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E-Government Issues in Developing Countries Using TOE and UTAUT Frameworks: A Systematic Review

Abstract

E-government, or electronic government, refers to the utilization of information and communication technology to improve and simplify the provision of government services and information to citizens, businesses, and government agencies. The adoption and implementation of e-government may be seen as an imperative for governments in developing nations. This research observes the intricacies of e-government implementation in developing countries, aiming to identify and analyze pivotal issues. By employing the preferred reporting items for systematic review and meta-analysis method, this research discovers the intricate landscape of e-government implementation. Also, utilizing the Technology-Organization-Environment and Unified Theory of Acceptance and Use of Technology frameworks, the study uncovers substantial issues rooted in organizational limitations like limited awareness and inadequate top management support. The scarcity of essential infrastructure, notably reliable internet access, exacerbates these issues, deepening the digital divide between urban and rural areas. These findings emphasize the crucial role of clear regulations and unwavering top management support. Success in technology adoption hinges on the synergy between organizational, technological, and environmental factors. This thorough investigation illuminates the complex dynamics associated with the implementation of e-government in developing countries, providing invaluable insights for policymakers, practitioners, and researchers navigating the complexities of digital governance.

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Keywords:
issues; e-government; literature review; technology-organization-environment framework; unified theory of acceptance and use of technology framework; developing countries

Introduction

E-government refers to the use of information and communication technologies, particularly the Internet, as a tool to achieve better government (Majeed et al., 2019; Novianto, 2023; OECD, 2003). Numerous developing countries are actively engaged in the implementation of e-government initiatives. The implementation of e-government involves transitioning from a manual or traditional system to a digital one (Novianto, 2023; OECD, 2003b). Implementing e-government in developing countries offers great potential and opportunity for improving their government and citizen satisfaction levels (Ndou & Department, 2004; Ramadani et al., 2022). In developed countries, the concept of seamless, 24/7 access to government services without waiting in lines is becoming increasingly common and even expected (Basu, 2004; Majeed et al., 2019). However, to achieve this same level of efficiency and flexibility for developing countries can be far more challenging than in developed countries. However, deploying online service systems presents significant challenges at local, national, and international scales, particularly within developing nations (Al Mudawi et al., 2020, Sabani, 2020).

Smart government is characterized by its commitment to monitoring advancements in information and communication technologies (ICT) and incorporating them into governance strategies. This integration proposes to enhance decision-making processes by fostering collaboration among diverse stakeholders. (Pereira et al., 2018). The notion of smart government, highlighting active participation in decision-making processes, is intricately linked to the transparency of administrative systems and the accessibility of public services (Arief et al., 2021). From these studies, it can be concluded that the difference between e-governance and smart governance lies in the level of technology involvement and the integration of intelligence in government administration.

The strong implementation of e-government is an important initial step toward an effective smart government. E-government is the foundation for smart government and without a strong foundation in e-government, it is not possible to achieve the full potential of smart government (A. Kumar, 2017; Omar Hujran et al., 2021). Moreover, the definition

of e-government is the use of ICT to improve the delivery of government services and smart government is the use of ICTs to transform the way that governments operate (A. Kumar, 2017).

To achieve a smart government, it is necessary to identify issues related to the implementation of e-government first. Additionally, the outcomes, whether successful or unsuccessful, of e-government initiatives in developing/transitional countries have been categorized. Estimations reveal that 35% of projects end in total failure, 50% encounter partial failure, and only 15% are deemed successful (Heeks, 2003). Additionally, many failures in e-government implementation are due to the compartmentalized sectoral egos in horizontal interactions and discrepancies and misalignments in vertical structures (Ramadani et al., 2022). The data stated that e-government projects have seen more failures than successes.

Understanding the issues is crucial for the successful implementation of e-government programs. Several studies have shed light on the myriad challenges and opportunities associated with the adoption and implementation of e-government initiatives in developing countries. These studies examined case studies that focused on implementing various e-government applications. E-Sri Lanka refers to a comprehensive e-government initiative in Sri Lanka aimed at exploiting the power of ICT for national development covering all government services (Weerakkody et al., 2009). In Malaysia, there is e-procurement which is one of Malaysia's e-government initiatives that refers to the use of electronic methods in every stage of the purchasing process from the identification of requirements through payment and potentially to contract management (Aman & Kasimin, 2011). The establishment of a Government Enterprise Architecture (GEA) network in Iran represents a pivotal stride toward the envisioned e-government framework, designed to enhance the government's efficiency in fulfilling designated responsibilities. This initiative aims to reduce task completion times, publicize suggestions received from government agencies, and augment the precision of decision-making processes (Sharifi & Zarei, 2004). Also, issues in e-government implementation for parking tax in DKI Jakarta encompass ineffective monitoring, data integration difficulties, inadequately regulated sanctions and compliance, and the issuance of technical recommendations offline, emphasizing the imperative for comprehensive improvements across monitoring, data integration, compliance enforcement, and technical processes (Ratna Wulandari & Valiant Salomo, 2021).

Understanding the issues in e-government implementation is the measurement of success because it allows governments and stakeholders to identify and address the specific challenges that hinder the effective adoption and operation of e-government services. Recognizing these issues not only highlights areas where improvements are needed but also provides a clear path for targeted interventions and resource allocation (Zeebaree et al., 2021). Past research endeavors have delved into the challenges and prospects inherent in the adoption and execution of e-government initiatives within developing countries, citing cases like E-Sri Lanka (Weerakkody et al., 2009), e-procurement in Malaysia (Aman & Kasimin, 2011), and Iran's GEA network (Sharifi & Zarei, 2004). To comprehensively address these issues, this research adopts a dual approach by integrating the Technology-Organization-Environment (TOE) framework, which evaluates technological, organizational, and environmental factors, with the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, focusing on individual and social determinants of technology acceptance.

Moreover, its objective is to delve deeper into various issues arising in the implementation of e-government, with a specific focus on locations within developing countries, because implementing e-services in developing countries

is often challenging due to educational disparities and local norms that affect citizens' understanding and adoption of e-government services (Majeed et al., 2019). This is significant because most previous research tends to rely on a single framework or is limited to a single case study, often conducted within the context of developed countries (Majeed et al., 2019). By combining TOE and UTAUT and emphasizing developing countries, this study addresses critical gaps in the literature on e-government implementation in developing countries to comprehensively analyze both organizational challenges and individual adoption factors, expanding the research scope to more diverse developing contexts, and examining the impact of local educational disparities and cultural norms on e-government success. Implementing e-government in developing countries is complex due to sectoral isolation and structural misalignments but understanding these challenges through systematic literature reviews (SLR) can guide tailored improvements and resource allocation for more effective e-government implementation (Aman & Kasimin, 2011; Majeed et al., 2019; Weerakkody et al., 2009; Zeebaree et al., 2022).

