The Role of the Digital Divide in Navigating E-Government Services: Insights from Egypt. A Conceptual Framework

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Abstract

This study examines the challenges governments encounter in implementing effective digital government services, with a focus on how the digital divide influences e-government performance. We propose a theoretical framework that identifies the key determinants of the digital divide—including access disparities, skills gaps, and socioeconomic barriers—and their consequential impacts on e-government outcomes. The framework elucidates the mediating role of the digital divide in shaping citizen engagement, service convenience, and citizen satisfaction. Using Egypt as a case study, we assess the country's e-government initiatives, their international recognition (as reflected in indices such as the GovTech Maturity Index and E-government development survey), and the empirical strategies employed by the Egyptian government to mitigate digital inequalities. By integrating global benchmarks with localized

policy responses, this study contributes to the discourse on inclusive digital governance and offers insights for policymakers seeking to enhance e-government performance while addressing digital exclusion.

Keywords

E-government. Digital divide. Egypt. Citizen engagement. Citizen satisfaction. Service convenience.

الملخص

تتناول هذه الدراسة التحديات التي تواجهها الحكومات في تنفيذ خدمات حكومية رقمية فعالة، مع التركيز على كيفية تأثير الفجوة الرقمية على أداء الحكومة الإلكترونية. نقترح إطارًا نظريًا يحدد العوامل الرئيسية المسببة للفجوة الرقمية، بما في ذلك تفاوتات الوصول، والفجوات المهارية، والعوائق الاجتماعية والاقتصادية، وتأثيراتها المترتبة على نتائج الحكومة الإلكترونية. ويوضح الإطار الدور الوسيط للفجوة الرقمية في تشكيل مشاركة المواطنين، وملاءمة الخدمات، ورضا المواطنين. باستخدام مصر كدراسة حالة، نقيم مبادرات الحكومة الإلكترونية فيها، والاعتراف الدولي الذي حظيت به (كما يتجلى في مؤشرات مثل مؤشر نضج تقنية الحكومة واستطلاع تنمية الحكومة الإلكترونية)، والاستراتيجيات التطبيقية التي اتبعتها الحكومة المصرية لتخفيف أوجه عدم المساواة الرقمية. من خلال الجمع بين المعايير العالمية واستجابات السياسات المحلية، تساهم هذه الدراسة في النقاش حول الحوكمة الرقمية الشاملة، وتقدم رؤى لصانعي السياسات الذين يسعون لتعزيز أداء الحكومة الإلكترونية مع معالجة الإقصاء الرقمي.

الكلمات المفتاحية

الحكومة الإلكترونية. الفجوة الرقمية. مصر. مشاركة المواطنين. رضا المواطنين. ملاءمة الخدمات.

1- Introduction

A vast number of technology innovations have developed over the past decade, prompting government authorities, social communities, and business organizations to transform their values and core systems (Liu & Kim, 2018). According to Tangi et al. (2021), governments are among the top organizations using these technologies and switching to electronic government, or e-government, which changes the public services systems. E-government is a global phenomenon that affects people, professionals, scholars, and companies. It administers and provides public services at all levels of the nation by utilizing information and communication technology, or ICT (Carter et al., 2022). E-government platforms are increasingly being used by governments as a vital tool for communicating with their citizens and providing public services. To increase citizens' trust and satisfaction with government performance, digital public services are essential. Additionally, using digital platforms to offer public services makes them easier and more comfortable (Hartanti et al., 2021).

However, this digital transformation in the public sector occurs within a context of digital inequalities, whether in developed or developing nations. Disparities in access to and use of digital technology for a range of purposes are referred to as the "digital divide" (Venkatesh & Sykes, 2013). The literature on the digital divide has been extensively studied in relation to the adoption of technology (Vassilakopoulou & Hustad, 2023).

