Bibliometric Analysis of Global Scientific Literature on Web Accessibility

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Abstract: Having considered that website has becoming an essential platform to communicate, exchange of information and enabling transactions for organizations, making it accessible to the widest range of visitors is getting paramount. Web accessibility concerns mainly on formulating reliable framework to web developers in ensuring accessibility of the web to all visitors regardless of their physical disabilities and limited capabilities. Owing to the growing numbers of research on this domain, this paper analyses and reports various types of published works related to the web accessibility. This study adopted a bibliometric analysis based on the data obtained from Scopus online database as of May 2018. Based on the 'key words' search results, the study finalized 1,103 valid documents for further analysis. Authors then employed VOS viewer for data visualization purpose. This article reports the results using standard bibliometric indicators, particularly on the growth rate of publications, analysis of the citation, and research productivity. As the results revealed, there is an increased growth rate of web accessibility literature over the years since 2001. Meanwhile, a total of 897 (81.32%) documents were multi-authored with a mean collaboration index of 2.87 authors per article. An analysis by country, The United States of America (USA) is ranked first in productivity with 265 (20.87%) published documents. With respect to the frequency of citations, Lawrence and Giles (1999)'s article emerges as the most cited article with an average of 48 citations per year. Overall, the increase number of works on web accessibility indicates growing awareness on its importance and specific requirements.

Keywords: Web accessibility; bibliometric analysis, WCAG, Section 508

I. INTRODUCTION

The concept of Web Accessibility refers to process of ensuring the design of websites, tools, and technologies that account for people with various disabilities[1]. Having said that, accessible website enables people with varying disabilities to browse, perceive, understand, interact as well as to take part on the web activities. Web accessibility not solely concern in meeting the needs of web users with permanent disabilities, but to facilitate users with various physical or infrastructure-related limitations, either permanently or temporarily. These include, among others, people with limited bandwidth for Internet access or people that suffer from aging-related constraints [1]. Hence, ensuring web accessibility enables potential users to access the web contents regardless of their physical limitations and context of its use[2].

Having accessible web at all time is paramount particularly for the websites with substantial public access such as higher institutions, public sector, healthcare, library or legal entities. More importantly, the demand for more accessible-web is even more crucial in line with growing diversity of devices being used to access the website over time, such as mobile phones, tablets and wearable devices[3]. In short, web accessibility remains as a crucial issue on website regardless of the platform used in assessing the web.

As to ensure consistency in ensuring web accessibility, web administrators may rely upon two commonly available guidelines. First, Web Content Accessibility Guidelines (WCAG) 2.0 as issued by Worldwide Web Consortium (W3C) in 2008 [4], an international standard organization for the Internet. Overall, WCAG 2.0 encompasses 12 general guidelines on web accessibility with 61 indicators. More recently, W3C releases WCAG 2.1 in June 2018 that incorporates additional indicators to deal with mobile version web, people with low vision as well as people with cognitive and learning disabilities.

WCAG classifies web accessibility into three level of conformance, namely; Priority 1 (Level A), Priority 2 (Level AA) and Priority 3 (Level AAA) [4]. The least compliance status (as represented by Level A)merely fulfils minimum number of web elements that warrant accessible web to the people with disability. The next conformance level (Level AA)requires more advanced elements to substantially remove accessibility barriers for wider group of web users. Finally, the widest accessibility of the web is demonstrated by complying to the highest conformance level as set out by WCAG guideline(Level AAA). Website with this level of conformance incorporates most advanced and extensive features in ensuring widest accessibility.

Other than WCAG, Section 508 of the United States Rehabilitation Act 1973 could be another benchmark for web accessibility assessment applicable for web administrators. The Act specifically addresses various issues in providing equal access of resources and information to the disabled groups. It generally recommends to web administrators 16 critical components in designing and presenting highly accessible websites[5]. In contrast to WCAG that merely serves as a guideline for web accessibility, Section 508 makes it compulsory for the US federal agencies to ensure equal access of all electronic and information technology applications toall citizen, regardless of their disability status.

Web accessibility guidelines are essential, particularly for web developers to benchmark the web site being developed as to be accessible to the largest audience possible [3].

