Journal of Contemporary Governance and Public Policy, 4 (1) April 2023, 97-114
ISSN: 2722-3981 (Print), ISSN: 2722-3973 (Online)
Available Online at https://journal.ppishk.org/index.php/jcgpp

JOURNAL OF CONTEMPORARY GOVERNANCE AND PUBLIC POLICY

E-Government Development Index Impact on World Governance Indicator Index in Southeast Asian Countries

Mohamad Sukarno[1]*, Achmad Nurmandi[2]

[1] Master of Government Affairs and Administration, Universitas Muhammadiyah Yogyakarta, Indonesia

[2] Department of Government Studies, Universitas Muhammadiyah Yogyakarta, Indonesia

*Corresponding Author Email: m.sukarno.psc22@mail.umy.ac.id

Received: 12 January 2023; Revised: 16 March 2023; Accepted: 18 March 2023

Abstract

The aims of this study is to find out how the E-Government Development Index (EGDI) affects the World Governance Index (WGI) in Southeast Asia. The choice of a Southeast Asian country is important because, in general, Southeast Asia is a developing country that needs improvement, especially in the area of government. Southeast Asian countries still have governance that hasn't worked well as a whole, and non-government actors still have the most power. The method used in the research is quantitative machine learning (Google Collab Research) analysis. Data processing is carried out in the form of extras from EGDI and WGI in Southeast Asian countries to find the influence of the two data sets. The results showed that the impact of EGDI on WGI was the greatest in the indicators of government effectiveness and regulatory quality, with a score above 0.53. The reason behind this is the increase in digital bureaucracy in all sectors of government; it also has an impact on good governance. Then, in the sector of corruption control, some countries have also adopted ICT, and some of them have succeeded in reducing corruption. Sectors that have adopted digital bureaucracies, such as education, environment, crisis management, and sustainable development. In the regulatory quality sector, institutional improvements are carried out to suppress corruption and improve the quality of democracy by involving non-governmental actors. The lowest indicator is voice and accountability, with a score below 0.49 (moderate). This is because there is still a lot of development in terms of governance and government institutions, which have not run optimally.

Keywords: *E-Government Development Index; Governance; Southeast Asian Countries; World Governance Indicator Index*

Copyright © 2023 by Authors, Published by Pusat Penelitian Ilmu Sosial dan Humaniora Kontemporer, Indonesia. This is an open access article under the CC BY-SA License (https://creativecommons.org/licenses/by-sa/4.0).

How to Cite: Sukarno, M., & Nurmandi, A. (2023). E-Government Development Index Impact on World Governance Indicator Index in Southeast Asian Countries. *Journal of Contemporary Governance and Public Policy, 4*(1), 97-114. https://doi.org/10.46507/jcgpp.v4i1.106

Permalink/DOI: https://doi.org/10.46507/jcgpp.v4i1.106

Introduction

Effective governance is defined as a government that can formulate and implement policies and responds to all the needs of its citizens (Leclerc, 2020; Khatib et al., 2022; Cramer, 2022). This is also clear from the content of governance, which has a positive effect on reducing the index of endemic corruption, inflation, and transaction costs so that the economy works better (Marcos et al., 2020; Ullah & Rahman, 2021; Jiang, 2018). Then, governance can be an opportunity to improve welfare, which can be seen from its characteristics such as transparency, law enforcement, participation, and responsiveness (Keser & Gökmen, 2018).

Gjaltema (2020) explains the concept of governance as the successful reduction of governance fragmentation in the global sustainability or natural resources sector as an important activity to increase accountability and transparency networks. In governance, there are at least three actors who have contributed, namely companies, the private sector, and the government, to create adaptive governance and manage it collectively (Gorwa, 2019). Gritsenko & Wood (2022) described governance as public governance that has projections on the production and implementation of ideas, plans, regulations, and policies that are of concern to the public and private sectors.

In governance, the form of collaboration between the public sector and private actors and the government is coordinating to deal with issues that are at stake and become a common domain (Pahl-Wostl, 2019). All actors involved in the discussion bring their interests to be further discussed and agreed upon as a policy (Y. Chen et al., 2021). Derakhshan et al., (2019) say that when a policy is put into place, the people involved also evaluate and control to protect the interests of each party. So that later it can be efficient and effective in the final result (Waheed et al., 2021).

One of the empirical literatures used in analysing the composite index of governance is the World Governance Index (WGI), which has six indicators (Pinar, 2015). The Worldwide Governance Index (WGI) is a parameter adopted by The World Bank's Quality of Public Service Policymaking that assesses the credibility of government and independence quality of public services (Al-ahdal et al., 2020). The WGI uses six criteria, such as "voice and accountability; political stability and regulatory effectiveness; violence and terrorism; the quality of government rule of law; and the absence of corruption controls" (Ghatak, 2019).

The six WGI indicators are described as follows: 1). Voice and accountability: has the purpose of evaluating citizens ability to participate and be free to express and socialize with the government (Alsaleh et al., 2021). Effective communication then becomes one of the bases for creating a good voice and holding people accountable. Effective communication then becomes one of the bases of creating (Hartani, Cao, & Nguyen, A. Q., 2020). Asongu & Odhiambo (2020) mention the leadership factor in which political power becomes the capacity for change in it. 2) Political stability and the absence of violence: is the perception of political instability or the possibility that it can be overthrown by unconstitutional means and can be done in destructive ways motivated by politics and terrorism? Huque & Jongruck (2018) mention the leader factor, in which

political power becomes the capacity for change. Violence or acts of terrorism become exogenous and affect the stability of citizens in the state (Gaberli, 2022). 3) Government effectiveness: the implementation of a system to achieve goals and benefit all elements There are six dimensions, namely information, system, service, and user satisfaction (Santa et al., 2019). 4) Regulatory quality: the ability of the government to implement its policies or regulations in a healthy manner and have positive implications for its citizens (Sabir et al., 2019). With good regulation—political, economic, and executive—governance can run with state goals. All public and private institutions can comply with existing regulations so that as a result, legal cases such as nepotism, corruption, misappropriation, and disputes can be minimized (Adams & Akobeng, 2021). 5) Rule of law: implement applicable legal norms with a high governance capacity so that their legitimacy has an impact on justice for their citizens (Toshkov et al., 2022). The legal crisis is the background for fair law enforcement for all elements (Scicluna & Auer, 2019). Thuy et al., (2020) stressed that a weak rule of law would have implications for the oversight and arbitrariness of various governing and nongovernmental actors. 6) Control of corruption: implementation of good regulatory quality in reducing information asymmetry, increasing accountability, and limiting corrupt behavior (Lee et al., 2020) Abdillah & Dwi (2020) explain that a weak rule of law would have implications for the oversight and arbitrariness of various governing and non-governing actors.

