ANALYZING COUNTRIES THAT HAVE MADE SIGNIFICANT PROGRESS IN BRIDGING THE DIGITAL DIVIDE THROUGH E-GOVERNMENT PROGRAMS: LESSON LEARNED FROM ESTONIA, RWANDA, SOUTH KOREA, SINGAPORE, TAIWAN AND UNITED STATES

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Abstract

The digital divide, marked by unequal access to information and communication technologies (ICT), remains a significant social issue worldwide. This paper examines the progress made by e-government programs in Estonia, South Korea, Singapore, Taiwan, and the United States in reducing this divide. Through targeted sampling of 20 peer-reviewed studies published between 2018 and 2023, we identify key factors that contribute to digital inclusivity, including government-backed digital literacy initiatives, robust ICT infrastructure, and user-centered design principles. Our analysis reveals that high-speed internet accessibility, citizen engagement platforms, and strategic digital policies are essential in enabling marginalized populations to access public services effectively. Furthermore, we discuss challenges such as privacy concerns and the need for sustainable funding to support ongoing digital access. These findings underscore the importance of tailored approaches to address the unique barriers faced by different communities. This study provides a comparative framework to guide other nations in formulating impactful e-government strategies aimed at bridging the digital divide and fostering a more inclusive digital landscape. By leveraging successful practices from these case studies, policymakers can enhance the effectiveness of e-government initiatives and ensure equitable access to essential services in the digital age.

1.0 Introduction

Digital technology innovation is ushering in a new era of quick, effective, and widely available public services. However, there is inconsistent progress toward modern e-government. The idea of the digital divide has changed recently. However, digital divide is now being understood to be a social problem relating to the discrepancy in information accessible to everyone having access to information communication and technologies (ICT). In terms of ICT accessibility, digital divide is also referred to as nations, regions, cities, and companies that operate at changing socioeconomic and cultural levels [1]. Inequalities in income, color, ethnicity, gender, and other comparable factors that affect access to internet infrastructure, information, and expertise, and equality of opportunity, are all part of this disparity.

Since the causes of the digital divide are complicated and controversial, determining and implementing appropriate solutions requires a precise diagnosis of the problem. There is a large digital divide. There is a direct link between poverty and the digital divide. Nearly 40% of people on Earth reside in low-income nations. A billion or so people lack access to ICT. The digital divide also takes many different forms. Research shows that a person residing in a developed country has a higher chance to use the internet than those living in a developing nation, irrespective of the number of info kiosks or

tele centres that are placed in a low-income or developing country. This indicates that closing the digital divide will require education and a shift in mindset. Governments should take action by creating and utilizing e-government tools to improve e-readiness, promote and instruct ICT usage, and non-discriminatory in the development of ICT skills [1].

When it comes to facilitating the expansion and application of comprehensible ICT content and available e-services, governments ought to take the lead. Additionally, they must support the establishment of an appropriate and non-discriminatory e-government environment by means of government assurances, strategic orientations, and regulatory frameworks. E-governance has the potential to be an equally effective tool in closing the gap as broadband access at a reasonable price. Modern technology may make using gadgets like computers and mobile phones easier.

1.1 E-Government Success Stories

Defined digital government as the various electronic interactions that include provision and sharing of online government services, exchange of information with citizens, and businesses as well as between different units within the same government. In essence, e-government has always meant utilizing internet technologies to make agencies work more effectively as well as provide government services online. Therefore, it is clear that the concept of e-government entails the use of various ICT tools by the government to interact with companies and public citizens and access to online information systems supporting open government data and governance modernization efforts [2]

Therefore, the use of ICTs in an efficient manner provides residents and businesses with government services is known as e-government. It is the utilization of internet services in government processes to accomplish goals for the public good through digital means. E-government's primary goal is to promote efficiency within governmental processes by reducing costs and completion time. E-Governance has relied on a very effective institution framework. The system will also reform working methods and procedures in a manner that will facilitate equitable distribution of resources among the mentioned public entities with an eye on sustainable practices. Governments around the world can be more effective, participatory, and responsive on matters related to citizen requests for accountability and transparency through innovations and e-governance. However, they can later restore public confidence in them.

A study by [3] claims that some e-government initiatives have been quite successful in underdeveloped nations. As instances of success, consider Brazil, India, Singapore, Chile, and Korea. e-gov. has the potential to significantly advance development. In developing nations, information technology serves as a catalyst for administrative reform. For instance, despite having few raw materials, Singapore uses internet services to revolutionize its economy and, consequently, the rapid development in the country [3].

[2] Commends Singapore and Chile for their e-Gov development success stories in their respective countries. Singapore offers its people and businesses a plethora of online transaction and information resources. Chile is also complimented for its capacity to conduct business online and for its ability to submit bids and request proposals for contracts. These promote ties between governments, corporations, and citizens as well as citizen participation in government.

[3] report states that digital government services enhance upon and most importantly changes the civic sector. Third world countries face significant challenges that constrain investment in e-government projects. It is important as well that successful e-government projects in developing countries help them achieve their ambitions like transforming government through innovation. [4] urges for expanding e-government research beyond success, pointing out that the sustainability component of e-government programs is a neglected area. In order to investigate any possible connections between the two ideas, the author examines sustainability and e-government success in an integrated way.

2.0 Aims, materials and method

To systematically identify and retrieve the most relevant and high-quality scholarly sources on the impact of the digital divide on access to information and communication technologies (ICT), with a focus on how e-government and digital literacy initiatives may contribute to reducing disparities in digital access, particularly in low-income and developing region. For the objective of precisely finding and retrieving the most pertinent sources related to the topic

and goal of the study a thorough search strategy was created. ProQuest Central, SAGE Journals Online, EmeraldFull text, Wiley Online, Elsevier, Springer, John Wiley & Sons, EbscoHost, and Taylor & Francis were the databases that were searched. Exclusion and inclusion criteria was used to determine the calibre of the articles that were chosen. The inclusion criteria comprised of the following: (i) publications that were written in full text and published in English; (ii) scholarly and peer-reviewed; and (iv) research that were released between 2018 and 2023. All papers that were not published within the specified five years were excluded based on the exclusion criteria.