With this overarching goal, the study aims to tackle and offer a more comprehensive insight into the challenges faced in the realm of e-government implementation, particularly within developing countries. The research question guiding this exploration is as follows: ***What are the issues of e-government implementation in current references?*** To identify and analyze the challenges that hinder the implementation of e-government initiatives in developing countries. The unit of analysis in this research encompasses literature covering governmental bodies tasked with e-government services, targeted e-government projects aimed at digital transformation, and stakeholders including citizens and government employees.

This study is a systematic literature review to answer research questions and fill research gaps. The remainder of this paper is organized as follows: in section (2) Literature Review; (3) Research Methodology; (4) Results; (5) Discussion; and (6) Conclusion.

Literature Review

E-government

E-government involves using information and communication technology to boost the effectiveness and swiftness of government management, facilitating the provision of services to citizens, businesses, government institutions, and employees on a global scale and without time restrictions. This strategy can amplify operational effectiveness, foster transparency, adhere to good governance principles, enhance the quality of services provided to citizens, and simplify their access to government services (Nookhao & Kiattisin, 2023). Also, e-government may enhance the quality of life of citizens and contribute to the growth of the digital society and economy (Nookhao & Kiattisin, 2023).

E-government represents a multidisciplinary transformation initiative, set in motion by harnessing ICT as a catalyst. The objective is to cultivate and advance high-quality, integrated, and impactful public services for the populace. Its broader purpose encompasses the effective management of constituent relations and the provision of support for the economic and social development goals of citizens, businesses, and civil society, operating at the state, national, and international levels (Arief et al., 2021).

Over the years, the issue of implementing e-government in developing countries and especially in transition countries has been the subject of numerous studies (Grecu & Dicusar, 2021). This study has centered on the issues behind e-government project failures, impediments to e-government implementation, and related concerns. By identifying issues for e-government project failures, addressing

impediments to implementation, and highlighting related concerns; it contributes significantly to the ongoing discourse on e-government implementation. Also, this study examines how e-government serves as a strategic initiative to foster improved governance, streamline public administration, and support the socio-economic development of nations. It highlights the adoption and implementation challenges specific to developing countries, including issues like infrastructural deficiencies, limited digital literacy, and the persistent digital divide that affects the effectiveness of e-government initiatives. This encompasses frameworks such as the Technology-Organization-Environment (TOE) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which help in dissecting the technological, organizational, and environmental factors influencing e-government adoption.

Technology-Organization-Environment (TOE)

When conducting research, many authors commonly rely on the TOE framework originally proposed by Tornatzky and Fleischer in 1990 as a fundamental basis. TOE framework encompasses various dimensions that could impact the acceptance and integration of innovative solutions within an organization (Tornatzky et al., 1990). Furthermore, the TOE framework delineates the elements influencing the adoption process, encompassing characteristics of the innovation to be adopted (technology), the entities implementing the innovation (organization), and the context in which the adoption occurs (the environment), as shown in Figure 1 below.

The TOE framework is an apt framework or theory for scrutinizing the factors that influence the adoption of technology within an organization, including government organizations (Sihotang et al., 2022). In contrast to alternative theories, TOE primarily focuses on the attributes within these three dimensions. This versatility makes the TOE framework highly applicable across various academic fields and situations. Scholars have the flexibility to tailor the factors from each dimension to align with the unique characteristics of an organization and the technology being adopted.

Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is frequently employed within an essentially realist paradigm. This usage guides the design and interpretation of deductive quantitative studies, aiming to identify the most critical factors influencing the adoption of a specific technology (Pinfield et al., 2020). Indeed, UTAUT studies typically center around individuals' adoption decisions, emphasizing the factors that influence

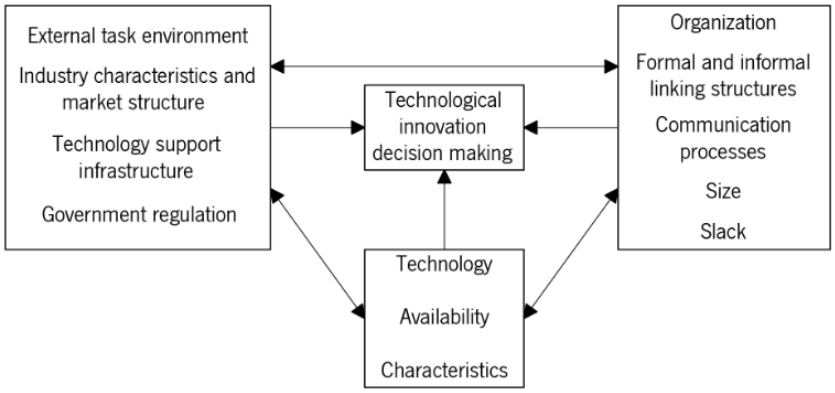

Figure 1. TOE Model by Tornatzky and Fleischer (1990)
Source: Tornatzky et al., (1990)

how users accept and use a specific technology. Moreover, UTAUT aims to explain user intentions to use an information system and subsequent usage behavior as explained in the following image shown in Figure 2 below.

In the context of the UTAUT model, four key constructs emerge as pivotal direct determinants of user acceptance and usage behavior. These constructs are performance expectancy, effort expectancy, social influence, and facilitating conditions. They collectively contribute to shaping users' attitudes and behaviors toward adopting and using technology (Venkatesh et al., 2003). Performance expectancy, as the first construct, refers to an individual's belief in the system's capacity to yield job-related gains. Effort expectancy, the second construct, pertains to the perceived ease associated with using the system. Social influence, the third construct, is the degree to which an individual perceives that influential others believe in the adoption and use of the new system. Lastly, facilitating conditions, the fourth construct, encompass the belief in the existence of organizational and technical support infrastructure to facilitate effective system usage. Together, these constructs shape individuals' attitudes and behaviors toward the adoption and utilization of a specific technology within the UTAUT framework.

The selection of the UTAUT model for this study stemmed from its widespread acceptance and utility in elucidating user acceptance and adoption of emerging technologies. This model, developed through a meticulous review and synthesis of eight IT adoption theories and models, has demonstrated superior performance, surpassing each of its predecessors by explaining up to 70% of the variance in the intention to use technology (Rabaa'i, 2017).

