Sosiohumaniora - Jurnal Ilmu-ilmu Sosial dan
ISSN 1411 - 0903 : eISSN: 2443-2660
Vol. 26, No. 3, November 2024: 439 - 452

Comparative Analysis of the E-Government Development Index: A Case Study of Singapore and Afghanistan

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ABSTRACT
This study analyzes the differences in the development of e-government in Singapore and Afghanistan using the E-Government Development Index (EGDI) indicators which include the Online Services Index (OSI), Human Capital Index (HCI), and Telecommunication Infrastructure Index (TII). The findings show that Singapore's success in e-government is underpinned by strategic investments in ICT infrastructure, the adoption of innovative policies such as the "Smart Nation," and sustainable human resource development. In contrast, key challenges in Afghanistan include political instability, corruption, limited basic infrastructure, and low levels of digital literacy, all of which hinder the implementation of e-government. In addition, the study reveals the importance of a cross-sectoral approach and community engagement to create an inclusive digital ecosystem, an aspect that is not measured in the EGDI framework. This research offers new insights into digitalization strategies that developing countries can implement to accelerate their digital transformation.

Key words: EDGI; Telecommunication Index; Human Capital Index; Singapore; Afghanistan

Analisis Komparatif Indeks Pembangunan E-Government: Studi Kasus Singapura dan Afghanistan

ABSTRAK
Penelitian ini menganalisis perbedaan perkembangan e-government di Singapura dan Afghanistan dengan menggunakan indikator E-Government Development Index (EGDI) yang mencakup Online Services Index (OSI), Human Capital Index (HCI), dan Telecommunication Infrastructure Index (TII). Temuan menunjukkan bahwa keberhasilan Singapura dalam e-government didukung oleh investasi strategis dalam infrastruktur TIK, adopsi kebijakan inovatif seperti "Smart Nation," dan pengembangan sumber daya manusia yang berkelanjutan. Sebaliknya, tantangan utama di Afghanistan meliputi ketidakstabilan politik, korupsi, keterbatasan infrastruktur dasar, dan rendahnya tingkat literasi digital, yang semuanya menghambat penerapan e-government. Selain itu, penelitian ini mengungkap pentingnya pendekatan lintas sektor dan keterlibatan komunitas untuk menciptakan ekosistem digital yang inklusif, sebuah aspek yang tidak diukur dalam kerangka EGDI. Penelitian ini menawarkan wawasan baru tentang strategi digitalisasi yang dapat diterapkan oleh negara berkembang untuk mempercepat transformasi digital mereka.

Kata kunci: EDGI; Telecommunication Index; Human Capital Index; Singapore; Afghanistan

INTRODUCTION

The rapid growth of information technology has boosted government efficiency, with e-government aiming to enhance transparency, reduce costs, and improve accessibility (Danuri, 2019 ; Ronchi, 2019). It aims to reduce costs and improve government operations, making them more efficient, transparent, and accessible, while increasing citizen and business involvement (Lněnička, 2015). E-government, which began in the 1990s with online public services, has grown rapidly with technological advancements (Twizeyimana & Andersson, 2019; Arias & Maçada, 2018). The first online services launched in 1990 marked the start of global digital government transformation (Marin, 2022). However, e-government implementation varies, as seen in Singapore's advanced ICT infrastructure and Afghanistan's challenges with political instability and low digital literacy.

E-government improves services by offering faster, more accessible options like online submissions and payments, reducing bureaucracy (Singh et al., 2022; Hooda et al., 2022). It enhances e-democracy by enabling citizen participation and feedback through online platforms (Adnan et al., 2022 ; Abied et al., 2022). Additionally, it boosts transparency by making government data more accessible, strengthening oversight and reducing corruption (Alomari et al., 2022; Sheoran & Vij, 2022).

The global e-government ranking guides countries in refining strategies, evolving from website evaluation to assessing the quality of government services (Araújo & Andrade, 2022). E-government aims to transform interactions between governments, society, businesses, and

DOI: https://doi.org/10.24198/sosiohumaniora.v26i3.56427
Submitted: 20 July 2024, Accepted: 21 February 2025, Publish: 27 February 2025

other governance elements (Kabbar, 2020). A key report in this area is the UN E-Government Development Index (EGDI), tracking global e-government progress (Baranov, 2022; Jain, 2022).

The e-government development index and digital economy progress are influenced by social, economic, political, technological, demographic factors, and national culture (Zioło et al., 2022 ; Marino & Pariso, 2019). Developing countries invest in e-government to boost service efficiency, engage citizens, enhance transparency, and reduce corruption (Bakon et al., 2020; Agbozo & Asamoah, 2019; Tintin et al., 2018). Effective e-government requires strong ICT, focusing on urban services, information, and citizen interaction (Sussy & Vicente, 2021). Though more efforts are needed to increase citizen involvement and transparency (Cifuentes Faura, 2022).

E-government utilizes ICT to improve government efficiency, transparency, and citizen participation in democracy (Hariguna et al., 2022). It supports two-way communication between the government and citizens, adapting to technological advances (Pazmiño-Sarango et al., 2022 ; Lindgren et al., 2021). E-government also aims to enhance administrative transparency and efficiency (Güler et al., 2020). With the rise of the Internet, government websites serve as platforms offering information, technology, and resources to citizens (Tejedo-Romero et al., 2022).

