AJAX

WORLD WIDE WEB/WORLD WIDE WAIT

18 February 2005 by Jesse James Garrett

- Ajax is nothing more than an approach to web interaction. This approach involves transmitting only a small amount of information to and from the server in order to give the user the most responsive experience possible.

- AJAX is a web development technique for creating interactive web applications.
- Why to Learn Ajax?
- AJAX stands for **A**synchronous **Ja**vaScript and **X**ML
- Ajax uses XHTML for content, CSS for presentation, along with Document Object Model and JavaScript for dynamic content display.
- AJAX is a web browser technology independent of web server software.

- A user can continue to use the application while the client program requests information from the server in the background.
- AJAX cannot work independently. It is used in combination with other technologies to create interactive webpages.
- JavaScript
- Loosely typed scripting language.
- JavaScript function is called when an event occurs in a page.
- Glue for the whole AJAX operation.

- DOM
- API for accessing and manipulating structured documents.
- Represents the structure of XML and HTML documents.
- CSS
- Allows for a clear separation of the presentation style from the content and may be changed programmatically by JavaScript
- XMLHttpRequest
- JavaScript object that performs asynchronous interaction with the server.

- Here is a list of some famous web applications that make use of AJAX.
- Google Maps
- A user can drag an entire map by using the mouse, rather than clicking on a button.
- https://maps.google.com/

- Google Suggest
- As you type, Google offers suggestions. Use the arrow keys to navigate the results.
- https://www.google.com/webhp?complete=1&hl=en

- Gmail
- Gmail is a webmail built on the idea that emails can be more intuitive, efficient, and useful.
- https://gmail.com/

- Yahoo Maps (new)
- Now it's even easier and more fun to get where you're going!
- https://maps.yahoo.com/

- All the available browsers cannot support AJAX. Here is a list of major browsers that support AJAX.
- Mozilla Firefox 1.0 and above.
- Netscape version 7.1 and above.
- Apple Safari 1.2 and above.
- Microsoft Internet Explorer 5 and above.
- Konqueror.
- Opera 7.6 and above.

- A Rich Internet Application (RIA) is one which is connected, interactive, and responsive. An RIA is connected via the Internet to other people or other systems, provides effective communication through short, quick response times, and is therefore pleasant, useful, and useable.

- Traditional Web Applications vs. Ajax Applications

- Traditional Web Applications:

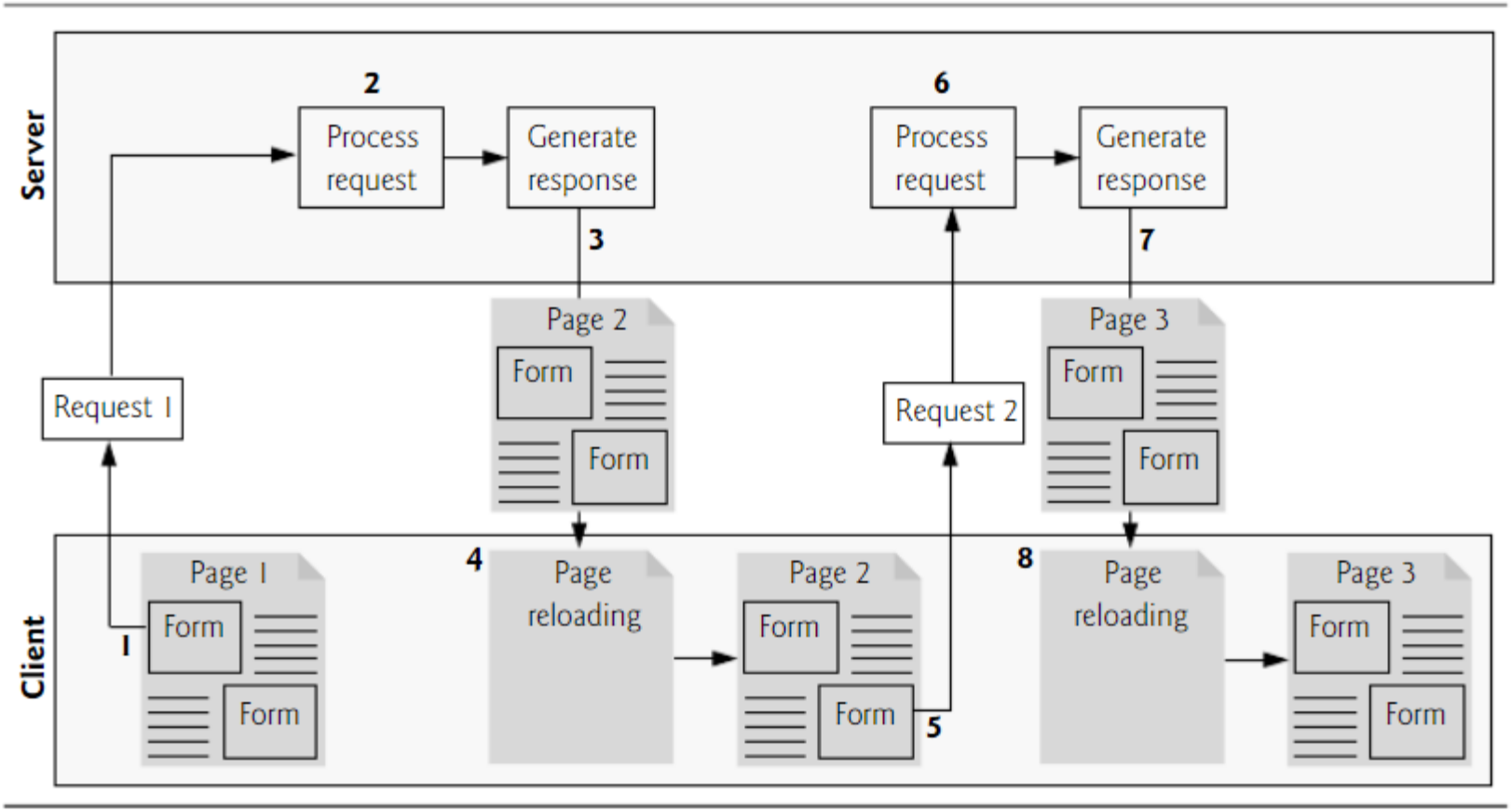


Fig. 16.1 | Classic web application reloading the page for every user interaction.

