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RESEARCH ARTICLE

Opening Governance: A Comprehensive Analysis of the Effect of E-Government Index on the Regulation of Quality on the Australian Continent

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Abstract: This research explores the relationship between the E-Government Development Index (EGDI) and the Quality of Government Regulation in Australian states. This study uses a quantitative approach with exposure to literature studies through Scopus and analyzes primary and secondary data. This research produced Online Service Index (OSI) p-values (0.388), E-Participation Index (EPI) p-values (0.764), Human Capital Index (HCI) p-values (0.000), and Telecommunication Infrastructure Index (TII) p-values (0.000) as predictors of Regulatory Quality (RQ). The use of the Smart PLS version 3 method and reliability and validity tests demonstrate the reliability of the proposed model. Statistical analysis yielded interesting results: EPI and OSI had no significant effect on RQ, while HCI and TII had a positive and significant relationship. These results provide insight into the factors influencing Regulatory Quality in the context of E-Government in Australia, supporting policy development to improve the efficiency and quality of public services. The research also contributes to an understanding of the impact of EGDI on governance and regulation at the state level.

Keywords:

EGDI, Regulatory Quality, Australia

About the Author

The author is a student of the Master of Government Science at Universitas Muhammadiyah Yogyakarta. Interested in the field of Local Governance, E-Government.

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1. Introduction

Governance is a fundamental pillar of societal advancement, significantly influencing economic growth, improving public service delivery, and promoting fair resource allocation.(Abdalla, Kassim, and Yeap 2023). The emergence of digital technologies has dramatically reshaped governance, ushering in the era of electronic government, or e-government.(Karpenko et al. 2023). This transformation has brought forth innovative tools and methods that enhance government operations, making them more transparent, efficient, and responsive. (Roespinoedji 2021). A crucial aspect of this shift is the effect of e-government on regulatory quality, a topic that, while essential, has not been thoroughly examined for transparency. (Gu et al. 2023).

Australia, as a continent and a region characterized by diverse political, economic, and social systems, presents a unique landscape for analyzing the influence of e-government on regulatory frameworks. (Lomos, Luyten, and Tieck 2023). The nations within the continent exhibit varying levels of e-government maturity, policy priorities, and institutional capacities, offering a rich tapestry for comparative analysis. (Prasasti et al. 2023). This paper investigates the correlation between EGD I rankings and regulatory quality in Australia, highlighting the mechanisms through which digital governance frameworks contribute to or hinder regulatory effectiveness.

The study of government open data and e-government refers to information and communication technology.(Xiao, Chi, and He 2023). Electronic-based government in government operations to increase the efficiency and effectiveness of transformation services using digital solutions to change the administration and public services.(Anas and Cahyawati 2023). Public transparency is the level of openness of information held by the government or public institutions that can be accessed easily by the public.(Petersson 2022). Public implementation involves government policies, programs, or projects with concrete steps to achieve the goals in the policy plan.(Nestico, Macchiaroli, and Siano 2020). ICT infrastructure includes all physical and software components that support the functioning of information and communication systems(Nazim, Munshi, and Ashar 2023). Improving the quality of e-gov develops a series of strategic steps to increase efficiency and user satisfaction in utilizing government operational ICT.(Pham et al. 2023).

