Exploring The Strategy of E-Government Inclusion in Developing Countries

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Abstract. E-government has the potential to facilitate citizens' access to public services in a more flexible form without reducing its effectiveness. However, developing countries face a digital divide problem in its implementation. This study aims to identify the theoretical background of the digital divide in the e-government context and propose alternative solutions to improve e-government inclusion in developing countries. We utilize co-citation analysis and a systematic literature review (SLR). From the literature review findings, we categorize the problem into four perspectives: information systems, infrastructure, end-user, and organizational perspectives, and we propose the related strategic solution. Furthermore, we propose four research agendas focusing on an evaluation study of existing e-government initiatives, encouraging multiple channels of e-government services, a social mobilization strategy to facilitate e-government inclusion, and social media utilization to promote e-government adoption. This study contributes to organizing knowledge regarding the digital divide and its alternative solution that could be followed up through various research agendas.

Keywords: e-government, digital divide, developing country, social inclusion

1 Introduction

Researchers indicate that the digital divide of e-government services is happening in various countries. The digital divide refers to the individuals left behind in the digital revolution, which leads to the digital access gap [1]. At the same time, digital inclusion refers to the activities that allow citizens and disadvantaged groups to have access and skills to use information and communication technologies (ICTs), enabling them to participate in and enjoy the information society [2]. The inequality issue of access to digital technology becomes critical as it potentially excludes citizens from the benefits of e-government services [3]. Researchers found various factors contributing to the digital divide and issues related to e-government services. Gauld et al.'s [4] research in Australia and New Zealand indicates that respondents with older age and lower education tend to be reluctant to use sophisticated 'transactional' e-government services. Pérez-Morote et al.'s [5] research in European Countries highlighted the existence of a digital divide as they found that e-government usage is positively affected by citizens' trust in government, educational levels, and income. Reddick et al.'s [6] research in Canada identified that the digital divide affects access to e-government, particularly

among women and older people, who prefer using the phone for assistance. Abu-Shanab's [7] research on Jordanians indicates that the level of awareness of the e-government initiatives and citizen familiarity with the e-government application contribute to e-government adoption. The previous study indicates that the digital divide is a global issue that should be addressed by optimizing equal access to digital services for diverse citizens with appropriate information systems services.

In developing countries, the digital divide may escalate as the socioeconomic demography, geographical landscape, and digital infrastructure inequality issues are more challenging [8,9]. Additionally, the lack of digital literacy and awareness further complicates the challenges of e-government services' inclusion in developing countries [9,10]. Therefore, we argue that digital divide issues regarding e-government initiatives would be more intense in developing countries. Consequently, the strategy to address these problems may differ from those in developed countries.

Previous studies have proposed improvements in digital competence training [1], cohesive e-government training [11], specialized learning activities for older citizens [12], and raising citizen awareness of e-government services [7]. However, the proposed strategy remains general and does not yet cover the holistic digital divide problem related to e-government initiatives in developing countries. We argue that scholars need a comprehensive point of view to generate holistic alternative solutions that are useful as references for further research, policy-making, and developing strategies to increase e-government inclusion. Therefore, this study aims to 1) Identify the theoretical background of the digital divide in e-government implementation through co-citation analysis of the published articles, 2) Investigate the theoretical perspective of solving the digital divide problem in implementing e-government in developing countries through systematic literature review, and 3) Propose a research agenda for the e-government inclusion strategy in developing countries.

This study provides insights into understanding the e-government inclusion problem in developing countries and its alternative solution. This study also proposes future research agendas for further investigation related to digital divide and to obtain empirical data for evidence-based policy making. That insight could contribute to government bodies addressing the digital divide problem. The following sections of this article will cover the research method, findings, future research agenda, and conclusion.

2 Research Method

This study uses co-citation analysis to understand the theoretical background of the digital divide problem in e-government implementation and a systematic literature review (SLR) to identify the problems causing the digital divide in e-government implementation in developing countries and alternative solutions from primary articles. Co-citation analysis will help researchers understand the developing knowledge patterns in the related issue [13,14]. Meanwhile, SLR facilitates researchers to conduct evidence-based reviews through relevant and credible academic literature [15]. We use multiple approaches because we try to provide strategic recommendations to bridge the digital

divide in e-governance based on credible references that serve as a reference for research in related fields [15,16].

