Edulib 12 (2) (2022) 179-196

JURNAL UPI

EDULIB

Journal of Library and Information Science

Journal homepage: http://ejournal.upi.edu/index.php/edulib/index

Analysis of Online Accessibility of Public Access Catalogue on SLiMS and INLISLite Applications Based on WCAG 2.0

M. Annas Dwi Cahyono[1], Inawati[2]

[1]Library and Information Science, Faculty of Literature, Universitas Negeri Malang, Indonesia
Correspondence author email : annas.dwicahyono.1802146@students.um.ac.id

ABSTRACT

This study aims to determine the level of OPAC accessibility in SLiMS and INLISLite applications. Four main guidelines on website accessibility will be analyzed: perceivable, operable, adaptable, and robust. The four guidelines are based on the Web Content Accessibility Guidelines (WCAG). This study uses a quantitative approach with descriptive methods and data analysis techniques using manual checks based on the WCAG-EM guidelines, which focus on two levels, namely A and AA. The results of the study based on four indicators are (1) perceivable on SLiMS and INLISLite experiencing problems in providing alternative text, (2) operable on SLiMS and INLISLite found problems in the focus element, (3) understandable on SLiMS and INLISLite fail to meet the criteria for providing language, and (4) robust, both applications have succeeded in utilizing HTML syntax according to the provisions. Thus, from the four indicators, the SLiMS and INLISLite applications still need to meet several criteria at level A, namely the criteria for using language, using color, and providing alternative text on non-text elements. Meanwhile, at level AA, there is a failure in the focus element.

ARTICLE INFO

Article History:
Submitted/Received Oct 14, 2022
First Revised Nov 15, 2022
Accepted Nov 25, 2022
First Available online Nov 26, 2022
Publication Date Nov 27, 2022

Keyword:
Accessibility,
OPAC,
Website

1. INTRODUCTION

The development of information technology has made human life easier with the help of the internet. Information previously limited to television and radio can now be accessed easily. Ease of access to information is inseparable from the presence of the internet. Vinton Cerf is known as the "father of the internet" and the creator of the first commercial e-mail system to illustrate that the internet can be an inclusive place. Initially, commercial e-mail was created as a tool for the deaf to receive messages. Apart from that, Vinton Cerf's goal was to develop e-mail to help his deaf wife communicate. E-mail is a balance for everyone, whether they have limitations or not, so everyone can take advantage of the same technology (Firth, 2019). Initially, e-mail became a helpful tool for everyone to exchange information. However, along with its development, the internet is limited to e-mail and is no longer inclusive. Computers and the internet, which should be used as tools to help people with disabilities, are no longer in line with Vinton Cerf's initial expectations (Solsman, 2017).

Some people who have disabilities need a tool that is used to operate a computer. Assistive devices bridge users and their devices (Kalbag, 2017). Assistive devices can help everyone operate a computer. Several assistive technologies, such as switch inputs, eye trackers, speech recognition, screen magnifiers, screen readers, and keyboards, are often used in technological devices. Some of these tools are used based on the problems faced by users. However, on some websites, the tools sometimes cannot run optimally because the website has low accessibility. So that access to information becomes difficult and cannot be utilized by the community optimally (Utami, 2015).

The library is known as a place to find various types of information in various forms. The development of information technology has helped libraries to evolve with the times. The collections that are stored and managed by the library are not limited to the form of book collections but also digital books, which are now widely used by the public at large. Technological developments also affect a library so that it can develop various kinds of services that users can use for free, such as providing digital collections and providing free Wi-Fi (Himayah, 2013).

It is also much easier to find collections in the library with an online catalog or the Online Public Access Catalog (OPAC). Along with the times, the catalog, initially in the form of a card, has changed to an online catalog (Fitriyani, 2017; Piliang, 2013). Online catalogs, better known as OPAC, contain bibliographical information from information center collections, which are flexible, modern, and more accessible than card catalogs (Husain & Ansari, 2006). There are two types of OPAC, namely Web OPAC, and OPAC. Conceptually, the two types have the same concept. However, OPAC is utilized in a limited scope, namely in the local scope. Meanwhile, Web OPAC is utilized more globally because it is uploaded on a web server so that everyone can access it (Husain & Ansari, 2006).

In Indonesia, two applications are known that are often used by libraries to make OPACs easily and for free. The two applications are INLISLite (Integrated Library System) and SLiMS (Senayan Library Management System). INLISLite was developed directly by the National Library, while SLiMS was developed by the Jakarta SLiMS Community (SENAYAN). Both provide OPAC services and admin pages useful for processing library collection catalogs. Both applications are open source. So, everyone can use and modify it for free.

Both applications were developed by utilizing HTML and CSS to design websites that are as attractive as possible, provide comfort to visitors, and can provide a sense of comfort when visiting the page. Website display or user interface design supports the aesthetic side of the website, while user experience design supports the convenience or user experience in

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

accessing the website (Krug, 2013). However, other aspects need to be considered to create a website that is comfortable for all users, namely website accessibility.

Accessibility in the context of the website can be interpreted as the extent to which a website can be used by all levels of society (Kalbag, 2017). A bad website design can prevent some users from accessing information (Horton & Quesenbery, 2013). So, websites with high accessibility are needed and can help those with limitations or disabilities (Krug, 2013). Accessibility also plays an important role for users without disabilities. Designing a website to be inclusive or have a high and adequate level of accessibility can help everyone to have equal rights in accessing information. Accessibility can also increase ranking on a website-based search engine and reduce the cost of creating a website (Firth, 2019).

Web accessibility is regulated by the Web Content Accessibility Guideline (WCAG). WCAG is a guideline that web developers can follow in order to design websites with adequate accessibility. These guidelines are not mandatory or restrictive and must be followed. Some developers do not follow this rule because they think it will reduce the aesthetic side of the website. So, there are still many websites that have low accessibility.