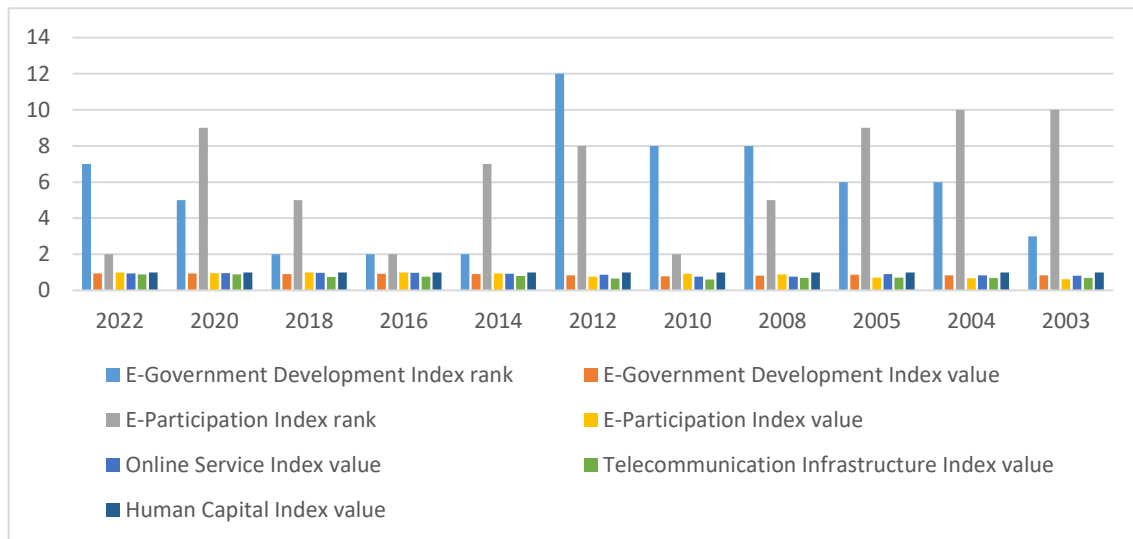
E-government can be interpreted as government agencies using information and communication technology (ICT) to provide public services to the public and business people.(Putra and Imanuel 2020). Delivery of government information and services via the Internet, use of social media to interact with the public, and application of digital tools in internal government operations(Pernagallo and Torrisi 2020). Acceptance of E-Government initiatives depends on society's readiness to adopt this innovation, which is influenced by perceived benefits, ease of use, compatibility, and trust.(Vasilescu et al. 2023). Various models and frameworks have been developed to evaluate the progress of E-Government and digital transformation in the public sector.(Fábián and Kollár 2023). The main focus is understanding the factors influencing society's adoption of E-Government initiatives. At the same time, the public value of E-Government is also a focus of study, especially in the context of creating public value through E-Government development.(Gaur 2024).

Regulatory quality refers to how government regulations or policies achieve goals efficiently, effectively, and fairly. (Alfar, Elheddad, and Alshubiri 2023). Aspects often evaluated in assessing regulatory quality involve the clarity, readability, and stability of regulations and their ability to stimulate economic growth and innovation and ensure public protection.(Mohd-Rashid et al. 2023). This can involve stakeholder involvement, speed of the regulatory process, and reduction of bureaucratic burden, which can also influence the quality of regulations.(Bah et al. 2022).

Good regulatory quality creates a reliable and supportive legal environment for all parties involved, including businesses and the general public(Mohammed, De-Pablos-Heredero, and Montes Botella, 2023). Reasonable regulations must address problems without excessive bureaucratic burdens or obstacles(Aparajita Gupta & Sharma, 2023). Evaluation of the quality of regulations is important in the

government's efforts to ensure that the regulations issued meet their objectives without causing undesirable(Aldeki, 2023).

Table1. Data on countries in Australia 2003-2020



Several previous studies have examined the topic of the E-Government Development Index (EGDI)(Amiri and Sangar 2023). Discusses the main challenges in implementing e-government, as well as good governance strategies in the context of electronic-based government(Fahlevi and Nugraha 2023). Examining the E-Government Development Index (EGDI) in the context of transformative steps to ensure the sustainability of the evaluation, in line with public transparency efforts(Zwijnenburg and Ballinger 2023). It focuses on the involvement of people with disabilities in accessing public services.(Xhaferaj and Skara 2023). Research on government services and innovations that emerge as a result of the adaptation of Information and Communications Technology (ICT) infrastructure(Moore et al. 2023). And develop a series of strategic steps for efficiency and user satisfaction in using Information and Communication Technology (ICT) to improve the quality of e-gov(Witarsyah et al. 2020). Overall, these studies explore the E-Government Development Index (EGDI) from various perspectives related to e-government development. The aspects investigated involve electronic-based government, e-government implementation, public transparency, public implementation, ICT infrastructure, and improving the quality of e-gov in exploring the impact of EGDI on government administration, especially in the context of regulatory quality.

