Assessment of the Museum Pendidikan Nasional website with System Usability Scale (SUS)

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Abstract. Museum Pendidikan Nasional (Musdiknas) is one of the icons of Universitas Pendidikan Indonesia. Musdiknas has received many visits from various groups who want to know the history of education development from the beginning to the present. Based on the results of the interviews, most of the visitors browsed the website first before coming directly to the Musdiknas. This shows that the influence of website accessibility can affect visits to the Musdiknas. Therefore, it is necessary to study how visitors evaluate the Musdiknas's website so that managers can develop the Musdiknas website so that it has maximum use value. The method used is a survey with data analysis techniques using the System Usability Scale (SUS). The study results show that the Musdiknas website is in a good category. However, there are still things that need to be improved on several aspects that can improve the visitor experience when visiting the website. Based on the research that has been done, it can be concluded that Musdiknas's website has use value in the good category and can meet visitors' information needs.

Keywords: Museum Pendidikan Nasional, SUS, System Usability Scale, Museums Website.

1   Introduction

Access to information is easier to obtain in today's digital era. Some things are affected by the development of information technology, including information provider institutions such as museums. The museum is one of the information centers whose existence is essential as a learning medium. Museums can be a source of learning where students or the public can obtain sources of knowledge. On the other hand, museums can also function as learning media for teachers, teachers, or curators to provide information to their users so that the learning process can become more active and interactive [1]. The museum's functions also include collecting, nursing, presenting, and preserving cultural heritage for learning, research, and entertainment or recreational purposes [2].

Museums have a role in managing collections and information belonging to their collections to be distributed as knowledge or learning and research materials. Museums are synonymous with the period of antique objects or from the past. These collections

have the necessary knowledge content as a reference source for developing new information. In the digital and technological era, the relevance of museums as a source of information is a concern because, at this time, information can be easily found and accessed anywhere and anytime without having to visit the museum in person. The development of digital technology creates the existence of media art and popular culture, which influences the presence of traditional art, including museums which makes it necessary to develop the functions of collecting, presenting, exploring, contemplating, and grouping digital cultural elements, especially in this case in museums [3].

Museums need to carry out innovations and developments in connection with the digital era. Museums will not be left behind by the times if museums can integrate with technology. One example is implementing the delivery of information about museums online through digital media, including the website. Website is a digital page capable of containing information in the form of images, sounds, and videos that can be accessed using the internet [4]. The richness of the types of media that somebody can load on a website is an additional point as a conveyer of information through digital media that is easy to access. According to Laws in his book entitled Museums, Websites, and Social Media, the use of websites at museums includes conveying educational information, also relating to museum conservation and marketing, as well as information regarding opening hours, tours, locations, and exhibitions to provide unique learning resources for its users [5]. Museums can utilize the website to display various information in the museum digitally so that people do not always have to come to the museum to see the museum's collections. The website can also be a means of disseminating information about the activities carried out by the museum to attract more types of customers. The shift towards digital museums has the potential to enable museums to reach a wider variety of users, including people who have never visited museums or non-traditional visitors (digital visitors) [6]. One of the museum's goals is to provide the broadest possible range of information to the general public. To achieve this goal, the museum needs to promote the museum, one of which can be done through the website.

Users can find information in various media and digital platforms, one of which is through the website. However, at this time, not many museums utilize websites to convey information related to museums and promotional media. This phenomenon causes more official information about the museum from second parties, such as city government websites or third parties from various authors' websites or personal blogs. The following data summarizes 21 museums in Bandung City from Detik Jabar [7] and the author's observations.

Table 1. Museum website in Bandung City.

