The Effect of Leadership Style on the Implementation of Artificial Intelligence in Government Services

Ghina Nabilah Effendi¹, Ulung Pribadi²
¹ Student of Master’s Program of Government Affairs and Administration, Universitas Muhammadiyah
Yogyakarta, Indonesia
² Lecturer of Master’s Program of Government Affairs and Administration, Universitas Muhammadiyah
Yogyakarta, Indonesia
E-mail: ghina.nabilah.psc19@mail.umy.ac.id

Abstract. Artificial Intelligence (AI) has been widely used in human life, especially in the field of government, including Indonesia, which uses AI as an effort to reform the bureaucracy to be active and efficient. One obstacle found in the application of AI in Indonesia is the leadership factor, especially in public services, with complicated service procedures that require innovations to provide solutions to people’s problems. The ability of leaders is an essential aspect in facing the industrial revolution 4.0 where humans cannot beat the machine, but humans have the mind that distinguishes the two; a leader must form a culture of leadership system with a strong organization and influence through leadership style. Currently, the City of Jambi is in the public spotlight with a new model of leadership of Mayor DR. Syarif Fasha who applies technology-based services to facilitate the Jambi people’s access to government services. Researches on AI for government services are mostly done, but the research that explains leadership styles in the application of AI to government services is very minimal. Thus, this research focuses on the influence of leadership style on the implementation of artificial intelligence for government service. This study used a descriptive qualitative method and data sources obtained through website and application of the government service, the Mayor’s social media, report document and journalism related to the research topic. Data analysis used the Nvivo 12 plus data-processing application and crosstab. The results showed that the leadership style influenced the response of AI and the progress of the city through indicators of government quality, performance, responsibility, and attractiveness, which affect leadership style in the application of AI for government services.

Keywords: Artificial Intelligence, Leadership Style, Government Service

1. Introduction

Current developments in information technology have an impact on changes in communication and people’s lifestyles (ICT) [1]. The well-known communication phenomenon has shifted from personal face-to-face interactions, and nailed to electronic and print media, to online interaction using the internet, which reaches all aspects [2]. Indonesia is a country with one of the world’s biggest social media users, with the number of 90 million active users [3]. The Association of Internet Service Providers (APJI) states that Indonesia is in the position of 7th most social media users in 2015 in social media such as Facebook, Instagram, Twitter, WhatsApp, and LINE [4]. Social media opens public interaction in cyberspace, so everyone must use social media, including the government as a service provider, must be able to access the internet network in national development, which is influenced by communication for equitable development solutions [5].

Based on a research by Lestari [6], the old government bureaucracy is slow, thus causing the quality of the Indonesian government to be low. Local governments are required to be creative and innovative in providing services to the community, especially in the face of the industrial revolution 4.0 [7]. This era must have a trend in supporting the improvement of the quality of technology, namely Artificial Intelligence (AI), which uses smart machines in public services, and this is closely related to advancements of e-government that makes optimal use of AI [8]. E-Government is currently an online service media or social media as a form of government service today. Southeast Asia has demonstrated the positive impact of using AI and provides solutions regarding visual inspection, control, and automation of calibration adjustments and identify problems directly [9]. In 2018 World Economic
Forum, experts stated that in the next 30 years, robots would replace current jobs. This is the challenge that we will face in the future [10].

Furthermore, research from the International Data Corporation (IDC) Asia Pacific in CNN [11] survey shows Indonesia as the country with the highest AI-adoption rate in Southeast Asia in 2018, at 24.6%. However, in practice, the application of AI in Indonesia still has constraints, especially in leadership factors, given that leaders and employees are still sceptical towards the adoption of this technological trend [12]. The ability of leaders is an essential aspect in facing industrial revolution 4.0 where humans cannot beat the machine, but humans have the mind that distinguishes the two; a leader must form a culture of leadership system with a strong organization, and influenced by leadership style [13].