Digital literacy, closing the digital divide, government policy, ICT for development, regional development, internet penetration, ICT infrastructure, public sector technology, digital transformation, digital divide, digital inclusion, government technology initiatives, and access to online services were among the key words used. Boolean operators were utilized to broaden the research's scope. OR, and AND were the Boolean operators. For instance, to obtain the most accurate results, specific key words were concatenated. The digital divide AND its change, the use of ICT for development OR its closing, the availability of online services AND/OR governmental regulations were all included. Numerous peer-reviewed texts were found during the search; these were analysed and categorized into several themes to complete the literature study. The themes have been extensively discussed in the subsequent paragraphs. The thematic analysis to synthesize findings from 20 selected articles, categorizing them into themes related to e-government success and digital inclusivity. Data coding was conducted manually by two coders to improve reliability, with intercoder agreement calculated to ensure consistency. Each theme was reviewed iteratively to confirm alignment with the study's objectives.

3.0 Results

3.1 Analysis of Existing Studies

The selected articles were reviewed to yield a number of themes. The 20 articles analyses yielded 6 themes, some of which had sub themes. The themes analyses included key features of successful E-government programs, Impact on Digital Inclusion, Measurement of E-Government Success, Technological Infrastructure and Resources, Government Leadership and Commitment on enhancing E-government, User-Centered Design and Accessibility, Citizen Engagement and Feedback Mechanisms. The themes and sub-themes are explained in subsequent paragraphs.

3.2 Summary of Existing Studies

3.2.1 Key Features of Successful E-Government Programs

Programs for e-government in developing nations are evaluated based on a number of criteria. Accessibility and inclusion are two characteristics. As stated by [5]. Seniors' digital exclusion is influenced by a number of social and technological factors that determine how widespread this situation is. It stems from a variety of factors, including a fear of technology, diminished manual and mental skills, socioeconomic position, and a mismatch between the demands of the elderly and the technological world. Social policies are mostly used to address the needs of the elderly, whereas digitization policies and procedures are used to provide government services [5]. Research by [5] was centered on two goals. The primary goal is to pinpoint the essential aspects prompting seniors' embrace the use of modern technologies in government. The creation of a research approach for evaluating digital technologies policies for senior citizens' digital inclusion from a social and technical standpoint is the second goal. Many countries worldwide use digital government internet sites to distribute public services to their citizens. As a result, it is now imperative that governments guarantee that e-government websites are usable by all parties, irrespective of their abilities related to vision, cognition, and hearing [6]. [6] conducted an evaluation of Indian e-government website accessibility based on the requirements imposed by WCAG 2.1 guidelines regarding a research sample comprising of sixty-five sites belonging to different departments. As stated by [6], most e-government websites do not conform to WCAG 2.1 level A. In conclusion, for universal accessibility, the makers and constructors of e-government ports must put accessibility attributes into consideration throughout

According to [7], the use of internet sites owned by the government is to offer help to all people in the country. Consequently, these websites ought to be user-friendly, legible, and equally reachable to everyone on different communication devices. The authors concentrated on examining the efficacy,serviceability, and convenience of Indian government internet sites. [7] discovered in their

study that many of the websites owned by the government did not adhere to WCAG 2.0 accessibility criteria, had poor usability, and were not completely accessible on mobile devices.

[8] discovered in their study that e-government service accessibility is critical for all citizens, but especially for people with disabilities (PWD). According to their research, e-government services in Ghana provide a number of obstacles for those with impairments. PWDs struggle with affordability when it comes to the price of using Internet services in general or E-government systems in particular. The high cost of assistive technology, low bandwidth, outdated technology, and the expense of Internet access all work against people using the internet in underdeveloped nations [8].

According to [9], the public sector's digital first service strategies are making it more difficult to provide inclusive services to all users. Authentically inclusive businesses start with comprehending and embracing the various user perspectives, including help-seeking behaviors. As a result, the authors advise that improving the inclusion of all government e-services is imperative. The study by [9] emphasizes how crucial it is to comprehend how people seek help and the demographic of non-digital lodging.

3.2.2 Impact on Digital Inclusion

For all residents, digital inclusion in government services is essential. An investigation on the effects of digital financial inclusion in rural China was carried out by [10]. [10] claim that digital inclusive finance reduces farmers' financial limitations and influences their propensity and capacity to make educational investments, which enhances the buildup of human wealth. Even though difficult to measure, digital inclusive finance has a substantial effect on the development of human capital in rural areas. According to [11], China's sustainable economic growth can be fostered by financial innovation and the advancement of ICTs in the digital age. It is quite amazing how quickly digital finance inclusion has represented business and economic growth in China in recent years [10]. Financial support for pesticides, imported machinery, farming, technology advancement, education, and even access to foreign markets has been made possible by digital inclusive finance [12]. For the purpose of allocating fiscal resources in developing and evolving markets, economies are concentrating on inclusive digital finance. Together, public and private groups are promoting inclusive digital finance in various underprivileged areas. One of the biggest economies, China has demonstrated a sharp increase in the promotion of inclusive digital banking to enhance the growth of underserved areas. The buildup of human capital is an essential approach, in the case of China, between digital inclusive finance and economic development. This has a major impact on the development of technology, education, and wealth in China's rural areas [10]. Governments must thereby promote digital accessibility even in the context of economic transformation.

3.2.3 Measurement of E-Government Success

[13] Claim that ICTs are being heavily utilized by public entities. Leading to the development of e-government, they anticipate adding value for the public. On the other hand, there is scant practical data regarding realizing the anticipated advantages. The current framework approaches for IT value, which center on the private sector, are inappropriate for e-government. The authors gauge the effectiveness of e-government services using ecological sustainability and structural performance. Result in value for the public that is determined by ecological sustainability and structural performance. The study by [13] proved that the research methodology was adequate for assessing the worth of digital government services from the viewpoint of administration personnel.

The assessment of digital government initiatives' efficacy, impact, and overall value is made possible by the measurement of e-government success, which is a crucial issue in e-government research and practice. This issue includes a wide range of approaches and KPIs that aid in determining how well e-government initiatives are performing for governments and researchers. Understanding how to assess the results of such programs and make data-driven decisions for development requires a thorough examination of this issue.

A popular method for gauging the accomplishment of e-government is Service Quality Assessment. Using variables including website usability, response time, dependability, and content accuracy, this approach evaluates the ability of services provided by digital technology platforms. A number of frameworks have been established to evaluate the value of government digital services, including the

DeLone and McLean model and the E-Government Service Quality (EGSQ) model [14, 13]. Governments can prioritize service upgrades and detect potential service gaps with this strategy.

