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Smart City and Society 5.0: Involvement of Information Technology in The Development of Public Service Systems in Indonesia

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ABSTRACTS

Smart city and society 5.0 are two things that form a symbiotic mutualism because smart cities require smart people who have reached the level of society 5.0 and society 5.0 requires a technology-based place. One of the important factors in realizing a smart city and shaping the Indonesian society 5.0 is by ensuring the operation of an efficient information system. In Indonesia, various problems hinder the development of smart cities. These problems include the city government's lack of responsiveness in responding to public complaints and the lack of government transparency in managing the city and the lack of facilities for efficient exchange of information between the community and the government and the lack of digital literacy of Human Resources (HR). This study aims to provide an overview of the public service system that may be applied in the development of a smart city with the concept of society 5.0 in Indonesia. The method used in this study is a systematic literature review using sources from national and international journals published in 2011-2021. The results of this study show a picture of a better and integrated public service system that may be applicable in Indonesia. The results of the study are based on the results of data analysis, problems, and conditions for the application of public services in Indonesia. The adapted system is expected to overcome the problems of urban development in Indonesia towards a smart city gradually and evenly.

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1. INTRODUCTION

This study is discussed how information technology can play a role in the development of a smart city with the concept of society 5.0 in improving the public service sector in Indonesia. In research conducted by Meijer & Bolivar (2016) Smart city is defined as a city that applies human resources, social capital, and modern telecommunication infrastructure to realize continuous economic progress and advanced life characteristics, with wise resource management involving the community in government. While the concept of society 5.0 itself prioritizes the integration of the roles of humans and technology so that there is a balance and reduces the risk of the degradation of human roles. The two concepts are integrated into a system that is expected to encourage system improvement in Indonesia, especially the public service sector.

The previous public service system had a good concept, as regulated in Undang-Undang No. 25 the year 2009, only that its implementation was still not ideal. In reality on the ground, indeed, there are still many deviations and it is felt that there are still shortcomings in their implementation (Lubis *et al*., 2018). For example, in this case, as we know, Indonesia is an archipelago country in which the provinces are located separately from each other. It is quite a problem in terms of communication where it is constrained by the distance from each other which results in complaints and complaints access cannot reach the center quickly. Although the information on complaints and complaints can be collected regionally, in reality, the information is often hampered in each region and results in the information not being distributed. On the other hand, some irregularities occur, such as the many practices of collusion, corruption, and nepotism. Other problems are related to sanctions that are still not firm, lack of community participation, lack of understanding of public services themselves, and lack of quality human resources.

The existing public service system in Indonesia, although it already has a good concept, still needs improvement and development along with the times. However, the public service in Indonesia needs improvement because in fact, there are still many shortcomings and irregularities, and it is proven by the ineffectiveness of data processing and too many deviations. Therefore, the purpose of this study is to provide an overview of the public service system that might be applied to answer the problems that exist in Indonesia. Improvement and development of the system which also leads to the digitization of information technology to realize a smart city, but still referring to the into society 5.0 concept in its application is expected to be a good solution for system development.

2. METHODS

The method used in this study is a systematic literature review. Systematic Literature Review (SLR) is a literature review method in which there is a process of identifying, assessing, and interpreting. Systematic Literature Review is a means of evaluating and interpreting all available research relevant to a particular research question, topic area, or phenomenon of interest. This method aims to present a fair evaluation of the research topic using a reliable, rigorous, and auditable methodology. In **Figure 1**, the stages of the systematic literature review were carried out in this study.

