

# Original Research Article

## IT in the Public Sector: a Road for Development Services, a Bibliographical Study

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### ABSTRACT

**Purpose** : Information Technology (IT) research in the public sector is an interesting topic to study considering that currently IT is an integral part of the public sector. This study aims to find out the development of research articles on IT in the public sector published in international journals from 2011 to 2020 so that they can be input and direction for new researchers in making theoretical frameworks so that they know which journals and authors should be consulted when researching IT in Indonesia. public sector.

**Methodology** : In the initial search, 976 journals were found, the next selection was to search for journal articles that specifically discussed IT in the public sector, as many as 140 journals were found.

**Result** : The results obtained were 140 journals discussing IT in the public sector in 2011-2020 published in international journals with Q1-Q4 criteria at Scimago as many as 104 journals and the remaining 34 journals published in other international journals. Topics that are often used include e-government, social media, innovation, open government, smart cities, open data, governance, public sector, intellectual capital and technology.

**Conclusion** : Based on research on the growth of IT research articles in the public sector in 2011-2020 an average of 14% or a total of 14 articles per year. The trend of research tends to decrease and the authors of these articles come from many countries in America and Europe, while there are still few countries in Asia.

**Keywords** : Information Technology, e-Government, Public Sector, Governance, Bibliography

### 1. INTRODUCTION

This study aims to provide information about the development of IT research in the public sector in international journals through bibliometric research mapping, from 2011–2020 using the VOSviewer analysis tool. The results of this study are expected to provide information on topics that are often used in research, determine the research area with the largest research results, the year of research, and find out research journals. The research results are expected to provide an overview of the potential research topics so that they can be a reference for further researchers for research development in the same field.

The implementation of the New Public Management (NPM) proposed by Hood (1997) has now been widely applied to the public sector, which focuses on improving public services that are effective, efficient and transparent. The impact of the industrial revolution that continues to develop makes information technology (IT) in the public sector important. Utilization of IT is used to achieve organizational strategies and goals so that they are in line with efforts to improve the implementation of the NPM. Information Technology is not only important for corporate business, it is an integral part of the public sector [1]. In the public sector,

technology also provides benefits for management in improving services to the public [2] [3] [4] [5].

Phenomena that are often found in developing countries include not so good services to the community due to lack of professionalism of employees, high service costs caused by long procedures and the length of time the services provided. The use of technology in developing countries has a significant impact. E-government in developing countries improves public services, reduces corruption, and more open and inclusive government [6] [7]. Community participation in development will determine the success of the government, including through the development of existing technology [8] [9].

This article examines the development of information technology in the public sector. IT research in the public sector is important to research considering that there is very little IT research in the public sector, especially in developing countries [1]. The development of IT research in the public sector in 2011-2020 can be observed in tables and figures 1. This research uses bibliometric mapping analysis and VOSviewer with data sourced from the scientific database web on the Publish on Perish (PoP) application. Science mapping is an attempt to describe the observed knowledge and then map the development of that knowledge. Bibliometrics is the study of bibliographic analysis of scientific activities based on the assumption that a researcher conducts research and must communicate the results to all [3].

## **2. LITERATURE REVIEW**

### **2.1. Information Technology (IT)**

The definition of information technology (IT) refers to all forms of technology used to be able to create, store, change and also use that information in all its forms [4]. IT is a combination of computer equipment and the internet. The combination of computer technology consists of hardware and software for processing and storing information with information technology for distributing information. The information technology used includes computers (mainframe, mini, micro), software (software), databases, networks (internet, intranet), electronic commerce, and other types related to technology [5].

[6] explain the three types of innovation in the public sector :

1. Incremental innovation (which is closer to 'continuous improvement', and hence more unclear definition of innovation).
2. Radical innovation: new services, products, delivery methods, etc.
3. Systemic innovation: large-scale and fundamental institutional change.

Additional innovation will build on existing knowledge and increase resources in the company, which will increase competence. Meanwhile just make changes with simple technology with resultant products to stay competitive in the market. On the other hand, radical innovation requires completely new knowledge and resources. Radical innovation takes advantage of technological advances and provides products that can win market competition. The use of information technology that is currently developing in society, so that by utilizing it technological advances make it easier for company management in the process of diffusion of innovation to society. Utilization of information technology increases the development of service product innovation [7].