Furthermore, this study distinguishes itself by not only adopting the Technology-Organization-Environment (TOE) and Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks but also by focusing explicitly on the specific context of developing countries. Most existing research tends to either concentrate on a singular framework or limit its scope to case studies within developed nations. By merging TOE and UTAUT and concentrating on developing countries, this research offers a more

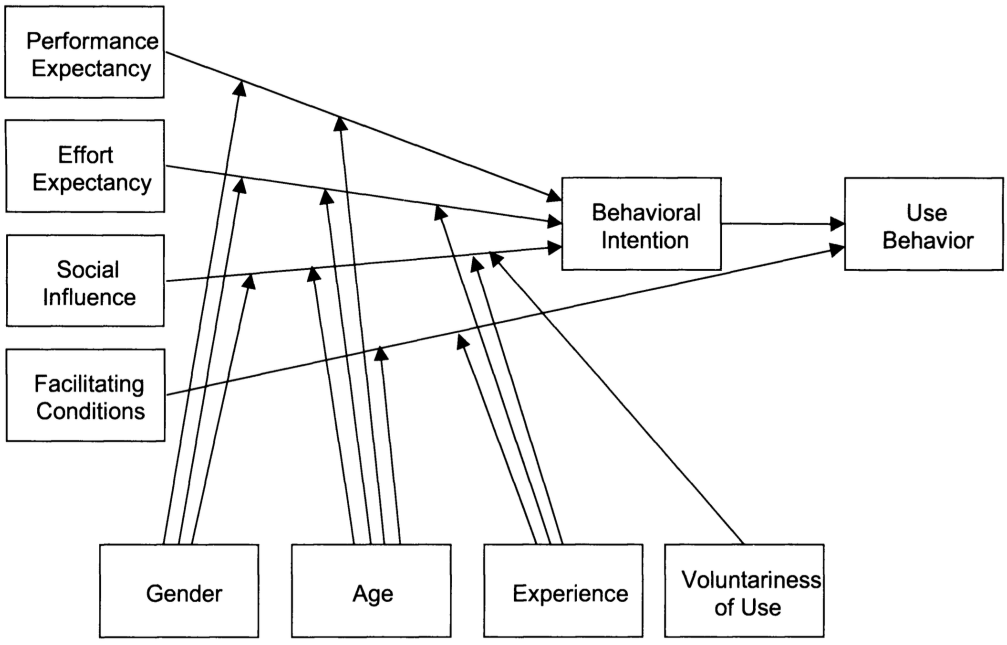

Figure 2. UTAUT Model by Venkatesh et al.
Source: Venkatesh et al., (2003)

nuanced and contextually relevant understanding of the challenges associated with e-government adoption in these unique settings.

Methods

This research employs a qualitative methodology aimed at examining the factors or elements under investigation, which are the issues encountered in the implementation of e-government. The research methodology focuses on e-government in developing countries using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method and aims to ensure a rigorous, transparent review of the existing literature. The focus on developing countries is strategic and justified by the unique challenges these regions face, including limited infrastructure, digital divides, and varying levels of digital literacy, which may not be as pronounced or are differently characterized in developed countries. This geographic focus allows for a deeper exploration of specific barriers and enablers in environments where e-government could have transformative impacts but faces significant hurdles. The methodological focus on PRISMA ensures a structured, replicable approach to synthesizing a wide array of studies, enhancing the reliability and validity of the findings by providing a comprehensive, unbiased review of current research.

Eligibility Criteria

As shown in Table 1, this study has set five distinct inclusion criteria (IC) for our research and implemented specific exclusion criteria (EC) to simplify our research selection procedure. The initial criterion (IC1) entails the inclusion of papers published exclusively within the time frame ranging from 2019 up to 2023. The second one (IC2) entails selecting papers that are written in English, as English serves as the global language commonly employed by scholars to communicate their research findings. The third criterion (IC3) involves identifying articles that explicitly mention terms such as issues, barrier, challenge, benefit, obstacle, driver, and success factor in developing countries. Next criterion (IC4), this study exclusively considered papers that are only published in journals falling within Q1, Q2, and Q3 quartiles, as defined by Scimago Journal & Country Rank, will be considered. Papers categorized as Q1, Q2, and Q3 are crucial for reference because they represent high-quality research publications in respected journals (Katchanov & Markova, 2016; Shaikh et al., 2024; Walters, 2016; Zhu et al., 2015). These categories are often associated with rigorous peer review processes, ensuring the reliability and credibility of the information contained within these papers, also high-tier journals, which are often interdisciplinary, can enhance both the diversity and quality of research due to their prestigious standing and wide visibility (Shaikh et al., 2024; Zhu et al., 2015). The assertion that focusing solely on journals categorized as Q1, Q2, and Q3 does not lead to a lack of diversity in recognized research is supported by some studies. For instance, Zhu et al. argue that including journals from Q1, Q2, and Q3 can contribute to research diversity and quality as researchers target prestigious interdisciplinary journals for their publications, aiming for higher visibility and impact. The last one (IC5), is articles that have been published in global or international journals and conferences. The inclusion of articles from global or international journals and conferences in the criteria for selection ensures the systematic review's comprehensiveness, credibility, and currency. This approach guarantees a thorough analysis of existing literature on the research topic, incorporating a diverse range of perspectives and up-to-date insights from reputable sources around the world.

For the first exclusion criteria (EC), firstly, articles focusing on topics other than issues will be excluded from our analysis (EC1). Additionally,

this study didn't consider articles that lack full-text access or are duplicates of previously included studies (EC2 & EC3). Moreover, exclusion criteria extend to articles primarily centered around the private sector, as they do not align with our research objectives (EC4). Lastly, this study disregarded working papers and presentation materials to ensure the quality and relevance of the materials included in our study (EC5). The inclusions and exclusions criteria above are presented in the table below:

Table 1.
Inclusions and Exclusions Criteria

Type	Criteria	Code
Inclusion	Articles published in 2019	IC1
	Articles are written in English	IC2
	Articles related to and focused on e-government issues in developing countries	IC3
	Papers categorized as Q1, Q2, and Q3	IC4
	Articles published in international journals or conferences	IC5
Exclusion	Articles that concentrate on topics other than issues	EC1
	Full-text access is not available	EC2
	Duplicate studies	EC3
	Articles focused on private sectors	EC4
	Working papers, presentation	EC5

Source: Proposed by the authors (2023)

Quality Assessment Questions (QAQ)

Quality Assessment Questions (QAQ) is a method to assess the risk of bias included in this study. QAQs are specifically crafted questions designed to aid researchers in evaluating the methodological quality of studies, including the risk of bias (Sargeant et al., 2022). These questions are tailored to identify methodological weaknesses that might affect the validity and reliability of study outcomes. The application of QAQs is crucial as they provide a structured framework to critically evaluate the quality of research studies. QAQs ensure the reliability and credibility of the study's findings. By systematically evaluating the risk of bias, researchers can identify potential limitations and weaknesses in the methodology, leading to more accurate and trustworthy conclusions. Also, QAQs transparently reporting the methods used for bias assessment enhances the paper's overall transparency and replicability, allowing other researchers to assess the validity of the study's results. Therefore, employing robust methods, such as QAQs, to assess the risk of bias is essential in ensuring the high quality and integrity of research papers.

