Analysis of Trends in Library Archive Digital Management from 2019 to 2023

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Article Info	**ABSTRACT**

This research aims to understand and find problems related to managing library digital archives using bibliometric analysis. Bibliometric analysis was carried out on journals on the topic "Library Digital Archive" taken from the Web of Science (WoS) which produced 3,211 overall results, then filtered again according to the period from 2019 to 2023 producing 847 data and 500 data were taken for bibliometric analysis. To overcome and minimize risks arising from digital library archives using biblioshiny applications related to literature from 2019 to 2023. Analysis of journals related to library digital archives requires adjustments to archive management to digital form following advances in information technology, by using the flowchart method to carry out bibliometric analysis to provide emphasis during training or formulating policies, to expand knowledge about library digital archives to obtain positive results from adapting information technology and trends related to library digital archive management.

ABSTRAK

Penelitian ini bertujuan memahami dan menemukan permasalahan terkait pengelolaan arsip digital perpustakaan menggunakan analisis bibliometric. Analisis bibliometrika dilakukan terhadap jurnal mengenai topik "Library Digital Archive" yang diambil dari Web of Science (WoS) yang menghasilkan 3.211 untuk hasil keseluruhan, kemudian difilter kembali sesuai periode muali 2019 sampai 2023 menghasilkan data sebanyak 847 dan diambil 500 data untuk dianalsis bibliometrik. Guna mengatasi dan meminimalisir resiko yang timbul dari adanya arsip digital perpustakaan dengan menggunakan aplikasi biblioshiny terkait literatur tahun 2019 sampai 2023. Analisis jurnal terkait arsip digital perpustakaan memerlukan penyesuaian pengelolaan arsip ke bentuk digital sesuai kemajuan teknologi informasi. Dengan menggunkan metode flowchart untuk melakukan analisis bibliometric guna memberikan penekanan saat pelatihan ataupun merumuskan kebijakan, untuk memperluas ilmu pengetahuan tentang arsip digital perpustakaan guna memperoleh hasil positif dari adaptasi teknologi informasi dan tren terkait pengelolaan arsip digital perpustakaan.

1. INTRODUCTION

Archives in an organization are very important as a source of information. By keeping up with the times, storing and rediscovering information documents that have been stored digitally. The development of technology has had an impact on the archives sector, where initially paper-based

archives were replaced with digital-based archives, the population of which could overflow. With the development of digital archives, it is now one of the best options to be implemented in agencies because it is more efficient in storing important and long-term files (Anisah et al., 2021; Azmir & Salim, 2022; Jarlbrink & Snickars, 2017; Tjiptasari, 2018). In the digital era, which is becoming a trend, archive management is also adapting to technological developments to change the archive base into digital form. The risks and opportunities of having archives on a digital basis will provide their contribution to their users. Over time, modernization will mean that archives on a digital basis need to be created and demanded to be used as much as possible to facilitate access to the network. Therefore, it is important to understand digital archives to maintain the continuity of an institution and meet the need for information (Devi et al., 2023; Dhani Sugiharto, 2010; Karauna et al., 2022).

In recent years, a diverse range of computerized information resources has been developed by publishers and libraries. Information is no longer produced in the form of paper and ink, but rather in electronic formats, such as e-books, e-papers, and other digital sources. The rapid growth in the production of electronic-based information has given rise to the term digital library (Safri, 2019). Library and information science concerned with the development of printed literature using several mathematical and statistical principles known as bibliometrics. Bibliometrics is a study activity to analyze and measure literature using quantitative methods and using mathematical and statistical approaches according to Prithchard (1969) in (Rifauddin, 2016). Bibliometrics is also defined by Reitz (2004) in article (Lincoln et al., 2021; Nkechi, 2015), which is a term that uses mathematical and statistical methods to study and identify patterns in the use of library materials and services or to analyze the development of special literature. Literature analysis uses bibliometrics to measure and understand unstructured research data (Yuadi, 2023). Bibliometrics is useful for making it easier to understand the overall picture of descriptions contained in research related to specific topics mathematically. Bibliometric studies that are carried out well can become a strong foundation for advancing a special field so that more understanding can be gained from a special field, not forgetting mathematics to make it more meaningful (Donthu et al., 2021; Tupan et al., 2018; Yuadi, 2023).

The development of this increasingly advanced era accompanied by developments in information technology has created an increasing need for information which has had an essential impact on the field of archives. Technology helps archive management in transforming the field of paper-based archives to digital formats which make it easy for users to store documents or data for long periods. In this digital era, advances in digital archive management are increasingly being used, and a lot of research has been carried out to develop digital archive management so that it can provide benefits in terms of efficiency and effectiveness for users (Chen & Chen, 2010; Fachmi & Grataridarga, 2023; Ferreira & Ramalho, 2004; Nyfantoro et al., 2020; Widiastuti & Yuadi, 2023). In line with the modernization process, digital archives are now considered more suitable to meet the needs of users who demand speed of sharing, ease of access, and flexibility in using them. So, it is necessary to adapt to the use of digital archives because advances in technology make digital archives important to use to maintain information needs and other benefits (Aldahwa Putri, 2022; Putranto, 2018; Tenawahang et al., 2023).

According to the Big Indonesian Dictionary, digital archives are a term for digital "relating to numbers for a particular calculation system". Meanwhile, digitalization is "the process of providing or using digital systems." Based on the meaning of the words digital/digitization, the terms digital/digitization and archives are in the context of the media. The purpose of digital archives is archival storage that is managed in digital form. Managing digital archives is currently an option for both institutions and organizations because it can streamline storage Library and information science is concerned with the development of printed literature using several mathematical and statistical principles known as bibliometrics. Bibliometrics is a study activity to analyze and measure literature using quantitative methods and using mathematical and statistical

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2. METHOD

This research uses a bibliometric approach method whose data is taken from a database published by Web of Science in a particular year. The reason for taking a bibliometric approach as the methodology used is to obtain an overview of research related to topics taken in a particular year. Apart from that, this bibliometric approach is used to measure the amount of research taken from a scientific field (Anggraini & Yuadi, 2023; Ellegaard & Wallin, 2015; Lestary et al., 2023; Sanusi et al., 2023; Triansyah & Kurniawati, 2024; Yuadi & Khusniah, 2022). The flow of this research from data collection to becoming an article is explained in the flowchart in Figure 1 below.

