

E-Government Adoption in Developing Countries: A Systematic Review of Challenges and Opportunities

Adopsi E-Government di Negara Berkembang: Tinjauan Sistematis terhadap Tantangan dan Peluang

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ABSTRACT

e-Government adoption in developing countries faces complex challenges influenced by technological, economic, social and cultural factors. This research aims to explore the role of government policy in encouraging and facilitating e-Government adoption in developing countries and identify critical obstacles that are often faced. The method used is a systematic literature review using the PRISMA framework. The research results show that effective government policies, technological support, economic investment, and increasing digital literacy are very important for the successful implementation of e-Government. This research has important implications for policy makers in formulating more effective strategies to support government digital transformation.

Keywords: E-Government, developing countries, government policies, barriers, technology adoption, digital literacy

ABSTRAK

Adopsi e-Government di negara-negara berkembang menghadapi tantangan kompleks yang dipengaruhi oleh faktor teknologi, ekonomi, sosial, dan budaya. Penelitian ini bertujuan untuk mendalami peran kebijakan pemerintah dalam mendorong dan memfasilitasi adopsi e-Government di negara berkembang serta mengidentifikasi hambatan kritis yang sering dihadapi. Metode yang digunakan adalah tinjauan literatur sistematis dengan menggunakan kerangka kerja PRISMA. Hasil penelitian menunjukkan bahwa kebijakan pemerintah yang efektif, dukungan teknologi, investasi ekonomi, dan peningkatan literasi digital sangat penting untuk keberhasilan implementasi e-Government. Penelitian ini memiliki implikasi penting bagi pembuat kebijakan dalam merumuskan strategi yang lebih efektif untuk mendukung transformasi digital pemerintahan.

Kata Kunci: E-Government, negara berkembang, kebijakan pemerintah, hambatan, adopsi teknologi, literasi digital

1. Introduction

The adoption of e-Government in developing countries is a multifaceted process influenced by various factors. Previous research has highlighted the challenges and opportunities in implementing e-government initiatives in developing countries (Alfiani, 2024). The adoption of e-government is seen as a means to encourage economic growth and development in a country (Canini & Yu, 2020). Several studies have emphasized the importance of understanding the level of maturity and factors influencing the adoption of e-government services in countries such as India (Kumar et al., 2022). Additionally, research has also explored

the determinants necessary to increase the adoption of e-government services by citizens in developing countries, with a focus on locations such as Egypt ("undefined", 2020).

Factors such as trust play a crucial role in influencing e-government adoption by citizens, so governments need to identify potential factors influencing adoption to implement effective e-government strategies (Alkhateeb & Abdalla, 2021). Problems and challenges related to cloud computing in e-government systems in developing countries have also been identified, including cultural influences and resource limitations (Mudawi et al., 2020). Understanding these factors is critical for governments aiming to increase e-government adoption and make informed IT investments for sustainable development (Zejnnullahu, 2023).

Performance expectations have been established as a significant factor influencing e-government adoption in developing countries, as evidenced by studies in countries such as Pakistan, Saudi Arabia, Turkey, and India (Sabani et al., 2023). Acceptance and use of e-government services in developing countries continues to face challenges such as the digital divide and limited access to technology (Muhammad & Hromada, 2023). Government support has been identified as a key factor driving e-government adoption in developing countries (Sihotang et al., 2023).

Although e-government initiatives are promising, their implementation in developing countries such as Nigeria faces challenges, with many projects failing or being abandoned due to undesirable outcomes (Chukwu et al., 2019). Transparency has been highlighted as an important factor in e-government adoption in developing countries such as Indonesia (Sabani, 2020). Failure of e-government projects to deliver expected results is common in developing countries (Bakunzibake et al., 2019).

Research shows that the critical factors influencing e-government adoption are related to government size, administrative level, and regional aspects (Bojang, 2021). The impact of metaphors on e-governance adoption by citizens in developing countries has been explored, revealing low awareness and adoption rates among citizens as barriers to successful e-governance projects (Hooda & Singla, 2019). External factors such as government readiness, socio-cultural norms, and industry support influence e-commerce adoption in developing countries (Kabanda & Matsinhe, 2019).

