

DATA GOVERNANCE AND ITS SCIENTIFIC OUTLOOK IN INDONESIA: A LITERATURE REVIEW

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ABSTRACT

Data is a crucial asset in every organization nowadays. Data governance is needed to manage and control data. The development and implementation of data governance in Indonesia are fascinating. This paper aims to find the trending topic of data governance study in Indonesia. This paper used a literature review method to find trending topics.

In Indonesia, data governance has been discussed in topics: the data governance design/model, data governance maturity, and data governance's relationship with other variables. Most of the study was looking at data governance in government institutions. For future research in data governance in Indonesia, more research on the impact of data governance is challenging. Furthermore, identify the relationship of data governance with other variables such as data quality, data security, and the performance also engaging to be studied. Besides, the study on data governance in other institutions such as higher education, hospital, the financial industry, and other service organization also has an opportunity.

Keywords: Data governance; Indonesia; Literature review.

INTRODUCTION

Data becomes an essential asset in the organization. Organizations should appropriately manage their data since data is an asset (Khatri & Brown, 2010; Ladley, 2020). Effective data governance can solve data problems (Al-Ruithe et al., 2018). Data governance can be defined as "the policies and processes that continually work to improve and ensure the availability, accessibility, quality, consistency, auditability, and security of data in a company or institution" (Schmidt & Lyle, 2010). Many studies have discussed data governance for more than a decade.

"Data Governance always has been a complicated issue for most organizations" (Zaino, 2020). Better data governance practices could help the government handle complex rapid change faces (Findie et al., 2016). Indonesia faces complex development challenges as a developing country, which means the government needs better data governance. Identifying research topics on data governance in Indonesia is essential since data governance becoming word wide issue. Moreover, based on the Scopus database, scholars from many countries such as the United States, the United Kingdom, and some countries in Asia, including Indonesia, have studied data governance. Figure 1 shows the countries' network analysis by VOS Viewer software.

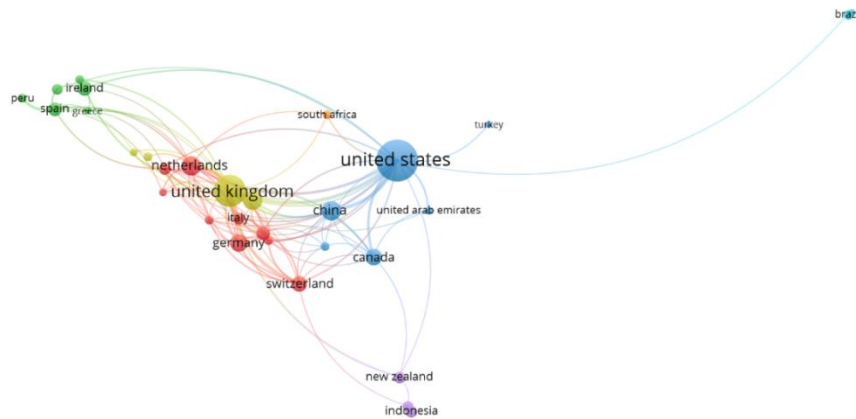


FIGURE 1

COUNTRY NETWORK ANALYSIS BY VOS VIEWER

Hence, this paper will describe data governance research topics in Indonesia and potential further research on data governance. This study aims to find data governance research topics in Indonesia. This study is a literature review study using Scopus and Web of Science (WoS) as database resources and Google Scholar as another resource.

DATA SOURCES AND METHODOLOGY

This comprehensive literature review has involved extensive note-taking highlighting any possible references to data governance and Indonesia. Articles containing references to data governance are then analyzed in more depth for finding the research topics. Part of this analysis involves differentiating and combining the collected data (Miles & Huberman, 1994). Emphasis is placed not on the words themselves but on the meaning of the words. Therefore, regardless of the description, all data governance is recorded to understand that the sorting stage will begin to place data governance in a similar category.