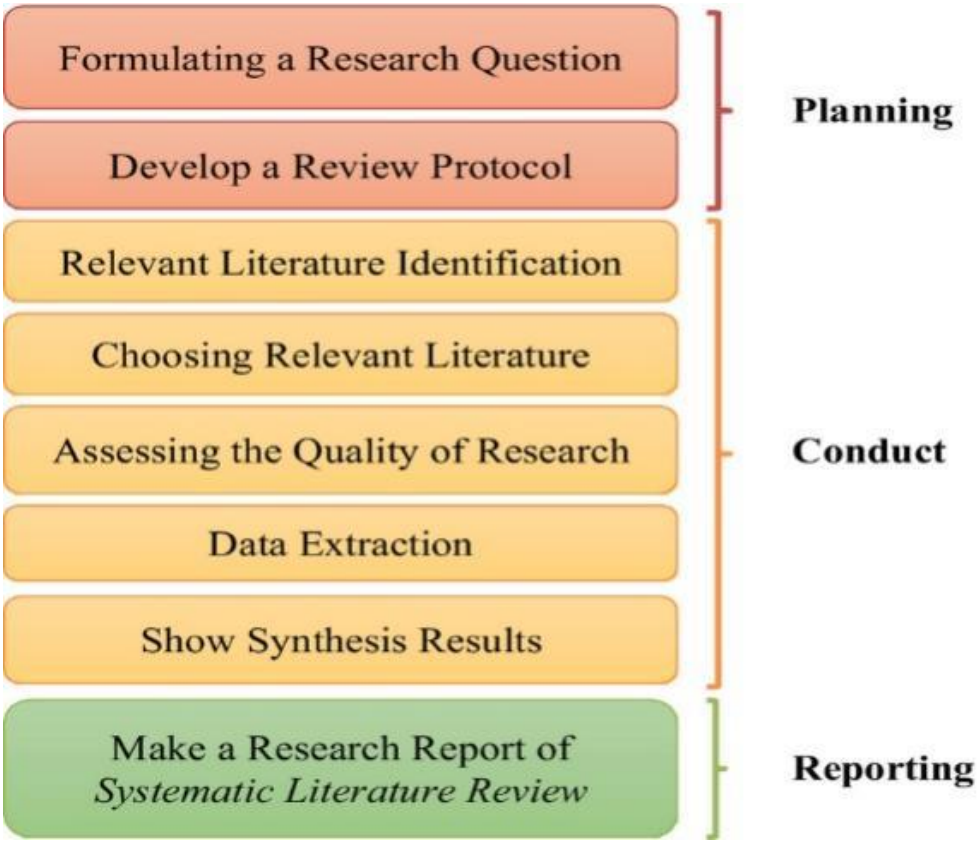

Figure 1. Systematic Literature Review steps.

This study uses a system of literature review steps as shown in **figure 1**. The first stage, namely the planning stage, includes formulating a research question and developing a review protocol. Research questions based on the needs of the topic. Research Questions discussed in this study are:

RQ1. What is a good and efficient public service?
RQ2. How is the involvement of information technology in public services?
RQ3. What kind of system designed can overcome the existing problems?

On RQ1. The author adds questions related to the general description of a good and efficient public service standard. Furthermore, RQ2 is a question concerning a more explanation in the involvement of information technology in public services. Regarding the background, RQ3 is used in this scientific article to describe system designed can overcome the existing problems.

In the next stage, namely the conducting stage, identification of relevant literature is carried out, choosing relevant literature, assessing the quality of research, data extraction, and showing the synthesis result. From all the stages of conduct, several parts are shown that represent the stages of the process, such as search process, inclusion & exclusion criteria, quality rating, data extraction, and analysis synthesis.

2.1. Search Process

The data source that we used to do a literature review in this study is a digital-based database from national and international sources, as follows:

(i) Google Scholar
(ii) ScienceDirect

(iii) ResearchGate
(iv) International & National database.

2.2. Inclusion and Exclusion Criteria

Inclusion criteria (inclusion) are used as a standard set to determine the appropriate source. The inclusion criteria in this study, namely:

(i) Using sources that come from national and international journals with a period of 2011-2021.
(ii) Using literature that falls into the category of scientific articles/journals/books.
(iii) Using literature that matches the keywords and topics that have been determined.

Exclusion criteria (exceptions) were used to exclude articles that were not relevant to the answer to the research question.

(i) Informal literature survey (no defined research questions; no defined search process; no defined data extraction process).
(ii) Sources that are outside the scope of the inclusion period or less than 2011.
(iii) Duplicate reports of the same study (when several research reports are in different journals, the most complete version of the study is included in the review).