Ajax Web Applications:

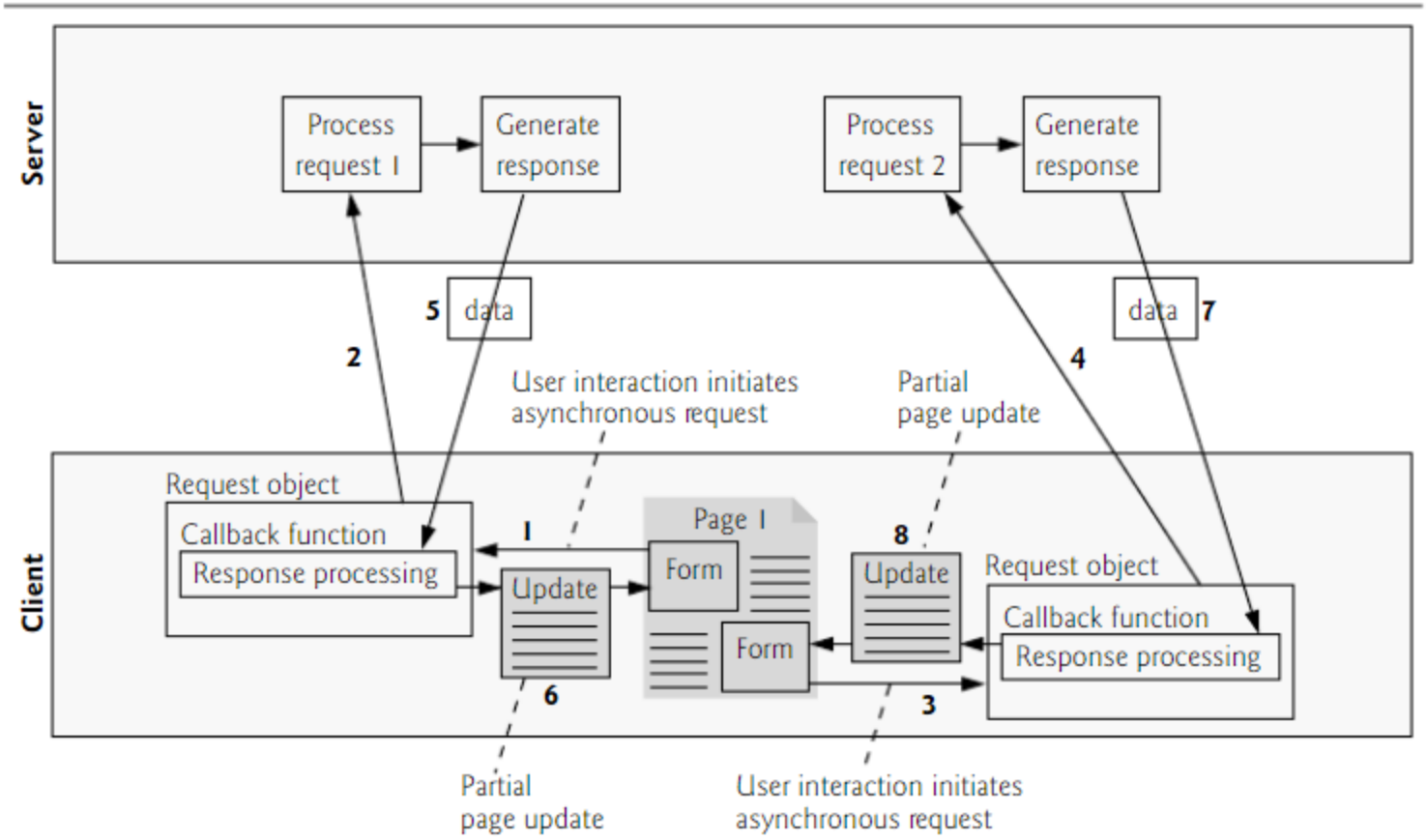


Fig. 16.2 | Ajax-enabled web application interacting with the server asynchronously.

Ajax Principles :

