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ANALYTICAL REVIEW ON AJAX TECHNOLOGY

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ABSTRACT

Ajax (Asynchronous javascript and xml)is a technology not any programing language.It is a technology for creating "better faster more responsiveweb pages" .Web applications with Ajax are supported to replace all our traditional desktop applications.Ajax sometimes written (AJAX),means a web server without submitting a form or loading a page.In this paper author has discussed about the latest technology which is Ajax .Under which I will cover the performance increment by using this technology and the advantages(pros)and disadvantages (cons)of this technology.And also comparison between pervious technology used and the drawbacks of that technology by which we adopt the technology Ajax.

Keywords : AJAX,DOJO, EMAIL,SYSTEM DESIGN, WEBMAIL

I. INTRODUCTION

Ajax (Asynchronous JavaScript and XML) is a set of web development techniques using many web technologies on the client-side to create asynchronous web applications. With Ajax, web applications can send data to and retrieve from a server asynchronously (in the background) without interfering with the display and behaviour of the existing page. By decoupling the data interchange layer from the presentation layer, Ajax allows for web pages, and by extension web applications, to change content dynamically without the need to reload the entire page .In practice, modern implementations commonly substitute JSON for XML due to the advantages of being native to JavaScript.Ajax is not a technology, but a group of technologies. HTML and CSS can be used in combination to mark up and style information. The DOM is accessed with JavaScript to dynamically display – and allow the user to interact with – the information presented. JavaScript and the XML Http Request object provide a method for exchanging data asynchronously between browser and server to avoid full page reloads

1.1 TECHNOLOGIES

The term Ajax has come to represent a broad group of Web technologies that can be used to implement a Web application that communicates with a server in the background, without interfering with the current state of the page. In the paper that coined the term Ajax, author explained that the following technologies are incorporated:HTML (or XHTML) and CSS for presentation.The Document Object Model (DOM) for dynamic

display of and interaction with data.JSON or XML for the interchange of data, and XSLT for its manipulation.JavaScript to bring these technologies together.Since then, however, there have been a number of developments in the technologies used in an Ajax application, and in the definition of the term Ajax itself. XML is no longer required for data interchange and, therefore, XSLT is no longer required for the manipulation of data. JavaScript Object Notation (JSON) is often used as an alternative format for data interchange, although other formats such as preformatted HTML or plain text can also be used. Asynchronous HTML and HTTP (AHAH) involves using XML HTTP Request to retrieve (X) HTML fragments, which are then inserted directly into the Web page.

1.2. BENEFITS OF AJAX

There are 4 main benefits of using Ajax in web applications:-Callbacks: Ajax is used to perform a callback, making a quick round trip to and from the server to retrieve and/or save data without posting the entire page back to the server. By not performing a full postback and sending all form data to the server, network utilization is minimized and quicker operations occur. In sites and locations with restricted bandwidth, this can greatly improve network performance. Most of the time, the data being sent to and from the server is minimal. By using callbacks, the server is not required to process all form elements. By sending only the necessary data, there is limited processing on the server. There is no need to process all form elements, process the ViewState, send images back to the client, or send a full page back to the client.Making Asynchronous Calls: Ajax allows you to make asynchronous calls to a web server. This allows the client browser to avoid waiting for all data to arrive before allowing the user to act once more.3-User-Friendly: Because a page postback is being eliminated, Ajax enabled applications will always be more responsive, faster and more user-friendly.4-Increased Speed**:** The main purpose of Ajax is to improve the speed, performance and usability of a web application. A great example of Ajax is the movie rating feature onNetflix. The user rates a movie and their personal rating for that movie will be saved to their database without waiting for the page to refresh or reload. These movie ratings are being saved to their database without posting the entire page back to the server.

1.4. NEED OF AJAX

Ajax is used for increasing the performance of web services by using a light weight languages which can also work on low bandwidth also, and can be easily accessible to all type of bandwidth .To increase the speed,replace all our traditional desktop applications,faster because less details transmitted and becausethe browser has less work to do.