2.1 Article Selection Protocol

The primary article in this study was collected from the Scopus database. We consider the Scopus database because it has credibility in listed articles from various reputable journals. We conducted two stages of article selection, the first as input for co-citation analysis and the second as input for SLR. The article selection steps are presented in Figure 1. In the *identification* step, we apply a general search key without specifically addressing the developing country to collect a greater number of articles, which is important to get more representative results of co-citation analysis. We performed the following search key: (TITLE-ABS-KEY("e-government" OR egovernment OR "electronic government") AND TITLE-ABS-KEY ("digital divide" OR "digital inclusion")) AND (LIMIT-TO(SUBJAREA,"BUSI") OR LIMIT-TO(SUBJAREA,"SOCI") OR LIMIT-TO(SUBJAREA,"ECON") OR LIMIT-TO(SUBJAREA,"DECI")). This search resulted in 452 documents. Furthermore, in the screening step, we limit to only journal and proceeding papers, and English-written documents will be included in the analysis. The screening process leaves 330 included documents for co-citation analysis. Furthermore, for the Systematic Literature Review stage, we added one more search key at "TITLE-ABS-KEY" with the word "developing country," which left 39 articles for Review. Finally, in the *eligibility* step, we apply inclusion and exclusion criteria focusing on the topic discussed. The collected document should contain a discussion regarding the problem of the digital divide in the e-government implementation and propose an alternative solution to solve the digital divide problem. Document that do not directly discusses that information were excluded from the primary article to be reviewed. The last steps left 20 documents that were *included* in the review process.

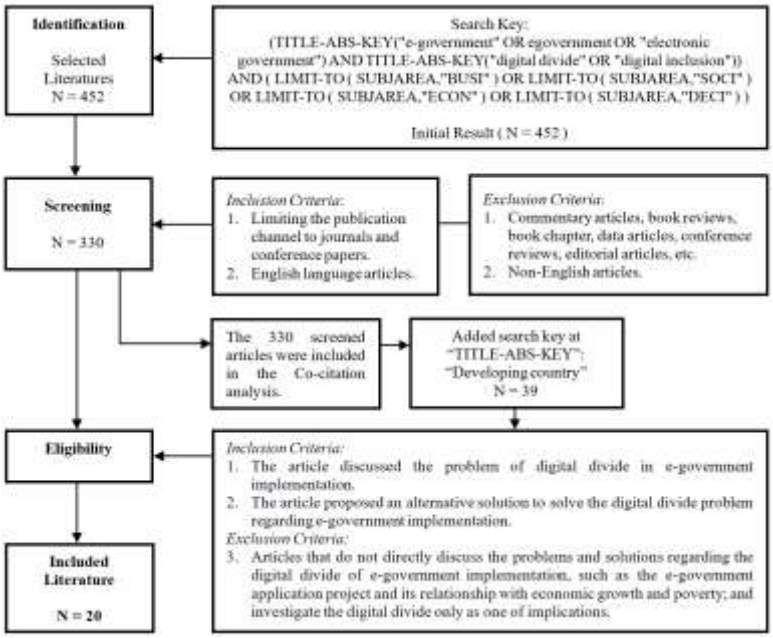


Fig. 1. Article Selection Protocol

2.2 Data Analysis

In the first phase, we applied co-citation analysis to identify the theoretical background to understanding the digital divide phenomenon in the implementation of e-government. We used R Studio with a biblioshiny package to do co-citation analysis on the 330 screened articles. Furthermore, we reviewed the co-citation articles, particularly articles with high betweenness centrality, to identify the related articles' theoretical background and research findings. After that, we highlighted the key topic and described the findings. In the second phase, we applied a systematic literature review to deepen our understanding of the digital divide related to e-government implementation in developing countries. This phase aimed to identify the specific problem of the digital divide in developing countries and identified the alternative solution proposed by the primary article to improve e-government inclusion in developing countries. Scholars argue that SLR could help researchers gain a comprehensive mapping of knowledge, which is significant in providing insight and guidance for researchers, practitioners, and policymakers to act on further research and practical solutions to improve e-government inclusion [15,16]. Finally, we proposed a future research agenda that can be conducted to generate relevant strategies to bridge the digital divide issue and promote e-government inclusion in developing countries.

