

노인전문요양병원의 웹 콘텐츠 접근성 개선방안

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Improvement of Web Contents Accessibility in Geriatric Hospitals

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요 약

2008년에 장애인차별금지법이 제정되었고, 2013년 4월 11일부터 웹 접근성 준수가 시행되었다. 따라서 모든 법인과 단체는 2015년까지 웹 접근성 준수를 충족해야 한다. 본 논문은 한국형 웹 접근성 평가도구인 K-WAH 4.4를 적용하여 노인전문요양병원의 웹 접근성을 평가하였고 그에 대한 개선 방안을 제안하였다. 웹 콘텐츠 접근성 지침 2.0에 따라 노인전문요양병원을 평가한 결과 매우 낮은 웹 접근성 준수율을 보였다.

ABSTRACT

2008 Disability Discrimination Act was enacted, Web accessibility compliance has been carried out from April 11, 2013. Therefore, all of the institutions and corporations in 2015, must fulfill the compliance of Web accessibility. In this paper, research for Web accessibility of Geriatric Hospital, to raise the improvement. We have applied the K-WAH 4.4 as accessibility evaluation tool. The results were evaluated on the basis of the Web Content Accessibility Guidelines 2.0, it was very low.

키워드

Web Accessibility, Geriatric Hospital, Web Content Accessibility Guidelines 2.0, K-WAH 4.4
웹 접근성, 노인 전문 요양 병원, 웹 콘텐츠 접근성 지침 2.0, 웹 접근성 자동 평가 도구 4.4

1. Introduction

The Disability Discrimination Act, enacted in April 2013, mandates companies and institutions to ensure their Web accessibility starting in 2015. The time available for compliance is short. All companies and institutions must be prepared as soon as possible. Otherwise, if a person reports discomfort in using the website of the company or institution and demonstrates it, the host will have to pay a fine of 30 million won or be imprisoned for three years[1-3].

Web accessibility guarantees equal availability to both healthy and handicapped people of all information provided on websites, to solve issues with information divide. A correctly designed website ensures access to its content without discrimination. Thus, the user experience must be considered when putting up a website. To ensure full compliance with these measures, the government has presented Standard Guidelines for Web Accessibility.

The Korea Web Content Accessibility Guidelines 2.0 of the Korea Internet and Security Agency has

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four principles and 13 instructions that evaluate the compliance with Item 22. KISA have led the accreditation until 2013. Accreditation is carried out by the certification body specified by the Ministry of Science, ICT, and Future Planning in its amendment of the National Information Technology Basic Law in 2014.

After the evaluation, upon authentication, the WA certification mark issued by the Ministry of Science, ICT, and Future Planning must be affixed. The Korea Institute of Web accessibility certification and value, webwatch, Korea Blind Union is specified in the certification evaluation specified institutions.

Another key issue addressed by this Act is the rapid aging of Korean society. Thus, the maintenance of the Web accessibility of Geriatric Hospital for interested elderly people is required[4].

General hospitals already comply with Web accessibility guidelines, and university hospitals, starting from their 2010 fiscal year, have been steadily progressing to the quality certification stage for Web accessibility, a state of full Web accessibility, as attested to by a certification mark.

In this paper, in accordance with the change in the Web accessibility of geriatric hospitals is evaluated and recommendations for its improvement are presented.

II. Web Accessibility Evaluation Method

2.1 Research methods and limitations

The Web accessibility of Geriatric Hospital is evaluated in terms of the ease of access to its website by the elderly and the disabled, using the K-WAH4.4 tool of the Korea Internet and Security Agency.

Then based on the Web Content Accessibility Guidelines 2.0, a titles provided, alternative text with explicit basic language is offered, and suggestions are made to facilitate the opening of

new windows, provide labels, reduce markup errors, etc. in accordance with the user needs, for the prevention of six detailed steps.

2.2 Web Accessibility Guidelines 2.0

The Korean Web Content Accessibility Guidelines 2.0 describes how to create Web content that all users can easily access. These Guidelines enable Web content creators and developers to comply by providing a procedure for the easy creation of the appropriate content.

The Guidelines reflect the 2008 W3C(: World Wide Web Consortium) international standards and the Web Content Accessibility Guidelines(: WCAG).