The methodology applicable, based on the flowchart in Figure 1, explains the flow of determining topics, collecting data, and arriving at conclusions about the topics or keywords to be studied. In the initial stage, the researcher determines what topic will be studied, the researcher finds a topic that matches what is desired, namely a discussion of library digital archives. Several other researchers have studied the topic of digital archives in certain sectors so that researchers determine what theme will be taken from the previously selected topic. Next, the researcher looked

for data and keywords that appeared and were needed from the theme taken. And don't forget to apply limit criteria to the data to select the type of data that is appropriate to the topic to be reviewed. (KS, 2021; Manurung & Manuputty, 2020).
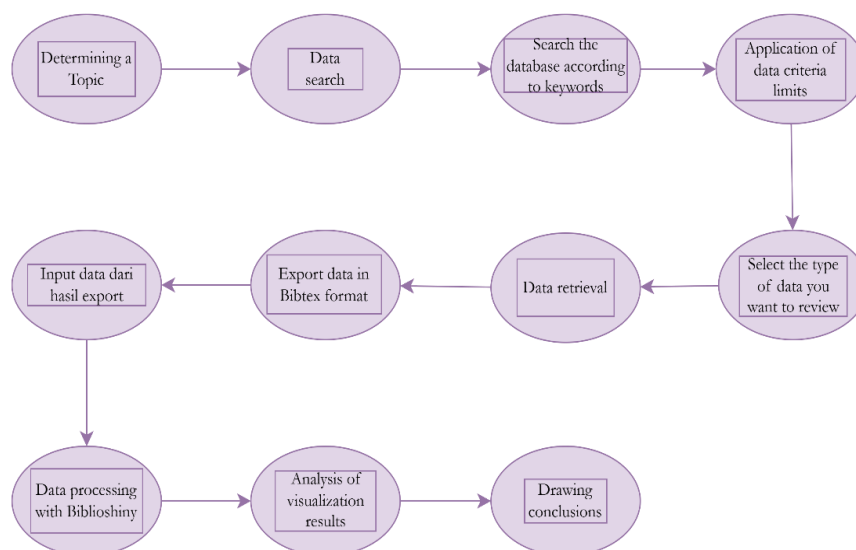

Figure 1. Flowchart

Based on this research, it was carried out using the bibliometric method, which is the application of mathematical and statistical methods to books, journals, proceedings and other communication media by retrieving the data needed by researchers taken from the Web of Science (WOS) for export into Bibtex format. Taking data on the topic " Library Digital Archive " taken from Web of Science (WoS) which produced 3,211 overall results, then filtered again according to the period from 2019 to 2023 producing 847 data, and 500 data were taken for bibliometric analysis (Hugar et al., 2019; Karauna et al., 2022; Sulisnaeni, 2022). Thus, researchers use bibliometric methods to carry out analyses related to the topic of library digital archives. With the help of the RStudio application, it is directed to the biblioshiny website so that researchers can analyze the data that has been exported. Next, data will be imported from the data export results on Web of Science (WOS) into biblioshiny so that researchers know the results of the digital archive topic description in the library that has been taken. Then, finally, data visualization will be carried out to draw appropriate conclusions according to the results of the analysis that researchers have carried out at biblioshiny (Aliwijaya et al., 2023; Az et al., 2024; Chavarro et al., 2019; Hidayat et al., 2023).

This article aims to analyze previous research on the topic of library digital archives from 2019-2023 using bibliometric methods, as well as taking an index of previous research data from the Web of Science. Apart from that, this article aims to discover the advantages and disadvantages of digital archives in libraries, as well as to find solutions to various problems in managing digital archives in libraries with the risks and impacts caused by digital archives.

3. RESULTS AND DISCUSSION

The characteristics of digital archive data in libraries have the main information summarized in Table 1 which explains the characteristics of scientific publications whose databases are taken from WoS, which are then processed using Biblioshiny for bibliometric analysis (Novia & Toni, 2022). Data taken from WoS is 500 filtered data covering several periods, starting from 2019 to 2023. Table 1 presents the main information from digital archive data in libraries which shows that there are 500 documents, some of which come from 260 sources (Journals, Books, etc.), which

have been written by 1367 authors and there are 182 single-author document authors who wrote on the topic of digital archives in libraries.

The annual growth rate of documents regarding digital archives in libraries was -9.84%, which experienced a decline in journals published on the topic of digital archives, with an average document age of 3.14 per year. Apart from that, the average citation is 2,528 documents with references from the WoS index of 14,495 documents from the vulnerable years 2019-2023.

Documents on the topic of digital archives in libraries are indexed in WoS from various types of documents, namely (329) articles, (5) book chapter articles, (14) early access article documents, (2) proceedings paper articles, (1) books, (23) book review documents, (17) material editorial documents, (1) material editorial documents; book chapters, (2) news items, (91) proceedings papers, (14) reviews, and (1) review documents; early access. There are 321 keywords in the document, apart from that there are also 1641 keywords written by the author. There are 186 author collaborations with documents written by a single author, while for documents written jointly there are 2.97. For writing documents in collaboration with international writers, it is 13%(Marbawi & Salim, 2019; Nani Rahayu & Sobari, 2021).

Table 2 and figure 2 explain the specific analysis regarding the production of documents or articles indexed in WoS regarding the topic of digital archives in libraries from 2019-2023. Table 1 displays 112 articles of documents produced in 2019, 109 articles were created in the following year, namely 2020, in 2021 WoS indexed 89 articles were produced, then in 2022 there was a good number of document production of 116 articles, and lastly in 2023 there will be 74 articles produced and indexed in WoS on the topic of digital archives in libraries.