E-Government uses ICT to improve efficiency, accessibility, and transparency (Osah & Pade-Khene, 2020). The UN E-Government Survey, conducted biennially since 2001, tracks global progress and evaluates e-government via the Online Services Index (OSI), Telecommunications Infrastructure Index (TII), and Human Capital Index (HCI) (Zioło et al., 2022). E-Government is a key element of global government modernization (Mellouli et al., 2020). It is central to government modernization and public service efficiency (Bwalya & Mutula, 2016). For instance, Adams & Paul, (2023), on SDGs and Althunibat et al. (2024) on OSI's role in accessibility in Jordan.

Beyond EGDI, additional methods have been developed to assess e-government performance. The e-government maturity model evaluates the stages of e-government implementation, as illustrated by Nursafitri & Jayadi, (2023). Analytical Hierarchy Process (AHP), as discussed by Rakhani et al., (2023), introduces metrics such as security, performance, and accessibility for government websites. Furthermore, Husni et al. (2022) introduced the Digital Twin concept to improve digital governance and public service delivery.

This study integrates the EGDI framework as its primary assessment tool while incorporating insights from maturity models and AHP to provide a comprehensive analysis of e-government development in Singapore and Afghanistan. By utilizing these frameworks, this research offers a richer understanding of how e-government systems are implemented, highlighting their strengths and limitations in diverse contexts.

The EGDI (e-Government Development Index) is used to measure the development of e-gov in various regions and countries at the national level. The EGDI is a composite index based on a weighted average of the following three indices: the online services index (OSI), the telecommunications infrastructure index (TII), and the human capital index (HCI) (Turmanidze et al., 2020; Torres-Porras & Duarte-Amaya, 2018).

The E-Government Development Index (EGDI), introduced by the UN in 2003, is a tool for assessing e-government development globally. It measures success through three components: Online Service Index (OSI), Telecommunications Infrastructure Index (TII), and Human Capital Index (HCI) (Turmanidze et al., 2020).

1. **Online Service Index (OSI):**
   OSI measures the quality and availability of government online services, assessing factors such as the existence of service portals, the number of services offered online, and the quality of citizen-government interaction on digital platforms (Wahid et al., 2019)
2. **Telecommunications Infrastructure Index (TII):**
   TII evaluates the telecommunication infrastructure supporting e-government, including the number of internet users, fixed broadband subscriptions, and the capacity of telecommunication networks.
3. **Human Capital Index (HCI):**
   HCI assesses the education and skills of the community supporting e-government adoption, including literacy rates, education enrolment rates, and ICT skill levels. (Gupta et al., 2020)

The three e-government dimensions are: The Online Services Index measures the maturity of a country's e-government websites, including national, ministry, and sector-specific portals. The Telecommunications Infrastructure Index (TCI) evaluates a country's telecom infrastructure based on internet users, fixed phone lines, mobile subscribers, fixed internet subscriptions, and broadband availability. The Human Capital Index (HCI) is based on adult literacy and education levels (Zhao et al., 2022 ; Aniscenko et al., 2017 ; Kabbar, 2020 ; Alkhatri et al., 2017).

$$EGDI = 1/3\ [OSI_{Normalized} + HCI_{No\ Normalize} + TII_{Normalized}]$$

The Z-score standardization is applied to each component before normalizing to balance the EGDI, ensuring similar variance across components. This prevents one index from dominating. After standardization, the arithmetic mean represents the "equal weight" of each component. To calculate the standard Z-score for each component:

$$Xnew = \frac{(x - \mu)}{\sigma}$$

X is the raw score that should be standardized;
μ is the average of the population;
σ is the standard deviation of the population.

The EGDI is essential because it provides a comprehensive overview of how countries are adopting and implementing technology in public service. In Research Osman & Zablith, (2020) The index helps governments to:

1. **Determining Policies**
   Providing a basis for the government to formulate policies and strategies for improving e-government services.
2. **Identifying Weaknesses**
   Identifying areas that need improvement, such as ICT infrastructure or ICT education.
3. **Global Benchmarking**
   Allows comparisons between countries, so that governments can learn from best practices and successful strategies from other countries

Research shows that e-government development, measured by EGDI, improves governance by reducing corruption, boosting efficiency, and increasing citizen involvement. Enhancements in OSI and TII are linked to better governance and regulatory quality (Sukarno & Nurmandi, 2023). Thus, EGDI is vital for improving global governance and public services.

Some of the studies that have reviewed the analysis of the e-government development index in the Asia include; Jain, (2022) examines the impact of policies on EGDI. Al-Refai, (2020), argues that e-government development drives economic growth in GCC countries and urges more focus on EGDI in East Asia. Turmanidze et al., (2020), highlighted e-government's impact on public service delivery and transparency, with the UN's EGDI as a global benchmark. ElMassah & Mohieldin, (2020) and Kuldosheva, (2021), identify critical gaps in implementation, particularly in developing countries and comparative studies between countries at opposite ends of the e-government spectrum in Asia.