Although researchers have emphasized the need for an integration between the digital divide concerns and e-government adoption and usage models, research on the digital divide and e-government has been investigated as two distinct study streams (Carter et al., 2016; Helbig et al., 2009). A complex paradox is created when e-government collides with the digital divide; despite all the beneficial outcomes of digital public service, it can create novel levels of exclusion nationwide. Essential government services that have migrated online may be inaccessible to citizens with low digital skills or no access to digital technology, which might lead to a two-tiered public service delivery system (Ranchordas, 2021). According to Botrić and Božić (2021), e-government development can improve public services, but it also has a dual character that can empower certain groups while making inequality worse for others. E-government projects run the danger of escalating social exclusion rather than promoting inclusion if some groups do not have access to digital technologies.

This conceptual paper examines the digital divide impact from the customer (i.e., citizen) perspective, by showing how the digital divide affects citizens' perception of e-government services' convenience, citizens' satisfaction, and engagement. Moreover, this study uses secondary data from national reports and international indices to show case e-government performance

in Egypt and examples of some of the mechanisms that Egypt adopts to bridge the digital divide.

2- Research problem and objective

Egypt's ongoing digital transformation is engineered to adapt to the digital era, to reach tangible public value for the citizens and the economy. The Egyptian government's vision for "Digital Egypt" is based on the values of inclusion, accessibility, and sustainability. Over the past years, the government has extended secure, connected government platforms, improved digital services, and increased infrastructure expenditures to promote digital equity for all residents. The ongoing growth of the Digital Egypt platform has been a significant milestone in making government services more streamlined, accessible, and user-centric. The platform currently provides an expanding range of digital services that improve transparency and efficiency. In addition, many mobile applications have been implemented to improve public service delivery, resulting in easier and more convenient interactions for residents (MCIT, 2025).

While digital platforms improve efficiency, it is acknowledged that not all citizens use technology in the same way. The multi-channel strategy guarantees that services are available via online platforms, in-person support at post offices and service sites, and alternate delivery options for individuals who require them. This balance of digital-first but not digital-only is critical to our objective of making government services

simpler, efficient, and generally available. Digital transformation, however, goes beyond connectivity. It is about providing every person, regardless of background, with the tools, skills, and access necessary to succeed in a technologically advanced environment. To close the digital gap, the government invested extensively in broadband expansion, fiber-optic networks, and improved mobile connections, with a particular emphasis on rural and underserved areas (MCIT, 2025).

Egypt's digital vision aims to enhance the public service convenience, citizen satisfaction, and engagement, which aligns with the theoretical stream of research in e-government, that the main outcomes of e-government are service convenience, citizen satisfaction, and citizen engagement (Fathya et al., 2023; Weigl et al., 2024; Wu et al., 2024). Nevertheless, the Egyptian government acknowledges the vital role that the digital divide plays in achieving those objectives and employs action plans to overcome digital divide barriers.

The current study aims to articulate a theoretical framework that aligns with the "Digital Egypt vision" to provide theoretical evidence of some of the vision pillars. More particularly, it aims to answer two questions

RQ1. What are the main determinants of the digital divide?

RQ2. How digital divide influence citizen engagement, citizen satisfaction, and service convenience?

1- Theoretical Framework

3-1 E-government

The use of information and communication technology (ICT) in conventional government processes to convert them into digital public services is known as electronic government, or e-government (Malodia et al., 2021; Reddick, 2011). Platforms offered by e-government make it easier for citizens to access and use the different governmental services and information domains (Wu et al., 2024). Governments have unprecedented opportunities to serve the public and many stakeholders more effectively (Alshehri et al., 2012; Dawes, 2009). E-government created social effects and public benefit while changing how citizens and different governmental organizations interacted (Chan et al., 2025; Zyzak et al., 2024). The use of e-government has been shown to be advantageous; it raises public trust in the government, increases accessibility and convenience, and improves the quality of public services. E- government saves individuals time and effort by enabling them to quickly and easily undertake public service transactions from home or other locations using their personal computers or mobile devices (Chan et al., 2025; Panagiotopoulos et al., 2019).