Description	Results
Main Information About Data	
Timespan	2019:2023
Sources (Journals, Books, Etc)	260
Documents	500
Annual Growth Rate %	-9,84
Document Average Age	3,14
Average Citations Per Doc	2,528
References	14495
Document Contents	
Keywords Plus (Id)	321
Author's Keywords (De)	1641
Authors	
Authors	1367
Authors Of Single-Authored Docs	182
Authors Collaboration	
Single-Authored Docs	186
Co-Authors Per Doc	2,97
International Co-Authorships %	13
Document Types	
Article	329
Article; Book Chapter	5
Article; Early Access	14
Article; Proceedings Paper	2
Book	1
Book Review	23
Editorial Material	17
Editorial Material; Book Chapter	1
News Item	2
Proceedings Paper	91
Review	14
Review; Early Access	1

Table 1. Main Information Data

Year	Articles
2019	112
2020	109
2021	89
2022	116
2023	74

Table 2. Annual Scientific Production

Figure 2 displays a visualization of the graph of article production regarding digital archives in libraries that have been indexed in WoS. Processing this data produces results from the number of articles produced each year.
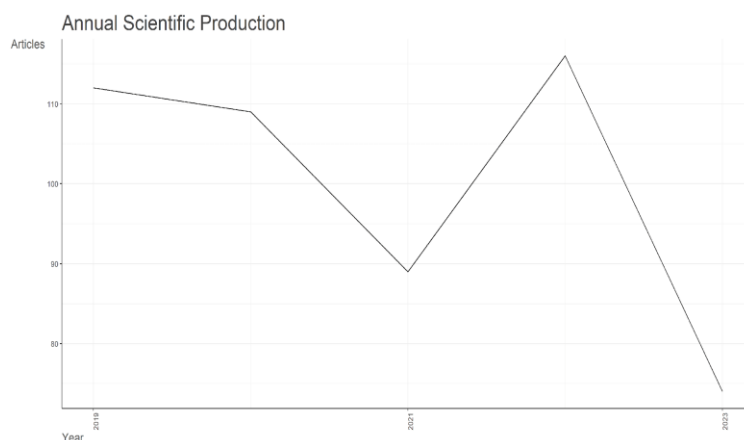

Figure 2. Annual Scientific Production

The production of article data from 2019 to 2023 that has been indexed by WoS is depicted in the annual scientific production graph in Figure 2. Figure 2 also explains the increase and decrease in the production of articles about digital archives in libraries that have been indexed by WoS. Judging from the graph, the year 2022 will be the year of the highest article production on digital archives with 116 article documents indexed by WoS. 2023 is the year that produces the lowest number of article documents indexed by WoS, where 74 articles were produced in that year.

Journals that publish many articles on the topic of library digital archives according to the results of the WoS index analysis can be seen from the picture shown in Figure 3 from Biblioshiny. Figure 3 provides an overview of the most relevant journals in studying the topic of library digital archives. The image shows the names of the top 10 journals that are relevant for publishing articles in library digital archives. Journals that are in the top 10 according to WoS analysis are; The first place is the journal Nauchnye I Tekhnicheskie Biblioteki-Scientific which published 22 articles on the topic of digital library archives, followed by the journal 2019 ACM/IEEE Joint Conference On Digital Libraries which published 14 articles, Electronic Library at number three also published 14 articles, the same as the previous journal. , while the journal Digital Library Perspectives also published 13 articles in its journal, the Journal of Documentation published 11 articles about library digital archives, Archival Science published as many and the International Journal On Digital Libraries published 8 articles each in its journal, and finally, there were three international journals published 7 articles in their respective journals, namely; journal ACM Journal On Computing And Cultural Heritage, Desidoc Journal Of Library & Information Technology, Journal Of Librarianship And Information Science. From the explanation, it can be concluded that many journal sources are relevant in publishing articles on the topic of library digital archives.
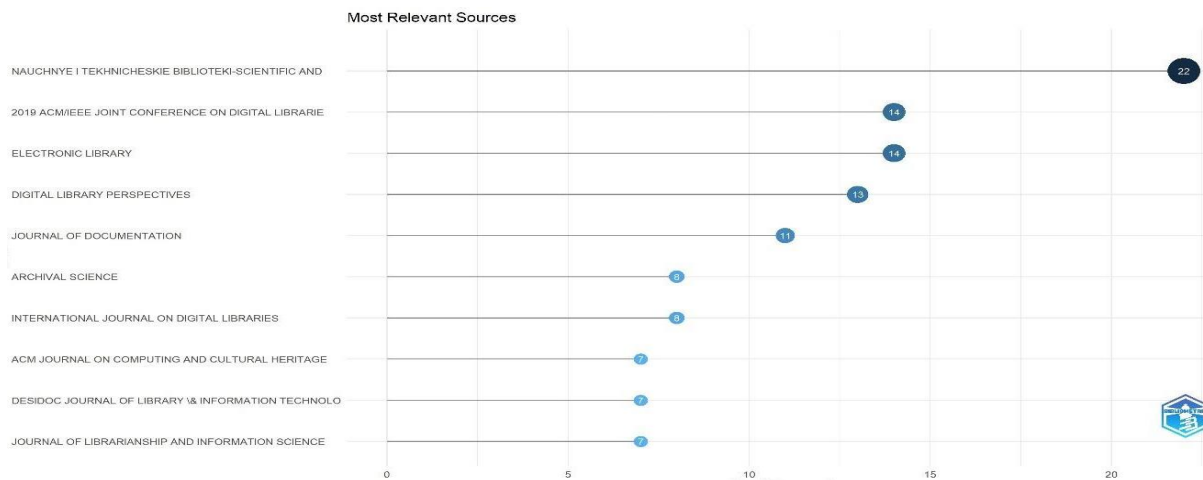
Figure 3. Most Relevant Sources

Meanwhile, the analysis according to Bradford's law is in accordance with Figure 4, showing the results of this legal ranking showing the ranking of international journals according to the number of articles published by the journal. The results of the ranking displayed are the same as the results of the Most relevant source analysis shown in Figure 3, but here we see 20 journals that publish articles about library digital archives.

The production of article authors on the topic of library digital archives from time to time, data taken and indexed in WoS starting from 2019-2023 shows several authors and the number of articles published each year as shown in Table 3. It can be seen from Table 3 that there are many articles about digital archives that have been written by several authors from 2019 to 2023. The categorization of article authors is shown in Table 3, the authors of articles on the topic of digital library archives are sorted according to the specified categories.
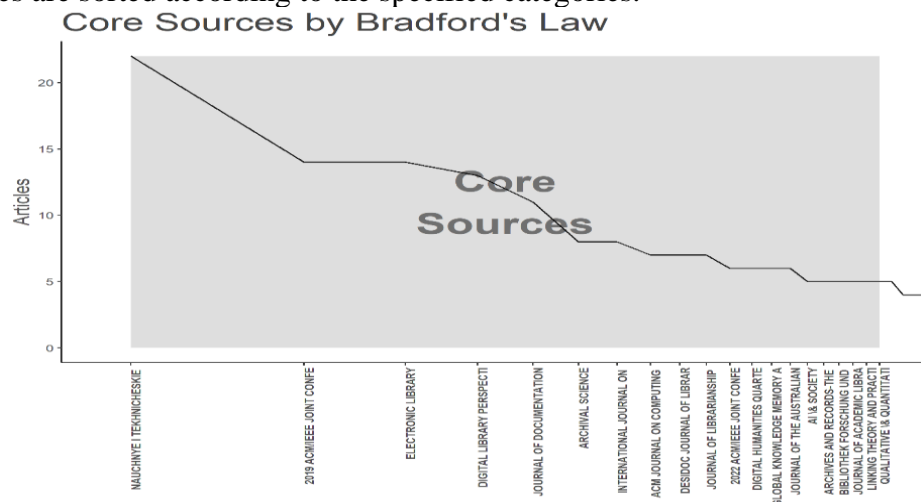
Figure 4. Bradford's Law