The Mayor of Jambi, Syarif Fasha, is the present leader who is an inspirational figure of youth who brings a new spirit to the city of Jambi. The Mayor of Jambi is very familiar with the Instagram account he manages under the name of @fasha_jbi and has 68.2 thousand followers, far above other regional heads. The charm of the Mayor of Jambi is not only in the real world, but Fasha is very popular in cyberspace because of his creativity that inspires people, especially young people. Fasha has a leadership style that brings Jambi better and even has very rapid development; Fasha creates two-way communication with the use of Artificial Intelligence between the government and people in the service and make it easier to listen to people’s aspirations directly. Fasha realized that, as a public official, she has the power to form digital communication with the mission of accelerating development and equitable development with the BANGKIT BERDAYA (Bangun Kelurahan Secara Intensif dan Terpadu Berazaskan Swadaya) [14].

Until now, there has been no research that specifically addresses the effect of leadership style in the application of AI in government services. Therefore, this study was conducted to analyse the Effect of Leadership Style on the Implementation of Artificial Intelligence for Government Service as a regional government innovation, with the aim of this study to determine the leadership style, implementation of AI for public service, and the influence of leadership style in the application of AI.

2. Method

This study used a qualitative approach to explain the phenomena that occur and understand the meaning of the events that occur [15]. Qualitative research is a type of research that expresses holistic-contextual aspects by collecting genetic data and utilizing researchers as instruments to collect data [16]. Qualitative research describes research activities and impacts [17], and this illustrates the identification of essential things with proper meaning. The study was conducted in the city of Jambi, Sumatra, Indonesia. The capital region of Jambi Province is famous in ancient literature, with the motto of Tanah Pilih Pesako Betuah. Jambi city is the centre of the government as well as a social, economic, cultural centre, with the soul of the community unit, whether the individual, group, or institutional, holding traditional values and legislation. The area led by Dr.H.Syarif Fasha has a breakthrough in the use of AI for government services that led Jambi into a developed city today. This region also has the highest population in Jambi Province, which is 17% of the total population of Jambi province.

Furthermore, data collection technique in this study was field data, involving online data from websites and social media, supported by a literature review on leadership styles on the application of AI for government services, especially the city government of Jambi, with Mayor Syarif Fasya as the object of research in this article. Data analysis used Nvivo12 software with data transfer to Nvivo12, which is a qualitative document analysis tool with the help of a computer device. They are easy to use and can process words and explore word frequencies, attributes, cases from big data, producing categories of factors or sub-factors in the research [18]. In this study, the unit of analysis is Artificial Intelligence, which is used in government services, which is further linked to the leadership style of the Mayor of Jambi.
3. **Basic Theory**

3.1 **Artificial Intelligence**

Increasing population growth also affects the level of urbanization. It also affects the service process in the government system. The population of the city is estimated to reach 70% in the future [19]. Therefore the government needs innovations in the form of Artificial Intelligence to facilitate the government to obtain services; AI can overcome industry challenges by using quality control automatically [12]. Furthermore, the existence of Artificial Intelligence helps facilitate a process of forecasting and ranking of things that can happen in the future, and that is supported by the laws. Artificial Intelligence will provide significant changes to the government or private sector by facilitating work in facing the industrial revolution 4.0 [20], so scientific and correct understanding of the government towards AI becomes essential in order to develop the potential of the region [9].

3.2 **Leadership Style**

Leadership style is a crucial point to achieve goals in the organization; leadership style is a characteristic or strategy of leaders which is applied directly or indirectly in an organization as an effort to achieve organizational goals [21]. Leadership style is also a pattern of consistent behaviour that is applied in work. Leadership style comes from the theory of two considerations, namely:

1. **Leadership based on the structure**
   - Leadership with the structure of duties and responsibilities in carrying out the main tasks, responsibilities, functions, ideas, and work performance

2. **Leadership based on consideration**
   - Emphasis on leadership that gives attention and support to subordinates with regulations, ethics, and work relations [22].
   - A leader will adjust to the situation and use his authority to direct others and take full responsibility to achieve goals [23]. The application of leadership style shall be adjusted to the needs, situations, and conditions to be able to influence others [24]. Thus, a credible government requires leaders with the right leadership style, especially in improving information technology; at this time, leadership style is needed to encourage innovations.

