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Analysis on Design Issues of Educational Website Standards

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ABSTRACT
With the introduction of WWW (World Wide Web) by Tim Berners-Lee in 1989, in computer, the use of web site and its importance become visible to the world. [1] Today's web sites have so many features than in the past. With the increase of features in web sites, it becomes necessary for the developer to have compliance to the standards so that websites work properly. The standards that the W3C creates help establish consistency in the way that Web document are authored and how they are rendered in the browser. [2] Based on the evaluation of these standards, developers can measure the efficiency of the website. In this paper author analysed the web site by evaluating its certain features and then compared them against standards. For evaluating website's features, author uses a tool called Website Optimization. This tool gives a detailed analysis of parameters for a website. [3] The author took 25 educational websites of north-India, analyse their different parameters and on the basis of analysis shows their overall standards compliance.
Key Words: Websites, Evaluation, Standards and analysis.

I. Introduction
There are plenty of reasons why you should follow standards when you build your sites. Businesses, developers, and users all stand to gain from standards-compliant practices. Here are a few most compelling reasons why all of the websites you build should be standard-compliant:

* Decreasing development time.
* Decreasing maintenances time.
* Increasing design capabilities.
* Creating cleaner code.
* Creating more stable code.
* Saving money on development costs.
* Saving money on server bandwidth costs.
* Helping developers meet deadlines.
* Speeding up the load times.
* Improving accessibility.[1]

Developers, businesses, and users all reap the benefits of web standards, but there is one even more compelling reason to make the change: Web standards can help optimize your site for search engines and can generate more traffic on your site. Poorly constructed legacy code can cause problem for search engines while indexing your site. [1]
So keeping the benefits of website standard in mind it become necessary for developers to measure website's standards.

We can evaluate the website compliances by considering its parameters. In order to check whether website follows all the standards or not, all the parameters of website are checked and compared to the standards. Depending upon analysis of these parameters it can be shown whether website is developed with standards or not. In order to evaluate the parameters of website we need a tool that provides us a detailed analysis of website. In this paper author uses a tool "Website Optimizer". It extracts all the details of website, analyse the data and after analysis create a report for website. The report shows different parameter used in the website and their comparison with standards. Out of the various parameters of website the tool focuses on the list of parameters which are discussed below: [3]

(a)Total HTML:-
This parameter of web site calculate the total no. of html file on the web page .The no. of HTTP web request increases accordingly as the no. of html file increases. Minimizing http request is the key for website optimization. [4]

(b) Total Objects:-
This parameter counts the total no. of objects being used in the website. These objects include html file, CSS file, CSS images, JavaScript, multimedia, etc. Above 20 objects per page the overhead from dealing with the actual objects accounts for more than 80% of whole page latency. In order to remove the overhead associated with objects combine, refine, and optimize the objects. Replace graphics rollover with the CSS rollovers to speed display and minimize HTTP requests. Consider using CSS sprites to help consolidate decorative images. Using CSS technique such as colour backgrounds, borders, or spacing instead of graphics techniques can reduce HTTP requests. [4]

(C) Total Images:-

This counts for the total Image being used in the website. It should be reduced to reasonable numbers. Recommend combining, replacing, and optimizing your graphics. Replace graphic rollover menus with CSS rollover menus to speed display and minimize HTTP requests. Consider using CSS sprites to help consolidate decorative images. Use CSS techniques such as colour backgrounds, borders, or spacing instead of graphic techniques to reduce HTTP requests. Replace graphic text headers with CSS text headers to further reduce HTTP requests. Finally, consider optimizing parallel downloads by using different hostnames to reduce object overhead. [4]

(D) Total CSS:-

It counts for the total CSS being imported in the website.

Because external CSS files must be in the HEAD of your HTML document, they must load first before any BODY content displays. Although they are cached, CSS files slow down the initial display of your page. Remember to place CSS files in the HEAD and JavaScript files at the end of the BODY to enable progressive display. [4]

(E) Total Size:-

It evaluates the overall size of the website by calculating the total size of all the objects being used in the website. In order to achieve good response time for website we should consider reducing size of website. For example consider reducing total page size to less than 100K to achieve sub 20 second response times on 56K connections. [4]

(E) Total Script:-

It counts the total number of external script files being used in the website. Consider reducing this to one or two. Combine, refactor, and minify to optimize your JavaScript files. Ideally you should have one on your pages. Consider suturing JavaScript files together at the server to minimize HTTP requests. Placing external JavaScript files at the bottom of your BODY, and CSS files in the HEAD enables progressive display in XHTML web pages. [4]

(E) HTML Size:-

The total size of HTML file is calculated here. This size should be minimized as far as possible.HTML size should be such that it will not affect the average time user are willing to wait for a page to display(10 sec). [4]

(E) Image Size:-

It calculates the total size of your images on the website. It should not be over 100k. Consider switch graphic formats to achive smaller file sizes (from JPEG to PNG for example). Finally, substitute CSS techniques for graphics techniques to create colored borders, backgrounds, and spacing. [4]

(E) Script Size:-

This parameter evaluates the total size of all external script of your website. The total size of the external script should be less than 8K. [4]

(E) CSS Size:-

The size of all the external CSS   which is used in the website is calculated in this parameter. The total CSS size should be less than 8K. [4]

(E) MULTIM Size:-

This parameter counts for the size of all the external multimedia being used in the website. This should be less than 10K. [4]

II. Methodology

The process of measuring overall website's standards-compliance involves two steps:

First, check all the parameters used in the website and secondly compare those parameter's standards with the pre-defined standards for each parameter.