Table 3 also displays the number of articles created and published in journals, as well as showing in what year the author wrote the article about library digital archives.Authors who created and published articles on the topic of library digital archives from 2019 to 2023, as shown in table 3, namely; Kolosov KA published 6 articles, Goncharov M. published 5 articles, writer Milligan I. published 5 articles, then writer Shrayberg YL also has 5 articles, followed by writer

Candela G. who published 4 articles, the same as writers Klein M., Lin J ., Ruest N., Xie Z., Zavalina OL who also wrote 4 articles in the period 2019 to 2023.

The countries that cite the most articles are visualized in Figure 5 which shows a map of which countries cite articles on the topic of digital archives. An explanation of the number of countries that cite is also shown in Table 4 which shows the top ten countries that have cited the most articles on the topic of digital library archives. The country that frequently cites articles about digital library archives is Spain with an average of 22.30 articles cited (335 articles). This is followed by several other countries which have average citations for article documents on the topic of digital library archives, such as the average for documents cited in the USA is 1.80 (235 articles), the UK average is 3.10 (105 articles), then Austria with an average -average citations 2.30 (42 articles, for other countries, namely Netherlands, Australia, Ireland, Germany, Canada, China, and so on. The average results can be seen clearly through the table that has been displayed or seen through bibliographic analysis with index data from WoS about library digital archives.

Many articles are also cited by other authors in several articles and individual reports. Table 5 shows the ten most cited articles in the period 2019 to 2023 with a total of 500 other article documents that have been indexed by WoS regarding digital archives and libraries. Table 5 shows the name of the author, year and journal in which it was published article, apart from that it also shows the number of citations of the document and shows the DOI link column of the article to see in detail the contents of the article (Astuti & Lestariningsih, 2021; Meiladinov & Andriyani, 2022; Stork & Astrin, 2014).
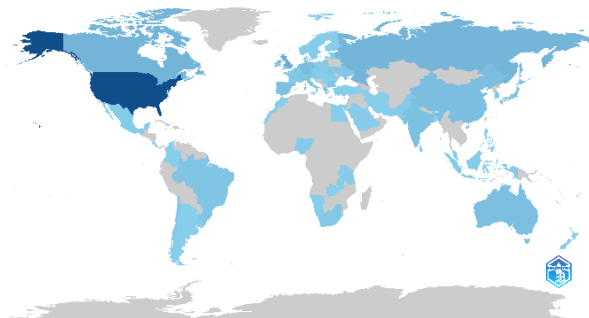

Figure 5. County scientific production

Country	T.C	Average Article Citations
Spain	335	22.30
Usa	235	1.80
United Kingdom	105	3.10
Austria	76	25.30
Netherlands	67	6.10
Australia	42	2.30
Ireland	40	3.60
Germany	39	2.10
Canada	34	1.30
China	34	2.10

Table 4. Most Cited Documents

Author	Years	Freq
Kolosov Ka	2020	3
Kolosov Ka	2021	2
Kolosov Ka	2022	1
Goncharov M	2020	2
Goncharov M	2021	2
Goncharov M	2022	1
Milligan I	2019	3
Milligan I	2020	1
Milligan I	2022	1
Shrayberg Yl	2020	3
Shrayberg Yl	2021	1
Shrayberg Yl	2023	1
Candela G	2021	1
Candela G	2022	2
Candela G	2023	1
Klein M	2019	1
Klein M	2021	1
Klein M	2022	2
Lin J	2019	4
Ruest N	2019	3
Ruest N	2022	1
Xie Z	2019	2
Xie Z	2022	1
Xie Z	2023	1
Zavalina Ol	2021	2
Zavalina Ol	2022	1
Zavalina Ol	2023	1

Table 3. Authors' production over time

This table also shows the average normal number and the annual number of cited articles. In first place Table 5 shows articles written by Aguado DS and his team which published articles in 2019 in the IEEE Trans Vis Comput Graph journal, with the number of article document citations per year being 51.33 (total citations 308). For further explanation, you can see directly in Table 6 which contains details of the 10 most cited articles as well as article links, average citations, and the number of sites in an article on the topic of library digital archives whose data has been taken from WoS.

Paper	DOI	Total Citations	TC per Year	Normalized TC
Aguado Ds, 2019, Astrophys J Suppl Ser	10.3847/1538-4365/aaf651	308	51.33	48.04
Windhager F, 2019, Ieee Trans Vis Comput Graph	10.1109/TVCG.2018.2830759	69	11.50	10.76
Yan R, 2019, Astrophys J	10.3847/1538-4357/ab3ebc	42	7.00	6.55
Wevers M, 2020, Digit Scholarsh Humanit	10.1093/llc/fqy085	31	6.20	10.46
Uehlberger G, 2019, J Doc	10.1108/JD-07-2018-0114	29	4.83	4.52
Champion E, 2020, Virtual Archaeol Rev	10.4995/var.2020.13226	26	5.20	8.77
Zeng Ml, 2019, Prof Inf	10.3145/epi.2019.ene.03	21	3.50	3.28
Acker A, 2020, Arch Sci	10.1007/s10502-019-09325-9	20	4.00	6.75
Romein Ca, 2020, History	10.1111/1468-229X.12969	19	3.80	6.41
Fanea-Ivanovici M, 2020, Ieee Access	10.1109/ACCESS.2020.2975542	16	3.20	5.40

Table 5. Most Global Cited Documents

Figure 6. Words Cloud

Figure 6 and Figure 7 show the keywords that are frequently used in WoS-indexed articles regarding library digital archives. To see the frequency of a keyword in articles on the topic of library digital archives, you can use the results of bibliometric analysis of WoS data which shows that the larger the word size, the more frequently the keyword is used in the content of the article. In Figure 6, the so-called word cloud visualizes the frequency of words frequently used in articles about library digital archives. It can be seen from Figure 6 that the keywords library and archive appear to be the largest in size compared to the other keywords, this shows that the words library and archive are often used in articles on the topic archive digital library.

