Digital Government for Anti Corruption: A Systematic Literature Review

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Abstract

Corruption is a major crime that harms state finances and the public interest. One way to fight corruption is to implement digital government to increase government transparency and accountability. The purpose of this study was to undertake a thorough review of the literature on government digitalization and anti-corruption.This study used a descriptive analysis approach to 99 articles obtained from the Scopus database in the 2019-2021 period. The data in the form of RIS is processed by using VOSviewer which showed that Government, Transparency, Corruption, Governance and Level are the most dominant concepts that are most often explained by researchers. This indicated that these four keywords have a very significant influence in studies on this topic. This research contributed to providing a reference for policy makers or relevant stakeholders in preventing corrupt practices through the application of digital government which is increasingly important during Covid-19. The limitation of this study lied in the reference source which only comes from Scopus and the short duration of data collection. Therefore, in order to produce a comparative, broad and comprehensive analysis, further studies need to include sources of other reputable international journals such as the Web of Science (WoS) and increase the duration of data collection.

Keywords: *Digital Government*, *Anti-Corruption*, *Information Technology*, *Bureaucracy*, *Accountability.*

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A. INTRODUCTION

In the digital age, old bureaucratic organizational structures are being phased out and replaced by e-government initiatives. The use of information and communication technology (ICT) has enabled administrative expenses to be reduced and the vast potential of technology to be exploited for more efficient public services to be realized. Governments supply digital public services (also known as e-government) to citizens using ICTs. Income tax declarations, notifications, and assessments; birth and marriage certificates; SIM renewal; and other sorts of request and delivery of permits and licenses are all examples of digital public services. Governments may give information and services to citizens at any time, from any location, and on any platform or device by leveraging digital services (Pedrosa et al., 2020). Governments should disclose honestly on their websites because citizens have a right to know how public money is spent, which is also beneficial in combating corruption (Rodrguez-Breijo, Simelio, and Molina-Rodrguez-navas, 2021; Baharuddin et al., 2022).

The advancement of information and communication technology (ICT) has improved international access to a wealth of information and the level of openness.

This has had an effect on not only the extent of ICT use by citizens, but also on the way government administration operates. ICTs have cleared the path for governments to successfully react to citizens' requests for administrative transparency and for the implementation of e-government systems. Along with the development of e-government infrastructure, the majority of countries have boosted their national competitiveness by improving public services, providing the groundwork for them to mature into the world's top ICT hub. With the advancement of high technology, information and communication technology, and e-government, which all contribute to increased government efficiency, productivity, democracy, responsiveness, and transparency, the demand for an efficient government administration system and government transparency has increased (Lee et al. , 2018).

Public services which including Open Government Data (OGD) have emerged as a new trend in society, and it is widely recognized that OGD not only accelerates the development of digital technology, but also significantly drives economic growth and contributes to long-term economic progress. Following this trend, the Indonesian government then published six guidelines covering quality standards and service coverage, as well as e-government application development, institutionalization, authority, information, and business involvement in digital-government development, development of good governance and change management, assignment and financing of digital-government projects, and the latest digital-government competency standards (Jacob et al., 2019). Additionally, e-government as a strategic resource is regarded as having influence and is related with government transparency and reputation. Thus, the quality of e-government might indicate the amount of employee satisfaction (Iglesias-Antelo, López-López, and Vázquez-Sanmartn, 2021).

Furthermore, E-Government is also used as an effort to prevent corruption. The anti-corruption campaign is no longer a common program among the public and the government. This program or campaign evolves over time and adapts to current global conditions. Most countries have considered that their country has implemented government digitization in order to reduce the risk of corruption cases. However, this statement is not properly realized. Many efforts have been made to make the anti-corruption campaign a success, but corruption cases are still occured. One of the activities or government activities that have a high risk of corruption is Public Procurement As a result, Article 9 of the United Nations convention Against Corruption mandates that the government set up an effective system for public procurement (UNODC, 2013).

The use of e-government in government is considered to provide fresh air for the community because it can be seen how efficient and effective digital-based services are, without the need to go through many steps in managing the administration. Government digitalization is a strategy whose benefits have been echoed in minimizing corruption cases in the government order. Additionally, the usage of e-government bolsters anti-corruption efforts against asset seizures by state officials and those who plot schemes to perpetrate serious political corruption. Supports the assertion that, despite the fact that many governments have used e-government as an

anti-corruption approach for more than two decades, the absence of convincing empirical evidence on the impact of e-government on corruption persists (Adam, 2020).

According to the aforementioned statement and the consensus of the majority of scholars and researchers, the enforcement of the rule of law should be bolstered through the strengthening of existing institutions such as the Corruption Eradication Commission, and the fight against corruption should be stepped up with a "zero tolerance" approach that is enforced across all sectors and institutions. As such, designate the launch of a lifestyle audit as one of the numerous strategies for assisting this objective (Asheela-Shikalepo, 2021).

Studies on digital government and anti-corruption have been carried out by many researchers with different perspectives. Conducted research (Mahmood, Weerakkody and Chen, 2019) saw that digital government succeeded in increasing public trust in the Bahraini government because it was proven to be able to minimize corrupt practices. According to recent studies (Lee, Daz-Puente, and Martin, 2019; Naeem, 2019), open government has successfully reduced corruption in a number of nations through strict public restrictions, ultimately boosting people's wellbeing. This finding is also in line with the study research (MácHová, Volejníková and Lněnička, 2018) which saw that in the period 2002-2016 E-government succeeded in reducing corruption rates. The same thing is also confirmed by research (Rodríguez-Navas and Breijo, 2021) which proves that e-Government has succeeded in reducing corruption. This is inseparable from digital government which is able to increase government accountability and transparency (Jameel et al., 2019; Mansoor, 2021) so that corrupt practices of government officials can be minimized. Another finding from Senada (Tavares and da Cruz, 2020; Matheus and Janssen, 2020; Porumbescu, Cucciniello and Gil-Garcia, 2020) which sees open government as successful in increasing government transparency. In contrast to these studies which were conducted specifically to see the relevance of Digital Government as an effort to fight corruption, this study takes a different perspective. This article uses the Systematic Literature Review method to show the trend of topics regarding digital Government and anti-corruption studies and their analysis so that they can be more comprehensive and comparative to show the urgency of corruption prevention efforts through digital government.