Then, the E-Government Digital Index (EGDI) is the concept to increase the development of Southeast Asia. EGDI can be defined as the use of information and communication technology (ICT) in communicating with governments and conducting business through electronic media (Turmanidze et al., 2020). In determining EGDI parameters, there are several indicators, such as devices, mapping, and key measurements, that support digital transformation in various countries (Kabbar, 2021). In addition, EGDI has a matrix that has three different classifications: the "Online Services Index (OSI), Telecom Infrastructure Index (TII), and Human Capital Index (HCI)" (Stofkova et al., 2022).

The Online Service Index is a part of the EGDI indicator (Dahalin et al., 2019), which shows how ICT is used to get public services to people. The second indicator, the Telecommunication Infrastructure (TII), looks at how people use the internet, phones, ICT, and infrastructure for community and human resources (Kabbar, 2021). Finally, The Human Capital Index (HCI) has a human resources component as the main base for providing online service availability (Gupta et al., 2020). These options include electronic participation components and referring the security component for e-governance services.

EGDI and WGI have also been used in several studies as parameters of a country's governance development (Zhao et al., 2021). In several studies, EGDI and WGI have also been used as parameters for a country's development of governance. They explained in their research that the indicators in WGI are the development parameters of a country's development to study the increase or decrease of governance. The dimensions used are also percentile values from every five years, which are then extracted into six dimensions of governance (Aleksic et al., 2019).

The regions of Southeast Asian countries are categorized as regions that still have diverse resource strengths. Then, in government practices, governance is still found to be ineffective (not following governance rules) (Miller et al., 2020). In their governance, several Southeast Asian transnational countries in the government sector are even controlled by non-state actors who act as pressure groups (Breslin & Nesadurai, 2018). Then, Alhari & Fajrillah (2022) also mentioned that countries in the Southeast Asia region are still far away, ranked 88th in the world, and are considered less involved in technological sophistication in government performance. Therefore, it is necessary to accelerate the development of advanced government services and the adoption of technology in various sectors.

Public services in Southeast Asia still have a limited number of services provided by the government, and some of them are still found to be unavailable to their users (Nguyen et al., 2020). In the 2016 EGDI data report, the positions of Southeast Asian countries such as Singapore (7th), Malaysia (48th), Brunei Darussalam (59th), Thailand (73rd), the Philippines (75th), and Vietnam (59th) were compared to those of developed countries (Saniagati & Welly, 2021). Qumara (2019) said that digital transformation is a necessary change because e-government is a measure of how satisfied the public is. In addition, the ICT aspect also has an important role as a role model for realizing good governance and how to reduce corruption, uphold transparency, foster public accountability, and innovate in service delivery (Yulianto et al., 2021).

Therefore, the World Governance Index is important for measuring six governance indicators in each country, especially in regional countries; therefore, this study will analyse a correlation between the development of the EGDI and the WGI. This will then become a milestone for new thinking about related policies or regulations and determine governance that is in line with the current digital era. The two databases will later be used to conduct an in-depth study and correlation of Southeast Asia Country WGI data with the UN Government Index, as well as a mapping form of future regression predictions.

Research Methods

This research uses quantitative methods and machine learning (Python) for analysis. The results are then put through Google Collab Research. Using Python to collect and analyse data for linear algebra and arithmetic classes and functions (Duarte et al., 2020). The data process is carried out by data extraction as a whole (EGDI) and WGI Southeast Asia (country). The choice of a country in southeastern Southeast Asia Southeast Asia because, in general, Southeast Asia is classified as a developing country and requires development, especially in the governance sector (Tawakkal, 2022).

The Southeast Asian technology governance network is based on the process of setting the agenda and making policy, and it has not changed since (Tan et al., 2021). The standard values used are -2.5 (weak), -2.5-0.49 (medium), and 0.49-2.5 (strong) (L. Chen & Aklikokou, 2021). In addition, a pretreatment process is used to set the end goal that Google Studio shows. The approach used in this study is to choose features that have a high correlation value as predictions for the future; for more details, see figure 1.

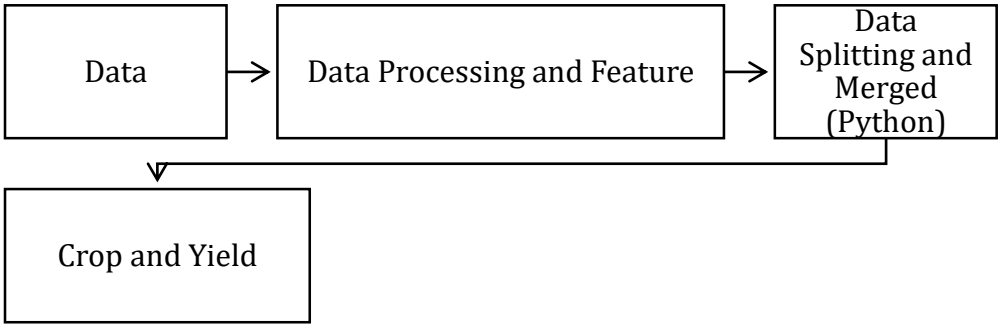


Figure 1. Research Stages
Source: Processed by Authors (2022)

When it comes to collecting data, there are two main sources: WGI Data, which is made up of countries in Southeast Asia, and the UN E-Government Data Base. In the future, Python will be used to analyse these two datasets through Google Collab Research, and Google Studio will be used to show the results.

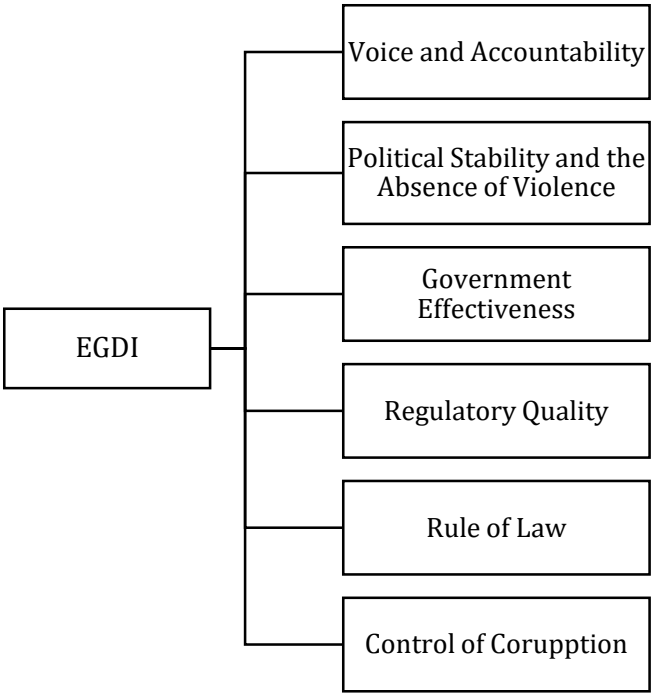


Figure 2. Theoretical Framework
Source: Processed by Authors (2022)

Based on figure 2 and the theoretical framework, the author wants to see the correlation between the EGDI (TII, OSI, and HCI) index and the WGI indicators (Voice and Accountability, Government Effectiveness, Political Stability and the Absence of Violence, Rule of Law, Control Corruption, and Regulator Quality). The value (score) of the indicator will be verified in countries in Southeast Asia. Then also, for the E-Government Development Index value, we have taken a field named 'EGDI' and converted it to a percentage (%).