Number	Museum	Website
1	Gedung Indonesia Menggugat	Not available
2	Hall of Fame Jawa Barat - Panggung Inohong	Not available
3	Museum 3D	Not available

Number	Museum	Website
4	Museum Barli	Not available
5	Museum Bio Farma	Not available
6	Museum Bumi Pakarang Susuhunan	Not available
7	Museum Gedung Sate	Not available
8	Museum Geologi Bandung	https://museum.geologi.esdm.go.id/
9	Museum Kebudayaan Tionghoa	Not available
10	Museum Konferensi Asia Afrika	https://www.asiafricamuseum.org/
11	Museum Kota Bandung	Not available
12	Museum Lapas Banceuy	Not available
13	Museum Mainan 198	Not available
14	Museum Mandala Wangsit Siliwangi	Not available
15	Museum Nike Ardila	Not available
16	Museum Pendidikan Nasional	https://museumpendidikannasional.upi.edu/
17	Museum Perjuangan Rakyat Jawa Barat	Not available
18	Museum Pos Indonesia	Not available
19	Museum Preanger	Not available
20	Museum Sri Baduga	Not available
21	Museum Virajati Sesko AD	Not available

Based on the data from the table above, it can be seen that museums rarely use websites. Only 3 out of 21 museums in Bandung City use the website, although information for the rest can still be found online from second or third parties. Some museums use other media to promote and disseminate information such as social media. However, each platform has its advantages. The website itself is considered to have benefits, including facilitating unlimited access to information as long as it is connected to the internet, built with a platform-independent design, the website can be easily accessed on various browsers such as Internet Explorer, Mozilla Firefox, Google Chrome, and others, the website also hyperlinks or can be connected to other websites with each other so that they can be connected quickly with additional information that is being searched for [8].

There is research that shows how the condition of the websites of several museums in the city of Bandung. One of the results of his study describes the view of one of the museum heads interviewed regarding the urgency of having a museum website, especially for the Musdiknas itself. Ideally, a museum website should be able to fulfill promotional elements because one of the existence of this website is to support the museum in conducting promotions [9]. This result was also reinforced by the interviews conducted with several Musdiknas visitors who stated that they visited the Musdiknas website before deciding to visit the Musdiknas in person. Based on this, it can be noted

that website accessibility affects visitors' decisions to visit the museum directly, so good website management needs to be a concern. However, there are constraints in terms of resources to support focused website management. Other research also states that although the existence of a museum is believed to be a practical step for promotion, in reality, the competence of human resources has not been fully able to manage the museum website optimally coupled with the availability of supporting facilities that have not endorsed developing the museum website itself [10].

It should be noted that the information available on the website does not appear by itself. The internet can provide and contain a variety of information. However, the availability of this information depends on someone's contribution so that they can manage and fill in the content. In this case, in developing a website for a museum, it is also necessary to create content relevant to the information on its website. Developing website content requires skills and collaboration from various disciplines to make the information presented more compelling and diverse [11]. Museum Pendidikan Nasional (Musdiknas) provides much information to learn, add new knowledge, or become a user reference source. Currently, Musdiknas has various collections displayed in the museum window, but not all collections have complete and clear information because it takes much space to store this information. A curator usually handles that information, but this can't be done if visitors don't visit in person. In this case, Musdiknas utilizes the website so that its existence can be more existent and easy to find on the internet. Visitors can visit the Musdiknas website at the link https://museumpendidikannasional.upi.edu/ dan https://museumdiknas.id/.

Based on observation results, the two official websites owned by Musdiknas have their respective roles. The first website with the link https://museumdiknasional.upi.edu/ focuses on information about museums in general, the latest news, and photos of activities carried out at the museum. The second website, namely https://museumdiknas.id/ more focused on other supporting feature services. Musdiknas use this feature to improve the visitor experience so that it is more diverse by utilizing a virtual tour using a 360° camera. In addition, on this second website, there are also facilities for making reservations for individuals and groups. The existence of the two websites is to share the server load and solve the problem of limited features on the website with the campus domain as the institution that oversees the Musdiknas. Musdiknas website on the link https://museumpendidikannasional.upi.edu/ is the first website published by Musdiknas. This website is in the same domain as Universitas Pendidikan Indonesia, which oversees the Musdiknas in museum activities. Compared with the second website on the link https://museumdiknas.id/, the information on the first website is complete if the information content required by visitors is information related to museum identity such as opening hours, ticket prices, available facilities, location access, activities, and collection information in general.