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From user perspective, web accessibility guideline may become a useful tool to assess or compare accessibility of given websites. Having accessible website ultimately warrants more effective browsing experience on the web [6].

In line with evolving web-based applications worldwide, we can observe growing importance of ensuring web accessibility. This has attracted various concerns and triggers varying issues surrounding the web accessibility. Previous research in web accessibility focuses on various aspects that include (among others); current state of web accessibility of a website of as specific business sector, assessment or comparison of different kinds of web accessibility tools, user's perspective on web accessibility and areas for possible extension on web accessibility.

There have been number of research carried out by researchers to explore the current state of web accessibility in various sectors such as libraries [7], hotel [8], and public/government sectors [2, 3, 9, 10]. In other respect, several works reported an evaluation of available applications/tools in assessing accessibility of a given web [11], possible areas in extending web accessibility [12, 13] and web accessibility assessment across differing countries[14, 15]. Other researchers, on the other hand, focus on identifying problems faced by disabled people while browsing the website [16]. Meanwhile, introducing longitudinal approach in assessing web accessibility has been proposed as to evaluate improvement of the web accessibility over time [17].

To date, various tools are made available to automate the process of assessing web accessibility. These automated assessment tools incorporate either WCAG 2.0 guideline, Section 508 United States of Rehabilitation Act 1973 or both. Automated assessment tools offer more user friendly, quick and ease of reporting to the web developers or users on web accessibility status of a given web. Prior works have employed various automated tools such as A Checker, Wave, and Web Acc Checker to automatically assess the web accessibility [18, 19].

With growing numbers of web accessibility-related studies, it is therefore useful to observe the general patterns revealed by those studies. A Bibliometric analysis gains popularity as one of the approaches in revealing research trend/pattern. Bibliometric study (also referred as scientometrics study)usually employs mathematical/statistical tools as its approach in evaluating quantity and quality of the published materials to observe trends or pattern of a specific research area[20].In addition, extensive bibliometric analysis helps to make prediction and growth of research in a particular research domain [21]. Most common aspects being observed using bibliometrics analysis include publication classification, citations, authorship details, publication impact and country of focus.

Despite growing interest towards web accessibility research, there have been relatively limited attempts to report the trend of prior works, particularly those that used bibliometric approach. A study by Ahmi and Mohamad [22], for example, was restricted to a specific publication type (thesis) as listed in Google Scholar. Despite meaningful output reported, extending the scope of the publication types while deploying other data sources may potentially extend its value. Meanwhile, number of works have been reported to employ such approach in other research domains. These include social science [23], engineering [24] and sentiment analysis[25], city logistic [26] and 3D printing [27].

Other studies that focused on IT-related domain such as e-learning [28], e-government [29] and Information and Communication Technology (ICT) [21].Dias [29],has employed the bibliometric analysis on journal articles, conference proceedings and book chapters to examine the trend of scholar works published by researchers in Portuguese higher education institutions on e-government issues. The focus of the inspection is on international publication as published in Scopus database. Tibaná-Herrera, Fernández-Bajón, and De Moya-Anegón[28]examined previous works published in several databases based on the e-learning related descriptors. The study revealed that e-learning research are predominantly published under social science category, while some were classified under Computer Science and Health category. They recommended that e-learning may become another thematic category under scientific publication system. Meanwhile, Cherng, Malim and Singh[21]performed bibliometric analysis to examine the trend of prior research that examine the relationship between ageing and ICT. The analysis employed computerized analysis of keywords used by the published articles as extracted from selected online databases. The study incorporated growth analysis and Latent semantic analysis approaches that extend the presentation of the thematic analysis on the keywords used in previous studies. The study produced collection of related key terms that were grouped and ranked based on their relevance and growth trend over the years.

Apart from concentrating on specific research domain, prior studies using Bibliometrics analysis approach also limit their scope by specifying the journal database (s) being considered for analysis. Among the most common database employed were; Web of Science [21, 25, 30, 31], Scimago [24], Ebscohost [32], Science Citation Index [33] and Emerald [34].Expecting richer analysis and better insight of the data, several works pooled multiple databases in a single study. For example, Hajduk [26] examined research on city logistics as published in WOS, Scopus, Emerald, Elsevier and Ebscohost. Meanwhile, Tibaná-Herrera, Fernández-Bajón, and De Moya-Anegón[28]concentrated on e-learning related articles published in Scopus and Scimago databases.