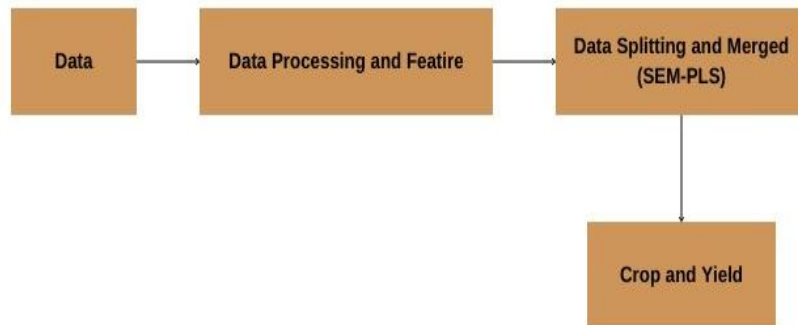
Based on several previous studies, this research focuses on the impact of the E-Government Development Index on government regulation quality in Australian countries. This study proposes a hypothesis that variables such as the Online Service Index (OSI), Telecommunication Infrastructure Index (TII), Human Capital Index (HCI), and E-Participation Index (EPI) can have a significant influence or not on the quality of government regulations in a country. New South Wales (NSW), Northern Territory (NT), Queensland (QLD), South Australia (SA), Tasmania (TAS), Victoria (VIC), Western Australia (WA), and the Australian Capital Territory (ACT).

2. Methods

This study adopts a quantitative method. This quantitative method is applied through an explanatory strategy, where the initial stage involves the collection and analysis of quantitative data, followed by the collection and analysis of qualitative data through the Scopus database. In the early stages, the research uses quantitative methods focusing on primary data. The primary data was taken from the United Nations

(United Nations) website in a unique study on the Australian continent—especially EGDI sample data in Australian countries, and implementing Smart PLS software version 3. Innovative PLS 3 software has the advantage of calculating multiple regression, which is an advantage over other software. Later, we can see how EDGI is implemented in Australia. This method uses a Likert scale containing 1 (Strongly disagree), 2 (agree), 3 (neutral), 4 (strongly agree), 5 (strongly disagree). To measure the relationship of independent variables to dependent variables.

Figure 1. Research Stages



Source: Created by authors

Theoretical Framework

E-Government Development Index on Government Regulatory Quality

The E-Government Development Index (EGDI) is a metric used to evaluate the level of development of the quality of e-government regulations in a country (Jeong 2023). This index includes the human capital index, telecommunication infrastructure index, online service index, and e-participation index. (Duisenkul et al. 2023). In a study of the Human Capital Index index in the use of technology to assess the level of skills and community participation in the use of information technology (Wang et al. 2022). Furthermore, the infrastructure technology availability index in measuring Technology Availability involves evaluating a country's information and communication technology infrastructure, including aspects of internet access. (Rachmawati and Fitriyanti 2021). Then, the online public service index assesses the availability of digital public services, such as online registration, tax payments, and administrative services. (Wiguna and Hariyani 2022). The electronic participation index refers to community involvement in making government decisions and contributing to public issues through electronic platforms and technology. (Chomistriana and Simanjuntak 2022).

The use of the E-Government Development Index (EGDI) is to improve the quality of government regulations through information and communication technology, as stated in previous research (Nugraha et al. 2021). With electronic-based government, building transparency and solid public implementation of technology, increasing people's digital literacy, and providing online public services, the government can improve e-gov quality, efficiency, and accessibility of public services (Purbokusumo & Santoso, 2021). The implementation of e-government is also identified as a factor that can increase bureaucratic efficiency, reduce administrative costs, and expand public access to public services (Al-Refaie & Ramadna, 2021). Key indicators in this variable include digital infrastructure readiness, human resource capacity, and the scope of bold services the government provides. The goal is to improve the quality of government regulation through more transparent, efficient, and inclusive processes, which ultimately support good governance. The mandate is to ensure that all policies, regulations, and implementation aspects are aligned with a digital approach to address community needs, increase public trust, and encourage innovation and sustainable development.