B. LITERATURE REVIEW

1. Digital Movement

Some examples of digital activities being used as information media, such as during the Flint water crisis, which is a case that is often found in several sources of knowledge to textbooks, due to the government's failure to take responsibility for the ongoing water crisis. The main problem related to administrative matters is the quality of government accountability and transparency which is considered poor and not optimal in managing the Flint water crisis. As a result, the Flint water crisis resulted in criminal and civil charges, which are still pending and increasing. The media's response to this problem is to present the topic of the water crisis first and

foremost as a governance issue involving accountability, transparency, and asking the Michigan government to respond more quickly as part of its emergency response work (Chavez et al., 2017).

Government agencies are increasingly using social media to disseminate information, raise awareness, and advocate for public policies. Social media has received a lot of attention in the formation of public policy. However, the policy's structure has remained mostly unchanged over time. There is still much to learn about how to maximize the potential of social media to improve policy outcomes, despite its widespread use. As a result, it was decided to investigate the role of social media in public policy processes and policy creation in a developing country environment and to identify gaps in the existing social media strategies of public organizations. For example in India, social media is increasingly being used by citizens to express their opinions and public institutions to communicate information. However, its use is mainly limited to one-way communication in strategic political ways (Rathore, Maurya and Srivastava, 2021).

2. Digital Government

The implementation of digital government or e-government is diverse and tailored to the needs of each agency. Some examples of countries that have implemented digital government are first, electronic parking in Indonesia. In practice, four major impediments to implementing the e-parking concept exist. These factors include a widening digital divide, a deficient workforce in terms of both quality and quantity, a lack of appropriate legislation, and insufficient infrastructure. Apart from these four hurdles, we discovered additional significant factors: poorly planned investments, a lack of leadership, and low-quality education and marketing. These three additional factors also contributed to the initiative's inability to accomplish its aims. These findings suggest that any new efforts in the delivery of public services, particularly those involving the use of ICT, should be effectively explained and consulted with the implementing unit. Additionally, the program must be accompanied by a set of approved policies to ensure its long-term viability (Rachmawati and Fitriyanti, 2021).

Conducting research on direct and indirect relationships between the government and the public via social networks during the COVID-19 epidemic, perceived government responses to COVID-19, and views of the effectiveness of e-governance in relation to general public trust in the government. The research findings indicate that interactions between the government and the community or the public via social media, perceptions of the government's response to Covid-19, and perceptions of the effectiveness of e-governance all correlate positively with overall public trust in the government. These findings emphasize the critical nature of communication between government officials and the general population through the use of digital technologies and social media. Similarly, research demonstrates the critical nature of a government's rapid and successful response to a crisis in order to regain public trust (Hartanto, Agussani and Dalle, 2021).

While the adoption of technology in the development of information systems is an innovation that has the potential to improve governance, particularly in regional governments with diverse leadership, each region's readiness remains in doubt. Without the availability of infrastructure and human resource competencies, innovation cannot be executed. E-government, defined as the use of technological innovation to government, aims to streamline all government tasks related to providing services to the community. These objectives are achievable with the availability of resources for e-government deployment. To ensure optimal and thorough implementation, considerable pressure is required. This pressure will intensify and become a focus in government actions. Effective e-government implementation will result in an increase in public accountability as a result of local governments fulfilling their commitments to the community (Defitri et al., 2020).

3. Digital Government for Anti-Corruption

Corruption has been characterized as the "single greatest impediment to economic and social growth" as a key sort of immoral behavior. The absence of any open, corruption-prone public administration poses a severe threat to e-government and public trust. As a result, e-government practices have the ability to boost public trust and confidence in government, which is the primary foundation around which the framework of justice and democratic governance is formed. Jameel et al(2019) .'s research demonstrates an empirically significant association between e-government practices and public trust in local self-government, with corruption acting as a moderating factor. The findings imply that by expanding relationships with people and their responsive insights, e-government can foster procedure-based confidence.

Positive examples from a variety of countries about the usage of e-government in the field of public administration and political system democratization. The case of Ukraine's implementation of the Digital State demonstrates a positive association between the Government to Citizens approach to e-government and the model for adopting anti-corruption procedures and reducing corruption. Anti-corruption methods successfully adopted in the modern world of information and communication. Thus, the function of e-government in political modernization can be clearly characterized by a conceptualization of the possibilities and necessity of incorporating current technologies and communication advancements into public administration, most notably the adoption of e-government (as one of the mechanisms of democratization and prevention of corruption). Thus, e-government can be characterized as a technique of distributing information and communicating with the public in order to enhance governance and anti-corruption mechanisms (Marysyuk et al., 2021).

According to empirical studies, the primary elements influencing government corruption are the level of economic and user education, governance, government rules, and other things. Lee et al. (2018) demonstrate a significant association between e-government adoption, governance, government regulation, and government corruption. Additionally, the current state of ICT and e-government development

somewhat mitigates the effect of user level, governance, and government regulation on government corruption reduction. These findings imply that advances in ICT and e-government both mediate and contribute to the reduction of government corruption, and that expanding ICT utilization and monitoring government actions through these technologies will be a critical component in reducing government corruption. Additionally, implementing an e-government system creates new opportunities for decreasing corruption by eliminating the information asymmetry between citizens and government.