In WCAG, four main principles are measured: perceivable, operable, understandable, and robust (Caldwell, Cooper, and Reid, 2008). These four points are also known as POUR. (i) perceivable regarding the appearance and components of the website, (ii) operable, regarding the ease of navigating buttons or displays on the website, (iii) understandable, related to the ease of each operation/use and easy-to-understand display, and (iv) robust, regarding the ability website so that it can be utilized by using various tools.

There have been several studies related to website accessibility conducted by Amalina (2021) entitled "Kerjabilitas.com Website Accessibility for Visual Disabilities Based on Web Content Accessibility Guidelines 2.1". In this study, researchers tested accessibility by involving users as respondents. This research is also known as user testing. As a result, problems were found in several aspects, primarily perceivable points with the lowest score, followed by understandable, operable, and robust (Amalina, 2021).

Another study focuses on the level of accessibility of higher education websites conducted by Arasid (2017) with the title "Analysis of State University Website Accessibility Based on WCAG 2.0 Guidelines". As a result, it is known that there are many obstacles found on state university websites. Many errors were found in alternative text components, info and relationships, page titles, link destinations, language, input data, labels and instructions, and the criteria name, role, and value (Arasid, 2017).

From previous research, this research will focus on manual testing with technical checks or manual analysis by understanding and directly observing the website (Gill, 2008). It is intended that the data obtained can be comprehensive. Meanwhile, previous research used more evaluation applications, such as TAW, to obtain data. TAW is an online evaluation tool that functions to measure website accessibility automatically. Due to its intuitive nature, sometimes some elements are found that cannot be analyzed by TAW. Thus, it is necessary for humans to further analyze the problems generated through automatic accessibility evaluation tools such as TAW.

The purpose of this research is to find out how the accessibility level of the Online Public Access Catalog (OPAC) in the Senayan Library Management System (SLiMS) and INLISLite applications is by the accessibility guidelines provided by the Web Content Accessibility Guideline (WCAG).

2. METHODS

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

This research uses a quantitative approach with descriptive methods. Descriptive research aims to determine the value of the independent variables without making comparisons between one variable and another (Kurniawan & Puspitaningtyas, 2016). This study uses a quantitative approach. The data obtained is in the form of a checklist. Quantitative research is a research approach that examines specific populations or samples using research instruments with quantitative or statistical data analysis (Sugiyono, 2013).

This study focuses on the four indicators available in the WCAG, namely perceivable, operable, understandable, and robust. In each indicator, several criteria must be met. Each criterion is divided into several levels, namely A, AA, and AAA. The lowest A level and the highest and strictest AAA level. Each level means that the higher the level, the more people can access the website. The AA level is the level most commonly used by developers because, in some countries, there are legal requirements to meet this criterion (Dowden & Dowden, 2019; Holder, 2022). This study focuses on the AA level because, at this level, more developers use it to develop their websites, and the requirements that must be met are flexible (Holder, 2022.).

Data collection techniques by direct observation of objects and WCAG-EM documentation. During data collection, the researcher acts as the main instrument. The researcher did not intervene/change/modify the research subject but left the subject naturally (Suyitno, 2018). Direct observations were made on the two OPAC applications, both of which have demo website pages that can be accessed via a browser, namely https://slims.web.id/demo/ , and https://demoinlislitev3.perpusnas.go.id/opac/search.

Furthermore, the data is presented in the form of images and described. The method used is WCAG-EM which was created to evaluate websites using WCAG guidelines (Henry & About-Zahra, 2020). The procedure includes five stages, namely :

Table 1. The Five Stages of WCAG-EM

No.	Stages	Description
1	Define scope	Two websites analyzed, namely SLiMS and INLISLite The criteria analyzed are at the A and AA levels https://slims.web.id/demo/
2	Browsing the target website	https://demoinlislitev3.perpusnas.go.id/opac/search The sections to be analyzed on each website include HTML, CSS, WAI-ARIA, and javascript
3	Website sample selection	Three sample website pages were selected, including the front page, search results, and collection details
4	Selected sample audit	Evaluation is carried out directly on each sample website. Several tools are used to assist the analysis process, namely Developer tools in the browser to help check HTML and CSS syntax Color contrast analyzer (CCA) to check the percentage of color contrast W3C markup validator to validate HTML syntax ANDI to help read elements such as screen readers and determine the focus of elements ChromeVox as a screen reader tool
5	Reporting of evaluation findings	The final stage, when all stages have been carried out, is documenting each step of the stages and findings during the analysis.

Sources: https://www.w3.org/WAI/test-evaluate/conformance/wcag-em/

3. RESULTS AND DISCUSSION

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Accessibility level measurement according to the Web Content Accessibility Guidelines (WCAG) can be divided into 4 main principles: perceivable, operable, understandable, and robust. Each principle has guidelines that contain various criteria that should be done and avoided to get a WCAG level of accessibility.

Perceivable

In the perceivable principle, there are four guidelines: text alternatives, time-based media, adaptable, and distinguishable. Text alternatives are a way to make information accessible through various media according to user needs. This is useful so that users can find the information in non-text content. Non-text content can be in the form of diagrams, audio, video, animation, and images. A screen reader tool assists in changing text information into speech or sound. Giving the 'alt' attribute to images is a way to provide alternative text to images. Meanwhile, you can add captions or subtitles as an alternative to text for videos.

Missing the alt attribute on an image will make an image unable to be identified by tools. In INLISLite, it is known that the sample search page and collection details fail because they do not provide alternative text. Meanwhile, the alternative text failed to be fulfilled on the sample search page in SLIMS. Both failed because they removed the 'alt' attribute on image elements according to the WCAG success criteria with code F65 – Remove alt attribute or text alternatives on image elements (Accessibility Guidelines Working Group, 2022b). Without alternative text, tools such as screen readers cannot identify images and present them to users (Figure 1).