Online Service Index

The Human Capital Index (HCI) functions as a metric that measures the extent to which the government utilizes its people's economic potential and professionalism.(Islam et al. 2023). Actions taken by the government to improve people's quality of life include providing opportunities for more significant economic growth and initiating skills improvement so that people can compete more effectively as professionals.(Bower 2023). Efforts are also made to provide high-quality health and education services to improve the population's welfare.(Håkansson and Komzia 2023). The Online Service Index (OSI) is an important component in e-government measurement used to assess the extent to which the government provides digital-based public services. The indicators used include the availability of official government websites, their interactive functions, ease of access to public information, and the ability to transact online. The main objective of OSI is to promote transparency, efficiency, and inclusiveness in providing public services through information technology while increasing public trust in the government. The OSI mandate focuses on the government's obligation to provide responsive, affordable, and technology-based public services by international standards, as stipulated in the United Nations E-Government Survey report.

Telecommunication Infrastructure Index

The Telecommunications Infrastructure Index (TII) measures the availability of telecommunications and technology infrastructure across the country. This includes various aspects such as internet access, cable TV, radio, and cell phone signals provided to meet community needs.(Wagola et al. 2023). The Telecommunications Infrastructure Index (TII) analyzes factors such as the number of internet users, mobile phone SIM users, and other variables.(Paul and Adams 2023). In addition, the Telecommunications Infrastructure Index (TII) also evaluates how these services are utilized and signal strength in various regions to improve the general quality of service throughout the country.(Rehman, Sohag, and Saeed 2023). Telecommunication Infrastructure Index (TII) is an indicator used to measure the capacity and quality of a country or region's telecommunications infrastructure in supporting digital communications and connectivity. The main objective of TII is to provide a comprehensive picture of the readiness of telecommunications infrastructure to support digital services, e-governance, and information technology transformation in society. TII's mandate includes monitoring the development of telecommunications infrastructure, such as internet networks, mobile phones, and broadband access, as well as encouraging efforts to improve the quality of information technology services that are evenly distributed and affordable. This index is usually calculated based on indicators such as the number of internet users, broadband network capacity, fixed and mobile telephone customers, and the availability of secure servers that support the digital ecosystem.

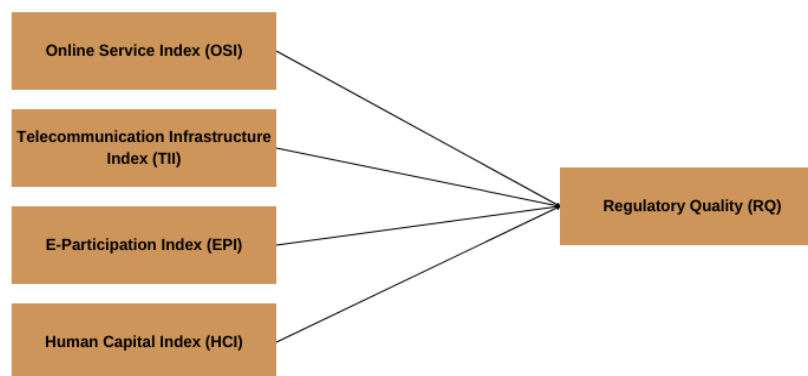
E-Participation Index

The E-Participation Index (EPI) aligns with other countries; a country's EPI reflects the e-participation procedures implemented by its government(Perez-Morote, Rosa, and Cortes, 2022). These metrics focus on supporting practice(Kabanov, 2022). However, it is important to understand how various countries utilize online resources to promote interaction between their governments and citizens and among citizens themselves for mutual benefit(Shaikh et al. 2021). The E-Participation Index (EPI) is an indicator used to measure a country's electronic participation (e-participation) in supporting the public decision-making process through digital technology. The purpose of the EPI is to assess the extent to which governments utilize information and communication technologies (ICTs) to engage citizens in three key dimensions: e-information (information provision), e-consultation (involvement in consultation), and e-decision-making (participation in decision-making). The mandate of the EPI is to encourage governments worldwide to increase transparency, strengthen citizen engagement, and facilitate inclusive and participatory governance through digital platforms. This supports the sustainable development goals (SDGs), especially in effective, accountable, and transparent governance.

