Website Arrangement of the Library and Information Science Department, Faculty of Education, Universitas Negeri Jakarta

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ABSTRACT

The department website functions as a strategic medium in representing academic identity, providing institutional information, and supporting the tridharma services of higher education. This study aims to analyze the quality of the website of the Library and Information Science Department, Faculty of Education UNJ through a qualitative descriptive approach with structural observation methods, Nielsen heuristic evaluation, and accessibility audits using WAVE and Google Lighthouse. The results of the study show that the website has displayed the identity of the Department with a simple appearance, but the content is still limited and less interactive. In terms of usability, the main drawbacks are in navigation, typography consistency, and the absence of a dedicated error page. The WAVE audit found accessibility issues in aspects of WCAG 2.1, including 15 contrast errors, images without alt text, unordered headings, blank buttons, and inconsistent use of ARIA. Meanwhile, Google Lighthouse results show a low performance score (64) due to JavaScript load and large image size, although *the accessibility* (86), *SEO* (83), and *best practices* (100) aspects are relatively good. As such, major improvements need to be focused on technical optimization (image compression, lazy loading, HTML validation), accessibility improvements (contrast, alt text, keyboard navigation), as well as content development and navigation to make it richer, consistent, and user-friendly.

Keywords: academic website; usability; accessibility; heuristic evaluation; WCAG 2.1

1. Introduction

The Department website is a strategic digital media that represents academic identity, conveys institutional information, and provides services that support the activities of the tridharma of higher education. In the digital era that demands speed, openness of access, and ease of navigation, the arrangement of Department websites is very important. Especially for the Library and Information Science Department, Faculty of Education, State University of Jakarta (PSI FIP UNJ) which scientifically has a close relationship with information management, digital literacy, and the use of information technology.

According to Nielsen (1999), a good website must meet the principle *of usability*, which is easy to use, efficient, and fun for users. If the structure and content of the website are not arranged properly, it will hinder users in finding information and reduce trust in educational institutions. Matera, Rizzo, and Carughi (2006) added that the effectiveness of a website is not only determined by the aesthetics of the design, but also by the ease of interaction, speed of access, and availability of user-based information services. This is in line with the research of Firdaus, et al. in Artanto, et al. (2022). Websites as digital media have the ability to update information quickly and in real-time as an event develops (. In other words, the success of a Department website does not only depend on its appearance, but also on its ability to meet the academic needs of its users.

The Library and Information Science Department of FIP UNJ as an academic institution that focuses on information science should have a website that is able to represent scientific

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competence, digital literacy, and the use of information technology more strongly. However, preliminary observations show that the content and features available are still limited, navigation is less interactive, and accessibility issues are still found based on *the principles of the Web Content Accessibility Guidelines* (WCAG). This condition shows that there is a gap between the scientific identity of the Department and its digital representation.

Based on these conditions, this study aims to analyze the structure, content, and function of the website of the Library and Information Science Department FIP UNJ, as well as formulate recommendations for rearrangement to suit the principles *of usability*, *accessibility*, and user needs. This research is important because the results are expected to be able to produce a website development strategy that is more representative of the scientific identity of the Department, while strengthening the function of the website as a medium of academic services and scientific information.

The benefits of this research can be felt by various parties. For Departments, the results of this research can be the basis for strengthening academic image and competitiveness through the presentation of information that is more structured, consistent, and easily accessible. For students and prospective students, a more organized website will make it easier to obtain academic information, student activities, and self-development opportunities. For lecturers and education staff, websites can be a more systematic medium for publishing works, profiles, and tridharma activities. Meanwhile, for the wider community and partners, a representative website will provide a comprehensive overview of the contribution of Departments in the field of library and information science.

In contrast to previous research that emphasized more on *user interface evaluation*, *user experience*, or quality measurement with certain methods such as WebQual (Barnes & Vidgen, 2002), this study combines the heuristic evaluation approach and accessibility audit. Thus, this study offers a more comprehensive point of view, not only assessing the technical quality of the website, but also the extent to which the website is able to reflect academic identity and support the Department's information services optimally.

2. Research Methodology

This study uses a qualitative descriptive method that aims to analyze the structure, content, and function of the website of the Library and Information Science Department, Faculty of Education, State University of Jakarta (https://fip.unj.ac.id/s1psi/). The qualitative descriptive method was chosen because it was able to describe the phenomenon in depth and contextually, especially in assessing the usability and accessibility aspects of the website (Creswell & Poth, 2016). The research was conducted in order to compile recommendations for redesigning the website to suit the principles *of usability*, *accessibility*, and user needs.