The results of bibliometric analysis on keywords that are often used in articles are also shown in Figure 7 which is called a treemap. The treemap in the figure shows that the larger the square of a keyword, the greater the percentage of usage of that word in articles for the period 2019-2023 whose data has been indexed by WoS. For example, the keyword library has a keyword usage

percentage in the 2019-2023 period of 8%, followed by the word archive which has a usage percentage of 6%, and you can see even more results of the keyword usage percentage in articles about library digital archives from Figure 7. The data results were taken from biblioshiny analysis by obtaining indexed data from WoS.
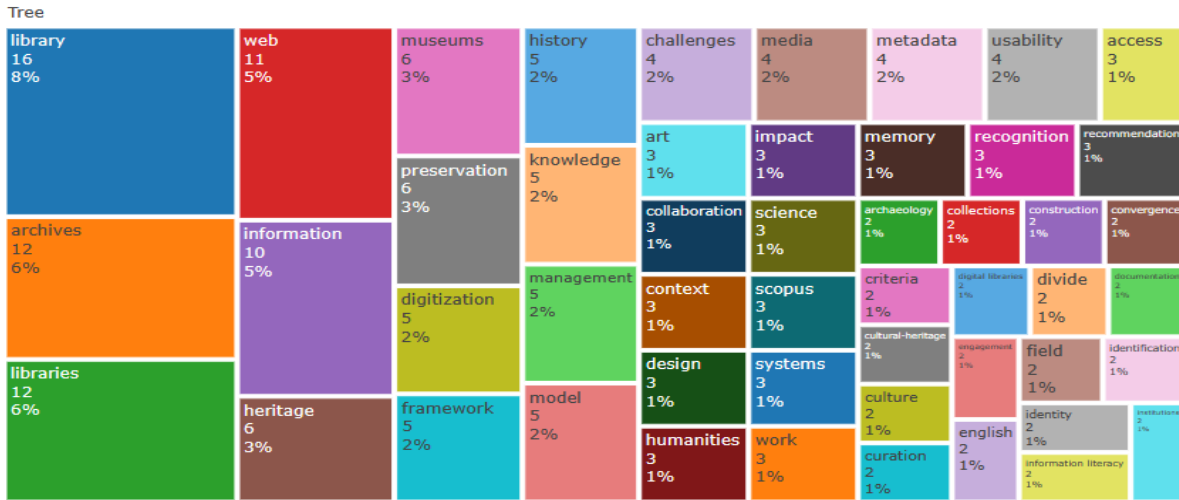

Figure 7. Tree Map

Figure 8. Co-occurrence Network

Co-occurrence network analysis presents the results shown in Figure 8. The bibliographic analysis method is used to examine the possible relationships between two bibliographies. From the results of bibliometric analysis regarding the relationship between co-occurrences in articles indexed in WoS regarding library digital archives, several cluster results are shown. The first and most significant cluster is visualized in red. This topic is often triidentified consisting of, libraries, archives, museums, heritage, collaboration, challenges, and construction. The second cluster depicted in blue contains topics; library, information, usability, impact, and access. Finally, the cluster illustrated in green is identified as consisting of topics; web, scopus, and science.
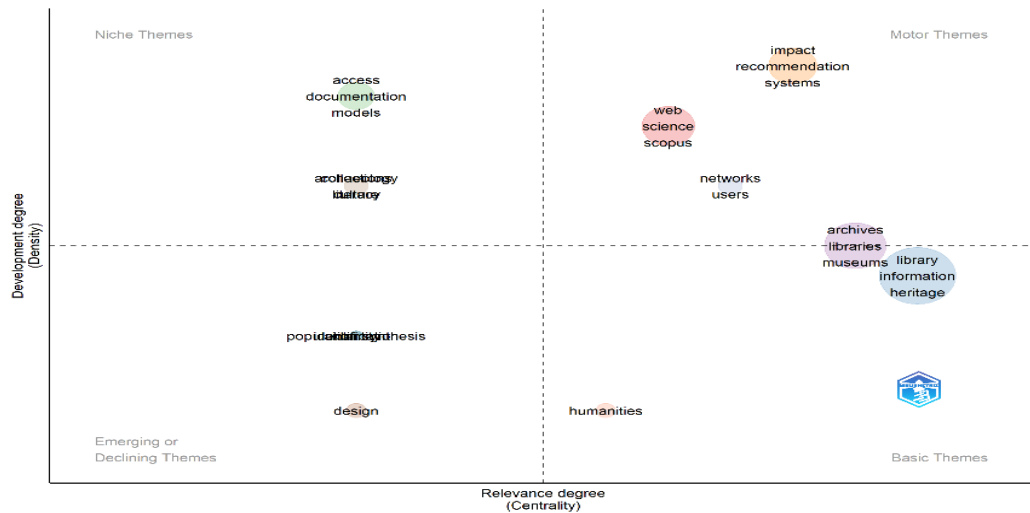
Figure 9. Thematic Map