In assessing the quality of the study, several key questions were addressed. Firstly, the status of publication was indeed utilized as an inclusion criterion, with a specific focus on papers published in journals falling within Q1, Q2, and Q3 quartiles according to Scimago Journal & Country Rank. These categories were chosen due to their association with high-quality research publications and rigorous peer review processes, ensuring the reliability and credibility of the information presented in these papers. Secondly, the study confirmed that both a list of included and excluded studies would be provided in the final version of the paper, indicating transparency in the selection process. However, it's important to note that while this paper did not explicitly mention conflict of interest, it is generally considered good practice to disclose any potential conflicts of interest in a research paper to maintain transparency and ethical integrity.

Identification Search String

This study collected articles from expansive online journal repositories, such as ScienceDirect, IEEE, Scopus, Emerald, and ProQuest. After that, this study carefully selected the correct keywords to identify accurate literature. This keyword selection was done in three parts.

1. Firstly, the first set of keywords, which includes "ISSUES" "CHALLENGE" "BARRIER" "PROBLEM" "OBSTACLE" OR "FACTOR" OR "SUCCESS" OR "FAIL." This set of search strings encompasses various aspects that can arise when considering the implementation of e-government in developing countries. It

covers issues, challenges, barriers, problems, obstacles, and factors that influence the success or failure of e-government initiatives.

2. Next, the keyword "EGOVERNMENT", indicates a focus on electronic government initiatives. It refers to the use of information and communication technology to enhance the efficiency, transparency, and government services in developing countries.
3. Lastly, the keyword "DEVELOPING COUNTRIES" highlights the geographical context in which e-government initiatives are being considered. Developing countries often have unique issues and needs when adopting e-government due to differences in technology infrastructure, internet accessibility levels, and economic factors.

So, the combination of the search string namely ("ISSUES" OR "CHALLENGE" OR "BARRIER" OR "PROBLEM" OR "OBSTACLE" OR "FACTOR" OR "SUCCESS" OR "FAIL") AND "E-GOVERNMENT" AND "DEVELOPING COUNTRIES", will yield specific and relevant search results related to the factors of the issue in the implementation of e-government in developing countries. This can help researchers, practitioners, and policymakers better understand the issues and opportunities associated with e-government in this context.

Implementing Systematic Literature Review (SLR)

The authors began the Systematic Literature Review (SLR) process by going through stages of identification, screening, and inclusion, as shown in Figure 3.

1. Identification: The initial stage involved conducting a keyword search using the query: ("ISSUES" OR "CHALLENGE" OR "BARRIER" OR "PROBLEM" OR "OBSTACLE" OR "FACTOR" OR "SUCCESS" OR "FAIL") AND "E-GOVERNMENT" AND "DEVELOPING COUNTRIES".
2. Screening: This phase consists of three segments. In the first segment, this study evaluated each article based on its title, abstract, objectives, and study findings. Articles that passed this initial screening were subjected to a full-text review based on eligibility criteria (IC 1,2,3,4,5). Also, during this phase, this study conducted a thorough check to identify and remove any duplicate articles. After implementing three inclusion criteria (IC) to identify the most pertinent articles and have also introduced specific exclusion criteria (EC) to simplify our research selection process. By adhering to the PRISMA methodology, this study employed these criteria to encompass a total of 20 papers in our review.
3. Included: The final stage entailed assessing the number of articles that offered pertinent insights to address the research question.

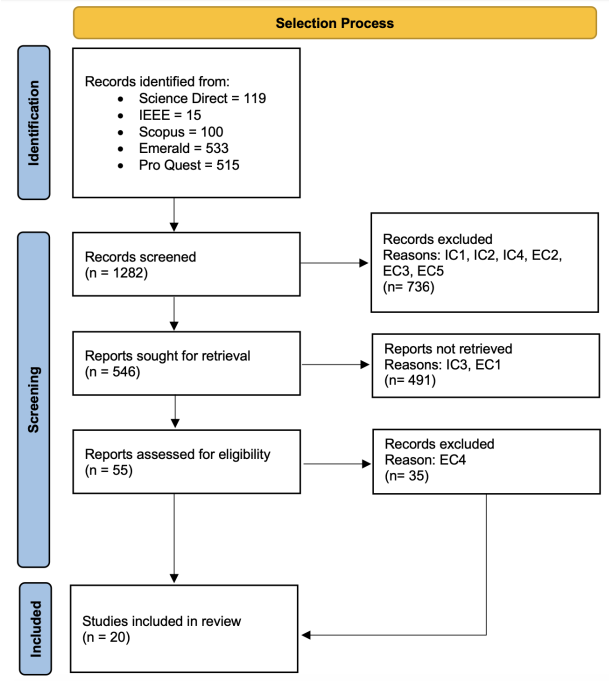

Figure 3. Systematic Literature Review (SLR) Selection Process

Source: Proposed by the authors (2023)

Results and Discussion

Data Extraction

After the selection of articles, this research proceeded with the crucial step of data extraction.

To understand the progression in literature, it's important to examine the trends in research (Novianto, 2023). Also, examining the evolution of literature, focusing on the e-government challenges is important in this data extraction (Israwan Setyoko et al., 2022)

Within this context, Table II contains information about 14 developing countries along with their respective literature references. Subsequently, this study assigned a unique number to each of these countries, which will facilitate the process of mapping each country about the issues addressed in the study. This numbering system allows for easy cross-reference between countries and the specific issues they face as discussed in the research. Also, this organized approach streamlines the analysis of the diverse experiences of these developing nations regarding the issues related to e-government implementation. Overall, it enhances the clarity and coherence of our research findings.

Study Synthesis

This synthesis involved the systematic categorization of these factors, organizing them in a structure for analysis and comparison. The resulting Table III serves as a valuable tool in this study, providing a comprehensive overview of the diverse issues faced by developing nations in their e-government endeavors. By categorizing these factors by country, this study was able to identify patterns, variations, and unique contextual elements that contribute to a deeper understanding of the e-government landscape in each specific developing country. This strategic approach enhances the robustness of our research findings and contributes to a more nuanced perspective on the dynamics of e-government adoption in these regions.