III. Statistical Analysis of Web Accessibility

3.1 Web accessibility of concepts

Web accessibility means all people can use a website without physical or environmental limits [3-5]. Ease of use and understanding of web content, as well as robustness, are the features that ensure the accessibility of a website. The Korea Internet and Security Agency defines Web accessibility as follows. "Any user, such as a disabled or elderly person without professional capability, in any technical environment, is guaranteed access to all the information provided on the website."

3.2 Evaluated selection

For this study, we searched for "geriatric hospitals" online using the NAVER search engine. The power link results listed 10 sites.

However, one site did not allow evaluation of its Web accessibility, and another site was connected to a shopping mall for general products. Therefore, the geriatric hospitals (GHs) evaluated were those of Yonsei(YE), HanaHyo(HH), Maguns (MN), SongChu(SC), CheonAn(CA), JuEun(JE), JungDream(JD), and SeoulJesus(SJ).

Table 1. Evaluation Geriatric hospital

GH	URL, Beginning address
YH	http://www.yседen.co.kr/
HH	http://hanahyo.co.kr/
MN	http://www.magnushospital.co.kr/index
SC	http://www.hyomedics.com/site1/masterpage/default.aspx
CA	http://www.chyoyang.com/kr/main.php
JE	http://www.joeeunraphas.com/
JD	http://www.jungdream.net/index.asp
SJ	http://drys.srphone.kr/pctablet.php

3.3 Result of web accessibility analysis

3.3.1 alternative text provide

It was confirmed that when alternative text for an image was provided, recognition of the image was easy. Therefore, suitable alternative text must be provided. Multimedia content must especially provide image alternatives such as captions. Without regard to color and brightness, alternative text makes it possible to recognize images.

Table 2. Alternate text compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	553	395	28.6
HH	3882	17	99.6
MN	2077	1681	19.1
SC	318	96	69.8
CA	1210	1202	0.7
JE	1036	756	27.0
JD	221	169	23.5
SJ	336	278	17.3
Average	1204.1	574.3	35.7

As shown in Table 2, the average alternative text compliance rate was low: 35.7%. Only one hospital, HH, had a high compliance rate of 99.6%. CA had the lowest rate.

3.3.2 Provision of a Title

The provision of an appropriate title for a web page facilitates the user's Web content management. The title must be straightforward and must be provided to enable the user to analogize the frame (a block of content).

Table 3. Title provision compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	25	0	100.0
HH	101	3	97.0
MN	100	10	90.0
SC	19	19	0.0
CA	58	5	91.4
JE	23	2	91.3
JD	12	0	100.0
SJ	40	14	65.0
Average	47.3	6.6	79.3

As shown in Table 3, the average compliance rate with title provision was 79.3%. Although compared with the other evaluation items, the title provision compliance rate appeared generally high, SC did not comply with it at all, and SJ's compliance rate was only 65%.

The provision of alternative text, the highest importance in web accessibility compliance matters. When using multimedia[6] must provide textual information to aid understanding. images, video file, script is the same.

Fig. 1 is an example of YH website that isn't following the alternative text. The method to describe the alternative text is to use alt or longdesc as the relatively long term[7].

```

<td><a href="/"></a></td>

<td><a href="/login/login.asp"></a></td>

<td><a href="/member/member_rule.asp"></a></td>

<td><a href="/intro/sitemap.asp"></a></td>
    
```

Fig. 1 An example of providing error of alternative text in YH

Fig. 2 is the improvement of alternative text errors in the image of YH web page. This is an improved example by additionally scribing 'login' and 'join member' in title using alt.

```
<td><a href="/"><imgsrc="./images/common_icon_home_01_off.gif"
"border="0 "></a></td>

<td><a href="/login/login.asp"></a></td>

<td><a href="/member/member_rule.asp"><
/a></td>

<td><a href="/intro/sitemap.asp"></a></td></tr >
```

Fig. 2 An example of improved alternative text provision

3.3.3 Basic language explicit

The default language of the Web page must be displayed in the contents of the text on the screen and must be automatically convertible to TTS (Text to Speech) and to Braille.

