Journal of Governance and Public Policy
ISSN: 2460-0164 (print), 2549-7669 (Online)
Vol 11, No 3 (2024): Page no: 271-286

E-Government Development on Control Corruption: A Lesson Learned from Singapore

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Article Info

Article History;
Received:
2024-01-24
Revised:
2024-07-03
Accepted:
2024-09-02

Abstract: This study explores the success of e-government in controlling corruption in Singapore and its potential applicability in Indonesia. Using a qualitative approach and literature review, it assesses anti-corruption efforts based on the E-Government Development Index (EGDI), focusing on the Online Service Index (OSI), Telecommunication Infrastructure Index (TII), and Human Capital Index (HCI). The findings reveal that Singapore, through its Corrupt Practices Investigation Bureau (CPIB), has effectively used digital platforms like e-complaints, e-booking systems, and AI-driven solutions to strengthen anti-corruption efforts. In contrast, Indonesia faces challenges due to a lower EGDI, particularly in underdeveloped TII, and a need for stronger AI support and legal reforms. The Corruption Eradication Commission (KPK) also requires improvements in human resources, with a shift towards meritocracy to reduce conflicts of interest. Unlike Singapore's independent anti-corruption framework, Indonesia's KPK is constrained by administrative processes and supervisory involvement, limiting its capacity to combat corruption effectively. The current research builds upon existing studies by integrating the EGDI indicators with a focus on e-government's role in corruption control, a dimension that has been underexplored, especially in comparative analyses between Singapore and Indonesia. The use of digital platforms in anti-corruption efforts and AI integration, as seen in Singapore, represents an advanced approach in this field. The novelty of this research lies in its detailed examination of the technological and institutional gaps between Singapore and Indonesia in implementing e-government for corruption control.

Keywords: *control corruption; CPIB; EGDI; Singapore*

DOI: https://doi.org/10.18196/jgpp.v11i3.21447

INTRODUCTION

The development of E-Government in this contemporary era has become a tool for breaking the chain of corruption in the government sector (Sadik-zada et al., 2022; Afriana et al., 2020; Kajendran, 2022; Georgescu, 2022) because changes in government digitalization have implications for management in e-government and reduce corruption (Myovella et al., 2019; Alhassan & Adam, 2021; Shabbir et al., 2021). Management in the e-government system has demanded changes in the public sector administration system so that digital governance structures can reduce corrupt behavior (Sadik-zada et al., 2022; Chen & Aklikokou, 2021).

This situation is then supported by several literature reviews, stating the effect of e-government affects monitoring corruption (Purnamasari et al., 2022; Espina-Romero & Guerrero-Alcedo, 2022; Kim & An, 2022; Zhao et al., 2021). The impact of anti-corruption behavior is due to external and internal factors of a public institution (Androniceanu et al., 2022). Internal factors include public organization structure, organizational staff, and strategic planning (Owusu et al., 2019; Ingrams & Schachter, 2019).

The e-government sector needs Information Communication and Technology (ICT) in all public sectors (Galushi & Malatji, 2022). ICT helps reduce corruption in terms of information asymmetry facilitation, standardization of government policies, and optimization of bureaucracy (Adam & Fazekas, 2021; Fan et al., 2021). Therefore, ICT tools in the development process towards e-government have projections on the restructuring of interactions between citizens and the government, government and private sector, and between governments (Mouna et al., 2020). With the existence of ICT media in e-government, the resulting impacts such as integrity audits, protection by corruption whistleblowers, transparent budgets, and rules that discretion government bureaucracy will be audited in the system (Schopf, 2019).

United State Development through the measurement of the E-Government Development Index (EGDI) then becomes a solution to the government development process in e-government governance (Zioło et al., 2022; Martins & Veiga, 2022; Doran et al., 2023). In EGDI, there are three parameters, namely: "Online Service Index (OSI), Telecommunication Infrastructure Index (TII), and Human Capital Index (HCI)" (Adjei-Bamfo et al., 2019; Androniceanu, 2019). OSI indicators measure the extent of development in public services (Dahalin et al., 2019). Kabbar (2020) explained the success of the government in making service-like websites, which are derived from aspects of public services (health, education, social services).