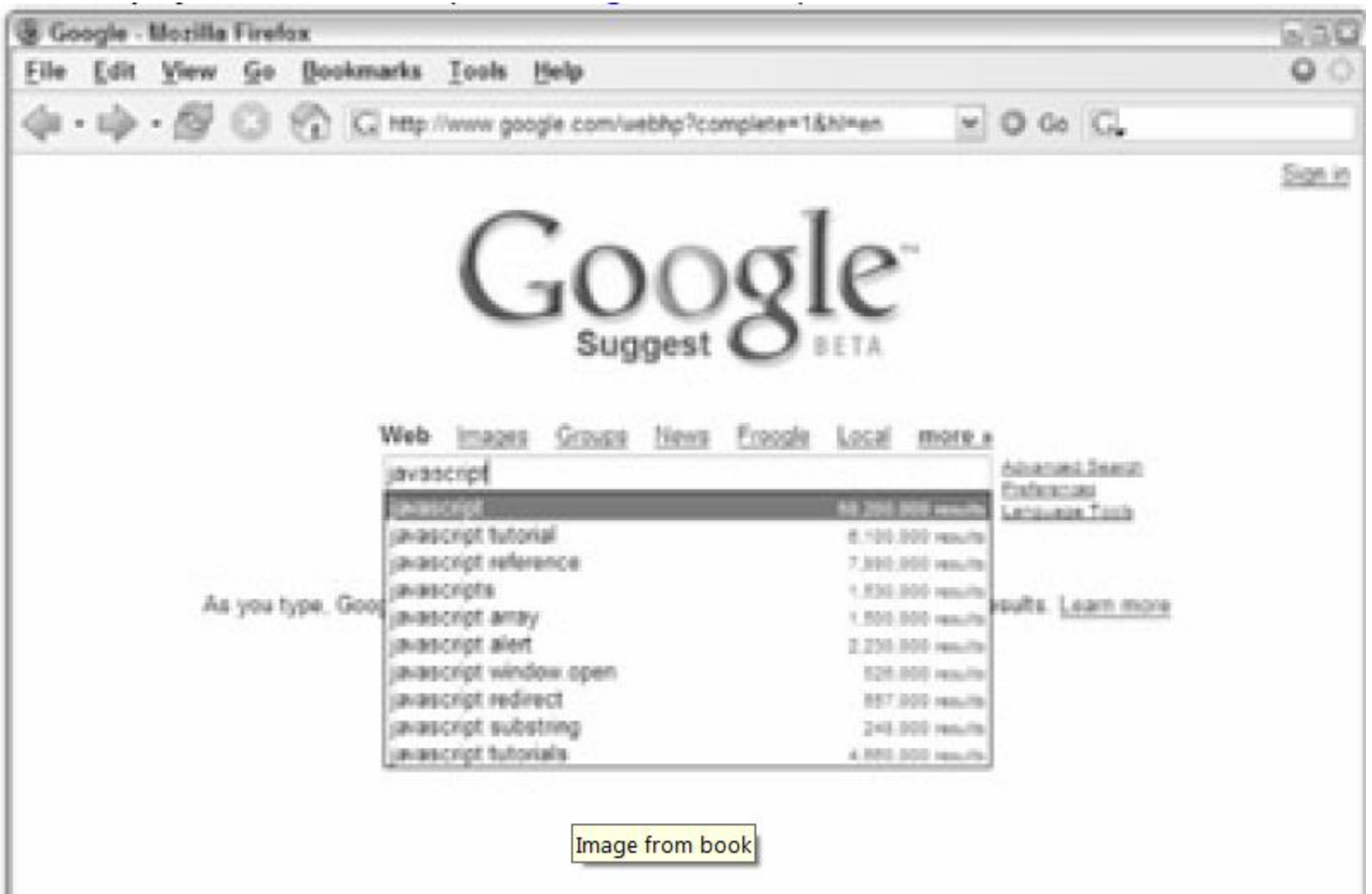
1. **Minimal traffic**
2. **No surprises**
3. **Established conventions**
4. **No distractions**
5. **Accessibility**
6. **Avoid entire page downloads**
7. **User first**

Technologies Behind Ajax :

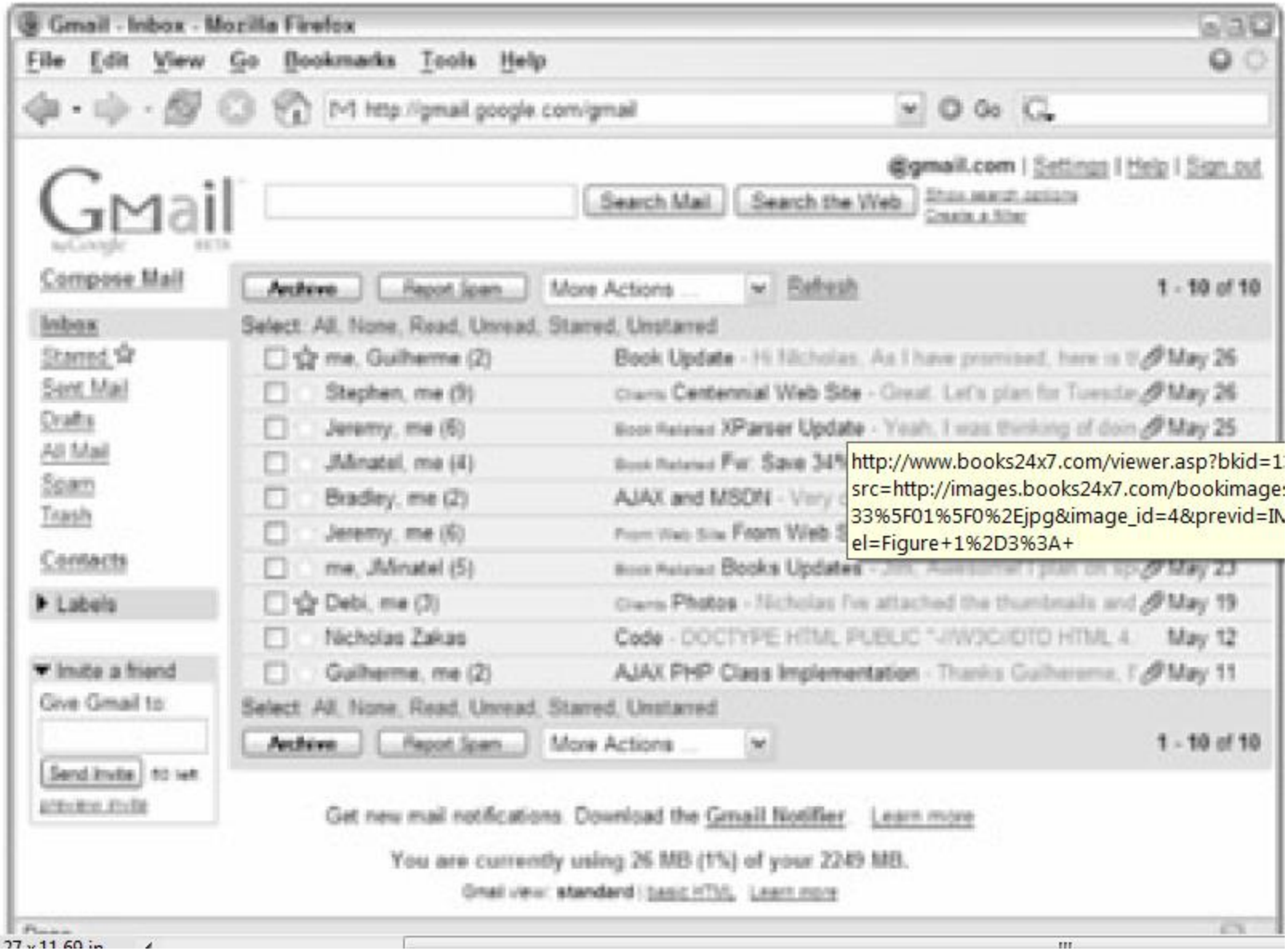
- **HTML/XHTML: Primary content representation languages**
- **CSS: Provides stylistic formatting to XHTML**
- **DOM: Dynamic updating of a loaded page**
- **XML: Data exchange format**
- **XSLT: Transforms XML into XHTML (styled by CSS)**
- **XMLHttp: Primary communication broker**
- **JavaScript: Scripting language used to program an Ajax engine**