The usability factor is something that needs to be considered by the Musdiknas website so that the website can be utilized optimally. Website managers need to consider the perceptions of museum visitors so that the website, both in terms of appearance, available features, and the content displayed, can match what visitors expect. Apart from being interactive and informative, museums must also not forget the usability factor of the website. Website visuals must be attractive and according to user

needs [12]. The website must also be easy to access, even with an extensive and varied menu. In this case, Musdiknas has the opportunity to develop a website to maximize its utilization to establish museums in digital form.

This usability factor is one of the keys to the success of a website because this factor affects one's learning experience [13]. The reason is that if a person's learning experience is not good, the information presented will not be very effective and can even be in vain. Usability consists of several factors: usability, efficiency, effectiveness, satisfaction, learning ability, and accessibility [14]. Ideally, these factors will affect the quality of the usability of a website. Before developing the Musdiknas website, it must be evaluated so that in further action, in terms of appearance, features, and content, it can match visitors' needs to obtain maximum use value.

Based on the explanation in the introduction section, this research focuses on visitors' perceptions of the Musdiknas website. Currently, Musdiknas already has two separate websites with different information presented. The focus of this research is on the first website, namely https://museumpendidikannasional.upi.edu/. This is determined by considering the type of content available on the first website, which is more directed to the museum's identity in general because most of this information is sought after by visitors who will visit the museum. Website development must be done to maximize the website's potential and obtain maximum use value. The results of this research can be the basis for the museum to improve the Musdiknas website in terms of appearance, features, and content of the Musdiknas website so that it is expected to attract more visitors to come to the museum directly after exploring information about the museum through the website.

2   Method

This study uses a quantitative approach. This approach was chosen so that the results obtained can be generalized and carried out in other similar studies [15], especially research on the usability of websites. The survey method uses data processing techniques using the System Usability Scale (SUS). SUS is described as a scale with a range of 1-10, like the Likert scale, which provides a subjective overall assessment of the usefulness of a system [16].

By using SUS, users of a particular system can provide an assessment by looking at its usefulness. SUS is generally used by respondents who have the opportunity to use the system to be evaluated before debriefing on the use of the system [16]. Evaluation results using SUS will be more accurate if it is done for users who are accessing the system for the first time to create a first impression [17].

This study uses SUS with the following considerations (1) Providing a point estimate measure of usability and customer satisfaction, (2) Comparing different tasks within the same interface, (3) Comparing iterative versions of the same system, (4) Comparing competing implementations of a system, (5) Competitive assessment of comparable user interfaces, (6) Comparing different interface technologies [18]. SUS is expected to obtain assessment results that can describe the long-term cycle in system

development and communicate comparisons between trends and system usage for users.

SUS is used in studies that focus on evaluating information systems in the form of websites, platforms, or specific applications from the user's point of view and assessing the usability of the system [14]. In addition, other studies have conducted systematic reviews related to the application of SUS in evaluating technology in education, which illustrates how trends use SUS in evaluating a platform [13]. To see how SUS describes the score obtained by the system, it can be interpreted through the following figure:
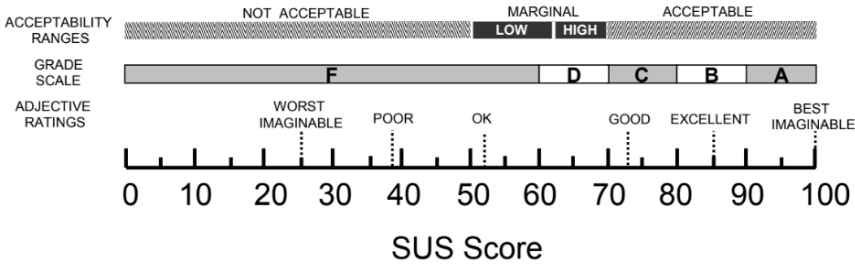

Fig. 1. A comparison of the adjective ratings, acceptability scores, and school grading scales in relation to the average SUS score [19]

The target respondents of this study were students of the Universitas Pendidikan Indonesia who had accessed the Musdiknas website on the link https://museumpendidikannasional.upi.edu/ taken by convenience sampling technique with 176 respondents. The respondents were chosen because they were located spatially and administratively near the location where the researcher collected data [20], and the respondents had also accessed the Musdiknas website. The results of this research data can be the basis for assessing the quality of websites using SUS.