2.1 Research Design

This study was designed as a single *case study*. Case studies are considered relevant because they allow researchers to conduct an in-depth exploration of the research object in a contextual and holistic manner (Yin, 2018). The main focus of the research is the evaluation of the navigation structure, the availability of academic information features and library services, and the quality of user experience).

2.2 Data Collection Techniques

Three main techniques were used in this study:

1. Direct Observation
   The researcher observed the appearance of the website interface, menu navigation, and content available on each page. Direct observation was chosen to obtain empirical data related to the

actual structure and functionality of the website (Anggito & Setiawan, 2018). The documentation process is carried out with screenshots and manual recording of the available menus and sub-menus.

1. Heuristic Evaluation
   The *usability* assessment is carried out using 10 heuristic principles of Jakob Nielsen (1994), namely *Visibility of System Status*, *Match Between the System and the Real World*, *User Control and Freedom*, *Consistency and Standards*, *Error Prevention Recognition Rather than Recall*, *Flexibility and Efficiency of Use*, *Aesthetic and Minimalist Design*, *Help Users Recognize*, *Diagnose, and Recover from* Errors, *Help and Errors. Documentation* .
   Heuristic evaluation is an effective evaluation method to systematically identify interface design problems without involving many users (Nielsen, 1994). The evaluation was carried out independently by the researcher using observation sheets and assessments on a scale of 1–5 for each principle.
1. Accessibility Audit
   To measure the extent to which the website meets the principles of digital accessibility, the researcher uses *the Web Content Accessibility Guidelines* (WCAG) 2.1 which includes four main principles, including *Perceivable* (information can be felt by the user), *Operable* (can be run by all devices), *Understandable* (easy to understand), *Robust* (compatible with current and future technologies). WCAG 2.0, developed by the World Wide Web Consortium (W3C) since 2008, is the main standard for web accessibility by providing a comprehensive framework to make digital content more accessible to people with disabilities (Shah, H. 2023). The audit was conducted using *digital tools* such as WAVE (*Web Accessibility Evaluation Tool*) and Google Lighthouse on the Chrome browser, as recommended by previous research.

2.3 Data Analysis Techniques

The analysis is carried out in a descriptive thematic manner, with the following steps:

1. Classify the results of the observation of the website structure
2. Assess each heuristic based on the evaluation sheet
3. Analyze accessibility audit results from *external* tools
4. Compile a table of findings, initial conclusions, and rearrangement recommendations

Thematic analysis approaches are used to identify patterns and themes that emerge from the data (Braun & Clarke, 2006). The analysis provides a more comprehensive understanding of the quality of website design and service

3. Results and Discussion

3.1 Research Results

The results of the study are presented based on three analysis approaches: structural observation of the website, evaluation of usability heuristic, and accessibility audit based on WCAG 2.1.

3.1.1 Website Structure and Availability of Information

Based on the results of observations, the website of the Library and Information Science Department, Faculty of Education, State University of Jakarta has displayed a simple interface with a dominance of green and blue colors according to the university's identity, and supported by informative icons that make it easier for visitors. The main menu navigation is quite clear with categories such as Profile, Academic, and Student Affairs, although it is still limited and can be improved with the addition of other menus such as publications, alumni, or the latest news. In terms of content, the website already provides basic information about registration, academic services, and campus life, but it is still fairly concise and does not display complete details such as curriculum, lecturer profiles, and research conducted. Website functionality is more informative without interactive features that support academic activities directly, and optimal social media integration has not been seen.

The readability of the text is quite good with clear color contrast, but the accessibility aspect for mobile devices and users with limitations still needs to be considered in order to reach more people. In terms of appearance, even though it is simple, the visual design of the website can be developed

more modern with a more dynamic and responsive layout arrangement, so that it can provide a better user experience. In addition, the provision of up-to-date information such as news on Department activities, student achievements, and academic agendas will make the website more lively and useful for students, lecturers, and the general public.

Figure 1 Web Display of the UNJ Library and Information Science Department

Overall, this website has fulfilled its basic function as an information medium and representation of the identity of the Department, but it still needs further development in terms of content completeness, interactivity, integration with other digital platforms, and improvement of design quality and accessibility. With improvements in these aspects, the Library and Information Science Department website can become a modern academic portal that is not only informative, but also interactive, inclusive, and relevant to the needs of the digital era.