Human Capital Index

The Human Capital Index (HCI) is an indicator that measures the extent to which the government utilizes the economic potential and professionalism of its people.(Li and Han 2023). This includes steps taken by the government to improve people's quality of life, provide opportunities for more significant economic growth, and encourage skills improvement initiatives to increase their competitiveness as professionals.(Zhang et al. 2023). The government also strives to provide high-quality health and education services as part of efforts to improve the welfare of its citizens.(Uche and Ngepah 2023). The Human Capital Index (HCI) is an indicator designed to measure the contribution of human capital to a country's future economic productivity. The index aims to show how effectively a country prepares future generations with the skills and health needed to reach their full potential in the labor market. Mandated by the World Bank, the HCI is used to encourage investment in education, health, and social protection, thereby improving the quality of human capital. The indicator includes several key components, such as child survival rates, educational attainment, and population health, all of which contribute to assessing the extent to which a child born today can be expected to reach their full productivity potential in adulthood.

Figure 2. Theoretical Framework



Source: Created by authors

Hypothesis

H1 Online Service Index (OSI) has a positive and significant effect on Regulatory Quality (RQ)

H2 Telecommunication Infrastructure Index (TII) has a positive and significant effect on Regulatory Quality (RQ)

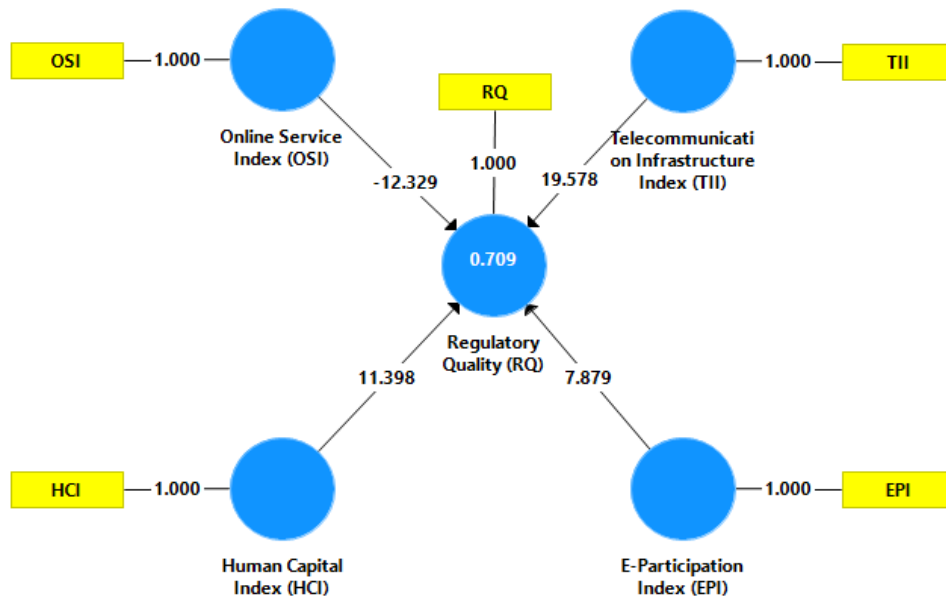
H3 Human Capital Index has a positive and significant effect on Regulatory Quality (RQ)

The H4 E-Participation Index (EPI) has a positive and significant effect on Regulatory Quality (RQ)

3. Result and Discussion

External model planning is a crucial stage in this research, which aims to identify and determine the indicator characteristics of each latent variable(Talaviya et al., 2020). In this phase, the operational definition of the latent variable is explained in detail, establishing a clear connection between the indicator and the latent variable, reflecting the essence of the underlying latent variable. As a measurement instrument, the external model acts as a key element in providing an empirical basis for the concepts in latent variables(K. Shah et al., 2020). As well as guaranteeing reliable measurement accuracy(Aaryan Gupta et al., 2020; Parekh et al., 2020). This entire planning process forms the basis of a solid framework for analyzing the relationships between variables in a study carefully and accurately.