Elements of the technology acceptance model and supporting conditions have been found to influence e-government adoption in public sector organizations, emphasizing the importance of support, training, and awareness of the benefits of technology (Sayegh et al., 2022). E-governance has been recognized as a driver of socio-economic development in countries such as Pakistan, demonstrating the transformational potential of ICT in governance ("Exploring the Role of E-Governance in the Economic Performance of Pakistan under Covid-19", 2023). The importance of examining factors related to technology adoption, including e-government, has been emphasized in both developed and developing countries (Alomari & Khan, 2022).

In conclusion, e-government adoption in developing countries is a complex process influenced by various factors such as trust, transparency, government support, and cultural norms. Understanding these factors and overcoming challenges such as the digital divide and limited access to technology is critical to the successful implementation of e-government in developing countries.

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This research aims to explore the crucial role of government policy in stimulating and facilitating E-Government adoption in the context of developing countries. The main focus is to identify policy factors that influence the success of implementation as well as identifying

critical obstacles that are often faced in the process. An in-depth literature review is needed to fully understand how government policy can act as a key catalyst in the transformation towards a more effective and digitally responsive government. Currently, a significant literature gap still exists in the analysis of government policies regarding E-Government adoption in developing countries, which highlights the urgency and relevance of this research in the global context of modern public administration.

The urgency of this research lies in the importance of understanding the strategic role of government policy in the context of E-Government adoption in developing countries. The adoption of information technology in public administration can significantly improve the operational efficiency and transparency of public services, provide wider access to services for the public, and strengthen the relationship between government and citizens. However, complex challenges such as limited technological infrastructure, low digital literacy, and policy barriers often hinder successful implementation. Therefore, a deep understanding of how government policies can stimulate E-Government adoption and overcome these barriers is essential in advancing public administration in the digital era.

This research will provide new contributions in deepening effective policy strategies to overcome the unique challenges faced by developing countries in adopting E-Government. By analyzing existing literature and identifying successful policies and identified barriers, this research will provide critical insights for policymakers, practitioners, and researchers. It is hoped that this research can expand understanding of the key factors that influence the success of E-Government implementation in the context of developing countries, as well as formulate more effective policy recommendations to support the digital transformation of governments throughout the world.

2. Research methods

2.1. Article Collection

To ensure the accuracy and relevance of the articles that will be included in this research, data collection was carried out through reputable international databases, such as Scopus and Web of Science. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method was used as a framework to manage the process of searching, selecting and analyzing articles.

2.2. Keywords

Article searches were carried out using the following main keywords: "E-Government adoption", "developing countries", "government policy", "barriers", and "challenges". These keywords were chosen to ensure articles that are relevant to the research focus, namely E-Government adoption in developing countries, related government policies, as well as obstacles that may be faced in the implementation process.

2.3. Number of Articles

In the initial stage of the search, a number of articles were identified that met the specified search criteria. These numbers will be further detailed in subsequent analyzes to ensure appropriateness to the research aims and relevant methodological quality.

2.4. Article Inclusion and Exclusion Techniques

Articles to be included in this literature review must meet the predetermined inclusion criteria, namely focusing on E-Government adoption in developing countries, discussing the role of government policy in the adoption process, and identifying the obstacles faced. Articles that are not relevant to the topic, do not focus on a developing country context, or do not cover aspects of government policy will be excluded from the analysis.

3. Results and Discussions

3.1. E-Government Concepts and Theories

E-government, which involves the use of technology in government operations and service delivery, relies on various theories to understand technology adoption and acceptance. The Technology Acceptance Model (TAM), for example, is the main basis for explaining how users assess and use new technology (Purnama & Ginardi, 2019). TAM emphasizes the importance of perceptions of usefulness and ease of use in shaping users' attitudes and intentions towards technology adoption (Cao, 2023). In addition, the Combined Theory of Acceptance and Use of Technology (UTAUT) integrates several theories, including TAM, to comprehensively examine technology acceptance by users (Haryanti & Subriadi, 2020).