Figure 1. Screen reader results for image elements on INLISLite

The INLISLite homepage sample, SLIMS detail page, and homepage samples have successfully met the success criteria. Both meet the success criteria because they provide alternative texts. Both of these applications use two ways to fulfill this, namely by adding an 'alt' attribute to images and combining links and text with images in the same element. Both techniques are by WCAG recommendations. Thus, the tool can identify and convey information in the image to the user.

The second guideline, namely time-based media, has three success criteria at level A and two success criteria at level AA. This guide attempts to provide a user-friendly way of making use of time-based media, namely audio, and video. The convenience provided follows success criteria, such as providing captions, sign language, audio descriptions, and alternative media. However, both OPAC applications do not provide video or audio media in them. Thus, this guideline cannot be analyzed due to the unavailability of time-based media such as audio or video.

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

The third guideline is adaptability, there are three success criteria at level A. This guideline emphasizes the availability of adaptive pages (on computers and cellphones) without losing the information in them. The three success criteria include info and relationship, meaningful sequence, and sensory characteristics. Info and relation in both applications have met the success criteria. Both applications make use of HTML syntax semantically for each HTML structure. This is by the technique recommended by the WCAG by utilizing semantic elements with code G115 – Using semantic elements to mark up the structure (Accessibility Guidelines Working Group, 2022d). The heading tags in the SLIMS application are more sequential than those in INLISLite (Figure 2). The heading structure on all three sample INLISLite pages only displays H3 headings. For initial titles, it is recommended to use the largest heading, namely H1, followed by the next heading up to H6. With a sequential heading structure, the structure of the content on the page can also be seen more clearly by users.

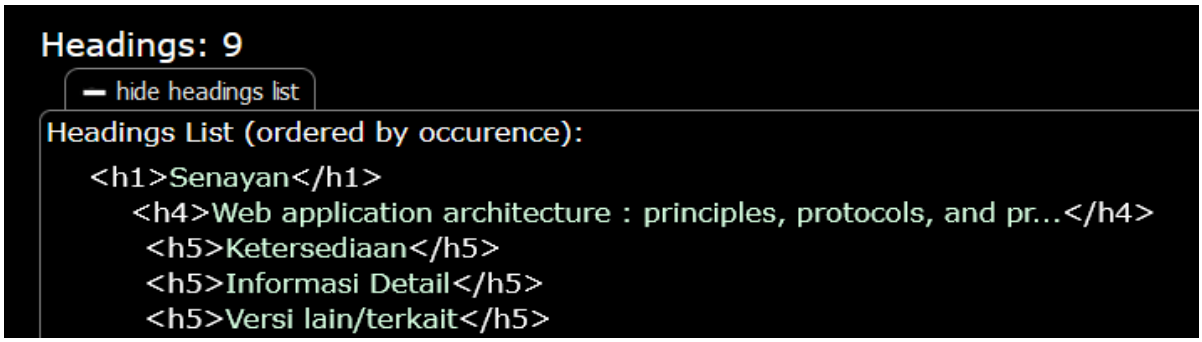

Figure 2. The heading structure on the SLiMS sample detail page

SLiMS uses WAI-ARIA to help create HTML structures (Figure 3). In several elements, WAI-ARIA can help an assistive device run properly. Meanwhile, INLISLite has not utilized WAI-ARIA. Thus, the screen reader found several obstacles when reading the navigation elements.

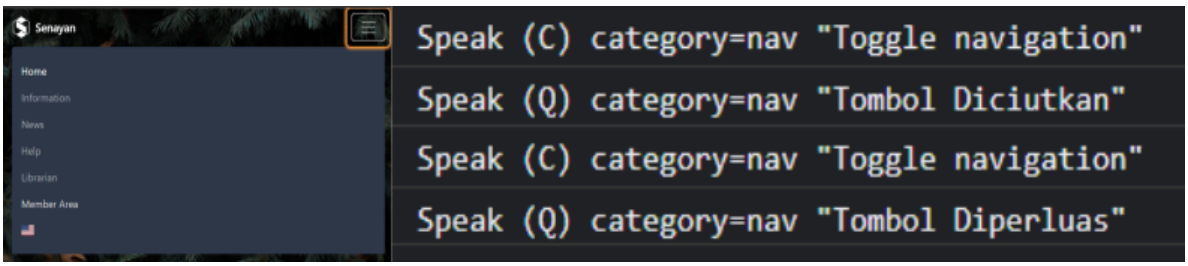

Figure 3. The WAI-ARIA function on the screen reader on SLiMS

The following success criterion is a meaningful sequence. This criterion emphasizes the appropriate order for each content. Appropriate order means that the visual, DOM, or HTML syntax orders are the same. The goal is that the content is clear to users when using the tools. SLiMS and INLISLite can meet these success criteria. Visually and HTML syntax can display content sequentially without changing the meaning of each element. This is by the technique suggested by the WCAG, namely the DOM order according to the visual order with code C27 – Making the DOM order match the visual order (Accessibility Guidelines Working Group, 2022a) and sorting content in a meaningful or clear order according to code G57 – Ordering the content in a meaningful sequence (Accessibility Guidelines Working Group, 2022c).

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

The last success criterion is sensory characteristics. This criterion ensures that every information and element on the website does not rely solely on sensory characteristics such as color, shape, size, and sound. Elemental instruction examples such as "round button" and "right button" will confuse some users, so it is not recommended to use this method. INLISLite has met this success criterion by providing identification that is not sensory alone. INLISLite provides a clear search button in the search input and describes the button's function by adding the text "Search" to the search button (Figure 4).

Meanwhile, on SLiMS, the buttons do not work correctly. The image on the right side of the search input is just an image without a specific function. Thus, SLiMS fails to meet this criterion because it provides images that do not have a specific function and cannot be identified by tools.