3.1.2 Heuristic Evaluation Results

The evaluation of the *website usability* of the Library and Information Science Department, Faculty of Education UNJ was carried out using the 10 Heuristic Principles of Jakob Nielsen (1994). The assessment was carried out independently by the researcher through direct observation and a rating scale of 1–5 (1 = very poor, 5 = very good).

Table 1 Website Usability Evaluation Results

No	Heuristic Principle	Shoes (1-5)	Observation Results	Discussion & Arrangement Suggestions
1	*Visibility of System Status*	3	No indicator marking active pages.	It is necessary to add different highlights or colors to the active menu so that users know their position on the site.
2	*Match Between the System and the Real World*	4	The language used is in accordance with the academic context, the general terms are used.	That's fine, but the abbreviation needs to be explained so that it is easy for all users to understand.
3	*User Control and Freedom*	3	Navigation is available, but there are no breadcrumbs or "back to top" buttons".	Add quick navigation features like breadcrumb and "back to top" for user flexibility.
4	*Consistency and Standards*	4	The menu is quite consistent, but the typography is sometimes less uniform.	Match font sizes, colors, and layouts for a more consistent look.

5	*Error Prevention*	2	There is no clear mechanism if the link is broken (error 404).	Create a custom error page so that users don't get confused when an error occurs.
6	*Recognition Rather than Recall*	3	The menu dropdown helps, but the abbreviation "HR" is less clear.	Use full terms or add tooltips to make them easier to recognize.
7	*Flexibility and Efficiency of Use*	3	Standard navigation, limited search features.	Add advanced search features or content filters to improve efficiency.
8	*Aesthetic and Minimalist Design*	3	The homepage view is pretty dense with text and large images.	Summarize the text on the main page, using the "read more" option to make it more focused and concise.
9	*Help Users Recognize, Diagnose, and Recover from Errors*	2	There are no clear and user-friendly error messages yet.	Add informative error messages and solutions to guide users.
10	*Help and Documentation*	3	Contacts are available, but there is no help page or FAQ yet.	Create a dedicated help/FAQ page that can guide new students and general visitors alike..

3.1.3 Website Accessibility Audit

The accessibility audit was conducted to measure the extent to which the website of the Library and Information Science Department, Faculty of Education, State University of Jakarta meets *the Web Content Accessibility Guidelines* (WCAG) 2.1 standard. This audit used two digital devices, namely WAVE (*Web Accessibility Evaluation Tool*) https://wave.webaim.org and Google Lighthouse on the Chrome browser. Based on WCAG 2.1, there are four main principles that are referenced. First, perceivable, which is information must be able to be captured by the user's senses, either through text, visuals, or non-visual alternatives. Second, operable, which means that all the features and functions of the website can be run on various devices and ways of interacting. Third, understandable, i.e. content must be understandable by users through clear language, structure, and navigation. Fourth, robust, which underscores that content needs to be compatible with current and future technologies, including with various accessibility tools. Based on these principles, an accessibility evaluation can provide an idea of the extent to which a user-friendly website is being used by all users.

Table 2 Website Accessibility Audit Results

Principle WCAG 2.1	**Observation Results (WAVE)**	**Analysis & Structuring Suggestions**
Perceivable	- Text color contrast with background is inconsistent (15 contrast errors).- Alt text on some images is not available (1 linked image without alt).- Heading structures (H1, H2, H3) are not in order.	- Improve color contrast to make the text easy to read. - Add alt text to the entire image. - Use a heading hierarchy as per accessibility standards.
Operable	- Navigation is accessible via mouse, but it is not yet optimal for keyboard-only users (7 empty buttons). - The "skip to content" feature already exists, but it doesn't work optimally yet.	- Make sure the navigation is fully accessible with the keyboard.- Improve the function of the buttons and make sure all buttons have clear labels.- Optimize "skip to main content" to go directly to the main content.
Understandable	- The language is consistent, but there are abbreviations (e.g. "HR") that are not explained.- Text links are sometimes just the words "click here" without context.- There are redundant links (10 double links).	- Use simple and consistent language.- Add abbreviated explanations.- Make the link text more descriptive (e.g. "Download Academic Guidelines").- Reduce confusing double links.
Robust	- The website can be opened in modern browsers (Chrome, Firefox, Edge).- There are 27 ARIA elements, but some of them are not optimal.- The HTML structure is still not up to standard..	- Apply ARIA attributes appropriately to interactive elements.- Perform HTML5 validation for long-term compatibility.- Improve consistency in using ARIA roles and landmarks.

