

A Study on HTML5 Web Standard Compliance of Korean University Website utilizing Web Standard Validators

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Abstract: - When the users are utilizing web service, many types of web browsers and various web access medium are used. In order to meet the needs of these various users, web standard is in need. When the web sites are developed in compliance with the web standard, internet users in various access environments can use comparatively identical designs and functions regardless of the type of operating system or web browser. In this paper, a study on the compliance with the web standard of Korean university websites, was carried out utilizing the web standard validator, possessing the capability to check the HTML5 standard compliance of web sites. The analysis result of this study is expected to be utilized in web compatibility analysis and web environment analysis in the future.

Key-Words: HTML5, web compatibility, web standard validator, web markup validator, SMIL, MathML

1 Introduction

HTML5 emerged in 2008, which had newly added function to the HTML that can improve performance, and as the next generation web standard, HTML5 platform was established as the international standard in 2014. The fundamental principle of HTML5 is "Realization of web application that does not rely on device or other platform", and it allows easy processing of various added functions such as video and audio, in addition to the latest multimedia contents without having to use the ActiveX[1]. Since then, web browser companies have been competitively developing HTML5 based web support technology in smart phones and smart televisions.

In 2012, a survey result was announced indicating that the average ratio of switching to the next generation web standard HTML5 was 12% domestically, which displayed an extremely low state compared to the 44% internationally including in the United States and etc.[2]. The government developed and supplied diagnostic tool so that the web sites can perform self-check of the level of compliance to the standard including HTML5.

Accordingly, this paper studied compliance with the web standard in the level of utilization of HTML5 of Korean university web sites. Using the Web HTML5 Validator and the Web Markup Validator of W3C, the ratio of HTML5 utilization and the web standard compliance of each university

web sites were analyzed regarding 50 Korean university web sites. Based on the results of the analysis, we wish to apply it in analyzing the web compatibility and in analyzing the web environment in Korea.

2 Web Standard

Web standard is the standard specified by the W3C(World Wide Web Consortium), which is an international standards organization, and it refers to creating a website by accurately utilizing the tag in accordance with both the purpose and the method of use and by adding the contents regarding problematic web browsers[3].

When the website is developed in compliance with the web standard, internet users in various access environments can utilize comparatively identical designs and functions regardless of the type of operating system or web browser. In addition, when the website is created in compliance with the web standard, website modification and management becomes easy, and available space can be secured in the web space, as it reduces unnecessary sources and files, thus leading to quicker page loading speed[4].

As the contents and CSS are separated in website created in compliance with the web standard, it possesses an advantage in that it will not have any problems understanding documents in not only the

existing browser, but also in the browsers which will be developed in the future that do not support style sheet function. Using the web standard, structurization of the (X)HTML source can be done to fit the level of importance, and when cleanly organized sources are generated, the search robot can properly conduct the search. Furthermore, documents created using the web standard, can easily be read in virtually all browsers, mobile phones, PDA, and support software for the handicapped[5].

HTML5 is the next generation web standards. HTML can display only text and hyperlink but HTML5 allows the browser to easily handle a variety of additional features and the latest multimedia content such as video, audio, without ActiveX. It can be said "Evolved web programming language". Since the early days of the web, HTML has evolved into many versions. HTML5 standardization team announced the first draft of the standard in 2008 and the final standard was released October 28, 2014. The basic principle of the HTML5 standard which has been adopted as the next generation of web is "To build web applications that do not depend on the device and platform". This is also industry-standard that Microsoft, Google, Apple, Mozilla, Opera, etc. web browser companies are also participating.

Global companies, including the web browser companies are actively introducing HTML5 because the standardized functions such as graphics, video and audio. There are a lot of support HTML5 tags in the latest version such as Firefox, Chrome, Opera, Safari browser. However, features that support each web browser are different. Figure 1 shows the support for HTML5 by web browser[6].

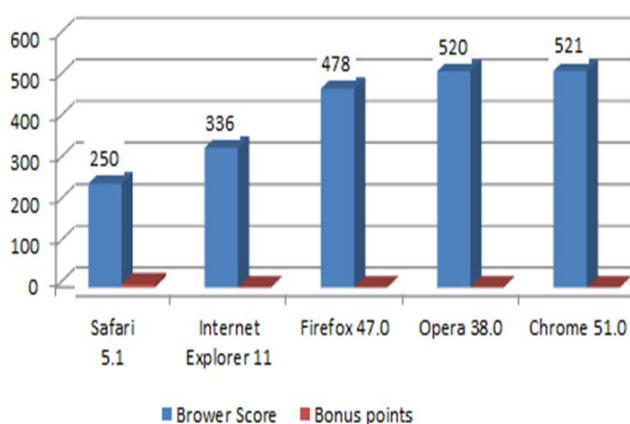


Fig. 1. Support for HTML5 by web browser

HTML5 have new tags and attribute to provide newly various functions. And it is possible that web

page can contain more semantic information. It can be changed meaning of the tags previously used. Element to interfere with the semantic were removed. HTML5 was grouped by usage of all tags and made the contents model, as shown in Figure 2.

