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Accessibility to E-Commerce Websites for People with Disability in Indonesia

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ABSTRACT

Using a website has become a primary method for delivering information, doing promotion, and marketing activities. E-commerce business people acknowledged the importance of developing a reliable website to reach the market through the internet, as part of e-service, especially in a country with a large market share like Indonesia. Unfortunately, not every e-commerce web designer is aware of the website accessibility criteria, the lack of awareness creates barriers for persons with disabilities to access e-commerce websites, as buyers and sellers. The accessibility gap of those website limits the ability of persons with disabilities to optimize the presence of e-commerce as an economic opportunity. We need to overcome the barriers to create an inclusive society in Indonesia. This paper aims to provide an overview of the accessibility of e-commerce websites in Indonesia, to find the common web accessibility issues, classified them comparatively into several tiers, type of issues, and then calculates the correlation of total issues with the number of visitors. This study analyzes 39 e-commerce websites. We evaluate based on Web Content Accessibility Guidelines (WCAG) 2.0, using an automated tool called "aXe". The study shows evidence of various accessibility issues of e-commerce websites in Indonesia, emphasizing the necessity of web designers to pay more attention to accessibility for users with disabilities. This study also provides several recommendations to website accessibility as part of e-service quality.

Keywords: e-commerce; website accessibility; e-service quality; evaluation tool; users with disabilities.

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INTRODUCTION

The development of communication technology allows us to disseminate information using digital media easily. The rapid use and development of the internet should allow the society to have an increased well-being, specifically related provision and delivery of information (Darmaputra et al., 2017). Endless technological advancement and digital transformation, also continuously change the society in doing work, communicating, playing, and doing everyday life (Groff, 2013).

It is very common for any government institution, private sectors, and NGOs to disseminate information and engage with their public using websites. Unfortunately, some website developers tend to neglect web accessibility, limiting the public to access the websites easily. The accessibility issues are often due to developers overlooking the standard and guidelines of website accessibility. Web accessibility is a critical aspect that would determine the quality of a website (Hamid et al., 2020).

Accessibility is often associated with the interests of people with disability, even though accessibility to seek information on digital media is not only beneficial for people with disabilities, but the interest of the wider public also need to be addressed. Seeking information via online media has become the new norm for every one (Arief et al., 2020). On the other hand, websites are the most popular internet services compared to other platforms (Prasetio et al., 2016). Websites that can be easily accessed is very important for people in their effort to gain information (Mathew Martin & Rabindranath, 2017).

One of the most important needs from the public is to access information related to products and services offered comfortably (Hussain et al., 2016). The comfort of seeking and obtaining information would naturally increase the number of visitors, conversely. Difficulties in accessing the website would negatively affect website visitors to return for more information.

Furthermore, in the context of the Covid-19 pandemic, one of the impacts is that the number of unemployed in Indonesia has increased during the pandemic, and has almost reached 10 million (Egeham, 2021). The pandemic also has an impact on the economic aspects of people with disabilities because many of them have also lost their jobs (Ministry of Social, 2021). The Minister of Labor of the Republic of Indonesia reveals that there are 247,000 people with disabilities who are unemployed in Indonesia (Situmorang, 2021). Therefore, the government is also trying to optimize economic growth through MSMEs, including MSMEs managed by persons with disabilities.