3-1-1 E-government and digital divide

Rather than being a binary construct, the concept of digital divide has been recognized as a multidimensional construct. Van Dijk & Hacker, (2003) identified four possible forms of digital

inequalities: 1) physical/material access to digital/ICT technologies (e.g., device ownership, connection), 2) psychological access which is the motivation and interest to use digital technologies, 3) usage access that refers to the beneficial usage opportunities, and 4) skill access, which is disparities in technology users' operational competences and capacity for efficient use (Van Deursen & Van Dijk, 2014, 2019). The "digital divide" is characterized by the concerning disparity in access to and utilization of digital technologies (Khan et al., 2012). The difference between those who can access and utilize digital infrastructure and those who cannot or only have restricted access (Venkatesh & Sykes, 2013).

Many public administrations continue to prioritize infrastructure transformation in spite of these worries, and research on the adoption of e-government frequently ignores the context and variety of digital public services, viewing them as a generic phenomenon (Lindgren et al., 2019). While e-government has many advantages, it also poses risks by widening the digital divide, further disadvantageously affecting already marginalized groups, and strengthening social inequality mechanisms. According to the United Nations (2022), digital inequality is the new face of inequality (Morte-Nadal & Esteban-Navarro, 2025).

Research on the digital divide initially concentrated mostly on examining the sociodemographic aspects associated with

place of residence, income, gender, and education being the primary determinants of the digital divide (Pérez-Morote et al., 2020; Venkatesh & Sykes, 2013). Nonetheless, sociodemographic status is still seen as a key predictor of the digital divide in recent studies about e-government (Harvey et al., 2023; Vassilakopoulou & Hustad, 2023). However, recent studies have brought attention to how the digital divide affects how people use and perceive e-government (Patergiannaki & Pollalis, 2024; Tran Pham & Le Hoang Thuy To Nguyen, 2024). As a result, the present study will look at how digital inequalities affect citizen satisfaction, service convenience, and citizen engagement. Moreover, most of the empirical work on digital divide was conducted in developed countries; however, integrating digital divide to investigate e-government in developing countries can provide critical insights to understand the barriers and challenges that face e-government success (Bakon et al., 2020). As illustrated in figure (1) that also articulates the research conceptual framework.

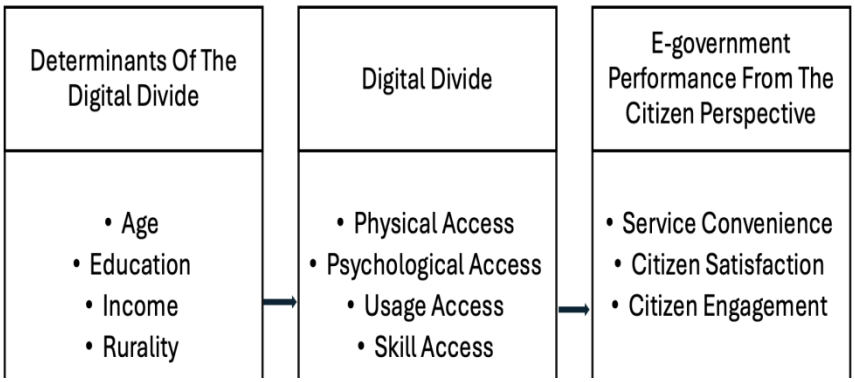

Figure (1) conceptual framework.

3-2 Determinants of the digital divide

Sociodemographic factors, including income, age, education, geographic location, and infrastructures' access all have a significant impact on the digital divide. The literature shows that disparities in digital access, influenced by factors such as income, age, and education, have a significant impact on citizens' ability to benefit from and use e-government services (Harvey et al., 2023; Vassilakopoulou & Hustad, 2023). For example, individuals with higher income levels have more access to ICT resources, including more dependable internet connections. Education aids in the development of digital skills, the reduction of digital anxiety, and the possibility for individuals to adapt to and navigate diverse e-government systems. The greater the wealth and educational level, the better they bridge the digital divide, resulting in less apparent digital inequality (Dodel, 2024; Pérez-Morote et al., 2020).