Results and Discussion

This section includes the conclusion and discussion. Data that is adequate must back up any result. The results should then be able to answer the research question. Before presenting the results of the WGI analysis, this study displays the Worldwide Governance Indicators of countries in Southeast Asia and the EGDI shown in each of its components in table 1.

Table 1. Countries with the Highest WGI and EGDI Scores
Source: Acquired by Authors Using Google Studio (2022)

Country	Variable	Indicators						Total
		GE	RQ	RL	CC	PSAV	VA	
Singapore	EGDI	0,92	0,92	0,92	0,92	0,92	0,92	0,91
	WGI	100	100	98,56	99,04	97,17	38,16	532,93
Brunei Darussalam	EGDI	0,74	0,74	0,74	0,74	0,74	0,74	0,74
	WGI	90,38	76,92	80,29	87,02	90,57	22,22	447,4
Malaysia	EGDI	0,79	0,79	0,79	0,79	0,79	0,79	0,79
	WGI	82,21	74,04	73,08	62,5	50,94	40,1	382,87
Indonesia	EGDI	0,66	0,66	0,66	0,66	0,66	0,66	0,66
	WGI	0,66	0,66	0,66	0,66	0,66	0,66	0,66
Thailand	EGDI	0,76	0,76	0,76	0,76	0,76	0,76	0,76
	WGI	63,46	58,65	57,69	38,46	24,53	26,09	268,88
Philippines	EGDI	0,69	0,69	0,69	0,69	0,69	0,69	0,69
	WGI	56,25	53,37	31,73	34,13	18,87	41,06	235,41
East Timor	EGDI	0,46	0,46	0,46	0,46	0,46	0,46	0,46
	WGI	19,23	21,63	11,06	45,19	52,83	57,97	207,92
Cambodia	EGDI	0,51	0,51	0,51	0,51	0,51	0,51	0,51
	WGI	37,98	29,81	17,79	11,06	41,04	12,56	150,23
Myanmar	EGDI	0,43	0,43	0,43	0,43	0,43	0,43	0,43
	WGI	14,42	28,37	10,58	27,88	9,91	21,74	112,89
Laos	EGDI	0,38	0,38	0,38	0,38	0,38	0,38	0,38
	WGI	22,6	21,15	20,67	14,9	69,34	3,38	152,05
Vietnam	EGDI	0,68	0,68	0,68	0,68	0,68	0,68	0,68
	WGI	61,54	46,63	48,56	42,31	44,81	12,08	255,93

Description
GW : Government and Effectiveness
RQ : Regulatory Quality
RL : Rule of Law
CC : Control of Corruption
PSAV : Political Stability and Absence of Violence/Terrorism
VA : Voice and Accountability

That's why we chose Google Data Studio. It is an online business intelligence platform that helps visualise data and create interactive reports and dashboards (Azis et al., 2022). The data is numerical, so quantitative research can be carried out on it, and we have to compare different agreements to find relationships between them (Snipes, GeniferSnipes, 2018). To that end, we have checked the top countries that have the highest EGDI Index values and, with it, checked their WGI index values, just as we did with the top countries that have the lowest EGDI Index values, and with that, we also checked their WGI index values.

There is a link between the data from EGDI and WGI when it comes to good governance. The correlation is expressed as having implications if it has a score (value) of 0.109, $p<0.01$, and is negative and significant (-0.085, $p<0.05$). The connection means that when the score (value) (Iqbal et al., 2019) on the WGI Southeast Asia is greater than that on the EGDI, then the country has a good public service value. The two most influential impact categories of the WGI are government effectiveness indicators with a score above 0.53 and regulatory quality indicators.

Table 2. Digital Mobile Singapore
Source: Hanjaya et al., (2019)

Indicators	Singapore
Population	5.7 million
Internet	83 percent (4.83 million)
Unique mobile	82 percent (4.71 million)
Active mobile internet users	80 percent (4.58M)
Web traffic desktop	20 percent – YoY-60 percent
Mobile web traffic	78 percent- YoY+75 percent
Go online via desktop	39 percent
Do it online via mobile	39 percent

The data from table 1 shows that the country with the highest score on government effectiveness is Singapore. Then countries such as Brunei Darussalam, Malaysia, Indonesia, and Thailand are also relatively good and are heading in the best direction. Then, for regulatory quality indicators, Singapore is also the country with the best value in Southeast Asia, while other countries are still in the development stage. In the control of corruption dimension, Singapore has the most dimensions compared to other

countries. It can also be argued that other countries are still abandoning their homework on controlling corruption. The use of the internet in the country does not escape the government's effectiveness score, as shown in table 2.

Smart home facility management, which keeps track of all the activities of Singapore's management community, has a big impact on the country's digital progress (Huseien & Shah, 2022). This is supported by the Singapore Government's innovation in carrying out governance, such as the existence of smart nation Singapore and smart traffic Singapore, which are already supported by IoT (Shamsuzzoha et al., 2021). Then, Singapore also occupies the best position with a value of 90, and other countries' average value is still below. Indicators of political stability and absence of violence/terrorism Singapore has good values, while other countries such as Brunei Darussalam, Malaysia, Indonesia, Thailand, and others still have countless questions about peace and political stability in their countries. The last dimension of voice and accountability is that, in general, Southeast Asia has a poor record and poor values because the score is very low. It also causes a crisis of democracy, namely freedom of speech and state accountability (Hernández-Moreno, 2020). This then becomes a challenge for other Southeast Asian countries in developing their countries' e-government governance. For more details, it can be seen in table 3 for the following internet digital data.