Then next, TII indicators are measured through the availability of telecommunications infrastructure such as the internet, devices (media), and wireless broadband (Gupta et al., 2017; Stofkova et al., 2022). Finally, HCI indicators are measured based on "human capital" as an essential actor in achieving productivity and innovation in e-government (Hunter & Shaffer, 2022). The author will then use the three indicators in the EGDI as measures against control corruption.

In handling corruption, one of the Southeast Asian countries with the best corruption index is Singapore, as seen in Table 1 below.

Table 1. Corruption Perception Index

Country	Skor
Danish	90
Finland	87
New Zealand	87
Singapore	84
Sweden	84
Switzerland	82
Netherlands	80
Germany	79
Ireland	77
Luxembourg	77

Source: (Transparency International, 2023)

Singapore has an anti-corruption policy (no tolerance) in every policy taken by its government (Quah, 2021). "Anyone who breaks the rules will be caught and punished – no cover-ups, no matter how senior the officer or how embarrassing it may be. It is far better to suffer the embarrassment and keep the system clean than to pretend that nothing went wrong and let the rot spread," said the Singapore official (Jon, 2021). In this case, Singapore is the Southeast Asian country most concerned about corruption cases, as evidenced by a perception index of 4 globally.

Singapore and Indonesia, two neighboring countries in Southeast Asia, have different approaches to managing corruption cases, which are manifested in various aspects. Singapore has an independent and strong Corrupt Practices Investigation Commission (CPIB) capable of efficiently investigating and prosecuting corruption cases. In contrast, the Corruption Eradication Commission (KPK) in Indonesia often faces obstacles and political interference, hampering its

effectiveness (Yulianita et al., 2020). The investigation process in Singapore is fast due to a strong legal system, while in Indonesia, the process is often complicated and slow due to weak coordination and political interference. Punishments in Singapore are generally harsh, providing a strong deterrent effect, while in Indonesia, they vary and are often considered too light. In terms of prevention, Singapore implements a meritocracy system, high salaries for civil servants, and early anti-corruption education, all of which are effective. On the other hand, efforts to prevent corruption in Indonesia are still weak, as can be seen from the high levels of corruption in various sectors (Chua, 2023). This contrast shows that Singapore's system is more effective in cracking down on and preventing corruption, providing valuable lessons for Indonesia.

Meanwhile, one of the other Southeast Asian countries in Indonesia that experienced a corruption perception index was Indonesia. This decline is the most significant and drastic since the reform (Bagaskara, 2023). Here is the data in Table 2.

Table 2. Corruption Perception Index

Country		**Indonesian**	
CPI Score 2022	34	CPI Score 2021	38
Rank	110	Rank	96

Source: (Transparency International, 2023)

The corruption index in Indonesia decreased by 4 points from the previous year and ranked Indonesia 100th in the world compared to the previous year at 96th. The decline in Indonesia's corruption perception index was caused by worsening corruption cases and politicians in the country over the past year (Annur, 2023). Transparency International also noted that the weakening corruption index in Indonesia is caused by the political system, special payments, and export-import cases (Saptohutomo, 2023).

Meanwhile, the e-government development of the two countries (Indonesia and Singapore) has a high disparity in the parameters of EGDI (OSI, TII, and HCI) in the aspect of corruption control. Here is the Table 3. data according to UN Development

Table 3. EGDI Singapore and Indonesia

Rank	**Country**	**EGDI**	**OSI**	**TII**	**HCI**
12	Singapore	0.9133	0.952	0.9021	0.8758
77	Indonesian	0.716	0.764	0.7438	0.6397

Source: (United Nations, 2022)

The success of corruption eradication and Singapore's e-government development is supported by various ICT tools in public spaces (Mahardika Hariadi & Luqman Wicaksono, 2019). By exploring the relationship between EGDI and corruption, this study can make significant new contributions to the anti-corruption and e-government literature, as well as offer practical insights for policymakers to leverage digital technologies in their efforts to combat corruption. Therefore, this EGDI has significant implications for the development of e-government in controlling corruption. So, this study will analyze the effect of e-government development with EGDI parameters on Singapore (the best country in the Southeast Asian Region) and Indonesia's opportunities (learning from the case of Singapore).