Figure 4. Search input on SLiMS

The fourth guideline is that there are two different criteria for success at level A and three criteria for success at level AA. The success criteria include using color, audio control, contrast (minimum), resizing text, and images of text. The first criterion is the use of color. This criterion ensures that users can access information on the website through color differences. WCAG sets a 3:1 ratio for background and foreground to fulfill this criterion. Both SLiMS and INLISLite applications comply with the ratio guidelines set by the WCAG, namely above 3:1 for each element and text (Figure 5). The failure found in INLISLite is the loss of text decorations, such as underscores in the link text. The loss of text decoration makes a link difficult to identify visually. Meanwhile, in SLiMS, the text-decoration is maintained on the sample detail page, which contains details of the book collection.

Figure 5. The contrast ratio on one of the elements in INLISLite

Audio control criteria cannot be analyzed because, in SLiMS and INLISLite, no time-based media such as audio can be analyzed. The following criterion is the color contrast (minimum). This criterion is the same as the use of color criterion, but with a higher contrast ratio of 4.5:1 and focusing only on text elements. SLiMS and INLISLite, both of them have

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

succeeded in fulfilling this criterion with a ratio above the requirements set by WCAG above 4.5:1.

The resize text criterion ensures that web pages can be enlarged by up to 200%. Thus, elements and text become more visible. The goal is that users with vision problems can still access the information available on the website. Every available browser also has a feature to enlarge and reduce the size of the website display. SLiMS can be enlarged by 200% without losing or destroying the website's appearance.

Meanwhile, INLISLite found a problem with the sample search page. Book titles and covers overlap when the view is enlarged to 200% (Figure 6). However, no overlapping of these elements was found for the other two sample pages. Both of these applications have followed the criteria for a website to be enlarged by up to 200%. However, it is known that both applications still use a fixed unit size to create a font size of px. WCAG prefers to utilize em units which are more adaptive to the display of the user's device.

Figure 6. Overlapping on elements in INLISLite

The image of text criterion is the visual presentation of the text. If you want to modify every text on the website, it is advisable to use CSS instead of images. In both applications, there are no constraints to meet the criteria of images of text. Both have used CSS to change and modify the website's appearance to improve aesthetic.

Table 2. The results of perceivable principle analysis

Success Criteria	SLiMS Result	INLISLite Result
Text Alternatives		
1. Konten non-teks (A)	*Failed*	*Failed*
Time-based Media		
1. *Audio and video only* (A)	*Not present*	*Not present*
2. *Captions (prerecorded)* (A)	*Not present*	*Not present*
3. *Audio description or media alternatives (A)*	*Not present*	*Not present*
4. *Captions (live)* (AA)	*Not present*	*Not present*
5. *Audio description* (AA)	*Not present*	*Not present*
Adaptable		
1. *Info and relationship* (A)	*Passed*	*Passed*

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Success Criteria	SLiMS Result	INLISLite Result
2. *Meaningful sequence* (A)	*Passed*	*Passed*
3. *Sensory characteristic* (A)	*Failed*	*Passed*
Distinguishable		
1. *Use of color* (A)	*Failed*	*Failed*
2. *Audio control* (A)	*Not present*	*Not present*
3. *Contrast (minimum)* (AA)	*Passed*	*Failed*
4. *Resize text* (AA)	*Passed*	*Failed*
5. *Images of text* (AA)	*Passed*	*Passed*

Based on the analysis for each perceivable criterion, it is known that SLiMS got five passed, three failed, and six not present. Meanwhile, INLISLite got four passed, four failed, and six not present. SLiMS and INLISLite still need to meet the lowest level of A because three criteria still need to be met: non-text content, sensory characteristics, and use of color.

Operable

In the operable principle, there are four guidelines, namely accessible keyboard, enough time, seizures, and navigable. The first guideline is an accessible keyboard. This guide focuses on the functionality of the keyboard as a tool. There are two criteria for success at level A. The first criterion is the keyboard. This criterion aims to ensure that content on the website can be operated via a keyboard so that users with vision problems can use the keyboard as an alternative tool. In general, the four buttons that can be used to move between elements on a website are "Tab", "Shift + Tab", "Enter", and "Space". The "Tab" and "Shift + Tab" keys move back and forth between element focuses. Meanwhile, "Enter" and "Space" are used to press the button and open the link.

In SLiMS and INLISLite, this criterion is acceptable. The keyboard can be used without any problems. And every element on the website can be operated without problems such as keyboard traps. Keyboard trap is the second criterion on the principle of the keyboard. The keyboard trap, namely the keyboard condition, cannot be moved from one element to another. So, this condition will interfere with keyboard users accessing content on the website. In both applications, no keyboard trap problem was found.

The second guideline is enough time, there are two criteria for success at level A, namely timing adjustable and pause, stop, and hide. Both criteria relate to time and time-based media such as video and audio. Timing adjustable aims to allow users to read or interact with input on the website without a time limit. The time can be stopped or added if there is a time limit. SLiMS and INLISLite have no time limit for reading or accessing the application, including during the login session. Thus, both applications pass this criterion. In the stop, hide, and pause criteria, SLiMS and INLISLite do not have time-based media. So, this criterion cannot be analyzed.

The third guideline is that seizures have one success criterion at level A: three flashes or below the threshold. This criterion ensures that the website content does not contain flashes or flashes that can cause particular problems for some users. The cause of this flash can be found in the video or animation on the website. In SLiMS and INLISLite, no animations or videos cause flashes or flashes to appear. Thus, both applications successfully meet this criterion.

The fourth guideline is navigable, with four success criteria at level A and three success criteria at level AA. The first criterion is the bypass block. This criterion allows website

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

providers to provide navigation buttons that can lead directly to the website's main content (Figure 7). The availability of this navigation can speed up users to move their focus directly to the website's main content. Both SLiMS and INLISLite applications do not provide this navigation element.