3-2-1 Age

Age is a demographic variable that has been investigated in the literature to indicate individual disparities in the digital divide and technology adoption. This is because, on average, older people are less likely to use ICT than younger people. Thus, taking age disparities into account is crucial for completely understanding the digital divide. The age-related digital gap is based on the inequalities between individuals who were born and raised with ICT and those who were not (Masadeh et al., 2023; Pazmiño-Sarango et al., 2022).

3-2-2 Education

Several education-related criteria, such as adult literacy level and schooling years, have been widely employed in the literature to describe nations' digital progress. Education can also help to explain e-government progress. The reasoning behind this is that more highly educated people are more likely to use ICT tools for daily and professional activities, including e-government services. People in developing nations with greater levels of education are more likely to have access to ICT tools, such as a personal computer. Nonetheless, in the previous decade, the advent and availability of lower-cost mobile technology have helped to minimize the gap in ICT usage between different levels of schooling (Masadeh et al., 2023; Pazmiño-Sarango et al., 2022).

3-2-3 Income

The literature has extensively examined the relationship between sociodemographic variables and ICT adoption, concluding that wealthier nations as well as people are more likely to be among the first to adopt technological advances. In the e-government area, current economic disparities between nations are connected with the level of e-government advancement, implying that developed countries outperform underdeveloped countries in terms of e-government service development. GDP is the most commonly employed and preferred economic indicator in studies assessing the digital divide and e-government development among nations. GDP can be considered a clear and accurate indicator of a country's economic strength, making it an excellent indicator for country-level comparison studies. However, GDP figures are not accessible for municipalities, cities, or at the individual level. As a result, some research uses individuals' monthly or annual income as an indicator for the economic level (Pazmiño-Sarango et al., 2022).

3-2-4 Rurality

It appears logical to predict that a region's rurality, as measured by population density, is a significant driver of ICT usage. High-density communities are more likely to accept technological breakthroughs than less densely populated places because higher population density makes it simpler to interact,

and innovation is more visible. In recent years, Internet connections have spread to remote areas, including developing countries, reducing the digital divide in terms of access to ICT among countries. However, in underdeveloped and developing nations, Internet service availability and digital infrastructures may still be limited in rural and remote places. As a result, it is projected that e-government services would be less developed in geographically rural areas (Pazmiño-Sarango et al., 2022; Wen et al., 2023).

3-3 Digital divide and E-government performance from the citizen perspective

3-3-1 Digital divide and service convenience

Service convenience is referred to as citizens' assessment of the time and efforts necessary to use e-government services, which is consistent with Berry et al. (2002)'s definition of convenience as customers' perceived time and effort to commence service delivery. The omnipresent flexibility and accessibility that individuals may have through digital service channels is referred to as service convenience (Chan et al., 2021). The ability to access governmental services at any time and location without having to speak with a public servant is known as e-government convenience (Lindgren et al., 2019). One of the most important factors and favorable predictors for using e-government is convenience (Hujran et al., 2023).

Time reduction, accessibility, and simplifying procedures, is a fundamental argument for e-government initiatives. However, digital disparities transform convenience into hierarchical privilege. For digitally excluded people, e-government services turn physical access restrictions into digital navigation problems that frequently elevate costs for transactions. The skills-convenience nexus highlights how literacy inequalities reduce service efficiency. For example, elderly and low-literacy users expend much more cognitive effort navigating complicated interfaces, encountering dissatisfaction, and transaction abandonment (Bokšová et al., 2021; G. C. et al., 2024).

Research on the digital gap concentrates on proving how a smaller digital divide, as well as individuals' access to digital infrastructure and digital abilities, are positively related to e-government perception and use (Dodel, 2024; G. C. et al., 2024; Khan et al., 2012). Khan et al. (2012) found that ICT access and usage skills boost the intention and convenience of using e-government services. Bokšová et al. (2021) found that improved Internet access and ICT skills increase citizens' support for digital public services. Furthermore, more technologically savvy individuals are more inclined to use e-government (Ebbers & Jansen, 2016).