## **3. METHODOLOGY**

The population of this research is all IT journals in the public sector for the period 2011-2020 whose data was taken from Google Scholar through a search using the Harzings Publish or Perish (PoP) application with the keyword "technology information at public sector" in the search process in December 2021. Bibliometric analysis used to analyze the content of the scientific article literature. The study of research literature is systematic, explicit and reusable [8].

Pattah (2013) said that the use of the bibliometric method can be used to evaluate the results of scientific research because it has three functions, namely (1) the description function means providing a number of publishing activities at the state, province, city, or institutional level as a comparative productivity analysis, (2) the evaluation function is used to assess the performance of research units, and (3) as part of standard procedures for evaluating and monitoring science and technology. The indicators can be used to examine the interaction between science and technology resulting in the mapping of scientific fields and can track new developments in certain knowledge fields [9].

The initial search found 979 articles, the first step was to select 14 citation-link articles. Deletion of this citation type article because it was inaccessible (according to the Publish or Perish User Manual Guide). Selection was also carried out on book type articles that did not fit into the selection criteria for this study. The next step is the selection of journals that specifically discuss IT in the public sector, found as many as 140 journals for the period 2011-2020.

The data found from the final results of the data selection process are 140 journals (shown in Table 1) which will be sampled in this study. Data processing using Microsoft Excel in the process of processing and downloading research data. Mendeley applications are also used for library metadata. To find out the map of the development of international publications, this research uses the VOSviewer application.

#### 4. RESULT AND DISCUSION

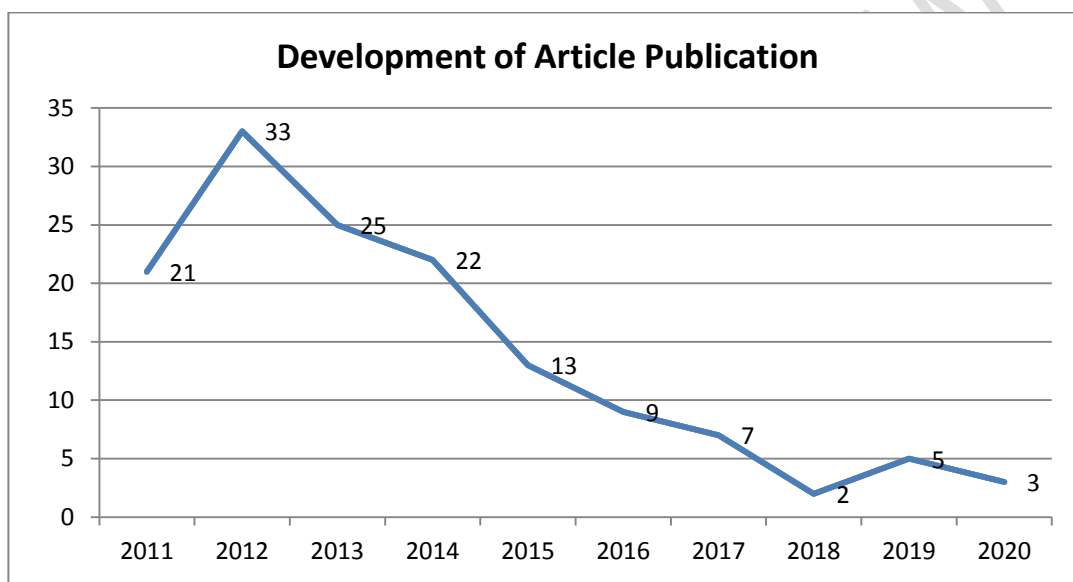
##### 4.1 Development of Research on IT in the Public Sector in 2011-2020

The search results for IT articles in the public sector from 2011 to 2020 found 979 journals. After being selected, 140 journal titles were found that met the criteria for IT research topics in the public sector. The development of research during these ten years experienced fluctuations that tended to decrease. The research average per year is 14%. Most research was found in 2011. This may be due to the euphoria of the industrial revolution 4.0 which was introduced to the public. The development of this research can be seen in Figure 1.

