Measuring the Impact of Digital Government Service: A Scientometric Analysis for 2023

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Abstract. This study explored the characteristics of digital government trends using research data from the Scopus database for 2012 to 2022. It used a qualitative descriptive method and software CiteSpace to analyze the data. Digitalization will help the community obtain appropriate services, produce collaborative practices, and allow digital innovation. The public sector is essential in public service issues and influences the economy, as it has the authority to issue and enforce regulations and policies. This study found that the number of publications on digital government has increased over the last ten years, with the UK being the region with the most journals. An analysis using CiteSpace Software revealed 11 related clusters, each with its discussion. Digital government transformation, efficient democratic responsiveness, transforming service delivery, and digitally-based enabler are discussed in detail. The research aims to identify best practices, media, and tools used to upgrade or start using digital services in governments. It is hoped that the results of this review can become capital for the government to make digital services even better, from administration to meeting the needs of the Indonesian.

Keywords: Digital Government · Public Service · E-Government · Scientometric Analysis

1 Introduction

Public services are obligatory things that the government of a country must provide. Public service is essential in conducting effective government and on the side of society. Public service can be used as a measure of the government's success in the execution of tasks and can also serve as a tool for performance [1]. Public services in this regard are all kinds of services the government provides to the general public. Public service can indicate whether the State has performed the administrative system only well or not. Despite the importance of a State doing fast and inexpensive public service, the opinion can make the service stuck because it does not want to change with the times.

The ratio of strategic value is not just the implementation of "faster and cheaper" than the current service plan. While "faster and cheaper" services would benefit traditional performance measurements and return on investment models, they could result

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in missed opportunities and lock inefficient structures by building complex and expensive IT systems around them [2]. It is imperative for public services to swiftly adjust to societal and technological advancements. Digital governance facilitates the expansion of services that effectively address the demands of contemporary society and the dynamic nature of the present era.

Digital government or bias is known as e-government, where the system of government or the way of government refers to the use of information technology. The digital government allows governments to change and improve the provision of public services, streamline administrative processes, and encourage citizens' involvement with the government of a country. Digital government can be a paradigm shift in the system of government that uses the power of information and technology (ICT) to make governance more efficient, accountable, transparent, and accessible to the general public. The development of digital technology can make governance more modern and reach many people from various layers, local, national, to global [3].

E-government has been implemented in Indonesia since 2003 through Presidential Decree No. 3 of 2003. Presidential Regulation Number 95 of 2018 defines e-government as an electronic-based government system (SPBE). E-Government improves public services by simplifying and combining data and information management processes. Services that involve the government, citizens, private companies, other government agencies, and their employees are carried out through E-Government. Since 2003, the Indonesian Ministry of Communication and Information has developed a Blueprint application for e-Government. The application blueprint is flexible because it does not depend on government policies and organizational structure changes. Local governments are given the freedom to translate and change it [4].

Digital government enables governments to innovate extensively because they can access many refractions and network with the outside world by entering the digital world. The public sector plays a vital role in public service issues and influences the economy. The public sector plays a vital role in an economy for several reasons. First, the Organization within it has the authority to issue and enforce rules and policies, including sanctions [5]. The realm of digital governance encompasses a wide-ranging influence on various domains, including economics, law, security, business, people, and international relations. The establishment of a digital government presence facilitates public access to government information and services. Additionally, the analysis of digital governance apps can be conducted using scientific tools, such as scientometric analysis, in order to gain insights about their advancements and effects.

Scientometric analysis tools have different strengths and weaknesses, so different types of analysts must work together to thoroughly analyze each aspect [6]. We can identify collaboration, effective writers, and research trends in digital governance with the aid of scientometric analysis. It helps us comprehend the effects of digital governance better. Different sorts of analysts must collaborate since different scientometric analysis techniques have varied strengths and drawbacks. Enhancing research and development in this area is crucial.

A government that ignores technology risks falling behind and becoming unstable. This study examines the impact of and reasons why digital governance has not been fully utilised. It contributes to knowledge expansion and the adoption of efficient and

inclusive digital governance. Scientometric analysis aids in maximising the potential of digital government to solve issues and build a better future through enduring innovation, research, and collaboration.

