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To what Extent Open Government Data (OGD) Portals Accessibility under the Indonesian Provincial Government?

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ABSTRACT

This article aims to examine the accessibility of providing open data services under open government data (OGD) portals at the local government level, where our have found 17 OGD official websites and have been selected under the control of several provincial governments in Indonesia. For this paper, we employed the highlighted WAVE and AChecker tools. Significantly, findings indicate that the most of 17 OGD portals have failed accessibility assessments with striking viewpoints obtained in the "ARIA" tool and followed by the "Structural Elements" sections analyzed using the WAVE tool, wherein only OP11 has a range of passed website accessibility tests. It is also consistent with the findings by the AChecker tool in the "Known Problem" and also "Likely Problem" sections pointed out that passed the test. However, it should be noted that the only three OGD websites that passed the test by AChecker were OP3, OP9, and OP16. As a result, there is a constant high frequency of "potential problems" discovered by AChecker than by the WAVE tool on the OGD websites.

Keywords: *Open government data, web accessibility, WAVE, AChecker*

ABSTRAK

Artikel ini bertujuan untuk mengkaji aksesibilitas penyediaan layanan data terbuka di bawah portal data pemerintah terbuka (OGD) di tingkat pemerintah daerah, di mana kami telah menemukan 17 situs web resmi OGD dan telah dipilih di bawah kendali beberapa pemerintah provinsi di Indonesia. Untuk makalah ini, kami telah menggunakan alat WAVE dan AChecker sebagai sorotan pengujian. Secara signifikan, temuan menunjukkan bahwa sebagian besar dari 17 portal OGD telah gagal dalam penilaian aksesibilitas dengan sudut pandang mencolok yang diperoleh dalam alat "ARIA" diikuti oleh bagian "Elemen Struktural" yang dianalisis menggunakan alat WAVE, di mana hanya OP11 yang memiliki rentang aksesibilitas situs web yang lulus tes. Ini juga konsisten dengan temuan alat AChecker di bagian "Masalah yang Diketahui" dan juga "Kemungkinan Masalah" yang ditunjukkan telah lulus uji. Namun, perlu dicatat bahwa hanya tiga situs web OGD yang lolos uji oleh AChecker adalah OP3, OP9, dan OP16. Akibatnya, ada frekuensi tinggi "masalah potensial" yang ditemukan oleh AChecker daripada oleh alat WAVE di situs web OGD.

Kata Kunci: *Data terbuka pemerintah, aksesibilitas web, WAVE, AChecker*

INTRODUCTION

During the last years, open data has become a new phenomenon that has attracted various sectors, including the government sector which has participated in implementing the open data policy agenda and practice (De Blasio & Selva, 2019; Huang et al., 2020; Safarov, 2019; T.-M. Yang & Wu, 2021). Through Open Government Data or abbreviated as “OGD”, it becomes a forum for the government to publish data, so this portal aims to report all forms of public policies and services, and can be reused for all stakeholders (de Juana-Espinosa & Luján-Mora, 2020). Therefore, the displayed data sets can be accessed, obtained and used freely for public interest (Rahmat et al., 2019; Zhang et al., 2022). This is in terms consistency of governments responsibility to getting public participation in the release of published the information (Conradie & Choenni, 2014; Shepherd et al., 2019). By expecting stakeholders participation, the information posted does not only at the implementation of the open data policy, but also expectation for continuous improvement where this is due to the response of data users (Park & Gil-Garcia, 2021).

The government’s openness in disclosing data is more essential in encouraging the flow of information for stakeholders, this will create an accountable, participatory and also responsive by the government sectors (MartinLnenicka & AnastasijaNikiforova, 2021). In which OGD portals website implement oriented to transparency, participation and collaboration (De Blasio & Selva, 2019), furthermore, increasing public trust as efforts by government itself (Matheus et al., 2021), wherein the public will be appreciated the government transparency of information release (Gsrimmelikhuijsen, Piotrowski, & Van Ryzin, 2020). According to Khurshid et al. (2022) were the convenience of utilizing OGD significantly improved citizens’ intention to using OGD. Therefore, OGD platform consists of making data accessible to the public and it allowed for transparency (Al-Jamal & Abu-Shanab, 2016). Nonetheless, Zhao & Fan, (2021) argues that, in general, local governments have low awareness of the implement of open data government which lacks knowledge of understanding the concept of OGD, certain institutions or working groups are needed and the allocation of professional staff resources assigned to ensure the successful implementation of OGD. This is in line with the statement’s Yang & Wu (2021) that an institution leader must to allocate resources and technical support in the implementation of OGD.