Figure 7. Example of a skip to content element to meet the bypass block criteria

The second criterion, namely page title d, aims to help users identify a website page without reading its entire content. Giving a title can use the HTML syntax "title". The syntax will display the title of the website content in the browser tab. The title should be descriptive to make it easier for users. This criterion will make it easier for every user to access the website. SLiMS and INLISLite have fulfilled this criterion by following the two techniques suggested by the WCAG, namely providing a descriptive title and utilizing the title syntax in HTML (Figure 8). Thus, both applications display the title of the book on the window bar or browser tab.

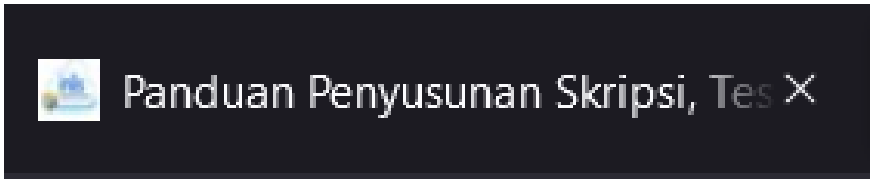

Figure 8. Giving descriptive titles to browser tabs in INLISLite

The third criterion is the focus order. This criterion ensures that when the user moves between elements using the keyboard, the user can move between elements in a consistent order. SLiMS and INLISLite have fulfilled this criterion by following the two techniques suggested by WCAG: making the DOM order match the visual order and placing elements in the appropriate order in the content (Figs 9 and 10). The visual content on the website will follow the order of the DOM. The sequence of this content can be modified by utilizing HTML and CSS syntax. However, the use of HTML and CSS to add focus to elements is rare. Because by default, some aspects in HTML have gained focus without needing to be manually added.

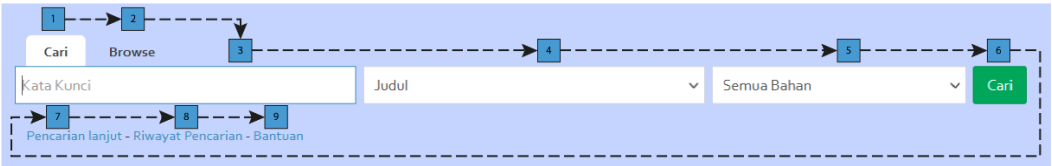

Figure 9. Sequence focus on INLISLite

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

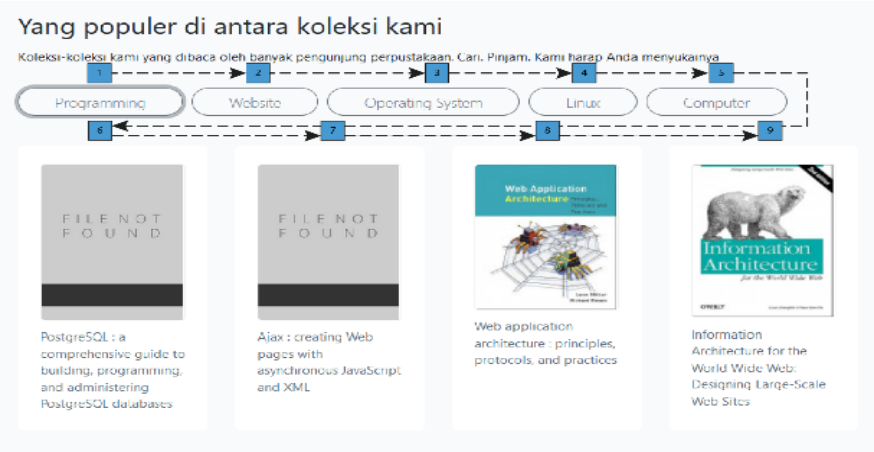

Figure 10. Sequence focus on SLiMS

The fourth criterion is link purpose (in context). This criterion aims to let users know the address or destination of each link on the website. To meet this criterion, each existing link can be added a description before the link, or the link can be given a descriptive name. Provision of links can be made by utilizing the HTML anchor syntax or "a". In both applications, this criterion was acceptable. Each link on the two sample pages is descriptive of the direction or purpose of the link. Every existing link also utilizes an anchor tag to create a link element. SLiMS also adds a title attribute to the link, which functions as a description to clarify the link's purpose. The attribute will appear as a pop-up when the cursor is over the link (Figure 11).

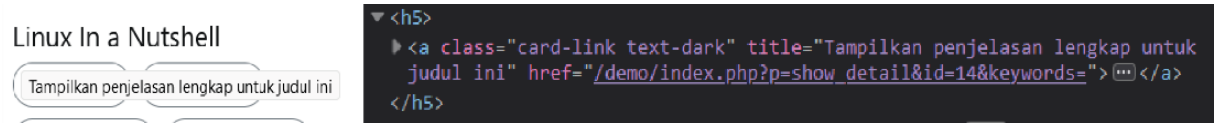

Figure 11. Utilization of the title attribute on links in SliMS

The fifth criterion is multiple ways. This criterion aims to allow users to find any content on the website in various ways. Providing alternative ways to find content can help any user who may be more comfortable finding content in some way. Providing ways to find content can be in the form of searching content within the website, links between pages, or a table of contents and content. SLiMS and INLISLite provide a search mechanism and a table of contents or contents. The search mechanism is essential thing in an OPAC because it can help speed up content being found by users. They also provide another way to find content by grouping it by a specific collection type. So, users can find it easier and more targeted to find collections on OPAC.

The sixth criterion is headings and labels. This criterion aims to help each user understand any information on the website and how that information is organized. To meet this criterion, the website title, heading, and website label must be descriptive. A descriptive title will help users quickly find the information they seek. Moreover, descriptive labels will help users understand the intent and purpose of each element on the website. Both have provided a descriptive heading containing the collection title. So users can immediately understand and find the collection that users want. Labels in INLISLite are not found constraints, each available label describes the purpose of the associated element. Thus, it is clear to the part of the user.