Examples of usage of AJAX:

- **Google Suggest**



- **Gmail**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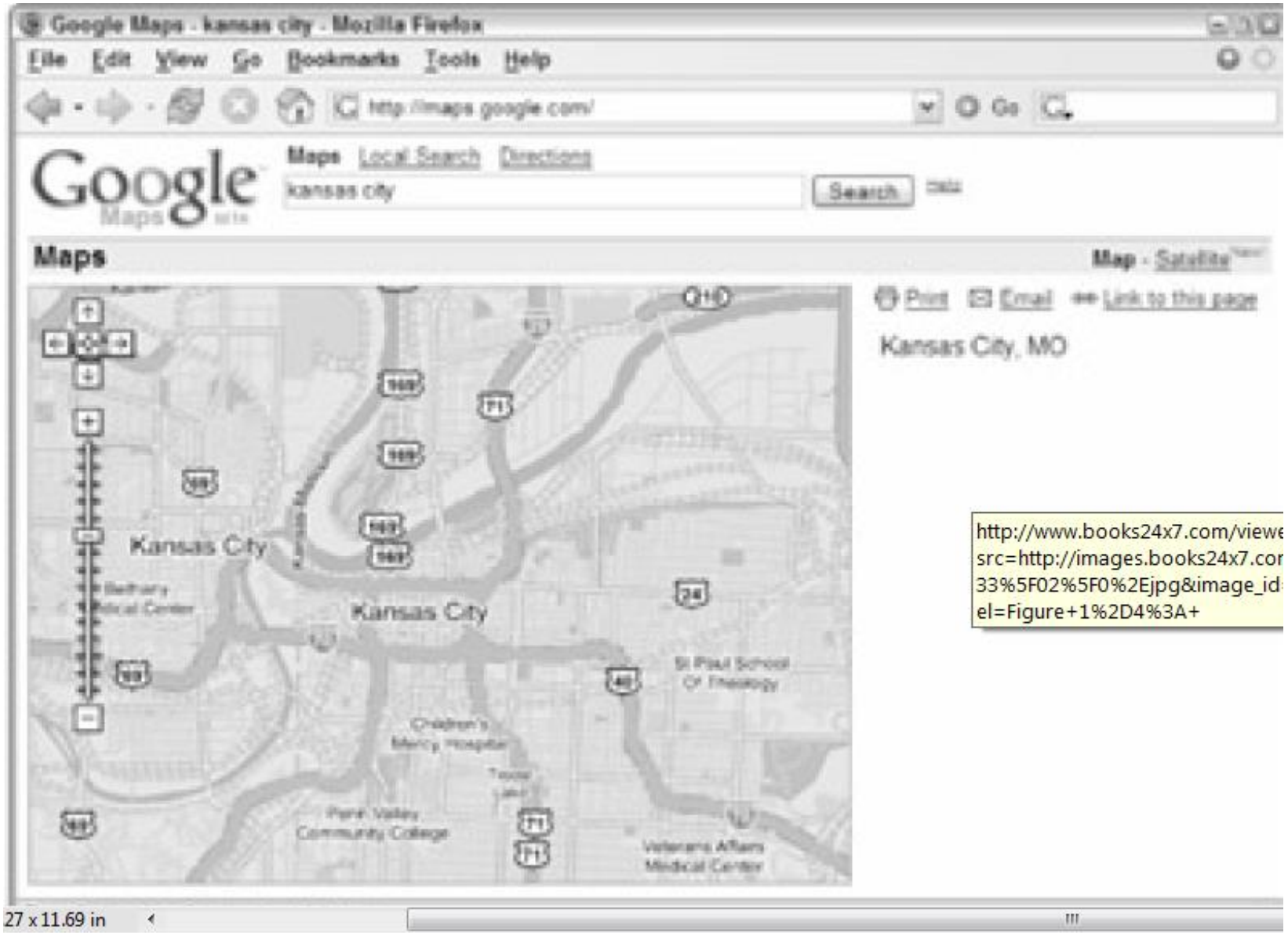
- **Google Maps :**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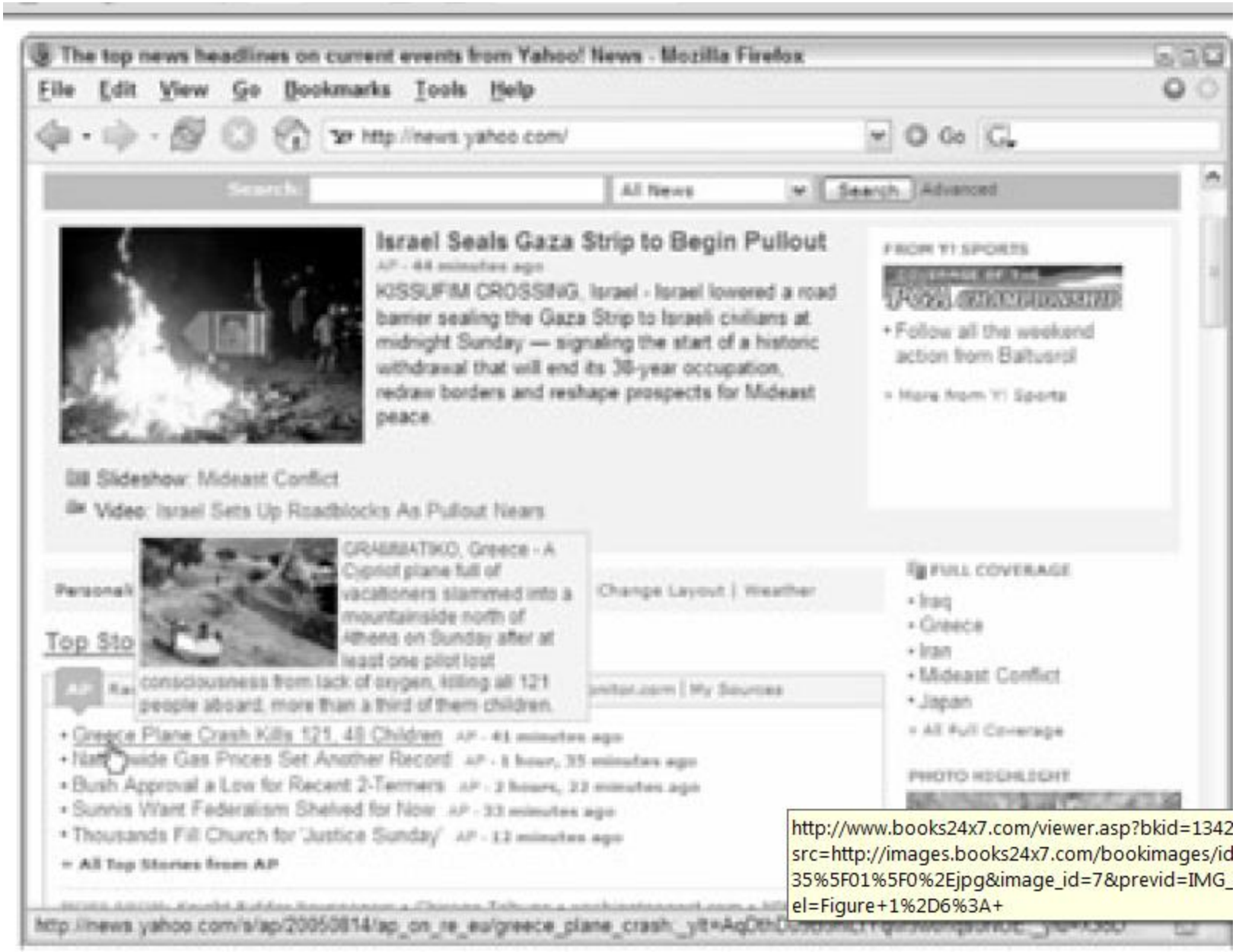