2 Literature Review

The state apparatus or bureaucracy carries out public service regarding the fulfillment of civil affairs and the basic needs of society [7]. Public service can be used as a measure of government success in the execution of tasks and can also be used to measure performance [1]. In public service, a government can make an image for a bureaucratic performance because, in its journey, public service is not free of bureaucracy [8]. The bureaucracy still has some weaknesses in dealing with public services. According to Maryam [1], Public services provided by government bureaucracy have many problems, such as lengthy time, uncertainty, and costs, to make it difficult for communities to get a decent service. This leads to the lowest level of government service. Lips & Eppel [9] say that the development of complex public services helps us understand how the standards of digital public services are changing rapidly to meet new and growing needs.

Digital government, in short, is using technology to access and bring government services to society [10]. Von Haldenwang [11] argues that renewal thinkers should consider the often-limited capacity and willingness of public institutions to cooperate with one another. Digital government is very needed because of the accessibility that can reach many groups. However, not all groups are able to access digital-based services. According to Lee [12] that, information communication technology (ICT)-based practices cannot be successful for the community unless they are aware of and actively engage with government social media platformsple will be helpful if they can access the service properly. An in-depth conception and reflection of the main types of interactions between citizens and public officials, known as public meetings, assisted by digital public services created [13].

Digital government can be a solution for standardizing digital services that cover a range of resources, capacities, and needs of different local and city governments [14]. In practice, e-government is using the Internet to conduct government business and provide improved public services in a manner that prioritizes community service [15]. With many developments that will bring much change, according to Tangi [16], The applications, processes, cultures, structures, and responsibilities of old government officials will be transformed by digital technology. The use of technology in government is experiencing growth, and it takes time to become something good. Industry, government, and academia have assessed the e-government environment, two essential infrastructures that have emerged that help the research community understand this new phenomenon [17]. There are many things that cause studies or discussions about digital government to continue to grow. According to Opinion Moore [18] In areas such as democracy, decision-making, health care, education, integration, security, land surveys, and the provision of social services, digital governance through an e-government framework is essential. In order to do this, it is necessary to improve the system of work, as stated by Sensuse [19]. To improve the quality of public services, the use of digital governance requires a shift from "electronic" services to more "smart" services.

Digital government makes it possible to facilitate collaboration with outsiders. Collaboration can be done can be with anyone, as said Sari & Isnaeni [20] Interaction between government and society (G2C - Government to Citizen), government and companies (G2B - Government to Business), and relations between government (G2G) - Relationship) are all parts of e-government. Digital government or e-government cannot be carried out optimally in collaboration because, according to Rozikin [21] Overall, Indonesia's Government to Government (G2G) program is still in the early stages of implementing e-government, considering that many local governments have not implemented e-government, this stage is still limited to interaction with the community and has not fully reached the transaction stage.

Digital government can also create an open government that has many benefits. As stated by Meijer [22], open government is considered to have many benefits, such as being more efficient, reducing corruption, and increasing government legitimacy. This reason makes it very popular among politicians and policymakers. Interinstitutional collaboration, transparency of actions and operations, and citizen participation in Open Digital Government (ODG) increase confidence in using ODG services [23]. Not only is the government more open, but it will also increase a country's market potential, as said Ivanova [24]. Careful consideration of the impact of digital governance is crucial in order to comprehend its implications and facilitate its continued expansion. This will facilitate the optimisation of benefits and enable effective responses to the constant changes in the contemporary governance landscape.

3 Research Method

This research method uses a systematic review of the literature aimed at reviewing scientific articles on digital governance that have previously been published in the Scopus-indexed database. The selected articles are articles published over the last ten years, from 2012 to 2022. The data that appears on the scopus page is then re-filtered and obtained in 109 documents that are used as a database in this research. To obtain data that is systematically filtered and obtained using Scopus, it is searched using some keywords or queries like this:

((TITLE-ABS-KEY("digital government") AND TITLE-ABS-KEY("Public Service") OR TITLE-ABS-KEY(technology)) AND PUBYEAR > 2012 AND PUBYEAR < 2022 AND (LIMIT-TO (OA, "all")) AND (LIMIT-TO (DOCTYPE,"cp") OR LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (LANGUAGE,"English"))).

After obtaining the data needed for this research using software in the form of CiteSpac, which makes it possible to access the data needed in this scientometric research. Scientometric analysis tools have different strengths and weaknesses, so different types of analysts must work together to thoroughly analyze each aspect [6]. CiteSpace is a free program that is used to process data based on Java and is generally used to analyze the progress of science visually [25].