OGD has been recognized with boosting transparency and providing a view into how governments operate. OGD has been shown in certain studies to have a beneficial influence on anti-corruption and fraud, which is consistent with the transparency element. By minimizing bias and abuse of political authority and public funding, transparency should result in less corruption (Matheus and Janssen, 2020). Open data research has demonstrated that data quality, rather than quantity, is critical for digital services and innovation. Through data disclosure, the public receives access to information that enables numerous economic, political, scientific, and social projects and advances. Simultaneously, governments are exploring new methods to exploit data beyond their usual borders through the analysis of data from a variety of social media outlets (Janssen et al., 2017).

C. METHOD

Descriptive analysis and literature study were used as methods in this research. The implementation of descriptive analysis is carried out by utilizing software to analyze qualitative data, or what is often referred to as QDAS (Qualitative Data Analysis Software) in the form of VosViewer which is then analyzed and described based on the data generated. The data processed by VosViewer is taken from the Scopus database as the main data source in this study. VosViewer then processes data sources from Scopus – one of the journal databases that has gone through a peer-reviewed process – to map the research discussion we want, namely about keywords or research topics, countries with dominant contributions, and authors with dominant contributions in research related to the theme of government digitalization and anti-corruption.

Then is the literature study method that we carry out by utilizing the Mendeley application as a tool or media to review articles that are related to the theme of government digitalization and anti-corruption. We also get data from Mendeley from Scopus because it is considered a central source of journal data that has been reviewed by experts from each research field, and has the capacity that is considered the most complete in the world and provides good scientific academic information. This study was carried out through searching the Scopus database with several criteria, namely the keywords government digitalization and anti-corruption published in 2019 to 2021. The search results showed that there were 99 articles that passed the selection based on these requirements.

The writing of this article aims to determine the progress of research and the extent of research coverage on government digitalization and anti-corruption in 2019 and 2021. For this reason, this research is directed at conceptualizing studies in the development of research on government digitization and anti-corruption. This article was written based on several focuses of writing in order to have a quality translation and description of a well-systematic discussion, such as research topics or keywords, frameworks, and several other research findings that have been published and indexed on Scopus. In addition, there are several stages carried out in this research including:

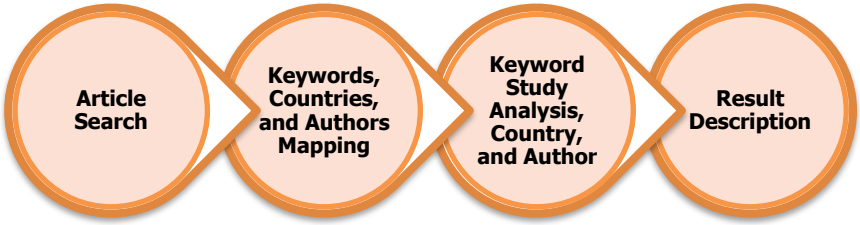


Figure 1. Research Phase

The graph above will be easier to understand and answer through several questions, such as (1) How are relations and clustering in research on government digitization and anti-corruption? (2) What are the keywords or themes that dominate research related to government digitization and anti-corruption? (3) Which countries have contributed to research related to government digitization and anti-corruption? (4) Which author has the highest level of activity in research related to government digitization and anti-corruption? (5) What types of mapping are used in research related to government digitization and anti-corruption?

D. RESULT AND DISCUSSION

The first discussion is the number of document publications by year. This topic presents data from 2019 to January 2022 that has been processed. The documents collected consist of several types of documents, such as journal articles, review articles, seminar proceedings articles, notes, and the like. The trend of document publication is important to know as an aspect of consideration and attention in future research and can be used as reference material.

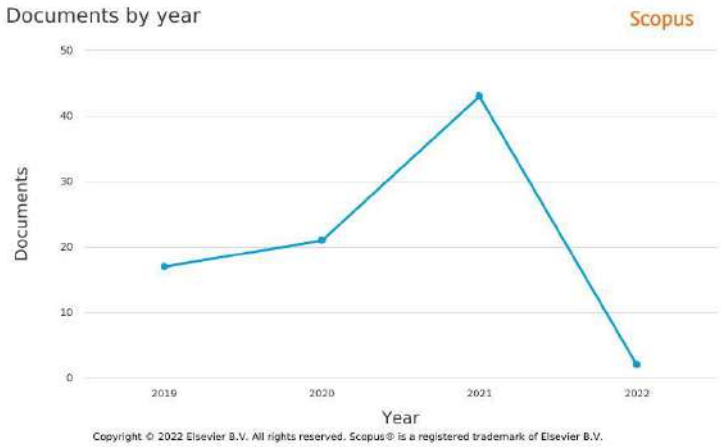


Figure 2. Trends in publication of articles on Digital Government for Anti Corruption from 2019 to 2022.

The results of the processed data above describe an upward trend from 2019 to 2021, and decrease in 2022. The downward trend in 2022 is because the document data collected is only based on the results of publications that occurred in January, so it is natural for a downward trend to occur. The increasing number of publications of documents with the theme of digital governance and anti-corruption shows that these topics have become topics or discussion materials that have attracted the attention of researchers and are also the case in the countries where the authors conduct research. The number of document publications that has increased from year to year illustrates the enthusiasm of the authors to explore various research topics with the main topics of digital governance and anti-corruption. The increasing trend of document publications also shows how research innovation is developing.

The next discussion is about the number of publications from countries or regions. This material is included as a discussion in this paper because it is important to know together the domination of a country on research with certain themes. The findings can also describe how authors from that country have intensely carried out research on certain themes. This discussion needs to be discussed as an effort to help provide attention and reference for future research.