3-3-2 Digital divide and citizen satisfaction

Citizen satisfaction refers to citizens' satisfaction with the performance of e-government services based on their experience

and perception of service quality (Li & Shang, 2020). Citizen satisfaction is enlightening and critical for analyzing the efficacy of digital public services from people's perspectives. Citizen satisfaction has been identified as a critical driver of citizens' ongoing intention, trust, intention to use, perceived net benefits, continuous use, and adoption in the context of e-government (Fathya et al., 2023). Several studies have examined this relationship and shown that increasing public satisfaction with digital government services leads to positive outcomes (Kala et al., 2024; Ma & Zheng, 2019; Myint, 2022; Nookhao & Kiattisin, 2023; Pham et al., 2023).

Prior studies have examined the relationship between the digital divide and citizen satisfaction with e-government services (G. C. et al., 2024; Mesa, 2023). Malodia et al. (2021) identified the digital gap as a moderator that reduces e-government quality and user satisfaction. Ebbers and Jansen (2016) discovered that the more technologically skillful people are, the more satisfied their experiences are with digital public services. Furthermore, elevated digital skills as well as access to digital platforms foster public services conveniently by saving citizens their effort and time in using the digital services, which will ultimately increase their satisfaction (G. C. et al., 2024; Mesa, 2023).

3-3-3 Digital divide and citizen engagement

The literature has operationalized a vast number of definitions of citizen engagement (CE) (Siebers et al., 2019).

According to Tran Pham and Le Hoang Thuy To Nguyen (2024), two primary definitions of citizen engagement are used in the literature. First, CE explains how individuals recognize the validity of their government's policies and accept its authority and power (Asher et al., 2019). Second, CE is described as a process that includes the quantity and quality of interaction between people and pertinent government agencies; empirical research has mostly focused on this process-oriented definition (Tran Pham & Le Hoang Thuy To Nguyen, 2024). Notwithstanding differences in focus, these definitions all agree on the basic idea that the relationship dynamics between citizens and the government are at the heart of citizen engagement (Ekman & Amnå, 2012; Siebers et al., 2019). Interestingly, nevertheless, a large portion of the literature now in publication operationalizes citizen engagement mainly through metrics related to citizen acceptance or use of government services.

Moreover, Masadeh et al. (2023) demonstrated that Jordanian citizens' intention to use e-government was significantly influenced by three facets of the digital divide's dimensions, access, skills, and innovativeness. Access had the greatest impact, followed by the dimension of skills and, finally, the dimension of innovativeness. Robles et al. (2022) explored the rejection of e-government services in Spain, finding that age, gender, and education influence digital skills and online trust, which predict the rejection of online government engagement.

Martins & Al-Shekaili (2021) investigated the discrepancies in e-government involvement in Oman. Based on a nationally representative sample of users and families, they discovered that education, employment position, age, and digital abilities (the strongest predictor) all enhance the likelihood of using online government services. Finally, Gerpott & Ahmadi (2016) used a nationwide representative sample of German citizens to investigate household and individual predictors of e-government engagement. They discovered that young, less educated people with less regular Internet access, and those with lesser levels of digital abilities were less likely to use e-government services. The strongest predictors were digital skills, frequent Internet use, and education (Gerpott & Ahmadi, 2016).

2- The case of Egypt

Digital Egypt is a strategy and goal that provides the groundwork for Egypt's digital transformation, in line with the Egypt 2030 vision. The major goal is to improve residents' quality of life and promote e-government. The government is always attempting to improve digital services across all ministries and government agencies in accordance with Egypt's Vision 2030. Egypt's digital transformation plan aims to improve resident services through digitalization (MCIT, 2025).

Egypt provides digital public services through a variety of platforms, incorporating the Digital Egypt platform, mobile applications, and official websites from various government

units, as well as digital kiosks tactically located throughout the nation's public service agencies and major shopping malls. These many service channels are intended to improve people's convenience by making services more accessible and widely available. These platforms offer a wide range of public administrative services, such as court services, traffic management, commercial registration, real estate tax administration, civil status documentation, and notary services (MCIT, 2025).