Figure 3. Outer Model



Realibility and Validity Test

Table 2. Cronbach’s Alpha and Composite Realibility

	Cronbach’s Alpha	Composite Realibility
E-Participation Index	1.000	1.000
Regulatory Quality 2023	1.000	1.000
Human Capital Index	1.000	1.000
Online Service Index	1.000	1.000
Telecommunication Infrastructure Index	1.000	1.000

The reliability measurement for each variable was tested using the Composite Reliability value and Cronbach's Alpha value. In order to proceed to the next test, the Composite Reliability and Cronbach's Alpha values must meet the standards. Namely, Cronbach's Alpha must be greater than 0.6, while Composite Reliability must exceed 0.7. The value obtained is 1,000, or perfect can happen. The collection of answers is carried out by the UN Nation every two years. This answer indicates that the answers from the respondents are reliable or consistent. The data obtained are the survey results that were conducted authentically and initially with the respondents.

Table 3. R-Square

	R-Square
Regulatory Quality	0.709

Data shows that the Regulatory Quality variable has an R-Square value of 0.709. This shows that the Regulatory Quality variable has a significant relationship with other variables in data analysis. The R-Square value for the Regulatory Quality variable illustrates that the Online Service Index (OSI), Human Capital Index (HCI), E-Participation Index (EPI), and Telecommunication Infrastructure Index (TII) can comprehensively explain the Regulatory Quality variable with a perfection of 70.9% and is included in the Strong Correlation category.

Table 4. Discriminan Validity Test (Heterotroit Monotrait Ratio (HTMT))

Variable	E-Participation indeks	Human capital indeks	Online service indeks	Regulatory quality	Telecommunication infrastructure indeks
E-Participation index					
Human capital indeks	0.328				
Online service indeks	0.006	0.239			
Regulatory quality	0.134	0.304	0.815		
Telecommunication infrastructure index	0.223	0.616	0.813	0.780	

In correlation analysis between variables, a relationship can be observed. Regulatory Quality correlates positively with the Online Service Index (0.815) and the Human Capital Index (0.304). This shows that regulatory quality strongly and positively influences the online service and human capital indexes. Besides, Regulatory Quality also shows a relatively high positive correlation with the Telecommunication Infrastructure Index (0.780), indicating that good regulation is closely correlated with developing telecommunications infrastructure. Although the E-Participation Index also shows a positive correlation with Regulatory Quality (0.134), this relationship is not as strong as the correlation with other variables. This analysis illustrates the complexity of interactions between variables in the context of regulations, online services, human capital, and telecommunications infrastructure.

Hypothesis

Table 5. Hypothesis Test

Hypothesis Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics	P Values	Assessment of Hypothesis
RQ -> EPI	-0.134	-0.074	0.447	0.301	0.764	Rejected
RQ -> OSI	-0.304	-0.261	0.352	0.864	0.388	Rejected
RQ -> HCI	0.815	0.821	0.158	5.158	0.000	Accepted
RQ -> TII	0.780	0.809	0.105	7.444	0.000	Accepted

Hypothesis analysis regarding the relationship between Regulatory Quality (RQ) and the E-Participation Index (EPI) variable with a T-Statistics value of 0.301 and P Values 0.764 was rejected, the Online Service Index (OSI) with a T-Statistics value of 0.864 and P Values 0.388 was rejected. Human Capital Index (HCI) with a T-Statistics value of 5.158 and P Values 0.000, acceptable or perfect results, and Telecommunication Infrastructure Index (TII) with a T-Statistics value of 7.444 and P Values 0.000, acceptable or perfect results.

The E-Participation Index (EPI) shows a T-Statistics value of 0.301 and A Value of 0.764, indicating that electronic participation as measured by the EPI has the impact of rejection or rejection on the quality of regulations. Supporting results from previous research stated that the stateliness of E-Participation (EPI) shows a T-Statistics value of 0.301 and an A value of 0.764, indicating that the electronic participation measured by EPI has a rejection or rejection impact on the quality of regulations. The results of this hypothesis test also rejected the previous research theory. (Perez-Morote, Rosa, and Cortes, 2022). (Beiderbeck et al. 2023) It also revealed that the E-Participation Index (EPI) has a negative or negative effect on the quality of regulations. This is the same as the Online Services Index (OSI) with a T-Statistics value of 0.864 and a P value of 0.388, indicating that online services measured by OSI hurt the quality of regulations. Supporting results from previous studies state that (Panchiwala & Shah, 2020). Reveals that the Online Services Index (OSI) has a negative or negative effect on the quality of regulation. However, it departs from the theory that has been explained above, which is sourced from (Håkansson & Komzia, 2023), So the theory does not apply to this case study.