Bibliographic study usually reports analysis from various perspectives. The following table provide comparative analysis of attributes being examined in earlier bibliometric studies in various research domain.

Table. 1 Attributes examined in Bibliometric analysis

Author	Domain	Attributes Examined
Bucher [23]	Social Science	• Publication title Language used • Authors profile • Affiliation of authors
Tibaná-Herrera, Fernández-Bajón, and De Moya-Anegón[28]	E-learning	• Keywords • Source type
Marinescu and Nedelcu [27]	3D Printing	• Total research productivity, • Scientific output of countries, • Individual institution authors, • Journals and their collaborative networks
Shukla and Moyon [35]	Library and Information science	• Year published • Authorship (number of authors), • Degree of collaboration, • Geographical distribution (national vs international)
Dias [29]	e-government	• Year of publication, Citations, • Topics addressed, Scope, • Methods used, • Authors and their affiliation institutions
Cherng, Malim and Singh[21]	Ageing & ICT	• Keywords used by authors
Zyoud et al. [31]	Cocaine Intoxication	• Year published • Country • Authorship • H-index

As indicated in the above table, among the most commonly examined aspects include; publication outlet/journal, type of publication authorship e.g. number of authors per article and his/her affiliation analysis by year of publication, country of focus and h-index. Examination of the published works based on year of publication helps researcher to observe pattern and popularity of the research topic over time. Meanwhile, pattern of the research by sub-domain maybe revealed by analyzing the keywords used [25, 21]. Apart from that, keyword analysis does also provide meaningful insight on the popularity or degree of importance of a specific issue in a given research domain. On another respect, analysis of authors, their affiliation and h-index of the authors could reflect prominence of the article authorship.

Responding to limited works exploring trend of web accessibility studies, this paper conducts a bibliographic analysis on all types of publications related to 'web accessibility' as published in Scopus online database as of May 2018. Specifically, this paper presents analysis of all publications being examined in the aspects of document type, source of publication, year of publication, language used, subject area, geographical profile, authorship and citation analysis. This article helps to provide meaningful insights on the trend of previous publications in this research topic.

II. METHODS

Considering the fact that Scopus is the largest scholarly works database as compared to Pubmed or Web of Science [20, 36], the study employed this database as a basis to extract prior works on web accessibility. The database supplies publication details that include access type, year, author name, subject area, document type, source title, keyword, affiliation, country, source type and language. To further specify relevant scholarly works on the research domain examined, we restricted the search of web accessibility studies based on the title. As such the following query has been specified in the search process: (TITLE(web OR webs OR website OR websites "accessibility")).This query yielded a total of 1,103 documents for us for further analysis. The data were retrieved on 31st May 2018.

III. ANALYSIS AND FINDINGS

The analysis of extracted scholarly works encompass document types and source types, annual growth, language of the document, subject area, keywords analysis, country productivity, authorship and citation analysis. Most of the findings are presented as frequency and percentage. Meanwhile, we present annual growth data as number of retrieved documents per year including their frequency, percentage and cumulative percentage until May 2018.We report citation analysis as citation metrics and disclosed 20 most cited articles in web accessibility.

Document and Source Type

Data obtained is first analyzed based on its document type and source type. Document type refers to a type of document based on the originality of the document either conference paper, article, book chapter etc., while source type is the type of a source document weather it is journal, conference proceedings, book series, book or trade publication. The conference paper that appears under document type maybe different than those appears under the source type [20]. For example, a paper presented in a conference will be classified as conference paper under document type. However, the same paper maybe classified as full journal article, conference proceeding or book chapter under source type depending on its publication status.

As summarizes in Table 2, the documents published on web accessibility spread into 12 document types.

As indicated further, more than half of the total publications is in the form of conference paper (54.03%) and followed by an article (34.81%). Other type of documents represented less than 5% of the total publication respectively.