3 Findings

3.1 Co-Citation Analysis

The co-citation analysis result is presented in Table 1 and Figure 2. Co-citation clustering is the formation of clusters of co-cited documents [13]. Co-cited documents are the two or more documents that are cited by the paper from the research front, which are selected published papers from the academic database [13]. Different groups of co-citation patterns of the paper in the research front will lead to different clusters. The co-citation clustering would cluster the older papers and could not cluster the most recent papers because they have not yet been cited [13]. So that the co-citation analysis is an effective approach to identify the significant references of the literature in the research front, which indicates the foundation of the concept regarding the digital inclusion of e-government services. In the current study, the result indicates that the co-citation literature is distributed into four clusters. However, the current study is limited to reviewing the co-citation articles with significant betweenness scores. Therefore, we focus the review on the twenty documents in Cluster 1 and Cluster 2.

Network diagram in Figure 2 illustrating connections between various academic papers on e-government and digital society. Nodes represent individual papers, with blue and red colors indicating different thematic clusters. Lines between nodes show citation relationships. Prominent nodes include "layne k. 2001" and "belanger f. 2009,"

indicating highly cited works. The diagram visually maps the interconnections and influence of research within the field.

According to the literature review on Cluster 1, Bélanger and Carter [17] argue that the digital divide may hinders some populations from benefiting e-government services, highlighting disparities in access and skills [17]. Furthermore, Bélanger and Carter [18] indicate that government agencies should consider the disposition of trust to develop trust in the government and provide reliable e-government services. It was critical because trust in the government negatively affects perceived risk and usage intentions of e-government [18]. Consistently, Colesca and Dobrica [20] highlight the importance of user engagement and service accessibility, stating that it is critical for tailored e-government services to meet diverse user needs. Colesca and Dobrica [20] found that perceived usefulness, ease of use, information quality, and system quality are critical factors in encouraging user engagement in e-government services.

Additionally, Taipale [21] found that socio-demographic factors, such as education, having children, and place of residence significantly influence e-service usage [21]. Gender and income were also found to be moderating factors in the relationship between internet usage and e-government services [21]. Akman et al. [23] also found that gender and education levels significantly correlate with e-government usage. In this case, Warschauer [19] emphasized that technology alone cannot guarantee social inclusion or educational improvement. Therefore, government agencies should also pay attention to the importance of socially mobilizing technology for effective educational reform in e-government services. [19]. Moreover, Ferro et al. [22] reveal that self-learning is significant for acquiring basic IT skills. Ferro et al. [22] propose three distinct approaches in IT skills acquisition leading to different user needs, such as “the athletes”, “the laid-back”, and “the needy”, which is critical to guide the development of effective digital inclusion policies

Table 1. Co-Citation Analysis

No.	Node	Cluster	Btwnss	Closeness	Page Rank	Topic
1	Belanger F. 2009	1	260,01853	0,007462	0,076234	Digital divide on e-government services
2	Carter L. 2005	1	250,39284	0,007352	0,069777	Trust and risk on e-government services
3	Norris P. 2001	1	108,21449	0,006024	0,031476	E-government adoption
4	Colesca S.E. 2008	1	14,61144	0,005681	0,027539	E-government acceptance
5	Davis F.D. 1989-2	1	41,83727	0,006329	0,021919	TAM
6	Mossberger K. 2003	1	100,02568	0,007142	0,030237	Virtual inequality
7	Taipale S. 2013	1	31,21547	0,006024	0,036308	Socioeconomic demographic
8	Ferro E. 2011	1	44,25075	0,006024	0,023440	IT skills acquisition
9	Akman I. 2005	1	10,83204	0,005747	0,014945	Socioeconomic demographic
10	Belanger F. 2008	1	89	0,003205	0,023829	E-government trust
11	Layne K. 2001	2	388,19411	0,007299	0,035107	Stages of e-government development

12	Rogers E.M. 1995	2	58,70149	0,006451	0,029452	Diffusion of innovation
13	Davis F.D. 1989-1	2	18,51545	0,005988	0,019478	TAM
14	Okunola O.M. 2017	2	86,34119	0,006369	0,041343	Socioeconomic demographic
15	Morris M.G. 2000	2	39,49443	0,006211	0,024761	Technology adoption
16	Venkatesh V. 2003	2	67,55558	0,006451	0,021656	UTAUT
17	Chen Y.N. 2006	2	49,90438	0,006289	0,020626	E-government success strategy
18	Ebbers W.E. 2016	2	21,66504	0,005464	0,018878	Channel of online service
19	Fornell C. 1981	2	15,70457	0,006211	0,021139	SEM
20	Ma L. 2018	2	21,03459	0,006289	0,015573	E-government demand