2.3. Quality Rating

Quality assessment in this Systematic Literature Review method is evaluated using criteria based on four Quality Assessment (QA) questions:

QA1. Does the source meet the inclusion and exclusion criteria that have been described?
QA2. Is there an adequate explanation of the aims and objectives of the study?
QA3. Is the source very relevant to the topic of discussion raised in the study?
QA4. Has the baseline data/study been explained adequately?

The questions are scored with an assessment procedure based on the selection of three alternative assessments as follows:

Y = 2, if the answer from QA is yes/completely agree.
P = 1, if the answer from QA is partially/not completely appropriate.
N = 0, if the answer from QA is no/not appropriate.

The results of the quality assessment are as follows shown in **Table 1**.

Table 1. The results of the quality assessment.

No	Author	Title	Journal / Publisher Name	Year	Score
1.	Zhihan Lv, Xiaoming Li, Weixi Wang, Baoyun Zhang, Jinxing Hu, Shengzhong Feng	Government affairs service platform for smart city	Future Generation Computer Systems	2017	8
2.	Andrés Camero & Enrique Alba	Smart City and information technology: A review	Cities	2019	7
3.	Hsiaoping Yeh	The effects of successful ICT-based smart city services: From citizens' perspectives	Government Information Quarterly	2017	5

Table 1 (continue). The results of the quality assessment.

No	Author	Title	Journal / Publisher Name	Year	Score
4.	Nuriyanto	Penyelenggaraan Pelayanan Publik Di Indonesia, Sudahkah Berlandaskan Konsep "Welfare State"?	Jurnal Konstitusi	2014	6
5.	Bryand Rolando,	Tingkat Kesiapan Implementasi Smart Governance Di Kota Palangka Raya	Thesis	2018	5
6.	Sukumar Ganapati	Uses of Public Participation Geographic Information Systems Applications in E-Government	Public Administration Review	2011	8
7.	Novi Prisma Yunita & Rudi Dwi Aprianto	Kondisi Terkini Perkembangan Pelaksanaan E-Government di Indonesia : Analisis Website	SENTIKA 2018	2018	7

2.4. Data Extraction

In this stage, the inclusion criteria used are only based on predetermined keywords. While the exclusion criteria are based on discussions from sources that are not relevant to the topic of the problem raised. Journals that have been assessed are then extracted and classified based on primary and secondary data needs.

(i) Primary data. Collected through surveys, observations, and tailored to the needs. Primary data is taken from several journals that come from the selected database. In the process of obtaining primary data, an assessment of each journal is carried out, and the recording of the basic information is needed.

(ii) Secondary Data. Secondary data is used to complete the primary data. Secondary data was obtained by using the help of google.com. This data collection was obtained through several stages, including:

a. Observation (Observation)
   This is the stage of collecting data through direct observation to the source, namely https://www.google.com.
b. Literature review
   This is the stage to conduct a study of related data assessment obtained from https://www.google.com.
c. Documentation
   This is the stage where the data that has been collected is stored in the software.

2.5. Data Analysis/Evidence Synthesis

The data and facts obtained from the results of literature reviews conducted on several sources such as journals and official websites are as follows:

(i) Definition of related components (public services, smart city, and society 5.0).
(ii) The characteristics and standards of an efficient service system.
(iii) The role of information technology in public services and its involvement with the smart city concept.
(iv) E-government.
(v) Geographic Information System (GIS) & Public participation GIS (PPGIS).

3. RESULTS AND DISCUSSION

3.1 Public Services

Public services can be defined as all forms of services, both in the form of public goods and public services which in principle are the responsibility and are carried out by government agencies at the center, in the regions, and within the State-Owned Enterprises or Regional-Owned Enterprises. , in the context of efforts to meet the needs of the community as well as in the context of implementing the provisions of laws and regulations (Assistant *et al*., 2014). The public service system applied in the government order must be professional because it will face the community directly with various backgrounds. Professional public services, meaning public services that are characterized by accountability and responsibility from service providers (government officials).