3   Result and Discussion

3.1   Result

This study aimed to determine how visitors perceive the Musdiknas website using the System Usability Scale (SUS) research questionnaire. This research was conducted by distributing research instruments to visitors from the Universitas Pendidikan Indonesia. Based on the research results, 176 respondents can be described as follows:

Table 2. Respondent description based on gender.

Respondent Characteristic	Total	Percentage
Male	32	18,18 %
Female	144	81,82 %
Total	**176**	**100 %**

Table 3. Respondent description based on class.

Respondent Characteristic	Total	Percentage
Class of 2018	14	7,95 %
Class of 2019	68	38,64 %
Class of 2020	27	15,34 %
Class of 2021	35	19,89 %
Class of 2022	32	18,18 %
Total	**176**	**100 %**

Based on Tables 2 and 3 above, it can be seen that the majority of respondents were women, totaling 144 people, with a percentage of 81.82%, and 32 other people, or 18.18% were men. In addition, this study's respondents were university students from class 2018 to 2022. The majority of respondents were class 2019, with a percentage of 38.64% and totaling 68 people out of the total number of respondents. Then the class of 2021 has 35 people, the class of 2022 has 32 people, and the class of 2020 has 27 people. Meanwhile, 14 respondents were in the class of 2018, or 7.95% of the total respondents. From this description, it can be illustrated that this study involved a variety of respondents.

Musdiknas website can be accessed via the link https://museumpendidikannasional.upi.edu/. The information displayed on the Musdiknas website is a general description of the museum, such as activities being carried out, conditions for visitors, current minutes, museum activities, description of the number of collections, presentation of museum facilities, ratings, hyperlinks to museum social media, and footnotes containing addresses and emails museum. Overall, the Musdiknas website has provided a complete overview on their website. The hyperlinks on the Musdiknas website are also directed to active links that can be directly connected to Musdiknas social media, including Facebook, Twitter, Youtube, and Instagram.
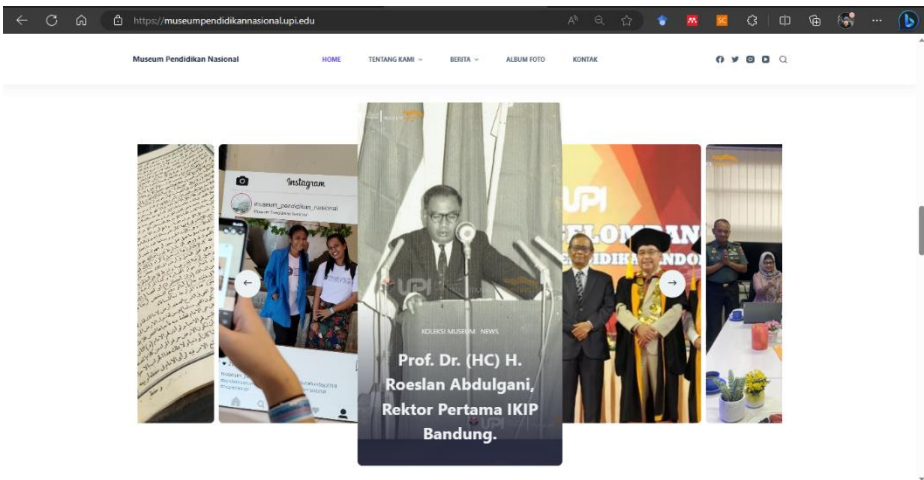
Fig. 2. Musdiknas Website Hompage

Fig. 3. Musdiknas News on Website

This study's results focus on discussing visitor perceptions of the Musdiknas website. The method used for this research is to use the System Usability Scale (SUS) score. Based on the results of data processing carried out, the results of the score assessment are obtained as follows:

Table 4. SUS Score Results.