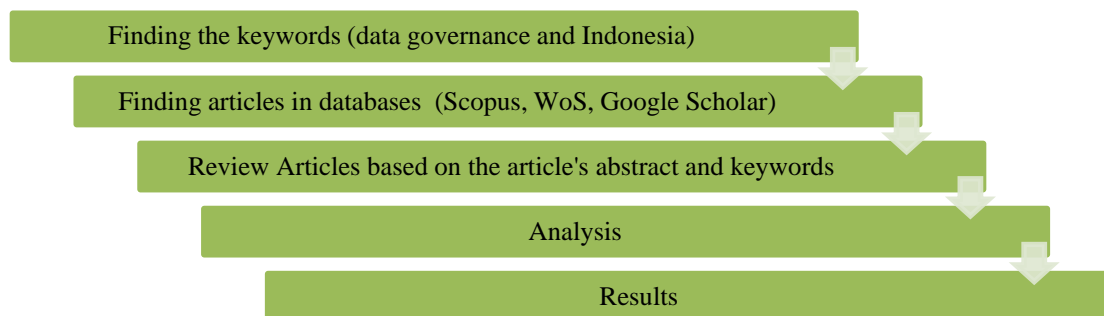


FIGURE 2

RESEARCH PROCEDURES

The analysis level can be a signal word, a set of words, phrases, or an entire document (Finney & Corbett, 2007). In this study, data governance and Indonesia are a set of words that become a keyword for sorting the articles from the database resource. After papers were sorted, the articles were reviewed based on the abstract and author keywords before analyzing them. Figure 2 shows the research procedure in this study.

RESULT AND DISCUSSION

This study aims to identify and categorize the literature that explicitly mentions data governance researched in Indonesia. To identify and classify data governance topics, this study following some procedures as shown on the PRISMA diagrams (Figure 3) and is explained below.

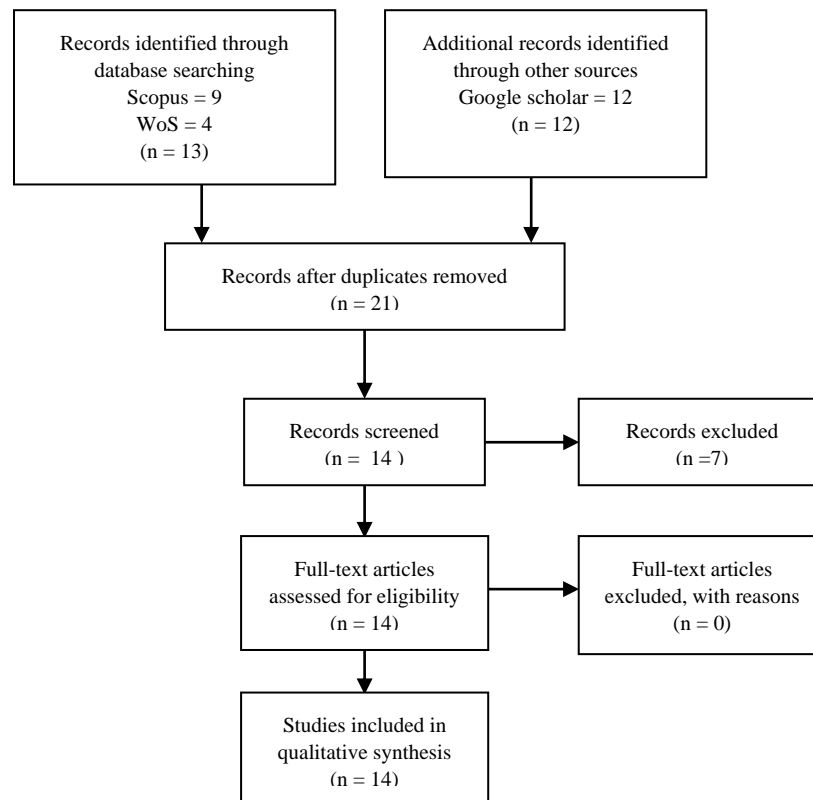


FIGURE 3

PRISMA DIAGRAM

First, this study decided to use data governance and Indonesia to identify articles from the databases. Scopus and WoS were used as database resources and Google Scholar as another resource. Second, finding articles on Scopus, WoS, and Google Scholar using keywords data

governance and Indonesia. Twenty-one articles were found in this step, consisting of nine papers found in Scopus, four papers also found in WoS, and twelve articles found in Google Scholar. Table 1 gives detail information about each founded article. These articles were published from 2010 until 2020 in various conference proceedings and journals. Most of the articles published in the conference proceedings, such as:

1. the International Conference on Advanced Computer Science and Information Systems (ICACSIS),
2. the International Conference on Information Technology Systems and Innovation (ICITSI),
3. AIP Conference,
4. International Conference on ICT for Smart Society (ICISS),
5. ACM International Conference,
6. International Conference on Information Management and Technology (ICIMTech),
7. International Conference on Industrial Enterprise and System Engineering (IcoIESE),
8. International Conference on Cyber and IT Service Management (CITSM), and
9. International Conference on Electrical Engineering and Informatics (ICEEI).