While prior research has examined individual aspects of e-government, there is a lack of comparative analysis between highly developed and underdeveloped countries within the EGDI framework. This study fills this gap by exploring the unique factors that contribute to Singapore's success and Afghanistan's struggles.

This study contributes to the literature by providing a detailed comparison between Singapore and Afghanistan using EGDI. The analysis highlights how policies, infrastructure, and socio-political factors drive or hinder e-government development. This research also offers actionable recommendations for other developing nations facing similar challenges to Afghanistan.

The study comparing e-government development in Singapore and Afghanistan based on the E-Government Development Index (EGDI) is important due to the stark contrast in their ICT infrastructure and implementation. Singapore's strong "Smart Nation" initiative contrasts with Afghanistan's political instability and limited resources. The study highlights the role of political stability, digital literacy, and infrastructure in e-government success, with Singapore ranking 12th in 2022 and Afghanistan much lower (169-184). This comparison serves as a key case study for understanding e-government development in different contexts.

This study analyzes and compares the development of e-government in Singapore and Afghanistan using the E-Government Development Index (EGDI), focusing on three components: the Online Services Index (OSI), Telecommunications Infrastructure Index (TII), and Human Capital Index (HCI). By evaluating data from 2016 to 2022, it identifies factors supporting and hindering e-government performance in both countries and examines the impact of government policies on ICT development in the public sector. The research addresses three key questions:

1. How do policies and infrastructure affect e-government in Singapore and Afghanistan (2016-2022), and what can developing countries learn from Singapore's success?
2. What factors drive e-government success in Singapore, and what constraints hinder Afghanistan?
3. What lessons can developing countries learn from Singapore's success, especially regarding Afghanistan's challenges?

METHOD

This study uses a quantitative approach with secondary data from EGDI reports (2016–2022) and a Systematic Literature Review (SLR) of articles from Scopus and Web of Science. It analyzes key EGDI components and evaluates trends in e-government development in Singapore and Afghanistan. Descriptive statistics and correlation analysis were used to compare trends and assess the impact of factors like ICT infrastructure, digital literacy, and government policies. The study highlights the importance of political stability and ICT investment for e-government success in Singapore and uses SLR to identify patterns in developing countries.

RESULTS AND DISCUSSION

This research is divided into five parts: Part I covers the E-Government Development Index (EGDI), Part II discusses the E-Government Ranking, Part III examines the Online Service Index (OSI), Part IV reviews the Human Capital Index (HCI), and Part V focuses on the Telecommunication Infrastructure Index (TII), using data from the past five years.

E-Government Development Index (EDGI)

The E-Government Development Index (EGDI) classifies scores as follows: 0.75–1.00 (very high), 0.50–0.75 (high), 0.25–0.50 (moderate), and below 0.25 (low) (Younus et al., 2023). Figure 2 compares the EGDI scores of Singapore and Afghanistan over the years.