The author took twenty five different educational website of North- India and evaluates different parameters for each site. The tool Website Optimizer gives us a deep down analysis of these websites depending upon the parameters used in the website and after analysing the results overall compliance of websites to the standards are shown.

III. Analysis

The author took 25 different educational websites of North-India given in table 1.0. Each website is analysed by the tool and their parameters are measured according to the standards defined by W3C. The author uses two symbols in table 1.0, which denote whether the parameter used in the website follows the standard or not. If cell following the website name under any parameter column contains symbol "X", it shows that parameter used in website does not follow the standards completely. On the other hand symbol "Y" denotes that the parameter completely follows the standards. The last column of table 1.0, Overall compliance checks all the parameters value and gives a website's overall compliances to standards in %age. i.e., if all the cell following the website name contain symbol "X" than overall compliance contain Value 0% .Otherwise if

all the cell contain symbol "Y" the overall compliance value will be 100%, showing that website follows the standard completely. The chart representation of overall compliance column data for 25 websites in figure 1.0., shows the diversion from standards in the websites.

Figure 1.1 gives the chart representation of data of the table 1.0. In figure 1 website's %age of compliance to standard are shown for each of eleven parameters. For instance to represent the data for total-HTML parameter we check value of all the cells in the column of total-HTML parameter. Like in Table 1.0 all the cells in column total-HTML have value of "Y", representing that all the 25 websites confirms to the standard for such parameter. Similarly, the data for other parameter are also represented.
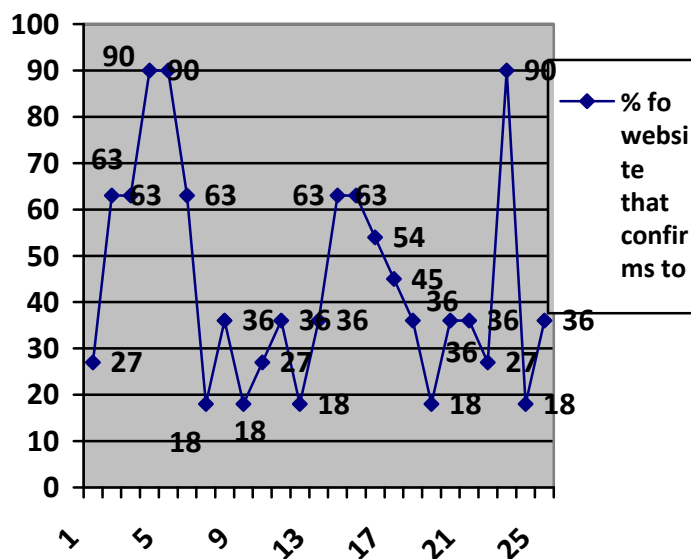
Chart rep. of overall compliance column data.

Figure 1.0

Data collected by analysing 25 educational websites of North-India.

Website name	Total HTML	Total Objects	Total Images	Total CSS	Total Size	Total Script	HTML Size	Image Size	Script Size	CSS Size	Multim Size	Overall compliance
1. www.jammuuniversity.com	Y	X	X	Y	X	X	X	X	X	Y	X	27%
2. www.kashmiruniversity.in	Y	X	X	Y	X	Y	Y	X	Y	Y	Y	63%
3. www.sharda.ac.in	Y	X	X	X	X	X	X	X	X	X	Y	63%
4. www.jkpsc.com	Y	Y	Y	Y	Y	Y	Y	Y	X	Y	Y	90%
5. www.nsdcudaan.com	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	Y	90%
6. www.jkssb.nic.in	Y	X	X	Y	X	Y	Y	X	Y	Y	Y	63%
7. www.ptu.ac.in	Y	X	X	X	X	X	X	X	X	X	Y	18%
8. www.amity.edu	Y	X	X	Y	X	X	Y	X	X	Y	X	36%
9. www.dituniversity.edu.in	Y	X	X	X	X	X	X	X	X	X	Y	18%
10. www.dknmu.org	Y	X	X	X	X	X	Y	X	X	X	Y	27%
11. www.chitkara.edu.in	Y	X	X	X	X	X	Y	X	X	Y	Y	36%
12. www.pcte.edu.in	Y	X	X	X	X	X	X	X	X	X	Y	18%
13. www.seglko.org	Y	X	X	Y	X	X	X	X	X	X	Y	36%
14. www.sachdevagroup.co.in	Y	X	X	Y	X	Y	Y	Y	X	Y	Y	63%
15. www.bgsbuniversity.org	Y	X	Y	Y	Y	X	Y	Y	X	Y	X	63%
16. www.skuast.org	Y	X	X	X	X	Y	Y	Y	X	Y	Y	54%
17. www.lpu.in	Y	X	X	Y	X	X	Y	X	X	Y	Y	45%
18. www.rmlau.ac.nic	Y	X	Y	Y	X	X	Y	X	X	X	X	36%
19. www.hau.ernet.in	Y	X	X	X	X	X	X	X	X	X	Y	18%
20. www.jnu.ac.in	Y	X	X	X	X	X	Y	X	X	Y	Y	36%
21. www.dbrau.ac.in	Y	X	X	Y	X	Y	X	X	X	Y	X	36%
22. www.kunanital.ac.in	Y	X	X	X	X	X	Y	X	X	X	Y	27%
23. www.uniraj.ac.nic	Y	Y	Y	X	Y	Y	Y	Y	Y	Y	Y	90%
24. www.allduniv.ac.in	Y	X	X	X	X	X	X	X	X	X	Y	18%
25. www.bhu.ac.in	Y	X	X	Y	X	X	Y	X	X	X	Y	36%

