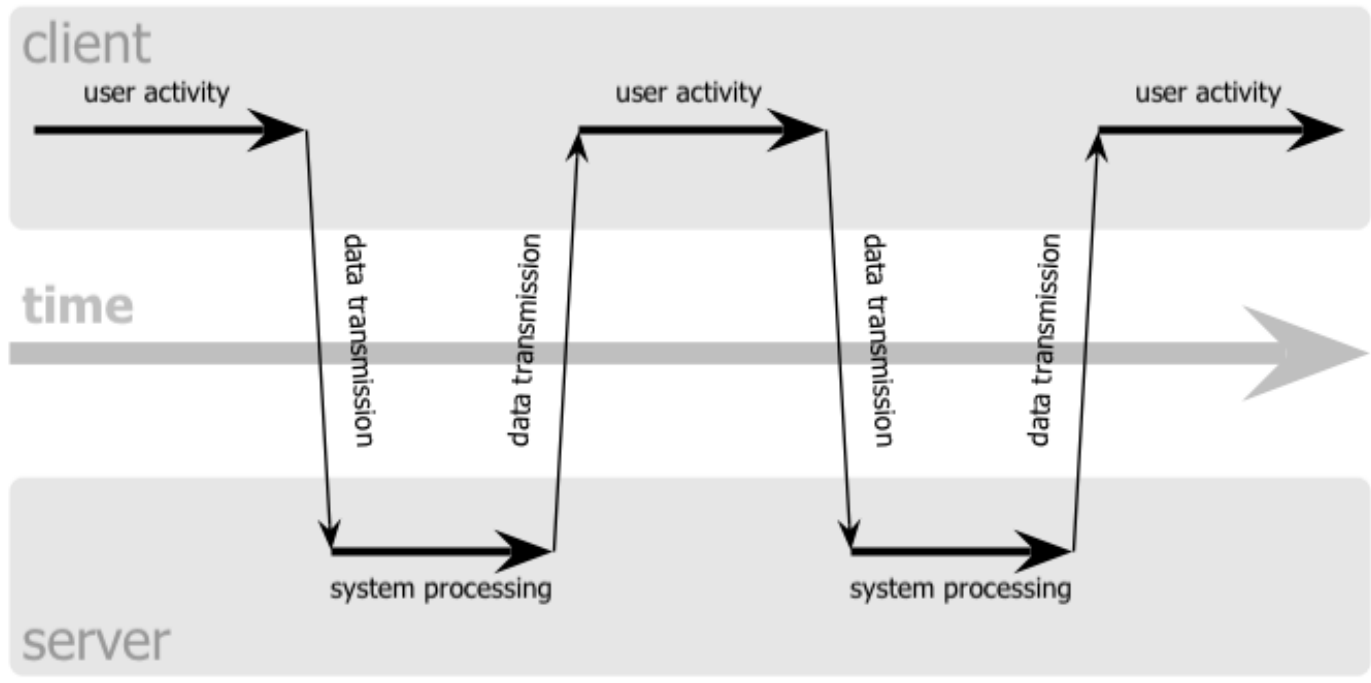
Ajax	HTTP
Asynchronous	Synchronous
HTML,XML,JSON, plain text	HTML
Requires modern browser	Any browser
Computation on client (and server)	Computation on server
Pages can be invisible	Pages are visible

The secret of Ajax

- Ajax is the XMLHttpRequest Javascript object present in IE6.0
- It initiates an **asynchronous** connection **behind the scenes** (without user intervention) and returns the result in the Javascript engine of the browser
- This connection is **outside** the normal HTTP cycle
- Works on IE6/7, Safari 2/3, Firefox (Opera is problematic).