Based on the results of the evaluation with WAVE, the website still has some accessibility weaknesses. In the *Perceivable aspect*, 15 contrast errors were found, 1 image without *alt text*, and an unsequential heading structure. In the *Operable* aspect, there are 7 empty buttons and *the skip to*

content feature is not optimal. From the *Understandable side*, the language is quite consistent, but there are unexplained abbreviations, generic links like "click here", as well as 10 double links. In the *Robust aspect*, although it can be accessed in various browsers, there are still suboptimal ARIA elements and HTML structures that are not up to standard. Major improvements need to be focused on improving contrast, adding *alt text*, optimizing keyboard navigation, improving links, and validating ARIA and HTML.

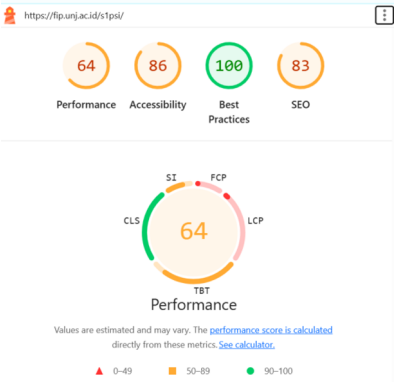

Figure 2 Google Lighthouse View

The results of Google Lighthouse's audit of the FIP UNJ Library and Information Science Department website provide an overview of four main aspects, namely *Performance, Accessibility, Best Practices,* and *SEO.* Each aspect shows a different level of quality and performance, so it can be used as a basis for determining improvement priorities. A summary of the audit results is shown in Table 3 below.

Table 3 Google Lighthouse Results

No	Assessment Aspects	Shoes	Key Findings	Initial Conclusion	Recommended Improvements
1	Performance	64	The initial load time (FCP, LCP) is slow, the TBT is quite high, but the CLS is stable.	The website's performance is adequate, but the speed is still low, which affects the user experience.	Optimize image size (use WebP/compression), reduce heavy JavaScript, use *lazy loading*, enable caching & CDN.
2	Accessibility	86	Color contrast is not optimal, there are elements without labels/alt text.	The website is quite accessible, but it's not completely user-friendly yet.	Add alt text to images, improve color contrast, make sure headings and labels are clear.
3	Best Practices	100	No issues related to security or development practices.	The website meets security standards and best practices.	Maintain safe and consistent development practices.
4	SEO	83	Meta description is not optimal, the heading structure is inconsistent, internal links are limited.	The website is quite search engine-friendly, but it is not yet optimal for search optimization.	Add unique meta descriptions, improve heading structures (H1–H2), optimize internal linking, make sure it's mobile-friendly.

Based on Table 1, it can be seen that the Best Practices aspect obtained a perfect score (100), indicating that the website is in accordance with security and development standards. The *Accessibility* (86) and SEO (83) aspects show quite good quality, although there is still room for improvement, especially in the alt text labels, color contrast, as well as meta description optimization and heading structure. Meanwhile, Performance received the lowest score (64), making it a top priority to improve through image optimization, heavy JavaScript reduction, and cache and CDN utilization.

3.1.4 Findings, initial conclusions and recommendations for restructuring

The analysis was carried out in a descriptive thematic manner by classifying the results of observations, assessing heuristic aspects, and combining audit results from *external tools* (WAVE and Lighthouse). The findings are then extracted into a table containing analysis aspects, main findings, initial conclusions, and recommendations for restructuring. This table aims to provide a comprehensive overview of the condition of the FIP UNJ Library and Information Science Department website as well as improvement steps that can be implemented.