RESEARCH METHOD

This research used a qualitative method with a literature study approach. Data sources were obtained from secondary data, which included scientific articles, books, and mass media reports that were relevant to the research topic. Scientific articles published in academic journals provide in-depth analysis and empirical findings on the relationship between EGDI and anti-corruption efforts and ensure the validity and reliability of the data through a rigorous peer review process. Books by e-government and anti-corruption experts offer theoretical insights and best practices, as well as historical context that enrich the understanding of the dynamics of EGDI and corruption in Singapore.

Media reports provide up-to-date information on the implementation of e-government and anti-corruption policies in Singapore, as well as reports on relevant corruption cases and

government actions. Secondary data allows researchers to gain diverse perspectives, save time and money, support data validation, and build a strong theoretical foundation for understanding the relationship between EGDI and anti-corruption.

This method allows researchers to collect and analyze information from various trusted sources to gain a comprehensive understanding. Singapore was chosen because it is a role model for eradicating corruption in the Asian region and is supported by ICT. Strict Anti-Corruption Policy, Effective Law Enforcement, Strong and Fair Legal System, Transparency and Accountability, Private Sector Partnership, and Leadership Commitment also support this. In this research, the EGDI (E-Government Development Index) indicator is used, which consists of three main components: Figure 1 shows the theoretical framework.

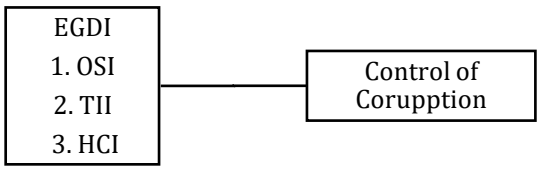

Figure 1. Theoretical Framework
Source: Processed by Authors (2023)

Online Service Index (OSI): Measures the quality and reach of online services provided by the government, including the availability of information and interactions that can be carried out digitally between the government and the public (Plaksin et al., 2017). Telecommunication Infrastructure Index (TII) Evaluates telecommunications infrastructure in a country, such as internet availability, number of internet users, and network capacity that supports digital services (Baraniewicz-Kotasińska, 2022). Human Capital Index (HCI) assesses the population's level of education and skills, which includes literacy rates, education levels, and the population's ability to use information and communication technology (Palma et al., 2009).

This study identified academic journals, books, and mass media reports relevant to the topic of EGDI and corruption eradication, then selected and evaluated data from these sources to ensure validity and reliability. Secondary data were integrated through cross-referencing and triangulation of information to build a strong and in-depth theoretical framework on the relationship between EGDI and corruption eradication. In this study, the authors will identify Singapore's success in eradicating corruption in the EGDI development sector. Then, after identifying and collecting data, the author will see the conditions in Indonesia. Furthermore, the key to Singapore's success in terms of EGDI can be applied and become Indonesia's opportunity in the future eradication of corruption.

RESULTS AND DISCUSSION

Online services in corruption control are projected to increase transparency and reduce corrupt practices in government bureaucracy (Androniceanu et al., 2022; Adam, 2020; Knox & Janenova, 2019). The adoption of technology was then chosen to support online services in controlling corruption (Mackey & Cuomo, 2020). Singapore then adopted the Corrupt Practices Investigation Bureau (CPIB) as the Anti-Corruption office (Quah, 2021). This CPIB method was formed to carry out a system of reporting, investigating, and improving the governance environment from corruption practices (Muhammad et al., 2023).

CPIB has three services: e-complaint for corruption, e-booking for the learning journey, e-booking for public education talks, and e-application for extension of bail bond (Lim, 2018). The e-complaint for corrupt service is the platform most in touch with Singapore's corruption control and eradication (Abdul Manaf et al., 2022). The CPIB Singapore website reported that the e-

complaint service is intended for all elements of society to complain about corrupt practices and gratification, as shown in Figure 2.