Table. 2 Document Type

Document Type	Frequency	% (N=1103)
Conference Paper	596	54.03
Article	384	34.81
Book Chapter	37	3.35
Review	37	3.35
Editorial	14	1.27
Article in Press	14	1.27
Conference Review	10	0.91
Note	4	0.36
Book	2	0.18
Letter	2	0.18
Short Survey	2	0.18
Erratum	1	0.09
Total	**1,103**	**100.00**

Meanwhile, as Table 3 shows, the documents maybe classified into five different source types, of which journal represents the highest type of source with 444 documents (40.25%) and followed by conference proceedings of 435 documents (39.44%). Book series also contribute quite significantly at 16.59% (183 documents) to the total number of the publications.

Table. 3 Source Type

Source Type	Frequency	% (N=1103)
Journals	444	40.25
Conference Proceedings	435	39.44
Book Series	183	16.59
Books	37	3.35
Trade Publications	4	0.36
Total	**1103**	**100.00**

Publication by Year and Annual Growth

Table 4 summarizes the details statistic of annual publications on web accessibility from 1996 to 2018. As per Scopus records, the first published research on web accessibility in 1996 was by Moszer, Kunst and Danchin [37]. The growth on the related publication somewhat slow in the next few years until it starts picking up in 2001 with an average of 64 publications a year since then. The highest number of publications is observed in 2007, with a total of 95documents (8.61%).

Table. 4 Publication Year and Annual Growth

Year	Frequency	% (N=1103)	Cumulative Percent
1996	1	0.09	0.09
1997	1	0.09	0.18
1998	1	0.09	0.27
1999	2	0.18	0.45
2000	5	0.45	0.91
2001	12	1.09	1.99
2002	30	2.72	4.71
2003	25	2.27	6.98
2004	40	3.63	10.61
2005	57	5.17	15.78
2006	65	5.89	21.67
2007	95	8.61	30.28
2008	69	6.26	36.54
2009	88	7.98	44.51
2010	80	7.25	51.77
2011	74	6.71	58.48
2012	74	6.71	65.19
2013	76	6.89	72.08
2014	76	6.89	78.97
2015	60	5.44	84.41
2016	72	6.53	90.93
2017	80	7.25	98.19
2018	20	1.81	100.00
Total	**1103**	**100.00**	

Languages of Documents

Based on Table 5, English is commonplace for most of the publications in this research domain (1047; 93.99%). Other commonly encountered languages include Spanish (29; 2.6%) and Portuguese (15, 1.35%). There are 10 documents that have been published in dual languages. Six of them are published in English and Spanish, while the remaining four articles are published in combination of English with Croatian, Dutch, German and Portuguese respectively.

Table. 5 Languages Used for Publications

Language	Frequency*	% (N=1114)
English	1047	93.99
Spanish	29	2.60
Portuguese	15	1.35
German	6	0.54
French	5	0.45
Japanese	4	0.36
Chinese	3	0.27
Croatian	1	0.09
Dutch	1	0.09
Italian	1	0.09
Slovenian	1	0.09
Turkish	1	0.09
Total	**1114**	**100.00**

*10 documents were written in dual languages

Subject Area

This study next classifies the published documents based on the subject area as summarizes in Table 6. Overall, the distribution indicates that research on web accessibility emerge in diverse subject areas ranging from information technology, engineering, mathematic, healthcare, business/management, science as well as social science. As reported, about half of the documents examined are in computer science area (46.73%)and followed by social science (13.9%).

Table. 6 Subject Area

Subject Area	Frequency*	% (N=1669)
Computer Science	780	46.73
Social Sciences	232	13.90
Mathematics	174	10.43
Engineering	168	10.07
Medicine	93	5.57
Business, Management and Accounting	50	3.00
Decision Sciences	31	1.86
Health Professions	26	1.56
Psychology	23	1.38
Arts and Humanities	21	1.26
Biochemistry, Genetics and Molecular Biology	17	1.02
Economics, Econometrics and Finance	10	0.60
Nursing	10	0.60
Physics and Astronomy	5	0.30
Earth and Planetary Sciences	4	0.24
Materials Science	4	0.24
Multidisciplinary	4	0.24
Neuroscience	4	0.24
Environmental Science	3	0.18
Agricultural and Biological Sciences	2	0.12
Chemical Engineering	1	0.06
Energy	1	0.06
Immunology and Microbiology	1	0.06
Undefined	5	0.30
Total	**1,669**	**100**