SUS Score Results	
Average Score	26,61
Multiplier	2,5
SUS Score	66,53

Based on the calculation results above, it can be seen that the System Usability Scale (SUS) score owned by the Musdiknas website is 66.53, which is in the Marginal High Acceptance category. Products with a SUS score of less than 70 should be considered products that need continuous improvement and monitoring [18]. In this study, the Musdiknas website, which is in the Marginal High category, can be interpreted as having an upper middle value and is still acceptable, but with a note that it needs improvement and supervision, also continuous improvement so that a maximum score can be obtained for the website.

In addition, in this study, the SUS website Musdiknas score, which reached 66.53, was also in the OK adjective rating category. The SUS score assessment, within this midpoint, indicates that the product is declared acceptable [19]. The acceptance of this product is intended so that the estimated point of use and user satisfaction with the Musdiknas website has reached a good level. However, continuous improvement and improvement are still needed for future steps.

The SUS score is also relied upon to express the context of effectiveness, efficiency, and user satisfaction with the Musdiknas website. Through an adequate test score as a basis for comparison, the data becomes a strong result to state that the website interface provided is sufficiently usable at this time [18], [19]. Therefore, from the results of this assessment, Musdiknas managers, especially those responsible for website management, are expected to be able to maintain the appearance of the website and existing information but not rule out the possibility of continuing to develop it so that it can still meet user satisfaction and have maximum use value. The Musdiknas website is said to be one of the accesses used by museum visitors before they visit the museum in person.

3.2   Discussion

The development of information technology is one of the main reasons for the formation of museums that can be accessed online or virtually through websites. In recent years, the concept of a museum that can be accessed online has become an exciting topic and a new way for visitors to access information related to museum collections [21]. Websites or the world wide web that provide offers are one of the accesses to presenting museum information that can be used only by utilizing the internet [22], so the creation of a museum website is also a matter of concern to the management of Musdiknas to remain adaptable to the times and make it easier for visitors to access information related to the museum.

The existence of a website for museums, including for Musdiknas, is undoubtedly a good opportunity to expand its reach to attract visits. Therefore, to keep pace with the

times, the existence of this museum website is one of the crucial things that need to be considered. Using the internet and websites is one the potentials to strengthen the attractiveness of museums so that they can be more universally accessible and strengthen the visitor experience in getting to know museums, including looking back at existing museum collections [23]. In this regard, visitors are an essential aspect that can provide an assessment of the development of the museum, including the development of the museum's website itself.

Visitor perceptions of the Musdiknas website provide information regarding the point of view held by each visitor. This point of view can be a recommendation for the Musdiknas to maintain its website performance and to continue developing in a better direction. In addition, through this website, museums can increase user access to their collections [24]. So that there is a reciprocal relationship between museums and visitors in the procurement of this website. Museums can expand the reach of visitors, and on the other hand, visitors can also access information about the museum through the website. In addition, in displaying its collections, museums must be open regardless of who and for what purpose visitors come to the museum so that museums must always be ready to exhibit all kinds of collections that will be exhibited [25].

Museum managers must also evaluate service quality by referring to visitor service experiences [26]. This visitor experience can also be seen in the website service, which is even one of the first steps accessed by visitors to find out about the services and collections in the museum. In addition, visitors often pay attention to the website's physical appearance because the management of services and the completeness of the information on the website can be a further aspect for them to continue to access the museum website [27]. In general, the information contained on the Musdiknas website is quite good. However, improvements must be made to obtain a maximum score, especially regarding appearance and content.

Evaluating the museum website based on visitor perceptions is critical to determine how far the museum provides use value to visitors through the information it conveys. When providing services to visitors, museums need to be able to pay attention to visitor expectations. These expectations must be met to increase interest in visits and become the basis for the museum to plan future programs [28].