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KISSUFIM CROSSING, Israel - Israel lowered a road barrier sealing the Gaza Strip to Israeli civilians at midnight Sunday — signaling the start of a historic withdrawal that will end its 38-year occupation, redraw borders and reshape prospects for Mideast peace.
Slideshow: Mideast Conflict
Video: Israel Sets Up Roadblocks As Pullout Nears
GRAMMATIKO, Greece - A Cypriot plane full of vacationers slammed into a mountainside north of Athens on Sunday after at least one pilot lost consciousness from lack of oxygen, killing all 121 people aboard, more than a third of them children.
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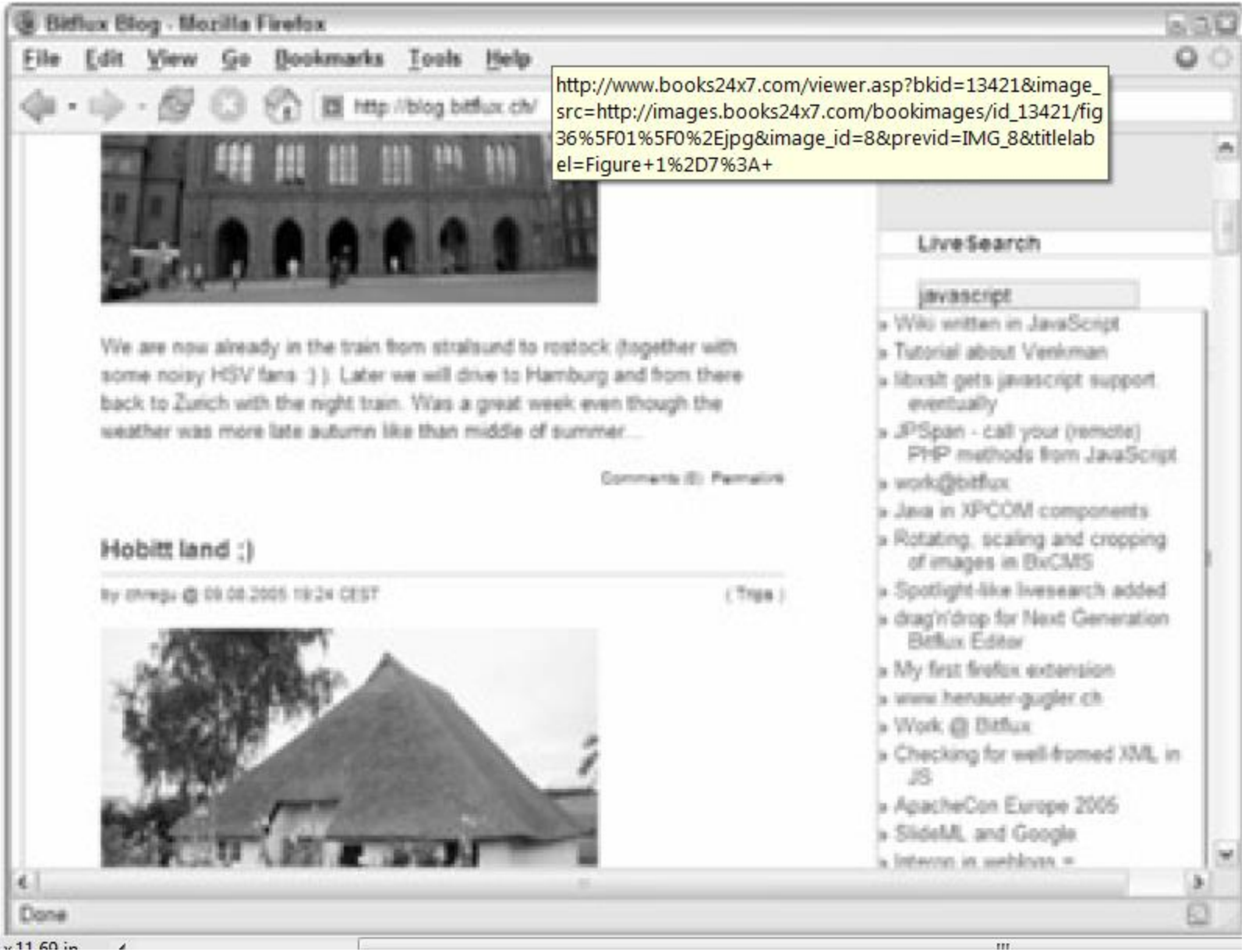
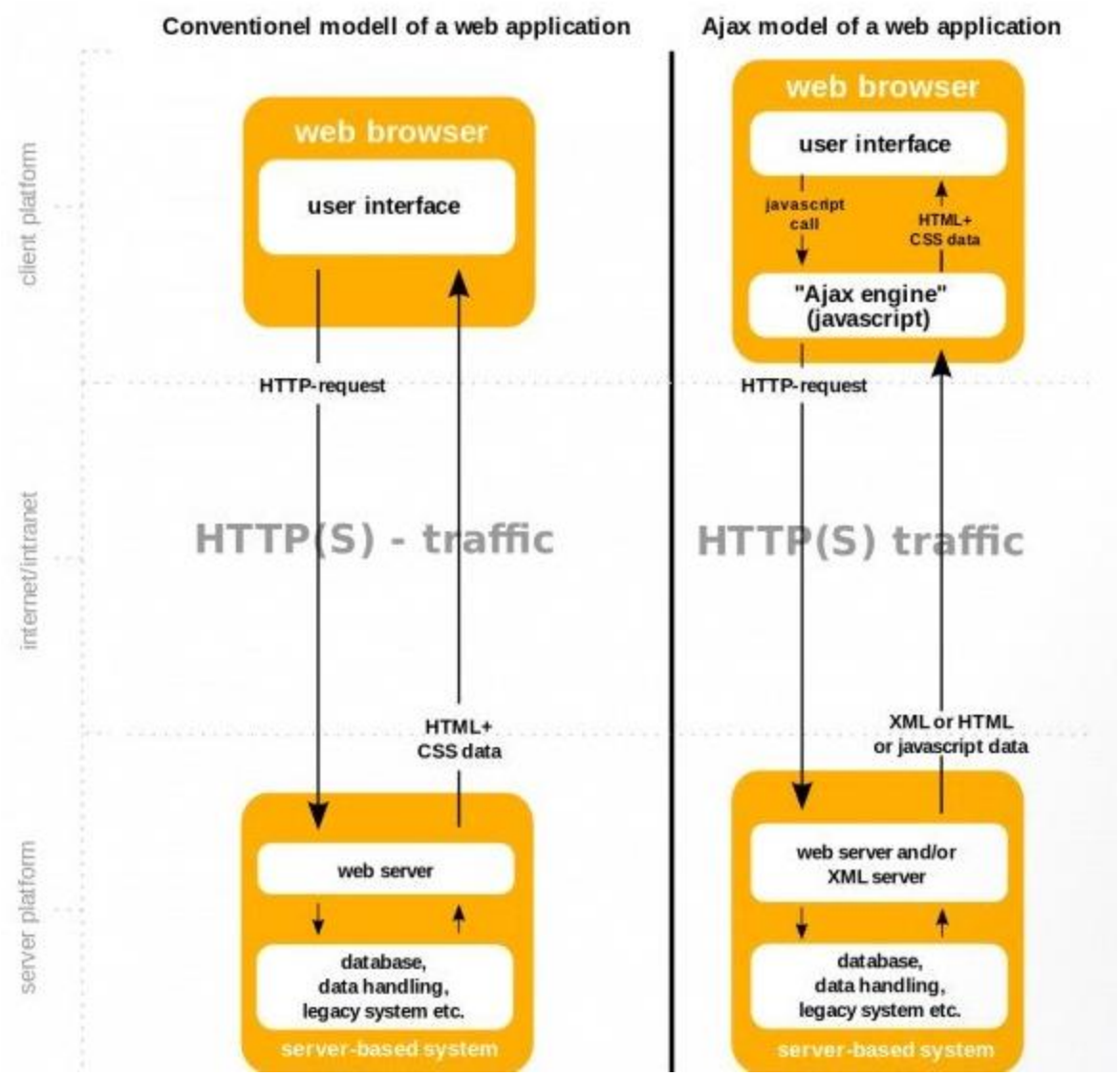
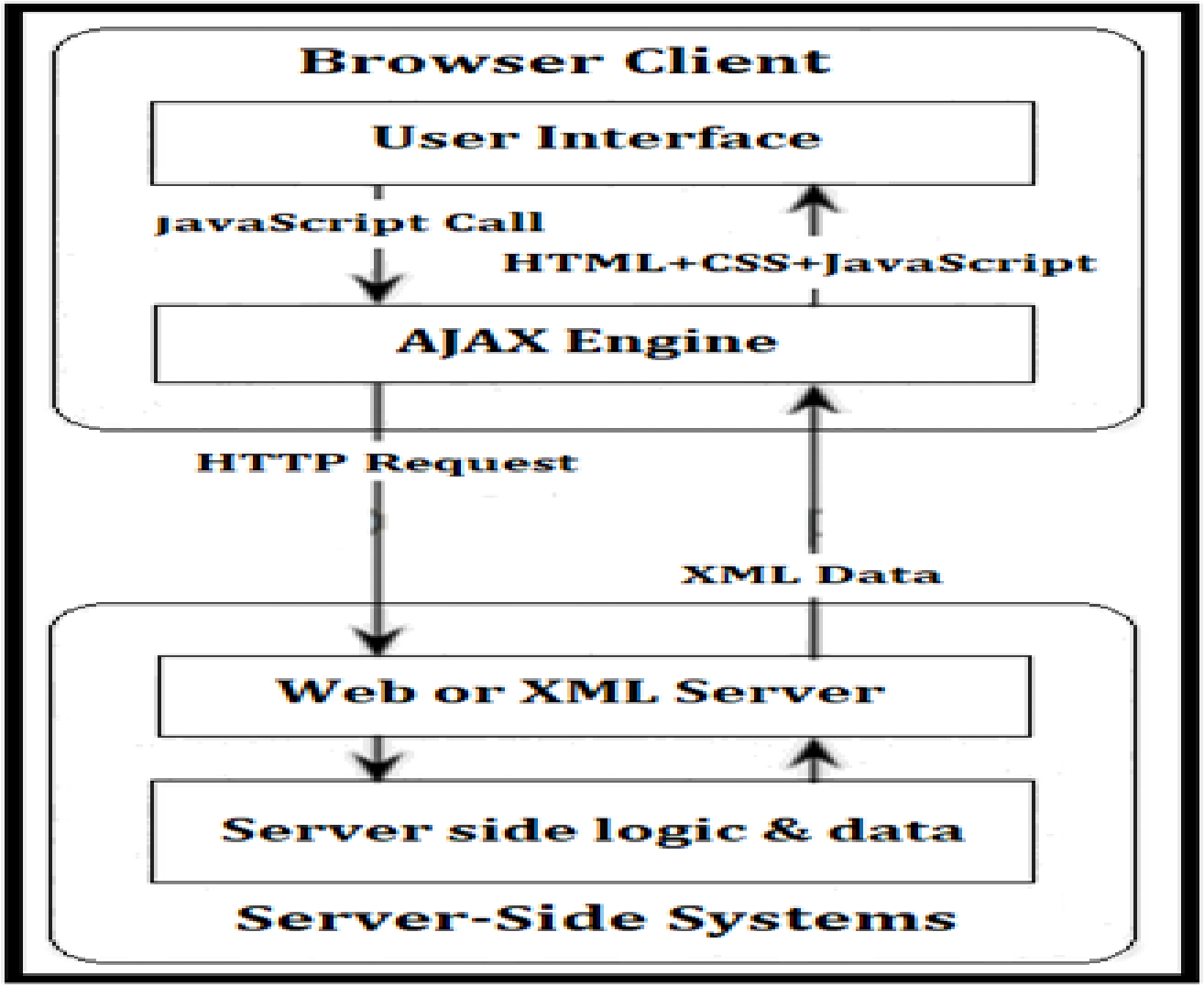
- **Bitflux Blog : live search**