3.3 **Leadership in the Implementation of Artificial Intelligence**

A leader should not only have excellent management skills, but also must encourage or motivate his/her subordinates to work hard. Leadership style influences the use of AI in government. Research by Saluky [12] states that the application of AI can improve the quality of the technology, including the government. AI uses smart machines to support public services. In CNN [11], it is said that AI has an impact in the form of efficiency, accuracy, and agility of innovation as an advanced analytic in problem-solving. In government, the main effect of implementing AI is the quality of the government, the performance of the government’s responsibility, and the attraction from the government. E-Government is government service today that uses AI, and this application is inseparable from the central role of the leader [25]. Some of these leadership styles, in implementing artificial intelligence in the government, can have an impact on the quality of government, the performance of government’s responsibility, and the attraction of the government.

3.4 **Theoretical Framework**

This study will look at the effect of leadership style on the implementation of artificial intelligence in government services. There are several indicators of assessment. The quality of governance is an aspect that is assessed based on community satisfaction which continues to change along with improvements. Performance is about how well a service is provided. Responsibility is an integral part of how the government deals with social problems. Meanwhile, attraction is a policy style that is influenced by leadership style.
Figure 1. Theoretical Framework

Leadership style is based on two aspects, they are leadership based on structure and consideration. This is done by looking at the government’s official website and applications to see indicators that indicate the leadership style as well as its effect on the implementation of artificial intelligence for government service.

4. Findings and Discussion

4.1 Jambi Mayor’s Leadership Style

Jambi City turned into a big city led by Dr. H. Syarif Fasha as Mayor of Jambi. He is considered to have a visionary and realistic leadership style, so he can be trusted [26]. This allows the leader to explain his idea to be implemented with a strong commitment [14].

The visionary leadership style of Jambi Mayor shows the leadership strength of Dr. H. Syarif Fasha in running the government, plus the significant implications of the 4.0 industrial revolution which requires leaders to think intelligently in decision-making and bureaucratic management patterns. Jambi City has been "on track" in facing this wave of revolution. In her leadership style, Fasha combines organizational culture, government leadership, and government bureaucracy to run the government in Jambi City and is known as "Bangkit Berdaya".

Figure 2.

| Variable                      | Visionary Leadership Style | Total |
|-------------------------------|----------------------------|-------|
| 1:Leadership based on Structure | 63.64%                     | 63.64% |
| 2:Leadership based on Consideration | 36.36%                     | 36.36% |
| 3:Total                       | 100%                       | 100%  |

Source: Coding Analysis through NVivo 12 plus Software

Based on the Crosstab Query-Rate 63.64% on the leadership variable based on structure, this explains the leadership style of the Jambi Mayor which has a structure of tasks and responsibilities in the form of main tasks, functions, ideas, and work performance of Jambi Mayor, Dr.H. Syarif Fasha or known as Fasha Jambi. The results of the Crosstab Query-Rate of 36.36% for leadership variables based on considerations explained that the mayor of Jambi who was visionary also applied the concept of leadership which gave attention and support to subordinates through regulation, ethics, and work relationships. So, in running the government of Jambi City, Dr. H. Syarif Fasha applies these two variables in his visionary leadership style. When connected with leadership theory, Dr. H. Syarif Fasha shows more leadership based on structure with a much higher percentage of 27.28%.

4.2 Implementation of Artificial Intelligence in E-Government Services

The Jambi City Government, led by Dr.H. Syarif Fasha, has made technology-based services using the official website and application that can be accessed by the Jambi city people to facilitate all forms of service in the community.
Figure 3.
Crosstab Query–Rate (%) Government Services

| Variable                | Government services | Total |
|-------------------------|---------------------|-------|
| 1:Government Website   | 40%                 | 40%   |
| 2:Government Application| 60%                 | 60%   |
| 3:Total                 | 100%                | 100%  |

Source: Coding Analysis through NVivo 12 plus Software

Based on the Crosstab Query–Rate (%) on the implementation of artificial intelligence in e-governance services, the government application variable has a value of 60% for public services that can be accessed by the public. 40% Crosstab Query–Rate (%) is found on government websites and this shows that Jambi Provincial Government uses the application more frequently. Evidenced by the number of downloads on the Playstore, the Jambi City Government application has been downloaded by ± 500,000 users with a rate ratio of 4.3 to 4.5 out of 5 ratings, while the Jambi City Government web service has ± 120,000 visitors per March 2020 with a ratio of 4.3.