Classification of Issues

Research Question: What are the issues of e-government implementation in current references? In this section, the authors intended

Table 2.
Data Extraction

Countries' Code	Countries	Literature's Code	Literature
C01	Indonesia	L1	(Sabani, 2020)
C02	South America	L2	(Pazmiño-Sarango et al., 2022)
C03	ASEAN Member	L3	(Apriliyanti et al., 2021)
C04	Developing Countries	L4	(Alshaher, 2021)
C05	India	L5	(R. Kumar et al., 2023)
C06	Afghanistan	L6	(Samsor, 2021)
C07	Developing Countries	L7	(Khan et al., 2021)
C08	Ghana	L8	(Ackom et al., 2022)
C09	India	L9	(Sharma et al., 2021a)
C10	Republic of Kazakhstan	L10	(Amanbek et al., 2020)
C11	Nigeria	L11	(Shenkoya, 2023)
C12	Developing Countries	L12	(Al Mudawi et al., 2020b)
C13	Pakistan	L13	(Butt et al., 2019)
C14	Nigeria	L14	(Muhammad & Kaya, 2023)
C15	Libya	L15	(Abied et al., 2022)
C16	Pakistan	L16	(Hassan & Lee, 2019)
C17	Nepal	L17	(Kirat Rai et al., 2020)
C18	Iraq	L18	(Jasim et al., 2021)
C19	Iran	L19	(Shahab et al., 2021)
C20	India	L20	(Samuel et al., 2020)

Source: Proposed by the authors

Table 3.
E-government Issues

Issues	Countries' Code
Government transparency	C01, C02, C06, C11, C15, C17
Human resource challenges	C01, C02, C03, C06, C15, C16, C18
Bridging the digital divide	C01, C03, C05, C06, C11, C13, C15, C16, C18, C19
Limited awareness	C01, C04, C05, C06, C09, C10, C11, C13, C14, C16, C18, C19, C20
Decreased citizen engagement	C01, C05, C09, C16
Poor performance	C01, C02, C05, C09, C11, C16, C20
Citizen attributes	C01, C20
Decreased transaction expenses	C01, C02, C03, C04, C20
Ensuring data security	C01, C02, C03, C05, C06, C07, C09, C11, C15, C16, C18, C19
User-friendliness of websites	C01, C02, C03, C07, C09, C10, C16, C18, C19, C20
Interoperability	C02, C03, C06, C09, C16, C20
Budgeting	C02, C03, C04, C06, C14, C16, C19, C20
Leadership	C02, C03, C04, C06, C07, C16, C19, C20
Top management support	C02, C04, C06, C07, C15, C16, C18, C19, C20
Corruption	C02, C07, C11, C15, C16, C20
Regulation	C02, C03, C04, C07, C11, C15, C16, C18, C20
Social, educational, and cultural aspects	C02, C03, C05, C06, C07, C09, C11, C18, C19
Information, system, and service quality	C02, C03, C05, C10, C11, C13, C14, C15, C16, C18, C20
Public consciousness	C02, C05, C06, C16, C18, C19
Resistance to change	C03, C04, C06, C07, C08, C09, C11, C14, C16, C18, C19, C20
Political	C03, C06, C07, C16, C18
Infrastructure	C04, C06, C09, C11, C12, C14, C15, C16, C19, C20
Structure of organizations	C07, C20
Gender issues	C07
Lack of digital literacy	C09, C20
Lack of trust	C09, C10, C12
Security and privacy	C12
Lack of attention to preservation of information on e-government sites	C12

Source: Proposed by the authors

to address the Research Question (RQ). The categorization procedure has recognized difficulties from chosen sources within the TOE framework, as illustrated in Table IV. This categorization process enables us to discern a cohesive pattern, clustering these critical elements into three distinct dimensions: Technological, Organizational, and Environmental.

Utilizing the TOE Framework to map issues in developing countries has the potential to offer a more comprehensive understanding of the situation. Based on Table IV and Figure 4, organizational issues emerge as the biggest issues in implementing e-government within developing countries. They have referenced a combined total of 99 times across 19 articles, accounting for approximately 53% of the total mentions. Technological and environmental impediments come next, with 51 mentions sourced from 17 studies and 35 mentions drawn from 16 studies, respectively.

The most significant issue originates from the **Organizational** dimension which includes fifteen different kinds of issues.

1. Limited awareness emerges as the most frequently discussed issue in the organizational dimension, appearing in a total of 12 different journals. To tackle this challenge and enhance public awareness about e-government programs, it is recommended that the government addresses education-centered issues. Prioritizing the education sector and allocating sufficient resources can significantly

Table 4.
Classification Issues Based on TOE

Issues	Literature's Code
Technological (n=51)	
Bridging the digital divide	L1, L3, L5, L6, L11, L13, L15, L16, L18, L19
Ensuring data security	L1, L2, L3, L5, L6, L7, L9, L11, L15, L16, L18, L19
User-friendliness of websites	L1, L2, L3, L7, L9, L10, L16, L18, L19, L20
Interoperability	L2, L3, L6, L9, L16, L20
Information, system, and service quality	L2, L3, L5, L10, L11, L13, L14, L15, L16, L18, L20
Lack of digital literacy	L9, L20
Organizational (n=99)	
Government transparency	L1, L2, L6, L11, L15, L17
Human resource challenges	L1, L2, L3, L6, L15, L16, L18
Limited awareness	L1, L4, L5, L6, L9, L10, L11, L13, L14, L16, L18, L19, L20
Decreased citizen engagement	L1, L5, L9, L16
Poor performance	L1, L2, L5, L9, L11, L16, L20
Citizen attributes	L1, L20
Decreased transaction expenses	L1, L2, L3, L4, L20
Budgeting	L2, L3, L4, L6, L14, L16, L19, L20
Leadership	L2, L3, L4, L6, L7, L16, L19, L20
Top management support	L2, L4, L6, L7, L15, L16, L18, L19, L20
Corruption	L2, L7, L11, L15, L16, L20
Regulation	L2, L3, L4, L7, L11, L15, L16, L18, L20
Resistance to change	L3, L4, L6, L7, L8, L9, L11, L14, L16, L18, L19, L20
Structure of organizations	L7, L20
Lack of attention to preservation of information on e-government sites	L12
Environmental (n=35)	
Social, educational, and cultural aspects	L2, L3, L5, L6, L7, L9, L11, L18, L19
Public consciousness	L2, L5, L6, L16, L18, L19
Gender issues	L7
Lack of trust	L9, L10, L12
Political	L3, L6, L7, L16, L18
Infrastructure	L4, L6, L9, L11, L12, L14, L15, L16, L19, L20
Security and privacy	L12