A few past studied have reported regarding the accessibility the government web site, such as Karaim & Inal (2019) showed that, in Libya, most of the websites have some significant major problems, which almost all government websites is failed accessibility, only one was passed. Gambino, et., al. (2016) have validated that some of Italian government website have been syntax errors and accessibility, all website are not fully compliant to the law by their Decree of the Minister. Ismail, et., al. (2018) faced that the India local government website their studied showed a prominent point of weaknesses

for accessibility standards, more than the result is Errors warning detected. Nakatumba-Nabende, et., al. (2019) evaluated, Ugandan, government portals showed do not match the intermediate WCAG level double-A guidelines. Additionally, Nikiforova & McBride (2021) surprisingly argues that Non-EU countries' OGD portals may have substantially lower rates of usability and accessibility due to less restrictive metadata and openness standards.

However, in Indonesia, some provincial governments have had initiatives in implementing OGD policies through few domain platforms, the implementation of OGD that is responsibility by the government from central to regional level government that should to open sources for data and information to public. In this term, in line with the Indonesia Presidential Regulation Number 39 in 2019 concerning One Indonesian Data, and also the Regulation of the Indonesian Minister of National Development Planning/ Head of the National Development Planning Agency Number 17 of 2020 Concerning Indonesian One Data Portal Management. Based on these regulation were provides firmness for the government to implement open data. Further, the present of openness of government data due to overlap and differences in data between agencies so as to provide real data obscurity, therefore, the regulation need a platform that is able to accommodate all data into one data source, as to create efficiency and effectiveness for the public in obtaining information about data and information.

Conceptually, this research study is to gain a comprehensive understanding of the proliferation of open data portals at the local level. Such portals face rising challenges in terms of data being accessible and readily available, particularly at a technological advancements range. Consequently, it is imperative to conduct an extensive assessment of open data concerns in terms of technical issues related to the accessibility of presenting extensive datasets within an integrated system that ensures convenient access for all users.

Moreover, we have been analyze some study regarding open government data, especially in Indonesia, such as the challenges to open government data (Sayogo, 2018), development of models of OGD used, and contributing factors to citizen-led involvement in OGD (Purwanto et al., 2020), furthermore, obstacle to open access to government data (Parung et al., 2018). Meanwhile, the existing literature has not previously reviewed the accessibility of the Open Government Data platform under Indonesian government (to the author's knowledge). Significantly, taking steps to start, we started a website accessibility study in Indonesia with cases under the Indonesian provincial government, in addition, this research will be examines the website accessibility by 17 Open Government Data portals under Indonesian provincial government.

RESEARCH METHODS

This study evaluated 17 open government data portal under Indonesian provincial government, and it operated by WAVE and AChecker. Yang, et al. (2020) claimed that WAVE and AChecker were chosen due to the general reliability of their assessments, and their widespread availability to any entity or person doing inspections. In addition, Alsaeedi (2020) stated that two popular web accessibility inspectors, Wave and AChecker, have been maximum for employed to check' website accessibility.

The WAVE is as an open-source automated test tool that checks websites for common access problems (Akgül, 2021), where, this app uses an algorithm to check the site via HTML (Tidal, 2021). Therefore, WAVE is a fully accessible automated tool for evaluating website problems using HTML by displaying a percentage algorithm. Furthermore, the WAVE allows several feature to determine website accessibility, such as Errors, Alert, Structural Elements, Contrast Errors, Features, and ARIA. These features have been become highlighted to this paper and have captured the potential issues by web portal access.

On the other hand, this paper also used the AChecker Tool. Desai & Srivastava (2016) were argue that the AChecker is a tool for assessing accessibility, that appears similar to WAVE, when checking by inputting the HTML of a website, further, the testing shows a range of obstacles. Furthermore, Ahmi & Mohamad (2016) were describe classification each term, including the term of "known problem" focuses on issues that were identified as accessibility impediments with accuracy. Secondly, the term of "Likely problem" has been recognized as possible barriers, but require personal inspection of the web for verification. Further, the term for "potential problem" are those that AChecker is unable to detect and must be manually checked by a human. In addition, Ahmi & Mohamad (2016) also captured that if no errors are discovered in all three issue areas, the website pass the accessibility assessment. If there are no mistakes detected in the known problems section but there are difficulties in the likely problems and/or possible problems sections, the website is regarded conditionally passed. Furthermore, if any issues are identified in the known problems section despite no errors being detected in the other remedies, the website quality is regarded to have failed the accessibility test.