Table 4 Findings, Initial Conclusions, and Realignment Recommendations

Analysis Aspect	Findings	Initial Conclusion	Realignment Recommendations
Structure & Content	A simple look with a clear identity, but the content is still limited and not yet interactive.	The website functions as a basic information medium, but it is less modern and dynamic.	Add a menu of publications, alumni, the latest news; integrate social media; Update content regularly.
***Usability* (heuristics)**	Navigation is less flexible, no breadcrumb/back to top, inconsistent typography, no dedicated error pages yet.	Usability is pretty good, but flexibility and consistency are low.	Add breadcrumb & back to top; equalize typography; create a custom error page; Add Advanced Search.
Aksesibilitas (WAVE)	15 contrast errors, images without alt, unordered headings, 7 blank buttons, redundant links, skip links are not optimal, ARIA is not consistent.	The website is accessible, but not yet disability-friendly and risks reducing inclusivity.	Improve color contrast; complete alt text; Head-to-head repairs; clearly label the buttons; optimize ARIA & skip links.
Performance (Lighthouse)	Score 64, slow load (FCP, LCP), JavaScript heavy, large images.	Low performance is a major obstacle to user experience.	Compress images (WebP), use lazy loading, reduce heavy scripts, enable cache & CDN.
Accessibility (Lighthouse)	Score 86, still have low contrast & unlabeled elements.	Accessibility is good enough, but not optimal.	Add alt text, improve contrast, keep the headings & labels clear.
SEO	Score of 83, less than optimal meta description, inconsistent heading structure, limited internal links.	The website is quite search engine friendly, but not yet optimal.	Add unique meta descriptions, fix headings, strengthen internal linking, optimize mobile displays.
Best Practices	Score 100, no security or development issues.	The website is in accordance with best practice standards.	Maintain security standards & development practices.

The table above shows that the structure and content aspects are still simple and need to be enriched to make them more dynamic. In terms of usability, improved navigation and typography consistency are needed. The results of the accessibility audit through WAVE showed a number of technical constraints that could potentially reduce inclusivity, such as low color contrast, blank buttons, and irregular heading structures. In terms of performance, a low Lighthouse score indicates the need for technical optimization such as image compression, *lazy loading*, and reduction of *heavy scripts* . While Lighthouse's accessibility score is relatively good, it still needs to improve the details on the labels and contrast. Meanwhile, the SEO aspect shows opportunities to increase visibility through meta descriptions, heading structures, and internal links. Finally, in the best practices category, the website has met security and development standards, so it needs to be maintained.

3.2 Discussion

The results of the analysis of the FIP UNJ Library and Information Science Department website show that in terms of structure and content, the website has displayed the identity of the Department with a simple appearance, but the content is still limited and has minimal interactivity. Nielsen (1994) emphasized that content quality and navigation structure are key factors in building trust and user experience. Therefore, the addition of interactive menus such as publications, breaking news, and social media integration is important to increase user engagement.

From the evaluation of the usability heuristic, weaknesses can be seen in the navigation aspect (absence *of breadcrumbs* or back *to top* buttons), typographic consistency, and the absence of special error pages. This is in line with Nielsen's heuristics that emphasize the importance of *visibility of system status* as well as *consistency and standards* to support an optimal user experience.

Accessibility audits with WAVE found problems related to the WCAG 2.1 standard, particularly in the aspects *of perceivable* (low color contrast, images without *alt text*, unordered headings), *operable* (blank buttons, skip links not yet optimal), and *understandable* (generic links and abbreviations without explanation). The principles of WCAG 2.1 (W3C, 2018) emphasize that web content must be perceiveable, operated, understood, and resilient, so these results show the need for improvements to make websites more inclusive.

Google Lighthouse's results reinforce these findings with a low performance score (64), mainly due to large image sizes and heavy JavaScript usage. Google (2021) emphasizes that page load speed has a direct effect on user experience as well as SEO ranking. The *accessibility* (86) and *SEO* (83) aspects are relatively good, although there is still room for improvement, while *the best practices* are up to standard with a perfect score (100).

Thus, website development priorities need to be directed towards improving speed and technical performance, accessibility for users with special needs, as well as adding richer content and more user-friendly navigation.

4. Conclusion

The website of the FIP UNJ Library and Information Science Department has functioned as an information medium, but the results of the analysis show that there are still weaknesses in the content structure, navigation, performance, and accessibility. Audits using WAVE found problems with color contrast, images without *alt text*, unordered heading structures, blank buttons, *redundant links*, and inconsistent use of ARIA, while Lighthouse highlighted low loading speeds despite optimal best practices. Therefore, the redesign needs to be focused on technical optimization (image compression, *lazy loading*, HTML5 validation), accessibility improvements (color contrast, *alt text*, keyboard navigation, ARIA), as well as more consistent content and navigation development, so that the website can become an inclusive, informative, and user-friendly academic media.

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