Figure 1 represents the stages of the research being carried out. The data collection process is carried out through the Scopus database with specific keywords to bring up the appropriate data. Scopus does not only document but also imports some data, such as graphics about publications, authors, the number of publications, and so on. This study

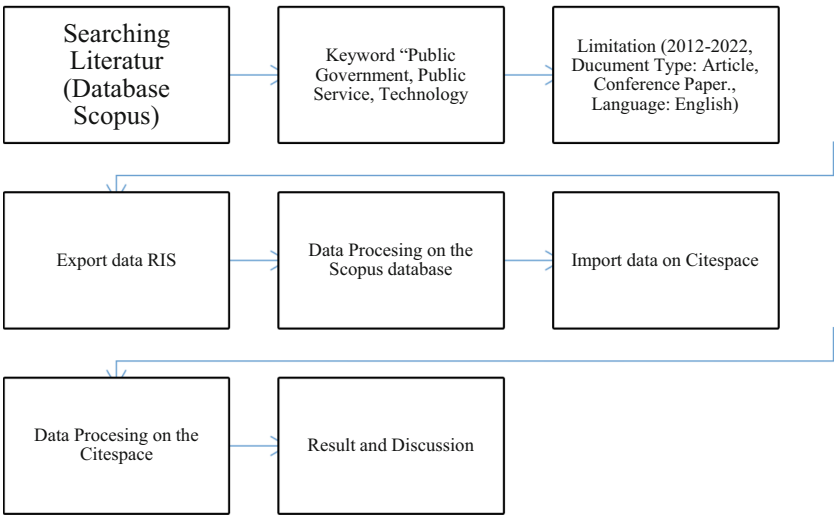

Fig. 1. Research Stages

also uses the Citespace application, which is helpful for mapping documents that have been obtained from Scopus. Citespace will bring up data visualizations from documents about digital government and public services that have been collected. After the required data has been collected, an analysis of the results can be carried out to fulfill this research.

4 Result and Discussion

4.1 Document by Year Digital Government

Publications growth of digital government and public service trends on the Scopus database from 2013 to 2022 is presented in Fig. 2.

Since 2013, there have been two publications about digital government on Scopus. Publications about digital government declined in 2014, with only one publication, and in 2015, there was no publication. Publications re-stick in 2016 with two publications; in 2017, there were seven publications increased; in 2018, there were 12; and in 2019, there were 18 publications. By 2020, the publication trend will fall back to just 14. Publications on the scope of digital government and public services rose again in 2021 with 19 publications and peaked in 2022 with the highest publication of 34 documents.

The graph above shows that from year to year, the government is more aware of the importance of digitizing their government. Even though there was a decrease in 2020 due to the presence of Covid-19, which required them to shift their focus to other things. In the following year, there was a surge in research on digital government because, at the time of Covid-19, all activities were shifted online, which required the government to innovate. Due to such demanding circumstances, e-government enables the amalgamation of public policies and services to promote inclusive economic growth, social development, and environmental protection [26].

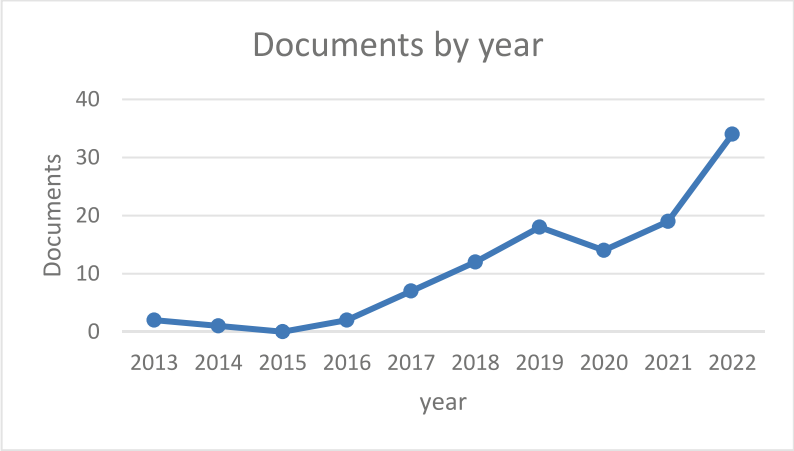

Fig. 2. Documents by year

4.2 Document by Source

There are five sources on the list that contributed to worldwide research of digital government and public service trends from 2016 to 2022. Figure 3 shows the sources with detailed information.