Table 1. E-commerce Website in Indonesia and the Number of Visitors

No	Name	URL's	Monthly Visitor
1	Tokopedia	https://www.tokopedia.com/	135,076,700
2	Shopee	https://shopee.co.id/	127,400,000
3	Bukalapak	https://www.bukalapak.com/	34,170,000
4	Lazada	https://www.lazada.co.id/	30,516,700
5	Blibli	https://www.blibli.co.id/	19,590,000
6	Bhinneka	https://www.bhinneka.com/	6,726,700
7	Orami	https://www.orami.co.id/	5,343,300
8	Ralali	https://m.ralali.com/	4,476,700
9	JD ID	https://www.jd.id	4,063,300
10	Zalora	https://www.zalora.co.id/	2,860,000
11	Sociolla	https://www.sociolla.com	2,836,700
12	Alfacart	https://www.alfacart.com	1,309,200
13	Jakarta Notebook	https://www.jakartanotebook.com	1,112,100
14	Fabelio	https://fabelio.com/	1,001,900
15	Jakmall	https://www.jakmall.com/	936,000
16	Matahari	https://www.matahari.com/	831,000
17	Elevenia	https://www.elevenia.co.id/	577,000
18	Jam Tangan	https://www.jamtangan.com	439,000
19	Otten Coffee	https://ottencoffee.co.id/	422,000
20	Laku6	https://www.laku6.com/	338,000
21	IStyle	https://www.istyle.id/	332,000
22	Mapemall	https://www.mapclub.com/	304,000
23	Sephora	https://www.sephora.co.id/	300,000
24	Orori	https://www.orori.com/	266,000
25	My Hartono	https://myhartono.com/en/	198,000
26	Favo by Asmaraku	https://favo.id/	192,000
27	PlazaKamera	https://www.plazakamera.com/	189,000
28	Mothercare	https://www.mothercare.co.id/	158,000
29	Bobobobo	https://www.bobobobo.com/id/	113,000
30	Pemmz	https://pemmz.com/	112,000
31	Dinomarket	https://www.dinomarket.com/	102,000
32	Berrybenka	https://berrybenka.com/	97,000
33	Hijup	https://www.hijup.com/en	92,000
34	Bro.do	https://bro.do/	86,000
35	Electronic City	https://eci.id/	83,000
36	Qoo10	https://www.qoo10.co.id/	53,000
37	Tees	https://tees.co.id/	32,000
38	Sorabel	https://www.sorabel.com/	29,000
39	Hijabenka	https://hijabenka.com/	19,000

Source: iPrice (2021)

In fact, the sectors most affected by the Covid-19 pandemic are micro, small, and medium enterprises (MSMEs), especially MSMEs owned by persons with disabilities (PWD). It happens because they have accessibility constraints in

conducting product marketing through digital platforms such as e-commerce, whereas there are not a few potential MSME actors with disabilities (Saputra, 2021). This fact emphasizes that it is necessary for developers of digital platforms such as e-commerce websites to pay attention to the accessibility aspect.

There are several e-commerce operating in Indonesia. As a country with a population density of 141 inhabitants per km2, and the population reaching 270.20 million people (Badan Pusat Statistik, 2021). Indonesia is a country with a market share that is potential for e-commerce businesses. The present study tried to find a list of all e-commerce operating in the territory of Indonesia, as well as reviewing the number of visitors. The following table displays all e-commerce website with numbers of visitors based on the database from iPrice (iPrice, 2021).

According to the Table 1, we identify 14 e-commerce websites with visitors above one million, 17 websites with a number of visitors between 100,000 and one million, followed by eight websites with visitors less than 100,000. The numbers shown in the table indicate a relatively high interest of the Indonesian public towards e-commerce, allowing the business to flourish. This situation should spark the awareness from the business community in paying attention to the aspect of accessibility of information as part of e-service quality.

Regarding the accessibility of e-commerce websites, there is still a dearth of accessibility research in the field of e-commerce which has now become a new business model, especially in Indonesia. There were previous studies evaluating the accessibility of university websites (Acosta-Vargas, Acosta, et al., 2018a), and hospital website (Acosta-Vargas, Acosta, et al., 2018b). One previous study has also evaluated the accessibility of e-commerce websites in Saudi Arabia (Alshamari, 2016). To the best of our knowledge, no study so far has comprehensively evaluated the accessibility of e-commerce websites in Indonesia, one of the countries that have a large market share as a target for e-commerce companies. To fill this gap, this study aims to evaluate and provide information on the accessibility of e-commerce websites operating in Indonesia.

It is important to evaluate the accessibility of e-commerce websites in Indonesia, allowing an increase in web performance and ease of access for the visitors. Improvements in web performance and accessibility will indirectly support local businesses in Indonesia, allowing the wheels of economy to move more rapidly. This study will be able to provide more detailed information on the information accessibility of websites to be used as reference for web developers and business practitioners, as we highlight the importance of acknowledging the web content accessibility guidelines and other standards in web development. Among several website accessibility tool and standard, the Web Content Accessibility Guidelines (WCAG 2.0) and aXe DevTools was applied as a tool and evaluation standard for the current study.