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Meanwhile, on SLiMS, one problem was found on the sample search page. Each collection search result has one symbol element that does not contain a label and cannot be operated using the keyboard. For other elements, SLiMS has provided descriptive labels.

The final criterion is the visible focus. This criterion relates to the keyboard. Any keyboard-operable element will receive focus. By default, the focus display on the website will be visible, that is, the element is wrapped in a blue line which indicates the element gets keyboard focus. The purpose of keyboard focus is so that each user can know which element has the focus. So users will experience clarity while operating the website using the keyboard. In INLISLite, the focus display has been modified to be less visible when operated with the keyboard. INLISLite fails to meet this criterion because the focus on the element needs to be recovered. Whereas in SLiMS, when accessed in the Firefox browser, the focus results become invisible, which means it fails to meet this criterion (Figure 12). However, when opened in the Chrome browser. SLiMS successfully fulfills this criterion because the focus is visible as a black line on each element that gets the keyboard focus (Figure 13).

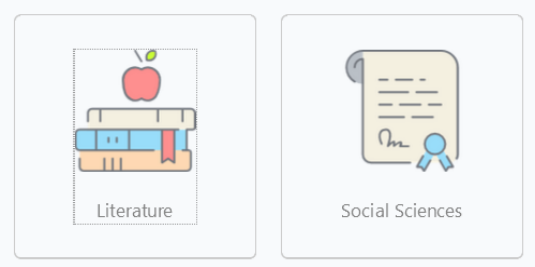

Figure 12. Focus element on SLiMS on the Firefox browser

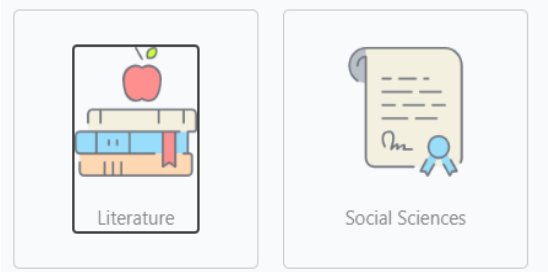

Figure 13. Element focus on INLISLite on the Chrome browser

Table 3. The results of the principle operable analysis

Success Criteria	SLiMS Result	INLISLite Result
Keyboard Accessible		
1. *Keyboard* (A)	*Passed*	*Passed*
2. *Keyboard trap* (A)	*Passed*	*Passed*
Enough Time		
1. *Timing adjustable* (A)	*Passed*	*Passed*
2. *Pause, stop, hide* (A)	*Passed*	*Passed*
Seizures and Physical Reactions		
1. *Three flashes or below threshold* (A)	*Passed*	*Passed*
Navigable		
1. *Bypass block* (A)	*Not present*	*Not present*
2. *Page titled* (A)	*Passed*	*Passed*
3. *Focus order* (A)	*Passed*	*Passed*
4. *Link purpose (in context)* (A)	*Passed*	*Passed*
5. *Multiple ways* (AA)	*Passed*	*Passed*
6. *Heading s and labels* (AA)	*Passed*	*Passed*
7. *Focus visible* (AA)	*Failed*	*Failed*

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Based on the analysis for each operable criterion, it is known that SLiMS and INLISLite got the same results: ten passed, one failed, and one was not present. SLiMS and INLISLite have met all the criteria at level A. However, one criterion can be added to SLiMS and INLISLite to increase accessibility, namely the bypass block criteria.

Understandable

In the understandable principle, there are three guidelines: readable, predictable, and input assistance. The first guideline is readable, there is one success criterion each at levels A and AA. The first criterion is the language of the page. This criterion ensures that the website provides the information needed by the tools to display the text correctly. The tool will run more optimally if the language of the website page has been predetermined. Thus, the tool can pronounce every word on the website with the correct language pronunciation. You can use the HTML lang attribute followed by the language code to meet this criterion. INLISLite has provided a lang attribute on the website. However, a problem was found with the language code. INLISLite does not enter the language code correctly. The correct language code contains two letter combinations according to ISO 639.1.

Meanwhile, INLISLite uses a three-letter combination language code that complies with ISO 639.2. The language code on the website uses a combination of two letters. So, INLISLite needs to fix the lang attribute part. In SLiMS, there is no lang attribute. Thus, SLiMS failed to meet this criterion.

The second criterion is the language of parts. This criterion relates to the same language as the first criterion. This criterion focuses on a smaller scope, such as paragraphs or specific elements. Meeting these criteria will help the tool to read every word on the website more accurately following the language specified in the website elements section. SLiMS and INLISLite, do not provide additional language attributes on certain website elements. Thus, this criterion cannot be analyzed.

The second guideline is predictable, with two success criteria at levels A and AA. The first criterion is on focus. This criterion ensures that every element or input on the website, when it receives focus, will not trigger changes to the content on the website. SLiMS and INLISLite meet these criteria. Any element on the website that receives keyboard focus does not trigger changes to the website content. One of them is the dropdown menu when in the mobile view, it can be operated without any problems. WCAG suggests that if an input can trigger content changes, it can use the active attribute instead of the focus attribute. Moreover, any website content changes should occur due to actions on the user's side.

The next level A criterion is input. This criterion is related to the previous criteria. This criterion focuses on input elements. In OPAC applications, the input elements are commonly found on search and login pages. Changes to website content will only occur if there is an action on the user's side such as pressing the "Submit" button. On INLISLite, these buttons are available on search and login pages. The "Submit" button's availability helps the user understand what action to take next after filling in each available input.

Meanwhile, in SLiMS, the button that functions like "Send" in the search input is not available. SLiMS only provides search input, if you want to make changes to content, all you have to do is press the "Enter" button on the keyboard. However, WCAG prefers to provide a separate "Submit" button because it will make it easier for users to understand the purpose of the input.