**Tabel 1. Processing of Article Data**

Year	First	Filtration			Private's Sector	Public's Sector
		Citation	Book	Not English Language		
2020	24	2	10		9	3
2019	39		12		22	5
2018	47	1	15		1	29

2017	72	3	19	1		42	7
2016	66	1	17			39	9
2015	110	2	20		2	75	13
2014	128		27			79	22
2013	162	2	37			98	25
2012	161		23	1		103	33
2011	169	3	13		3	127	21
<b>Total</b>	<b>978</b>	<b>14</b>	<b>193</b>	<b>2</b>	<b>6</b>	<b>623</b>	<b>140</b>



**Fig 1. Development of Article in 2011-2020**

From the research results as many as 140 international journals, journals published in international journals with Q1-Q4 criteria in Scimago as many as 106 journals and the remaining 34 journals published in international journals outside the Q1-Q4 criteria. This can be seen in table 2 and table 4.

The results of further observations, it is known that the Q1-Q4 criteria journals that contributed the most research were the Government Information Quarterly journals as many as 29 journals during 2011-2019. Elsevier Publisher is the publisher that most often publishes journals related to research topics. Meanwhile, the research auditors were dominated by the USA and Spain. There are still very few research auditors from countries in Asia and Africa. Can be seen in table 3.

**Table 2. Names of journals published by quartiles in Scimago**

Rate	Source	Scopus	Publication's Number	Years
1	Technology Analysis & Strategic Management	Q1, Q2	2	2013, 2012

2	Government information quarterly	Q1	29	2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019
3	Cambridge Journal of Regions, Economy and Society	Q1	1	2015
4	International Journal of Entrepreneurial Behaviour & Research	Q1	1	2011
5	Computers and Electronics in Agriculture	Q1	1	2017
6	International Review of Administrative Science	Q2	1	2016
7	Technological Forecasting and Social Change	Q1	2	2017, 2014
8	Smart Technologies and Innovation for a Sustainable Future, Advances in Science, Technology & Innovation Research Policy	Q3	1	2019
9	Organization studies	Q1	3	2015, 2012, 2011
10	Structural change and economic dynamics	Q3	1	2013
11	Nonprofit and voluntary sector quarterly	Q1	1	2014
12	International Journal of Public Sector Management	Q2, Q3	4	2020, 2019, 2014
13	Health Informatics journal	Q1	1	2012
14	The Journal of High Technology Management Research	Q2	1	2019
15	Public Administration Review	Q1	4	2013, 2012
16	Agriculture and human values	Q1	1	2011
17	Human Resource Management Review	Q1	1	2015
18	Administration & Society	Q1	1	2011
19	Journal of the Knowledge Economy	Q3, Q4	2	2013, 2011
20	Policy & Politics	Q2	1	2012
21	Structural change and economic dynamics	Q3	1	2013
22	Journal of Public Administration Research and Theory	Q1	1	2011
23	Applied geography	Q1	1	2014
24	Communications of the ACM	Q1	1	2014
25	Science Robotics	Q1	1	2020
26	Cities	Q1	1	2017
27	Trends in Food Science & Technology	Q1	1	2011
28	Public administration	Q1	1	2016
29	Automation in construction	Q1	1	2013
30	Management of Environmental Quality : an International Journal	Q4	1	2015

32	The Lancet	Q1	1	2011
33	Health affairs	Q1	1	2014
34	Advanced Engineering	Q1	1	2012
35	International Journal of Information Management	Q1	2	2017, 2014
36	Information Polity	Q1	2	2015, 2012
37	Information Systems Management	Q1	1	2012
38	Health informatics journal	Q3	1	2014
39	Information Systems Research	Q3	1	2012
40	Transportation Research	Q1	1	2011
41	Technology in Society	Q2	1	2012
42	IEEE Intelligent System	Q1	1	2012
43	World Development	Q1	1	2014
44	Computers in Human Behaviour	Q1	1	2015
45	Public Money & Management	Q2	1	2016
46	Automation in construction	Q1	1	2014
47	Journal of Asia-Pacific Business	Q3	1	2012
48	Information & Management	Q1	1	2013
49	Journal conference on electronic Government	Q3	1	2012
50	Information Systems Frontiers	Q2	1	2012
51	International Journal of Operations & Production Management	Q1	1	2011
52	Journal of the knowledge economy	Q3	1	2013
53	International Journal of Production Economics	Q1	1	2015
54	Management decision	Q1	1	2012
55	British Journal of Management	Q1	1	2013
56	Food policy	Q1	1	2011
57	Australian Planner	Q3	1	2015
58	Information and Organization	Q1	1	2011
59	Journal of health organization and management	Q2	1	2011
60	Journal of urban technology	Q1	1	2015
61	Waste management	Q1	1	2011
62	Socio-Economic Planning Sciences	Q1	1	2020
63	Journal of Enterprise Information Management	Q2	1	2013
64	Organization Science	Q1	1	2012
65	China Economic Review	Q2	1	2011
<b>Total</b>			<b>106</b>	