In the context of e-government, technology adoption is crucial. Studies have applied theories such as TAM, Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and UTAUT in various sectors, including agriculture (Bilali et al., 2021; Zhao et al., 2021; Dissanayake et al., 2022). These theories consider factors such as perceived benefits, costs, individual skills, and policy environment that influence technology adoption (Haneem et al., 2019). In addition, the literature highlights the importance of understanding user intentions and behavior in adopting technology, such as in the evolution of e-commerce (Haryanti & Subriadi, 2020).

Additionally, the application of technology adoption theories extends beyond traditional sectors. For example, in the tourism industry, TAM has been used to develop marketing strategies and understand users' behavioral intentions towards technology adoption (Sari et al., 2022; Hasni et al., 2021). Likewise, in the context of STEM education, these theories help in evaluating students' experiences and acceptance of new technologies (Oladele et al., 2022).

Overall, the synthesis of various technology adoption theories such as TAM, UTAUT, TRA, and TPB provides a solid framework for understanding and predicting technology acceptance and adoption in e-government as well as in other sectors. These theories cover various factors that influence user behavior, attitudes, and intentions towards technology adoption, thereby guiding policy makers and practitioners in implementing effective e-government initiatives.

3.2. Government Policy in Adopting E-Government

In developing countries, e-government adoption plays an important role in improving government services and their accessibility. Several studies highlight the importance of government policies in facilitating the successful implementation of e-government initiatives. For example, Waithaka & Kimani (2021) emphasize the positive impact of e-procurement practices on supply chain performance of county governments in Kenya, recommending policy formulation to support e-procurement adoption. Sabani (2020) emphasized the importance of providing education and training to citizens to support e-Government adoption, indicating that capacity building and education are important elements in this process.

Additionally, Kumar et al. (2021) discuss the influence of national culture on e-government development, pointing to the adoption of frameworks by organizations such as the United Nations to measure government performance in e-government initiatives. Additionally, studies by Bojang (2021) and Hasan (2024) highlight the crucial role of well-planned government policies in encouraging the adoption of e-government services, emphasizing the need for policymakers to formulate strategies that promote e-Government initiatives among citizens.

Furthermore, the literature confirms the importance of factors such as transparency, trust, and citizen involvement in the successful adoption of e-government. For example, Zhao & Liu (2019) focus on trust-related factors that influence citizens' adoption of e-government, while Yera et al. (2020) discussed the significance of citizens' trust in government institutions to encourage widespread adoption of e-Government initiatives.

In conclusion, the synthesis of these studies confirms the important role of government policy, capacity building, and factors such as transparency and trust in facilitating the successful adoption of e-government in developing countries. By formulating effective policies, providing education and training, and building trust with citizens, governments can improve the accessibility and efficiency of their services through e-government initiatives.

3.3. Factors Driving E-Government Adoption

3.3.1. Technological Factors

E-government adoption is influenced by various factors, including technological aspects such as Information and Communication Technology (ICT) infrastructure and internet availability. Advances in modern technology such as big data, Internet of Things, machine learning, and artificial intelligence have accelerated the need for e-government (Azzam, 2023). Countries that aim to remain globally competitive must fully utilize e-government, with the factors influencing its adoption relevant to both the internal and external government environments (Apleni & Smuts, 2020).

In marginalized communities, the adoption of mobile-government (m-Government) services is seen as a solution to the challenges faced in e-Government adoption, demonstrating the importance of considering alternative approaches in different contexts (Fröhlich et al., 2020). Specific models such as the GAM model have been developed to identify critical factors influencing e-government adoption at different levels of service maturity (Eibl et al., 2022). Factors influencing e-government adoption by employees have been researched, highlighting direct and indirect influences in adoption decisions (Amrouni et al., 2019).