In addition, there are three levels to examine the portal such as A, AA, AAAA from AChecker. Those level have been specific their classification, Nakatumba-Nabende, et al. (2019) have been highlighted that level A (basic accessibility) is minimum level of compliance that a web site must meet. Secondly, level AA (moderate accessibility) is the website meets all of the success criteria for levels A and AA. The level of conformity should be fulfilled required to eliminate any substantial impediments to accessing content on the website. Lastly, level AAA (high accessibility): The web site fulfills all three levels, i.e., levels A, AA, and AAA.

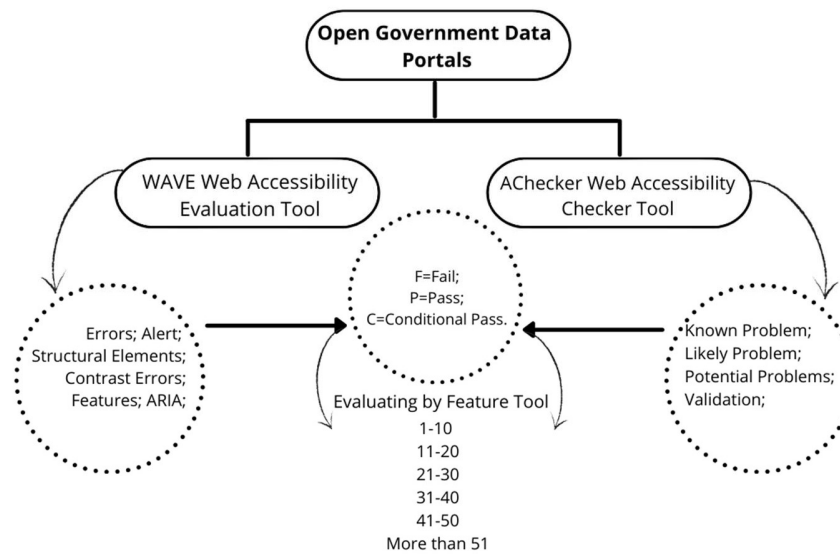


Figure 1. Research Flow

To check the data sources, we explored the official website under the Indonesian provincial government control, in which there are 17 official site open government data in several regions.

Table 1. List of URL's of OGD in Indonesian Provincial Government

ID	Indonesia Provincial Government	Website link
OP1	Nanggroe Aceh Darussalam	https:// data.acehprov.go.id/
OP2	Sumatera Selatan	http://satudata.sumselprov.go.id/
OP3	Riau	https:// rumahdata.riau.go.id/
OP4	Bangka Belitung	https:// data.belitung.go.id/
OP5	Kalimantan Barat	http:// data.kalbarprov.go.id/
OP6	Kalimantan Timur	https:// data.kaltimprov.go.id/
OP7	Kalimantan Selatan	https:// data.kalselprov.go.id/
OP8	Kalimantan Tengah	https://satudata.kalteng.go.id/
OP9	Banten	https://satudata.bantenprov.go.id/
OP10	DKI Jakarta	https:// data.jakarta.go.id/
OP11	Jawa Barat	https:// data.jabarprov.go.id/id
OP12	Jawa Tengah	http:// data.jatengprov.go.id/
OP13	DI Yogyakarta	http://bappeda.jogjaprov.go.id/dataku/
OP14	Bali	https:// balisatudata.baliprov.go.id/
OP15	Nusa Tenggara Barat	https:// data.ntbprov.go.id/
OP16	Sulawesi Utara	https://portaldata.sulutprov.go.id/
OP17	Sulawesi Selatan	https:// data.sulselprov.go.id/

RESULTS, DISCUSSION, AND ANALYSIS

Furthermore, this section discusses the results of web accessibility based on WAVE and AChecker tools. In this study, we examined the Open Government Data portals accessibility by WAVE which are Errors, Alert, Structural Elements, Contrast Errors, Features, ARIA. Besides, this paper also examines by AChecker which are Known Problems, Likely Problems, Potential Problems, Total Validation, these section with levels category of A, AA, AAA based on WCAG 2.0 guidelines.