Source: Proposed by the authors

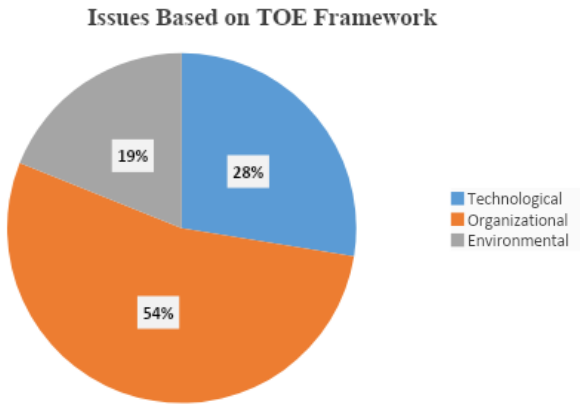

Figure 4. Mapping Issues Related to E-Government Implementation in Developing Countries Using the TOE Framework

Source: Proposed by the authors (2023)

contribute to improving overall education quality (Hassan & Lee, 2019). They also believe that some new academic programs, seminars, and R&D projects on e-governance would play a vital role in raising the citizens' awareness about e-government programs and services.

2. Top management also plays a significant role in the implementation of e-government because they are responsible for setting the strategic direction and vision of the organization. In Libya, top management support significantly affects Libya's decision to adopt cloud computing in the e-government

system (Abied et al., 2022).

3. Budgeting is an issue in e-government implementation due to the need for adequate funding, the complexity of projects, uncertainties, competing priorities, and the need to demonstrate long-term value and sustainability. Also, the budgeting cost is divided into two parts: direct monetary costs and time-related costs (Shahab et al., 2021a). Direct monetary costs refer to expenses incurred from obtaining necessary services and products. For instance, if the design and support of a mobile application are outsourced to a private digital company, the associated monetary expenditure falls under this category. On the other hand, time-related costs pertain to the expenses stemming from the hours contributed by staff members involved in the design and implementation of the system.

In the **Technological** dimension, data security is the biggest issue in e-government implementation. The issues in data security such as how to implement good security techniques, how to protect data, and how to manage data privacy and confidentiality (Shenkoya, 2023; Butt et al., 2019; Hassan & Lee, 2019). These research studies mention how data security needs to be guaranteed to ensure that the benefits of digitalization are optimized.

The second highest issue is related to the digital divide. The digital divide has the potential to exacerbate inequalities and marginalization within planning systems marked by unequal access to and proficiency in ICTs (Shahab et al., 2021). Furthermore, the concern related to the technological dimension also revolves around information system and service quality, interoperability, and user-friendliness of websites.

The **Environmental** dimension is the least emphasized aspect in the implementation of e-government, as it is mentioned in 35 instances across 13 chosen articles. Infrastructure is the most attention within the organizational dimension and is frequently discussed such as issues surrounding access to reliable internet. To achieve a successful implementation of e-government, the government must address and provide the necessary infrastructure required for e-government applications (Jasim et al., 2021).

Based on the information provided, the authors have pinpointed 28 issues categorized into three groups (according to the TOE framework) that hinder e-government initiatives within developing countries.

After classifying the data using the TOE Framework, this study employed the UTAUT Framework to achieve a more comprehensive understanding of the identified issues within the realm of e-government implementation in developing countries. This strategic approach allows for a nuanced exploration of the factors influencing technology adoption in these nations, pinpointing specific areas that require heightened attention and further research within this context.

Mapping issues into the UTAUT Framework for developing countries can provide a more comprehensive overview of the identified issues in the context of technology adoption and usage in those countries. This can assist further research in understanding the factors influencing technology adoption in developing nations and identifying areas that require more attention in this context.

Table V below provides the classification of UTAUT studies, which typically focus on the level of individual adoption decisions. Moreover, UTAUT aims to explain users' intentions to use an information system and subsequent usage behavior. The four classifications of UTAUT are Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. Within scholarly discourse, this framework categorizes studies that predominantly focus on individual adoption decisions, aiming to comprehensively elucidate user intentions and subsequent behavioral patterns in the context of

Table 5.
Classification Issues Based on UTAUT

Issues	Literature's Code
Performance Expectancy (n=28)	
User-friendliness of websites	L1, L2, L3, L7, L9, L10, L16, L18, L19, L20
Information, system, and service quality	L2, L3, L5, L10, L11, L13, L14, L15, L16, L18, L20
Poor Performance	L1, L2, L5, L9, L11, L16, L20
Effort Expectancy (n=39)	
Bridging the digital divide	L1, L3, L5, L6, L11, L13, L15, L16, L18, L19
Lack of digital literacy	L9, L20
Decreased transaction expenses	L1, L2, L3, L4, L20
Public consciousness	L2, L5, L6, L16, L18, L19
Resistance to change	L3, L4, L6, L7, L8, L9, L11, L14, L16, L18, L19, L20
Lack of trust	L9, L10, L12
Lack of attention to preservation of information on e-government sites	L12
Social Influence (n=35)	
Government transparency	L1, L2, L6, L11, L15, L17
Limited awareness	L1, L4, L5, L6, L9, L10, L11, L13, L14, L16, L18, L19, L20
Decreased citizen engagement	L1, L5, L9, L16
Social, educational, and cultural aspects	L2, L3, L5, L6, L7, L9, L11, L18, L19
Citizen attributes	L1, L20
Gender issues	L7
Facilitating Conditions (n=83)	
Ensuring data security	L1, L2, L3, L5, L6, L7, L9, L11, L15, L16, L18, L19
Interoperability	L2, L3, L6, L9, L16, L20
Budgeting	L2, L3, L4, L6, L14, L16, L19, L20
Human resource challenges	L1, L2, L3, L6, L15, L16, L18
Leadership	L2, L3, L4, L6, L7, L16, L19, L20
Top management support	L2, L4, L6, L7, L15, L16, L18, L19, L20
Regulation	L2, L3, L4, L7, L11, L15, L16, L18, L20
Corruption	L2, L7, L11, L15, L16, L20
Structure of organizations	L7, L20
Infrastructure	L4, L6, L9, L11, L12, L14, L15, L16, L19, L20
Political	L3, L6, L7, L16, L18
Security and privacy	L12