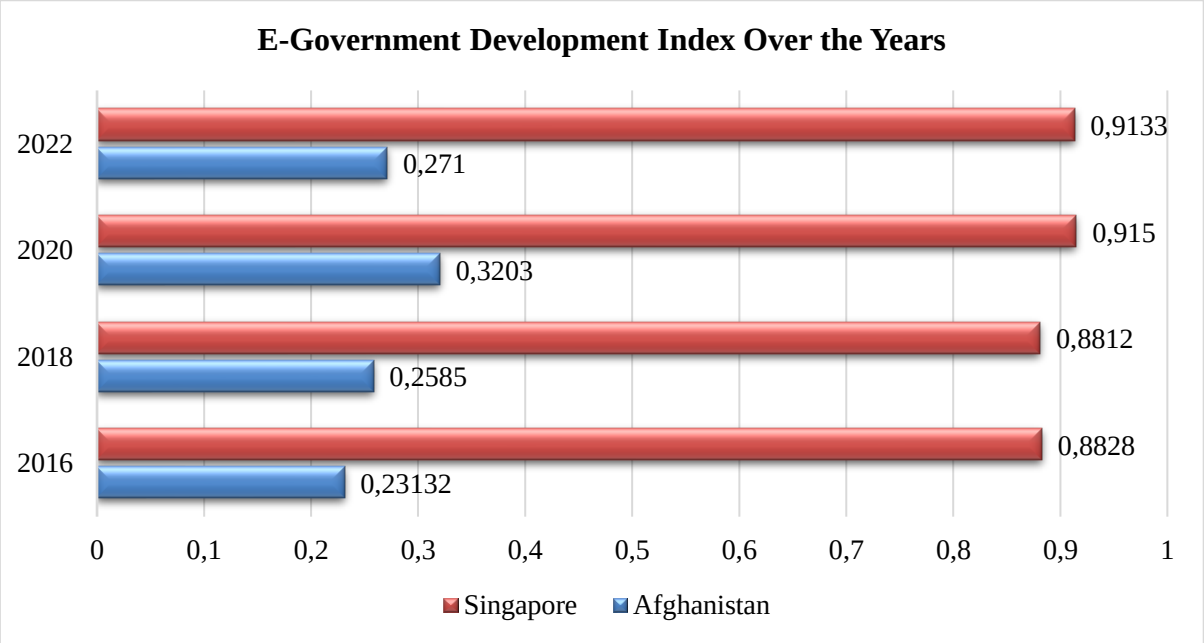

Figure 2. EGDI Afghanistan-Singapore Score 2016-2018

Source: UN E-Government Knowledgebase, 2023

The EGDI reveals a stark contrast between Singapore and Afghanistan from 2016 to 2022. Singapore consistently scored between 0.8 and 0.9, driven by strong ICT infrastructure, the "Smart Nation" initiative, and citizen digital upskilling. Afghanistan scored below 0.3 due to weak infrastructure, political instability, and low digital literacy. This emphasizes the importance of political stability and ICT investment for successful e-government, such as Nawaz & Koç, (2019), who stress the need for proactive digital strategies

Singapore's high growth in the E-Government Development Index (EGDI) is driven by its advanced ICT infrastructure and supportive digital policies, like the "Smart Nation" initiative launched in 2014. This initiative integrates technology into daily life, using ICT, networks, and big data to improve the lives of citizens, businesses, and the government (Erh, 2023; Opengovasia.com, 2021). The government invests heavily in research, technology education, and workforce upskilling (Initiative, 2020). Strong partnerships with multinational companies and initiatives like the "Digital Government Blueprint" further accelerate digital adoption and service quality (Luk, 2021 ; Ministry of Digital Development and Information, 2023; Smartnation.gov.sg, 2024a).

In contrast, Afghanistan's slow progress or decline in the E-Government Development Index (EGDI) is due to several factors. Prolonged conflict and political instability hinder infrastructure development and technology

implementation (Suardi, 2021). Limited ICT infrastructure and internet access, particularly in rural areas, are significant barriers (Younus et al., 2023). Additionally, a lack of skilled workers and inadequate IT education further impede e-government progress (Aljepory & Alane, 2022). The Afghan government has prioritized other needs over ICT development (Sukarno & Nurmandi, 2023). The Afghan government report indicates that despite efforts to improve e-government infrastructure and services, security and resource challenges still need to be addressed (Ahmadi et al., 2022).

E-Government Ranking

e-Government Ranking is a system used to assess how countries have developed and applied ICT in government and public services, typically based on various indices and surveys, including the e-Government Development Index (EGDI) published by the United Nations (UN).

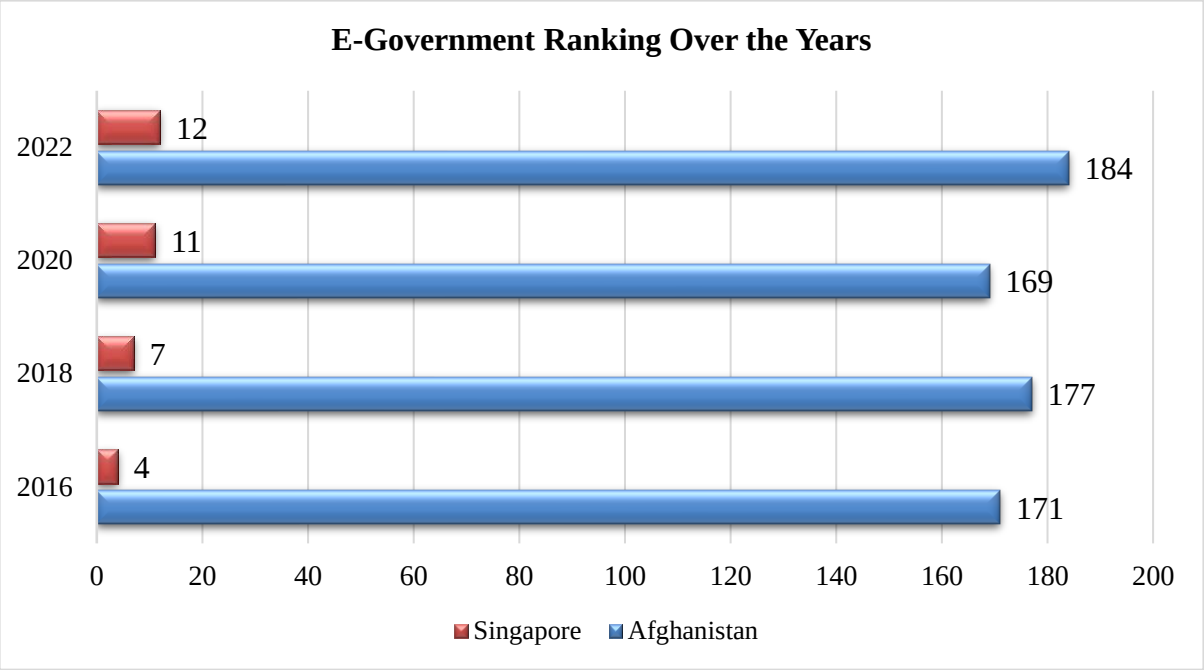

Figure 3. Afghanistan-Singapore E-Government Ranking 2016-2018

Source: UN E-Government Knowledgebase, 2023

The E-Government rankings show a stark contrast between Singapore and Afghanistan from 2016 to 2022. Singapore consistently ranked among the top 15, with a slight drop from 4th to 12th, driven by digital transformation, strong ICT infrastructure, and citizen-centric policies like "Smart Nation." In contrast, Afghanistan ranked near the bottom, between 169th and 184th, due to political instability, limited ICT infrastructure, and low digital literacy.