Analysis of 17 OGDs Portal under Indonesian Provincial Government using WAVE Web Accessibility Evaluation Tool

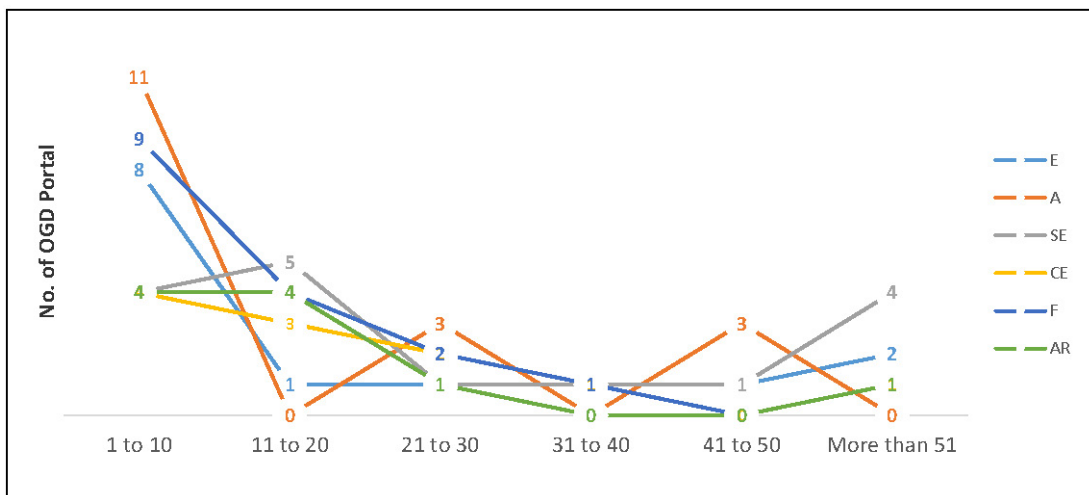
Table 2. Summary for OGD in Indonesian Provincial Government by WAVE

ID	WAVE Feature Tool											
	E		A		SE		CE		F		AR	
OP1	8	F	8	F	33	F	30	F	18	F	12	F
OP2	39	F	30	F	84	F	0	P	23	F	1	F
OP3	26	F	46	F	63	F	9	F	12	F	518	F
OP4	3	F	6	F	17	F	20	F	22	F	0	P
OP5	17	F	6	F	14	F	0	P	17	F	0	P
OP6	55	F	7	F	45	F	12	F	2	F	0	P
OP7	0	P	2	F	16	F	0	P	1	F	12	F
OP8	0	P	1	F	4	F	0	P	1	F	0	P
OP9	5	F	2	F	12	F	0	P	3	F	0	P
OP10	67	F	26	F	15	F	13	F	3	F	20	F
OP11	0	P	2	F	0	P	0	P	1	F	0	P
OP12	43	F	44	F	76	F	74	F	66	F	10	F
OP13	10	F	4	F	10	F	2	F	17	F	26	F
OP14	10	F	8	F	10	F	1	F	8	F	17	F
OP15	3	F	30	F	72	F	34	F	35	F	0	P
OP16	6	F	46	F	30	F	28	F	5	F	9	F
OP17	1	F	1	F	3	F	4	F	1	F	2	F
Total	293		269		504		227		235		627	

*Findings as at 24st March 2022. E=errors, A= Alert, SE= Structural Elements, CE= Contrast Errors, F=Features, AR=ARIA, P=Pass, F=Fail

Table 2 show that the reported for website accessibility evaluates regarding WAVE tool, by all the sections tested on 17 open government data portals, there were websites that passed the test, in terms of Error only three OGD passed (OP7, OP8, and OP11). Furthermore, for Structural Elements there is one portal that passes the test (OP11), then for Contrast Errors there are six websites that pass (OP2, OP5, OP7, OP8, OP9, and OP11), then on the ARIA term where there are seven sites that passed the accessibility (OP4, OP5, OP6, OP8, OP9, OP11 and OP15). For the Alert and Features section, all portals failed the accessibility test and the failed test results of the above sites are further summarized.