- Conventional and ajax model



- **AJAX Web Application Model**



AJAX Web Application Model

AJAX - The XMLHttpRequest object:

- The keystone of AJAX is the XMLHttpRequest object.
- All modern browsers support the XMLHttpRequest object.
- The XMLHttpRequest object can be used to exchange data with a server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.

Create an XMLHttpRequest Object:

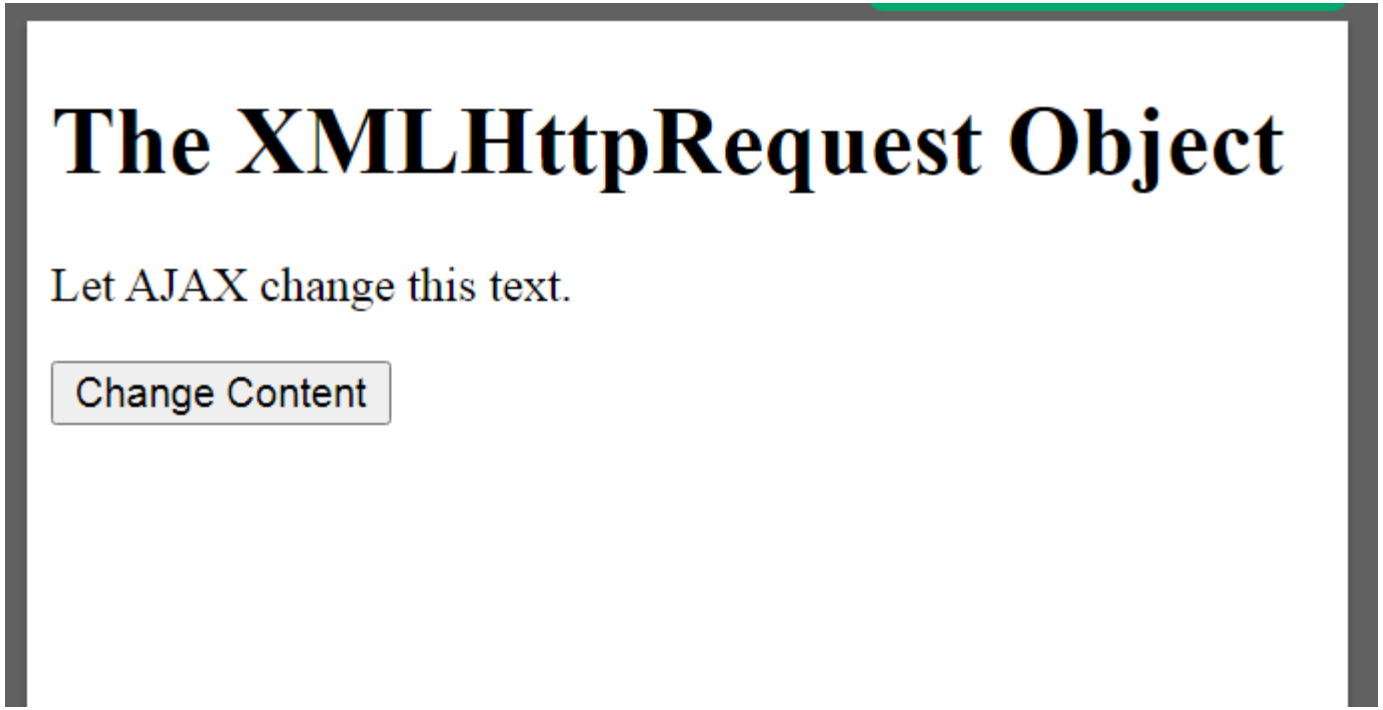
- All modern browsers (Chrome, Firefox, Edge (and IE7+), Safari, Opera) have a built-in XMLHttpRequest object.
- Syntax for creating an XMLHttpRequest object:
- *variable* = new XMLHttpRequest();

```
<!DOCTYPE html>
<html>
<body>

<h1>The XMLHttpRequest Object</h1>

<p id="demo">Let AJAX change this text.</p>

<button type="button"
onclick="loadDoc()">Change Content</button>
```

```
<script>
function loadDoc() {
  var xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("demo").innerHTML =
this.responseText;
    }
  };
  xhttp.open("GET", "ajax_info.txt", true);
  xhttp.send();
}
</script>

</body>
</html>
```

The "ajax_info.txt" file used in the example above, is a simple text file and looks like this:

```
<h1>AJAX</h1>
<p>AJAX is not a programming language.</p>
<p>AJAX is a technique for accessing web servers from a web page.</p>
<p>AJAX stands for Asynchronous JavaScript And XML.</p>
```


The XMLHttpRequest Object
Let AJAX change this text.
Change Content

The XMLHttpRequest Object

AJAX

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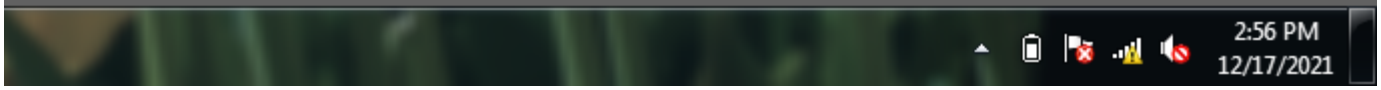
Change Content



XMLHttpRequest Object Methods

Method	Description
new XMLHttpRequest()	Creates a new XMLHttpRequest object
abort()	Cancels the current request
getAllResponseHeaders()	Returns header information
getResponseHeader()	Returns specific header information
open(*method,url,async,user,psw*)	Specifies the request *method*: the request type GET or POST *url*: the file location *async*: true (asynchronous) or false (synchronous) *user*: optional user name

send()	Sends the request to the server Used for GET requests
send(*string*)	Sends the request to the server. Used for POST requests
setRequestHeader()	Adds a label/value pair to the header to be sent

XMLHttpRequest Object Properties

Property	Description
onreadystatechange	Defines a function to be called when the readyState property changes
readyState	Holds the status of the XMLHttpRequest. 0: request not initialized 1: server connection established 2: request received 3: processing request 4: request finished and response is ready
responseText	Returns the response data as a string
responseXML	Returns the response data as XML data

status	Returns the status-number of a request 200: "OK" 403: "Forbidden" 404: "Not Found" For a complete list go to the Http Messages Reference
statusText	Returns the status-text (e.g. "OK" or "Not Found")