Whereas only six journals, two national journals and four international journals, published the articles, such as

1. Marine Policy Journal,
2. International Journal of Advanced Engineering Research and Science (IJAERS),
3. Jurnal Ilmiah Teknologi Informasi Terapan,
4. BRITech (Jurnal Ilmiah Ilmu Komputer, Sains dan Teknologi Terapan),
5. International Journal of Engineering & Technology, and
6. Journal of Information Systems

TABLE 1					
PAPERS RESULTING FROM EACH DATABASE ON THE 10th SEPTEMBER 2020					
No	Authors	Title	Year	Publish in	Sources
1	Aisyah M., Ruldeviyani Y.	Designing data governance structure based on data management body of knowledge (DMBOK) Framework: A case study on Indonesia deposit insurance corporation (IDIC)	2019	2018 International Conference on Advanced Computer Science and Information Systems, ICACSIS 2018	Scopus and WoS
2	Saputra D.A., Handika D., Ruldeviyani Y.	Data Governance Maturity Model (DGM2) Assessment in organization transformation of digital telecommunication company: Case study of PT Telekomunikasi Indonesia	2019	2018 International Conference on Advanced Computer Science and Information Systems, ICACSIS 2018	Scopus and WoS
3	Putro B.L., Surendro K., Herbert H.	Leadership and culture of data governance for the achievement of higher education goals (Case study: Indonesia University of Education)	2016	AIP Conference Proceedings	Scopus and WoS

4	Tallis H., Levin P.S., Ruckelshaus M., Lester S.E., McLeod K.L., Fluharty D.L., Halpern B.S.	The many faces of ecosystem-based management: Making the process work today in real places	2010	Marine Policy Vol. 34, Issue 2, 2010	Scopus and WoS
5	Wibowo S., Sandikapura T.	Improving Data Security, Interoperability, and Veracity using Blockchain for One Data Governance, Case Study of Local Tax Big Data	2019	Proceeding - 2019 International Conference on ICT for Smart Society: Innovation and Transformation Toward Smart Region, ICISS 2019	Scopus
6	Utama R.P., Purwandari B., Satria R., Kumaralalita L.	Open government maturity measurement on social media usage: The ministry of foreign affairs in Indonesia case study	2019	ACM International Conference Proceeding Series	Scopus
7	Maulina J., Ruldeviyani Y.	Data Governance and Data Architecture for the Ministry of Foreign Affairs of the Republic of Indonesia	2019	Proceedings of 2019 International Conference on Information Management and Technology, ICIMTech 2019	Scopus
8	Sekarhati D.K.S., Nefiratika A., Hidayanto A.N., Budi N.F.A., Solikin	Online Travel Agency (OTA) Data Maturity Assessment: Case Study PT Solusi Awan Indonesia -'Flylist'	2019	Proceedings of 2019 International Conference on Information Management and Technology, ICIMTech 2019	Scopus
9	Arman A.A., Sembiring J., Suhardi	The importance of data management to support open data - Case study in Indonesia	2014	ACM International Conference Proceeding Series	Scopus
10	Remi Indra Permana, Jarot S. Suroso	Data Governance Maturity Assessment at PT. XYZ. Case Study: Data Management Division	2018	2018 International Conference on Information Management and Technology (ICIMTech)	Google Scholar
11	Dwitama Heryadi Kurniawan; Yova Ruldeviyani; Mohammad Rizky Adrian; Sutia Handayani; M. Rizki Pohan; Rani Khairunnisa T	Data Governance Maturity Assessment: A Case Study in IT Bureau of Audit Board	2019	2019 International Conference on Information Management and Technology (ICIMTech)	Google Scholar