Traditional HTTP

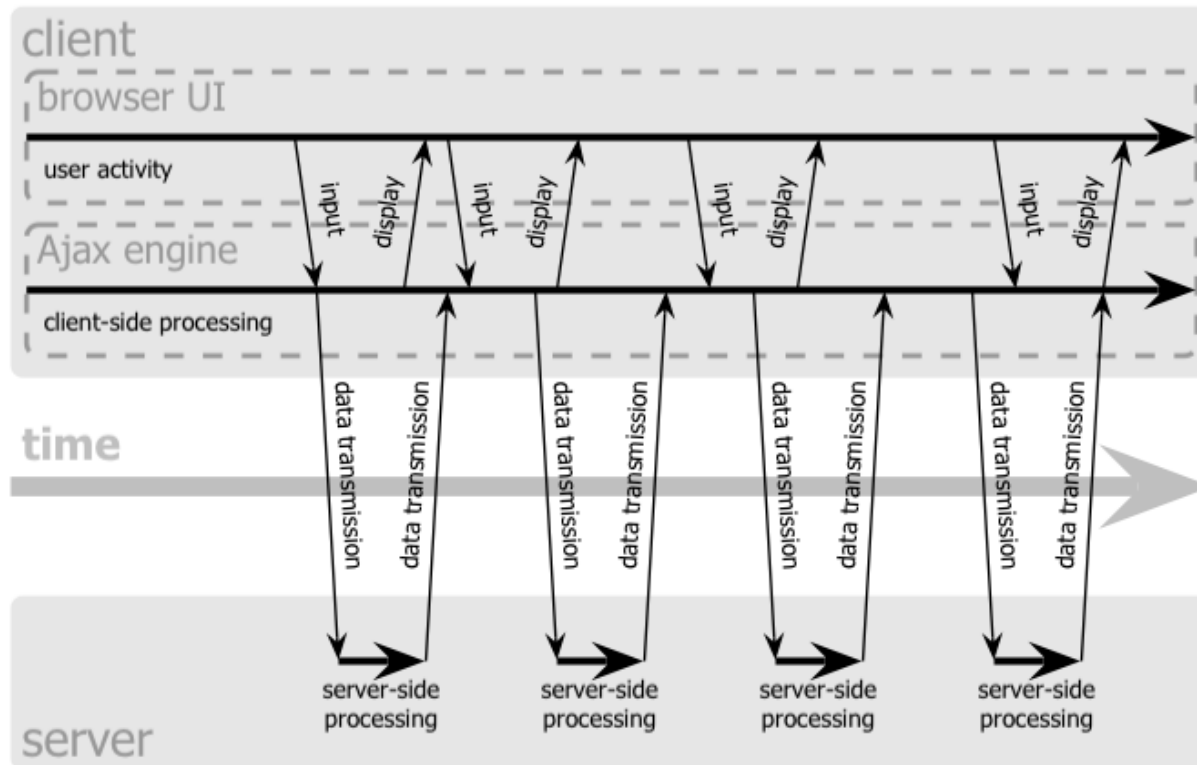
classic web application model (synchronous)



Request- Response in HTML (generated by JSP)

Ajax Mechanics

Ajax web application model (asynchronous)



Multiple connections behind the scenes

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Ajax Tricks

- Text boxes with autocomplete
- Zooming images
- Drag and drop
- Animations and effects
- Interactive Slideshows
- News tickers /Stock updates
- Dialogs in an page

Ajax (The good)

- Rich applications on the web
- Only update parts of page
- Responsive User interfaces
- Graphics Effects
- Validation of forms on the client
- No more JSP frames!

Ajax (The bad)

- Ajax Toolkits are immature
- Works only on modern browsers
- Pages load slowly the first time
- Computation on the client
- Can easily flood the network
- Web development must be revised
- Lack of Javascript debuggers

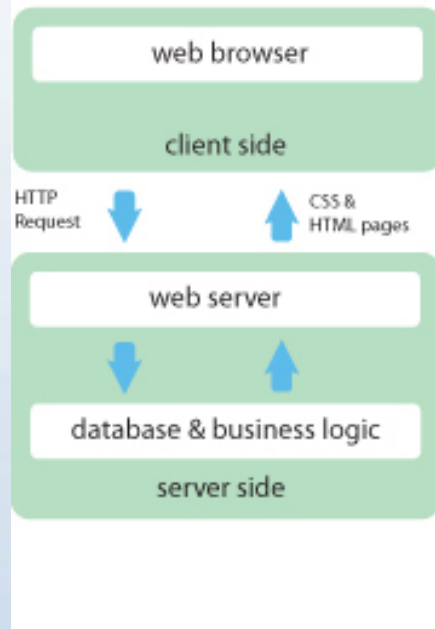
Ajax (The ugly)

- Browser depended
- Back button is broken
- Bookmarks are broken
- Javascript memory leaks (client side!)
- Brings complexity in Web development
- One more tier (see next slide)

The Ajax Tier

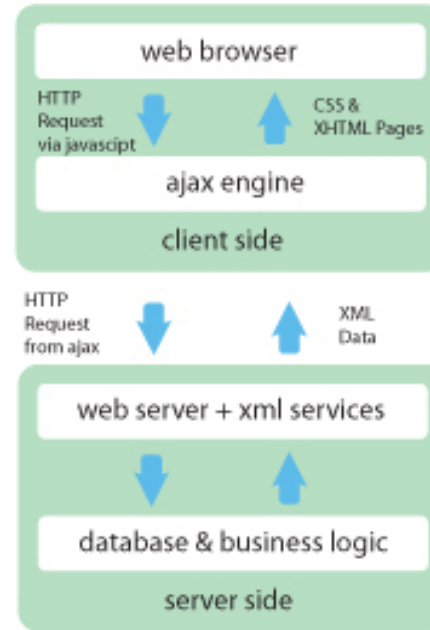
That was then....