Table 3. Total of Failed Evaluating by WAVE Feature Tool



Source: Author Analysis

Based on Table 3. Showing the failure range of the 17 Open Government Data portals accessibility test, the first thing that stands out in the Error is in the range of 1-10, where there are 8 sites that fail the accessibility test. Then, in the Alert section the same position on the rankings 1-10 where there are 11 portals that failed the accessibility test. Then, Structural Elements at range 11-20 became the highest range followed by range 1-10 with a total OGD of 5 and 4. In addition, the Contrast Error section at range 1-10 with a total OGD of 4, further in the section Features obtained the highest range, namely 1-10 where there are 9 OGD sites, and finally ARIA has two ranges, namely at levels 1-10 and 11-20 with an average of 4 web portals that fail the accessibility test.

Analysis of 17 OGDs Portal under Indonesian Provincial Government using AChecker Web Accessibility Checker

On the other hand, the major problem of OGD have been showed on Table X under AChecker tool analyze. This tool have captured for several problem of web accessibility, there are four section, and it presented was captured below.

Table 4. Summary Result for OGD by AChecker Based on WCAG 2.0 Guideline

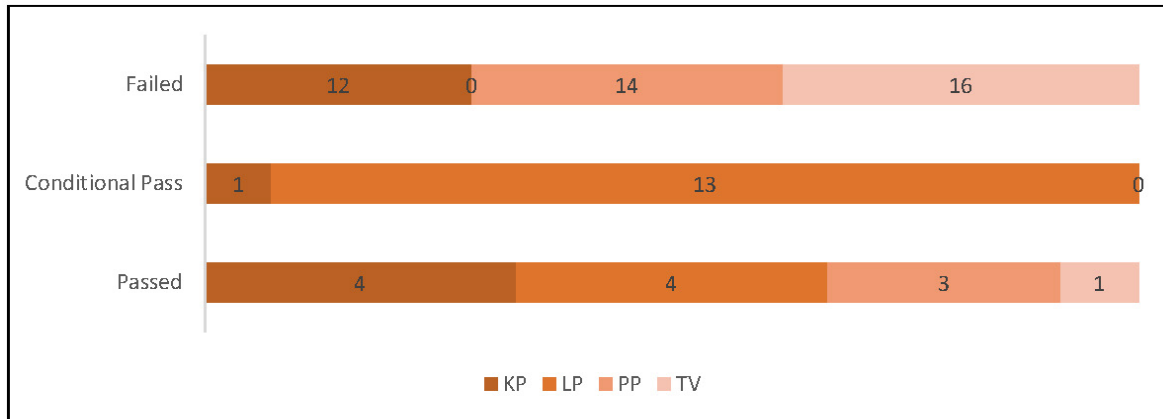
ID	AChecker Web Accessibility Checker															
	KP				LP				PP				TV			
	A	AA	AAA	R	A	AA	AAA	R	A	AA	AAA	R	A	AA	AAA	R
OP1	8	49	49	F	0	0	51	C	165	192	197	F	23	23	23	F
OP2	50	97	97	F	0	0	107	C	370	441	447	F	87	87	87	F
OP3	0	0	0	P	0	0	0	P	0	0	0	P	90	90	90	F
OP4	3	8	8	F	0	0	30	C	172	185	191	F	23	23	23	F
OP5	24	25	25	F	0	0	30	C	179	191	197	F	16	16	16	F
OP6	67	96	96	F	0	0	105	C	276	304	310	F	28	28	28	F
OP7	3	9	9	F	0	0	23	C	57	73	78	F	46	46	46	F
OP8	0	1	1	C	0	0	1	C	15	21	26	F	8	8	8	F
OP9	0	0	0	P	0	0	0	P	0	0	0	P	96	96	96	F
OP10	64	72	72	F	0	1	47	C	184	202	215	F	14	14	14	F
OP11	0	0	0	P	0	0	0	P	23	25	27	F	32	32	32	F
OP12	46	128	138	F	0	0	164	C	483	549	559	F	30	30	30	F
OP13	8	12	12	F	0	0	25	C	95	103	108	F	26	26	26	F
OP14	19	43	43	F	0	0	15	C	134	145	150	F	101	101	101	F
OP15	7	23	23	F	0	0	93	C	298	355	336	F	54	54	54	F
OP16	0	0	0	P	0	0	0	P	0	0	0	P	0	0	0	P
OP17	2	2	2	F	0	0	9	C	25	29	34	F	30	30	30	F

*Findings as at 24st March 2022. KP=Known Problems, LP=Likely Problems, PP=Potential Problems, TV= Total Validation, R=Result, F=Fail, P=Pass, C=Conditional Pass.