Singapore's high EGDI ranking is driven by its "Smart Nation" initiative, integrating AI, data analytics, and IoT to improve public services (Minardi, 2018). Investments in digital infrastructure, like high-speed internet and cybersecurity, support its leadership (Win, 2018). The SingPass system enhances citizen-government interactions, while GovTech promotes innovations like blockchain and cloud computing (Bojang, 2019; Tech.gov.sg, 2024). The Infocomm Media Development Authority (IMDA) fosters digital literacy and supports startups, ensuring a sustainable innovation ecosystem (Huseien & Shah, 2022; Tan & Teng, 2020). These efforts highlight the importance of aligning technology, governance, and public-private collaboration for sustained e-government progress.

Afghanistan's low E-Government Development Index ranking is due to political instability, conflicts, and weak institutions, which damage infrastructure and divert resources from technology development (M. H. Stanikzai & Hashim-Wafa, 2022). These challenges worsen corruption and inefficiency, hindering e-government efforts (Mohammad Younus & Shahzad, 2020). The lack of accountability further limits international support and investment in ICT (Chen, 2019; Güvenek et al., 2022). Unlike Singapore’s proactive approach, Afghanistan’s fragmented e-government efforts prioritize immediate security over long-term tech development, emphasizing the need for stability, reform, and targeted investments.

Lessons from Afghanistan highlight that without addressing systemic issues, ICT

investments may not improve e-government rankings. International cooperation focused on capacity-building and governance reforms could help Afghanistan overcome these challenges and create a more effective digital government.

Online Services Index

The Online Service Index (OSI) measures the quality and availability of government online services, including service portals, the number of online services, and the quality of citizen-government interactions through digital platforms.

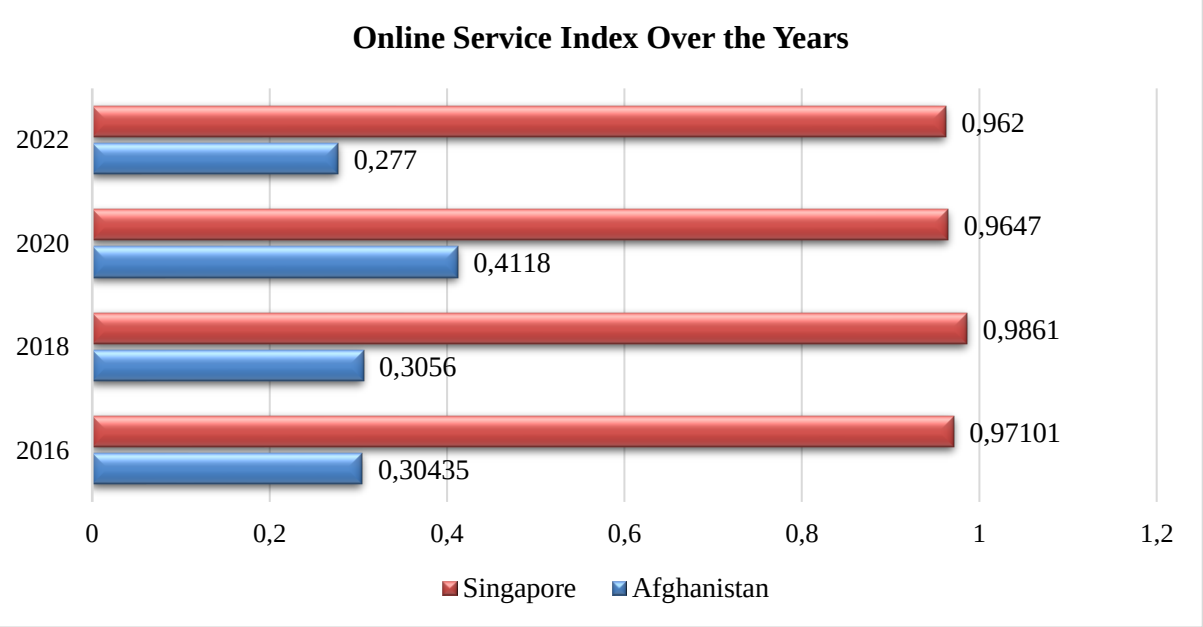

Figure 4. OSI Afghanistan-Singapore Score 2016-2018

Source: UN E-Government Knowledgebase, 2023

The figure shows a comparison of the Online Service Index between Singapore and Afghanistan from 2016 to 2022. It can be seen that Singapore has consistently achieved a near-perfect score in the online services index, with a score of 0.97101 in 2016 and slight fluctuations but still high to reach 0.962 in 2022. In contrast, Afghanistan showed a much lower score, with a slight increase from 0.30435 in 2016 to 0.277 in 2022, but still well below Singapore.