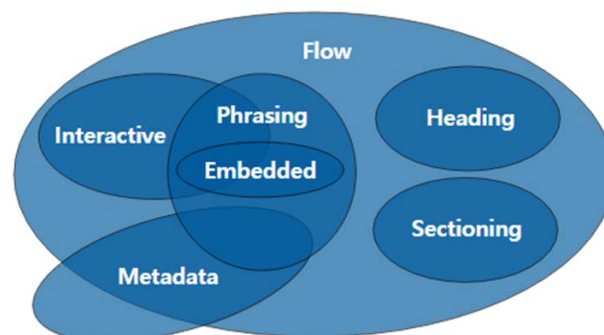


Fig. 2. HTML5 contents model[7]

3 HTML5 Web Standard Analysis on Korean university websites

We selected 50 Korean university websites and conducted a study regarding the web standard compliance by applying the Web HTML5 Validator[8].

In the Web HTML5 Validator results, 'Error' applies to cases in which there is no information or in which serious error can occur or cases in which the property is not valid or in which the declaration may be omitted in using the property value, in interpreting the general documents. 'Warning' refers to cases in which there are necessary items of recommendation or items of confirmation in interpreting the general document[9]. Of the detected error types, error related to HTML5 <!DOCTYPE html>, is recognized as website in which HTML5 has not been applied.

For websites in which HTML5 was not applied, Web Markup Validator[10] was used again to check the web standard compliance. Web Markup Validator is an HTML Validation service of W3C in Korean language provided by KLDLP, and it can check the markup validity of web documents including HTML, XHTML, SMIL, MathML and others.

Table 1 displays the results of the web standard compliance regarding the 50 Korean universities.

Table 1. Results of the web standard compliance regarding Korean universities

Web site	HTML5	HTML5 standard		Web standard	
		Error	Warning	Error	Warning
1	X	-	-	24	47
2	X	-	-	0	0

3	X	-	-	11	0
4	X	-	-	139	25
5	X	-	-	0	0
6	X	-	-	117	34
7	X	-	-	1	1
8	O	O	O	-	-
9	X	-	-	21	3
10	X	-	-	0	0
11	X	-	-	1	4
12	X	-	-	42	38
13	X	-	-	0	2
14	X	-	-	79	149
15	X	-	-	1	3
16	X	-	-	1	1
17	X	-	-	1	5
18	X	-	-	1	3
19	X	-	-	115	0
20	O	0	0	-	-
21	X	-	-	21	36
22	O	92	86	-	-
23	X	-	-	92	70
24	X	-	-	5	5
25	X	-	-	3	5
26	X	-	-	56	38
27	O	11	12	-	-
28	X	-	-	22	22
29	X	-	-	1	1
30	O	49	33	-	-
31	O	3	3	-	-
32	X	-	-	136	236
33	X	-	-	30	6
34	X	-	-	246	383
35	X	-	-	3	4
36	X	-	-	1	4
37	X	-	-	0	0
38	X	-	-	1	4
39	X	-	-	4	2
40	X	-	-	2	3
41	X	-	-	93	55
42	X	-	-	117	123
43	X	-	-	176	36
44	X	-	-	1	4
45	X	-	-	3	1
46	O	0	0	-	-
47	X	-	-	1	4
48	X	-	-	1343	2598
49	X	-	-	16	2
50	X	-	-	227	421

The results of this study showed that among the 50 websites of Korean universities, there were 7 websites in which the HTML5 was applied, and among them, 3 university websites were accurately in compliance with the HTML5 web standard. The study showed that 43 of the university websites still did not apply HTML5.

Compared to the HTML5 applied website ratio of 94% for the Korean government organizations, the HTML5 applied website ratio of 14% for the Korean universities indicated that there are still many university websites not applying HTML5.

Websites applying HTML5 had less number of errors and warnings on average compared to the websites that did not apply HTML5. Table 2 displays the web standard analysis result of the Korean universities.

Table 2. Web standard analysis result of the Korean universities

	Website using HTML5	Website using HTML
Number of website	7/50	43/50
Ratio	14.0%	86.0%
Error(Ave.)	13.7	69.5
Warning(Ave.)	4.8	96.1

4 Conclusion

In the web environment where various types of web browsers are used in utilizing the web service through various access medium, complying with the web standard in developing websites is extremely important. When the website is developed in compliance with the web standard, internet users in various access environments can utilize comparatively identical designs and functions regardless of the type of operating system or web browser.

In this study, Web HTML5 Validator and Web Markup Validator were utilized to analyze websites of 50 Korean universities regarding their compliance with the web standard. Of the websites selected as the subjects of the study, only 14% created their website applying HTML5, and 86% of the university websites still did not apply HTML5. Also regarding the number of errors in the websites of the subject universities, the websites applying HTML5 showed substantially less number of errors compared to the websites that did not apply HTML5.

The analysis results of this study are expected to be applied in analyzing the web compatibility and web environment in the future.

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