According to [15], Citizen Satisfaction and User Experience are crucial components of gauging the performance of digital led government initiatives. In the end, the effectiveness of e-government initiatives depends on how well they satisfy individuals' demands and expectations. User reviews, feedback systems, and surveys are essential tools for collecting information on citizen satisfaction. Well-known instruments for measuring user happiness include the UN E-Government Development Index and the American Customer happiness Index (ACSI) [16, 17]. A high degree of citizen satisfaction not only indicates that e-government programs are successful, but it also encourages more acceptance and usage of these services.

According to [18], two important metrics for assessing e-government initiatives are cost savings and efficiency. E-government is frequently implemented by governments to decrease paperwork, expedite procedures, and save administrative expenses. In this context, success is measured by examining the cost reductions attained by digitalization and automation [19]. Furthermore, evaluating the Return on Investment (ROI) of e-government initiatives aids in comprehending the monetary advantages they provide, including decreased administrative costs and better resource distribution [20].

Furthermore, citizen engagement, and participation can be used to gauge the success of e-government. E-government projects that are successful should make it easier for citizens to participate in democratic governance and policy-making. Metrics could include the quantity of online citizen consultations conducted, the involvement rates in e-democracy programs, and the influence of public input on government decision-making by utilizing platforms such as Twitter and Facebook, according to [21].

When evaluating the effectiveness of e-government, interoperability is crucial, particularly when there are multiple agencies or jurisdictions involved. According to [22], effective e-government initiatives should enable smooth data sharing between various government agencies. Evaluating the quantifiable degree of interoperability among systems and data is crucial in assessing e-government's capacity to dismantle administrative silos [22].

3.2.4 Technological Infrastructure and Resources

Technology resources and infrastructure make up the other theme. Technology infrastructure, which includes hardware accessibility and broadband connectivity, is essential to the effectiveness of digital led government initiatives as indicated by [23]. These components serve as the foundation for digital government services, making it possible for citizens to engage and access government services in an efficient and effective manner.

Success with e-government fundamentally depends on broadband connectivity. Both urban and rural residents depend on it for high-speed internet connection, which is necessary to provide online government services. Citizens may easily access government websites, fill out online forms, and use e-services when they have dependable broadband connectivity. Inadequate internet connectivity causes underprivileged communities to lose out on the advantages of government digital services, thereby widening the tech gap. To close this gap and enable everyone to access e-government services, governments must prioritize providing universal broadband access.

Another crucial element is internet service accessibility. In order to use digital led government services, citizens must have the necessary hardware, such as tablets, smartphones, and PCs. To guarantee that government digital-led initiatives are inclusive, governments need to take into account the population's levels of hardware ownership and digital knowledge [23]. Efforts to improve accessibility and inclusion can be achieved by offering low-income or disadvantaged persons free or inexpensive hardware. In order to guarantee that consumers may access services on any device, e-government websites and applications also need to be flexible and adaptable to different screen sizes.

Additionally, technology infrastructure is essential to government entities' internal operations [23]. To manage the growing demand for online services and guarantee data security, e-government projects require effective data centers, safe servers, and strong networking infrastructure. It takes qualified IT specialists and adequate technical support to manage and troubleshoot this infrastructure.

Regarding broadband connectivity and device accessibility, policymakers must take digital literacy into account. To properly use e-government services, citizens need to have the digital skills required in addition to the infrastructure [23]. In order to improve individuals' capacity to interact with digital services and increase the effectiveness and accessibility of e-government activities, governments can provide digital literacy training and programs.

Initiatives aimed at e-government frequently necessitate large financial investments in technology infrastructure. These covers setting up and maintaining data centers, cloud computing resources, and cyber security safeguards for private information. It is imperative to allocate resources towards these facets to guarantee the durability, expandability, and safety of e-government initiatives. There are several initiatives aimed to improve e-government:

(a) Government Leadership and Commitment

The accomplishment of e-government approaches is largely dependent on the dedication and leadership of the government as noted by [24]. The establishment of a clear vision, the allocation of resources, and the removal of bureaucratic obstacles are essential to the accomplishment of e-government programs. These tasks require the political will and policy support of government officials. The subsequent sub-themes hold significant importance in augmenting government leadership and dedication towards amplifying the triumph of e-government initiatives.

(b) Vision and Strategic Direction

The vision and tactical course of e-government initiatives are set by government leadership [24]. Leaders need to understand how digital transformation may boost efficiency, promote transparency, and improve service delivery. A clear vision directs the creation of policies, strategies, and resource allocation, giving the overall e-government endeavor direction and purpose.

(c) Resource Allocation

Allocating financial and human resources to e-government initiatives requires government commitment [24]. E-government initiatives may find it difficult to obtain the necessary money without the financial support and endorsement of leaders, which could impede the projects' growth and execution. To guarantee that these projects obtain the required funding, budgetary planners at the government level must give them top priority.

(d) Policy Support

The establishment of a supportive policy and political atmosphere are crucial for e-government. Leaders have the power to pass laws that preserve digital infrastructure, expedite regulatory procedures, and enable data sharing between government departments. E-government initiatives may be hampered by bureaucratic and legal barriers that are lessened by clear and supporting rules.

(e) Change Management

To overcome bureaucratic resistance to change, government leaders' dedication is essential. Government entities frequently need to undergo considerable organizational and cultural changes to enhance e-government. Through these changes, staff can be led and inspired by strong leadership, which promotes an innovative and customer-focused culture of service delivery.

(f) Public Trust and Data Privacy

Building and preserving public confidence in e-government is a major responsibility of government officials. They have a strong commitment to the data privacy and security. One of the main duties of government leadership is creating and implementing data protection rules and guaranteeing the safe management of citizens' data. People are more disposed to use e-government services when they have confidence in the security of their data.

(g) Encouraging Digital Inclusion

In order to promote digital inclusivity, government commitment is also essential. Regardless of a citizen's socioeconomic background or level of digital proficiency, leaders can establish policies and programs to guarantee that all people have access to e-government services. This involves initiatives to offer training in digital literacy, reasonably priced internet connectivity, and user interface accessibility.

(h) Adaptation and Evolution

Government officials must be dedicated to modifying and growing e-government initiatives in order to accommodate the ever-changing demands and technological capabilities of the digital landscape. Programs for e-government should be viewed as dynamic, long-term initiatives that call for constant innovation and improvement.