With the following characteristics, the first one is effective, prioritizing the achievement of what are the goals and objectives. The second is simple, simply means the procedure/service procedure. Next, organized in an easy, fast, precise, uncomplicated manner, easy to understand, and easy to implement by people who request services. Clarity and certainty (transparent), means that there is clarity and certainty regarding:

(i) Service procedures/procedures.
(ii) Service requirements, both technical requirements and administrative requirements.
(iii) Work units and/or officials who are authorized and responsible for providing services.
(iv) Details of service fees/tariffs and payment procedures.
(v) Service completion schedule.

The fourth is transparency. Transparency means that procedures/procedures for requirements, work units/officers in charge of service providers, time of completion, details of time/tariffs, and other matters relating to the service process must be informed openly so that they are easily known and understood by the public, whether requested or not requested. Then it's efficiency which means:

(i) Service requirements are only limited to matters directly related to the achievement of service goals while still taking into account the integration between requirements and related service products.
(ii) It is prevented from repeating the fulfillment of requirements if the process of public service in question requires the completeness of requirements from other relevant government work units/agencies.
(iii) Timeliness, this criterion implies that the implementation of community services can be completed within the specified timeframe.
(iv) Responsive, more directed at responsiveness, and quickly respond to what are the problems, needs, and aspirations of the people being served.
(v) Adaptive, quickly adapting to what are the demands, desires, and aspirations of the people served who are always experiencing growth and development.

In addition to having the characteristics of professional public services, public services in Indonesia must of course meet the standards set out in the law. Components of public service standards according to Article 21 of the Law No. 25 of 2009 includes at least:

(i) Legal basis, namely the laws and regulations that form the basis for service delivery.
(ii) Requirements, namely requirements that must be met in the management of a type of service, both technical and administrative requirements.
(iii) Systems, mechanisms, and procedures, namely standardized service procedures for service providers and recipients, including complaints.
(iv) Completion period, which is the period of time required to complete the entire service process of each type of service.
(v) Fees/tariffs, namely fees charged to service recipients in managing and/or obtaining services from the provider, the amount of which is determined based on an agreement between the operator and the community.
(vi) Service products, namely the results of services provided and received by predetermined provisions.
(vii) Facilities, infrastructure, and/or facilities, namely equipment and facilities needed in the provision of services, including equipment and service facilities for vulnerable groups.
(viii) Implementing competencies, namely abilities that must be possessed by implementers include knowledge, expertise, skills, and experience.
(ix) Internal control, namely control carried out by the head of the work unit or the direct supervisor of the executive.
(x) Handling complaints, suggestions, and inputs, namely Procedures for implementing complaints handling and follow-up.
(xi) The number of implementers, namely the availability of implementers by the workload.
(xii) Service guarantees that provide service certainty are carried out in accordance with service standards.
(xiii) Guarantee of service security and safety in the form of a commitment to provide a sense of security, free from danger, and the risk of doubt, namely Certainty provides a sense of security and is free from danger, risk, and doubt.
(xiv) Performance evaluation of implementers is an assessment to find out how far the implementation of activities is in accordance with service standards.

Judging from the results of the analysis of the data that has been stated above, the concept of public services in Indonesia can be said to meet the criteria. This has also been fully regulated in Undang-Undang No. 25 the year 2009 as a whole. However, when viewed from the existing problems, public services in Indonesia itself must be improved and developed in its implementation in the community. Because in fact, the implementation of public services in Indonesia still has many shortcomings and irregularities, for example, problems in data collection due to regional factors, deviations in the form of practices of collusion, corruption, and nepotism, sanctions that are still not firm, lack of community participation, lack of understanding of public services themselves, and lack of quality human resources. Therefore, with the application of the combined concept of smart city and society 5.0, the public service system in Indonesia can be upgraded to digitalization with more roles than the community.

3.2 Information Technology Involvement

Information technology will play a role as a media, in this case. Because now the adoption of information and communication technology (ICT) applications for the development of innovative, sustainable, and smart cities has become a new model of city cooperation between government and companies. According to the definition, the concept of the smart city is understood as a combination of "ideas about how information and communication technologies might improve the functioning of cities". Smart cities are generally classified into

several domains such as Economy, Environment, Governance, Living, Mobility, and People. Based on the six domains, the public service system is included in the governance domain which will be referred to as part of smart governance. Smart Governance is concerned with using CS/IT to improve democratic processes and public services (e-government) and to support and facilitate better planning and decision making. From the smart governance concept, there is e-government which is a term in the process of utilizing information technology as a tool to help run the government system more efficiently.