*Some documents are classified in more than one subject area

Keywords Analysis

For the purpose of keywords analysis, authors mapped the keywords supplied for each document using VOS viewer, a software tool for constructing and visualizing bibliometric networks(see Fig. 1). Fig.1 presents a network visualization of the authors' keywords produced by VOS viewer in which color, circle size, font size, and thickness of connecting lines indicate strength of the relationship amongst the keywords. Related keywords as indicated by the same color are commonly listed together. For example, the diagram suggests that web accessibility, evaluation, user, assistive technology and screen reader are closely related and usually co-occur together.
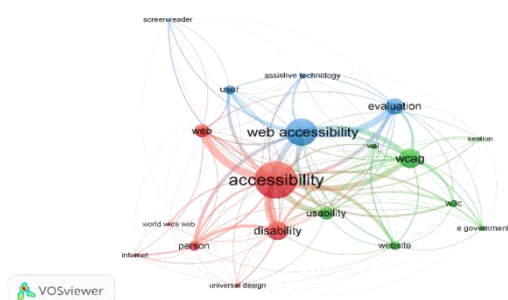

Fig. 1 Network visualization map of the author keywords

Meanwhile, usability, WCAG, disability, internet, WCAG 2.0, web, e-government, evaluation, disabilities and w3c are among the keywords with the highest occurrences after removing core keywords specified in the search query i.e. web accessibility and accessibility (see Table 7).

Table. 7 Keywords

Author Keywords	Frequency	Percent
web accessibility	328	8.4
accessibility	281	7.2
usability	67	1.7
wcag	61	1.6
disability	48	1.2
internet	40	1
wcag 2.0	40	1
web	40	1
e-government	33	0.8
evaluation	33	0.8
disabilities	30	0.8
w3c	30	0.8
people with disabilities	24	0.6
guidelines	23	0.6
wai	22	0.6
world wide web	20	0.5
universal design	19	0.5
assistive technology	18	0.5
automated evaluation	18	0.5
section 508	18	0.5

Geographical Distribution of Publications

Taken as a whole, researchers from 68 different countries have contributed to the publication in web accessibility area. All countries contributing to the productivity of publications in this research area are listed in Table 8. Top on the list are the United States of America (USA) with a total of 265 (20.87%) documents followed by the United Kingdom (UK) (127: 10%) and Spain (125: 9.84%).

Table. 8 Countries contributed to the publications

Country	Frequency	% (N=108)
United States	265	20.87
United Kingdom	127	10.00
Spain	125	9.84
Brazil	64	5.04
Portugal	52	4.09
Germany	48	3.78
Italy	46	3.62
France	39	3.07
Japan	34	2.68
Australia	33	2.60
Norway	27	2.13
Greece	26	2.05
South Korea	26	2.05
Austria	24	1.89
China	21	1.65
India	21	1.65
Turkey	19	1.50

Canada	18	1.42
Malaysia	18	1.42
Ecuador	15	1.18
Switzerland	11	0.87
Belgium	10	0.79
Ireland	9	0.71
Taiwan	9	0.71
Argentina	8	0.63
Netherlands	8	0.63
Saudi Arabia	8	0.63
Thailand	8	0.63
Colombia	6	0.47
Hong Kong	6	0.47
Jordan	6	0.47
South Africa	5	0.39
Kyrgyzstan	4	0.31
Poland	4	0.31
Chile	3	0.24
Cuba	3	0.24
Cyprus	3	0.24
Czech Republic	3	0.24
Finland	3	0.24
Iran	3	0.24
Lebanon	3	0.24
Pakistan	3	0.24
Romania	3	0.24
Slovenia	3	0.24
Sri Lanka	3	0.24
Sweden	3	0.24
Uganda	3	0.24
United Arab Emirates	3	0.24
Denmark	2	0.16
Egypt	2	0.16
Ghana	2	0.16
Guatemala	2	0.16
Indonesia	2	0.16
Israel	2	0.16
Macedonia	2	0.16
Oman	2	0.16
Algeria	1	0.08
Bahrain	1	0.08
Bangladesh	1	0.08
Costa Rica	1	0.08
Estonia	1	0.08
Latvia	1	0.08
Nepal	1	0.08
New Zealand	1	0.08
Nigeria	1	0.08
Serbia	1	0.08
Tunisia	1	0.08
Viet Nam	1	0.08
Undefined	50	3.94
Total	**1270**	**100.00**