Source: Proposed by the authors (2023)

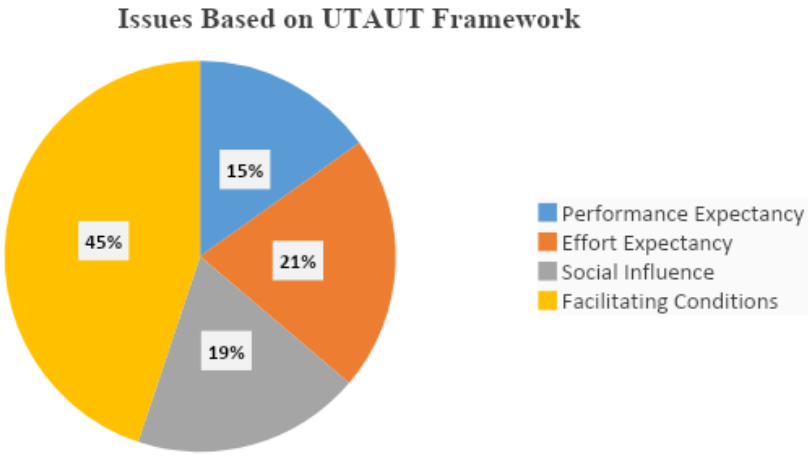

Figure 5. Mapping Issues Related to E-Government Implementation in Developing Countries Using the UTAUT Framework

Source: Proposed by the authors (2023)

technology adoption.

Based on Table V and Figure 5 mentioned above, the UTAUT dimension with the highest number of papers is **Facilitating Conditions**, with 83 papers (45%). This indicates that factors related to the environment and infrastructure are crucial areas to consider in the context of technology adoption and usage in developing countries. For instance, factors such as the availability of infrastructure, leadership, or government support and regulations to users' needs are all critical aspects to address in this context. In infrastructure issues, difficulties in accessing vital infrastructure, like dependable internet, are a barrier to e-government implementations (Shahab et al., 2021). While many urban planners and city dwellers have internet and digital devices, only some in the country have equal access. People in informal settlements and low-income areas often lack the infrastructure for the Internet and can't afford digital devices. This widens the gap between cities and rural areas (Shahab et al., 2021).

The most found issue in the Facilitating Conditions category of UTAUT is Ensuring Data Security, which appears in 12 out of 83 instances. This indicates that one of the primary issues in facilitating the adoption and usage of technology is ensuring data security. In the context of information technology and communication, data security becomes a critical factor that must be taken seriously. One of the issues faced by e-governments is the lack of equipment for security, and citizens have a fear of security breaches such as unauthorized access and resource manipulation (Jasim et al., 2021).

After addressing the concern of Ensuring Data Security, the subsequent issues in the Facilitating Conditions section of UTAUT are Top Management Support and the Regulation Issue. Each of these issues is present in 9 out of 84 instances.

1. Top Management Support: this issue indicates that support from top-level management within an organization plays a crucial role in facilitating the adoption and usage of technology. Top management support is important for successful e-government adoption because it can help to create a culture of innovation and change within the organization (Apriliyanti et al., 2021). When top management is supportive of e-government initiatives, it can help to overcome resistance to change and encourage employees to embrace new technologies and processes. Additionally, top management support can help to ensure that e-government initiatives are properly funded and resourced, which is critical for their success.
2. Regulation: this issue highlights the role of regulations and policies in facilitating technology adoption. Clear and appropriate regulations can provide the necessary guidelines for organizations and individuals to adopt technology correctly and in compliance with the law. Also, decision-makers prioritize the issues of e-government implementation, including the ability to formulate laws for e-governments, provide digital security, and distribute confidence among citizens and institutions to deal with the digital revolution represented by e-government (Shahab et al., 2021).

These two issues, Top Management Support, and the Regulation Issue, along with the previous issues related to Data Security, create a more comprehensive framework for understanding the factors influencing technology adoption and the conditions that facilitate its usage. In the context of developing countries, these factors become highly critical in successfully increasing technology adoption. Factors such as service accuracy, communication harmony between superiors and subordinates, human resource capabilities, and the absence of standard operating procedures (SOP) underscore the critical role of organizational

and facilitating factors in determining the success of technology implementation in a government setting (Melati et al., 2020).

Furthermore, the highest percentage in the *Organizational Scope within TOE* and *Facilitating Conditions within UTAUT* indicates that factors related to the organization and its surrounding environment play a significant role in the adoption and usage of technology. In the context of TOE, the highest percentage in the Organizational scope suggests that factors such as organizational structure, organizational culture, management capabilities, and internal support within the organization have a significant impact on technology adoption. This may mean that organizational policies, procedures, and practices need to be carefully considered in efforts to enhance the acceptance and usage of technology within that environment.

On the other hand, the highest percentage in Facilitating Conditions in UTAUT emphasizes the importance of factors that facilitate the use of technology. This can include the availability of adequate technology infrastructure, support from the government or top management, and conditions that support smooth technology usage. In the context of developing countries, these aspects may be crucial in ensuring that technology is accepted and used effectively.

Overall, the highest percentage in organizational and facilitating factors indicates that in the context of developing countries, the acceptance and usage of technology depend not only on technical factors but also significantly on organizational and environmental factors. Therefore, research and efforts to improve technology adoption in developing countries should seriously consider these aspects.

The implementation of e-government in developing countries faces a myriad of challenges that span technological, organizational, and environmental dimensions, as comprehensively analyzed through the TOE and UTAUT frameworks. Technological challenges, particularly the digital divide and cybersecurity concerns, underscore the critical need for equitable access to digital resources and robust security measures to protect citizen data and ensure trust in e-government systems. The works of (Al Mudawi et al., 2020) illuminate these issues, suggesting that enhancing infrastructure and cybersecurity is not merely a technical requirement but a foundational necessity that supports the legitimacy and effectiveness of digital governance. Organizational challenges such as limited awareness among stakeholders and inadequate top management support, as discussed by (Imam & Zaheer, 2021), emphasize the necessity for informed leadership and strategic planning. These studies highlight the pivotal role of top management in not only deploying e-government solutions but also in fostering an environment where digital transformations are embraced rather than resisted.