Table 4. Basic language explicit compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	25	25	0.0
HH	100	2	98.0
MN	100	90	10.0
SC	19	19	0.0
CA	56	56	0.0
JE	21	21	0.0
JD	12	12	0.0
SJ	31	0	100.0
Average	45.5	28.1	26.0

The average basic language explicit compliance rate was very low: only 26.0%. Only those of HH and SJ were high, at 100.0% and 98.0%, respectively. The lowest rate was 0.0%.

It is the guideline about accurately indicating the basic language of web page. Fig. 3 does not provide lang property of <html> tag.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional/EN" "http://www.w3.org/TR/xhtml1/DTD/xhtm
l1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">
```

Fig. 3 An example that is not indicating the basic language in SC

Therefore, the accurate definition for the basic language like web page of Hallym University medical center should be required even it wasn't handled as the website for web accessibility evaluations like Fig. 4.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional/EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1
-transitional.dtd">

<html lang="ko" xml:lang="ko" xmlns="http://www.w3.org/19
99/xhtml">

<head>
<meta http-equiv="Content-Type" content="text/html; charset
=euc-kr" />

<meta name="naver-site-verification" content="210b36d250f01
29fd893a5a45e69329f3afa5c4"/>

<meta http-equiv="X-UA-Compatible" content="IE=edge"/>
<title>hallym university medical center </title>
```

Fig. 4 An Examples that is well-defined the basic language

3.3.4 Notice of new window opening

The user need no longer be asked to confirm whether or not he wants to open a new window or be given the option to not open it. In situations when the user is not known, new windows must not open.

Table 5. New window opening compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	-	-	-
HH	21	0	100.0
MN	176	0	100.0
SC	-	-	-
CA	159	0	100.0
JE	3	0	100.0
JD	-	-	-
SJ	-	-	-
Average	89.8	0.0	100.0

Table 5 shows that the new window opening compliance rate was 100.0%.

3.3.5 Label provision

The format control elements and labels must be connected to each other. Near the input control, a label must be provided indicating how to input data.

Table 6 shows the label provision compliance rate. The average result was very low: only 21.1%. However, HH's rate was 100.0%.

Table 6. Provide a label compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	73	71	2.7
HH	105	0	100.0
MN	40	20	50.0
SC	31	27	12.9
CA	68	68	0.0
JE	10	10	0.0
JD	63	61	3.2
SJ	13	13	0.0
Average	50.4	33.8	21.1

3.3.6 Markup syntax

The elements of the markup language must be closed and opened to check if they are suited to the nested relationship and to the declaration of the property to the grammar. To provide robustness and prevent errors, the elements of a markup language must be used. The nesting of tags, the value of the declaration, and the ID attributes of the property must not overlap.

The markup compliance rates shown in Table 7 are very low, except for that of MN (93.0%).

Table 7. Grammar mark-up compliance rate

GH	Item-No	Error-No	Observe-Ratio
YH	25	25	0.0
HH	100	41	59.0
MN	100	7	93.0
SC	19	4	78.9
CA	56	51	8.9
JE	21	21	0.0
JD	12	9	25.0
SJ	31	31	0.0
Average	45.5	23.6	33.1

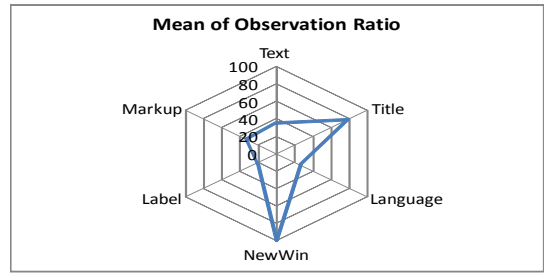


Fig. 5 Average compliance rate

In Fig. 5, K is the average compliance rate of WAH 4.4, which was applied to six detailed instructions. The results are plotted on the radial graph. As shown in the graph, the new window open compliance was high, but the compliance with the remaining items was very low.

IV. Conclusion

This paper focused on the enforcement of the obligation of companies and institutions to ensure their Web accessibility until 2015. In particular, the compliance of geriatric hospitals was evaluated.

The K-WAH 4.4 website evaluation tool was used to rank the NAVER power links that elderly or disabled people visit frequently. The results were very low for all the regions. Therefore, improvement measures must be implemented within the time limit. Efforts to increase the depth review and compliance rates must also be made. In future research, the qualitative aspect of Web accessibility must in turn be evaluated.

감사의 글

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