(i) User-Centered Design and Accessibility

Enhancing the success of e-government services has been made possible in large part by the implementation of accessibility features and user-centered design concepts [25]. By putting user requirements and preferences first, these guidelines enhance the effectiveness, efficacy, and inclusivity of digital government facilities. The extra sub-themes in the paragraphs that follow were developed to examine the success of digital technologies by the government in detail.

(j) Improved Experience for Users

E-government services with user-friendly interfaces, easy navigation, and logical information architecture are guaranteed by user-centered design [25]. By emphasizing the user experience, usability is improved and citizens can more easily engage with government websites and applications. Because of this, citizens are more inclined to make use of these services, which raises adoption rates and increases the effectiveness of e-government initiatives.

(k) Accessibility for All

In order to guarantee that everyone has access to digital services by the government, including those with impairments, accessibility features are crucial. E-government websites and apps stick to rules such as the Web Content Accessibility Guidelines (WCAG) to make them useable by anyone with a range of disabilities, including hearing or vision impairments [25]. This inclusive strategy shows a dedication to serving all individuals and is consistent with the ideals of equal access to government services.

(l) Digital Inclusion

Digital inclusion is facilitated by accessibility features and user-centered design. Accessible and user-friendly e-government services contribute to closing the digital divide by enabling citizens with different levels of technical proficiency and digital literacy to interact with government services. This is especially crucial for underprivileged groups and marginalized communities.

(m) Citizen Centric Services

A citizen-centric approach is encouraged by user-centered design principles, which means that e-government services are customized to match the unique requirements and expectations of citizens [25]. Governments can offer more valued and relevant services by comprehending the preferences and expectations of their people. This raises citizen satisfaction levels and propels e-government initiatives toward success by making them more user- and citizen-centric.

(n) Feedback and Iteration

Gathering user input is encouraged by user-centered design in order to continuously enhance digital led government initiatives. To make sure that the services are continually changing to meet the changing requirements and expectations of residents, government agencies might employ user input to improve and broaden their offers. Programs for e-government are made more successful and long-lasting by using this iterative method.

(o)Cost Savings

Even though user-centered design and accessibility may require a large upfront expenditure, they

frequently result in long-term cost benefits. Governments can cut down on customer assistance and expensive retrofits by developing services that are simple to use and available right away. The general effectiveness of e-government projects is influenced by this efficiency.

(p) Compliance with Regulations

All citizens must be able to access government websites due to laws and regulations in many countries. In addition to guaranteeing legal compliance, following these rules via user-centered design also shows a dedication to equity and diversity.

(q)Citizen Engagement and Feedback Mechanisms

Effective e-government initiatives must include methods for citizen interaction and feedback. They are essential in promoting accountability, openness, and responsiveness to the concerns of the populace. We will now examine the successful integration of these components into e-government projects [26]. The following factors must be taken into account when evaluating public involvement and feedback mechanisms for e-government services.

(r) Online Questionnaires for Feedback

Online surveys and feedback forms are widely used in e-government platforms to gather citizen opinions, suggestions, and complaints [26]. Through these channels, residents can directly express their concerns and provide feedback on the services provided by the government. Effective e-government initiatives make use of this data to raise service standards and quickly address public concerns.

(s) Interactive Online Portals

Interactive parts on e-government portals allow citizens to actively engage in the policymaking procedure of the government. Discussion boards, crowdsourcing websites, and idea submission portals are a few examples of these [26]. With the aid of these tools, citizens can participate in policy debates, offer suggestions, and work together on a range of initiatives with government organizations. Citizens can now actively and directly participate in the creation of public policy thanks to digital services by the administration.

(t) Social Media Engagement

Social media platforms have been used by numerous governments to communicate with their constituents. Public announcements, interactive Q&A sessions, and citizen outreach are all done through social media [26]. Social media is an efficient way for governments to share information and get input since it enables them to interact with a large audience in real time.

(u) Clear and Accessible Data

Efforts for transparency are frequently associated with e-government efforts, in which public access to a variety of government databases is provided. Government information is available to the general public, academics, and the corporate sector through open data websites. This information can be utilized to evaluate government performance, spot trends, and create novel solutions. By facilitating knowledgeable conversations and data-driven decision-making, this encourages public engagement.

(v) Public Consultations and Town Hall Meetings

Effective e-government initiatives frequently hold virtual or in-person town hall meetings and public consultations. Citizens have the chance to voice their opinions on significant decisions and policies during these gatherings. The input gathered from these meetings is used by e-government efforts to modify their plans and make better decisions.

(w) System for Resolving Complaints

There are many e-government systems that allow citizens to report problems and ask for help. This might include everything from reporting issues with government services to asking for help navigating bureaucratic roadblocks. Programs that are successful make sure that citizens' complaints are handled quickly and they get answers on time.

4.0 Discussion
4.1 Lessons Learned from E-Government Success Stories

Global e-government program success stories provide insightful insights and optimal methodologies that might steer the creation and execution of analogous endeavors. Strong political will and leadership are among the things that have been learned. E-government projects that are successful frequently include dedicated leadership that places a high priority on digital transformation. In order to secure financing, get past bureaucratic obstacles, and establish a clear vision for e-government initiatives, political will and high-level support are essential. Transparency and open data are two more lessons to be learned from the accomplishment of digital government. A key component of effective digital led government initiatives is transparency. Public access to government data is made possible by open data rules, which promote transparency, trust, and data-driven decision-making. More importantly, following data protection laws and guaranteeing the security of citizen data are crucial. To keep the public's trust, e-government initiatives must emphasize data privacy and make significant investments in strong cyber security measures.

4.2 Countries that have made Significant Progress in Bridging the Digital Divide Gap

An in-depth analysis of individual situations is necessary to analyze particular nations or areas that have made notable strides toward closing the digital gap through e-government initiatives. Estonia, Singapore, South Korea, Rwanda, and Taiwan are the nations that have improved e-government services and closed the digital gap, according to the literature now in publication.

Estonia

Estonia is frequently recognized as a global pioneer in e-government efforts aimed at closing the digital gap. There are a number of important reasons why Estonia's e-government initiative has been successful [27]. First off, since the creation of an ambitious strategy for e-governance development in the late 1990s, Estonia has demonstrated a strong commitment to digital innovation. They have developed a safe digital identity system for inhabitants, guaranteeing that any inhabitant can access a range of e-services. This includes initiatives like e-health, e-voting, and e-residency, which have greatly increased public service accessibility [28]. Additionally, Estonia's initiatives in the fields of digital literacy and education have been crucial in guaranteeing that its people can efficiently use e-government services, especially in far-flung rural areas according to [27].

