Analyzing the Design Issues of Indian E-Government Websites

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ABSTRACT: Design of the e-government web site could be a crucial issue that ought to be thought-about for improving its effectiveness, potency and satisfaction w.r.t services to public (user). During this study the effectiveness of assorted style parameters (such as page size, composition, transfer/download time etc.) on e-government web site are analyzed by taking into concerns completely different web site development standards counseled for them. The aim of this study is to analyze completely different government web site by testing their existing (design) style with the assistance of on-line tools to grasp their deviations from the standards and to gauge their performance with reference to the parameters thought-about by the tool. The outcomes indicated that there\'sis a requirement to improve the planning options/ design issues of e-government web site so as to be simpler and user-centric. The authors took ten Government websites of India, analyze their completely different parameters and on the premise of study show their overall compliance with the standards and design guidelines. With the assistance of the outcomes obtained a graphical analysis of the websites is formed by the authors that verify the impact of those parameters on the potency and accessibility of the government websites.

KEYWORDS: e-government, website design, website evaluation, website standards, website guidelines

1. INTRODUCTION

As web usage is growing daily the populations round the globe are coming nearer. With the arrival of World Wide internet as a colossal development, it\'samazingly brought the globe nearer creating it a smaller thing to live in for its user. The quantity of persons seeking data and services on-line are increasing quickly in nearly each country of the globe. The people expect government websites to avoid wasting their cash and time. The responsibility of the govt. is to create/style websites that are straight forward to use and are accessible to every sort of person. Implementing the straightforward principle of getting web site that works well and doesn't confuse the user or get him annoyed, can facilitate to cut back the abandonment of the web site by visitors. However through out the development phase of website, errors creep into the design of internet sites either internally or externally.

Evaluation is an organized determination of a subject's merit, price and significance, by using criteria ruled by a group of standards. Design, organization and simple use are necessary issues. Websites can offer helpful sources of information; but if they are slow to load and/or troublesome to navigate, search or scan, then their contribution or utility are going to be diminished. An efficient internet website style is one within which users are able to notice data quickly and in an exceedingly logical manner.
Do they visit the content you would like them to visit? Are they searching within the right places of your internet page? Are you able to get your user's attention, or do they leave quickly? It's not with regards to the content either. If website's design load slowly – or if moving from one section to a different takes in an extended time – it affects the user's expertise and experience.

Things must be considered in web site design are as follows:
• is very important information being looked by the user?
• are the navigation and action things intuitive?
• is that the user being directed to sections in a logical way?
• is the website page load quickly enough to not withdraw the user?
Based on the on top of reasons an in depth study of government websites of India was done with the assistance of web page analyzer, an internet tool provided by web site Optimization [4]. The tool calculates the dimensions/ size of individual parts and sums up every kind of web page element. Supported these page characteristics the paper then offers recommendation on a way to improve page load time. The tool includes the most recent best practices for web page size guidelines and trends, and internet web-site optimization techniques in its recommendations.

II. METHODOLOGY

Here 10 e-government websites of India were analyzed by the authors for the above defined parameters [4]. Supported the outcomes collected from the tool, a graphical analysis of the websites was created that helped to find out their deviations from the rules/guidelines provided.
The parameters taken for analysis of websites are as follows:-

1. Total HTML
2. Total Objects
3. Total Images
4. Total CSS
5. Total Size (bytes)
6. Total Script
7. HTML Size (bytes)
8. Image Size (bytes)
9. Script Size (bytes)
10. CSS Size (bytes)
11. Multimedia Size