Table 3. Southeast Asia Accesses the Internet
Source: L. Chen (2020)

Country	Internet Penetration User	Mobile Connection		Electricity Access		
		3G	4G	Urban	Rural	Part of the Rural Population
Brunei Darussalam	94.4 %	92.2 %	90.0 %	100.0 %	100.0 %	22.5
Singapore	84.4 %	100.0 %	100.0 %	100.0 %	0.0 %	0.0
Malaysia	80.1 %	96.2 %	92.0 %	100.0 %	100.0 %	24.6
Philippines	60.1 %	93.0 %	80.0 %	96.9 %	86.3 %	55.7
Thailand	52.9 %	98.0 %	98.0 %	99.9 %	100.0 %	48.5
Vietnam	49.6 %	95.0 %	95.0 %	100.0 %	100.0 %	65.8
Cambodia	34.0 %	83.9 %	57.5 %	100.0 %	36.5 %	79.1
Indonesia	32.3 %	93.8 %	90.4 %	100.0 %	94.8 %	45.5
Myanmar	30.7 %	90.5 %	75.1 %	89.5 %	39.8 %	65.4
Laos	25.5 %	78%	9.0 %	97.4 %	80.3 %	60.3
East Timor	45.1 %	100%	7.0 %	76.4 %	55.3 %	46.3

So, Southeast Asian countries are building a lot of digital infrastructure to support e-government. The Southeast Asia Investment Report has reported Southeast Asian countries with digital infrastructure projects with the following data in figure 3.

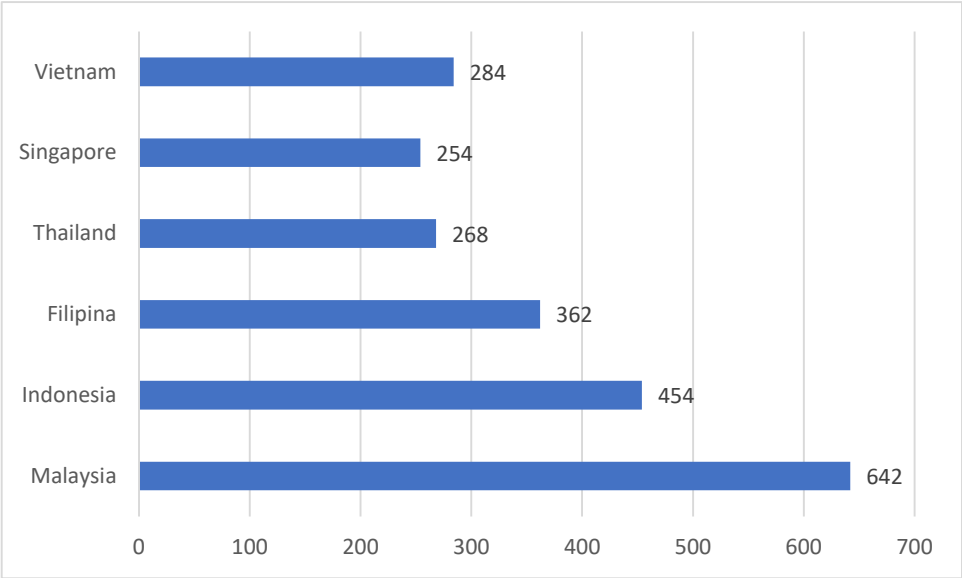


Figure 3. Holders of Digital Infrastructure Projects in Southeast Asia
Source: Ahdiat (2022)

This is a possibility that makes digital bureaucracy possible, and it has been used in different parts of the government to help with good governance. The developed sectors are education, a clean environment, health, political institutions, and quality services. Crisis management and sustainable development (Abdou, 2021). Reflecting on Singapore, which has the most advanced digitalization in Southeast Asia, at least it has developed the concept of "Many Agencies, One Government" to build collaboration between sectors in government (with the main portal E-Citizen) (Rahman et al., 2020). Then there is Malaysia, which manages approximately 13 thousand public services, where about 83 percent of its services have switched to electronic or online systems (Machmud et al., 2021). Therefore, it is a challenge for Southeast Asia's member states to develop e-governance.

Then in Southeast Asian countries, the instruments used by their members are to mitigate risks, search for economic benefits, and deal with conditions that are full of uncertainty (Mekhum, 2020). In his research, Mueller (2021) stated that Southeast Asian countries demonstrate the institutional sector of government, both central and regional, to create good governance and serve their citizens. It is also mentioned in his research by Darusalam (2021) that countries in Southeast Asia are already heading in a progressive direction in terms of quality governance and are developing ICT tools in their government sectors.

When it comes to innovation in the Southeast Asia Region, the capital of innovation capacity has a lot to do with human resource capacity. There are four main indexes. namely Higher Education Enrollment (TER), Government Expenditure on Education (GEX), Patent Journal (PTT), and High Technology Export (HEX) (Muhamad et al., 2018). The growth of Southeast Asia's GDP, which is accelerating in that direction, also lends support to this. In addition, the development of scores (value) in Southeast Asian countries also has implications for increasing their country's GDP. The estimation results

show that GDP periods have a positive impact on GDP. Six indicators of governance have a significant impact on GDP in Southeast Asian countries (Iskandar et al., 2020). It is shown in the eight countries that have the highest GDP in Southeast Asia. It is also stated in the study of Crocco & Tkachenko (2022) that good governance in natural resource management occurs when a country dependent on agricultural exports is supported by strong and effective governance. This finding supports the claim that the impact of natural resources on the economic development of a country depends on the performance of that country's governance.

Then, a group called Digital Data Governance (DDG) was set up to improve service innovation and digital data protection, which led to better regulation in Southeast Asia. The principles are "consent, notification, and purpose; the accuracy of personal data; security safeguards; access and correction; transfer to other countries or regions, which emphasises the importance of consent in data transfer and storage; and accountability" (Ministry of Communication and Information Singapore, 2021). Then Tampubolon & Ramadhan (2020) explained that at least DDG was also made with four common goals of Southeast Asian countries, namely: first, it promotes strategies to detect threats following international law and its principles. Second, promote dialogue on risk reduction measures by sharing the perspectives of each member state on using ICT in conflict. Third, encourage cooperation between countries. Fourth, develop a security plan for the theoretical and practical use of ICT. Finally, consider the expansion of terms and definitions related to the use of ICT. ASEAN began to improve state relations in the region by building the ICT sector, one of which was the establishment of a Computer Emergency Response Team (CERT). For more details, it can be seen in table 4.