Studies have emphasized the importance of transparency, ICT infrastructure, and citizen-centric attitudes towards ICT use in driving e-government adoption (Sabani, 2020; Fröhlich et al., 2020). The ability to use computers and the internet is essential for successful e-government implementation, with a lack of these skills potentially leading to marginalization, especially in rural areas (Blom & Uwizeyimana, 2020). ICT infrastructure is considered a crucial component for implementing e-government systems to ensure efficient digital public administration (Mohale, 2024).

E-government initiatives can improve governance by leveraging ICT to improve service delivery and transparency, as seen in the transformation of government operations in the South African police service (Melato et al., 2019). The readiness of government institutions for inclusive and sustainable ICT accessibility plays an important role in successful e-government implementation (Othman et al., 2023). In addition, the influence of ICT infrastructure on the implementation of centralized data centers in national governments was found to be statistically significant (GICHERU, 2022). In conclusion, e-government adoption is a complex process influenced by technological factors, ICT infrastructure, transparency, citizen attitudes towards technology, and government support. Understanding these factors and their interactions is critical to the successful implementation of e-government initiatives worldwide.

3.3.2. Economic Factors

E-government adoption is influenced by various factors, including economic considerations, government investment in technology, and the financial capabilities of society. Studies have shown that effective e-government implementation can increase public sector modernization, increase government efficiency, and increase transparency in financial processes (Gherasim & Ionescu, 2019). Additionally, adoption of e-government services is driven by positive attitudes towards technology, which can lead to increased use of e-government platforms (Nguyen, 2022).

Additionally, factors such as client satisfaction, trust in government, and service quality play an important role in promoting the adoption of e-government services (MacLean & Titah, 2021; Mensah et al., 2020). Investments in information and communications technology (ICT)

infrastructure and ICT network readiness are important to improve service quality and efficiency in e-government implementation (Nam et al., 2022). Furthermore, training government personnel, developing infrastructure, and ensuring data security are important to increase the capacity of government officials to implement e-government initiatives effectively (Amir, 2023).

In the context of public value, the successful adoption of e-government services depends on the creation of sufficient public value that motivates citizens to accept and use these services (Mensah et al., 2022). The integration of technology in governance processes has become an important instrument in simplifying administrative procedures and increasing the overall effectiveness of governance (Saikia, 2019). Additionally, the use of blockchain technology has been identified as a way to increase the transparency and security of e-government systems (Lykidis et al., 2021; Walde & Yadav, 2022).

Overall, e-government adoption is a complex process that requires consideration of economic factors, technology investment, public attitudes toward technology, service quality, public value, and the security and transparency of e-government systems. By addressing these factors, governments can improve their e-government initiatives and better serve their citizens.

3.3.3. Social and Cultural Factors

The factors influencing e-government adoption are very complex and include social, cultural aspects, digital literacy levels, and public trust in technology. Research by Bojang (2021) and DeLone & McLean (2003) emphasizes critical factors such as information quality, system quality, service quality, user satisfaction, citizen trust, political will, and stakeholder support that impact e-government adoption. In addition, a study by Apriliyanti et al. (2020) and Sayegh et al. (2022) underscore the importance of institutions, leadership, organizational culture, and technology acceptance models in determining the success of e-government programs. Government trust and support are also important factors in driving intention and adoption of e-government services, as shown by Nguyen (2022) and Zhao & Liu (2019).

Additionally, digital literacy, as pointed out by Monko (2023), and public trust in technology, as highlighted by Wa & Zhang (2023), play an important role in e-government adoption. Monko's study specifically shows that familiarity with computer literacy positively influences e-government adoption by public sector workers. Public trust increases the positive impact of business expectations on e-government adoption, especially in environmental governance initiatives. In conclusion, successful implementation and adoption of e-government requires a deep understanding and comprehensive handling of these factors.