(1)Total HTML:- This parameter of website calculate the entire number of hypertext markup language (html) file on the web page .The number of communications protocol i.e. Hyper Text Transfer Protocol web request increases consequently as the number of hypertext markup language file increases.
(2) Total Objects:- This parameter counts the entire number. of objects being employed within the web site. These objects embrace hypertext markup language file, Cascade style sheet (CSS) file, CSS images, JavaScript, multimedia, etc. More than20 objects per page, the overhead from managing the particular objects accounts for over 80% of whole page latency.
(3)Total Images:-This counts for the overall Image being employed within the web site. It ought to be reduced to affordable numbers.
(4) Total CSS:- It counts for the overall CSS being imported within the web site. Because external CSS files should be within the HEAD of your hypertext mark-up language document, they need to load first before any BODY content displays.
(5) Total Size:- It evaluates the general size of |the web site by calculating the overall size of all the objects being employed within the website.
(6) Total Script:- It counts total of external script files being employed within the web site. Consider minimizing this to at least 1 or 2.
(7) HTML Size:-the overall size of hypertext mark-up language file is calculated here. This size ought to be reduced as way as attainable.
(8) Image Size:-It calculates the overall size of your pictures on the web site. It must not be over 100k.
(9) Script Size:- This parameter evaluates the overall size of all external script of web site. The overall size of the external script ought to be not up to 8K.
(10) CSS Size:-The dimensions of all the external CSS that is employed within the web site is calculated in this parameter. The overall CSS size ought to be not up to 8K.
(11) MULTIM Size:- This parameter counts for the dimensions of all the external multimedia being employed within the web site.

III. ANALYSIS AND RESULTS

On testing and analyzing of 10 e-government sites on Webpage analyzer tool the, statistics obtained for numerous parameters are listed within the table3.1 given below:

Table 3.1

S. No.	Website Name	Website URL	Total HTML	Total Objects	Total Images	Total CSS	Total Size (bytes)	Total Script	HTML Size (bytes)	Image Size (bytes)	Script Size (bytes)	CSS Size (bytes)	Multimedia Size
1	Department of Land Resources	http://www.dolr.nic.in	1	27	22	2	255623	2	33978	170698	23517	27430	0
2	Ministry of Tourism	http://www.tourism.gov.in	1	154	138	1	2009896	14	16518	1732822	258804	1752	0
3	Department of Scientific and Industrial Research	http://www.dsir.gov.in	1	141	121	3	267856	15	90059	88644	89153	3	0
4	Department of Administrative Reforms and Public Grievances	http://darpg.nic.in	1	209	148	32	2749471	28	80241	2082313	385574	201343	0
5	National Informatics Centre Services Incorporated	http://nicsi.com/	1	42	27	1	355063	13	45578	72836	235663	986	0
6	Department of Agriculture & Cooperation	http://www.dac.gov.in	1	92	80	3	645190	8	35283	474610	127501	7796	0
7	Department of Electronics and Information Technology	http://deity.gov.in/	1	158	138	6	2288277	13	59019	2044377	157315	27566	0
8	Department of Financial Services	http://www.financialservices.gov.in	1	24	13	4	306446	6	142248	142248	57940	36119	0
9	Department of Telecommunications	http://www.dot.gov.in/	1	115	113	0	538257	1	8952	463382	65923	0	0
10	Ministry of Personnel, Public Grievances and Pensions	http://www.persmin.gov.in	1	17	11	3	1511600	2	8738	1211486	288630	2746	0

Based on the statistics obtained as displayed in Table 3.1 on top of and parameters consulted in section 2 of this paper the outcome measured are provided within the table 3.2 given below. Here (Y) within the cell for a web site under following parameter determines that the website follows the rules/ guidelines suggested for that specified parameter and (N) within the cell determines that the website doesn't follows the rules/ guidelines suggested for that specified parameter.

Table 3.2

| S. No.	Website Name	Website URL	Total HTML	Total Objects	Total Images	Total CSS	Total Size	Total script	HTML Size	Image Size	Script Size	CSS Size	Multimedia Size
1	Department of Land Resources	http://www.dolr.nic.in	Y	N	N	Y	N	Y	Y	N	N	N	Y
2	Ministry of Tourism	http://www.tourism.gov.in	Y	N	N	Y	N	N	Y	N	N	Y	Y
3	Department of Scientific and Industrial Research	http://www.dsir.gov.in	Y	N	N	Y	N	N	Y	Y	N	Y	Y
4	Department of Administrative Reforms and Public Grievances	http://darpg.nic.in	Y	N	N	N	N	N	Y	N	N	N	Y
5	National Informatics Centre Services Incorporated	http://nicsi.com/	Y	N	N	Y	N	N	Y	Y	N	Y	Y
6	Department of Agriculture & Cooperation	http://www.dac.gov.in	Y	N	N	Y	N	N	Y	N	N	Y	Y
7	Department of Electronics and Information Technology	http://deity.gov.in/	Y	N	N	N	N	N	Y	N	N	N	Y
8	Department of Financial Services	http://www.financialservices.gov.in	Y	N	Y	Y	N	N	Y	N	N	N	Y
9	Department of Telecommunications	http://www.dot.gov.in/	Y	N	N	Y	N	Y	Y	N	N	Y	Y
10	Ministry of Personnel, Public Grievances and Pensions	http://www.persmin.gov.in	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y