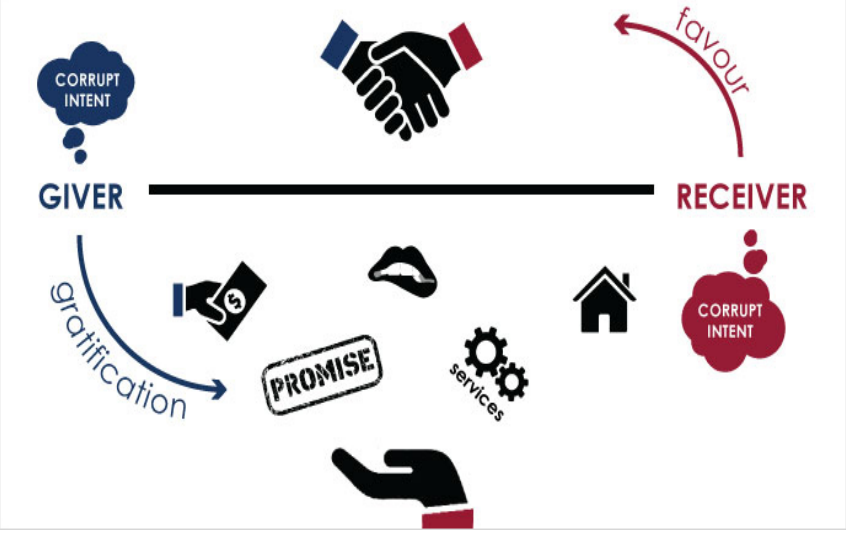

Figure 2. Online Service CPIB Singapore
Source: (CPIB Singapore, 2023)

CPIB Singapore explicitly accepts every complaint of corruption, detailing how it is alleged, when and where the incident occurred, what the gratuity looks like, and who the actors are. The broad authority of the CPIB in investigating corruption cases without political interference contributes significantly to its success in cracking down (Burke et al., 2017). Sari et al. (2021) further explained that the success of corruption control in Singapore is supported by the integration of anti-corruption values in organizational legitimacy, early identification of corruption risks, commitment to anti-corruption policymaking, and the provision of rewards, training, and comprehensive whistleblowing mechanisms for employees.

It is essential to contextualize the data and figures provided, such as digital infrastructure scores and salary tables, by analyzing their significance to enhance this section. For instance, while the salary data of CPIB employees is presented, its impact on motivation, performance, and corruption control needs deeper exploration. Understanding how these data points contribute to the overall effectiveness of anti-corruption measures will provide a more comprehensive analysis.

Another e-government development tool for controlling corruption is the availability of telecommunication infrastructure in the public sector (Castro & Lopes, 2022). This technological advancement facilitates the development of innovative systems to monitor and control corrupt practices (Merhi, 2022). For instance, the presence of robust digital infrastructure can enhance transparency and streamline reporting mechanisms, making it more challenging for corrupt activities to go undetected.

However, while data such as digital infrastructure scores and salary tables for CPIB employees are informative, they require proper interpretation and contextualization. For example, although salary data for CPIB employees is provided, its significance regarding employee motivation, performance, and its impact on corruption control is not fully explored. A deeper analysis is needed to understand how competitive salaries influence employee behavior and effectiveness in anti-corruption efforts. Additionally, examining how improvements in telecommunication infrastructure contribute to operational efficiency and accountability within anti-corruption agencies would offer a more comprehensive view of how these developments enhance overall anti-corruption measures.

Singapore itself in combating corruption is also supported by digital infrastructure with the following data:

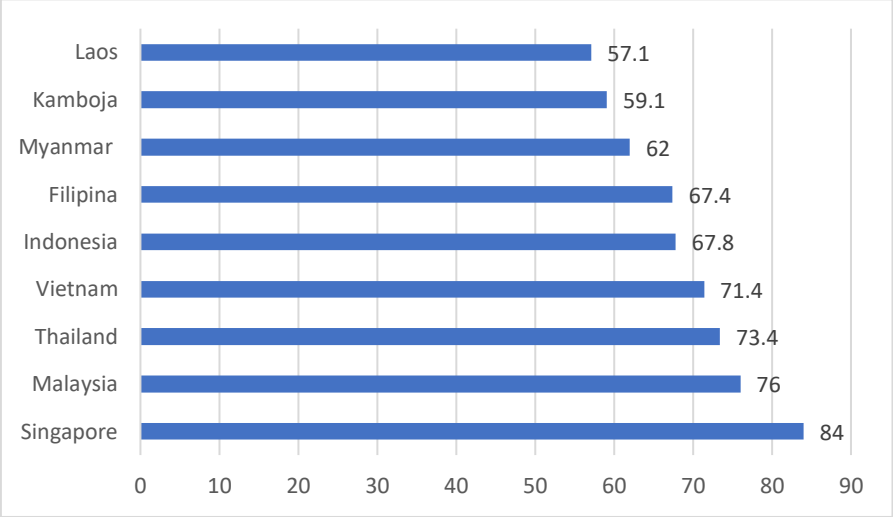

Figure 3. Digital Infrastructure in Southeast Asia
Source: (Lidwina, 2021)

Singapore occupies the top position in digital infrastructure in Southeast Asia, with a score of 84, indicating internet network access. Every government bureaucracy in Singapore has been digitized in every institution. Abdou (2021) explained that the Singapore government wants to make digital machines a medium of transparency and accountability in every aspect, including combating corrupt practices. In addition, the Singapore government established the Infocomm Development Authority (IDA) as the resilience of telecommunications infrastructure networks to secure government, businesses, and individuals (Ad'ha Aljunied, 2020).

In addition, the development of corruption control is also supported by human capital as the central control (Myovella et al., 2019). In implementing human resources to eradicate corruption, Singapore begins with a merit system recruitment pattern that remains the pattern of relationships through whistleblowing (Cooper, 2022). Through recruitment with meritocracy, employees who will be appointed as corruption controllers have qualifications in skills, achievements, and service procedures (Suzuki & Hur, 2022; Sunam et al., 2022; Andersen & Cornell, 2022).

In addition, in improving the meritocracy system, the Singapore Government increases the salaries of its employees every year to improve the quality of its performance, as shown in Table 4.

Table 4. Salaries of employees CPIB

Year	US$	CPIB Staff Ratio
2007	2.11	01:58,8
2008	2.22	01:56,2
2009	2.32	01:55,4
2010	2.90	01:56,4
2011	3.64	01:42,1
2012	3.82	01:38,5
2013	4.34	01:34,6
2014	5.36	01:26,7
2015	4.55	01:26,1
2016	4.89	01:26,7
2017	5.36	01:25,9
2018	6.07	01:25,4
2019	6.17	01:24,4
2020	6.23	01:24,3

Source: (Quah, 2022)

The increase in employees working at CPIB aims to reduce the gap between salaries in the public and private sectors to ensure that meritocracy still works. The result is significant performance and high work motivation (Jumady & Lilla, 2021; Kim, 2019). The implication is that it will become Singapore's best human capital in Asia and Southeast Asia (Lustrilanang et al., 2023).

Control corruption Indonesia: a Learned from Singapore

In the Elimination of Corruption in Indonesia, the Corruption Eradication Commission (KPK) is the leading sector in combating corruption (Alfada, 2019). The KPK has three main points in eradicating corruption: money laundering, corruption, and gratification (Abbas, 2021). Then, in improving the eradication of corruption through online services (digital), the KPK itself has the KPK Whistleblower's System (KWS), which can then be accessed directly through the official KPK website (Rodliyya & Vid Adrison, 2022). This system provides complaint services for all elements to be able to report every criminal act of corruption (Putri & Trisnaningsih, 2023).

However, in implementing the whistleblower system in Indonesia, there are still complexities in implementing the corruption eradication agency, as seen from the whistleblower system implemented by Singapore, as shown in Table 5.

Table 5: Comparison of Institution Eradication Corruption Indonesia and Singapore