**Table 3. Publishing Countries and Authoring Countries International Journals Q1-Q4**

Rate	Name of Publisher	Publisher	Authors	Year
1	Taylor & Francis	UK	UK	2013
2	academic.oup.com	USA	USA	2011
3	Citeseer	USA	USA	2012
4	content.iospress.com	Netherlands	USA	2015
5	content.iospress.com	Netherlands	Albany	2012
6	dl.acm.org	USA	South Korea	2014
7	Elsevier	Netherlands	Greece	2019
8	Elsevier	Netherlands	England	2012
9	Elsevier	Netherlands	Estonia	2017
10	Elsevier	Netherlands	Netherland	2014
11	Elsevier	Netherlands	USA	2015
12	Elsevier	Netherlands	Denmark	2013
13	Elsevier	Netherlands	Spain	2019
14	Elsevier	Netherlands	USA	2012
15	Elsevier	Netherlands	USA	2015
16	Elsevier	Netherlands	Taiwan	2011
17	Elsevier	Netherlands	China	2011
18	Elsevier	Netherlands	Finland	2017
19	Elsevier	Netherlands	UK	2013
20	Elsevier	Netherlands	USA	2015, 2013, 2012, 2011
21	Elsevier	Netherlands	Brazil	2011
22	Elsevier	Netherlands	Korea Selatan	2014
	Elsevier	Netherlands	Spain	2017, 2015, 2014, 2013, 2012
23				
24	Elsevier	Netherlands	Austria	2012
25	Elsevier	Netherlands	Australia	2014, 2013
26	Elsevier	Netherlands	Emirate	2014
27	Elsevier	Netherlands	Netherland	2014, 2013, 2012
28	Elsevier	Netherlands	Canada	2011
29	Elsevier	Netherlands	Iran	2012
30	Elsevier	Netherlands	Serbia	2014
31	Elsevier	Netherlands	Jordania	2015
32	Elsevier	Netherlands	Brunei	2013
33	Elsevier	Netherlands	Meksiko	2012
34	Elsevier	Netherlands	India	2017
35	Elsevier	Netherlands	Norwegia	2017