According to literatures in Cluster 2, the co-citation analysis results indicate that co-citation articles lie in the theory on the Technology Acceptance Model (TAM) proposed by Davis et al. [24], the Diffusion of Innovations theory by Rogers [25], and the Unified Theory of Acceptance and Use of Technology (UTAUT) formulated by Venkatesh et al. [26]. Carter and Bélanger [27] explore factors influencing citizen adoption of e-government services, integrating models from Technology Acceptance and Diffusion of Innovation. Carter and Bélanger [27] found that key predictors include perceived ease of use, compatibility, and trustworthiness. Carter and Bélanger [27] argue that government agencies should develop citizen-centered online services related to their e-government. Furthermore, Davis's [28] research indicates strong correlations between perceived usefulness, ease of use, and actual usage behaviors. Consistently, Rogers [25] discusses the diffusion of new technologies, emphasizing the importance of perceptions in adopting innovations. Rogers [25] argues that achieving a critical mass is essential for the successful diffusion of technology. However, Morris and Venkatesh [29] argue that different age groups have different approaches to technology adoption. Furthermore, Venkatesh et al. [26] review eight key factors of technology acceptance, develop a unified acceptance model, and empirically validate its efficacy, proposing a revised framework for understanding technology acceptance.

However, several co-citation articles highlight various aspects of e-government adoption beyond the technology acceptance features. Layne and Lee [30] discuss the chaotic nature of e-government initiatives and their challenges for public administrators. Layne and Lee [30] propose a 'stages of growth' model for fully functional e-government to cope with the technological and organizational challenges in each stage of e-government development. Chen et al. [31] identify key factors for successful e-government implementation, particularly in developed versus developing countries, and propose a framework for e-government strategies. Furthermore, Okunola et al. [32] highlight the impact of demographic, socioeconomic, and locational factors on Internet access and e-government experience and argue that the government should address those issues for citizen empowerment. Ebbers et al. [33] found that digital skills are less relevant for channel uptake but affect satisfaction with online services. However, in this context, Ebbers et al. [33] indicate that the e-government service provides a registration process online, while consultation processes are provided offline. Ma and Zheng [34] highlight the importance of understanding the demand side of e-government, suggesting that merely supplying e-government functions does not guarantee increased citizen

engagement. Additionally, Fornell and Larcker (1981) inidicates the use of structural equational modelling in the growing research regarding e-government.

Based on co-citation articles, we can reflect that the development of e-government should fulfill the criteria for technology acceptance, such as usefulness, ease of use, enjoyment, quality of information, and quality of service. However, when implementing e-government, government agencies should develop appropriate strategies that encourage citizens to access the application, improve technological literacy, facilitate the learning process, and provide appropriate internet infrastructure and technical support according to the demographic, socioeconomic, and locational factors of the targeted users (citizens). This underscores the need for a comprehensive understanding of the demand side of e-government, influenced by the objective of providing e-government services and the needs and capabilities of citizens to adopt related technology, which differ among social groups [34]. The urgency of this task cannot be overstated, as it is crucial for the successful adoption and utilization of e-government. Additionally, Fornell and Larcker [35] are identified as one of the co-citation articles. It indicates the use of structural equational modelling in the growing research regarding e-government

