Artificial Intelligence for Smart Governance; towards Jambi Smart City

Maratun Saadah¹
¹Department of Government Science, UIN Sulthan Thaha Saifuddin Jambi, Indonesia

E-mail: jp.maratun@uinjambi.ac.id

Abstract. The declaration of Jambi City towards smart city in 2017 has changed the trend of information technology development in Jambi. One of the famous smart city icons is SIKOJA that was launched in 2019. SIKOJA is an application that houses various e-government platforms in Jambi City. This research aims to analyse the potential use of artificial intelligence (AI) in the SIKOJA system toward Smart Governance indicators. This research used qualitative method of which the primary data were collected through observation, interview and documentations. The result of this study indicated that database in the SIKOJA integrated system is not yet maximized to develop further decision. Meanwhile, such database will give a powerful impact if it can be transformed into something, a decision, for example. SIKOJA can provide data about a sudden shortage of supply in the market without providing further decision options. SIKOJA is still focused on the information system rather than maximizing the data utilization for the next step using the AI. Finally, Jambi City Government should develop AI which can maximize the utility of the data gathered by SIKOJA integrated system.

Keywords: Artificial Intelligence, SIKOJA, Smart City

1. Introduction

Nowadays, cities are competing to become the foremost social entity. Names of big cities, such as Seoul, Surabaya and Kuala Lumpur, are remembered in the minds of the people because of the characteristics and advancement of their public services. The need of the city to provide excellent service requires an ‘enabler’ to improve services to the community. Debates on the future of urban development in many Western countries have been increasingly influenced by discussions of smart cities [1]. Hence, in the last few years, smart city concept has been gaining popularity among local governments [2].

Therefore, the Indonesian government through the Ministry of Communication and Information Technology (Menkominfo), the Ministry of Home Affairs, the Ministry of Public Works (PUPR), National Development Planning Agency (Bappenas), and the Presidential Staff Office initiated the 100 Smart Cities Movement.

Jambi City is one of the first smart city pioneers in Indonesia, along with 25 other cities in 2017. The concept of a smart city in Indonesia aims to build Indonesia’s future city as a sustainable and competitive city. Various efforts to support the achievement of a smart city of Jambi have been carried out, one of which is the SIKOJA application (Jambi city information system). SIKOJA is an application that houses various e-government platforms in Jambi City.

The application of e-government that turns numerous services into contactless and paperless mode is not enough. Unfortunately, the data have not been maximized to be of more benefit; that is the decision-making process that can be done by the Artificial Intelligence (AI) technology. With the SIKOJA information system, for example, services can be done digitally, licensing forms can be uploaded online without the need to directly come to the counter, and people can find out about their application’s information updates at hand. To monitor traffic, there is no longer any need to come to the site directly because it can be seen
through the CCTV included in the application. However, the information systems are still limited to data collection only, not yet at the sorting and decision-making stage [3], [4].

SIKOJA is the first step for the city government and the community at large. After the successful application of e-gov, it is time for the government to open up opportunities for the use of AI to accelerate development in the context of smart city with the reflection on Smart Governance as a main intersection of the main smart city dimensions [5]. Jambi Smart Governance focused on 3 (three) indicators, they are: public services, efficient public policy processes, and efficient bureaucratic management. Smart City relies on technologies. It is technology-grounded. Therefore this research looks at this opportunity to contribute and provide input regarding the chance for better use of AI technology to support Jambi Smart City.

2. Method

The object of this research focuses on Artificial Intelligence’s optimization toward SIKOJA application, which is a portal for digital-based services under the Jambi Smart City effort. The authors drew the components of Smart Government, as a pillar of Smart City, to suggest the use of AI in certain SIKOJA’s application features.

This research is a descriptive qualitative study; this was conducted to identify new information [6]. The type of this research, based on its implementation, is a development research, for the development of practical models or formations. The primary data were collected through structured or unstructured interviews and observations [7]. To support primary data, data from various sources such as news from the media, government regulations, awards and assessment from related stakeholders, were taken. These data were used as materials to support the research analysis. Then, the analysis of this research was assisted using NVivo 12 Plus.

3. Basic Theory

Discussion about artificial intelligence for public sector has been widely reviewed by researchers around the world, with the growing trend of interest in AI for public sectors [8]. Smart city discussions continue on the development of features with AI technology. AI can contribute to the development of smarter governance in various indicators [9], implementation of AI in public policy[10][11]. AI can also contribute to the bureaucratic discretion and decision-making [12], as well as proposes new concept of Digital Era Governance (DEG) [13].