Several guidelines and tools used to evaluate the level of accessibility of a

website. Web Content Accessibility Guidelines (WCAG) is guidelines created to make it easier for website developers to provide accessible information for people with various abilities. Initially, people were introduced with WCAG 1.0, which contains 65 checklists and three priority levels. These guidelines were later updated to WCAG 2.0, which consists of four main guidelines and equipped with success rate criteria to evaluate website accessibility (Darmaputra et al., 2017). Although WCAG 2.0 is already implemented and has been used as the basis of most regulations and policies, this guideline still has limitations (Vigo et al., 2013). Nevertheless, WCAG 2.0, serves its purpose as reference for various accessibility evaluation tools to be more focused on several criteria.

The main objective of this research is the evaluation of e-commerce websites in Indonesia in terms of accessibility. This study is based on the principle that measurement is the basic thing in improving something (Ismail & Kuppusamy, 2018). The measurement of website accessibility is presented in this paper. The research objectives of this study are: To find the status of e-commerce websites in terms of accessibility by using accessibility evaluation tools, to classify this e-commerce website into three categories based on the level of suitability for accessibility, to find common web accessibility issues among e-commerce websites, and to calculate the correlation between the number of issues and the number of visitors.

Accessibility evaluation can use several standards as a reference. Other studies have done this using the Stanca Act, WCAG 1.0, WCAG 2.0 (Acosta-Vargas, Acosta, et al., 2018b; Akgul, 2017; Gambino et al., 2016), and research that compares two standards (Ismail et al., 2018b; Li et al., 2012). This study employs the accessibility evaluation method, using WCAG 2.0. WCAG 2.0 was selected since this guideline has undergone improvements and development indicators from the previous guideline, WCAG 1.0. The World Wide Web Consortium (W3C) formulated WCAG 2.0 as a universal standard that can be adopted for developing websites that have good accessibility (Ismail & Kuppusamy, 2018; Olalere & Lazar, 2011). The selection of the tested websites used a total sampling of all e-commerce websites listed in Table 1.

Several evaluation tools can assist a study in identifying barriers to website accessibility. Each evaluation tool has a different range of guidelines in terms of quantity and accuracy (Vigo et al., 2007). There is research that evaluates using one tool (Arini, 2020), two tools (Kumari & Verma., 2020), and to using six tools at once (Ismail et al., 2018a). This study uses one evaluation tool to examine forty e-commerce websites. The evaluation tool used in this study is "aXe" from Deque because aXe has the lowest incorrectness scores compared to other tools (Vigo et al., 2013). The inspection results display: Need review, Critical, Serious, Moderate,

and Minor.

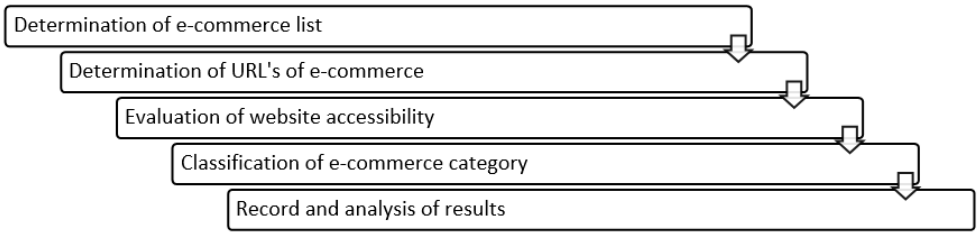

Figure 1. The Stages of Study

Source: Research Result (2021)