4-1 Egypt's E-government global recognition

Egypt's position in Oxford Insights' Government AI Readiness Index has improved significantly over time, demonstrating the country's commitment to advancing AI initiatives. The Index ranks nations according to their preparedness to adopt AI in government functions. Egypt placed 62nd internationally in 2024, up three ranks from the previous year and 49 places from 2019. This accomplishment demonstrates the country's ongoing efforts to create an AI strategy and infrastructure. In the 2024 E-government Development Survey, Egypt ranks 95th. This ranking is based on three components: the online service index (OSI) score of 0.70, the Telecommunications Infrastructure Index (TII) score of 0.69, and the Human Capital Index (HCI) score of 0.61 (UN, 2024). GovTech Maturity Index (2022): The 2022 GTMI survey contained 40 revised or extended GovTech indicators that

assessed the maturity of four GovTech emphasis areas. Egypt is one of Africa's top government technology economies, with strong development in GovTech enablers. There is a greater emphasis on GovTech enablers (0.80), public service delivery (0.79), and core government systems (0.78), rather than citizen engagement (0.62) (The World Bank, 2022).

4-2 Bridging the digital divide mechanisms in Egypt

To close the digital divide, the Egyptian government invested extensively in broadband expansion, fiber-optic networks, and improved mobile connections, with a particular emphasis on rural and underserved areas. Bridging the digital gap is equally important as expanding infrastructure. Rural and underprivileged populations will have increased access to digital services, thanks to focused programs that ensure technology promotes education, healthcare, and economic prospects across the country. Egypt Post's continuous modernization will provide new solutions, transforming postal facilities into dynamic engines for financial inclusion, e-commerce assistance, and digital transactions, as well as bringing key services closer to residents across all areas.

Digital Inclusion

MCIT oversees digitization activities to close the digital gap and facilitate a transition to a digital society, with an emphasis on improving ICT accessibility. Recognizing the transformative power of digitization, particularly for people with

disabilities, MCIT seeks to empower people, combat marginalization, and increase participation in societal activities. Another critical facet of the Ministry's digital inclusion activities is ensuring Internet safety, particularly for youths, which is accomplished by promoting digital citizenship. To achieve these objectives, MCIT develops initiatives that promote ICT accessibility, focusing on specific demographic groups such as rural inhabitants, people with disabilities, women, girls, youth, and children, while also boosting social and economic growth (MCIT, 2025).

Developing Digital Knowledge and Competencies

MCIT established the Digital Decent Life program to improve digital literacy in rural regions, which aligns with three main UN Sustainable Development Goals: SDG 10 on decreasing disparities, SDG 8 on decent work and economic growth, and SDG 5 on gender equality. The initiative aims to empower individuals with inadequate technology skills, create economic possibilities, and develop safe, digitally empowered rural communities in Egypt. The initiative offers workshops and training sessions that introduce participants to government services and digital platforms. It aims to improve digital skills, train employees and residents in targeted areas, increase public sector efficiency, and make better use of resources. Finally, it aims to reduce the digital barrier between rural and urban areas, so promoting more financial and technical inclusion. Since its inception under a 2022 cooperation protocol, the initiative has

worked in collaboration with the Decent Life Foundation, multiple ministries, the World Association for Al-Azhar Graduates, the National Council for Women, non-governmental organizations, and local governments. In 2024, the Ministry's efforts to promote digital literacy contributed to the digital skills of 43,018 citizens in Decent Life villages across 20 governorates during the initial phase, carrying the overall number of beneficiaries to 124,208 since the initiative's inception (MCIT, 2025).

Universal Service Fund

The Universal Service Fund (USF) is critical to increasing telecom service availability in underserved and distant locations. USF funds infrastructure initiatives to enable countrywide access to quality communication services, bridging the digital gap and supporting economic and social growth. The fund supports projects including mobile network development, broadband connection, and digital inclusion programs, which are consistent with Egypt's vision for a more connected and inclusive future. Through good administration, NTRA saved around EGP 3.368 billion in USF, decreasing the fund's deficit from EGP 6.695 billion to EGP 3.327 billion (MCIT, 2025).