E-government can help bridge the gap between government and society, which can reduce conflict between the two parties. As it is known that the territory of Indonesia is a large area with the shape of an archipelagic state which has an impact on the limitations of inter-island communication. Therefore, the role of information technology in the administration of government is needed through the concept of e-government. The concept of e-government itself has been implemented in Indonesia, but in reality, it is still not optimal in its implementation.

The implementation of e-government from every province in Indonesia, a summary of the data can be seen in **Table 2**. From these data, better solutions are needed as a driver for optimal implementation of e-government in Indonesia. From these data, better solutions are needed as a driver for optimal implementation of e-government in Indonesia.

According to the data has been shown in **Table 2**, a classification of the implementation stages is carried out in each province. The results of the classification of 543 websites into a 4-stage e-government model show that 83 local governments are still in the first stage (preparation), 341 are in the second stage (maturation), 115 are in the third stage (consolidation), and only 4 local governments have entered into the fourth stage (utilization). The data shows that only a small number of regions in Indonesia have entered the utilization stage, even at the consolidation stage the number is still relatively small. This proves that Indonesia is still not ready and needs more improvement and development in the field of e-government, especially in this case, especially in the public service sector.

The municipal applications of geographic information systems (GIS) across the different countries showcase the potential use of GIS in the e-government agencies such as property management, traffic, and transportation, urban planning, waste management, urban design and renewal, financial resource mobilization, etc. The application of GIS technology is expected to be one of the tools in solving existing problems. The use of GIS, in addition to contributing to the integration of data from different data sources, allows visualization of data using maps, which increases the usability of the system and assists in the decision-making process, and involves new spatial visibility into the transparency of state activities. This makes the activities of public administration transparent to all citizens.

Web and GIS technology-based e-government systems can promote the dissemination of urban information and enable citizens to raise objections to land use plans during different phases of the planning process, along with responding to such objections. **Figure 2** is an illustration of the Geographic Information System.

Table 2. Classification of e-government development status in Indonesia by province in 2018.

No.	Provinsi	Tahapan				
		Jumlah Pemerintah Daerah	Persiapan	Pematangan	Pemantapan	Pemanfaatan
1	Aceh	24		23	1	
2	Bali	10	1	3	6	
3	Banten	9	1	5	3	
4	Bengkulu	11	3	7	1	
5	DI Yogyakarta	6		4	2	
6	DKI Jakarta	7	1	5	1	
7	Gorontalo	7	4	3		
8	Jambi	12	2	8	2	
9	Jawa Barat	28	2	17	9	
10	Jawa Tengah	36	2	15	17	2
11	Jawa Timur	39	6	16	15	2
12	Kalimantan Barat	15	5	10		
13	Kalimantan Selatan	14	4	7	3	
14	Kalimantan Tengah	15	2	10	3	
15	Kalimantan Timur	11	2	4	5	
16	Kalimantan Utara	6	1	4	1	
17	Kep. Bangka Belitung	8	3	4	1	
18	Kepulauan Riau	8	1	5	2	
19	Lampung	16	2	11	3	
20	Maluku	12	2	10		
21	Maluku Utara	11	4	4	1	
22	Nusa Tenggara Barat	11	3	6	2	
23	Nusa Tenggara Timur	23	6	14	3	
24	Papua	30	4	22	4	
25	Papua Barat	14	3	11		
26	Riau	13	1	5	7	
27	Sulawesi Barat	7	1	6		
28	Sulawesi Selatan	25	2	20	3	
29	Sulawesi Tengah	14	3	10	1	
30	Sulawesi Tenggara	18	1	15	1	
31	Sulawesi Utara	16	4	10	2	
32	Sumatera Barat	20	3	10	7	
33	Sumatera Selatan	18	2	14	2	
34	Sumatera Utara	34	2	23	7	
		548	83	341	115	4

Figure 2. GIS Illustration.