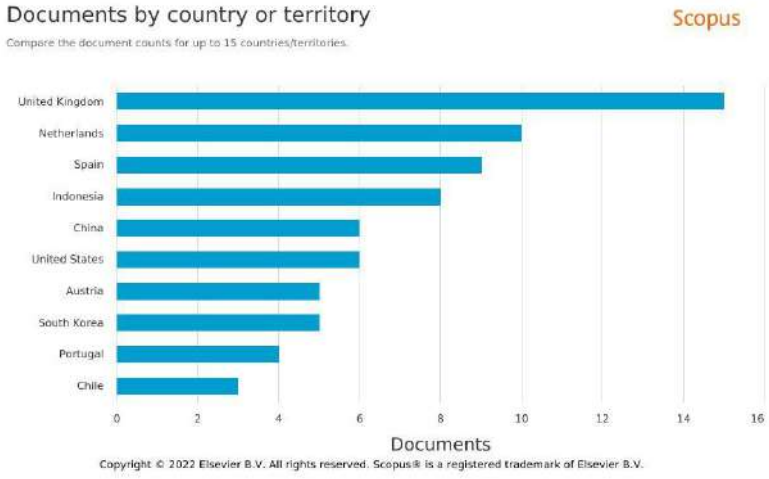


Figure 3. Publication of Articles on Digital Government for Anti Corruption by Country

Based on the picture above, it appears that the UK dominates the number of document publications with the theme of digital governance for anti-corruption. The data above also illustrates how intense the research is carried out or published in the countries where the researcher conducts the research. The findings reveal that of the total documents collected, the UK ranks first with 15 publications, followed by the Netherlands with 10 documents, Spain with 9 documents, Indonesia with 8 documents, and China and the United States with 6 documents. All data from the image above is taken from 2019 to January 2022.

Data obtained from all sources will be used to identify a broad range of topics for further study in this section. Scientific fields include social sciences, computer science, mathematics and natural science as well as engineering and economics.The subject area of the research study is the main component in a study, so it is important to discuss how broad the subject area of the study is related to research with the theme of digital governance for anti-corruption.

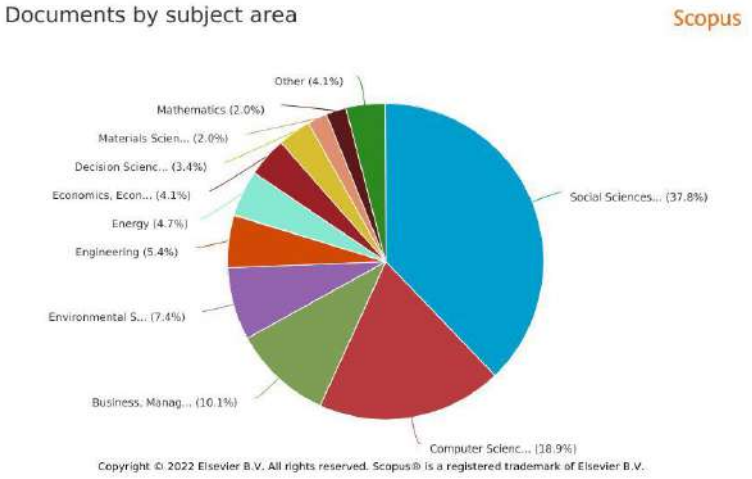


Figure 4. Publication of Articles on Digital Government for Anti Corruption by Field of Study

Based on the data generated from the image above, it appears that the subject area of research with the theme of digital governance for anti-corruption has more than five areas of study. The fields of study with the most total publications are social sciences, followed by computer science, and economics groups such as business, management, and accounting. The results of the data above can show that the scope of the study subject is the majority in the research documents that have been carried out. Based on the picture above, the subject area of the social sciences is the field that is most widely used as a topic subject in the discussion of research that has been carried out.

The next discussion is about the researcher with the most number of publications among other researchers. This data is important to know as information about which authors have the highest number of publications in writing papers with the theme of digital government for anti-corruption. This discussion also involves topics that are the expertise of the author in his study of digital governance for anti-corruption.

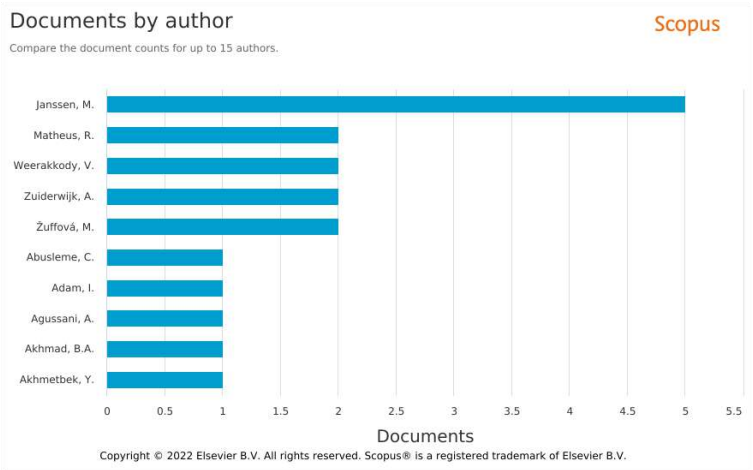


Figure 5. Publication of Articles on Digital Government for Anti Corruption by Author's Name

Based on the data from the image above, it appears that there is only one author with a dominant number of publications on research with the theme of digital governance for anti-corruption. Janssen, M. authoring five document publications published in the period of 2019 to early January 2022. These findings show that Janssen, M. has expertise and concern in science and research on digital governance. for anti-corruption. The findings reveal that the more dominant the topic discussed by the researcher describes, the researcher is indeed focused on discussing the topic of digital governance for anti-corruption.

This study examines how the sustainability and sustainability of research related to the digitization of government as part of the anti-corruption program that is currently taking place in various countries in the world. The research results, which were processed through VosViewer, went through several stages of selection in order to obtain strict and effective mapping results. Some of the steps selected are the minimum number of presence or mention of one keyword is 10 times per one document. We also choose a calculation system in the form of a full count or full counting to make it easier to interpret and describe the mapping results.