Graphical analysis of results:
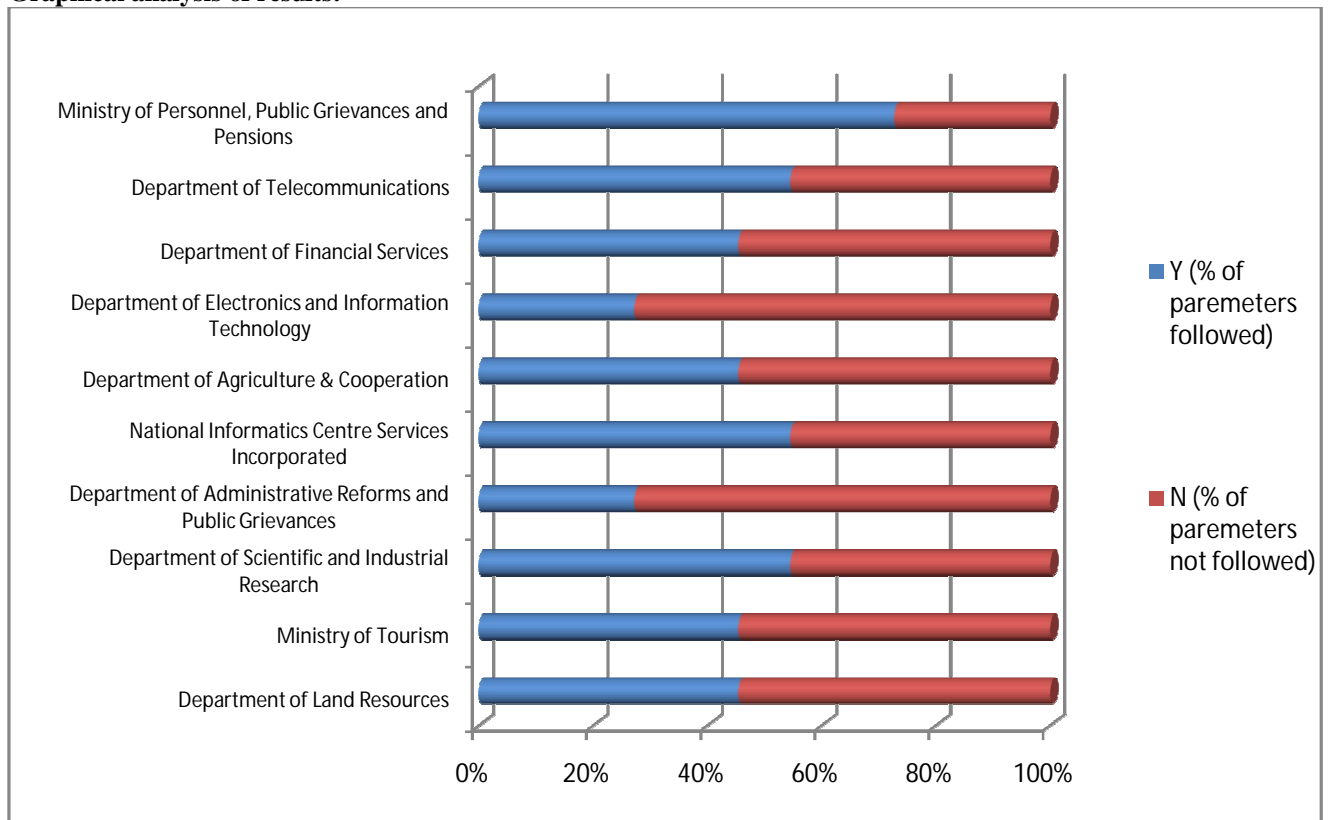
Figure 3 (a)

The above graph shows that selected e-government website follows few of the considered parameters and does not follow the complete website design guidelines. Here the graph represents name of E-government website, (y) represents the % of parameters followed by that website and (N) represents the % of parameters not followed by the e-government website. The graph concludes that most of the considered website follows nearby 50% of the design guidelines and 50% design guidelines are not followed by the e-government websites. Due to not following the parameters the e-government website reduces the effectiveness, efficiency and user satisfaction.