1.5. AJAX and JAVASCRIPT

Fuelled by the increased interest in Web 2.0, AJAX (Asynchronous JAVASCRIPT Technology and XML) is attracting the attention of businesses all round the globe.One of the main reasons for the increasing popularity of AJAX is the scripting language used – JavaScript (JS) which allows for a number of advantages including: dynamic forms to include built-in error checking, calculation areas on pages, user interaction for warnings and getting confirmations, dynamically changing background and text colours or “buttons”, reading URL history

and taking actions based on it, open and controlwindows, providing different documents or parts based on user request (i.e., framed vs. non-framed).AJAX is not a technology; rather, it is a collection of technologies each providing robust foundations when designing and developing web applications:**XHTML or HTML and Cascading Style Sheets (CSS)** providing the standards for representing content to the user**Document Object Model (DOM)** that provides the structure to allow for the dynamic representation of content and related interaction. The DOM exposes powerful ways for users to access and manipulate elements within any document.**XML and XSLT** that provide the formats for data to be manipulated, transferred and exchanged between server and client..**XML HTTP Request:** The main disadvantages of building web applications is that once a particular webpage is loaded within the user's browser, the related server connection is cut off. Further browsing (even) within the page itself requires establishing another connection with the server and sending the whole page back even though the user might have simply wanted to expand a simple link. XML HTTP Request allows asynchronous data retrieval or ensuring that the page does not reload in its entirety each time the user requests the smallest **JavaScript (JS)** is the scripting language that unifies these elements to operate effectively together and therefore takes a most significant role in web applications.As such, AJAX is meant to increase interactivity, speed, and usability. The technologies have prompted a richer and friendly experience for the user as web applications are designed to imitate 'traditional' desktop applications including Google Docs and Spreadsheets, Google Maps and Yahoo! Mail.At the start of a web session, instead of loading the requested webpage, an AJAX engine written in JS is loaded. Acting as a "middleman", this engine resides between the user and the web server acting both as a rendering interface and as a means of communication between the client browser and server.The difference which this functionality brings about is instantly noticeable. When sending a request to a web server, one notices that individual components of the page are updated independently (asynchronous) doing away with the previous need to wait for a whole page to become active until it is loaded (synchronous).Imagine webmail – previously, reading email involved a variety of clicks and the sending and retrieving of the various frames that made up the interface just to allow the presentation of the various emails of the user. This drastically slowed down the user's experience. With asynchronous transfer, the AJAX application completely eliminates the "start-stop-start-stop" nature of interaction on the web – requests to the server are completely transparent to the user.Another noticeable benefit is the relatively faster loading of the various components of the site which was requested. This also leads to a significant reduction in bandwidth required per request since the web page does not need to reload its complete content.Other important benefits brought about by AJAX coded applications include: insertion and/or deletion of records, submission of web forms, fetching search queries, and editing category trees – performedmore effectivelyand efficiently without the need to request the full HTML of the page each time.