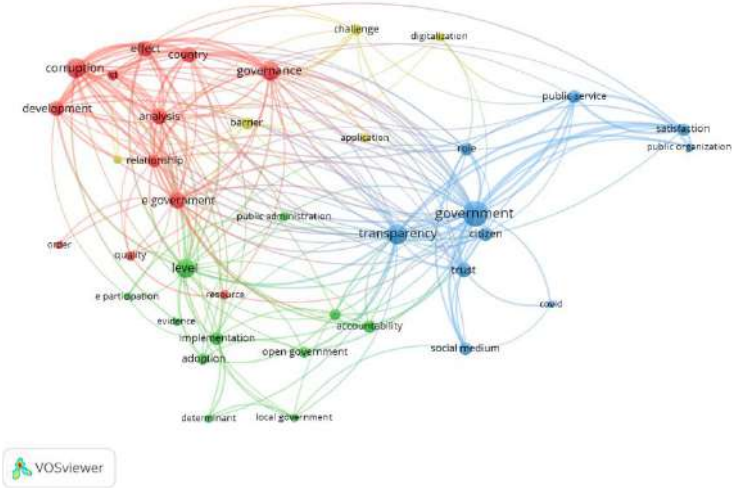


Figure 6. Keyword Network Mapping

As illustrated in the image above, the overall results of the VosViewer mapping indicate that research on the issue of digitizing government for anti-corruption has four clusters. Each cluster is filled by keywords that have items in common with each other. The picture above shows that there are several circles whose size is more dominant than the other circles. This condition illustrates that the circle has more mentions of keywords in the document than other keywords.

Table 1. Clusters of topics in the study of Digital Government

Cluster	=	Keywords	Items
Cluster 1	=	analysis; corruption; country; development; e government; effect; governance; ict; order; quality; relationship; resource	12
Cluster 2	=	accountability; adoption; determinant; e participation; evidence; implementation; implication; level; local government; open government; public administration	11
Cluster 3	=	citizen; covid; government; public organization; public service; role; satisfaction; social medium; transparency; trust	10
Cluster 4	=	application; barrier; challenge; digitalization; open government data	5
Total Items			**38 Items**

Based on the results of the VosViewer clustering, each keyword is grouped into one cluster not by chance, but because it has some similarities and relevance between keywords in the data of the articles that have been obtained. So it can be concluded as follows. Corruption in developing countries is linked to the development of ICTs as the basis for implementing e-government policies in a government in that country, according to the terms *"analysis; corruption; country; development; e government; effect; governance; ict; order; quality; relationship; resource"*. In order to diminish or eliminate the culture of corruption in government, the use of e-government in attaining transparency and accountability is an important factor. The context of developing countries is part of the topic because several previous research findings prove that corruption cases that occur in developing countries are difficult to smell by the public due to the lack of transparency to the public.

In cluster 2, the keywords included in this cluster are *"accountability; adoption; determinant; e participation; evidence; implementation; implication; level; local government; open government; public administration"* which illustrates that public administration in local government that involves the use of e-participation in order to achieve open government is a factor that determines the level of accountability of the government. So it can be said that the level of use or implementation of e-participants by local governments affects the accountability of their public administration. Then, in cluster 3, the words *"citizen; covid; government; public organization; public service; role; satisfaction; social media; transparency; trust"* are part of this group. This shows that

government services to deal with Covid-19 must be transparent and known to the public so that they can trust the government. Thus, the need for social media involvement in informing various policies for handling Covid-19 in order to achieve community satisfaction and trust.

Finally, cluster 4 with some keywords like *"application; barrier; challenge; digitalization; open government data"* illustrates that the government's digitalization policy using several applications is a challenge for the government in order to achieve the target or goal of open government. Digitization of government is a demand for the times and demands to be more open regarding policies and budget management to the public, as the party who has the right to government transparency. Thus, broadly speaking, research through VosViewer can make it easier to know the concepts and interrelationships between topics that have been researched and can be a reference for future research, and get attention for policy determination by the government.

Next is an analysis of the distribution of keyword overlays by time or year of publication. It is important to know the overlay analysis of the year of publication in an effort to ascertain what topics are currently attracting the attention of researchers and what topics still need to be developed. The analysis of the stretch of the year of publication can be seen from a collection of documents that have been published for more than ten years, to documents that have only been published in one year. The researcher makes the decision based on what he needs to do with the data and how he wants to talk about his choice in class.

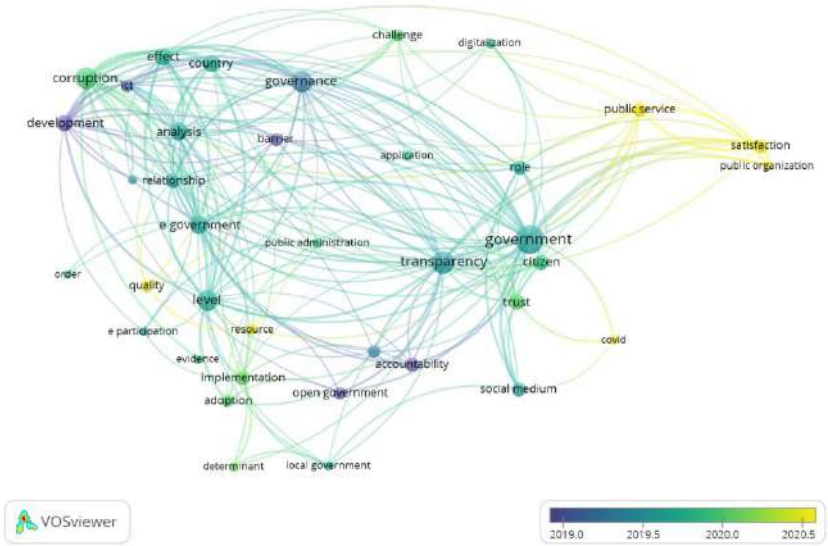


Figure 7. Keyword Overlay Mapping

Based on the image above, it can be seen that the range of keyword usage based on the year or time of publication is quite diverse. The results of the VosViewer analysis noted that the keywords *development*, *accontability*, *open government* dan *barrier* has an average publishing time in early 2019. Then, the keyword with an average publishing time in 2021 is Covid-19. The average time overlay recorded by VovViewer refers to the number of articles that have a record of the keyword in table 1 as well as

the publication time of each article with that keyword. So, we can find values that are not round from the results of the VosViewer analysis.