The research stages are started by compiling a list of e-commerce websites operating in Indonesia, referring to a reliable web resource. After the list was compiled, each websites' URL was checked by an evaluation tool. The study follows the aforementioned stage by deciding on the evaluation tools, followed by evaluating the websites' accessibility on two different times with two different human operators to avoid errors and to verify data validity for further analysis. By visiting the website one by one, the evaluation carried out with aXe DevTools is able to show the impact categories of accessibility issues, types of accessibility issues, and even the impact of each accessibility issue on people with certain disabilities. The types of issues that appear on each website are then recapitulated, and the frequency of occurrence of these types of issues is obtained. The next step is to classify. Based on certain parameters, E-commerce websites classifications are divided into three different levels. Next, each website is reviewed based on the e-commerce category and the level it gets. This study also seeks to map the issues that often appear in the examination. The last step of this study was calculating the correlation between the number of issues and visitors on all websites that were checked.

RESULTS AND DISCUSSION

General Accessibility Evaluation

The 39 websites resulted from a filtering during the evaluation process from May to July 2021. As mentioned, we used aXe tool from Daque to evaluate the impact type of violation. Table 2 displays the detailed results.

Table 2. Website Accessibility Evaluation Results by aXe

	TI	NR	C	S	MD	MN
39 Website	10305	1532	1341	5489	1605	338
Average	264,231	39,2821	34,3846	140,744	41,1538	8,66667

Note: TI (Total Issue), NR (Need Review), C (Critical), S (Serious), MD (Moderate), MN (Minor)

Source: Research Result (2021)

Table 2 shows all evaluated e-commerce websites were detected to have website accessibility issues. Two websites have zero need review issue, two websites have zero critical issue, one website has zero serious issue, and twelve websites have minor accessibility issues, and all of the evaluated websites have at least a single moderate issue detected.

There were 10,305 total issues comprising not reviewed (14.86%), critical (13.01%), serious (53.26%), moderate (15.57%), and minor (3.27%) categories. The largest average value is serious impact. Serious impact is a type of accessibility error which, if not corrected, there will be significant barriers for persons with disabilities to use this page (Sims, 2016).

Table 2 also shows the high number of issues included in the Need review group. Need review means it needs web accessibility specialist and proper experts to review these issues so that the web accessibility status of websites will be generated. Need review score needs experts to solve it. Hence, there is a need for human inspection of these web-sites so that the web accessibility of these websites will be improved (Ismail & Kuppusamy, 2019).

Tier Classification of E-commerce Websites based on Average Total Issues

Referring to the formula of previous research (Ismail & Kuppusamy, 2018), this study also conducted grouping based on tier. This grouping was on a relative measure for easier comprehension and analysis. The grouping of the three tiers of e-commerce websites is based on the average score calculated from the total issues identified by aXe. The grouping is Tier I (high accessible), Tier II (medium accessible) and Tier III (low accessible). Sites that fall into Tier I have total issues below the median range, which means they are higher accessible websites than the other two tiers of websites.

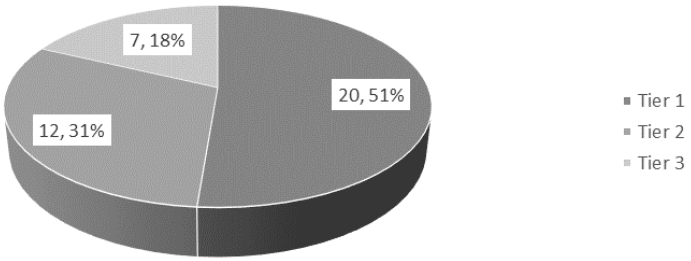

Figure 2. The Tier on the E-commerce Website Page based on Total Issue

Source: Research Result (2021)

Tier II websites are in the median range, which means they are less accessible websites than Tier I websites and more highly accessible websites compared to Tier III websites. The Tier III group of websites is above the median

range, which means they are less accessible websites than Tier II and III websites.

E-commerce websites that are in Tier 1 reach 51% or 20 websites. This means that more than half of the e-commerce websites studied have a total number of issues that are below the median area. This percentage shows that the number of websites that have a total issue below the average number is more than the number of websites that have a total issue above the average number.

This study also classifies the evaluated e-commerce websites based on several categories. We classify the category of e-commerce websites based on store origin location (based in Indonesia or International), business model (marketplace or inventory), store type (general, fashion, electronics, cosmetics, others), and number of monthly visitors. The detailed categorization is displayed in Table 3.