Singapore's strong performance in the Online Services Index (OSI) is driven by its use of advanced technologies like cloud computing and AI, supported by the "Smart Nation" initiative, and its investment in ICT infrastructure, setting a regional digital innovation standard in ASEAN (Chua et al., 2020; Malhotra et al., 2019). Conversely, Afghanistan's low OSI scores are due to challenges like political instability, weak ICT infrastructure, and limited public awareness, hindering effective e-government development (Machmud et al., 2021).

Singapore's "whole-of-government" approach, emphasizing collaboration across agencies and partnerships with multinational corporations, has been key to its high Online Services Index (OSI) scores, enabling the rapid adoption of advanced technologies like AI and blockchain for efficient public service delivery. In contrast, Afghanistan's fragmented strategy and lack of partnerships with private entities have hindered its ability to improve online services, exacerbating inefficiencies (Erh, 2023 ; M. Stanikzai et al., 2023).

On the other hand, Afghanistan faces challenges in developing online services and e-government due to political instability, ongoing conflict, and poor ICT infrastructure. These issues have damaged infrastructure and hindered technology-based public services. Limited investment in infrastructure and innovation, driven by resource constraints and security concerns, further impedes progress (Maiga, 2023).

The gap in online services index scores between Singapore and Afghanistan highlights differences in policy, investment, and infrastructure. Singapore’s coordinated policies and technological investments enable high-quality, accessible digital services, while Afghanistan’s structural challenges and instability hinder online service development.

Human Capital Index (HCI)

The Human Capital Index (HCI) gauges citizens' ability to use online government services, based on literacy and education. Figure 5 shows the yearly changes and progress in each country.

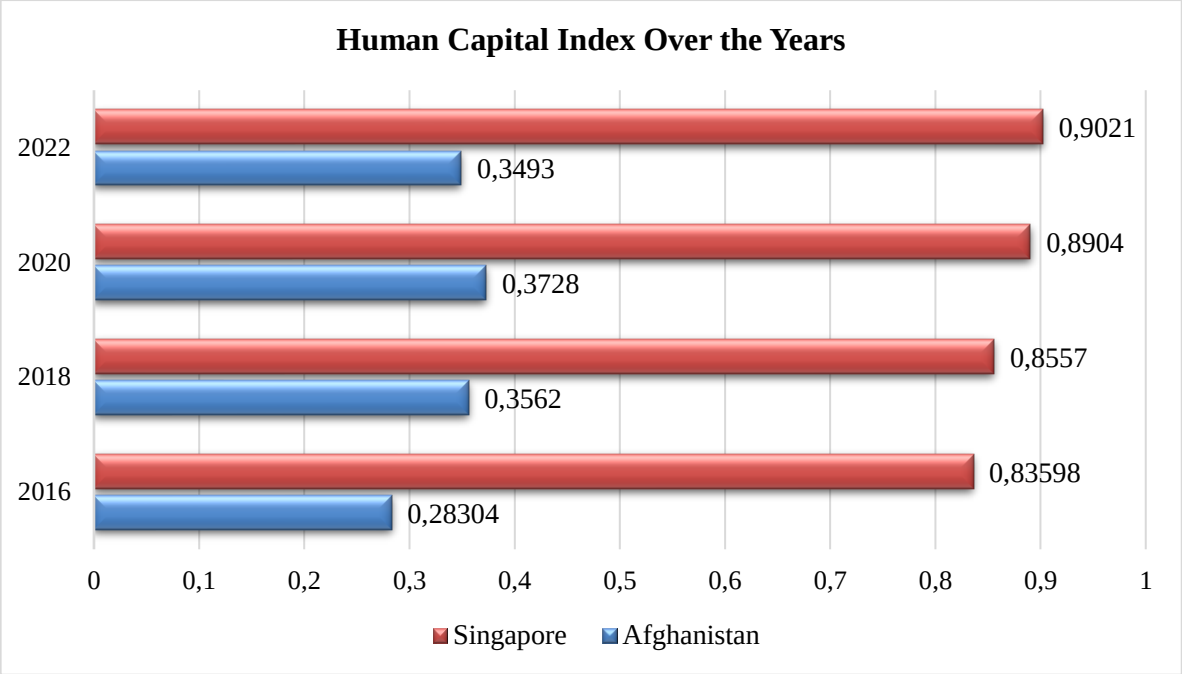

Figure 5. Afghanistan-Singapore HCI Score 2016-2018

Source*:* UN E-Government Knowledgebase, 2023

The Human Capital Index (HCI) reflects the role of education, skills, and health in e-government. From 2016 to 2022, Singapore's HCI rose from 0.836 to 0.902, boosted by policies like SkillsFuture and STEM investments (Kim et al., 2021 ; Abdurakhmanov, 2023). In contrast, Afghanistan's HCI stagnated at 0.28–0.34 due to limited education, low literacy, and political instability, hindering e-government progress (Hameed et al., 2023). This highlights the importance of investing in human capital for e-government success.