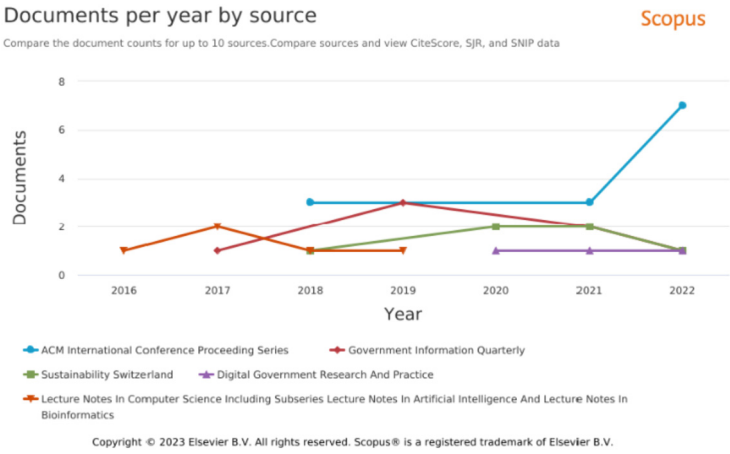

Fig. 3. Documents per year by source

The figure above shows that the ACM International Conference Proceeding Series published 13 documents, followed by the Government Information Quarterly, with seven documents. Sustainability Switzerland published six documents. It can be seen that starting in 2018, research on digital government and public services has been increasing

in publication. In Fig. 3, it can be seen that starting in 2018, researchers have begun to be able to easily take references from this source because their publications are increasing.

4.3 Countries Contributions

There are ten countries that contributed to digital government and public service trends from 2012 to 2022. Statistical data of publications indexed by the Scopus database is provided below in Fig. 4.

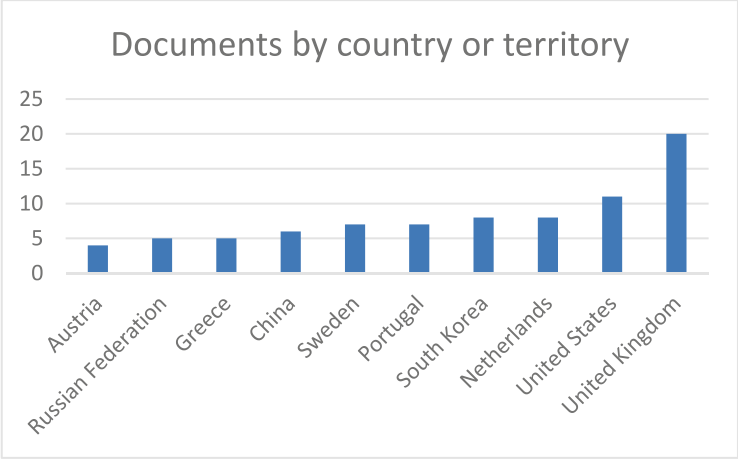

Fig. 4. Documents by country or territory

The survey looked at ten simple countries with the most publications on the scope of digital government and public services. The table below shows that the most published on the scope is the United Kingdom, with 20 documents. The dominant country in the study was the United States, with 11 publications, followed by the Netherlands and South Korea, with eight documents. Publications 7 documents have Portugal and Sweden. China, Greece, the Russian Federation, and Austria are the following four countries.

It can be seen that the United Kingdom has become a region that publishes research on digital government and public services. The United Kingdom is an advanced region and also conscious of technology, so it is not surprising that the advancement of digital services is at its forefront. The United States follows with the second-most publications. It is not surprising that the United States is a developed country and has made much progress in the field of government. It can be seen that their research on digital government is also massively carried out by researchers there. The top 10 countries and theories that issued documents on digital government and public services are famous for their initiative and willingness to grow. Covud-19 could be a leaping point or a basis for countries around the world to start digitalizing their governments because digitalization in the Covud-19 era can help in any sector, whether economy, health, or even education.

4.4 The Most Productive Authors

Referring to 109 analyzed documents, Fig. 5 top 10 most productive authors of digital government and public service trends from 2012 to 2022 indexed by the Scopus database in the specified period.