Based on the sub-categories classification, Tier 1, as a website category that is high accessible compared to the other two Tiers, also surpass Tier 2 and 3 in several sub-categories, except for the Marketplace, Cosmetics, and Others sub-categories. In that three sub categories, the number of websites in Tier 1 is the same as the number of websites in Tier 2 or Tier 3. Moreover, in the sub category 1-100 million visitors and the general sub category, the number of websites in Tier 1 is below the number of Tier 2 or Tier 3 (more detail in Table 3).

Table 3. The Tier on the E-Commerce Website Page Is Based On Categories and Subcategories

Categories	Store Origin		Business Model		Store Type					Visitors		
SC	ID	INT	MP	I	G	F	E	C	O	1-100 millions	100 thousands-1 million	< 100 thousand
Tier 1	15	5	6	14	5	9	3	1	2	5	9	6
Tier 2	9	3	6	6	6	1	2	1	2	7	3	2
Tier 3	6	1	6	1	4	2	1	0	0	2	5	0

Note: SC(Sub categories), ID (Indonesia), INT (International), MP (Marketplace), IN (Inventory), G (General), F (Fashion), E (Electronic), C (Cosmetic), O (Others).

Source: Research Result (2021)

Type of Issues

The most common types of issues that arise in accessibility issues are data that is important to know. Knowledge of the types of issues on website accessibility gives developers the opportunity to address them. One of the evaluation tools is

aXe, which has good material about what is an issue and how to fix it (Frazão & Duarte, 2020). The types of issues and the frequency of occurrence of issues on the websites studied are shown in Table 4.

The results of the examination show that the most types of issues that exceed 10% of the total number of types of issues are: Elements must have sufficient color contrast (50.13%); All page content should be contained by landmarks (14.50%); Images must have alternate texts (11.56%); and links must have discernible text (10.60%).

The number of issue types in Elements must have sufficient color contrast, more than half of the total number of issue types. 95% of the websites studied have this type of issue. Considering the frequency of occurrence of this type of issue is dominant, it is necessary to improve and improve, because if the color of elements don't have enough contrast, it might be difficult to read for people with vision impairments. This issue prevents users with disabilities from accessing website content.

Table 4. Type of issues

No	Type of Issues	F
1	<dl> elements must only directly contain properly-ordered <dt> and <dd> groups, <script>, <template> or elements14	16
2	<dt> and <dd> elements must be contained by a <dl>	14
3	<html> element must have a lang attribute	7
4	elements must be contained in a or	91
5	and must only directly contain , <script> or <template> elements	1
6	All page content should be contained by landmarks	1495
7	Alternative text of images should not be repeated as text	83
8	Alternative text of images should not be repeated as text17	17
9	ARIA attributes must conform to valid values	63
10	ARIA commands must have an accessible name	4
11	ARIA hidden element must not contain focusable elements	108
12	ARIA input fields must have an accessible name	14
13	ARIA progress bar nodes must have an accessible name	24
14	ARIA role should be appropriate for the element	16
15	ARIA roles used must conform to valid values	3
16	Buttons must have discernible text	103
17	Certain ARIA roles must contain particular children	3
18	Document should have one main landmark	30
19	Document should not have more than one banner landmark	4
20	Elements must have sufficient color contrast	5166
21	Elements must only use allowed ARIA attributes	148
22	Elements of role none or presentation should be flagged	1
23	Elements should not have tab index greater than zero	2
24	Ensure interactive controls are not nested	76
25	Ensure that scrollable region has keyboard access	6