	KPK Indonesia	**CPIB Singapore**
Website	kws.kpk.go.id	www.cpib.gov.sg
Component	1. Frontpage 2. User Registration/Login 3. Community Complaint: complaint of alleged corruption in your neighborhood to the KPK, Form, Title, Description, Parties allegedly involved, Appendix, Complainant, Complaint status, Complaint number, case category 4. Complaints to the Supervisory Board: complaints of alleged violations of the implementation of the duties and authorities of the KPK, Form, Title, Description, Parties allegedly involved, Attachments, Anonymous Complainants, Complaint status, Complaint number, Complaint Title. Case categories 5. Public Articles 6. Q&A 4. Questions & Answers: Non-site reporting media WEB can by WA, email, mail, Call center, SMS. Confidentiality of the whistleblower, follow-up reports, criteria Corruption, systematics of reports.	1. Frontpage 2. User Registration/ Login 3. Declaration of confidentiality of identity: Protection of whistleblowers Section 36 of the Corruption Prevention Law Chapter 241 and Privacy Statement 4. Complaint Step 1: Corruption complaint filed Step 2: Corruption complaint received by Bureau then channeled to Complaint Evaluation Committee Step 3: Applicant will be informed of further information 5. Other ways if you want to make a complaint: Phone, email

Source: (Arismaya, 2021)

Singapore's online services combating corruption are independent and do not depend on other institutions, as in Indonesia. Through Law No. 19 of 2019, the concepts of state independence agencies and anti-corruption agencies have been lost, including the KPK under the executive agency, the existence of investigation and investigation of the KPK, and the status of KPK

employees as civil servants (Putra & Fahmi, 2021; Oktavianto et al., 2019). Of course, this is inversely proportional to the services provided by Singapore, where CPIB is an independent corruption institution that can enter control and eradicate corruption in any sector (government or private). The authority to hold broad legal powers and the process of investigating and prosecuting various sectors of corruption make CPIB Singapore an independent corruption institution and consistently eradicates corruption (Singh, 2021). The independence of the Corruption Eradication Commission (KPK) is very important in handling corruption because it ensures that investigations and prosecutions are carried out objectively and free from political influence or personal interests. This independence allows the Corruption Eradication Commission to work with integrity and professionalism without fear of intervention from interested parties.

Then the next indicator that affects corruption control is the availability of Telecommunication, which is part of the construction of e-government buildings (Lee et al., 2018; Hasan et al., 2022). Indonesia itself, in the infrastructure network in the Southeast Asia Region, occupies the fifth position and is even far from Singapore, as depicted in Figure 4.

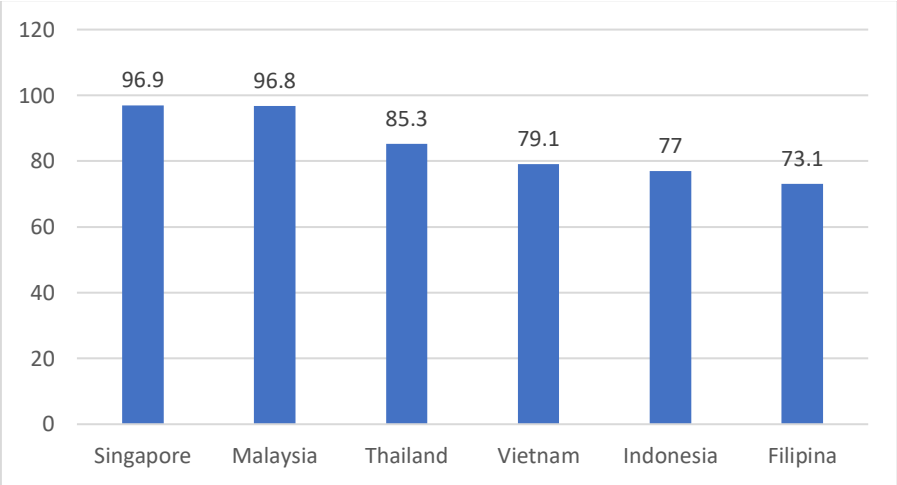

Figure 4. Telecommunications Infrastructure Southeast Asia
Source: (Annur, 2023)

Singapore has 96.9 points and is the country with the best telecommunications infrastructure. Then, Indonesia's position itself is still fifth with 77 points. The results of the figures affect the development of e-government, especially in combating corruption. Sabani et al. (2019) has less available ICT infrastructure, a low internet network, and a relatively high digital divide, bringing challenges and being highly corrupt (Purwanto & Emanuel, 2020). This condition is very contrary to Singapore, which has adequate infrastructure and is supported by Artificial Intelligence (AI) in every government sector, especially in combating corruption (Jiang et al., 2022). Therefore, this issue is a challenge for Indonesia in the future to eradicate corruption through e-governance by referring to Singapore as the country with the best corruption eradication index. With an extensive and quality network, law enforcement agencies such as the Corruption Eradication Commission (KPK) can collect, manage, and analyze data effectively. In addition, this infrastructure supports more efficient monitoring and reporting, enabling the public to report corruption cases in real time. Telecommunication technology also facilitates better coordination between various law enforcement agencies, thereby increasing the effectiveness of handling corruption cases.