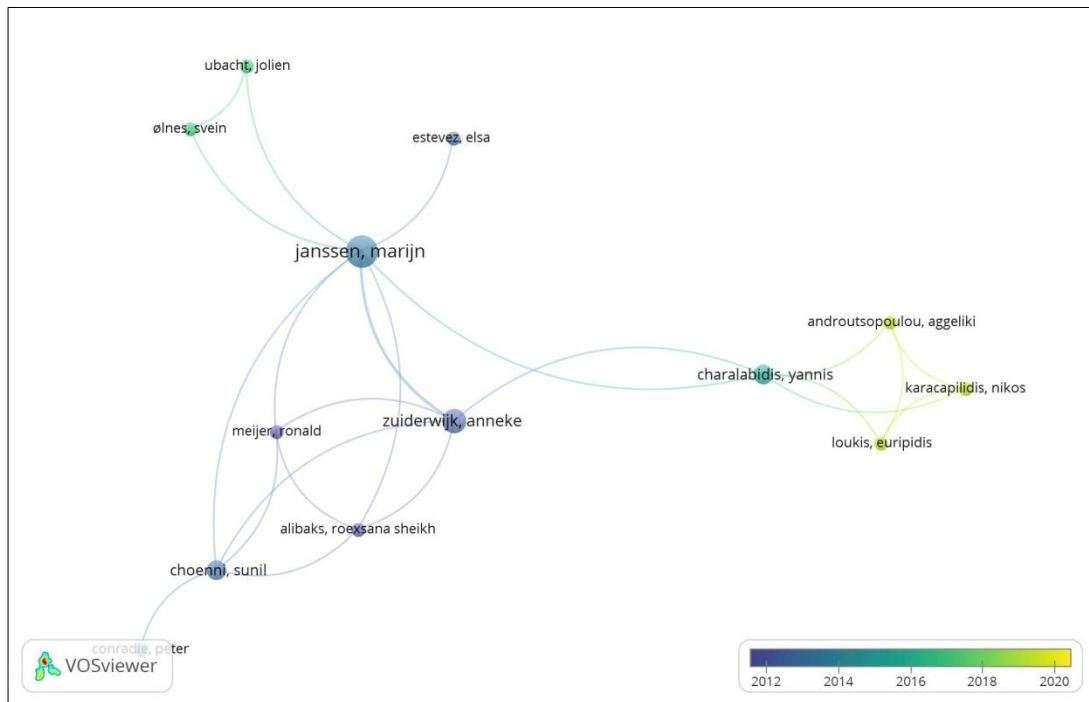
36	Elsevier	Netherlands	France	2015, 2013
37	Elsevier	Netherlands	USA	2018, 2016, 2014, 2012
38	Elsevier	Netherlands	UK	2011
39	Elsevier	Netherlands	Portugal	2015
40	Elsevier	Netherlands	South Korea	2014
41	Elsevier	Netherlands	Canada	2011
42	Elsevier	Netherlands	Australia	2011
43	Elsevier	Netherlands	Portugal	2020
44	Elsevier	Netherlands	Greece	2012
45	Elsevier	Netherlands	China	2011
46	emerald.com	UK	Ireland	2011
47	emerald.com	UK	Kazakhstan	2019
48	emerald.com	UK	Nigeria	2015
49	emerald.com	UK	Brazil	2020
50	emerald.com	UK	UK	2014, 2013, 2011
51	emerald.com	UK	USA	2012
52	emerald.com	UK	Korea	2019
53	emerald.com	UK	Vietnam	2011
54	healthaffairs.org	USA	USA	2014, 2012
55	ingentaconnect.com	UK	USA	2012
56	journals.sagepub.com	India	UK	2016
57	journals.sagepub.com	India	Switzerland	2013
58	journals.sagepub.com	India	USA	2014
59	journals.sagepub.com	India	Denmark	2018, 2011
60	olcstage.worldbank.org	USA	USA	2015
61	pubsonline.informs.org	USA	Canada	2012
62	pubsonline.informs.org	USA	USA	2012
63	science.org	USA	China	2020
64	Springer	Germany	Emirate	2019
65	Springer	Germany	Ethiopia	2011
66	Springer	Switzerland	USA	2012, 2011
67	Springer	Switzerland	Indonesia	2012
68	Springer	Switzerland	Greece	2013
69	Taylor & Francis	UK	UK	2012
70	Taylor & Francis	UK	Netherland	2012
71	Taylor & Francis	UK	Australia	2016, 2015, 2012
72	Taylor & Francis	UK	Canada	2015
73	Wiley Online Library	UK	Netherland	2016
74	Wiley Online Library	UK	USA	2013, 2012
75	Wiley Online Library	UK	UK	2013

**Table 4. International Journal Names**

Rate	Source	Publication's Number	Year
1	Administrative Sciences	1	2012
2	Administrative Theory & Praxis	1	2011
3	AI & Society	1	2014
4	American Journal of Public Health (AJPH)	1	2012
5	Available at SSRN 2709713	1	2015
6	Big Data & Society	2	2014
7	Computer and Society	1	2012
8	Communications of The Association for Information System (CAIS)	1	2014
9	EJEG	1	2012
10	European Scientific Journal	1	2016
11	Global Consortium on Higher Education and Research for agriculture (GCHERA) Conference	1	2011
12	GSTF Journal on Computing	1	2014
13	Human Resource Management Review	1	2015
14	Health Affairs	1	2012
15	Information Development	1	2016
16	International Journal of Economics and Management Engineering	1	2014
17	Innovation, Technology and Entrepreneurship Global Practice	1	2013
18	International Journal of Instruction	1	2012
19	International Journal of Education and Development using ICT	1	2012
20	International Journal of Managing Information Technology (IJMIT)	1	2014
21	International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)	1	2013
22	2016 13 <sup>th</sup> International Conference on Service Systems and Service management (ICSSSM)	1	2016
23	Journal Of Social and Development Science	1	2013
24	Journal of Arts and Humanities	1	2012
25	Journal of Advanced Research in Business and Management Studies	1	2016
26	Journal of Computer Mediated Communication	1	2012
27	Journal of Humanities and Social Science (JHSS)	1	2012
28	Management Science Letters	1	2017
29	Nanotechnology Research Directions for Societal Needs	1	2011
30	Philosophical Transaction of the Royal a Society	1	2013
31	Policy & Internet	1	2011
32	Review of Integrative Business and Economics Research	1	2016
33	Scandinavian Journal of Public Administartion	1	2017
34	Thirty Fifth International Conference on Information Systems	1	2014
35	The Economic and Labour Relations Review	1	2013
<b>Total</b>		<b>36</b>	