3- Implications for Theoretical and Practical Application

5-1 Theoretical contribution

This study contributes to the e-government citizen-centric literature by proposing a comprehensive theoretical framework from the customer perspective. It examines the impact of the

digital divide on citizens' perceptions of digital service convenience and their satisfaction with e-government services (Dechamps et al., 2025). It extends the existing literature that mainly focuses on technological and institutional factors. This paper Integrates digital divide theory with service convenience and citizen satisfaction models to explain how accessibility barriers shape user perceptions and engagement with digital government services. This study Challenges assumptions that infrastructure availability alone ensures e-government success, emphasizing socio-technical barriers (e.g., digital literacy, access, digital skills) that persist even in connectivity-enabled populations. This research also Highlights how policy-driven interventions (e.g., nationwide IT education, inclusive platform design) interact with cultural and socioeconomic factors, a contribution to more inclusive e-government service. This study provides novel insight into the literature by documenting the Egyptian government's initiatives in bridging the digital divide. This study's research context, i.e., e-government in Egypt, is inadequately explored in the literature (Haridy et al., 2025; Rouibah et al., 2024).

5-2 Empirical contribution

This paper provides theoretical evidence of the critical impact of the digital divide on e-government performance from the customer perspective. This supports the Egyptian government initiative to bridge the digital divide nationwide.

Any actions implemented by a government must be supported by adequate research. The policies must be cost-effective, effective, technologically creative, manageable, and socially acceptable. Because of the complexities of the digital divide, one policy may not regulate all of the issues at hand; instead, a portfolio of policies with various possibilities is required to reach out to every citizen in the country. Perhaps the best approach is to conduct a cost-benefit analysis. Cost-benefit analysis is a study of a project that includes numerous expenses such as establishment, maintenance, implementation, social, and environmental costs, among others. The advantages being examined might be both tangible and intangible.

These future expenditures and benefits are discounted to their present value using a predetermined rate of return determined by the analysts based on market returns. This is a complete method of weighing all available policies, allowing policymakers to select the optimal policy or policies from a menu of options. Nonetheless, all governments should encourage sustainable consumption and work toward sustainable growth. This refers to using only the resources that are necessary for a process without putting future generations at risk. This promotes sustainable development by encouraging everyone to follow processes that provide long-term benefits.

To address the skills gap, the government should implement comprehensive education and training programs

covering radio, television, mobile devices, and print media. Currently, most computer-related courses are offered by private institutions, restricting accessibility. By integrating information technology (IT) into primary school education, the Ministry of Education could help reduce this disparity. However, qualified IT instructors are essential to ensure effective learning from an early age. These initiatives would democratize digital skills, reducing technological inequalities.

The study emphasizes the significance of perceived service convenience, citizen satisfaction, and engagement in e-government. As a result, policymakers should prioritize developing user-friendly digital public service platforms that offer flexibility, easy access, and efficiency, saving time and effort for citizens.

4- Limitations and Future Research

The integration of the theoretical framework and the case of Egypt in e-government initiatives provides insights for future research. Most of the studies in the literature are cross-sectional research, which limits their ability to observe changes in citizen attitudes and behavior over time. A longitudinal approach or panel data examination is recommended to study the dynamic links between the digital divide and citizens' attitudes and behaviours. Although the literature provides findings from various political systems and countries. Yet, providing insights from comparative and mixed methods research can be insightful

to show how cultural norms, institutional capacity, and platform architecture condition digital divide effects. Digital Egypt Vision focuses on one marginalized category that is limited in the literature, which is people with disability. This provides insight into future research, as marginalized identities (disability and ethnicity) intersect with digital inequities yet remain underexplored. Intersectional analyses can reveal compounding disadvantages in e-government adoption. There is limited consensus on measuring "success" in inclusive e-government. Integrating qualitative user-experience data with quantitative performance metrics may yield richer evaluations. The current study focused only on convenience and satisfaction as citizens' perception and attitude dynamics that mediate the link between digital divide and engagement. Future research should consider other factors such as service quality, privacy concerns, trust, and cultural attitudes and factors.

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