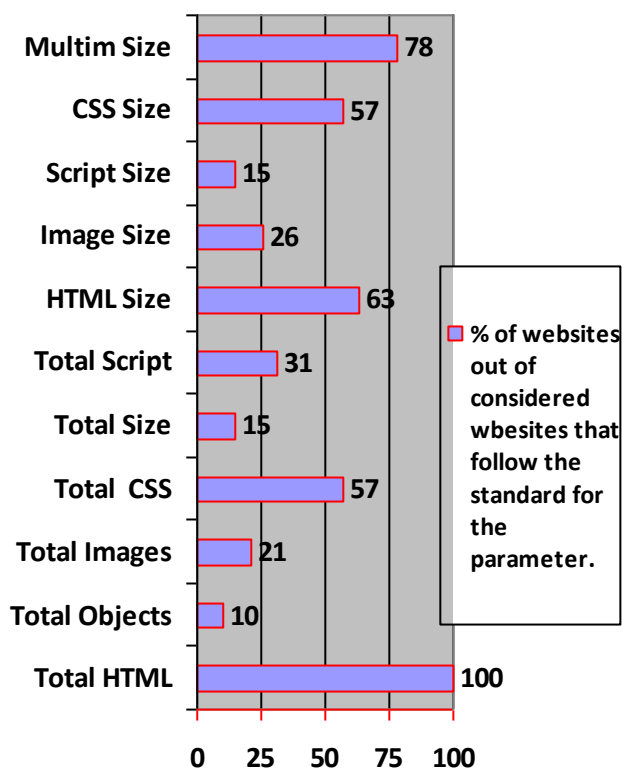**Table 1.0 [4]**

Chart analysis:

Figure 1.1

IV. Result and discussion

The table 1.0 shows us the data collected from tool. The data in the table categorise the websites into two classes. One that follows the standard and other that does not. For any website like www.jammuuniversity.in value in the cells for each parameter is checked. It is observed that the value is either "X" or "Y". X means that the parameter used in website does not follow the standard. Whereas the value of "Y" denotes that the parameter used in the site follows the standard. The value for overall compliance is calculated by checking the values for each cell in that row. e.g., The value for overall compliance for www.jammuuniversity.com can be calculated, by counting the number of "Y" symbols in the corresponding row and then dividing it by total number of parameters i.e., 3/11=.27 =27%. As the symbol "Y" denotes that the parameter used in the website follows the standard so for overall compliance of standard, of website we check, out of eleven parameters how many of them follow the standard completely. In www.jammuuniversity.com out of eleven only three parameters follows the standard as shown in the table 1.0. That means only 27% of the website obeys the standard completely. By analysing all the 25 educational websites of north-India we found that there is sharp up and down in results. None of the website

completely follows the standards. Although the value of overall compliance goes to 90% (for www.nsdcuddan.com) but the website www.ptu.ac.in shows 18% of the compliance.

Figure 1.1 gives us a chart representation of data in the above table 1.0. In the figure 1.1 all the eleven parameters of website are represented separately on the basis of the data collected from 25 different websites. For example total HTML parameter has the value of 100 in figure 1.1, this value represent that out of 25 taken websites , total HTML parameter of all the websites completely follows the standard. Similarly, other ten parameters value represent the %age of websites out of considered websites that follow the standard for that parameter.

From the above result author found that, the selected websites are not developed with respects to standards. It has also been observed that tool like Website Optimizer should be used while development. The tool provides you with a detailed analysis of your website and shows the direction how to compliance the standards. With the help of this analysis we can redevelop our website according to the standards to increase its accessibility.

V. Future Scope

This paper shows the importance of website optimization. Optimizing your websites helps you to represent your business and thoughts efficiently in the market. It has also been observed that while development process developer should focus on standards precisely. Lack of standards in website may decrease its accessibility to the users. A website which follows the standard completely can perform effectively in all criteria.

VI. Acknowledgement

References
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[2] Tim Berners-Lee: Inventor of the World Wide Web: Stephanie Sammartino Mc Pherson.
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