The concept of analytical structure of digital library archive topics that have been indexed in WoS is analyzed according to Figure 9 and Figure 10, namely in thematic mapping. Thematic mapping in question is grouping keywords thematically using algorithms. The thematic map visualized in Figure 9 and Figure 10, shows the results of the analysis of the relationship between several factors and each other. This is useful for understanding the evolution of research topics, identifying emerging topics, and displaying the overall thematic structure of the digital archive regarding relevant factors and their influence. Figure 9 shows several topic clusters that have been arranged into a thematic map regarding the topic of library digital archives, and Figure 10 shows a visualization of the relationship clusters for each factor in the library digital archive. Figure 9 and Figure 10 show several clusters with different colors, namely, red, green, purple, and blue. According to the color, the cluster includes several topics that have been grouped thematically. for example, one of the red clusters includes document data retrieval sources (Web, science, Scopus) that have been indexed on the topic of library digital archives. Figure 10 shows a more detailed network of relationships between keywords, identified in articles on the topic of library digital archives, which have been indexed in WoS and then the results shown are bibliometric analysis
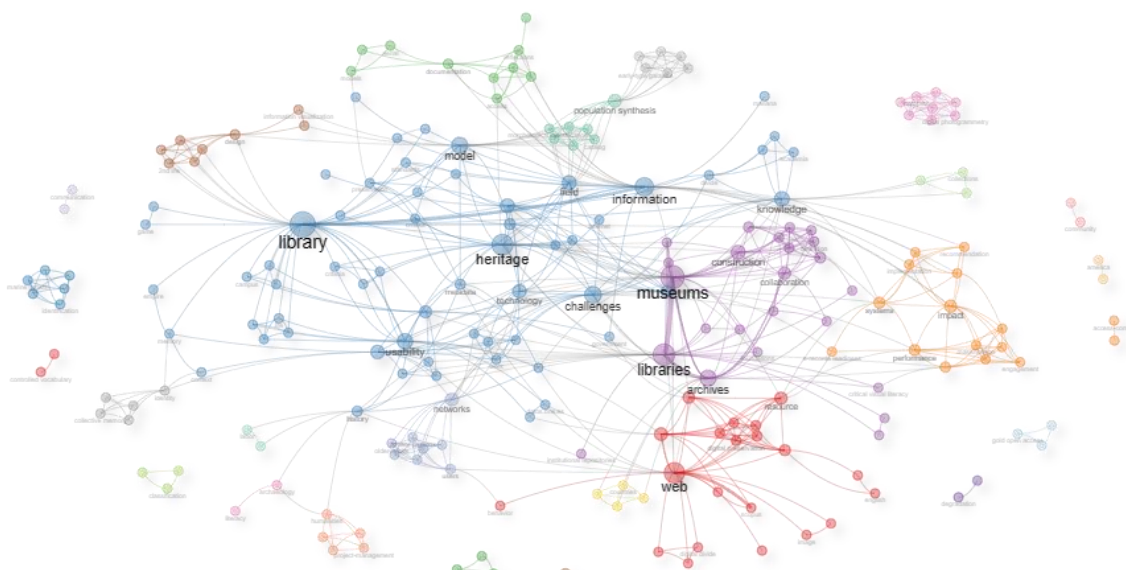

Figure 10. Thematic Map Network

(biblioshiny). Figure 10 shows a network of relationships, such as the word library is related to the word's heritage, information, model, challenges, and other words.

Regarding factorial analysis, using bibliometric analysis on the topic of library digital archives uses an approach with statistical procedures to identify several small factors from the various relationships between the variables used in the topic of library digital archives. The visualization shown in Figure 11 shows several factors that have been identified through bibliometric analysis (bibloshiny). This factorial analysis shows the number of correspondences or the number of variables in the library digital archive topic index data from 2019 to 2023. All cluster sections in Figure 11 are colored red and show what factors have been identified, such as resource, impact, information, and many other factors. influence and relate to each other.
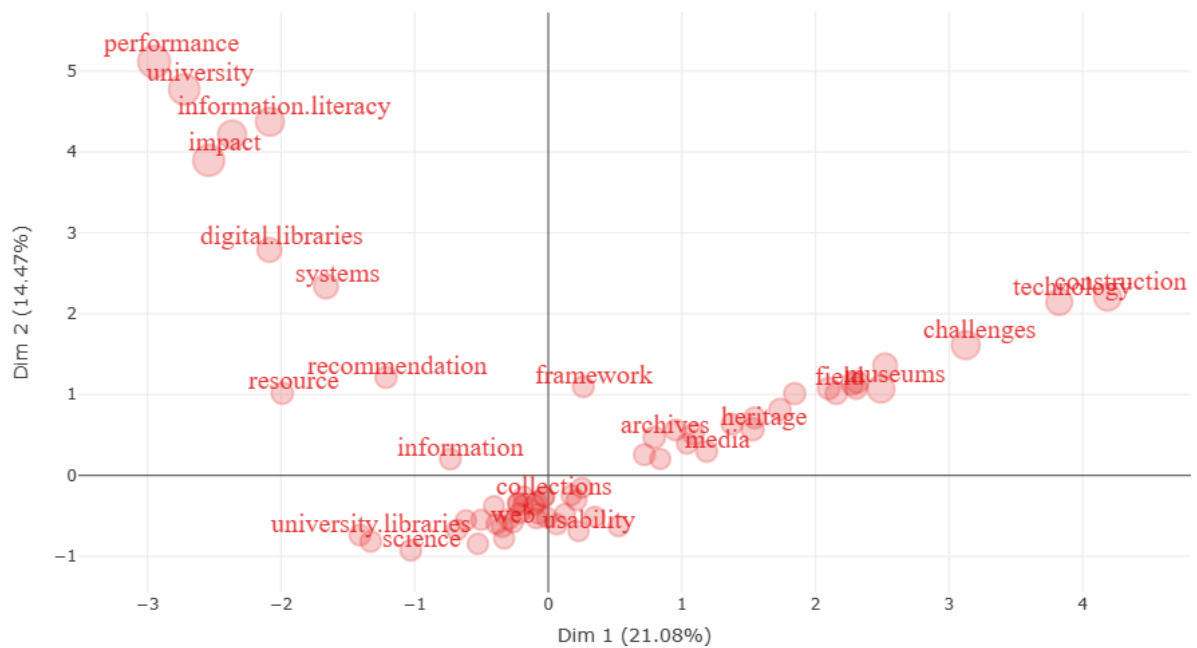

Figure 11. Factorial Analisis

Co-citation network analysis in bibliometrics (biblioshiny) aims to identify the frequency with which article documents are quoted or cited by other articles or research. Figure 12 shows a visualization of which documents are often cited when writing articles on the topic of library digital archives. The picture also shows an analysis of joint citations to understand the relationship between documents and identify which articles or documents have the same topic or are interconnected with the topic of library digital archives.
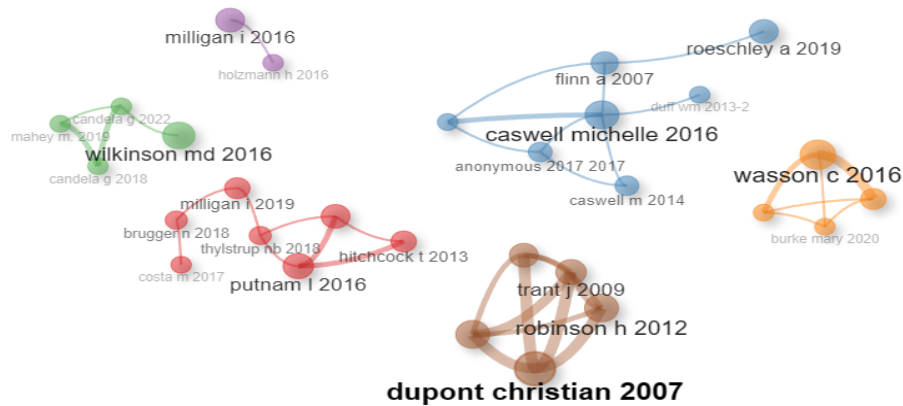
Figure 12. Co-citation Network