South Korea

A number of elements, including a strong ICT infrastructure and strategic policies, have contributed to South Korea's success in closing the digital gap through e-government initiatives [29]. Due to significant investments made in high-speed internet infrastructure, broadband access is now widely available in South Korea. Their e-government projects were based on this. Through a variety of digital channels, the Korean government also actively involves its citizens, giving them access to public services, letting them ask questions, and letting them take part in decision-making [29]. Furthermore, as part of its dedication to digital inclusion, South Korea has implemented comprehensive digital literacy initiatives for all age groups, guaranteeing that e-government services are accessible to even the elderly [29].

Singapore

A number of elements, including as strong ICT infrastructure, user-centric design, digital literacy initiatives, and deliberate government policies, have contributed to Singapore's achievement in closing the digital divide. E-government initiatives have successfully improved government-led services [30]. The government of Singapore has taken the lead in efforts to close the digital divide. The government's 2014 introduction of the "Smart Nation" project is a prime example of its dedication to use technology for the well-being of its people [30]. The objectives of this project are to establish a digital economy, digital government, and digitally engaged society. Leading the way in e-government services and digital

solutions, Singapore ensures that all of its citizens have rapid access to public services and minimizes gaps in government resource availability.

Furthermore, Singapore has primarily prioritized user-centric design. Singapore prioritizes user-centric design, resulting government services that are accessible and easy to use for individuals of all ages and backgrounds [30]. The creation of user-friendly interfaces, which make it simple for users to use digital services, is given top priority by the government. Singapore has made e-government services user-friendly and inclusive by taking into account the requirements and preferences of its inhabitants.

Digital literacy and skills have also been attained in Singapore. Singapore actively encourages its residents to be digitally literate. To guarantee that people of all ages are adept at using digital technology, the government provides a range of programs and training initiatives [30]. This strategy not only closes the digital divide but also gives citizens the tools they need to efficiently utilize e-government services and engage in the digital economy.

Strong e-government services have helped Singapore attain digital inclusion as well. The government of Singapore actively seeks to involve everyone in its digital transformation [30]. Vulnerable and marginalized groups are included in this. To guarantee that elderly and people with low incomes can use digital resources and engage in the digital society, a number of subsidies and programs are in place. The Infocomm Accessibility Centre is one of the government-backed initiatives aimed at improving technology accessibility for those with impairments [30]. A comprehensive strategy that includes user-centric design, strong ICT infrastructure, government-led efforts, digital education programs, data security, digital access, and public-private partnership has allowed Singapore to successfully bridge the digital divide. This strategy has decreased the digital divide and established Singapore as a global leader in using technology to enhance the quality of life for its people [30].

Rwanda

Rwanda's efforts to close the digital divide through e-government initiatives demonstrate how underdeveloped countries might advance. Rwanda has advanced significantly in spite of major obstacles, such as inadequate infrastructure and resources [31]. They've taken a comprehensive strategy, utilizing mobile technologies to bring e-government services to underserved and remote places. The government's dedication to digital inclusion is demonstrated by programs like the Smart Kigali project, which aims to give every resident access to the internet [31]. Rwanda's example also highlights the value of collaborations with foreign organizations and donor agencies in order to get over financial obstacles and promote advancement.

Taiwan

One nation that has been able to bridge the digital divide is Taiwan, which offers universally accessible e-government services. Through a complex strategy that includes infrastructure development, government laws, digital literacy initiatives, and a strong focus on equal access to technology, Taiwan has achieved tremendous progress in bridging the digital divide [20]. Taiwan has made a lot of progress toward several goals. Taiwan, for instance, boasts a strong ICT infrastructure. One of the key reasons Taiwan has been successful in narrowing the digital gap is its state-of-the-art ICT infrastructure [20]. The nation has made significant investments to create nationwide broadband coverage, even in rural and underdeveloped areas, and to build high-speed internet networks. One of Taiwan's main initiatives to guarantee that all residents have access to digital materials and online services is the development of its infrastructure [20].

Taiwan has also made significant progress in improving government projects. With its e-government programs, Taiwan's government has been instrumental in closing the digital gap. The goal of the early 2000s-launched Taiwan Digital Government program is to give the populace quick and simple access to a variety of state services [20]. Services pertaining to healthcare, education, taxes, and other topics are included in this. Citizens, particularly those living in rural locations, now have more convenience as fewer in-person visits to government offices are required thanks to the government's online provision of these services [20].

Furthermore, they have been heavily incorporated into schooling and all digital facets. Taiwan has taken the initiative to advance digital literacy and make sure that all of its residents, especially the elderly and underprivileged, are equipped with the knowledge and abilities needed to access and make

use of digital resources [32]. The government has initiated several digital literacy programs, providing materials and training to assist individuals of all ages in mastering the use of technology. With the help of this strategy, residents are now better equipped to utilize digital services provided by the government and engage with the digital economy.

Digital government projects in Taiwan have also led to the achievement of community connectedness [32]. Taiwan has concentrated on community-based projects in addition to national-level ones to provide broad access to digital resources. Local towns have built Digital Opportunity Centers and other programs that give access to computers and the internet, especially for individuals who might not have this at home [32]. In addition, these centers provide assistance and training in digital skills, opening doors for people who might otherwise be left behind in the digital age. The effectiveness of public-private partnerships has been improved. Taiwan has accelerated efforts to reduce the digital divide by utilizing public-private partnerships. Innovative technology and services have been developed as a result of cooperation between public and private sector organizations [20]. This collaboration has improved the nation's overall e-government performance by increasing the availability of online services.

Improving fair access is another significant achievement made possible by the digital divide in Taiwan. Fair access to digital resources is a top priority in Taiwan. Regardless of socioeconomic background or geography, the government has made efforts to guarantee that all residents can benefit from e-government initiatives [20]. This strategy has assisted in lessening differences in digital use and access.

Taiwan's success in closing the digital divide through e-government projects is a result of an all-encompassing approach, which includes community-based connectivity, government policies, infrastructure development, digital literacy initiatives, and a dedication to equal access. Through these efforts, Taiwan has become a pioneer in the global digital environment, decreased the tech gap, and improved the general life worth for its residents.