The Human Capital Index (HCI), with a T-Statistics value of 5.158 and a Value of 0.000, shows that the human capital index measured by (HCI) has a significant positive or accepted impact on the quality of regulations. The results of previous research state that (N. Shah, Bhagat, and Shah 2021) Revealed that the Human Capital Index (HCI) influences the quality of regulations. The Telecommunication Infrastructure Index (TII), with a T-Statistics value of 7.444 and P Values of 0.000, shows that Telecommunication Infrastructure, as measured by (TII) has a significant positive or accepted impact on the quality of regulations. With the results of previous research (Patel et al. 2020) Revealed that the Telecommunication Infrastructure Index (TII) had a positive influence. The results of this hypothesis test also support the research carried out. (Uche and Ngepah 2023) Moreover, the theory can be used in this case study. However, several studies show a different view from the results obtained from the hypothesis. Research (Man and Manaf 2023) Shows that the E-Participation Index (EPI) influences regulatory quality (RQ). This index is often disjointed because the focus is only on human resources who are active in using the internet, so it is not always in line with efforts to improve effective governance in a country and according to the Online Service Index (OSI), it influences regulatory quality (RQ) in several factors which cause the Online Service Index to reflect society's accessibility to access all forms of online services.

The Human Capital Index (HCI) influences the quality of regulations (RQ) to improve people's quality of life, provides opportunities for more significant economic growth, and encourages initiatives. The Telecommunication Infrastructure Index (TII) influences the quality of regulations (RQ) for only normative infrastructure provision. The results of this hypothesis test also support the theory of (Rehman, Sohag, and Saeed 2023). Therefore, it can be concluded that Regulatory Quality ~~correlates significantly~~ with the Human Capital Index and Telecommunication Infrastructure Index. At the same time, the hypotheses related to the E-Participation Index and Online Service Index are rejected. Based on the results of the hypothesis analysis, there is a significant relationship between the Human Capital Index (HCI) and the Telecommunication Infrastructure Index (TII) on regulatory quality. Therefore, countries on the Australian continent can adopt policies that focus on improving these two indices. Regarding HCI, governments must increase investment in education and skills training to create a more skilled and knowledgeable workforce. In addition, developing leadership programs and improving digital competencies for the community must be prioritized to create an ecosystem that supports high-quality regulations.

On the other hand, improving TII can be achieved by strengthening digital infrastructure, including expanding broadband internet access to rural and remote areas. The government must also encourage cooperation with the private sector to build more advanced communication technologies, such as 5G networks, to support more efficient digital services. By strengthening these two aspects, the quality of regulations can be significantly improved, supporting economic growth and creating more effective and inclusive governance. However, the findings also show that the E-Participation Index (EPI) and Online Service Index (OSI) do not significantly impact the quality of regulation. Therefore, policies related to e-participation and online services must be directed to improve effectiveness and accessibility by ensuring more inclusive and representative community participation.

4. Conclusion

The conclusion of this research shows that regulatory quality (Regulatory Quality) has a significant positive correlation with the Human Capital Index (HCI) and the Telecommunication Infrastructure Index (TII). This indicates that improving regulatory quality can be related to improving the human capital index and telecommunications infrastructure in Australian countries. However, the relationship between regulatory quality and the E-Participation Index (EPI) and Online Service Index (OSI) is insignificant. These findings imply that to improve the quality of regulations, the government needs to focus on developing human capital and telecommunications infrastructure. Meanwhile, aspects of E-Participation and online services do not fully contribute to the quality of regulations. Therefore, the recommendation for the government is to continue

strengthening aspects that have a significant positive impact and consider more effective strategies in integrating E-Participation and online services within the regulatory framework.

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