The results of the analysis above show that at the beginning of 2019, researchers focused on research discussions on the topics of development, accountability, open government and challenges. The three topics are considered to be in line with the discussion on government digitalization and anti-corruption. Followed by the keyword Covid-19 which is the keyword with an average time of publication in 2021. The five topics show that the use of topics regarding government digitalization and anti-corruption in 2019 and 2021 has progressed according to the current situation, meaning researchers have the initiative to develop topics according to the current situation.

Following that is a chart of keyword density levels based on overall link strength between two keywords. The overall link strength demonstrates that these keywords have a robust network of linkages and are connected or related. The keyword density map shows that these keywords are the most commonly discussed topics. Thus, in the future, the results of the density analysis will be able to direct researchers to explore more varied topics.

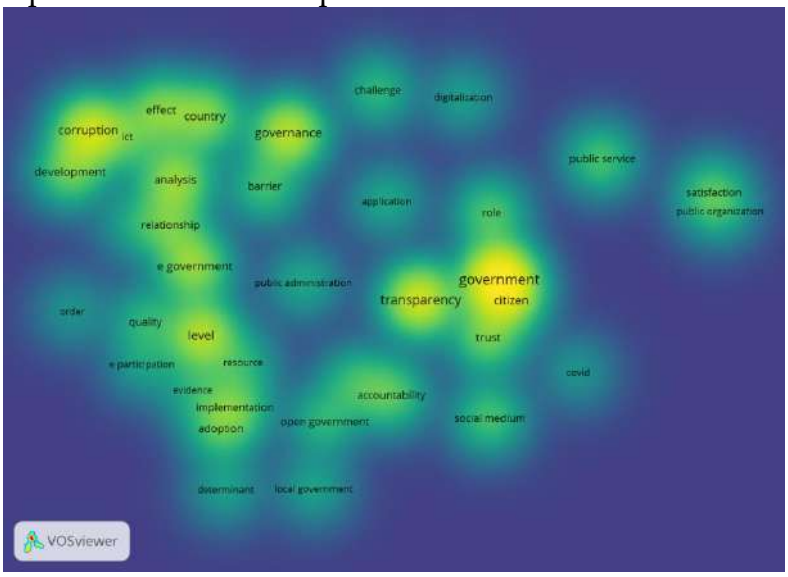


Figure 8. Keyword Density Mapping

Based on the picture above, there are five keywords that have the most striking color differences than other keywords. as previously explained, the image above is the result of processing VosViewer based on the "occurences" criteria. Thus, we can see that the word “Government and Transparency” is the most obvious. These two keywords proved to be the dominant keywords and had the most striking density of the others. When viewed based on recorded data, the keyword "Government" has 111 times the number of occurrences, while the keyword "Transparency" has 76 times..

Next is the keyword "Corruption" which has the third most striking color difference as evidenced by the results of VosViewer's processing which states that the keyword has a total of 69 mentions. Finally, the keywords "Governance" and "Level" which are in different cluster groupings are also included as dominant keywords with 64 and 60 mentions, respectively. The five keywords show the enthusiasm of the

researchers to use these keywords as topics in their research as an effort to dynamic and innovate the research that has been carried out.

The next discussion is network mapping by country. This mapping was carried out with the aim of knowing how far countries in the world have participated or become objects in this research. Network mapping by country has gone through several stages of processing in VosViewer. In this article, the results of network mapping by country are based on a minimum of three mentions or documents in each country. Therefore, only a few results can be seen on the display of data.

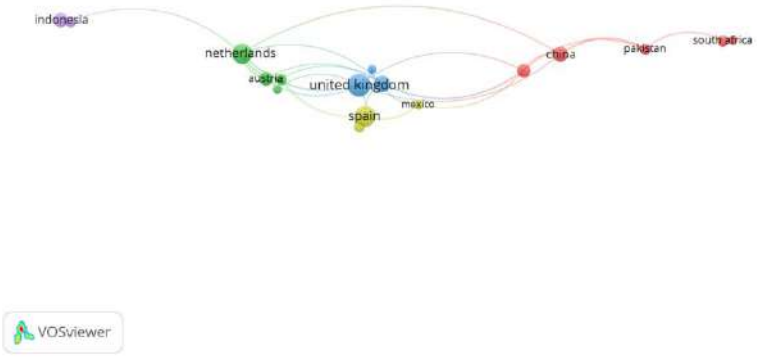


Figure 9. Mapping of Country Networks

Based on the picture above, it can be seen that each country listed has links or links with other countries. such as the examples in Indonesia and Malaysia which appear to have networks or links. The two countries have one bond or the same link because they have the same items, so they are grouped into one cluster. Likewise with the United Kingdom, where the picture shows the largest circle shape, in this case the United Kingdom has the highest influence or mention and involvement among the others. The following table contains other examples of cluster grouping.

Table 2. Clusters of Countries in Digital Government Publications

Cluster	=	Countries	Items
Cluster 1	=	China; India; Pakistan; South Africa; South Korea	5
Cluster 2	=	Austria; chile; germany; netherlands	4
Cluster 3	=	Saudi Arabia; United Kingdom; United States	3
Cluster 4	=	Mexico; Portugal; Spain	3
Cluster 5	=	Indonesia; Malaysia	2
		Total Items	**17**

Based on these clusters, several countries are grouped into one cluster based on several items in common. On the other hand, the importance of knowing information or mapping related to the state is an effort to further develop and expand the scope of location objects and objects of state contributions in future studies.