Table 4. Southeast Asia Accesses the Internet
Source: L. Chen (2020)

Framework	Strategic	Principle
Southeast Asia framework on digital governance	Ecosystem data and life cycle	Data integrity and trust Access control Data security
	Cross-border data flow	Cross-bored data flow
	Digitalisation and emerging technologies	Capacity building
	Legal regulations and policies	Personal data protection and privacy regulations Accountability Development and adoption of best practices

The quality of regulations and competitiveness, as well as all the other parts of governance, have been shown to have an effect on the process of development and have a lot of potential. So, Hassan et al., (2020) say that Southeast Asian countries should first focus on reforming their institutions to make government work better and improve the

quality of regulations. Southeast Asian countries can improve the quality of democracy and lower the risk of abuse by reducing corruption and maintaining the general rule of law and institutional conditions of their countries (Zakaria & Bibi, 2019). This is especially true when it comes to regulation.

It enforces rules in four Southeast Asian countries that have digital protection for personal data: Thailand, Singapore, Malaysia, and the Philippines. Other countries, like Indonesia and Vietnam, do not have this yet (Nasution, 2021). The regulations implemented by the four countries provide actual protection and verification of data in government transactions with its citizens and with other countries. Duho (2020) shows in his research that Southeast Asian countries can improve the quality of their regulations by designing and implementing regulations that promote private sector development. These efforts will provide equitable opportunities and facilities for the poor. Second, governments can pursue competitiveness and development policies that help meet poverty reduction goals in developing countries. Competitiveness boosts exports and employment, while development spending boosts the labour force and productivity. This helps limit poverty in some developing countries (Shang et al., 2020).

In the context of fighting corruption, ICT was also used to keep things open and move quickly (Kim, 2019). Islam & Fatema (2017) say that in the implementation of this ICT, controlling corruption in Southeast Asia will be very helpful because of the region's innovation practises and this technology. However, the fact that Southeast Asian countries, in general, have not implemented digital governance can be seen in the following figure 4.

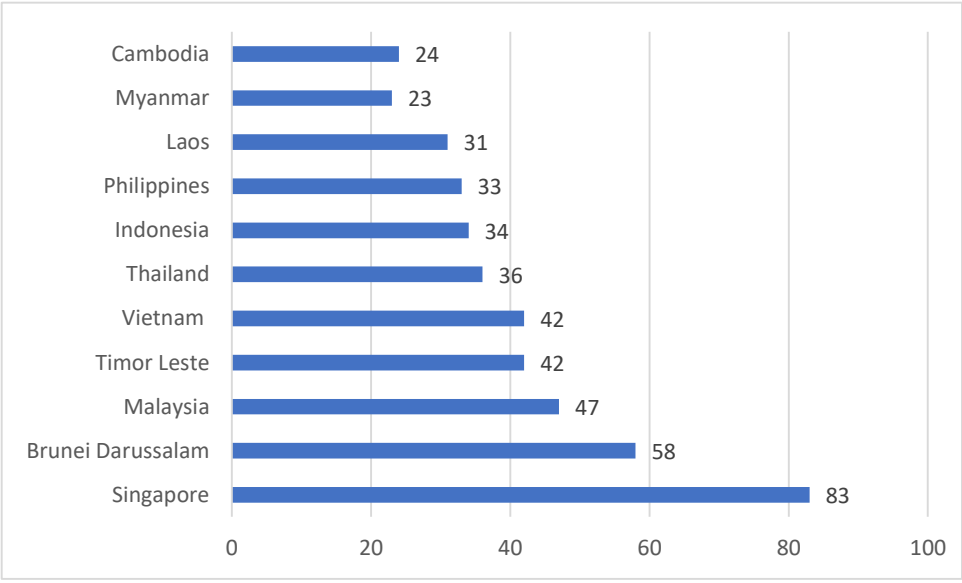


Figure 4. Corruption Perception Index in Southeast Asia
Source: Kameke (2023)

Singapore has the highest corruption perception index, which means that, compared to other Southeast Asian countries, it is thought to be the most helpful. There are three development strategies, namely (Mahardika Hariadi & Luqman Wicaksono,

2019): 1) "Commitment by the political leaders, especially Prime Minister Lee Kuan Yew, towards the elimination of corruption both within and outside the public bureaucracy; 2) "adoption of comprehensive anti-corruption measures designed to reduce both the opportunities and need for corruption; and 3) the creation and maintenance of an incorrupt anti-corruption agency that has honest and competent personnel to investigate corruption cases and to enforce the anti-corruption laws." In terms of maintenance, Singapore is better prepared than other countries, so this is a separate construction of IoT development to reduce corruption cases. Development is being developed as well. Then in the next research, Hartani, Cao, & Nguyen (2020), it was also mentioned that the technology used in corruption control has also been successfully carried out by bringing several models, namely "IPS unit root test, Pedroni cointegration, and FMLS estimation." This has implications for reducing corruption cases, as has been implemented in Malaysia. From the statistical data we have, the use of the ICT system in Malaysia has turned out to be able to reduce the rate of corruption crimes by up to 60 percent.

While the lowest score is found in the Voice and Accountability indicator with an average below 0.49 (medium category), this moderate category includes political stability in Southeast Asia. According to Xu (2021), this shows significance in the development of the Southeast Asian economy, although, on the other hand, it still requires improvements in governance and institutional quality. Therefore, in this case, the countries of the GCC should also improve their laws and regulations because it will affect the implementation of good governance, which indirectly plays an important role (Murshed et al., 2021).

Southeast Asian countries have a moderate score for having a voice and being accountable, but they still have a lot of problems with independence, accountability, political stability, and law enforcement. This is because of how power works and the problems with the justice system, human rights, freedom, and corruption (Pertiwi & Ainsworth, 2021). The score (or value) in the EGDI has no effect on the development of the WGI. Since the Southeast Asian power base hasn't changed, the development of good governance can't be done properly. Ramadlan (2021) in the results of the Freedom House report shows that in the last decade, in 2019, there was a decrease in the democratic freedom score by 19 percent (10 countries). This will have the effect of strengthening populism and undermining the principles of a democratic state because it overrides the values of transparency, accountability, and freedom of the press.

Conclusion

The most important effect of EGDI on WGI in Southeast Asian countries is on e-government governance indicators, which measure how digitalized all parts of government are. This is due to the internet infrastructure and e-services in public services backing up digital mobile. This happens because digital bureaucratic innovations are used in different parts of government, like education, the environment, crisis management, and sustainable development. A high government effectiveness score of more than 0.53 also has an effect on a country's GDP, which will be used as a measure of

good governance development in the future. On the other hand, the growth of digital governance in Southeast Asia is still centred on Singapore and Brunei Darussalam, two countries with a fair amount of power. This is due to the fact that both nations' digital governance is expanding quickly, which is a result of how simple and widely used the internet is. So, the biggest challenge for other countries is to improve their infrastructure so that digital mobile governance can be used in the public sector.