Furthermore, the implementation hurdles extend into socio-economic and cultural realms where disparities in education levels and resistance to technological change hinder widespread engagement with e-government platforms. (Majeed et al., 2019) discuss how socio-economic and cultural barriers can decisively impact the population's ability to effectively use and benefit from e-government services, suggesting that tailored approaches to education and cultural integration are crucial. On the front of enhancing user interaction with e-government services, (Panda & Rath, 2021; Venkatesh et al., 2003) contribute significantly to understanding how improving digital literacy and simplifying user interfaces can reduce effort expectancy, thereby increasing the adoption and usage of these platforms. This is complemented by the work of (Apriliyanti et al., 2021; Sharma et al., 2021) who argue for the importance of targeted educational programs and promotional campaigns that raise public awareness and facilitate deeper engagement with e-government services. Collectively, these studies provide

a layered perspective on the challenges and necessary strategic responses for advancing e-government initiatives in developing countries, indicating that addressing these multifaceted issues requires a coordinated approach that spans multiple aspects of governance, technology, and community engagement.

The strategies proposed to address the organizational challenges of e-government initiatives in developing countries are both comprehensive and contextually appropriate. The emphasis on raising awareness and educating both government employees and the public through targeted training programs and public awareness campaigns is a critical component of increasing e-government adoption (Ahmad et al., 2020). According to (Hassan & Lee, 2019), these initiatives can significantly enhance understanding and engagement with e-government services, fostering a culture that is more receptive to digital transformations. The development of user-friendly e-government platforms, as underscored by (Venkatesh et al., 2003) within the UTAUT model, further facilitates this by reducing the complexity and enhancing the accessibility of digital services, thus addressing one of the major hurdles in technology adoption. Also, educating government employees on best practices for designing user-friendly interfaces and providing user-centric services can enhance the overall user experience and satisfaction with e-government platforms (Maznorbalia & Awalluddin, 2020).

The need for robust leadership and structured governance in implementing e-government initiatives cannot be overstated. Imam & Zaheer (2021) highlight the importance of creating dedicated e-government departments, which can centralize expertise and coordinate efforts across various governmental departments. This strategy not only ensures the standardization of practices but also enhances the effectiveness of e-government initiatives through improved collaboration. Structured governance mechanisms also help in overseeing the implementation process, managing risks, ensuring compliance, and optimizing resource allocation (Novianto, 2023). Additionally, appointing e-government advocates within government setups can bridge the gap between IT specialists and policymakers, a critical factor in ensuring that technical solutions are not only implemented but are aligned with broader public sector objectives and policies. E-government advocates can help translate technical jargon into policy-relevant language, making it easier for policymakers to grasp the implications of digital solutions and make informed decisions (Novianto, 2023). This alignment is crucial for the systemic integration of e-government services into the broader public administration framework, as noted by Panda & Rath (2021), who emphasize that effective leadership is key to navigating and overcoming organizational barriers and fostering an innovative environment.

Conclusion

Summary

This study presents a critical analysis of the multifaceted challenges faced in the implementation of e-government in developing countries. The application of the TOE and UTAUT frameworks has elucidated that technological challenges like the digital divide and cybersecurity issues are not merely infrastructural deficiencies but are deeply intertwined with organizational culture and governance structures. For instance, the gaps in digital infrastructure and the need for robust cybersecurity measures, as detailed by (Al Mudawi et al., 2020), underscore the urgent need for holistic policy interventions that prioritize both technological upgrades and the cultivation of a security-conscious culture within government entities.

The organizational challenges, particularly limited awareness among stakeholders and inadequate leadership support identified in the research call for a systemic change in

how e-government initiatives are led and communicated. Aligning with the insights from (Imam & Zaheer, 2021), it is clear that the success of e-government efforts hinges on strategic leadership that not only embraces technology but also fosters an environment of informed participation and openness. Addressing socioeconomic and cultural barriers, a pivotal concern highlighted by (Majeed et al., 2019; Xiong et al., 2020) further amplifies the need for e-government policies to be inclusive and sensitive to the diverse contexts of users in developing regions, thus ensuring that no demographic is left behind in the digital transformation.

The synthesis of these findings points to a complex ecosystem where technological advancements and organizational transformations must proceed concurrently to achieve the full potential of e-government services. Looking ahead, there is a compelling need for empirical research focused on the impacts of specific interventions such as leadership development programs, infrastructural investments, and educational campaigns tailored to the unique challenges of developing countries. Such research would not only test the theoretical conclusions drawn from this study but also offer practical insights that could guide the effective implementation of e-government initiatives. Ultimately, this would contribute to more resilient and responsive governance structures that leverage digital technology to enhance service delivery and citizen engagement.

Limitations and Future Works

In conducting this study on e-government implementation in developing countries, several limitations were encountered, each of which influences the scope and depth of our findings. Firstly, a notable limitation was the availability and reliability of data. Despite extensive efforts to gather comprehensive and representative data from various developing nations, there were constraints related to the completeness and accuracy of the information. In some cases, data gaps and inconsistencies hindered the thoroughness of our analysis, impacting the generalizability of our findings. Additionally, the regional focus of our study posed another limitation. While this study strives to encompass diverse geographical regions, the specific countries selected might not fully represent the entirety of e-government initiatives within the developing world. Regional variations in policies, infrastructure, and socio-economic conditions were not exhaustively explored due to resource constraints, potentially limiting the applicability of our conclusions to a broader context.

Secondly, methodological limitations also influenced our study. The methods employed, while robust, were subject to certain inherent biases and constraints. Moreover, the rapid pace of technological advancements poses an ongoing challenge. The e-government landscape is continually evolving, rendering our snapshot of the field subject to obsolescence over time. Changes in policies, technological innovations, or societal attitudes could potentially alter the dynamics of e-government implementation, impacting the relevance of our findings in the future. Lastly, our study faced limitations related to cultural and linguistic nuances. Interactions with participants and the interpretation of qualitative data were influenced by language barriers and cultural differences. These factors could have influenced the depth of our insights, potentially leading to misinterpretations or incomplete understandings of certain aspects of e-government adoption. While these limitations present challenges, they also offer valuable insights for future research. Acknowledging and transparently discussing these limitations is crucial for contextualizing the study's findings and guiding future research endeavors in the realm of e-government implementation in developing countries. In addition to the common limitations identified in this study, the comparison

with the implementation of an e-government system in Indonesia called *Sistem Pemerintahan Berbasis Elektronik* (SPBE) provides an additional perspective on the complexity of e-government implementation. Despite Indonesia's improvement in the National SPBE Index and its e-government ranking according to the United Nations, issues such as public awareness, resistance to change, weak leadership, and limited resources remain significant hurdles (Menteri PAN-RB, 2023). Our study also faced similar limitations, where data constraints, especially in terms of completeness and accuracy, as well as cultural and language differences, influenced the depth of our insights.

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