II.WORKING MODEL OF AJAX

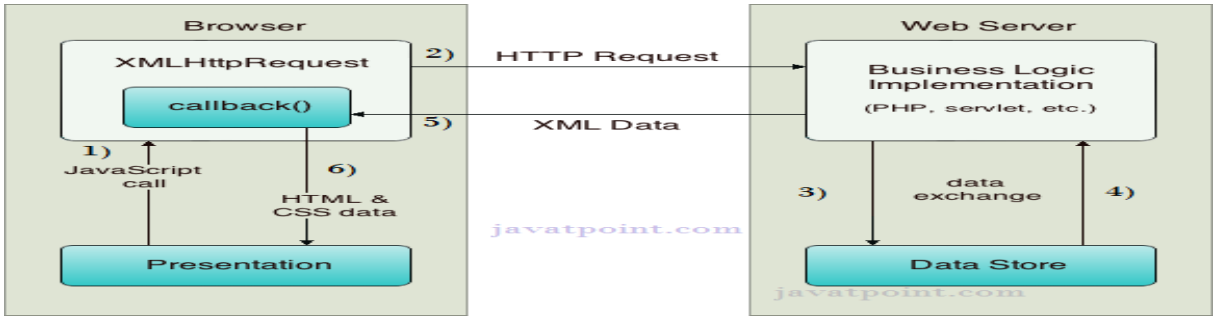

Fig 1:Working of Ajax security client side and server side

As you can see in the above example, XML HttpRequest object plays a important role.User sends a request from the UI and a javascript call goes to XML Http Request object.HTTP Request is sent to the server by XML Http Request object.Server interacts with the database using JSP, PHP, Servlet, ASP.net etc.Data is retrieved.Server sends XML data or JSON data to the XMLHttpRequest callback function.HTML and CSS data is displayed on the browser.

AJAX Security: Server Side:AJAX-based Web applications use the same server-side security schemes of regular Web applications.You specify authentication, authorization, and data protection requirements in your web.xml file (declarative) or in your program (programmatic).AJAX-based Web applications are subject to the same security threats as regular Web applications.

AJAX Security: Client Side:JavaScript code is visible to a user/hacker. Hacker can use JavaScript code for inferring server-side weaknesses.JavaScript code is downloaded from the server and executed ("eval") at the client and can compromise the client by mal-intended code.Downloaded JavaScript code is constrained by the sand-box security model and can be relaxed for signed JavaScript.

III. ANALYTICAL REVIEW

The term "Ajax" was publicly stated on 18 February 2005 by author Jesse James Garrett in the paper titled "Ajax: A New Approach to Web Applications", based on techniques used on Google pages. And the most efficiently technology used presently. In other papers such as "Research Issues in the Automated Testing of Ajax Applications".in which they had tell about issues related to ajax and testing of ajax applications. And the research paper name "Impactof AJAX inwebapplications" in which I get to know what is the impact of the ajax technology and how much it help us to increase in the performance and speed only with the help of this single concept with multiple functionalities.

Table 1: Observation on analytical review on Ajax

YEAR	AUTHOR NAME	TITLE NAME	ISSUES
2001	M. PEZZ`E AND M. YOUNG	SOFTWARE TESTING AND ANALYSIS.	NO ISSUES
2002	J. OFFUTT	QUALITY ATTRIBUTES OF WEB SOFTWARE APPLICATIONS.	ISSUES OF SPPED AND PERFORMANCE
2008	J.WILLEMSEN	IMPROVING USER WORKFLOWS WITH SINGLE-PAGE USER INTERFACES	IMPRROVEMENTS
2006	Lowry, P., Madariaga, S., Moffit	A THEORETICAL MODEL AND EMPIRICAL RESULTS LINKING WEBSITE INTERACTIVITYAND USABILITY SATISFACTION	ISSUES CAN'T PREDICTED
2005	Garrett, J. J.	A NEW APPROACH TO WEB APPLICATIONS	DESCRIPTION OF ABOUT AJAX:NO ISSUES
2011	SELENIUM.	IT IS WORTH NOTING THAT IF YOUR PAGE USES A LOT OF AJAX ON LOAD THEN WEBDRIVER MAY NOT KNOW WHEN IT HAS COMPLETELY LOADED. IF YOU NEED TO ENSURE SUCH PAGES ARE FULLY LOADED, THEN YOU CAN USE EXPLICIT AND IMPLICIT WAITS.	ISSUES AND IMPROVEMENT
2012	PIMENTEL, VICTORIA; NICKERSON, BRADFORD G.	COMMUNICATING AND DISPLAYING REAL-TIME DATA WITH WEBSOCKET	NO ISSUES

V. CONCLUSION

Ajax is no magic bullet as it can bring up new problems.However we could also show that the employment of Ajax brings a noticeable gain of efficiency and satisfaction in certain fields. Wisely used, Ajax can clearly improve the usability of web applications that way.

VI. FUTURE WORK

In future it can be attempted to formalize and quantify the mentioned problems of the Ajax technology. Future research can deal with a more comprehensive evaluation of other possible applications and include other usability aspects Ajax spread rapidly in the last years and will continue to do so.

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