**4.1. Map of IT Research Cooperation in the Public Sector in 2011-2020**





**Fig 3. Map of Cooperation Between Researchers on IT Topics in the Public Sector**

#### 4.2.3 Topics of interest in research

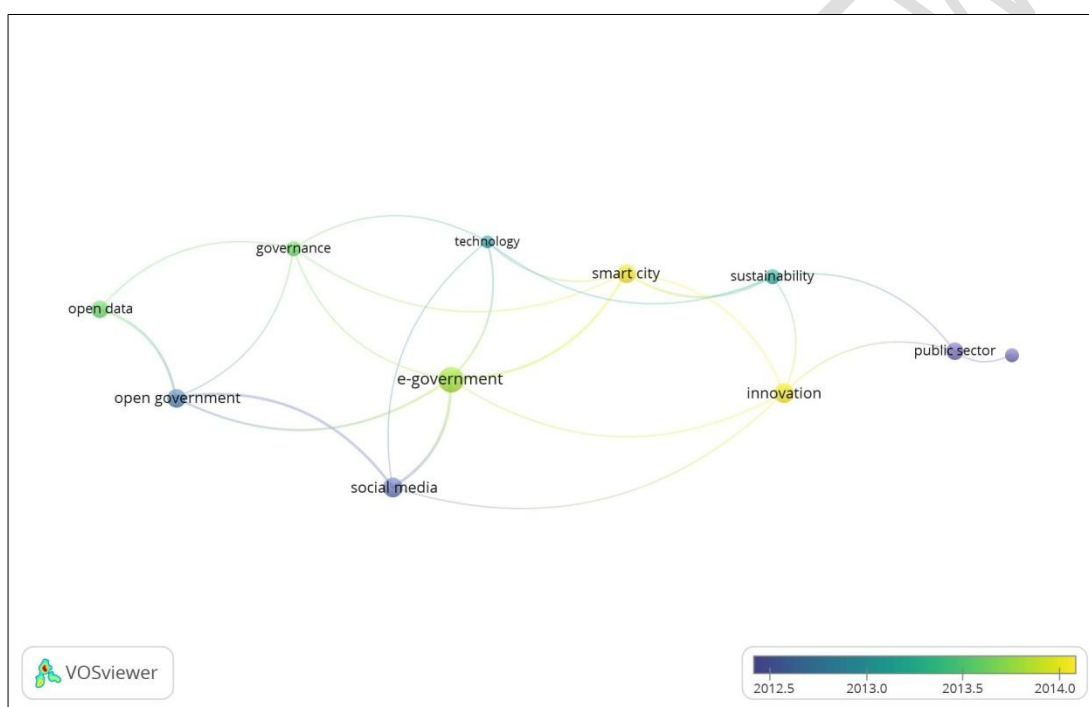
The topics most frequently used in IT research in the public sector in 2011-2020 are e-government, social media, innovation, open government, smart city, open data, governance, public sector, intellectual capital, technology. The occurrence rate for these words is 5 out of 529 keywords used (table 5). The topics that are most interested in are seen in keywords that are larger than the surrounding posts and the research that is most frequently researched is indicated by the lighter color keywords (figure 5). Based on this mapping, it is useful to determine the topic of further research with the same topic.