The last factor that affects the eradication of corruption is human capital, which is the leading sector. Human capital is an essential factor in providing a good service with the aim of a public sector organization (Chairiah et al., 2020; Senadjki et al., 2021). In the corruption eradication sector in Indonesia, employees at the KPK are civil servants selected based on meritocracy according to Law No. 19 of 2019 (Asyikin & Setiawan, 2020). The transition of the status of KPK employees in Indonesia from commission employees to civil servants is a public assessment of the KPK's independence status because it is under the executive family (Khasna & Diniyanto, 2021; Santika, 2020; Hafifurrahman, 2023).

Unlike human capital to control corruption in Singapore, the anti-corruption employees (CPIB) have been guaranteed independence in combating corruption. The Director of CPIB is appointed by the President, who comes from CPIB employees and then classified as Deputy Director, Special Investigator, and Assistant Director (Munawaroh, 2021). Then, in carrying out their duties, CPIB employees can carry out investigations in various sectors, such as civil servants, private employees, the military, parliament, judiciary, and the private sector (Transparency International, 2019). Then, in eradicating corruption, CPIB employees have no restrictions (do not require the permission of high-ranking officials) to investigate if corruption cases are found (Seo & Myeong, 2020).

Learning from the success of Singapore's human capital, Indonesia, through the KPK institution, can be more independent in eradicating corruption. However, the KPK has (Ratmono et al., 2021). The transfer of the status of KPK employees from the status of "commission employees" to "civil servants" has injured the corruption eradication process because they do not have their independence but are subject to bureaucratic rules (Ariani & Prasetyoningsih, 2022). In addition, The existence of the KPK Supervisory Board is one factor that reduces the value of independence in combating corruption because of its authority to grant permits or not in investigating a case and going through a complicated bureaucratic process (Rasji & Sormin, 2020). Then, in the KPK employee structure, the existence and position of the Supervisory Board is higher than the KPK Chairman because it is authorized to supervise the Chairman of the KPK and all its employees (Syahuri et al., 2022).

CONCLUSION

The development of Singapore's E-Government Development Index (EGDI) has played a crucial role in its efforts to eradicate corruption. Singapore's Open Systems Interconnection (OSI) sector is supported by the Corrupt Practices Investigation Bureau (CPIB) and benefits from strong supervision and control. Additionally, the impact of advanced communication networks and robust internet infrastructure has been instrumental in supporting anti-corruption measures. Singapore's human capital, as measured by the Human Capital Index (HCI), is carefully selected for competence and independence, enabling effective execution of duties.

From these findings, Indonesia can draw valuable lessons from Singapore's approach, particularly in the integration of ICT infrastructure, AI, and law enforcement. Singapore's investment in vital infrastructure across various sectors, including the CPIB, has allowed for seamless communication, efficient transactions, and streamlined administrative processes. By leveraging AI, Singapore has been able to monitor and control administrative activities from the outset, minimizing opportunities for corruption.

Then, to strengthen the law on eradicating corruption through the CPIB institution, Singapore applies independent law to eradicate corruption entering all sector lines (government and private). Unlike in Indonesia, the process of eradicating corruption must go through all administrative processes because the KPK Supervisory Board monitors employees and even KPK leaders when conducting investigations. Regarding human capital, Indonesia must learn a lot from Singapore that the status imposed is a non-civil servant with implications that it will carry out corruption combating independently, measurably, and not under the control of the leadership or executive. Then, the recruitment process is based on the meritocracy system, which is different from Indonesia, where the process still needs to be improved in terms of quality and competence.

ACKNOWLEDGEMENT

Thanks to the Masters of Government Affairs and Administration of Universitas Muhammadiyah Yogyakarta, this publication has been provided and supported.

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