As shown in Table 4, most of the open government data portals are failed to fulfil the web accessibility requirements as stipulated by AChecker test based on WCAG 2.0 guidelines. From 17 OGD portals, only three website OGD (OP3, OP9, and OP16) have completely passed the test for all accumulates by A, AA, and AAA levels. On the other hand, website accessibility for (OP11) was passes for KP and LP, but failed for PP. In addition, there are several CP for OGD website accessibility, such as in term of KP (OP8), in term for LP (OP1, 2, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, and 17), and the data that no mention before are failed to meet requirements by all levels based on WCAG 2.0 guidelines.

To be continued analyze, I cleared for total of potential of OGD under each section with result of pass, conditional pass, and fail.

Table 5. Potential Issues on OGD under Indonesian Provincial Government



Noted: KP=Known Problems, LP=Likely Problems, PP=Potential Problems, TV= Total Validation, R=Result, F=Fail, P=Pass, C=Conditional Pass.

Table 5 presents the majority of website accessibility problems from 17 OGDs under test based on WCAG 2.0 guidelines. Overall, there are some prominent points to be highlighted that the fail score has pointed out with 42 times of confirmation by grade level of A, double-A, and triple-A, wherein the high confirmation of the failed result is total validation. On the other hand, the conditional pass score that showed 14 times confirmation with a likely problem section is the source of high potential trouble. Lastly, the number of OGD passed confirmation by all grade levels tested is 12 times confirmation, with the two passed scores being known problems and likely problem sections.

The accessibility of the open government data portal under 17 Indonesian provincial government is still lacking and many of them do not pass after being tested through the WAVE tools and also AChecker. The findings in this study are similar to those found in Libya (Karaim & Inal, 2019). In Libya, using the AChecker tool, it also shows that there are still many government websites that lack accessibility, where the level of conformity with the AAA test level is reported to have all failed the test. This result is supported by previous research, wherein this was also found in 17 OGDs in Indonesian provincial government, the problem was that many failed the accessibility test at the AAA level. This is also in line with the findings by Ismail et al., (2018) states, where in India, the accessibility test of local government sites using the WAVE tool showed a lack of accessibility standards based on the WGAC 2.0 guidelines, this was also found in 17 OGDs in Indonesian provincial government. This finding also confirms that OGDs in Indonesian provincial government are still far less accessible than in European countries (Nakatumba-

Nabende et al., 2019). In addition, the dominant problem found from the WAVE test results from 17 OGD in Indonesian provincial government that the ARIA section was a major problem was found followed by Structural Elements, this finding was inversely proportional to the problems found from the results of the study by Ahmi & Mohamad (2016) argues, di Malaysia, government websites tested through the WAVE tool detected the features section as the highest problem followed by alerts.

CONCLUSION

To sum up, however, this article serves as the foundation for their improving website accessibility, which has been validated through tests using the WAVE and AChecker tools. These two tools have caught some of the problems that most websites have. First, from the monitoring of the WAVE tool, in terms of ALERT and features being the points where the problem is highlighted, the ALERT section provides vigilance on the accessibility of the website in all OGDs studied. This is also experienced in the features, where there are still many features that need improvement to be more accessible. Meanwhile, other sections, such as the error section, structural element, contrast error, and ARIA also failed in the accessibility test, although several OGDs had successfully passed the test, but needed further improvement. On the other hand, the results showed that the AChecker tool reported more errors at different checkpoints than the WAVE tool. Wherein, the test results used the Web Content Accessibility Guidelines with different levels, such as A, double-A, and triple-A, finding that there are still many Indonesian provincial government OGD websites that fail, whereas there are also many that obtain the conditional pass section. At least there are only three OGDs that passed the accessibility test.

Implicitly, the comprehension of open data developers necessitates significant effort in ensuring the accessibility of a wide range of data and information through a single portal. This is because certain open data portals are inaccessible and fail to inclusively provide information, as indicated by the research findings. This contributes to the existing body of knowledge by emphasizing the need of open data developers have the capability to demonstrate data accessibility in every product they deliver. Additionally, the pursuit of establishing accessible open data portals can offer enhanced convenience in data and information retrieval. Hence, a potential avenue for future advancement lies in the creation of a standardized model that ensures uniformity across various open data portals, while also incorporating robust security measures to counteract potential virus attacks.

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