AA-level criteria consist of consistent navigation and consistent identification. These two criteria relate to the consistency of each element and layout on the website. Every element that appears in the same or consistent order helps users to understand the whole website

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

more easily. So users can find the information, they want more quickly and easily. Layout changes and unimportant elements will only confuse the user. SLiMS and INLISLite have fulfilled this criterion by providing consistent elements. This is accomplished by providing navigational elements that do not change under any circumstances (Figures 14 and 15). Each element is given a consistent title label with no changes on every page.

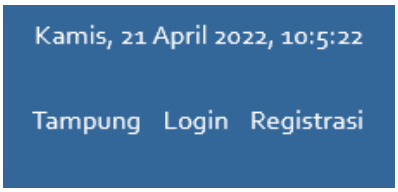

Figure 14. Navigation display on desktop devices on INLISLite

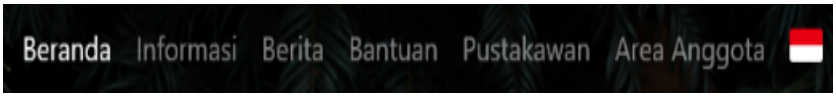

Figure 15. Navigation display on desktop devices on SlimS

The third guideline is input assistance, there are two success criteria at level A and AA, respectively. The four criteria in this guide are related to each other and are directly related to inputs. The first criterion is error identification, that is, there is an explanation as to why the error occurred when writing or sending input. This is useful so that users can immediately fix the wrong part. The second criterion is labels and instructions. Criteria focus on providing a label for each input so that the tool can read the input to fill with what value. This criterion also helps the user to distinguish between required and non-required inputs. The third criterion is the error suggestion. This criterion ensures that the website provides suggestions for correcting errors during the value input process. With this suggestion, users can immediately correct errors in input so that it will help the user experience while accessing the website.

The fourth criterion is error prevention (legal, financial, and data). This criterion ensures the data the user sends through the input is correct. However, this criterion is not needed in the OPAC because the input in the OPAC only relates to searching collections whose data are not sensitive. With these four criteria, the goal is for users to avoid problems and immediately fix errors when problems occur. In SLiMS and INLISLite, both of them have not used labels as input descriptions. It is a good idea to both also add a required input attribute. However, both have provided identification of errors and suggestions for correcting errors according to the first and third criteria (Figures 16 and 17).

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

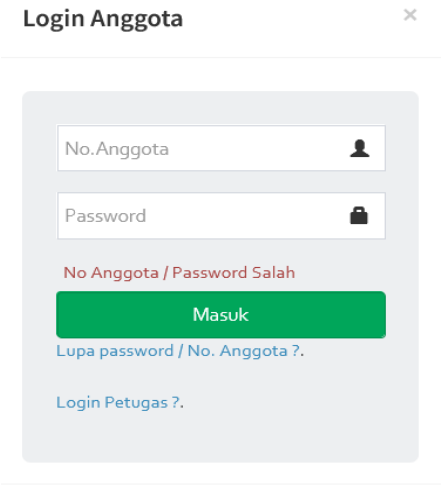

Figure 16. Error suggestions on INLISLite

Figure 17. Error suggestions on SliMS

Table 4. The results of the analysis are understandable

Success Criteria	SLiMS Result	INLISLite Result
Readable		
1. *Language of page* (A)	*Failed*	*Failed*
2. *Language of parts* (AA)	*Not present*	*Not present*
Predictable		
1. *On focus* (A)	*Passed*	*Passed*
2. *On input* (A)	*Passed*	*Passed*
3. *Consistent navigation* (AA)	*Passed*	*Passed*
4. *Consistent identification* (AA)	*Passed*	*Passed*
Input Assistance		
1. *Error identification* (A)	*Passed*	*Passed*
2. *Labels or identification* (A)	*Passed*	*Passed*
3. *Error suggestion* (AA)	*Passed*	*Passed*
4. *Error , prevention (legal, finansial, data)* (AA)	*Not present*	*Not present*

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Based on the analysis for each criterion in the understandable guidelines, it is known that SLiMS and INLISLite obtained the same results: seven passed, one failed, and two were not present. SLiMS and INLISLite still need to meet one criterion at level A, namely the language of the page. The other criteria are appropriate for the AA level, and all have been fulfilled.

Robust

In the robust principle, one guideline, compatible, contains two success criteria: parsing and name, role, and value. This criterion relates to how HTML syntax is utilized in developing websites. Each HTML syntax has a different purpose, so this criterion ensures that each syntax has been appropriately utilized. Overall both applications have utilized HTML syntax accordingly. Both of them need help using labels in the input section. Labs are recommended rather than placeholders or other attributes such as divs. Based on the results of the analysis for each of the criteria above. Both can provide compatible website content on various browsers. Although some problems were found in the syntax that needed to be more suitable, it did not have much effect on website compatibility.

Table 5. The results of the robust principle analysis

Success Criteria	SLiMS Result	INLISLite Result
Compatible		
1. *Parsing* (A)	*Passed*	*Passed*
2. *Name, role, value* (A)	*Passed*	*Passed*

Based on the analysis for each criterion in the robust guideline, it is known that SLiMS and INLISLite have fulfilled all the criteria in this guideline. Both of these applications have complied with all the criteria at level A

4. CONCLUSION

Based on the analysis results of the four main WCAG guidelines. There are advantages and disadvantages to the same aspects of SLiMS and INLISLite. Both of them have utilized this technology in terms of HTML and CSS syntax following their functions. Each element has utilized CSS to add aesthetic value and HTML to clarify the website structure. A straightforward website structure also makes every element and content operate without problems. Both also use the appropriate color contrast, above 3:1 for elements and 4.5:1 for text. Overall both have provided a way for the content on the website to be accessed by users. Problems for both SLiMS and INLISLite applications were found in label syntax and language. Labels play an important role in search input, so the availability of labels can help tools identify elements. SLiMS is technologically superior to INLISLite because it uses WAI-ARIA.