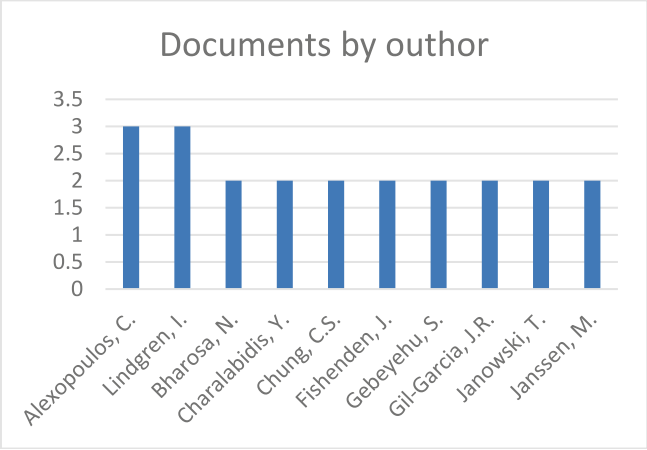

Fig. 5. Documents by author

The following section is the ten authors with the most publications on digital government and public services on Scopus. The authors in the table below are Alexopoulos and Lindgren, with three publications on Scopus. Eight other authors followed, with each publishing two documents in the Scopus, namely Bharosa, Charalabidis, Chung, Fishenden, J., Gebeyehu, S., Gil-Garcia, J.R., Janowski, T., and Janssen, M.

4.5 Mapping Visualization, Cluster Identification, and Analysis

Through citespace analysis, he produced 11 large clusters in which each cluster had its own point of discussion but was still related to each other, as shown in Fig. 6, which gave a cluster map taken using the citesapce application.

The results displayed from the citespace application can be displayed using some short descriptions that describe the cluster. Of the 11 clusters obtained, there are 0) digital government transformation, 1) efficiency democratic responsiveness, 2) transforming service delivery in this third cluster, 3) digitally-based enabler, 4) change agents, 5) bibliometric study, 6) best practice, 7) using the web, 8) electronic services, 9) collaborative platform, 10) artificial intelligence. The order of the clusters that appear is from the largest to the smallest cluster so that they can be identified quite easily. This analysis also provides data on what articles often appear when using the keywords digital government and public service.

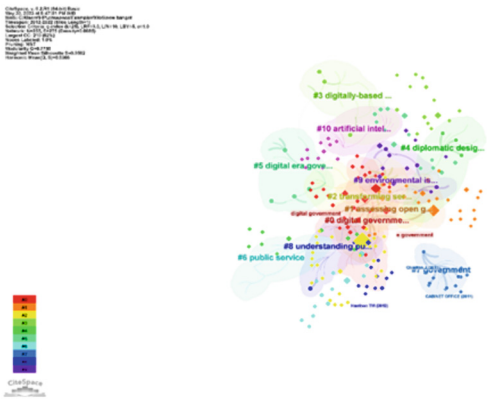

Fig. 6. Knowledge domain clusters in digital government and public services

4.5.1 Digital Government Transformation

This cluster has 34 members and a silhouette value of 0.898. It is labeled as digital government transformation by LLR, delivery processes by LSI, and artificial intelligence (0.84) by MI. The major citing article of the cluster is Bharosa, N "Inclusion through proactive public services: findings from the Netherlands: classifying and designing proactivity through understanding service eligibility and delivery processes."

This cluster has a discussion related to critical variables for creating service feasibility and service delivery so that they can be used to propose design principles to increase public service activity. The importance of increasingly proactive services is also included in this cluster discussion. Politicians are aware of the benefits of proactive governance, and the transition from reactive to proactive services is vast. The development of proactive services is a complex challenge that requires knowledge in many fields, including information technology, administration, data protection, and many areas of law (administrators, data defense, and human rights). In a general sense, proactivity refers to the transfer of citizen initiatives to governments and can be used in a variety of ways in the public sector. According to our research, we should discuss different levels of proactivity rather than considering them as dichotomy factors. Expanding the certification and delivery process is crucial to determine the possible level of proactivity [27].

4.5.2 Efficiency Democratic Responsiveness

This cluster has 31 members and a silhouette value of 0.97. It is labeled as efficient democratic responsiveness by LLR, the legal-rational process by LSI, and systematic review (0.69) by MI. The major citing article of the cluster is Ingram's "Assessing open government performance through Three public administration perspectives: Efficiency, democratic responsiveness, and legal-rational Process."