Based on the results of the research above, it can be seen that visitors' perceptions of the Musdiknas website show pretty good results in terms of the SUS score obtained. The SUS score illustrates that the Musdiknas website has good use value but requires improvement to get maximum use value. This assessment was obtained with the hope that the Musdiknas website could be further developed regarding appearance, features, and knowledge-based information. One of the most frequently mentioned in the data obtained is the need for convenience to access information about entrance tickets.

Suppose visitors to the Musdiknas website can easily accommodate visitors to get information about entrance tickets and can even order tickets online through the website. This certainly can make it easier for visitors to make reservations for both personal and group orders. In addition, it benefits visitors in accessing information and can make it easier for museum managers to report entry ticket sales and the number of visitors [29].

Based on the results obtained in the research, several things can be noted for Musdiknas so that they can improve their services through the website. Most respondents stated that they had no problems accessing the Musdiknas website, but some features are still expected to be improved and developed. Some of these features include the need for a menu or information that can directly direct visitors to find information related to tickets on the main page of the Musdiknas website. In addition, on the appearance of the Musdiknas website, which is accessed via desktop, there are still features whose information needs to be completed, such as the Trending Now feature, where several menu options still use templates.
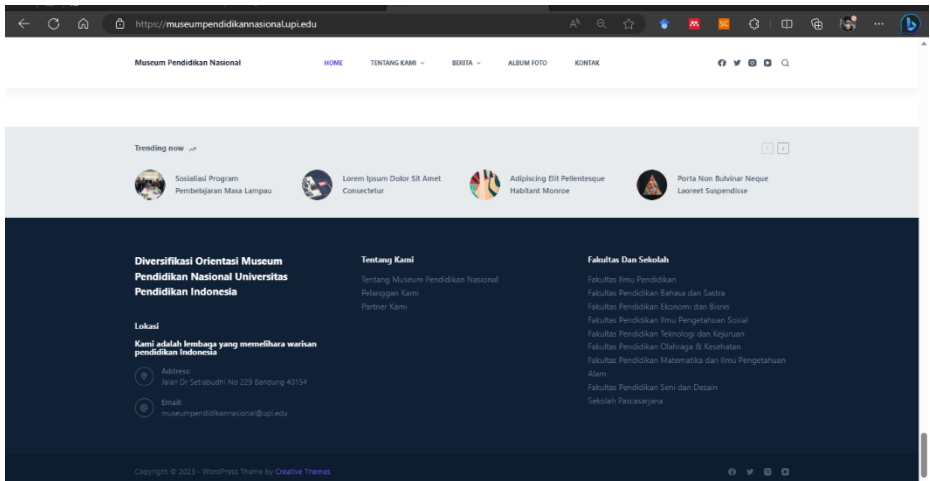
Fig. 4. Display the Trending Now section on Musdiknas Website.

The display in the Photo Album section on the Musdiknas website, especially for the Image Documentation section, is expected to be enlarged for desktop and mobile access. This is necessary in the hope that visitors can see the pictures on the Musdiknas website more clearly.
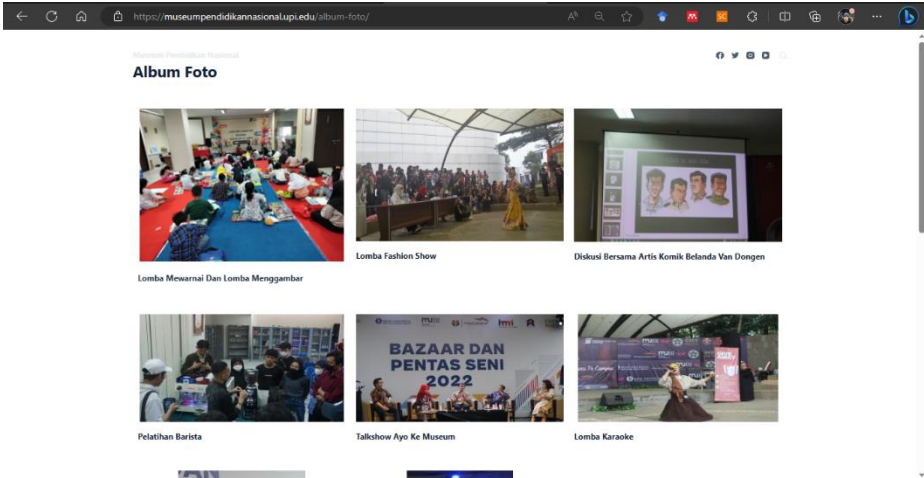
Fig. 5. Display of the Photo Album section on Musdiknas Website