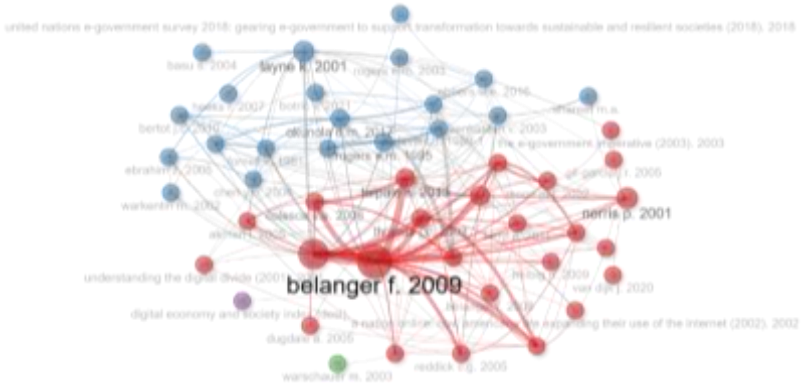


Fig 2. Co-Citation Map

3.2 Systematic Literature Review

Based on the main articles, several factors contribute to the digital divide, posing a challenge to e-government inclusion in developing countries. Based on the research findings of the primary literature, we categorized the problem and solution into four perspectives, including the information systems perspective, the infrastructure perspective, the end-user perspective, and the organizational perspective. These categorizations aimed to deliver a comprehensive point of view on the digital divide issue that is critical to developing appropriate strategies to improve e-government inclusion in developing countries. The optimal adoption of e-government services simultaneously improves the effectiveness of digital investment in the public sector. The literature review summary is observable in Table 2.

Information Systems Perspective

The primary article found a lack of adoption of e-government [36]. According to the co-citation article, previous studies have investigated the e-government issue through TAM [28], Diffusion of Innovations [25], and UTAUT [26] frameworks. Those frameworks are consistently found in the systematic literature review phase, which indicates that the adoption issue contributes to user experience with the e-government information systems, which leads to acceptance or resistance behavior. The key issues proposed by the primary article are user satisfaction [37], information systems usability regarding the ease of use issue [38], and lack of qualifications regarding the feature and service quality of the e-government information systems [39]. Regarding these findings, the digital divide issues should consider the information systems perspective to solve the problem of e-government acceptance and continuous adoption among citizens in general.

We found several alternative solutions proposed by the primary articles to address the information systems issues, such as improvement in information systems compatibility [36], system quality [37], relative advantage in security and privacy [40], service quality, ease of use [38], and a transparent regulatory framework and implementation strategy [39]. The compatibility of information systems to the specific task of related e-government services will lead to perceived usefulness among citizens and significantly impact the adoption of related e-government services [36]. System quality refers to the extent to which the e-government application works appropriately with minimum constraint to provide a smooth working experience when citizens use the e-government services [37]. Consistently, Arshad and Khurram [38] highlight the ease-of-use issue that should be improved to encourage various backgrounds of citizens to adopt e-government services easily. Perceived ease of use would stimulate low digital literacy users to intend to use the e-government service and continue using it when they get a convenient experience. Moreover, Alomari et al. [40] highlighted security and privacy issues that the e-government application should cover. It would facilitate trust in the e-government service regarding personal data security [36,40,41]. Finally, Garad and Qamari [39] propose a clear regulatory framework and implementation strategy for developing and implementing e-government information systems. That proposed solution could be applied to improve existing e-government information systems by focusing on improving certain functions or features to improve compatibility, usefulness, ease of use, and security and privacy features.

Digital Infrastructure Perspective

Infrastructure is one of the most significant aspects that primary researchers highlight regarding the digital divide issue in developing countries. The critical issue regarding infrastructure is the equalization of infrastructure availability, which leads to unequal access to digital infrastructure. Primary researchers found low internet infrastructure [6,42], low technological infrastructure [39,43], low access to the internet, technology, and digital tools [9,32], and a limited channel of government service [6] escalated the digital divide in e-government service.

Therefore, the previous studies highlight the need for internet access that is evenly distributed from urban to rural areas [9,32]. Providing equal access to the internet

demands reliable internet infrastructure throughout the country [6,32,36,42]. Furthermore, to ensure digital inclusion, the government should facilitate technology availability [36]. In many cases, citizens in rural areas lack technology ownership or have limited access to digital tools. In some cases, citizens have ownership of the technology but do not realize the potential of its usability for accessing e-government services. Therefore, government agencies could facilitate access to technology with two alternative strategies: 1) technical facilitation by facilitating citizens in accessing technology with a digital device provided by the government in specific service points in governmental offices, and 2) technical support by facilitating learning to adopt e-government services with the citizens' own device [6,32,42]. Additionally, regarding access to e-government services, the government could provide multiple channels of e-government service, which could be accessed through mobile applications, governmental offices (service points), or telephone services [6]. Those proposed solutions imply the needs of e-government information systems that accommodate a multichannel approach to enhance accessibility and promote digital inclusion [6]. The facilitation of digital devices and technical support would lead to further investment in e-government services. However, it is considerably commensurate as the government can deliver inclusive public goods and services, and the efficiency would simultaneously be increased due to the effective data gathering from digital devices.