Table 4. Type of Issues

No	Type of Issues	F
26	Ensures landmarks are unique	5
27	Form elements must have labels	6
28	Form elements should have a visible label	5
29	Frames must have an accessible name	5
30	Frames should be tested with axe-core	12
31	Heading levels should only increase by one	38
32	Headings should not be empty	6
33	id attribute value must be unique	227
34	IDs of active elements must be unique	13
35	Image buttons must have alternate text	1
36	Images must have alternate text	1191
37	Input buttons must have discernible text	2
38	Links must have discernible text	1093
39	Links with the same name have a similar purpose	133
40	Page must have means to bypass repeated blocks	3
41	Page should contain a level-one heading	29
42	Required ARIA attributes must be provided	2
43	Select element must have an accessible name	5
44	svg elements with an image role have an alternative text	1
45	The skip-link target should exist and be focusable	2
46	Zooming and scaling should not be disabled	16
	Total	10305

Source: Research Result (2021)

Table 5. Spearman Correlations Statistical Test between Total Issues Of Each E-Commerce Website and Number of Visitors

Variable	Number of e-commerce websites	Spearman Rho	Test of H_0: accessibility issues and number of monthly visitors are independent	Conclusion
Number of Total issues and Number of Monthly Visitors	39	0.2	Prob > |t| = 0.088	No correlations between number of total issues and number of monthly visitors of e-commerce websites

Source: Research Result (2021)

Correlation of Total Issues on Accessibility with the Number of Visitors

Referring to the results of previous research which states that accessibility has a positive effect on customer satisfaction (Khalaf Ahmad & Ali Al-Zu'bi, 2011), Thus there is research that proves the hypothesis that customer satisfaction impact on-site visits is statistically significant (Rita et al., 2019). Based on the two research results, this study seeks to link accessibility with site revisit.

Internet users may be classified into two types. First, Internet shoppers, and second is Internet browsers. In internet shopping, an internet browser can be defined as a person who online views merchandise on a retail Web site for information and/or recreational purposes without a direct intent to purchase (Forsythe & Shi, 2003). In this study, the context of site revisit refers to the second type, so the number of visits in terms of the number of visitors is shown in table 1. The results of the correlation between total issues and the number of visitors on each website under study are shown in Table 5.

Table 5 displays the result of spearman rho statistics test on whether the number of total issues of all e-commerce websites in the study is correlated with the number of monthly visitors. There was no evidence of correlation between number of total issues and number of monthly visitors with the test not statistically significant, $r_s = 0.088$, $p = 0.62$. Based on the statistic test, we can conclude that accessibility issues is not correlated with the number of monthly visitors of e-commerce websites.

The results of this calculation show that website visitors have not considered website accessibility as the major factor in visiting an e-commerce website. This is reinforced by data showing that there are 7 websites in tier 2, and 2 websites in Tier 3 but have several visitors between 1-100 million per month.

Comparative Test of Total of Issues in the E-Commerce Business Model

Previous research shows that the more or complex the content of a website, the more difficult it is to ensure its accessibility (Król & Zdonek, 2020). Moreover, another previous research also found that the complexity of a website also goes hand in hand with increasing accessibility issues for its users, especially people with disabilities (Hackett & Parmanto, 2005). Based on the two research results, using Mann-Whitney Test the present study seeks to test whether there is difference in the total of issue to accessibility of e-commerce websites which business models are marketplace and inventory. The business model refers to sub category of e-commerce website in the Table 3.

Table 6. Mann-Whitney Comparisons Statistical Test of Total of Issues in the E-Commerce Business model

Variable		N	Mean Rank	Mann-Whitney U	Asymp. Sig. (2-tailed)	Conclusion
Number of Total issue	Marketplace	15	27.40	69	.001	There is a significant difference in total accessibility issues of the business model of e-commerce
	Inventory	24	15.38			

Source: Research Result (2021)

E-commerce websites with a marketplace business model are assumed to have more accessibility issues than those with an inventory business model, because marketplace e-commerce websites are more complex with many menus, categories, pages, objects, and sections. The result shows that there is a significant difference in total accessibility issues of the business model of e-commerce (marketplace and inventory). E-commerce with marketplace business model had higher total issue of accessibility (M=27.40) than did those e-commerce with inventory business model (M=15.38), U=69, p= .001. The result confirms the results of previous research that the complexity of the website, such as e-commerce marketplace websites, is very likely to make the website have many accessibility barriers.