Number of Author

Table 9 shows the number of author(s) per documents. While 206 (18.68%) documents are single-authored, the remaining documents (897; 81.32%) are reported as multi-authored publications with the number of authors ranging between two and 26.

Table. 9 Number of Author(s) per Document

Author Count	Frequency	% (N=1103)
1	206	18.68
2	296	26.84
3	284	25.75
4	175	15.87
5	67	6.07
6	42	3.81
7	9	0.82
8	7	0.63
9	1	0.09
10	2	0.18
11	1	0.09
21	1	0.09
22	1	0.09
26	1	0.09
0*	10	0.91
Total	**1103**	**100.00**

*Conference review document. No author is listed for this type of document.

Citation Analysis

Table 10 summaries the citation metrics for the retrieved documents as of 17 June 2018. Table 10 shows total number of citations with average citation per year for all retrieved documents. As indicated, there are 8,600 citations reported in 22 years (1996 – 2018) for 1,103 retrieved articles with an average of 390 citations/year.

Meanwhile, Table 11 discloses 20 most cited articles (based on number of times being cited). In addition to total citations reported by Scopus, the table also discloses total number of citations reported by Google Scholar. The document entitled "Accessibility of information on the web" by Lawrence and Giles [38] that was published in 1999 has so far receives the highest number of citations (917 citations or an average of 48.26 citations per year).

Table. 10 Citations Metrics

Metrics	Data
Reference date	17/06/2018 11:10:10
Publication years	1996-2018
Citation years	22 (1996-2018)
Papers	1103
Citations	8600
Citations/year	390.91
Citations/paper	7.80 (*count=3)
Citations/author	4127.37
Papers/author	512.53
Authors/paper	2.87/3.0/2 (mean/median/mode)
Age-weighed citation rate	952.77 (sqrt=30.87), 439.29/author
Hirsch h-index	37 (a=6.28, m=1.68, 3161 cites=36.8% coverage)
Egg he g-index	63 (g/h=1.70, 3997 cites=46.5% coverage)
PoP hI,norm	27
PoP hI,annual	1.23