3.3.4. Political Factors

e-Government adoption is influenced by various factors, including political commitment and supporting policies. Political commitment plays an important role in ensuring the success of e-Government initiatives (Agbozo & Asamoah, 2019). Studies have shown that factors such as citizen trust, political will, and stakeholder support are critical for e-Government adoption (Bojang, 2021). In addition, the political environment, government structure, and political mechanisms can significantly influence the likelihood of e-Government adoption (Tan et al., 2020).

Supportive policies are also critical to the successful implementation of e-Government programs. Factors such as legislation, regulation, and top management support have been identified as predictors for organizational adoption of e-Government initiatives (Khurshid et al., 2020). In addition, the provision of adequate information and communication technology infrastructure, along with organizational culture and leadership, is critical to the success of e-Government projects (Apriliyanti et al., 2020). In conclusion, political factors, including political commitment and supporting policies, are the main drivers of e-Government adoption.

Political will, stakeholder support, and the existence of supportive policies and regulations are essential for the successful implementation of e-Government initiatives.

3.4. Barriers to E-Government Adoption

3.4.1. Technological Barriers

E-government adoption faces various barriers, including technological challenges, lack of ICT infrastructure, and concerns regarding data security and privacy. Technology barriers include issues such as ICT skills gaps, inadequate training opportunities, lack of computer literacy, limited computer access, poor internet connectivity, and inadequate experience with ICT (Tegegne & Wubante, 2022). The absence of a robust ICT infrastructure, including electricity, network coverage, and technical know-how, hinders successful e-government implementation (Addo & Agyepong, 2020). Additionally, lack of ICT infrastructure has been identified as a significant barrier to the adoption of e-government services in various contexts (Mohale, 2024; GICHERU, 2022).

Concerns about data security and privacy also hinder e-government adoption. Citizens' concerns regarding data security, privacy, and trust in new systems influence their desire to use e-government services (Hasan, 2024). In addition, e-government implementation is hampered by managerial challenges such as leadership failure, financial constraints, and workplace inflexibility (Mohamad et al., 2019). These barriers emphasize the complexity of factors that influence citizens' attitudes toward e-government services and their impact on adoption (Hasan, 2024).

In conclusion, overcoming technological barriers, improving ICT infrastructure, and ensuring data security and privacy are important steps to overcome barriers to e-government adoption. By focusing on these areas, governments can promote the successful implementation of e-government initiatives and improve the delivery of digital services to citizens.

3.4.2. Economic Barriers

E-government adoption faces various obstacles, including economic constraints, budget constraints, and community financial inadequacy. These barriers have been widely studied in the literature. Jacob et al. (2019) identified barriers to e-government adoption, categorizing them into various groups. Among these groups, economic barriers play a significant role in hindering the adoption of e-government services. Additionally, Paul and Enoch (2022) emphasize a lack of knowledge or awareness about e-government services as an important barrier to adoption. Mohamad et al. (2019) also pointed out managerial problems and financial constraints as the main obstacles to proper e-government implementation.

Furthermore, Bojang (2021) identified several critical factors that hinder citizens' adoption of e-government, such as organizational support, self-efficacy, benefits, and resistance. Sabani (2020) added that the shortage of qualified human resources further complicates the adoption of e-government services. These studies collectively highlight the multifaceted nature of barriers to e-government adoption, encompassing economic, managerial, and knowledge-related challenges. In conclusion, the literature provides a comprehensive understanding of the barriers to e-government adoption, illuminating the economic constraints, budget constraints, and financial inadequacy of communities that hinder the implementation of successful e-government initiatives.

3.4.3. Social and Cultural Barriers

E-government adoption faces various barriers, including social and cultural factors, resistance to change, and low digital literacy. Studies have highlighted that a lack of knowledge or awareness about e-government services is a significant barrier to adoption (Paul & Enoch, 2022). Additionally, resistance to change and low digital literacy have been identified as major

barriers to the adoption of e-government services (Jacob et al., 2019; AbdulKareem, 2024; Hasan, 2024). Factors such as leadership failure, lack of technical infrastructure, and cost-benefit considerations also contribute to barriers to e-government implementation (Mohamad et al., 2019; Schedler et al., 2019).