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(An ISO 3297: 2007 Certified Organization)
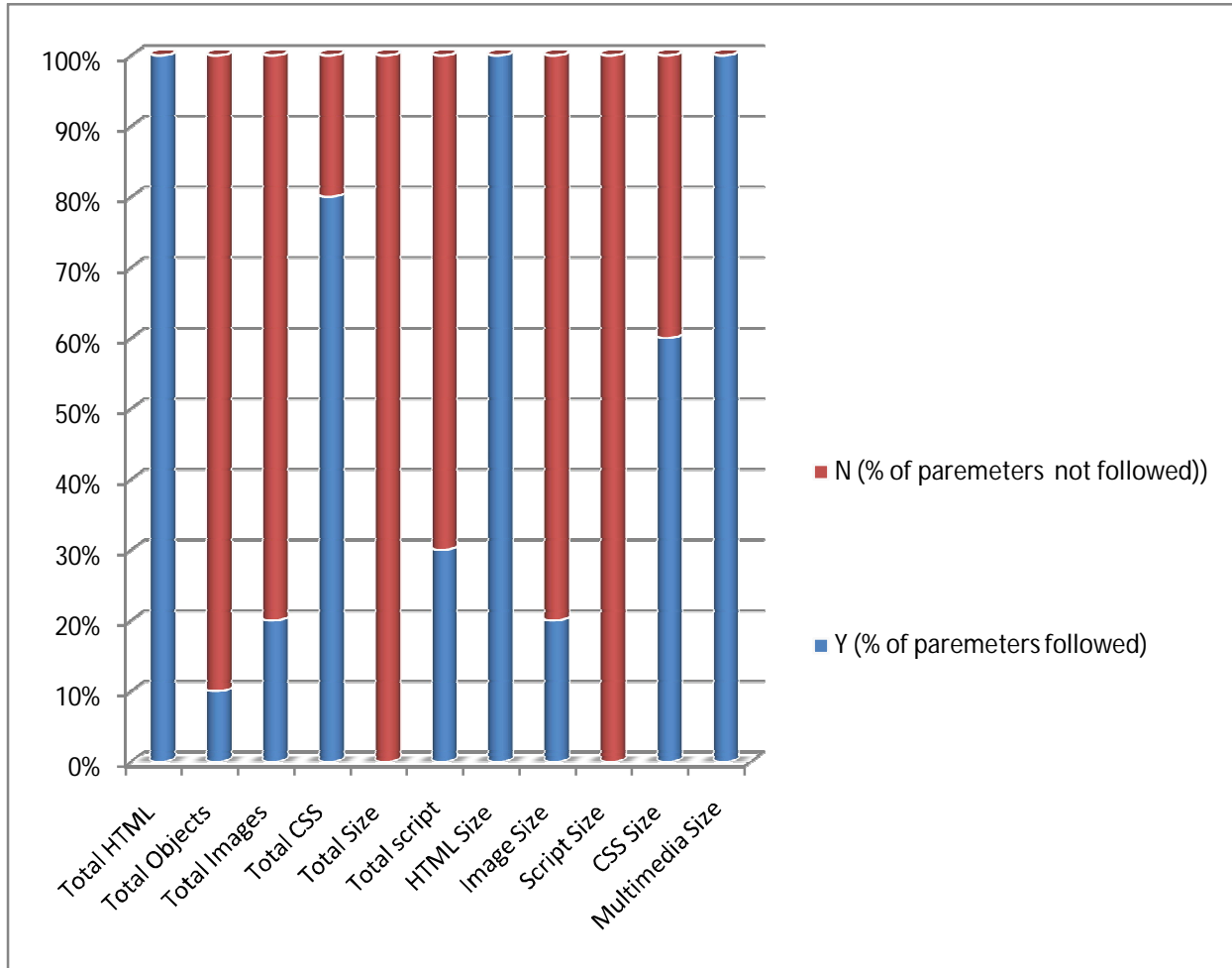
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Figure 3(b)

From the graph above in Fig.3 (b) it is clear that the parameters that follows the rules fully in above considered e-government web site of India are: total number of HTML files, HTML size and Multimedia size employed in the webpage. The parameter "Total size" and "script size" are on the stage of warning for the above studied website.100kb is suggested for higher performance for the websites for various electronic equipment speeds. The result indicates that most of the govt. sites are having sizes that are unacceptable from effectiveness, user-centric and efficiency point of view.