In Indonesia, there has not been much research on the smart city approach through AI. Researches are still wandering about smart cities from the e-government side. Likewise in the city of Jambi, a study on AI has never been carried out, while a smart city study has been carried out mostly regarding the implementation of the smart city program [14], examining smart city concept accommodation in the development plan [15], the eligibility of Jambi to become Smart City [16], and development of integrated complaint data centre to support Smart City [17]. Meanwhile, prototype proposal related to the application of AI in public services has never been carried out by Sukmawati [18]. The lack of discussion of smart city with AI approach provides an opportunity for authors to analyze the prospects of AI in an effort to become a smart city.

3.1 Artificial Intelligence Capacity

The term “artificial intelligence” is often used to describe machines (or computers) that mimic “cognitive” functions of humans, such as “learning” and “problem solving” [19]. AI can incorporate different levels of consciousness to fulfill different functions. Based on nine different consciousness levels, Capgemini Consulting defined AI as a technology which allows digital systems to monitor, analyze, act, interact, remember, anticipate, feel, moralize and create [20].

Originally, AI solutions were like reactive automators, because AI does things in automation. AI is programmed on the basis of rule-based, so it can monitor, analyse and act accordingly, such as automated routine tasks by a computer. Meanwhile, adaptive assistants
integrate the consciousness levels of reactive automators with contextual sensitivity. This complements AI solutions with interaction, memory and anticipation and allows AI to adapt in new circumstances and can learn from prior experiences. The last stage of AI evolution is autonomous imaginators, this stage allows AI to have a feeling, make morally driven decisions and create new things autonomously.

3.2 Smart Governance

The Smart City concept still strives for definitional clarity and practical import [21]. The Indonesian government itself, through Bappenas, has formulated a smart city plan. According to Boyd Cohen’s ‘Smart City Wheel’ [22] those are; Smart Governance, Smart Environment, Smart Mobility, Smart Economy, and Smart People. Main intersection of smart city dimensions is Smart Governance [5]. Even there is no clear definition about the smart city governance concept [23], but according to Cohen’s Smart City Wheel, Smart Governance can be reached through Information and Communication Technologies (ICT), Transparency and Open Data, and Enabling Supply and Demand Side Policy. Creating smart governance frames for urban policies is a way to improve the decision-making processes and increase the quality of public services delivery [24]. Furthermore, smart governance also means reshaping administrative structures and processes across multiple local government agencies and departments as well as stakeholders’ involvement in government [25].

Therefore, this study emphasizes Smart Governance in the perspective of Jambi City Regional Regulation of Jambi Smart City which focuses on Smart Governance within 3 (three) indicators public services, public policy processes and efficient bureaucratic management. The ‘public services’ indicator is represented by public administration services such as online public services; the ‘bureaucracy’ indicator is represented by bureaucratic governance that focuses on fairness, accountability, and transparency; the ‘public policy’ indicator is shown by public policy that takes on the perspective of positive impacts to society and therefore accommodates public aspirations [26].

4. Findings and Discussion

4.1 The Face of Jambi Smart City

Jambi City has started its movement towards a smart city since 2017. These efforts have received a legal support through regional regulation number 1 of 2019. This shows the strong commitment of the Jambi City government, according to the mandate of the national electronic-based government system (SPBE) master plan which requires strong, committed, and innovative leadership as a determinant of the success of SPBE in local government.

As a flagship program for the Jambi City Government in creating a Smart City, the SIKOJA Application is maximized as the main portal for an information system that integrates various e-gov service facilities in Jambi City. With SIKOJA, each SKPD is no longer allowed to create its information system but must coordinate with the Information and Technology Office (Diskominfo), so that it is connected to the SIKOJA application.

4.2 Application of Artificial Intelligence for Smart Governance

The application of AI to the public sector varies [10]. In Indonesia, the use of AI has not been implemented, especially in local governments. Nevertheless, the availability of applications in various sectors of public service and information has become the right first step (a solid foundation) for the use of next-level information technology, integrated into one accurate system, utilizing artificial intelligence to become a “smart” Jambi. With nine consciousness levels, AI can be used to maximize SIKOJA which was originally an information system.