On the other hand, INLISLite is superior in terms of website components which are more complete than SLiMS—based on the analysis of all the application components, SLiMS and INLISLite still failed to meet several criteria at level A. Failure was found in the criteria for the language of the page, use of color, and text alternatives. Meanwhile, at the AA level, there is a failure in the visible focus criterion.

5. AUTHOR'S NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

6. REFERENCES

Accessibility Guidelines Working Group. (2022a, April 27th). *C27: Making the DOM order match the visual order.* https://www.w3.org/WAI/WCAG21/Techniques/css/C27.html.

Accessibility Guidelines Working Group. (2022b, April 27th). *F65: Failure of Success Criterion 1.1.1 due to omitting the alt attribute or text alternative on img elements, area elements, and input elements of type 'image'*. Https://www.w3.org/WAI/WCAG21/Techniques/failures/F65.html

Accessibility Guidelines Working Group. (2022c, April 27th). *G57: Ordering the content in a meaningful sequence.* https://www.w3.org/WAI/WCAG21/Techniques/general/G57.html

Accessibility Guidelines Working Group. (2022d, April 27th). *G115: Using semantic elements to mark up structure.* https://www.w3.org/WAI/WCAG21/Techniques/general/G115.html

Amalina, S. S. (2021). *Aksesibilitas Website Kerjabilitas. com bagi Disabilitas Penglihatan Berdasarkan Web Content Accessibility Guidelines 2.1* [Doctoral dissertation, UNIVERSITAS AIRLANGGA].

Arasid, W. (2017). *Analisis aksesibilitas website perguruan tinggi negeri berdasarkan pedoman WCAG 2.0* [Doctoral dissertation, Universitas Pendidikan Indonesia].

Birney, A. (2020, December 17th). *WCAG Version History.* Https://accessibleweb.com/wcag/wcag-version-history/

Bureau of Internet Accessibility. (2019, December 16th). *History of the Web Content Accessibility Guidelines (WCAG).* Https://www.boia.org/blog/history-of-the-web-content-accessibility-guidelines-wcag)

Caldwell, B., Michael Cooper, dan Loretta Guarino Reid. (2008, August 2nd). *Web Content Accessibility Guidelines (WCAG) 2.0. Web Accessibility Initiative.* Https://www.w3.org/TR/2008/REC-WCAG20-20081211

Digital Education Strategies dan The Chang School. 2019. *Professional Web Accessibility Auditing Made Easy*. disunting oleh P. Ricablanca.

Dowden, M., dan Michael Dowden. (2019). *Approachable Accessibility*. Apress.

Firth, A. (2019). *Practical Web Inclusion and Accessibility*. Apress.

Fitriyani, Nurlina. 2017. *Pentingnya Perpustakaan Sekolah Sebagai Pusat Sumber Belajar*.

Gill, Satinder P. (2008). *Web Accessibility* . In S. Harper & Y. Yesilada (eds). Springer.

Henry, S. L., & Shadi About-Zahra. (2020, February 28th). *Website Accessibility Conformance Evaluation Methodology (WCAG-EM) 1.0. Web Accessibility Initiative*. https://www.w3.org/TR/WCAG-EM

Himayah, Himayah. (2013). Layanan dan Pelayanan Perpustakaan: Menjawab Tantangan Era Teknologi Informasi. *Khizanah Al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan* 1(1):1–6.

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182

Holder, Fiona. t.t. (2022, March 23rd). *WCAG Levels: Level A, AA, and AAA Compliance. My Accessible Website.* https://myaccessible.website/blog/wcaglevels/wcag-levels-a-aa-aaa-difference

Horton, S., dan Whitney Quesenbery. (2013). *A Web For Everyone: Designing Accessible User Experience*. Rosenfeld Media.

Husain, Rashid, dan Mehtab Alam Ansari. (2006). "From Card Catalogue to Web OPACs." *DESIDOC Bulletin of Information Technology* 26(2):41–47.

Kalbag, L. (2017). *Accessibility for Everyone*. A Book Apart.

Krug, Steve. (2013). *Don't Make Me Think*. In R. Chaerani (eds). Serambi Ilmu Semesta.

Kurniawan, Agung Widhi, dan Zarah Puspitaningtyas. (2016). *Metode Penelitian Kuantitatif*. Yogyakarta: Pandiva Buku.

Piliang, M. (2013). Sistem temu kembali informasi dengan mendayagunakan media katalog perpustakaan. *Iqra': Jurnal Perpustakaan dan Informasi*, *7*(02), 01-08.

Sims, Glenda. (2017, June 8th). *Understand WCAG 2.1: A History of WCAG.* Https://www.deque.com/blog/what-is-wcag-2-1-history

Solsman, Joan E. (2017, February 27th). In*ternet inventor: Make tech accessibility better already - CNET.* Https://www.cnet.com/news/internet-inventor-vint-cerf-accessibility-disability-deaf-hearing

Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Suyitno. (2018). *Metode Penelitian Kualitatif: Konsep, Prinsip, dan Operasionalnya*. In A. Tanzeh (eds). Akademia Pustaka.

Utami, Nadia Wasta. (2015). Gelap dalam Gemerlap: Gelapnya Akses Informasi Bagi Difabel dalam Gemerlap Era Digitalisasi. *CHANNEL Jurnal Komunikasi* 3(2):41–50.

Yayasan Mitra Netra. (2008, December 17th). *Pedoman Aksesibilitas Konten Web (WCAG) 2.0*. Https://mitranetra.or.id/wcag/#intro

DOI: https://doi.org/10.17509/edulib.v12i2.51377
p- ISSN 2089-6549 e- ISSN 2528-2182