Next is the mapping related to the average year of publication of a document, in this case the average year of publication of a document which in its discussion includes at least three countries in one document, either as an object of research or as supporting data for an argument. The discussion regarding the average time of publication of a document is important because it can be used and considered by researchers to carry out broader and more varied research related to the use of the state as the object of research and the state as supporting data for an argument.

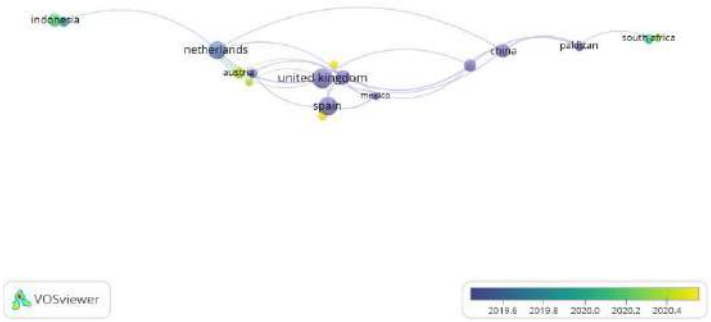


Figure 10. Mapping of Country Overlay

Based on the results of VosViewer's processing from the image above, it can be illustrated that the average year of publication of research or documents with the theme of e-government and corruption has various timescales. The image above shows that the time range recorded by VosViewer shows that these studies have a time span from early 2018 to 2020. Some of the countries shown based on VosViewer's analysis are Germany and Mexico which have an average publication time at the beginning of the year. 2018, and Saudi Arabia and Portugal are countries with an average time of publication in 2020.

The next discussion is network mapping with the author's name. The inclusion of the author's name in this study is important because it can show the author's strength and the relationship between the authors in the study. Network mapping by authors can also show how active an author is in collaborating with other researchers, and can also find references between authors who will collaborate in the future.

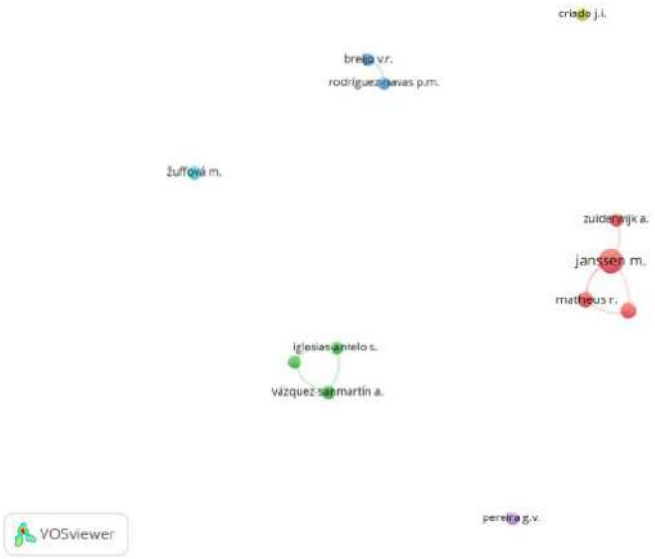


Figure 11. Authors Network Mapping

From the picture above, the relationship between authors is sorted according to the number of authors from one author to two or more documents, with the largest number of documents from one author to a maximum of 25 documents. The regulation is based on the consideration that research on various topics on digitalization of government and anti-corruption will be one of the strong concerns of the authors choosing this topic by including at least two documents in one author.

Table 3. Clusters of Authors in Digital Government Studies

Cluster	Authors	Items
Cluster 1	Janssen M.; Matheus R.; Weerakkody V.; Zuiderwijk A.	4
Cluster 2	Iglesias-Antelo S.; Lopez-López V.; Vázquez-Sanmartín A	3
Cluster 3	Breijo V.R.; Rodríguez-Navas P.M	2
Cluster 4	Criado J.I	1
Cluster 5	Pereira G.V	1
Cluster 6	Žuffova M	1
Total		**12**

Based on the table above, there are several authors who are incorporated into one cluster with more than one author, some are individuals in one cluster. We include the names of authors who are registered to carry out research with more than one document. For example, in cluster 1 there is an author on behalf of *"Janssen M"* who conducted collaborative research for seven times with two titles that made him the first author, namely *"Driving public sector innovation using big and open linked data (BOLD)"* and *"Transparency-by-design as a foundation for open government"*.

Next is a discussion related to the average time of publication or the year of publication of documents written by several previous authors. We include the average year of publication in order to be able to describe the average time of publication between one author and another. This mapping also shows the level or number of

collaborations between authors and can assess the level of author activity in publishing articles within one year.

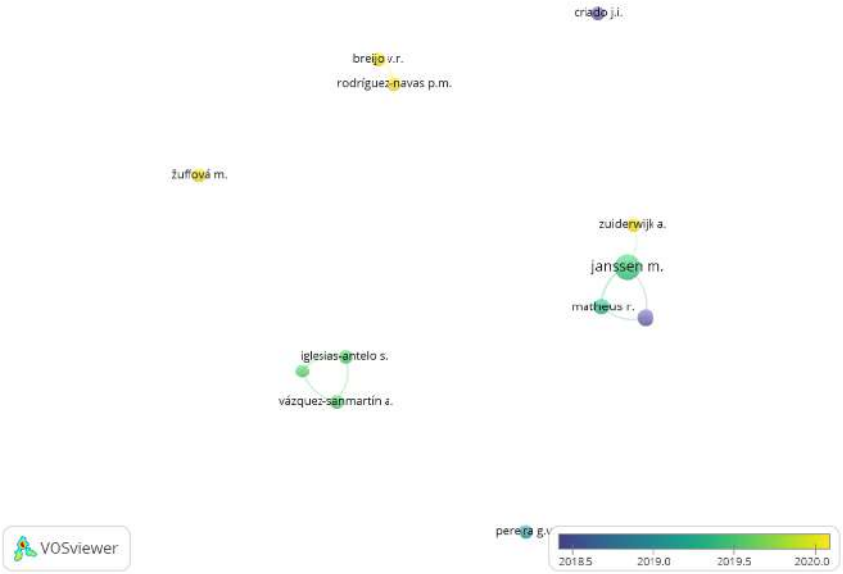


Figure 12. Research Overlay Mapping

From the picture above, it can be seen that the publication year overlay has a color group based on the author for each cluster. Some results show that most authors are yellow, so on average these authors published their articles in early 2019 to 2020. Authors, shown in blue, indicate the average number of years of publication at the end of 2018.