The results of this study show evidence of unawareness by website developers regarding website accessibility issues. Similar to findings in another country, a paper that explored Pakistani e-commerce websites showed evidence of violation of WCAG (Hamid et al., 2020). The same findings, the study of e-commerce websites from Saudi Arabia, also found several accessibility errors (Alshamari, 2016). Another research also states that Australian B2C e-commerce websites have not been designed with equal access for all users in mind (Sohaib et al., 2018).

Complying with WCAG is no easy task to accomplish, as it would require more resources. Technological advancement and constant evolution of human needs would make accessibility compliance a challenging and complex undertaking. WCAG compliance is not impossible, as a study has identified several barriers of WCAG compliance, particularly to accommodate users with disabilities. One of the most critical features that would exhaust web developer/designers resources is how to make a screen reader feature available for the visually disabled (Bose & Jürgensen, 2014). In addition, to build an inclusive accessible website requires an initial investment, in the form of financial and appropriate skills from the human resources of the developer (Acosta-Vargas, Acosta, et al., 2018a).

Accessibility is paramount for businesses. Public information providers, website developers and policy makers have to recognize the importance of accessibility. Technology would change social interactions, creating new problems of inequality and exclusion. Accessibility barriers will cause access gaps among various technology users. Lack of website accessibility can lead to the exclusion of some people and violation of human rights (Acosta-Vargas, Luján-Mora, et al., 2018), which includes the rights for users with disabilities to access information.

Aside from people with disabilities, the elderly also experiences accessibility barriers due to deteriorating health or physiological conditions. Users who experience age-related changes, such as poor vision, poor hearing, and reduced motor skills, would have challenges when accessing the website (Acosta-Vargas et

al., 2019). If we fail to acknowledge the issue of accessibility problems and address the situation, the information digital sphere will be further away from an inclusive society in the future, creating larger gaps for people with disadvantages.

The primary reason developers have not been able to meet WCAG standards is financial reasons. This reasoning is unfortunate given that knowledge of the steps to comply with the WCAG standards can be obtained easily. Many people believe that the costs of developing and maintaining an accessible website can actually be lower than for a less accessible site (Acosta-Vargas, Acosta, et al., 2018a).

The demand for web development that complies with WCAG actually creates new opportunities for e-commerce companies, as it would attract new users by allowing them to be more involved with the features offered, making them repeat the visit (Sohaib & Kang, 2016). Accessibility also has a significant effect on customer satisfaction (Tontini, 2016). This should be considered as a strategic step for a company, as part of marketing communication and e-service quality to reach a wider market including reaching consumers from the baby boomer generation who are starting to experience disabilities related to aging (Baker et al., 2002). Moreover, customers with high "disability pride" are more likely to respond with a positive sentiment toward accessibility (Goodrich & Ramsey, 2012).

Every institution should consider aspects of information accessibility, participation, and network for its users (Mathew Martin & Rabindranath, 2017). To do that, when developing an e-commerce platform, developers should comply with accessibility guidance to allow users with disabilities to access the website (Gonçalves et al., 2018). There is great hope that e-commerce companies can take better care in their effort to ensure that consumers with disabilities have equal access to websites to fulfill their rights for equal information access (Sohaib & Kang, 2016).

E-commerce companies, as companies engaged in goods and services, realize the importance of e-service quality and e-satisfaction. Website design has a positive association with overall e-service quality (Rita et al., 2019), and e-service quality has a positive influence directly and indirectly through e-satisfaction on consumer behavioral intentions, in terms of repeat visits to the site (Gounaris et al., 2010). These two statements should be able to encourage e-commerce website developers to improve the accessibility of their websites to achieve e-service quality, which leads to e-customer satisfaction.

Indeed, the results of the correlation analysis show that there is no significant relationship between the number of accessibility issues and the number of monthly visitors. However, this finding actually raises the suspicion that e-commerce website visitors do not understand yet or are not so concerned with

their right to get good website accessibility. Moreover, it can eventually lead to web developers being left unaware of accessibility issues on their websites. Considering that the issue of website accessibility also affects people with disabilities, this finding is necessary for the related activist/foundation/institute in advocating disability's right so that people with disabilities get good website accessibility.