This laster discusses open government is necessary for a democratic society, coupled with the existence of digital government, making openness has been heralded by governments that use information and communication technology (ICT) without carrying out

legal reforms whose institutions are needed to support accountability and transparency [28].

4.5.3 Transforming Service Delivery in This Third Cluster

This cluster has 29 members and a silhouette value of 0.99. It is labeled as transforming service delivery by LLR, government agency by LSI, and artificial intelligence (1.8) by MI. The major citing article of the cluster is Maruyama, M "Design teams as change agents: diplomatic design in the open data movement."

A discussion regarding the importance of digital designers and developers who must have data so that their work is better. Therefore, the role of the government is actually needed to provide the required data. Open data advocates see technology as a tool to rediscover citizenship and government. These groups indicate that space technologies are agents of change, diplomats, and supporters, in addition to experts in the design and development processes. These clusters are intended to investigate specialized CfA techniques that we call diplomatic designs, which combine participatory designs with agencies of change. Examples reveal that the primary goal of these individuals is to influence social change, with the technology they create only serving as a tool for that purpose [29].

4.5.4 Digitally-Based Enabler

This cluster has 18 members and a silhouette value of 0.96. It is labeled as a digitally-based enabler by LLR, public value by LSI, and Qatari experience (0.07) by MI. The major citing article of the cluster is Roy, JP "Service, openness and engagement as digitally- based enablers of public value? a critical examination of digital government in Canada".

This cluster discusses that public value creators can be the pivot for digital government transformation. A few arguments are presented in the discussion in an effort to clarify some of the major barriers to the creation of public value in the context of digital governance and to provide some fresh perspectives on how to do so while maximizing the use of digital innovation in government [30].

4.5.5 Change Agents

This cluster has 17 members and a silhouette value of 0.959. It is labeled as a change agent by both LLR and LSI and as artificial intelligence (0.03) by MI. The major citing article of the cluster is Maruyama, M "Design teams as change agents: diplomatic design in the open data movement."

This cluster discusses designer and developer experts who should have the same level as technical experts in obtaining government data. The responsibilities of government agencies include providing accessible and valuable data, enabling developers to use that data to create tools, and encouraging citizens to use new technologies. The objectives of one group may conflict with those of another group. This exposure investigates the usefulness of the diplomatic design approach, which emphasizes the craftsmanship and practice of negotiating using specific strategies, having this in mind [29].

4.5.6 Bibliometric Study

This cluster has 17 members and a silhouette value of 0.964. It is labeled as a bibliometric study by both LLR and LSI and as artificial intelligence (0.1) by MI. The major citing article of the cluster is Ravšelj, D "A review of digital era governance research in the first two decades: a bibliometric study."

This cluster has a discussion about the rise of digital technology, which has paved the way for the emergence of a new public governance model called the Digital Era Governance (DEG) model (often referred to as e-government, digital governance, e-governance, or governance digital governance) in which digital technology plays a central role. DEG research is a relatively new discipline marked by rapid development and evolution. Consequently, a comprehensive and in-depth strategy is required to comprehend the evolution of DEG research over time. In reviewing DEG research over the past two decades, this bibliometric study employs several established and innovative bibliometric approaches, including descriptive surveys, scientific production, network analysis, and thematic evolution. The results demonstrate the expansion of DEG research over the past two decades, particularly in recent years, as accelerated by some of the most pertinent articles published in prominent journals, with the majority of DEG studies conducted in developed nations [31].

4.5.7 Best Practice

This cluster has 13 members and a silhouette value of 0.953. It is labeled as bests practice by LLR, public service by LSI, and spatial planning (0.07) by MI. The major citing article of the cluster is Leão, HAT "Best practices and methodologies to promote the digitization of public services citizen-driven: a systematic literature review."

This cluster discusses public services that have become bigger and faster digital that the government uses. All levels of government are charged with providing services, protecting communities, and fostering economic growth. Although this is a long-term objective, citizens now expect the government to provide more excellent and quick delivery services. This paper presents a systematic review of the literature on the digitalization of government-provided services in several countries, motivated by the dearth of primary studies in the literature on the identification of the processes and methodologies used by governments and private companies to provide their services [32].

4.5.8 Using the Web

This cluster has 13 members and a silhouette value of 0.98. It is labeled as using the web by LLR, opportunities and challenges of using web 2.0 technologies in government by LSI, and using the web (0.01) by MI. The major citing article of the cluster is Sivarajah, U "Opportunities and challenges of using web 2.0 technologies in government".