The keyword Corruption was recorded as one of the keywords that had the highest mention of other keywords in Cluster 1. This finding illustrates that corruption is the topic of discussion that has the most links to other keywords. One example of an article that explains the relationship between the keyword corruption and keywords in Cluster 1 is *"Are emerging technologies helping win the fight against corruption? A review of the state of evidence"* by Adam and Fazekas, (2021) which explains about the use of technology in the world of government can minimize and even support anti-corruptionAdditionally, the study discovered that ICTs can aid in anti-corruption efforts by influencing public oversight in a variety of ways, including by enabling corruption reporting, promoting transparency and accountability, facilitating citizen participation, and facilitating government-citizen interactions. While the majority of past research indicates that ICT does play a role in reducing corruption, this does not mean that the policy is implemented as intended. On the other hand, the use of ICT is not immune to the political game above; in this case, it is the condition of corrupt public officials' level of control over key government institutions, including law enforcement, that allows the anti-corruption impact of ICT to be weakened or even reversed entirely.

The keyword level is enough to be the topic most discussed by researchers with up to 60 mentions. One of the articles that examines this keyword is *"Impact of E-government Development on the Level of Corruption: Measuring the Effects of Related Indices*

in Time and Dimensions" by MácHová, Volejníková and Lněnička, (2018) evaluates the impact of e-government development on corruption levels from an economic perspective. According to the findings, lower levels of corruption are related with more advanced e-government systems. A country under crisis tends to lose trust in its government more quickly than it gains trust in e-government. According to the conclusions of this study, e-governance and corruption have a strong association. Environmental, Usage, and Infrastructure sub-indexes are used to gauge a country's market circumstances and regulatory framework, as well as the level of ICT adoption by important community stakeholders. telecommunications infrastructure sub-index, which measures a country's ICT infrastructure capacity.

Government is not only the dominant keyword in Cluster 3, but also the dominant keyword in the entire Cluster. The keyword has been mentioned 111 times according to VosViewer. An example of an article that takes up this topic is "*Design principles for creating digital transparency in government*" by Matheus, Janssen and Janowski, (2021) found that many countries are adopting increased transparency in order to fight corruption, hold public officials accountable, and establish trust with citizens. Public officials have established digital lines of investigation and other forms of openness utilizing digital tools to publish information about internal activities. In order to achieve digital transparency, government institutions must first lay the technological and institutional groundwork and then use that groundwork to self-regulate for transparency. Many digital technologies exist to promote openness, but designing entire government systems for digital transparency remains a difficulty when combining them to achieve the necessary level of digital transparency.

Finally, the keyword "barrier" is the most frequently mentioned in Cluster 4. VosViewer records a total of 26 mentions. One article that discusses this is Smith and Sandberg, (2018) "Barriers to innovation with open government data: Exploring experiences across service phases and user types," which examines how innovation barriers affect OGD use across service lifecycle phases and how perceptions of barriers vary across different types of OGD users. Open government data (OGD) can catalyze community-beneficial outward open innovation (OI). However, impediments to innovation keep OGD users from creating social and technical value. Several of the challenges encountered in the usage of OGD include the fact that OGD users have varying motivations, prerequisites, methodologies, and goals, as well as expertise and capacity to overcome various forms of innovation barriers. Thus, the findings show that OGD programs aimed at increasing non-monetary open innovation must overcome barriers that develop during invention dissemination, constraints that are not directly related to the provision of OGD, and impediments faced by unidentified groups of OGD users.

E. CONCLUSION

The study of the role of digital governance for anti-corruption is an indispensable and important study to be conducted. Anti-corruption is a program that is being promoted to be held in all government agencies in any country. The anti-

corruption campaign is critical to monitor since it affects public confidence in the government's performance. One strategy for ensuring the effectiveness of the anti-corruption fight is to transition from traditional to modern governance. For the time being, modern governance is referred to as digital governance. Digital governance is expected to provide a panacea for the ongoing problem of corruption in government entities.

This study finds several important aspects related to the basis for implementing digital governance as part of the anti-corruption agenda. First, transparency and accountability. With the presence of an order for the opening of accesses that are the right to be known to the public covering the entire process through public information management, the government has the responsibility to implement all information needs that are the right of the community. Second, is Open Government or open government. Open government has become a mandatory agenda in all countries, due to the high demand for transparent and accountable government in order to minimize or even stop the increase in corruption cases. Third, is public trust. Public trust is important because this aspect can be a support for the state in implementing its governance. The main aspect that drives public trust is the quality of public data and information.

This article can contribute to the government or related stakeholders in formulating strategies/policies to eradicate corruption through digital government, which is increasingly important during Covid-19. The various studies that have been reviewed can be used as references to determine the strategy for implementing digital government. However, this study also has limitations in terms of reference sources which only come from the Scopus database and the duration of data collection is very short. It is therefore recommended that further studies use other reputable reference sources such as the Web of Science (WoS) in order to produce more comprehensive and comparative data analysis and increase the duration of data collection at least 7 years.

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