Indonesia has used GIS as a tool in governance. GIS technology in the city of Surabaya is used to show the location of the disaster and the closest route to reach it to the disaster management unit in charge of the command center as the recipient of emergency complaints who are also tasked with monitoring the condition of the city of Surabaya including monitoring river water levels (Utami & Ramdani, 2021). through CCTV cameras whose visual appearance can be monitored. For direct complaint services, the program developed by the Surabaya government at that time was standby service 112. However, even though the system was already running well, as times progressed, the use of the system could be developed and improved to adapt to existing technological advances.

As of now, the actual use of GIS can be applied with a digital concept that refers to a smart city. Existing GIS technology can be upgraded with digital displays such as web, applications, etc. that way, the data contained in the GIS can be accessed easily. If the application of GIS in e-government is associated with the concept of society 5.0, the system formed will be more transparent and can overcome the problem of the gap between government and society. If we look deeper, the integration of GIS and society has a similar concept to Public Participation GIS (PPGIS). PPGIS broadly refers to citizen participation in improving public services and decision-making using GIS. Unlike GIS, which is used for analytical processes and intraorganizational decision-making, PPGIS is extra-organizational, as citizens are also involved in collaborative mapping exercises and use GIS for individual or collective decision-making processes (Ganapati, 2011).

3.3 Public Service System Development

From the data obtained, we think and conclude an overview of a digital-based public service system with the application of the Smart City and Society 5.0 concepts that may be applied in Indonesia. The system in question is a public service system in the form of a website/web or application that has the following provisions:

(i) It is public and is a site created specifically for each region to facilitate the provision and collection of information regionally.
(ii) Using a Geographical Information System (GIS) as a data and information center

(iii) Connect directly to the data center. This is done to reduce delays and delays in information/complaints.
(iv) It is interactive and responsive where people can get, provide, and add valid reports or information.
(v) It is real-time and transaction data as well as all recorded data to reduce the risk of fraud from any party.

The provisions above are the result of data analysis, problems, and conditions for implementing public services in Indonesia. It is hoped that the system with these provisions can improve and upgrade the public service system in Indonesia to be better and more efficient in line with the times and technological developments and can overcome the problems of urban development in Indonesia towards a smart city gradually and evenly.

4. CONCLUSION

A public service that is applied in the government order must be professional and efficient in its implementation. A professional and efficient public service system has its characteristics and standards that have been regulated in Undang-Undang No. 25 the year 2009. The concept of public services in Indonesia can be said to meet the criteria, but if it is seen from the existing problems, it needs to be improved and developed in its implementation in the community. Therefore, with the role of information technology, its involvement is needed, especially in the development of smart governance as part of a smart city. From the smart governance concept, there is e-government which is a term in the process of utilizing information technology as a tool to help run the government system more efficiently.

The implementation of e-government in Indonesia has not been entirely effective. Therefore, new concepts and systems are needed, adapting to current conditions. From the data that has been collected, there is a description of a digital-based public service system with the application of the Smart City and Society 5.0 concepts which may be applied in Indonesia with the following provisions:

(i) It is public and is a site made specifically for each region.
(ii) Geographical Information System (GIS) as a data and information center.
(iii) Connect directly to the data center.
(iv) Interactive and responsive.
(v) Real-time and transaction data as well as all recorded data.

It is expected that the system can improve and upgrade the public service system in Indonesia to be better and more efficient in line with the times and technological developments and can overcome the problems of urban development in Indonesia towards a smart city gradually and evenly with these provisions.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

7. REFERENCES

Ganapati, S. (2011). Uses of Public Participation Geographic Information Systems Applications in E-Government. *Public Administration Review, 71*(3), 425–434.

Lubis, M., Kusumasari, T. F., and Hakim, L. (2018). The Indonesia Public Information Disclosure Act (UU-KIP): Its Challenges and Responses*. International Journal of Electrical and Computer Engineering (2088-8708), 8*(1), 94-103.

Meijer, A., and Bolívar, M. P. R. (2016). Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences, 82*(2), 392-408.

Utami, I. Q., and Ramdani, F. (2021). GEMAR: web-based GIS for emergency management and ambulance routing. *Informatics for Health and Social Care, 46,* 1-9.