In terms of regulatory quality, Southeast Asian countries have scores in the medium category or below 0.49. Only Singapore, Thailand, Malaysia, and the Philippines have taken steps to improve security in the government, public, and private legal sectors of their countries. Other Southeast Asian countries, on the other hand, are still only interested in the content of laws and have not yet adopted technology. So that it becomes a challenge in itself and a reference from the four Southeast Asian countries that have already realised it. In the area of corruption indicators, countries in Southeast Asia have also made efforts in adopting technology, and some of them have succeeded in reducing corruption committed by Singapore by utilising its maintenance technologies, "IPS unit root test, Pedroni cointegration, and FMLS." Although some of them have not taken advantage of the sophistication of technology to reduce corruption, The lowest score is on the indicators of votes and accountability that are still needed to improve governance and institutional governance. In addition, in terms of democracy, the Southeast Asia region also leaves behind problems, namely humanitarian issues, human rights violations, and corruption.

Acknowledgement

The Master of Government Affairs and Administration programme at Universitas Muhammadiyah Yogyakarta, Indonesia, supported this research. Also, the authors extend gratitude to all parties who have supported the project.

References

Abdillah, K., & Dwi, R. (2020). The Effect of Control Corruption, Political Stability, Macroeconomic Variables on Asian Economic Growth. *Jurnal Ilmiah Bidang Ilmu Ekonomi*, *15*(2), 161–169.

Abdou, A. M. (2021). Good governance and COVID-19: The digital bureaucracy to response the pandemic (Singapore as a model). *Journal of Public Affairs*, *21*(4), 1–10. https://doi.org/10.1002/pa.2656

Adams, S., & Akobeng, E. (2021). ICT, governance and inequality in Africa. *Telecommunications Policy*, *45*(10), 102198.

Ahdiat, A. (2022). Ini Negara Pemegang Proyek Infrastruktur Digital Terbesar di ASEAN. *Katadata.Com*.

Al-ahdal, W. M., Alsamhi, M. H., Tabash, M. I., & Farhan, N. H. S. (2020). The impact of corporate governance on financial performance of Indian and GCC listed firms: An empirical investigation. *Research in International Business and Finance*, *51*(August 2019), 101083. https://doi.org/10.1016/j.ribaf.2019.101083

Aleksic, A., Ljepava, N., & Ristic, M. (2019). Smart Technologies and Innovation for a Sustainable Future. In *Smart Technologies and Innovation for a Sustainable Future, Advances in Science, Technology & Innovation*. New York: Springer International Publishing.

Alhari, M. I., & Fajrillah, A. A. N. (2022). Enterprise Architecture: A Strategy to Achieve e-Government Dimension of Smart Village Using TOGAF ADM 9.2. *International Journal on Informatics Visualization*, *6*(2), 540–545.

Alsaleh, M., Abdul-Rahim, A. S., & Abdulwakil, M. M. (2021). The importance of worldwide governance indicators for transitions toward sustainable bioenergy industry. *Journal of Environmental Management*, *294*(June), 112960.

Asongu, S. A., & Odhiambo, N. M. (2020). Governance, CO 2 emissions and inclusive human development in sub-Saharan Africa. *Energy Exploration & Exploitation*, *38*(1).

Azis, N., Wahidin, A. J., Cakranegara, P. A., Muditomo, A., & Efendi, E. (2022). Visualization Of Tourist Visit Time Series Data Using Google Data Studio. *Jurnal Mantik*, *6*(2), 2153–2159.

Breslin, S., & Nesadurai, H. E. S. (2018). Who Governs and How? Non-State Actors and Transnational Governance in Southeast Asia. *Journal of Contemporary Asia*, *48*(2), 187–203. https://doi.org/10.1080/00472336.2017.1416423

Chen, L. (2020). Improving Digital Connectivity for E-commerce: A Policy Framework and Empirical Note For ASEAN. *ERIA Discussion Paper Series*, *March*, 7–30.

Chen, Y., Pereira, I., & Patel, P. C. (2021). Decentralized Governance of Digital Platforms. *Journal of Management*, *47*(5), 1305–1337.

Cramer, J. (2022). Effective governance of circular economies: An international comparison. *Journal of Cleaner Production*, *343*, 130874.

Crocco, O. S., & Tkachenko, O. (2022). Regional human resource development: the case of Southeast Asia and ASEAN. *Human Resource Development International*, *25*(1), 40–58. https://doi.org/10.1080/13678868.2020.1858261

Dahalin, Z. M., Idrus, M. R., Kasiran, M. K., Nadzir, M. M., Dahari, R., Razak, R. A., & Wahab, N. N. A. (2019). Online services index performance: Countries' analysis in OSI ranking to improve Malaysia UN ranking. *International Journal of Innovative Technology and Exploring Engineering*, *8*(8), 116–172.

Darusalam, Omar, N., Janssen, M., Said, J., & Sohag, K. (2021). The influence of ICT diffusion and globalization on the quality of governance: A study using panel data from ASEAN countries. *Information Development*.

Derakhshan, R., Turner, R., & Mancini, M. (2019). Project governance and stakeholders: a literature review. *International Journal of Project Management*, *37*(1), 98–116.

Duarte, V., Duarte, D., Fonseca, J., & Montecinos, A. (2020). Benchmarking machine-learning software and hardware for quantitative economics. *Journal of Economic Dynamics and Control*, *111*, 103796. https://doi.org/10.1016/j.jedc.2019.103796

Duho, K. C. T., Amankwa, M. O., & Musah-Surugu, J. I. (2020). Determinants and convergence of government effectiveness in Africa and Asia. *Public Administration and Policy*, *23*(2), 199–215. https://doi.org/10.1108/PAP-12-2019-0039

Gaberli, Y. C. (2022). Impact Of Political Stability And Absence Of Violence/Terrorism On

Tourism: A Panel Co-Integration Analysis. *Journal of Management and Economics Research*, *20*(December), 387–400.

Ghatak, M. (2019). Terrorism: A challenge to good governance in India. *The Impact of Global Terrorism on Economic and Political Development: Afro-Asian Perspectives*, 401–410. https://doi.org/10.1108/978-1-78769-919-920191030

Gjaltema, J., Biesbroek, R., & Termeer, K. (2020). From government to governance…to meta-governance: a systematic literature review. *Public Management Review*, *22*(12), 1760–1780. https://doi.org/10.1080/14719037.2019.1648697

Gorwa, R. (2019). What is platform governance? *Information Communication and Society*, *22*(6), 854–871. https://doi.org/10.1080/1369118X.2019.1573914

Gritsenko, D., & Wood, M. (2022). Algorithmic governance: A modes of governance approach. *Regulation and Governance*, *16*(1), 45–62.