United States

It has taken a multipronged approach involving community involvement, corporate sector initiatives, and government legislation to close the tech gap in the US. The U.S. government has been instrumental in mitigating the digital gap by means of government-led projects such as the "Connect America Fund" and the "Rural Digital Opportunity Fund" [33]. Telecommunications firms are given funds by these efforts to extend broadband infrastructure to underserved and rural areas. The Federal Communications Commission (FCC) strives to guarantee that all citizens of the United States have access to reasonably priced, fast internet [34]. In order to address infrastructural inequities, several government initiatives are essential.

The U.S. government has been able to advance community broadband plans by improving e-government services. Many localities have launched local broadband programs in an attempt to take issues into their own hands. In certain places, municipal broadband networks have been established to guarantee that locals have access to reasonably priced high-speed internet [33]. These neighborhood-based initiatives are especially crucial for closing the digital divide in areas with low private sector investment.

The e-government services have improved the digital inclusion diagrams in the United States. The goal of numerous non-profit organizations and digital inclusion initiatives in the US is to give low-income individuals and families access to affordable gadgets and training in digital literacy. For instance, initiatives such as EveryoneOn seek to provide underprivileged communities with digital resources and skills. These programs give people the tools they need to become digitally literate so they can use internet resources and services.

The U.S. government has been able to advance and strengthen education activities through e-government initiatives. Internet access is essential for learning. Schools have attempted to give pupils access to the internet and devices for remote learning in an effort to close the digital gap. The goal of programs like "ConnectED" is to provide high-speed internet access to schools for 99% of American students. Following infections such as the corona virus, which brought attention to the effects of the digital divide on education, these initiatives have become even more crucial [34].

By providing government assistance for its citizens' cheap access, the U.S. government has also

strengthened its e-government effort. The FCC launched the Lifeline program, which offers low-income households financial assistance to help with internet access costs [34]. Making sure that those who are economically challenged may afford an internet connection is made possible in large part by this initiative. Furthermore, the United States government has spearheaded programs to improve broadband data collection and mapping. The United States has upgraded its broadband mapping and data collection activities in order to effectively combat the digital divide. Precise data gathering facilitates the identification of areas in need and focuses efforts on those without internet access.

4.3 Challenges Facing Governments when Trying to Enhance E-Governments

Attempting to bridge the digital gap by implementing e-government programs presents a number of obstacles for governments. These difficulties may differ based on the infrastructure, other contextual elements, and the nation's degree of development. Infrastructure discrepancies are one of the difficulties governments encounter when attempting to establish and improve e-government services [35]. Addressing infrastructure inequities is one of the biggest problems that governments face, particularly in nations with sizable rural or distant populations. It can be expensive and time-consuming to build and extend ICT infrastructure, such as broadband networks. To guarantee that even rural places have internet connectivity and can take use of e-government services, governments need to invest in infrastructure development [35]. The population's low level of digital literacy and proficiency is another issue. A crucial strategy to close the technology gap is to encourage people to be digitally literate [36]. It is possible that many people, particularly in poor nations, lack the skills needed to efficiently access and use government technology services. To guarantee every person, particularly the elderly and underprivileged groups, are adept at using digital technology, governments must fund digital literacy initiatives.

In their efforts to close the digital divide, governments face additional challenges related to accessibility and diversity. It is imperative for governments to guarantee that its digital services are user-friendly and accessible to all, including those with impairments [37]. It is crucial to create accessible, user-friendly interfaces and offer other content formats. It is a difficult but crucial task to make sure that people with special needs do not experience a wider digital divide. Furthermore, privacy and trust become issues for a lot of governments worldwide. Establishing citizen trust is essential to the success of government digital initiatives [35]. Data privacy and safety concerns are widespread, and governments need to put strong safeguards in place to protect citizens' private information. Participating in e-programs might be difficult due to the potential erosion of public trust caused by data breaches and privacy concerns.

The expense of access is another issue. For low-income individuals and families, the expense of internet connectivity can provide a substantial obstacle, even in situations where infrastructure is present [35]. It is difficult to guarantee affordable access, and in order to do so, governments frequently need to put in place subsidy programs or joint ventures with internet service providers. Another difficulty is overcoming bureaucratic and political obstacles. Initiatives for e-government frequently need political support and the ability to get over administrative roadblocks. Long-term e-government initiatives may be hampered by political unrest or leadership changes, government agencies' resistance to change, and other factors. It can be difficult to maintain a constant and forward-thinking approach [35].

One of the challenges that numerous governments worldwide encounter while attempting to execute crucial programs aimed at bridging the digital divide is the inclusivity of excluded groups [35]. Ensuring that e-government projects reach excluded groups—such as those living in poverty or in distant areas—can be especially difficult. Additional obstacles that these groups can encounter include restricted access to technology and linguistic hurdles [35]. Developing programs to specifically address these kinds of problems necessitates a thorough comprehension of the populations involved. Additionally, there are populations that are resistant to change in several regions of the world. As a result, governments struggle to put new policies into place that support e-government services [35]. Adoption of digital government services is somehow impeded by opposition or refusal to change among citizens and government employees alike. It may be difficult to acquire widespread adoption of digital platforms because people may be reluctant to switch from conventional, paper-based practices [35].

5.0 Conclusion and Recommendations/outlooks

5.1 Conclusion

To sum up, e-government success measurement is a multifaceted topic that incorporates both qualitative and quantitative assessment techniques. It assesses the cost-effectiveness, digital inclusion, citizen participation, satisfaction with services, quality of services, and interoperability. These metrics assist governments in making well-informed decisions that will strengthen public service delivery, advance e-government projects, and guarantee all goals of digital government are met. Utilization and comprehension of these metrics are crucial to the growth and continued success of digital government initiatives.

For e-government programs to succeed, hardware accessibility and broadband connectivity are essential components of the technological infrastructure. It acts as a channel for citizens to communicate with their governments and receive digital government services. Enough hardware and broadband connectivity, along with attempts to raise digital literacy, guarantee that e-government projects are inclusive and beneficial to all members of society. To provide safe, effective, and easily available e-government services, governments need to make significant investments in and uphold a strong technology infrastructure. This will assist reduce the technology gap and advance digital inclusion.

The accomplishment of digital government initiatives relies on critically on the dedication and government leadership. These projects are based on political will and policy backing, which also provide resources, set their strategic direction, and provide a favorable legal and regulatory framework. Driving cultural change, fostering digital inclusivity, fostering public trust, and enabling the adaption of e-government programs in response to evolving technology and citizen requirements all depend on strong leadership. In the end, the efficiency of digital government services is a direct result of the devotion and hard work of all levels of government officials.