Figure 4.
Project Coding for Government Service Map

Source: Coding Analysis through NVivo 12 plus Software

The finding of Project Coding for Government Services Map showed 15 application services which consist of: Area Traffic Control System (ATCS), the application to view the activities of Jambi city through city CCTV; the Sikesal, complaint service application; the Sikoja, information about the Jambi city; Sipadek, application concerning online correspondence; Sipaten, administrative system application; Silancar, one-door licensing service in Jambi; Capsul Bus, Jambi city online transportation application supported by the Smart Dishub application; then checking service applications, such as PDAM, Jambi City Land and Building Tax Info, Jambi City Tax Check and Jambi City Statistics; then to find out news and government documentation through Jambi City PPID, and Sidak Application for employee performance.

All government service application activities are controlled through the Jambi City Operation Center (JCOC). Government services on the official website provide 12 services consisting of the Acceptance of New Students, Clean Water, Complaint Service, Demographics and Record-Keeping, e-Announcement, Employment and Social Services, Firefighters, Health, Levies and Taxes, Library, and Licensing. Waste Management is also controlled through JCOC. Jambi City is the first area in
Sumatra to have a City Operation Centre room (JCOC). The room is Jambi city’s control room which monitors city activities for 24 hours. The government of Jambi city implements government services by utilizing artificial intelligence in the form of e-government services.

### 4.3 Effect of Leadership Style on the Implementation of Artificial Intelligence

In Jambi, the government has implemented AI in the form of e-government services that have developed since 2013 until now. This is inseparable from Dr. H. Syarif Fasha who brought significant changes to the city of Jambi, with his visionary leadership style.

| Variable                  | Effect Leadership Style for implementation AI | Total  |
|---------------------------|-----------------------------------------------|--------|
| 1: Attraction             | 16.87%                                        | 16.87% |
| 2: Quality of government  | 32.53%                                        | 32.53% |
| 3: Responsibility         | 20.48%                                        | 20.48% |
| 4: The Performance        | 30.12%                                        | 30.12% |
| 5: Total                  | 100%                                          | 100%   |

Source: Coding Analysis through NVivo 12 plus Software

Crosstab Query–Rate (%) describes the influence of the Jambi Mayor Dr. H Syarif Fasha. The application of artificial intelligence with a visionary leadership style has the most significant effect on the quality of government with a value of 32.53%, which also affects the performance of the Jambi City Government at 30.12%. Furthermore, Fasha's leadership style also influenced the increase in the responsibility of government officials by 20.48%. Significant developments and changes in the city of Jambi increase the attractiveness with a value of 16.87%, where in the past the attractiveness of the city of Jambi was very low. In addition, this supports the community to advance and learn about information technology, as well as bring significant changes and the quality of life of the people of Jambi City in a positive direction.

### 5. Conclusion

Leadership style is very influential on the policy of each regional head. In Jambi province, the visionary leadership style of Dr. H. Syarif Fasha displays the efforts of the adoption of artificial intelligence in e-government services. His visionary leadership style is indicated on ‘leadership based on structure and consideration’ for his architectural leadership patterns with clear vision, clear goals, and broad range of achievements. Furthermore, the performance of the apparatus was also better. The application of AI in Jambi City is implemented through the official government website and in the form of government services that are controlled directly through the Jambi City Operation System (JCOC). It was found that application usage was higher than website usage. The use of AI in e-government services has a positive impact on the quality of government, performance, responsibility, and attraction for Jambi City. The most significant impact was found on the improvement in the quality of the city government. Jambi Province, with its prime performance and great responsibility, makes Jambi City even better and this has an impact on the attraction level of Jambi Province as a pilot area in the application of artificial intelligence in government, especially in e-government services that make Jambi a smart city.

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