Singapore's rapid HCI growth is driven by policies integrating human capital into national development, such as the SkillsFuture program promoting lifelong learning (Initiative, 2020 ; Kim et al., 2021). Investments in STEM education, vocational training, and teacher development have further strengthened human capital, aligning skills with the digital economy (Abdurakhmanov, 2023; Isreal et al., 2019). Singapore's approach sets a benchmark for other countries aiming to build innovative digital societies.

Afghanistan's low HCI (0.28 to 0.34) from 2016 to 2022 stems from challenges like lack of industrialization, brain drain, gender inequality, and poor education and healthcare (Hameed et al., 2023 ; Haqbin et al., 2023). Gender inequality, limited education for women, poor healthcare, and high maternal mortality hinder Afghanistan's human capital development (Abdelkarim & Shaimaa, 2021). Gender-based violence, conflict, and instability disrupt human resource development in Afghanistan, erode political trust, discourage foreign investment, and hinder essential services (Maizland, 2021).

These issues are worsened by political instability and low foreign investment, with only 30% primary school enrollment and a 37% adult literacy rate in 2020 (Unicef, 2021). Afghanistan's failure to invest in education and skills contrasts sharply with Singapore's proactive approach, underlining the need for stable governance, education, and international support to improve HCI and enable e-government.

Telecommunication Infrastructure Index (TII)

The Telecommunication Infrastructure Index (TII) measures e-government support infrastructure based on five factors: personal computers, internet users, telephone lines, mobile subscriptions, and broadband access, evaluated annually (Figure 6).

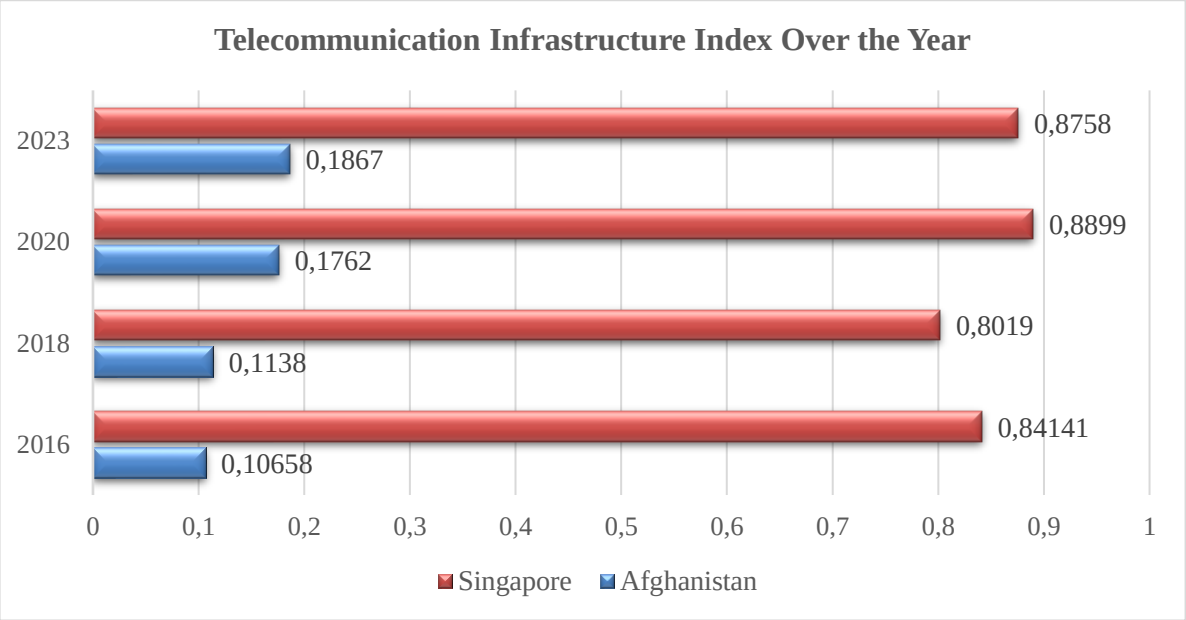

Figure 6. 2016-2018 Afghanistan-Singapore TII Score

Source: UN E-Government Knowledgebase, 2023

The Telecommunication Infrastructure Index (TII) highlights the contrast between Singapore and Afghanistan in ICT infrastructure. Singapore's TII improved from 0.84939 to 0.8731 between 2016 and 2022, driven by investments in 5G and fiber optics, boosting e-government services (Khairulbahri, 2021). In contrast, Afghanistan's TII remained low, rising from 0.18304 to 0.2045, hindered by limited resources, political instability, and poor infrastructure, which impeded e-government development (M. Stanikzai et al., 2023).

The differences between Singapore and Afghanistan highlight the importance of political stability, strategic investments, and regulatory frameworks in ICT infrastructure development. Singapore exemplifies how telecommunication infrastructure can boost e-government, while Afghanistan underscores the need for foundational investments and international support to close the digital divide.

Singapore has advanced telecommunications infrastructure through initiatives like the Smart Nation program (2014), investing in ICT, cloud computing, and IoT. Strong public-private collaboration and partnerships with multinational companies drive innovation, while a National Cybersecurity R&D program ensures digital infrastructure security (Kuo & Ps, 2022 ; Erh, 2023). Singapore's telecommunications success is driven by strategic government policies and significant investments in fiber optics and 5G, making it a global leader in connectivity. Collaborations with private companies have expanded coverage and affordability, showcasing the role of cooperative governance in ICT development (Forge & Vu, 2020).