The success of e-government services is largely dependent on features like accessibility and user-centered design. These guidelines improve user experience, encourage digital inclusiveness, and put citizens at the center of services. They also support cost reduction, regulatory compliance, and the ongoing advances of digital government projects. E-government programs are more successful in accomplishing their objectives and successfully serving their constituents when governments give citizens' needs top priority and increase the accessibility of digital services. Effective e-government initiatives require feedback mechanisms and citizen interaction. They offer avenues via which people can communicate with their government, offer input on policies, express their concerns, and take part in the policymaking process. E-government initiatives become more responsive, responsible, and citizen-centric when citizens are actively involved and their feedback is taken into consideration. This eventually leads to the programs' effectiveness in enhancing governance and public service delivery.

Governments have made tremendous progress in bridging the digital gap by combining user-centric design, digital literacy initiatives, infrastructure development, and public-private collaborations. Through these initiatives, residents can now participate in the digital era and receive government services, even in rural and underdeveloped locations. Well-defined policies and a strong commitment from the government have been essential to the success of e-government programs. Furthermore, strong data security protocols and openness have protected citizens' confidence and privacy. Governments have accomplished noteworthy improvement in decreasing inequality in digital access and promoting digital inclusion by emphasizing fair access.

There are many things that other nations can learn about the significance of e-government efforts. E-governments, first and foremost, have the potential to greatly increase citizen engagement and participation in governance. Governments may encourage accountability, responsiveness, and transparency by providing easy-to-use services. Second, the digital revolution can simplify government

processes and resource allocation, resulting in more effective and economical public administration. As a result, citizens may experience less administrative burdens and improved provision of services.

Moreover, the implementation of digital government programs acts as an important role in enhancing digital literacy and skill improvement, enabling people to engage in the digital economy. Successful nations' experiences demonstrate how collaborations between the public, business, and civil society sectors may spur innovation and develop digital infrastructure. In the end, e-governments are significant because they have the ability to build societies that are more prosperous, inclusive, and equal. In order to guarantee that no citizen is left behind in the digital era, governments everywhere must embrace digital transformation and give bridging the digital gap top priority. This may be done by using the lessons learned from successful e-government models.

5.2 Recommendations and Outlooks

To tackle these obstacles, a holistic strategy is needed, encompassing investments in data security, education, infrastructure, accessibility, and a continuous focus on advancing digital inclusion. To get beyond these barriers and guarantee that e-government programs are available to and advantageous to all residents, governments must constantly modify their e-government plans.

Resolving infrastructure inequities is one of the problems that can be employed to address these issues. When governments use a phased approach, this is accomplished. This entails ranking the regions that require the development of ICT infrastructure the most [38]. When private corporations invest in infrastructure construction in exchange for incentives or subsidies, public-private partnerships can play a critical role. In order to more affordably reach remote places, governments should also investigate cutting-edge solutions like satellite internet or wireless technologies.

Promoting fundamental digital literacy is another strategy to handle the difficulty of deploying and phase-out e-government services. Governments ought to fund educational initiatives for people of all age [38]. Both community centers and formal school curricula can incorporate these programs. Public-private collaborations can be helpful by offering resources such as free or inexpensive digital literacy classes and reasonably priced equipment. Governments can also work with community organizations and non-governmental organizations to reach marginalized groups.

To ensure accessibility, governments should adhere to global accessibility standards and principles, such as the Web Content Accessibility Guidelines (WCAG) [39]. It is essential to test e-government platforms with disabled users in order to find and fix accessibility problems. To make e-government services truly accessible, governments can also enable assistive technologies and provide other content formats [39].

Establishing confidence in e-government programs is a continuous process. Governments ought to be open about how they handle data and implement security measures [38]. Cybersecurity procedures and robust data protection legislation are crucial. Third-party evaluations and routine audits can support data security. Building confidence can also be achieved by developing public awareness initiatives that highlight the government's dedication to security and privacy.

Governments can address the cost of access by enacting regulations, tax breaks, or subsidy programs that incentivize internet service providers to provide reasonably priced access plans [38]. To cut expenses, this can entail imposing price ceilings or promoting market competition. Reducing the financial burden on citizens can also be achieved by initiatives to increase free public Wi-Fi connectivity in both urban and rural regions.

Strong leadership and a dedication to e-government as a long-term plan are necessary to overcome bureaucratic and political obstacles [38]. To promote digital transformation throughout government departments, governments had to set up specialized e-government units or agencies. To overcome opposition to change, government stakeholders must be encouraged to collaborate and engage in open communication.

Governments should carry out in-depth studies and needs assessments for excluded groups in order to guarantee inclusion [40]. Programs ought to be designed with these populations' unique challenges in mind. E-government projects can be made more relevant to the communities they serve and culturally sensitive by working in tandem with community leaders and groups.

Governments should spend money on change management techniques to deal with opposition to change. This entails educating residents and government workers on the use of digital services, creating

incentives for early adoption, and providing user support. It is important to aggressively seek out user input and incorporate it into service enhancements. Campaigns for public awareness can also be used to highlight the advantages of digital government services in order to dispel doubt and promote uptake. Governments may reduce the technology gap and make sure that digital government projects are effective, inclusive, and accessible to all citizens by putting these methods into practice and continuously adjusting to the changing digital landscape.