The high number of visitors can be the capital that spurs e-commerce companies to reach and keep their customers. If for now the trend of Indonesian people has not considered the quality of accessibility in choosing an e-commerce website, but in the future the situation of global business competition may be different. Therefore, in order to expect changes in consumer trends in Indonesia, e-commerce companies should consider the accessibility of their websites.

The government also needs to ratify and encourage business institutions to develop e-commerce applications that can be accessed by the wider public for the sake of creating an inclusive society. Regulations are needed to put emphasis on the importance of e-commerce websites in following the accessibility guidelines (Sohaib & Kang, 2016), which can be started by increasing awareness on the accessibility standard of web development to the developers (Acosta et al., 2018).

This study has several implications. First, complete research on the accessibility of e-commerce websites in several countries. If there has been research on e-commerce in Pakistan, Australia, Saudi Arabia (Alshamari, 2016; Hamid et al., 2020; Sohaib & Kang, 2016), then this study adds the results of an investigation about the accessibility of e-commerce websites in Indonesia, that has not been revealed before. This research can be a starting point for further studies related to website accessibility in Indonesia.

Second, this research also adds to the understanding of the issues that are often encountered on e-commerce websites. If in previous research it is known that most issues are missing labels for text elements and input help such as "label text is empty" (Sohaib & Kang, 2016). Also, the most frequently violated WCAG 2.0 success criteria are criteria non-text content in ensuring that all the non-text content of the webpage should have an equivalent text alternative (Hamid et al., 2020), lack of appropriate labels and instructions on data entry forms, and difficulty navigating when presented with unfamiliar or inconsistent terminologies (Alshamari, 2016). Meanwhile, this study found that the most important issues were Elements must have sufficient color contrast; All page content should be contained by landmarks; Images must have alternate text and links must have discernible text.

This research extends previous research on evaluating e-commerce websites that focuses on success criteria (Hamid et al., 2020), level of conformance (Sohaib & Kang, 2016), test results from several evaluation tools (Alshamari, 2016). The expansion of the findings in this study was developed to make efforts to group

tiers, the correlation between total issues and the number of visitors. Another implication is that this study identifies accessibility classes, although there were previous studies that grouped by tier (Ismail & Kuppusamy, 2018), but this study deepens the grouping aspect associated with the e-commerce category.

This study has several limitations, which can be addressed in future studies. First, although this study uses total sampling, it only evaluates 39 e-commerce websites listed on iPrice, uses one evaluation tool, and uses one type of guideline. Further research would be better if conducting research on a wider sample, for example comparing e-commerce websites in various groups of countries, using several evaluation tools and guidelines. Data collection in this study was only for 1 period, it would be better if it was possible to sequence, for example evaluating the accessibility of several websites in the first, second, third, fourth quarter of a year, to find out the pattern of development.

Future research will also be better if we conduct accessibility testing based on users' experiences by using addition tools used by persons with disabilities. The last recommendation for further research is to explore the correlation and influence of total issues with other variables.

CONCLUSION

The results of this study show that e-commerce websites in Indonesia still have several accessibility issues. Accessibility issues affect users with disabilities and the elderly to get information and services from e-commerce websites. These barriers can reduce their opportunities to take part as sellers and buyers. Most e-commerce websites are in Tier 1. More than half of the e-commerce websites studied have a total number of issues that are below the median area. However, in some categories, the number of e-commerce websites that are in Tier 1 is less than the number of e-commerce websites that are in the other two Tiers.

The most common types of issues are: Elements must have sufficient color contrast; All page content should be contained by landmarks; Images must have alternate text and links must have discernible text. Considering that the frequency of occurrence of elements must have sufficient color contrast is dominant, this issue can hinder users with disabilities in Indonesia in accessing e-commerce website content. Empirically, the present study reveals that there is no significant correlation between the number of accessibility issues and the number of visitors. It indicates at once that website accessibility is still not a major factor for website users to visit e-commerce websites, whereas getting good accessibility is a users' right especially for people with disabilities that actually has to be fulfilled by website developers.

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