The remainder of all the parameters are partially following the rules and therefore minimizing the performance and maximizing the transfer/download time of the webpage making them less effective from the user side of view.

On concluding the outcomes from the statistics obtained and also the graphical analysis created it has been observed that only some of the e-government websites follow some of the guidelines for website designing not fully feasible from user point of view.

IV. RECOMMENDATIONS

Here are some recommendations, based on the parameter, which are considered for analyzing the Design Issues of E-Government Websites. Following recommendations must be followed for a good website design.

(1)Total HTML:- Minimizing communications protocol (HTTP) request is the key for web site optimization.

(2) Total Objects:-To get rid of the overhead related to objects- refine, combine and optimize the objects. Replace graphics change with the CSS rollovers to quick display and minimize communications protocol (HTTP) requests. Use CSS scripts to assist consolidate decorative images. The use of CSS techniques like colored backgrounds, borders, or spacing rather than graphics techniques will cut back communications protocol (HTTP) requests.

(3)Total Images:-Combining, replacing, and optimizing of graphics is recommended. Replace graphic menus with CSS menus to quick display and minimize hypertext transfer protocol requests [3]. Use CSS scripts to assist consolidate displayed images. Use CSS techniques like colored backgrounds, borders, or spacing rather than graphic techniques to cut to further minimize hypertext transfer protocol requests. Replace graphic text headers with CSS text headers to more cut back hypertext transfer protocol requests. Finally, take into account optimizing parallel downloads by using different hostnames to cut back object overhead.

(4) Total CSS:-Thought hey are cached, CSS files impede the initial display of your page. Bear in mind to put CSS files within the HEAD and JavaScript files at the last of the BODY to enable progressive display.

(5) Total Size:-To attain a good response for web site we should always take into account reducing size of web site. as an instance take into account reducing total page size to not up to 100K to attain sub twenty second response times on 56K   connections.

(6) Total Script:- Combine, refractor, and alter to optimize your JavaScript files. Ideally you ought to have one on your pages. Take into account JavaScript files along at the server to reduce hypertext transfer protocol requests. Put external JavaScript files at end of your BODY, and CSS files within the HEAD permits progressive display in XHTML web page.

(7) HTML Size:- HTML size ought to be specified, it will not have an effect on the average time user are willing to wait for a page to display. The total size of HTML file should be below 100K. Approx. 50K of images and multimedia the web page takes about 20 seconds to load.

(8) Image Size:- Refer switch graphic formats to attain smaller file sizes (from JPEG to PNG for example). Finally, replace CSS techniques for graphics techniques to make colored borders, backgrounds, and spacing.

(9) Script Size:-Optimize JavaScript for size, combining them, and use HTTP compression where appropriate, for any scripts placed in the HEAD of documents. Substitute CSS menus for JavaScript-based menus to minimize or even eliminate the use of JavaScript.

(10) CSS Size:-Optimize CSS for size by eliminating whitespace, using shorthand notation, and combining multiple CSS files where appropriate. By using labeled container cells and descendant selectors you can target chunks of HTML content efficiently without the need to embed extra classes and styles.

 (11) MULTIM Size:-This must be less 10K.

V. CONCLUSION

Testing of some of the e-government websites of India was conducted to analyze the performance and user-centricity. Some of the important government websites of India were chosen for this study. The online tool "web Analyzer" was used because it provides a detailed analysis of the websites tested and therefore the areas that require to be improved. The results indicates that websites contains a serious accessibility downside. There is associate imperative got to improve the total size, minimize the amount of external objects, size of pictures used etc. to create e-government websites to be simpler, extremely user-centric, effective and simple accessible for the users. We would like to give thanks the developers of Web analyzer for the free on-line accessibility of their useful tool that provide to be key part for this study.

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