Table. 11 Most cited articles

No.	Authors	Title	Year	Cites	Cites per Year	GS Cites	GS Cites per Year
1	S. Lawrence, C.L. Giles	Accessibility of information on the web [38]	1999	917	48.26	2482	137.89
2	J. Lazar, A. Dudley-Sponaugle, K.-D. Greenidge	Improving web accessibility: A study of webmaster perceptions [39]	2004	132	9.43	301	21.5
3	H. Petrie, O. Kheir	The relationship between accessibility and usability of Websites [40]	2007	112	10.18	226	20.55
4	T. Sullivan, R. Matson	Barriers to use: Usability and content accessibility on the Web's most popular sites [41]	2000	110	6.11	258	14.33
5	J. Mankoff, H. Fait, T. Tran	Is your web page accessible? A comparative study of methods for assessing Web page accessibility for the blind [42]	2005	102	7.85	227	17.46
6	P.T. Jaeger	Assessing Section 508 compliance on federal e-government Web sites: A multi-method, user-centered evaluation of accessibility for persons with disabilities [43]	2006	93	7.75	185	14.42
7	S. Hackett, B. Parmanto, X. Zeng	Accessibility of internet websites through time [44]	2004	86	6.14	147	10.5
8	C. Power, A.P. Freire, H. Petrie, D. Swallow	Guidelines are only half of the story: Accessibility problems encountered by blind users on the Web [45]	2012	77	12.83	137	22.83
9	K.M. Griffiths, H. Christensen	The quality and accessibility of Australian depression sites on the World Wide Web [46]	2002	73	4.56	124	7.75
10	J. Abascal, M. Arrue, I. Fajardo, N. Garay, J. Tomás	The use of guidelines to automatically verify web accessibility [47]	2004	72	5.14	147	10.5
11	L. Von Ahn, S. Ginosar, M. Kedia, R. Liu, M. Blum	Improving accessibility of the Web with a computer game [48]	2006	70	5.83	188	15.67
12	H. Ritchie, P. Blanck	The promise of the internet for disability: A study of on-line services and web site accessibility at centers for independent living [49]	2003	70	4.67	122	8.13
13	P. Sun, J.B. Unger, P.H. Palmer, P. Gallaher, C.-P. Chou, L. Baezconde-Garbanati, S. Sussman, C.A. Johnson	Internet accessibility and usage among urban adolescents in Southern California: Implications for web-based health research [50]	2005	68	5.23	130	10
14	M.G. Friedman, D.N. Bryen	Web accessibility design recommendations for people with cognitive disabilities [51]	2007	64	5.82	122	11.09
15	A. Schmetzke	Web accessibility at university libraries and library schools [52]	2001	64	3.76	130	7.65
16	M. Vigo, M. Arrue, G. Brajnik, R. Lomuscio, J. Abascal	Quantitative metrics for measuring web accessibility [53]	2007	60	5.45	103	9.36
17	Y. Shi	The accessibility of Chinese local government Web sites: An exploratory study [54]	2007	60	5.45	114	10.36
18	J.T. Richards, V.L. Hanson	Web accessibility: A broader view [55]	2004	59	4.21	125	8.93
19	J. Lazar, P. Beere, K.-D. Greenidge, Y. Nagappa	Web accessibility in the Mid-Atlantic United States: A study of 50 homepages [56]	2003	58	3.87	113	7.53
20	C.A. Adams, G.R. Frost	Accessibility and functionality of the corporate web site: Implications for sustainability reporting [57]	2006	55	4.58	140	11.67

*GS – Google Scholar

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IV. CONCLUSION

Greater concern over web accessibility issues come hand in hand with the growing Internet reliance by today's businesses and communities. This has attracted considerable attention from scholars worldwide to examine and recommend possible remedies to deal with issues surrounding web accessibility. In response, this study has initiated a review of all kinds of scholarly works published to date on this topic. The study reports the trend of earlier studies using selected bibliometric indicators as obtained from Scopus database. Overall, bibliometric details of 1,103 documents were extracted from Scopus database. The results indicate that English becomes a primary language in about 9/10 of the retrieved documents. While about 20% documents are single authored, close to 50% of the documents have either two or three authors. The data also shows an increasing trend on number of authorships per document over time. As for the contributing authors, the USA reported the highest numbers of contributing authors, followed by UK and Spain. However, there are sizable contributions of scholarly works on this research domain from other European and Asian countries.

Issues pertaining to web accessibility get attention from diverse subject areas such as Computer Science, Social Sciences, Mathematics and Engineering. Nevertheless, about half of the examined documents are classified under Computer Science. In another respect, number of publications on web accessibility is picking up since 2001. Along with the increase in frequency of publications per year, this study also indicates higher average number of authors per document over the years. This trend, to some extent, indicates greater collaboration among authors in this area.

Despite valuable insights offered by this article, readers should take into account several limitations. Firstly, this study employed specific query/keywords to locate initial list of scholar works published as indexed by Scopus. Nevertheless, this practice has been commonplace for earlier bibliometrics related studies [53–58]. Despite the fact that Scopus is among the largest online databases that indexes all scholarly works, it does not perfectly cover all available sources. Thus, some exclusions are very much expected from this study. Furthermore, no search query is 100% perfect to capture all the scholar works in this area. Thus, false positive and false negative results are always anticipated. Secondly, authors employed Scopus's definition to determine the ranking of authors and institutions presented in this study. Some authors or institutions might also register more than one name into Scopus or having it spelled differently. Thus, resulted to in accuracy of the productivity of their authorship and affiliation details. Despite these limitations, our study was among the first to analyze bibliometric indicators of web accessibility literature. Quite importantly, this study confirmed the previous findings of similar study in the field of mobile technology in terms of growth and authorship trends [20].

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