Traditional web application model



...this is now

rich web application model using ajax



- DB, application logic, client and a new AJAX engine abstraction layer (coded in Javascript)

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- **PPP and Ajax**
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PPP Validation Tool

The screenshot shows the PPP Validation Tool interface. The title bar reads "PPP Validation Tool". The main window has a blue header with the text "PPP Validation Tool" and a European Union flag icon. Below the header, there is a navigation bar with "Services", "View", and "Help" menus. The main content area is divided into several sections:

- Survey Tree (Left):** A hierarchical tree view showing the survey structure. The selected item is "11.01.11.101.aa - Uncle Ben's rice".
- Product Details (Top Right):** A table showing details for the selected item:

11.01.11.101.aa - Uncle Ben's rice	
Brand	UNCLE BEN'S
Brand Type	Single / multiple brand specified
Ref. quantity	1000
Type	long-grain
Weight	500 - 1000 g
Parboiled	yes
Exclude	quick cooking rice
- Item Statistics (Top Right):** A table showing summary statistics:

Average:	2.88
Min price:	2.48
Max price:	3.15
Var. Coef:	7.34
Net. Price:	0.0
Add. Check:	N/A
- VAT: 0.0**
- Represent. Undefined**
- UK Observations Table:** A table with columns: Month, Shop Type, Shop ID, Obs. Price, Obs. Quantity, Price, Price Ratio, T value. The table contains 12 rows of data, each with a pencil icon, a blue arrow, and a red 'X' in the first column.

	Month	Shop Type	Shop ID	Obs. Price	Obs. Quantity	Price	Price Ratio	T value
	1	tyuyu	null	1.24	500.0	2.48	0.75	0.27
	5	fdgdfg	SuperMarket	2.74	1000.0	2.74	0.83	0.19
	12	fdgdfg	fgfg	2.78	1034.0	2.69	0.81	0.2
	3	4	4	2.89	1000.0	2.89	0.87	0.14
	5			2.45	1455.0	1.68	0.51	0.54
	1	2	3	4.0	5.0	800.0	241.69	261.85
	3	Mall	3	3.0	1000.0	3.0	0.91	0.1
	1	1	1	1.0	1.0	1000.0	302.11	327.59
	1	1	1	1.0	1.0	1000.0	302.11	327.59
	1	1	1	12.0	1.0	12000.0	3625.38	3943.06

The status bar at the bottom shows "Done" on the left and "PPP Validation Tool - Version xx.xx" on the right.

- Ajax/Dojo/JSP page

Ajax Toolkits

- Numerous toolkits with funny names
- Client side: Dojo, qooxdoo, scriptaculous, Prototype, Yahoo UI
- Server side: Echo, Dwr, Thinwire
- Google Web Toolkit, Microsoft Atlas
- Also for other languages such as PHP, python, ruby e.t.c

Ajax in PPP

- We started with Echo2 (Java server side) and redesigned to Dojo (Javascript client side)
- Dojo is popular (Apple Store/Sun JSF2)
- Dojo is more stable (0.9 waiting for 1.0)
- Dojo is modular (we use another tree)
- Dojo is transparent (Javascript editing)

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Using Dojo

- Dojo contains many widgets
- The most basic is ContentPane
- It has a property called **href** for a URL
- Can be changed dynamically to another jsp/html page.
- Use javascript to change content on the fly responding to user actions.

Dojo example

In Html code (from a JSP page)

```
<div id="rightPanel" dojoType="dijit.layout.ContentPane">  
    This text will be changed  
</div>
```

In a Javascript file loaded by the page (the function could run after clicking a button).

```
function showProduceProperties(productID)  
{  
    var where = dijit.byId("rightPanel");  
    where.setHref("showProduct.jsp?product=" + productID);  
}
```

Dojo Example

- Behinds the scenes an XMLHttpRequest object is created.
- The contents of showProduct.jsp are fetched
- The DOM node with id rightPanel is located
- The contents of the node are replaced with those of the JSP page.
- User sees changes content on the page without any reloading.

Conclusion

- Ajax allows for rich Web applications
- Ajax pages can be fast and usable
- Ajax toolkits are immature
- Problems with different browsers
- Use with caution until technology matures enough.