Gupta, R., Muttoo, S. K., & Pal, S. K. (2020). Regional E-governance development index for developing nations. *Digital Government: Research and Practice*, *1*(3).

Hanjaya, S. T. M., Kenny, S. K., & Gunawan, S. S. S. E. F. (2019). Understanding Factors influencing Consumers Online Purchase intention Via Mobile App: Perceived Ease of use, Perceived Usefulness, System Quality, Information Quality, and Service Quality. *Marketing of Scientific and Research Organizations*, *32*(2), 175–205.

Hartani, N. H., Cao, V. Q., & Nguyen, A. Q. (2020). Reducing Corruption Through E-Government Adoption, Information And Communication Technology In Asean Countries. *Journal of Security And Sustainability Issues*, *9*(16), 202–212.

Hassan, M. S., Bukhari, S., & Arshed, N. (2020). Competitiveness, governance and globalization: What matters for poverty alleviation? *Environment, Development and Sustainability*, *22*(4), 3491–3518. https://doi.org/10.1007/s10668-019-00355-y

Hernández-Moreno, S. (2020). Interface between citizens and government in the planning of smart cities . *Arquiteturarevista*, *16*(2), 237–258.

Huque, A. S., & Jongruck, P. (2018). The challenge of assessing governance in Asian states: Hong Kong in the Worldwide Governance Indicators ranking. *Asian Journal of Political Science*, *26*(2), 276–291.

Huseien, G. F., & Shah, K. W. (2022). A review on 5G technology for smart energy management and smart buildings in Singapore. *Energy and AI*, *7*, 100116.

Iqbal, S., Nawaz, A., & Ehsan, S. (2019). Financial performance and corporate governance in microfinance: Evidence from Asia. *Journal of Asian Economics*, *60*, 1–13.

Iskandar, D., Hendarto, R. M., & Reza, A. (2020). Good Governance and Natural Resource Curse; Which Hypothesis Is Prevailing in Asean Economies? *Jurnal Ekonomi Dan Pembangunan*, *28*(1), 45–54. https://doi.org/10.14203/jep.28.1.2020.45-54

Islam, M, M., & Fatema, F. (2017). Trading for SDGs: Trade liberalization and human development in the emerging economies. *Asian Development Policy Review*, *5*(4).

Jiang, Q. (2018). The Relationship between Economic Development and Governance Improvement. *Atlantis Press*, *58*(Isbcd), 473–477.

Kabbar, E. F. (2021). A comparative analysis of the e-government development index (EGDI). *14th International Conference on ICT, Society, and Human Beings, ICT 2021,*

18th International Conference on Web Based Communities and Social Media, WBC 2021 and 13th International Conference on e-Health, EH 2021 - Held at the 15th Multi-Conference on Comp, 23–29. https://doi.org/10.33965/ict2021_202106l003

Kameke, L. Von. (2023). *Corruption Perception Index in Southeast Asia In 2022, by Country*. Berlin: Transparency International.

Keser, A., & Gökmen, Y. (2018). Governance and Human Development: The Impacts of Governance Indicators on Human Development. *Journal of Public Administration and Governance*, *8*(1), 26. https://doi.org/10.5296/jpag.v8i1.12336

Khatib, M. El, AlMaeeni, A., & Alkamali, W. (2022). The Relation between Effective Digital Program Governance and Program Success. *American Journal of Industrial and Business Management*, *12*(09), 1402–1418.

Kim, C. H. P. and K. (2019). E-government as an anti-corruption tool: panel data analysis across countries. *International as an Anti-Corruption Tool: Panel Data Analysis across Countries*, *86*(4).

Leclerc, É. (2020). Smart city and e-governance in India, mapping a new urban landscape. *Mappemonde*, *128*. https://doi.org/10.4000/MAPPEMONDE.4227

Lee, C. C., Wang, C. W., & Ho, S. J. (2020). Country governance, corruption, and the likelihood of firms' innovation. *Economic Modelling*, *92*(January), 326–338.

Machmud, M., Irawan, B., Karinda, K., Susilo, J., & Salahudin. (2021). Analysis of the intensity of communication and coordination of government officials on twitter social media during the Covid-19 handling in Indonesia. *Academic Journal of Interdisciplinary Studies*, *10*(3), 319–334.

Mahardika Hariadi, T., & Luqman Wicaksono, H. (2019). Perbandingan Penanganan Tindak Pidana Korupsi di Negara Singapura dan Indonesia. *Recidive*, *2*(3), 265–279.

Marcos, E., De Castro, V., Martín-Peña, M.-L., & Vara, J. M. (2020). Training new professionals in service engineering: Towards a transdisciplinary curriculum for sustainable businesses. *Sustainability (Switzerland)*, *12*(19).

Miller, M. A., Middleton, C., Rigg, J., & Taylor, D. (2020). Hybrid Governance of Transboundary Commons: Insights from Southeast Asia. *Annals of the American Association of Geographers*, *110*(1), 297–313.

Mueller, L. M. (2021). Challenges to ASEAN centrality and hedging in connectivity governance—regional and national pressure points. *Pacific Review*, *34*(5), 747–777. https://doi.org/10.1080/09512748.2020.1757741

Muhamad, S., Che Sulaiman, N. F., & Saputra, J. (2018). The role of human capital and innovation capacity on economic growth in ASEAN-3. *Jurnal Ekonomi Malaysia*, *52*(1), 281–295. https://doi.org/10.17576/jem-2018-5201-21

Murshed, M., Rahman, M. A., Alam, M. S., Ahmad, P., & Dagar, V. (2021). The nexus between environmental regulations, economic growth, and environmental sustainability: linking environmental patents to ecological footprint reduction in South Asia. *Environmental Science and Pollution Research*, *28*(36), 49967–49988. https://doi.org/10.1007/s11356-021-13381-z

Nasution, S. H. (2021). *Improving Data Governance and Personal Data Protection through ASEAN Digital Masterplan 2025.* Jakarta: CIPS

Nguyen, T. T., Phan, D. M., Le, A. H., & Nguyen, L. T. N. (2020). The determinants of citizens' satisfaction of E-government: An empirical study in Vietnam. *Journal of Asian Finance, Economics and Business*, *7*(8), 519–531.