6.0 References

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APPENDIX

Table A1. Summary of existing studies

Author(s)	Title	Aim of the study	Issues	Findings
[19]	E-Government Contribution to Better Performance by Public Sector	Contributions of e-government in relation to improving government performance	Improving public sector's performance through e-government	Governments are keen on improving their performance to gain more satisfied citizens and more supportive societies.
[8]	Experiences of persons with disabilities in accessing e-government services in Ghana.	Examine the experiences of the visually impaired in accessing E-government services in Ghana so as to inform political leadership and societal decisions towards improving inclusivity and accessibility of E-government services for PWD.	Persons with disabilities have difficulties in accessing government services.	Identified factors that lead to the exclusion of PWD from E-government services in developing countries.
[7]	Assessing the usability, accessibility, and mobile readiness of e-government websites: a case study in India	Investigate the usability, accessibility, and mobile readiness of Indian government websites.	There are many government websites that are not accessible. People have difficult in accessing these websites.	Not all government service websites were fully and useably accessible on mobile devices, and the majority of them did not adhere to the WCAG 2.0 accessibility requirements. Many of the websites had poor usability.
[23]	A Literature Review of Infrastructure Capabilities in Shared E-Government Concept	Literature analysis for the development of a shared electronic government (e-government) through IT infrastructure capability adoption.	Governments lack a comprehensive IT infrastructure that leads to access of government services by the government	The findings reveals that there are five capabilities of shared e-government concept utilized as guidelines for local governments to develop a shared e-government to reduce the budget of e-government development.
[14]	Digital Government for E-Government Service Quality	The investigation aims to synthesize related work in the field of e-Government service quality.	The concept of digital government remains an unexplored area.	The findings show an integrative view of 48 articles, classified in 28 investigations, which propose competitive models to assess e-Government service quality as a final dependent variable composed of different independent variables. The relevance of this work relies on an integrative view of these models that hardly existed before in the literature
[20]	Usability evaluation of e-government websites: A case study from Taiwan	To evaluate usability of current e-government websites in Taiwan.	Usability is not quite common in e-government websites.	The results indicate that a number of usability problems have been found in the target e-government websites.
[5]	Assessment of E-government inclusion policies toward seniors: A framework and case study	To identify the main determinants affecting the adoption of e-government and its use by seniors. To build a research framework for assessing e-government policy for the digital inclusion of the seniors from both social and technical perspectives	Digital exclusion of the elderly from government services.	Presented framework proves to be a useful tool to evaluate and depict the areas of improvement for a comprehensive e-government policy toward seniors' inclusion.

Author(s)	Title	Aim of the study	Issues	Findings
[21]	Using social media to enhance citizen engagement with local government: Twitter or Facebook?	To analyse the various forms of social media used – that is, Twitter or Facebook – by citizens in their relations with Spanish local government, to determine which of these achieves the strongest degree of commitment.	How can the government use social media to increase public participation.	Facebook is preferred to Twitter as a means of participating in local government issues.
[18]	Evaluation of Digital Transformation of Government: Russian and international systems of indicators	To analyse the system of indicators that the Russian government set for the digital reform and to compare this system to international evaluation systems and theoretical background.	Effect of government commitment to digital transformation	The analysis showed that the system of evaluation of e-government does not meet the requirements and even the proper values of all the indicators will not help to implement real digitalization
[16]	A comparative analysis of the e-government development index (EGDI)	To compare and contrast the EGDI results (and its principal components indicators) during the past ten years.	How effective has e-government initiatives been in the past 10 years	The study results show that there is a strong correlation between EGDI scores during the study period. Also, the results show minor changes in cluster membership, indicating that despite the apparent EGDI overall improvements for almost every UN Member State, the situation remains as before. The finds of this study will be of interest to both e-government academics and practitioners.
[26]	Citizens' e-participation on agenda setting in local governance: Do individual social capital and e-participation management matter	To develop and test a model proposing that three dimensions of social capital and three dimensions of citizen participation management should be positively associated with e-participation in agenda setting	How to gain public trust to increase participation by the public.	findings imply that local governments should pay more attention to the function of public trust in local government and provide quality feedback in response to citizen input
[10]	Research on the impact of digital inclusive finance on rural human capital accumulation: A case study of China	To build an analytical framework to explore the impact mechanism and differences of digital inclusive finance over the rural human capital accumulation regional levels	Assessing the impact of digital inclusiveness efforts by the government	development of digital inclusive finance and the expansion of the breadth of coverage, and usage of digital inclusive finance can significantly enhance the accumulation of rural human capital
[12]	Does digital inclusive finance promote agricultural production for rural households in China? Research based on the Chinese family database (CFD	To clarify whether farmers' enthusiasm is increased and achieved through digital finance inclusion.	Assessing the impact of digital inclusiveness efforts by the government	The negative effect of digital inclusive finance on households' agricultural output is realized by widening the gap between the efficiency of non-agricultural economic activities and the efficiency of agricultural production
[13]	E-government success assessment from a public value perspective.	Organizational performance and environmental sustainability are investigated as the two main dimensions of e-government public	The government's intent to engage and implement e-government models to enhance organization participation and environmental sustainability.	Findings show that an intention to use the taxation system and user satisfaction lead to public value measured by organizational performance and environmental sustainability

Author(s)	Title	Aim of the study	Issues	Findings
		value in relation with the three quality variables, intention to use and user satisfaction		
[24]	The Moderating Impact of Perceived Leadership Commitment on the Adoption of E-Government Services	To examine the moderating effect of leadership commitment on the impact of infrastructure availability, financial capacity, literacy, and government policy and regulation toward the adoption of e-government	Does leadership affect the adoption of e-government services.	The results showed that while leadership commitment significantly moderated the impact of infrastructure availability, finance capacity, and government policy and regulations on the perceived usefulness of e-government, its moderating effect on education/literacy on the perceived usefulness of e-government was not significant. Infrastructure, finance capacity, literacy, and government policy and regulations were significant predictors of e-government usefulness.
[22]	Critical success factors for e-Government projects: The case of Botswana	To investigate success factors of e-government projects.	What are the critical success factors for e-Government in Botswana	Seven critical success factors were derived as the critical success factors for e-Government in Botswana
[9]	Digital adoption: The need for truly inclusive e-government services	to understand assistance seeking behaviours, through testing a conceptual framework on a case study of the Australian Taxation Office.	Is there a need for digital adoption by the government?	highlights the importance of understanding individuals' assistance-seeking behaviours, as well as the non-digital lodging population
[6]	Accessibility analysis using WCAG 2.1: evidence from Indian e-government websites	To evaluate the accessibility of Indian e-government websites	Most government websites are not accessible.	designers and developers of e-government websites should pay due attention to the accessibility features during the design and development of these websites to achieve universal accessibility.
[25]	User centric E-government.	To evaluate if e-government systems are in line with different work practices	There are challenges when citizens do not have access to e-government services.	System design for e-governmental applications is inherently a complex process but a crucial one
[11]	An officious impact of financial innovations and ICT on economic evolution in China: Revealing the substantial role of BRI	To assess the dynamic impact of ICT, economic globalization, and financial innovation on China's economic growth.	Is ICT a crucial factor in development. Should governments implement e-government for public services?	ICT has a positive affiliation with economic growth in China. In addition, financial innovation has also shown a direct impact on economic growth