The targets of Smart Governance in Jambi Smart City are public services, efficient public policy processes and efficient bureaucratic management. These three things can at least be achieved through the utilization of AI in SIKOJA as follows:
| Sikoja's Features | Current Function | Potential Use of Consciousness | Proposed Function |
|-------------------|------------------|--------------------------------|-------------------|
| CCTV              | Provide Visual Information | Monitor (IoT) Digital ears and eyes Act | Automated CCTVs can be connected to the traffic management. Record vehicle license plate of the traffic violators. Generate ticket and send it to the traffic violators email. Provide automatic warning (from recording) for certain traffic violators. Predictive maintenance of monitored public facility. |
| Jelalah           | Information of public area | Analyse | Directing user to the location with google maps. Notify users whenever the sites are closed. |
| Info COVID        | Information of Covid-19 spread | Analyse Act | Analyses the pattern of the covid-19 spread according to the patient travel history (red zone). Send warning to the users within the red zone. Notify the users of covid-19 updated cases. Remind the users to wear mask whether they are going out to public spaces ( according to the movement of the device). Chat-box (Basic questions can be answered, freeing up time for experts). |
| Cuaca             | Information of weather forecast | Analyse and Act | Determine alternative policy based on weather monitoring data and parameters from danger or threat. |
| Sikesal           | Information on public complaints | Act | Provides options for the problem (shortcut) to complain, and then connects citizens’ complaints directly to related agencies in the chat-box. The form submitted above (complaints) classify themselves. The data that has been inputted into the system are then classified according to the category of urgency, issues that have a higher priority are processed first, for example; group fire, blackout, flood. |
| Media Sosial      | Shortcut to social media platform | Analyse Act | Gather and identify problems and public sentiment from social media. Analyse the trend of information spread in various social media platform. Tailor certain policy communication to specific audience, such as Jambi City curfew regulation for the detected device in public space. |
Based on Figure 1, we can see the smart city implementation in Jambi is more concerned with efficient bureaucratic management with 42%. Then, the second concerned is public service with 33%. The third goal concerned with the smart city Jambi is an efficient public policy process. The result isn’t surprising because the features of SIKOJA just provide social media and sikesal to make easier public policy.

Talking about AI in government must be followed up about the data protection as well as community readiness in welcoming and utilizing this technology. There is a critical opportunity to shape the evolution of AI in a way that respects fundamental rights and upholds citizens shared values. Nevertheless, Jambi City Government has indeed thought carefully about the readiness of the system.

5. Conclusion

Based on the research result and discussion elaborated in Chapter 5, it can be concluded that the SIKOJA has not been maximized into an integrated system that provides more benefits. Therefore, SIKOJA is ready for the next AI technology; it has the data, the system, the legal protection and full support from the executives. AI could help at least in three smart governance goals: public service, bureaucratic efficiency, and public policy process. Meanwhile, further research is needed on the readiness of the Jambi City Government in utilizing AI. The ICT policy should be anchored in the outcome of effectiveness and efficiency for service providers, to satisfy the community. The application of ICT is expected not only to become cosmetic, beautifying the virtual city, but to cause significant impact. Finally, the need for technology is absolutely necessary. Although there are still a lot of significant progress that needs to be made, however, there are clear indications that the government of Jambi City is committed to this journey.

6. References

[1] R. G. Hollands, “Will the real smart city please stand up?,” in The Routledge Companion to Smart Cities, 2020.

[2] A. M. Mohamed and H. A. Manaf, “Designing a Sustainable Framework for Inclusive
Smart City: Harnessing Findings and Lessons from a Study of Selected Local Governments in Kedah Malaysia,” J. Asian Rev. Public Aff. Policy, 2020.

[3] I. Jatinangor, “Public Participation, Transparency-The Utilisation of Social Media: Bandung City WIKE ANGGRAINI,” J. Stud. Pemerintah., vol. 9, no. 1, pp. 1–26, Feb. 2018.

[4] Y. Suwarno and N. K. Wati, “E-GOVERNMENT INSTITUTIONAL CAPACITY IN PROVINCIAL GOVERNMENTS OF WEST-JAVA AND EAST-JAVA,” J. Stud. Pemerintah., vol. 11, no. 2, pp. 285–314, Jul. 2020.

[5] G. V. Pereira, P. Parycek, E. Falco, and R. Kleinhans, “Smart governance in the context of smart cities: A literature review,” Information Polity. 2018.