Furthermore, the readiness of citizens and organizations to adopt e-government plays an important role in its successful implementation. Studies show that factors such as organizational support, self-efficacy, benefits, and control influence citizens' adoption of e-government services (Bojang, 2021; Sabani, 2020). Additionally, the impact of national culture on e-government development cannot be ignored, as citizens with a preference for maintaining the status quo may reject e-government initiatives (Kumar et al., 2021).

In overcoming these barriers, increasing digital literacy, providing organizational support, and promoting awareness about the benefits of e-government services are critical. Governments need to focus on building trust, ensuring transparency, and improving ease of use of e-government platforms to encourage adoption (Zhao & Liu, 2019; Shao et al., 2023). By understanding and reducing these barriers, governments can facilitate the successful adoption and implementation of e-government services to better serve their citizens.

3.4.4. Political Barriers

The adoption of e-government faces various obstacles, especially political obstacles that hinder its successful implementation. Political obstacles include a lack of commitment from policy makers, bureaucratic inefficiencies, and corruption-related problems (Tan et al., 2020). These barriers are significant factors contributing to the slow adoption of e-government services. Studies show that political factors, such as lack of political commitment, coordination, and strategy, play a crucial role in hindering the adoption of e-government initiatives (Schedler et al., 2019). Additionally, resistance to change and lack of knowledge or awareness about e-government services have been identified as substantial barriers to e-governance adoption (Paul & Enoch, 2022).

Leadership failures and a shortage of qualified human resources further complicate e-government implementation, emphasizing the importance of strong leadership and skilled personnel in driving successful e-government adoption (Mohamad et al., 2019; Sabani, 2020). Furthermore, factors such as trust in technology and government, as well as perceived risk, influence citizens' willingness to adopt e-government services (Mashaka et al., 2019). The acceptance and success of e-government ultimately depends on the willingness of citizens to accept this innovation (undefined, 2020).

Overall, barriers to e-government adoption are multifaceted, with political factors, lack of commitment, bureaucratic challenges, corruption, and resistance to change playing a significant role in hindering the progress of e-government initiatives. Overcoming these barriers requires concerted efforts from policymakers, strong leadership, adequate resources, and a focus on building trust and awareness among citizens to drive successful e-government adoption.

4. Conclusions

The adoption of e-government in developing countries is influenced by various factors such as government policy, technological factors, economic factors, as well as social and cultural factors. Effective government policies and strong support are critical to successful e-government implementation. Technological factors such as ICT infrastructure and digital literacy also play a crucial role. In addition, economic factors such as investment in technology and people's financial capabilities, as well as social and cultural factors such as public trust and resistance to change, also influence e-government adoption. By understanding and addressing these factors, governments can increase effective e-government adoption and implementation.

This research has several important implications. First, the government needs to formulate supportive policies and provide strong support for e-government initiatives. Second, investment in ICT infrastructure and increasing digital literacy are essential to overcome technological barriers. Third, the government must pay attention to economic factors by allocating an adequate budget for e-government development. Fourth, increasing digital awareness and literacy among the public and building public trust in technology and government is very important to overcome social and cultural barriers. In this way, the government can encourage wider adoption of e-government and improve the quality of public services.

This research has several limitations that need to be noted. First, this research primarily focuses on developing countries, so the results may not be fully applicable to developed country contexts. Second, this research relies on existing literature, so there may be limitations in the scope of the studies analyzed. Third, other factors that might influence e-government adoption such as political factors and data security are not discussed in depth. Fourth, this research does not involve direct empirical analysis, so further research is needed to confirm these findings.

Future research could expand these findings in several ways. First, comparative studies between developing and developed countries can provide deeper insight into the factors influencing e-government adoption. Second, empirical research involving field data can help confirm the findings and provide stronger evidence. Third, further studies on political factors and data security in the context of e-government adoption are needed to provide a more comprehensive picture. Finally, research that explores specific strategies to overcome the barriers identified in this research can provide practical recommendations for e-government policy makers and implementers.

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