In this cluster, the discussion that is published is related to public administration, which is assisted by the web making new opportunities for progress for the government. This technology has offered a series of new opportunities and difficulties for these governmental entities, and the discussion of Web 2.0 technology is more engaging than the old model of information provision or the construction of digital services. This study examines the potential presented to public authorities by Web 2.0 technologies and the

obstacles that may need to be addressed by these authorities when incorporating these technologies into their work practices. The study does this by referring to previous research that has been conducted [33].

4.5.9 Electronic Services

This cluster has 13 members and a silhouette value of 0.982. It is labeled as an electronic service by both LLR and LSI and as a sensitivity review (0.03) by MI. The major citing article of the cluster is Luna-Reyes, LF, "Understanding public value creation in the delivery of electronic services."

This cluster discusses ways to analyze and define public value creation through electronic services. Using a process model to understand value creation through electronic services in Mexico is the subject of the current discussion. The ultimate goal of this unique initiative is to collect data through citizen surveys to understand the relationship between system quality, information quality, user satisfaction, system usage, and individual benefits [34].

4.5.10 Collaborative Platform

This cluster has 13 members and a silhouette value of 0.912. It is labeled as a collaborative platform by LLR, an environmental issue by LSI, and public health service (0.18) by MI. The major citing article of the cluster is Sapraz, M "Implicating human values for designing a digital government collaborative platform for environmental issues: a value-sensitive design approach."

This cluster aims to implicate essential human values for designing a Digital Government Collaborative Platform (DGCP). The conversations that take place in this cluster will play a role in the design of DGCP as an e-government solution, particularly for Environmental sustainability. The goal of this design is to construct successful collaboration for developing nations that have various socio-political and multicultural characteristics. In addition, the study made a contribution to the VSD literature by creating DGCP as an electronic service for the government [35].

4.5.11 Artificial Intelligence

This cluster has 12 members and a silhouette value of 0.98. It is labeled as artificial intelligence by LLR, artificial intelligence in the urban environment: smart cities as models for developing innovation and sustainability by LSI, and artificial intelligence (0.02) by MI. The major citing article of the cluster is Ortega-fernández, "Artificial intelligence in the urban environment: smart cities as models for developing innovation and sustainability."

This cluster discusses Smart City (Granada) in order to discuss which strategic technological actions to implement in different topical areas of action: the economy, sustainability, mobility, government, population, and quality of life. The advancement of better public administration, mobility, environment, economy, and quality of life in urban areas requires technological and digital innovation as well as AI. Consideration of the trend shift from functional systems to more sustainable and intelligent systems

is crucial for the transformation of traditional cities into smart cities. For the financial structure to be optimized, the ICT infrastructure must be ready. It is necessary to combine a wide range of issues, including those relating to the environment, service quality, social behavior, etc. [36].

5 Conclusion

Government digital public services have advanced significantly in recent years. Fundamental changes in how governments connect with citizens and provide public services have been brought about by the digital revolution. We will highlight some of the key points that demonstrate the progress, advantages, and potential of digital public services. Digital government services have advanced significantly. Information and communication technology has been used by governments around the world to simplify and speed up administrative procedures. Online applications for documents, invoices, and registration are some examples of public services that are now easily accessible via digital platforms. This allows customers to buy the services they need with less time and effort.

According to the report, Various sectors, including the online economy and health care, embrace digital governance, which is very beneficial to society. For example, after the outbreak of COVID-19, more hospitals use online hospital registration, appointments, and access to electronic medical data. Through the penetration of online markets, digitization has allowed small and medium-sized business owners to thrive in the economy. All this shows how beneficial digital public services are for society.

Despite significant progress, government investment in the required technology infrastructure continues to rise as digital public services continue to expand. This requires better Internet connectivity, data security, and more dynamic and user-friendly software development. To ensure that everyone in the community, especially in rural areas and under-serving populations, has equal access to digital public services, the government also works with civil society. It is vital that the public actively participate in the decision-making process and monitor the growth of digital public services.

The public has benefited greatly from digital governance, which has reduced administrative barriers and improved the efficiency of public service provision, among others. Citizens no longer have to physically go to government offices to make requests, report problems, or ask for information. Greater comfort and accessibility is offered, especially for those with time or physical constraints. Moreover, because data and information are easily accessible by the public, digital governance also increases transparency and accountability of governments.

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