Afghanistan's low Telecommunication Infrastructure Index (0.18–0.20 from 2016 to 2022) reflects challenges like political instability, limited resources, and corruption, hindering ICT development and e-government implementation (Ahmadzai & McKinna, 2018; Slimankhil et al., 2020 ; Hameed et al., 2023). Unlike Singapore's strategic public-private partnerships, Afghanistan's fragmented efforts lack the infrastructure needed for e-government.

Addressing Afghanistan's challenges requires international support for regulatory reforms, rural connectivity, and transparent governance. The contrast with Singapore underscores the importance of coordinated policies and long-term investments in telecommunications. Afghanistan's lack of foundational investments highlights the need for strategic planning and collaboration to overcome infrastructural and socio-political barriers.

Lessons Learned and Implications for Global E-Government Development

The e-government experiences of Singapore and Afghanistan highlight the importance of political stability, technology investment, and human resource development. Singapore's success shows that stability and policies like "Smart Nation" are key for effective e-government (Chang & Das, 2020; Dresel et al., 2020). Similarly, Estonia's success underscores the role of stability in digitization. For politically unstable countries like Iraq, stabilizing politics and implementing long-term digital strategies are crucial for maximizing technology benefits in the public sector (Kotenok et al., 2020).

Investment in ICT infrastructure is key to successful e-government, as shown by

Singapore's and South Korea's focus on advanced telecommunications (Lee & Bae, 2022). Countries like Ethiopia and Bangladesh can benefit from this model, as reliable ICT infrastructure improves online service accessibility and speed (Atinaf et al., 2023; Hossain, 2022). Therefore, infrastructure development is a crucial element for developing nations aiming to enhance public services through digitization.

In addition to political stability and infrastructure, human resource development and digital literacy are crucial. Afghanistan's main challenge is low digital literacy and insufficient human resources for public technology adoption. In contrast, Rwanda has successfully improved digital literacy through a government-supported national training program, showing that even countries with limited resources can enhance their digital capacity (Bälter et al., 2022; Jean De Dieu et al., 2022). Countries like Uganda can adopt similar strategies by increasing access to digital education and ICT skills training to enable more effective use of government-provided technology (Abima et al., 2021).

Cooperation between government and the private sector is key for e-government development. Singapore and Israel have successfully partnered with multinational companies to drive digital adoption (Osman & Zablith, 2021 ; Peled, 2021). Countries like Kenya can benefit from this approach, where private sector expertise and resources aid e-government implementation (Güler et al., 2020). Developing nations should create frameworks to encourage private sector participation in public tech projects.

Global Relevance and Broader Implications

The e-government experiences of Singapore and Afghanistan provide valuable lessons, with Singapore's success attributed to political stability, ICT investments, proactive policies, and government-private sector collaboration. This underscores the importance of stability, strategic planning, and long-term investments in infrastructure and human capital for building effective digital services. Recent studies highlight that digital infrastructure and cross-sector cooperation are crucial for sustainable e-government in developing countries.

Afghanistan's e-government challenges, shaped by political instability, low digital literacy, and weak infrastructure, highlight the importance of international support and national commitment to ICT education. Focusing on digital literacy and ICT skills can bridge the digital divide and foster inclusive public sector growth. Comparing Afghanistan and Singapore shows that public-private collaboration is crucial for e-government success. Singapore's partnerships across sectors, including private, government, and international bodies, enhance digital resilience, especially in cybersecurity. Developing countries can adopt this model to support public sector digitization.

E-government promotes transparency and reduces corruption, directly improving governance quality. In Afghanistan, despite challenges, e-government has helped distribute power more equitably and reduce monopolies, a major corruption source. Other countries can adopt this model to create a transparent, accountable government, boosting public trust by making information more accessible.

Countries with limited resources, like Rwanda and Singapore, show that digital education policies drive public sector technology adoption. Rwanda's digital literacy program and Singapore's SkillsFuture initiative highlight the importance of investing in digital skills development, crucial for e-government success, especially for nations in the early stages of technology adoption.

This study's global relevance is clear, as countries at different development stages can learn from Singapore and Afghanistan's e-government experiences. Singapore offers a model for stable nations with long-term investment capacity, while Afghanistan highlights challenges in unstable, resource-limited countries. By applying these lessons, nations can strengthen e-government, promote transparency, improve services, and increase public engagement, paving the way for successful digital transformations.

CONCLUSION

The study shows that the success of e-government in Singapore is driven by strategic investments in ICT infrastructure, proactive policies such as the "Smart Nation," and sustainable human resource development, providing important lessons for developing countries. In contrast, political barriers, lack of infrastructure, and low levels of digital literacy have limited Afghanistan's development, highlighting the need for policy reform and international collaboration. In addition to the EGDI framework, the study emphasizes the importance of a cross-sectoral approach and community engagement in creating an inclusive and effective digital ecosystem, providing new insights into more holistic digitalization strategies.

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