Besides, as seen in **Fig. 5.** above on the current desktop display, the category menu taskbar options on the Musdiknas website have not yet appeared. The search feature on the Musdiknas website is not visible. So that makes it difficult for some visitors to access it. The Musdiknas website can not only be accessed on a desktop but can also be accessed on a mobile phone. The appearance of the Musdiknas website, which is accessed by mobile, can be seen in **Fig. 6.** below:
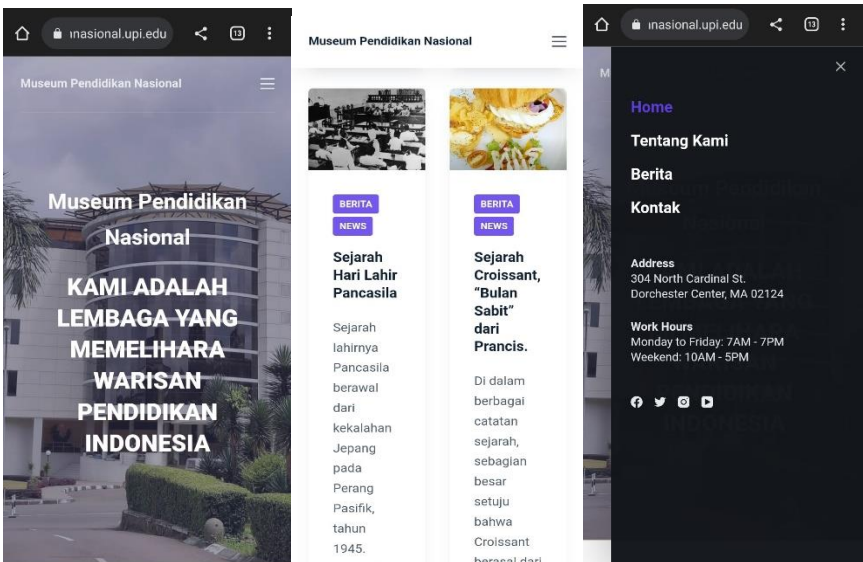
Fig. 6. Mobile Display on Musdiknas Website

The Musdiknas website's mobile appearance also has several notes that need attention. Among them is that the choice of categories in Photo Albums has not been listed on the menu section like the appearance of the Musdiknas website on the desktop. It is hoped that the appearance of news articles displayed on the Musdiknas website, which can be accessed by mobile, can be more responsive so that visitors can get a better experience accessing the service.

Based on the results of this study, the Musdiknas website is directed to develop based on the perception and level of visitor satisfaction. The level of visitor satisfaction can be designed based on an overall evaluation of task-specific, aesthetic, and other features found on the Musdiknas website [30]. The Musdiknas website can still be redeveloped by adding other interactive media such as videos, animations, or online museum tours already used by several prominent museums and can be done via the website. With the recommendations for developing the Musdiknas website, it is hoped that visitors to the Musdiknas website will be encouraged to visit the museum in person.

4   Conclusion

Based on the research that has been done, it can be concluded that the existence of the Musdiknas website has good usability value to meet visitors' information needs regarding museum information. Based on the results of interviews with several visitors, most visitors will first visit the Musdiknas website before making an in-person visit. This shows that the influence of website accessibility can affect visits to Musdiknas. The study results show that the Musdiknas website is already in a good category based on the SUS score, but it needs to be improved so that the SUS score obtained also increases and has maximum use value. Several development suggestions include adding a menu to enhance the visitor experience when visiting the Musdiknas website. Recommendations for further research are expected to be able to analyze in more detail by paying attention to every aspect of the SUS to obtain maximum information for the development of the museum website, especially for the future Musdiknas.

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