Co-citation networks are useful for increasing the integrity of knowledge and providing facilities for identifying relevant scientific literature and communication in compiling articles or research reports. It can be seen from Figure 12 that the document article written by Wasson C. was cited in 2016, Robinson H. compiled an article that was cited in 2012 and articles written by other researchers can be seen from Figure 12. So, the explanation in Figure 12 shows the articles cited will be interconnected if several article authors cite compiled articles, this will happen because the field of study being researched, such as library digital archives, is appropriate and relevant between the compiled articles and previous research articles to be quoted or cited in the latest articles.
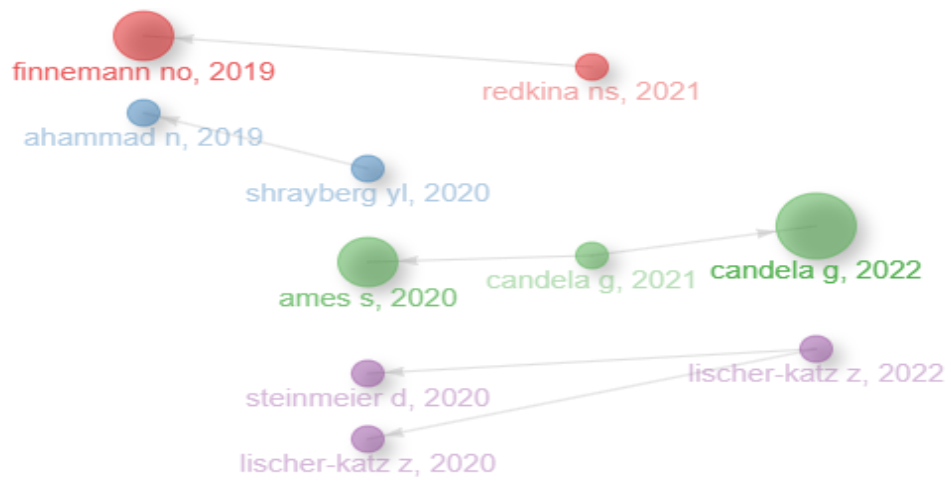

Figure 13. Historiograph

The results of bibliometric analysis (biblioshiny) regarding historiography explain history which refers to a field of science being researched, as Figure 13 shows the authors who have been identified as compiling or helping to create articles on the topic of library digital archives in the period 2019 to 2022. The information available in Figure 13 shows the relationship between articles and articles cited during the 2019-2022 period regarding the topic of library digital archives. Apart from that, Figure 13 is useful for showing or looking for additional sources that are relevant to the topic of library digital archives, such as the article written by Ames S. in 2020 which can be a source of additional information that can be cited for further research, namely Candela G. in 2021 and 2022 in the articles he has prepared. For other relationships between articles, you can see Figure 13, which displays several article authors and article authors citing them from year to year from 2019 to 2023.

Node	Cluster	Betweenness	Closeness	PageRank
kolosov ka	1	0	0.25	0.02894574725861431
goncharov m	1	0	0.25	0.02894574725861432
shrayberg yl	1	2	0.3333333333333333	0.0270373868878941
volkova ky	1	0	0.2	0.01763522115897984
klein m	2	4	0.1666666666666667	0.03005491524414586
xie z	2	0.8	0.1666666666666667	0.03617211320943235
fox ea	2	0.8	0.1666666666666667	0.03617211320943235
ayala br	2	0	0.125	0.01547999770726149
jones sm	2	0	0.1	0.008103933505741177
kelly m	2	0.4	0.1666666666666667	0.02786308097014068

Table 5. Collaboration Network

In social structural analysis, it is divided into two, namely collaboration networks and countries, collaboration word map. This analysis shows what cooperative relationships are in compiling articles, starting from cooperative relationships between article authors or cooperative relationships between countries in compiling articles. Figure 14 and Table 5 show the collaboration network, which is a relationship between one author and another. Only some of the authors are shown in the table. From Table 5, only some of the authors are shown from 39 other authors who have written articles on the topic of library digital archives. It can be seen from Figure 14 that the author's relationship network is illustrated with one other author in compiling articles from 2019 to 2023, details of the collaborative relationship between the authors can be seen in Table 5 which contains several forms of explanation in the table. As an example of author collaboration, the relationship between authors shown in Figure 14 is that authors Shiri A and Kelly EJ, have collaborated to compile and publish articles on the topic of library digital archives.

Collaborative relations between countries are shown in Figure 15 and Table 6 which shows the detailed network of relations between countries in compiling articles on the topic of library digital archives from 2019 to 2023. In Figure 15 you can see the connecting network of countries collaborating. connecting network in the country's collaboration map. Judging from the illustration of the country collaboration map, many countries have collaborated in compiling articles or conducting research on the topic of library digital archives in the period 2019 to 2023.
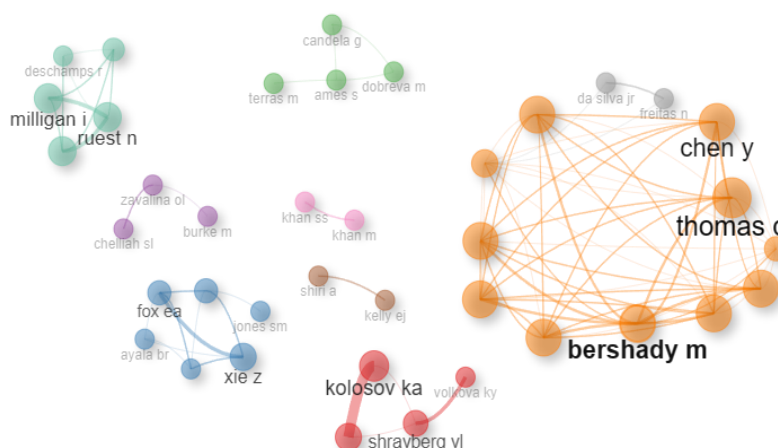