Pahl-Wostl, C. (2019). The role of governance modes and meta-governance in the transformation towards sustainable water governance. *Environmental Science and Policy*, *91*(October 2018), 6–16. https://doi.org/10.1016/j.envsci.2018.10.008

Pertiwi, K., & Ainsworth, S. (2021). "Democracy is the Cure?": Evolving Constructions of Corruption in Indonesia 1994–2014. *Journal of Business Ethics*, *173*(3), 507–523. https://doi.org/10.1007/s10551-020-04560-y

Pinar, M. (2015). Measuring world governance: revisiting the institutions hypothesis. *Empirical Economics*, *48*(2), 747–778. https://doi.org/10.1007/s00181-013-0796-0

Qumara, A., Sulistya, W., Ranti, B., & Simangunsong, S. A. (2019). A Case Study of Indonesian Government Digital Transformation : Improving Public Service Quality through E-government Implementation. *IEEE Access*.

Rahman, A., Satispi, E., & Adiyasha, D. L. (2020). Perbandingan E-Government Antara Singapura Dan Jepang: Perspektif Determinan Dan Perannya Dalam Mengefektifkan Pemerintahan Dan Mengendalikan Korupsi. *Kolaborasi : Jurnal Administrasi Publik*, *6*(2), 178–199.

Ramadlan, M. F. S. (2021). Kemunduran Demokrasi dan Kebebasan Pers di Asia Tenggara: Refleksi dari Enam Negara. *Jurnal Penelitian Politik*, *18*(2), 141–157.

Sabir, S., Rafique, A., & Abbas, K. (2019). Institutions and FDI: evidence from developed and developing countries. *Financial Innovation*, *5*(1).

Saniagati, A., & Welly, J. (2021). Digital Transformation in Indonesian FDA (Food and Drug Authority). *JIPCS*, *4*(3), 161–170.

Santa, R., MacDonald, J. B., & Ferrer, M. (2019). The role of trust in e-Government effectiveness, operational effectiveness and user satisfaction: Lessons from Saudi Arabia in e-G2B. *Government Information Quarterly*, *36*(1), 39–50.

Scicluna, N., & Auer, S. (2019). From the rule of law to the rule of rules : technocracy and the crisis of EU governance. *West European Politics*, *42*(7), 1–23.

Shamsuzzoha, A., Niemi, J., Piya, S., & Rutledge, K. (2021). Smart city for sustainable environment: A comparison of participatory strategies from Helsinki, Singapore and London. *Cities*, *114*(December 2020), 103194.

Shang, G., Sui Pheng, L., & Jia Hui, W. (2020). Drivers and barriers for multiskilling workers in the Singapore construction industry. *International Journal of Construction Management*, *20*(4), 289–304.

Singapore, M. of C. and I. (2021). *1st ASEAN Digital Ministers' Meeting approves Singapore-led initiatives on ASEAN Data Management Framework, ASEAN Model Contractual Clauses for Cross Border Data Flows and ASEAN Cert Information Mechanism*.

Snipes, GeniferSnipes, G. (2018). Product Review Google Data Studio. *Journal of Librarianship and Scholarly Communication*, *6*(General Issue), 0–5.

Stofkova, J., Poliakova, A., Stofkova, K. R., Malega, P., Krejnus, M., Binasova, V., & Daneshjo, N. (2022). Digital Skills as a Significant Factor of Human Resources Development.

Sustainability (Switzerland), *14*(20). https://doi.org/10.3390/su142013117

Studies, C. for I. P. (2021). *Improving Data Governance and Personal Data Protection through ASEAN Digital Masterplan 2025*.

Tampubolon, T., & Ramadhan, R. (2020). ASEAN Personal Data Protection (PDP): Mewujudkan Keamanan Data Personal Digital pada Asia Tenggara. *Padjadjaran Journal of International Relations*, *1*(3), 270.

Tan, S.-Y., Taeihagh, A., & Sha, K. (2021). How transboundary learning occurs: Case study of the asean smart cities network (ascn). *Sustainability (Switzerland)*, *13*(11).

Tawakkal, G. T. I. (2022). A Potential For Causality In Development Countries (Tracking E - Participation And E-Government In Southeast Asian Countries). *Jurnal Politico*, *22*(2), 58–70.

Thuy, T., Luong, H., Nguyen, T. M., Anh, T., & Nguyen, N. (2020). Rule of Law, Economic Growth and Shadow Economy in Transition Countries. *Journal of Asian Economics*, *7*(4), 145–154. https://doi.org/10.13106/jafeb.2020.vol7.no4.145

Toshkov, D., Carroll, B., & Yesilkagit, K. (2022). Government capacity, societal trust, or party preferences: what accounts for the variety of national policy responses to the COVID-19 pandemic in Europe? *Journal of European Public Policy*, *29*(7), 1009–1028. https://doi.org/10.1080/13501763.2021.1928270

Turmanidze, R., Dašić, P., & Popkhadze, G. (2020). Statistical Analysis of E-Government Development Index (EGDI) of Georgia. New York: Springer.

Ullah, M. N., & Rahman, M. S. (2021). Good Governance in Bangladesh: a Study of World Governance Indicators. *Indonesian Journal of Social Research (IJSR)*, *3*(3), 201–216. https://doi.org/10.30997/ijsr.v3i3.145

Waheed, A., Shah, M. A., Khan, A., & Jeon, G. (2021). An infrastructure-assisted job scheduling and task coordination in volunteer computing-based VANET. *Complex and Intelligent Systems*. https://doi.org/10.1007/s40747-021-00437-3

Xu, X., Abbas, H. S. M., Sun, C., Gillani, S., Ullah, A., & Raza, M. A. A. (2021). Impact of globalization and governance determinants on economic growth: An empirical analysis of Asian economies. *Growth and Change*, *52*(2), 1137–1154. https://doi.org/10.1111/grow.12475

Yulianto, A., Isaac, O., Alrajawy, I., & Ameen, A. (2021). Exploring Intention to Use E-Government : The Role of Technology Acceptance Model with Self-Efficacy and System Quality Exploring Intention to Use E-Government : The Role of Technology Acceptance Model with Self-Ef fi cacy and System Quality. *Intelligent Computing and Innovation on Data Science*, *September*. https://doi.org/10.1007/978-981-16-3153-5

Zakaria, M., & Bibi, S. (2019). Financial development and environment in South Asia: the role of institutional quality. *Environmental Science and Pollution Research*, *26*(8), 7926–7937. https://doi.org/10.1007/s11356-019-04284-1

Zhao, H., Ahn, M. J., & Manoharan, A. P. (2021). E-Government, Corruption Reduction and the Role of Culture: A Study Based on Panel Data of 57 Countries. *International Journal of E-Planning Research*, *10*(3), 86–104.