12	Dody Setiyawan	A Proposed Model of IT Governance within Cloud Computing and Data Management in Higher Education	2019	International Journal of Advanced Engineering Research and Science (IJAERS), Vol-6, Issue-10, Oct- 2019	Google Scholar
13	Alivia Yulfitri	Modeling operational model of data governance in government: Case study: Government agency X in Jakarta	2016	2016 International Conference on Information Technology Systems and Innovation (ICITSI)	Google Scholar
14	Hanung Nindito Prasetyo	A Review of Data Governance Maturity Level In Higher Education	2016	Jurnal Ilmiah Teknologi Informasi Terapan, Vol. 3, No. 1, 2016	Google Scholar
15	Alivia Yulfitri	Analysis of Governance Maturity Data Using Stanford Data Governance Maturity	2020	BRITech (Jurnal Ilmiah Ilmu Komputer, Sains dan Teknologi Terapan) Volume 1, No 2 Januari 2020	Google Scholar
16	Hanung Nindito Prasetyo, Soni Fajar Surya Gumilang	Data Governance Strategy for E-Government in Bandung District Governments	2019	International Journal of Engineering & Technology,	Google Scholar
17	Hanung Nindito Prasetyo, Regina Nathania Djepapu, Ferra Arik Tridalestari, Ironman Hariman	Development of Project Document Management System Based on Data Governance with DAMA International Framework	2018	Proceedings of the 2018 International Conference on Industrial Enterprise and System Engineering (IcoIESE 2018)	Google Scholar
18	Rela Sabtiana; Satrio Baskoro Yudhoatmojo; Achmad Nizar Hidayanto	Data Quality Management Maturity Model: A Case Study in BPS-Statistics of Kaur Regency, Bengkulu Province, 2017	2018	2018 6th International Conference on Cyber and IT Service Management (CITSM)	Google Scholar
19	Amri Hanif; Tien Fabrianti Kusumasari; Rachmadita Andreswari	Analysis and Design of Data Synchronization Algorithm for Master Data Management Tools Based on Open Source Platform at PT. XYZ	2019	2019 International Conference on Electrical Engineering and Informatics (ICEEI)	Google Scholar
20	R. Tenie Pennata Kusumah; Suhardi	Designing information governance in statistical organization	2014	2014 International Conference on Information Technology Systems and Innovation (ICITSI)	Google Scholar
21	Budi Yuwono dan Aditya Arinanda	Metode Perancangan Struktur Fungsi Danperan Tata Kelola Data Berbasis COBIT	2010	Journal of Information Systems, Volume 6, Issues 2, October 2010	Google Scholar

Third, after finding the articles from the databases, the articles were reviewed to determine the topics trend on data governance in Indonesia. From twenty-one founded articles, it becomes 14 articles after reviewed. Based on these articles, the study analyzes the topic in each article.

Fourth, 14 articles are eligible to be analyzed. These articles have been analyzed to identify and classify research topics. Based on these articles, three research topics are data governance design/model, the maturity of data governance, and the relationship of data governance with other variables (open data, leadership, and culture). Detailed information shows in Table 2.

Most of the researchers in Indonesia study on data governance design/model topics from 2010-2020. Seven articles discussed modeling, design, or architecture of data governance in the organizations/institutions. Data Management and Body of Knowledge (DMBOK) and Control Objective for Information and related Technology (COBIT) were used to design data governance. The ideas and concepts presented in the DMBOK2 will be applied differently across organizations (DAMA International, 2014). Applying data governance activities based on DMBOK can be an initial solution for data problems (Aisyah & Ruldeviyani, 2019). Moreover, almost all research studied in government institutions: Indonesia deposit insurance corporation (IDIC), the Ministry of Foreign Affairs of the Republic of Indonesia, Government agency X in Jakarta, and Bandung District Governments. Government institutions need data governance to solve data problems (Aisyah & Ruldeviyani, 2019), meet the accuracy and availability of public information (Yulfitri, 2017), and provide transparency for helping decision-making (Prasetyo & Gumilang, 2019).

The maturity of data governance is another topic of data governance research in Indonesia. Data Governance Maturity Model (DGM2) and Stanford Data Governance Maturity usually use this model to measure data governance's maturity in the organization. Measuring data governance maturity is to identify the organization's problems and give recommendations to the organizations (Permana & Suroso, 2018; Saputra et al., 2019; Yulfitri, 2020) so that organizations can improve data governance implementations (Prasetyo, 2016; Kurniawan et al., 2019).