Figure 14. Collaboration Network

To be able to see in more detail which countries are collaborating in preparing articles or research from WoS index data on the topic of library digital archives from 2019 to 2023, shown in Table 6 which shows the collaboration relationship and the number of articles published, such

as Belgium collaborating. with Denmark, Estonia, and Luxembourg having published one article on each collaboration between their countries. Through bibliometric analysis (biblioshiny) of WoS indexed library digital archive topic data, the results of the bibliometric analysis (bibloishiny) show that the total number of countries collaborating is 272 by also displaying the number of articles produced between countries from 2019 to 2023.

From	To	F
Australia	Brazil	1
Australia	Chile	1
Australia	France	1
Australia	Hungary	1
Australia	Italy	1
Australia	Japan	1
Australia	Korea	1
Australia	Mexico	1
Australia	Norway	1
Australia	South Africa	1
Australia	Spain	1
Australia	Sweden	1
Australia	Switzerland	1
Australia	U Arab Emirates	1
Austria	Finland	1
Austria	Switzerland	1
Belgium	Denmark	1
Belgium	Estonia	1
Belgium	Luxembourg	1
Brazil	Chile	1
Brazil	France	1

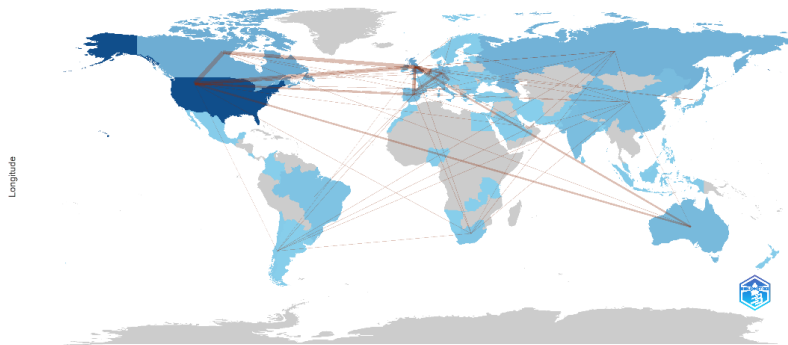Table 6. Countries' Collaboration World Map

Country Collaboration Map

Figure 15. Countries' Collaboration World Map

This research aims to use bibliometric analysis (biblioshiny) by taking research data publications that have been indexed in the WoS database, to identify the writing of journal articles, papers, and other fields of study related to the topic "library digital archives" within a certain period. has been determined. The data period taken in WoS starts from 2019 to 2023 with the amount of data exported being 500 documents that have been indexed in the WoS database. In the data taken, there were 1367 authors divided into 182 single authors on documents, and 186 authors who collaborated as sole authors of documents. The average co-authorship was 2.97 for documents while international co-authorship was 13%. The results of the bibliometric analysis also show what types of documents are indexed in the WoS database which uses the topic of library digital

archives, namely: articles; book chapters, articles; early access, articles; proceedings paper, book, book reviews, editorial material, editorial material; book chapters, news items, proceedings papers, reviews, and reviews; early access.

The results of this research by carrying out bibliometric analysis (biblioshiny) highlight the topics that appear most frequently or are used in research documents related to "Library Digital Archives, as well as the large percentage of citations in documents related to the topic, apart from that it also highlights the collaboration of author networks that are interconnected in various forms such as an article writing team or a relationship that cites documents related to the appropriate field. The results of the analysis also reveal that the annual publication trend related to "library digital archives" has experienced a drastic decline, however in 2020 and 2022 many documents related to library digital archives will be published, this can happen due to one factor such as the increase in the number of internet users and the start of the public's literacy towards technology because digital-based archive technology is considered easier compared to manual archives in the form of paper books.

Journal publications related to digital archives in libraries in the period 2019 to 2023 explain many factors related to the topic taken, as well as displaying factors related to the topic. Various factors related to the topic of library digital archives from the results of bibliometric analysis (biblioshiny) show many factors from performance, university, impact, system, information, and many more that can be seen in the factorial analysis map. This can increase the system's job satisfaction in archiving documents according to its field, especially concerning the library digital archive field which often groups documents to be stored and can be found again when information seekers need it. Apart from that, it can also have an impact on making human life easier by using technological assistance in storing documents and rediscovering document information that has been stored in databases, to create a more efficient and effective life in preserving documents digitally.

4. CONCLUSION

This research is the result of an analysis that has been carried out using bibliometrics (biblishiny) and explains the results of its analysis through visualization of index data taken from the Web of Science (WoS) regarding " Library Digital Archives ". From this bibliometric analysis, several important pieces of information were found that helped in representing the image of published documents related to "Library Digital Archives". From the data taken and analysis carried out to obtain the conclusion that from 2019 to 2023 international articles related to " Library Digital Archives " were widely studied by researchers from year to year, however, there were visible increases and decreases in the period 2019 to 2023. Trends about the library's digital archives, this bibliometric analysis provides broader knowledge regarding the topic being studied due to the occurrence of several phenomena that cause researchers to study to publish articles related to the library's digital archives. Of the many factors related to the topic of library digital archives, ranging from performance, university, impact, system, information, and many more, which can be seen in the factorial analysis map.

A total of 500 articles taken from all over the world have been published regarding digital library archives and many countries have cited documents related to this topic, with Spain being the highest citation with a total of 335 documents cited from the results of the bibliometric analysis. Based on this study, it is proven that technology has played an important role in managing digital archives because developed countries have made a good contribution to managing their digital archives. Articles that have been indexed by the Web of Science can provide directions for future research. Regarding the topic of " library digital archives " currently it still needs to be explored further so that problems and other impacts can be addressed properly by developments in information technology. This is to reduce errors in managing the library's digital archives so that the data obtained is more accurate. Don't forget that when analyzing data in bibliometrics, you

must be careful so that researchers can obtain accurate and correct data. For this reason, it is necessary to understand the use of bibliometrics in analyzing an international journal article so that the resulting analysis results are appropriate and correct.

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