**Tabel 5. The Most Used Keywords in Research**

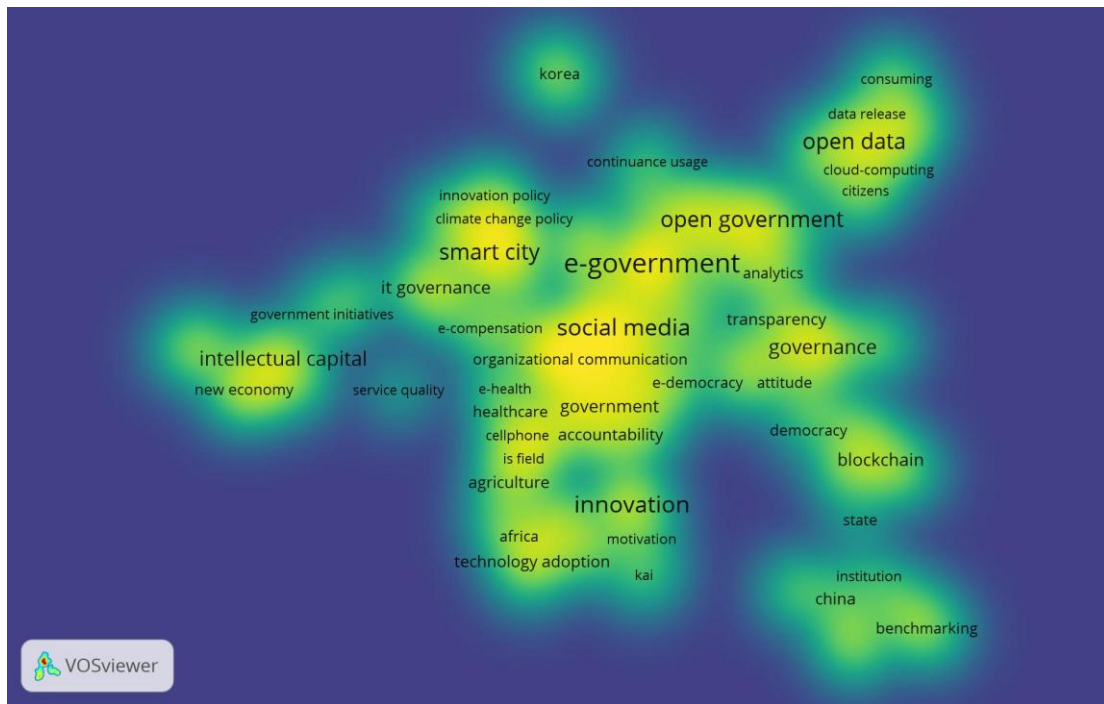
Rate	Keywords	Occurances	Total Link Strength
1	E-government	19	97
2	Social media	12	66
3	Innovation	11	56
4	Open government	10	54
5	Smart city	10	47
6	Open data	9	46

7	Governance	7	45
8	Public sector	9	44
9	Intellectual capital	6	33
10	technology	5	32

While the development of the most use of keywords over the last ten years can be seen in Figure 4 where among the keywords has a link as shown in Figure 4



**Fig 4. Map of Most Keywords Based on Overlay Period 2011-2020**



**Fig 5. Keywords Map Based on Research Density Period 2011-2020**

## 5. Conclusion

Based on the research that has been done, it is concluded that the growth of IT scientific articles in the public sector in 2011-2020 has an average of 14% or as many as fourteen articles per year. This can be seen from the highest article publication data in 2012 as many as 33 articles, while in 2019 there were only 2 articles. The number of international article publications found was 140 articles. There are 104 journal publications published in Scopus quartiles 1 to 4, while the remaining 36 journals are published in international journals outside Q1-Q4.

From the observations made, obtained 529 keywords which are divided into 36 clusters. Topics that are often found in research are e-government, social media, innovation, open government, smart city, open data, governance, public sector, intellectual capital and technology. The trend of research for 10 years tends to decrease so that this can be an opportunity for further research development from previous research.

This study has limitations that can be used as opportunities for future research. First, article collection is still focused on IT keywords in the public sector for the period 2011 to 2020 so that it has the potential to produce quite a lot of articles if the research range is longer. For further research, it is possible to enter more diverse keywords so that more data can be collected from research articles on IT in the public sector. Second, this study uses a PoP application on the Google Scholar database which allows for limited data, so that future researchers can use other databases such as Scopus, Web of Science.

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