No	Research Topics	Authors	Title	Year
1	Data governance design/model	Aisyah M., Ruldeviyani Y.	Designing data governance structure based on data management body of knowledge (DMBOK) Framework: A case study on Indonesia deposit insurance corporation (IDIC)	2019
		Maulina J., Ruldeviyani Y.	Data Governance and Data Architecture for the Ministry of Foreign Affairs of the Republic of Indonesia	2019
		Alivia Yulfitri	Modelling operational model of data governance in government: Case study: Government agency X in Jakarta	2016
		Hanung Nindito Prasetyo,	Data Governance Strategy for E-	2019

		Soni Fajar Surya Gumilang	Government in Bandung District Governments	
		Amri Hanif ; Tien Fabrianti Kusumasari ; Rachmadita Andreswari	Analysis and Design of Data Synchronization Algorithm for Master Data Management Tools Based on Open Source Platform at PT. XYZ	2019
		R. Tenie Pennata Kusumah ; Suhardi	Designing information governance in statistical organization	2014
		Budi Yuwono dan Aditya Arinanda	Metode Perancangan Struktur Fungsi dan Peran Tata Kelola Data Berbasis COBIT	2010
2	Maturity of data governance	Saputra D.A., Handika D., Ruldeviyani Y.	Data Governance Maturity Model (DGM2) Assessment in organization transformation of digital telecommunication company: Case study of PT Telekomunikasi Indonesia	2019
		Remi Indra Permana, Jarot S. Suroso	Data Governance Maturity Assessment at PT. XYZ. Case Study: Data Management Division	2018
		Dwitama Heryadi Kurniawan ; Yova Ruldeviyani ; Mohammad Rizky Adrian ; Sutia Handayani ; M. Rizki Pohan ; Rani Khairunnisa T	Data Governance Maturity Assessment: A Case Study in IT Bureau of Audit Board	2019
		Hanung Nindito Prasetyo	A Review Of Data Governance Maturity Level In Higher Education	2016
		Alivia Yulfitri	Analysis of Governance Maturity Data Using Stanford Data Governance Maturity	2020
3	Relationship of data governance with other variables (open data, leadership, and culture)	Arman A.A., Sembiring J., Suhardi	The importance of data management to support open data - Case study in Indonesia	2014
		Putro B.L., Surendro K., Herbert H.	Leadership and culture of data governance for the achievement of higher education goals (Case study: Indonesia University of Education)	2016

Research on data governance's relationship with other variables was rarely studied - only two articles found in Indonesia. Open data, leadership, and culture are the variables that were used in previous researches. Data governance is essential to support all open data principles (Arman et al., 2014). Cultural factors, including leadership, are essential in data governance studies (Putro et al., 2016).

CONCLUSION

Research in data governance is growing in IS, as is the need for research in this area as an increasing number of organizations view data as a valuable asset. A review of the data governance literature suggests a lack of research that explicitly examines data governance activities. Nevertheless, several studies contribute to our understanding of data governance

through modeling (Khatri & Brown, 2010; Otto, 2011; Tallon, 2013). This study reveals some progress in exploring data governance research topics in Indonesia.

The selection process yielded 21 articles subject to selection and exclusion criteria, which use data governance and Indonesia as the keywords. Following a more in-depth review, 14 were found to serve the research aim explicitly. These 14 papers were analyzed based on the articles' abstract and author keywords. This technique was selected to conduct an in-depth analysis of the data governance topics mentioned in these papers. There are three main research topics identified: data governance model/design, data governance maturity, and the relationship between data governance and other variables (open data, leadership, and culture).

This research has two limitations. Firstly, the research focused only on academic literature in the data governance area, ignoring practitioners' publications specifically. Institutions such as DAMA and The Data Warehousing Institute (TDWI) may provide further insight into data governance programs from a practitioner perspective. Future research may highlight differences in theory and practice (DAMA International, 2014). Secondly, the research presented in this paper only comes from Scopus, WoS, and Google Scholar. Other database sources did not include in this research, like as Ebsco online, Science Direct, Emerald Insight, AIS electronic library, and ACM Digital library.

For future research in data governance in Indonesia, more research on the impact of data governance is challenging. Furthermore, identify the relationship of data governance with other variables such as data quality, data security, and the performance also engaging to be studied. Besides, the study on data governance in other institutions such as higher education, hospitals, the financial industry, and other service organizations also has an opportunity.

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