[6] I. Soehartono, “Metode penelitian sosial: suatu teknik penelitian bidang kesejahteraan sosial dan ilmu sosial lainnya,” Tesis KOMI, 2011.

[7] P. Corbetta, Social Research: Theory, Methods and Techniques. 2011.

[8] W. G. de Sousa, E. R. P. de Melo, P. H. D. S. Bermejo, R. A. S. Farias, and A. O. Gomes, “How and where is artificial intelligence in the public sector going? A literature review and research agenda,” Government Information Quarterly. 2019.

[9] T. Yigitcanlar, K. C. Desouza, L. Butler, and F. Roozkhosh, “Contributions and risks of artificial intelligence (AI) in building smarter cities: Insights from a systematic review of the literature,” Energies. 2020.

[10] B. W. Wirtz, J. C. Weyerer, and C. Geyer, “Artificial Intelligence and the Public Sector—Applications and Challenges,” Int. J. Public Adm., vol. 42, no. 7, pp. 596–615, May 2019.

[11] Y. Duan, J. S. Edwards, and Y. K. Dwivedi, “Artificial intelligence for decision making in the era of Big Data – evolution, challenges and research agenda,” Int. J. Inf. Manage., 2019.

[12] J. B. Bullock, “Artificial Intelligence, Discretion, and Bureaucracy,” Am. Rev. Public Adm., 2019.

[13] T. M. Vogl, C. Seidelin, B. Ganesh, and J. Bright, “Algorithmic Bureaucracy: Managing Competence, Complexity, and Problem Solving in the Age of Artificial Intelligence,” SSRN Electron. J., 2019.

[14] H. Y. Bela, “MENEROPONG SMART CITY KOTA JAMBI DARI PERSPEKTIF KEBERLANJUTAN DAN POLA PENGEMBANGAN KAMPUNG BANTAR,” J. Trias Polit., 2019.

[15] A. F. Rahmatullah, E. P. Purnomo, and A. N. Kasiwi, “Rencana Pembangunan Jangka Menengah Daerah Kota Jambi 2013–2018 Sudahkah Memasukkan Pentingnya Konsep Smart City,” Moderat J. Ilm. Ilmu Pemerintah., 2020.

[16] N. Nasution, G. W. Bhawika, A. Wanto, N. L. W. S. R. Ginantra, and T. Afriliansyah, “Smart City Recommendations Using the TOPSIS Method,” in IOP Conference Series: Materials Science and Engineering, 2020.

[17] L. Puad, “Pengembangan Aplikasi Terintegrasi Sebagai Pusat Data Pengaduan Warga
Untuk Layanan Smart City Di Kota Jambi,” Indones. J. Comput. Sci., 2019.

[18] L. Sukmawati, “Sistem Pakar Talenta Implementasi Kecerdasan Buatan Dalam Pelayanan Publik Menuju Sragen Smart City,” Sist. Pakar Talent. Implementasi Kecerdasan Buatan Dalam Pelayanan Publik Menuju Sragen Smart City, 2013.

[19] S. J. Russell and P. Norvig, Artificial Intelligence A Modern Approach; PearsonEducation. 2003.

[20] Tinholt, D., “Unleashing the potential of Artificial Intelligence in the Public Sector,” Capgemini, 2017.

[21] S. Joss, F. Sengers, D. Schraven, F. Caprotti, and Y. Dayot, “The Smart City as Global Discourse: Storylines and Critical Junctures across 27 Cities,” J. Urban Technol., 2019.

[22] B. Cohen, “Boyd Cohen: ‘The Smart City Wheel,’” The Smart City Wheel, 2015.

[23] M. Razaghi and M. Finger, “Smart Governance for Smart Cities,” Proc. IEEE, 2018.

[24] P. Elisei and M. Prezioso, Smart Governance Answers to Metropolitan Peripheries: Regenerating the Deprived Area of the Morandi Block in the Tor Sapienza Neighbourhood (Rome). 2014.

[25] H. J. Scholl and S. Alawadhi, “Creating Smart Governance: The key to radical ICT overhaul at the City of Munich,” Inf. Polity, vol. 21, no. 1, pp. 21–42, Feb. 2016.

[26] A. Herdiyanti, P. S. Hapsari, and T. D. Susanto, “Modelling the smart governance performance to support smart city program in Indonesia,” in Proc. Computer Science, 2019.