Table 2. SLR Findings: Digital Divide Problem and Proposed Solutions

No.	**Digital Divide Problems**	**Proposed Solutions**
1.	*Information Systems Perspective*	
	• Lack of E-government adoption [36] • User satisfaction [37] • Usability (Ease of use issue) [38] • Lack of qualifications [39]	• Improve compatibility [36] • Improve system quality [37] • Improve e-service quality (regarding ease of use) [38] • Improve relative advantage in security and privacy [40] • Clear regulatory framework and implementation strategy [39]
2.	*Infrastructure Perspective*	
	• Broadband internet access/ Low internet access [6,42] • Low access to technology/digital tools [9,32] • Weak technological infrastructure [39,43] • Channel of government service [6]	• Equally distributed internet infrastructure [6,32,36,42] • Improve technology adoption [6,32,42] • Distributed technology availability [36] • Improvement of technology infrastructure [39,43] • Multiple channels of e-government service [6]
3.	*End-User Perspective*	
	• Socio-economic factors/ income and education disparities [6,9,32,42] • Low computer/digital literacy [9,10,43] • Lack of awareness about service [10,37], Social exclusion problem [44] • Cultural norms [45] • Gender gap [7,9,38] • Locational factors [32]	• Adequate training to improve digital literacy/self-efficacy [10,41,46] • Technical support [10,41] • Individual and community/Citizen empowerment (resource building) [41,44,47] • Mobile phone proliferation and telecenters [48] • Attention to local contexts and cultural infrastructure [41] • Attention to digital convergence [44]

	• Digital divide and trust [41] • Lack of e-government adoption/resistance to change [36,38,40]	• Generating trust [36] • Social influence, word of mouth (WoM), and benefiting social network [36,38,40]
4.	*Organizational Perspective*	
	• Institutions, leadership, resources, and organizational factors [49] • Apprehensiveness towards technology, preferring manual processes over electronic ones [50] • Significant digital divide (even on advance e-government services) [51]	• Leadership approach and good governance [49] • Managing knowledge-based resources effectively [51] • Clear strategy of e-government implementation [50]

End-User Perspective

The primary articles have significantly highlighted end-user issues as contributors to the digital divide concerning e-government services in developing countries. It leads to the argument that end-user issues are the most significant issue, which implies the digital divide. We use the term end-user to represent citizens who use the e-government service. According to the primary articles, we found complex problem representing problem that comes from the end-user perspective, including socio-economic factors (income and education disparities) [6,9,32,42], gender gap [9,38,45], locational factors [32], social exclusion problem [44], low computer and digital literacy [9,10,43], resistance to change [36,38,40], lack of awareness about service [10,37], cultural norms [45], trust [41].

Socioeconomic factors are the identical problems in developing countries, such as the gap in income, educational background, and social support, that lead to social exclusion in the use of digital technologies and digital literacy to optimize the use of digital tools. Consistent with the co-citation article, Warschauer [19] stressed that technology alone does not ensure social inclusion or educational improvement. Therefore, the government should initiate social mobilization of technology for effective educational reform aimed at e-government services inclusion and user engagement that meet diverse user needs [19,20]. Additionally, locational factors also become identical issues in developing countries as the development of infrastructure is not equally implemented, particularly in rural areas. Those situations exclude the end user from the availability of e-government services due to unawareness of such technology, inability to access such digital devices, and resistance to adoption due to a lack of digital literacy. Moreover, several primary articles found the gender gap and cultural norms to be significant contributors to the digital divide problem. These norms may discourage certain groups from engaging with digital technologies.

In this case, firstly, the government should give appropriate attention to developing an appropriate strategy through policy research to improve inclusive access to e-government that specifically addresses the socioeconomic and demographic issues. Those strategies should focus on social inclusion in e-government services. The government should improve access to digital literacy among its citizens so that they can get e-government services wherever they are and whatever their social and economic circumstances are. Practically, the government should give appropriate attention to digital

convergence in local contexts [44], facilitate adequate training to improve digital literacy [10,36,41], and facilitate technical support [10,41]. Secondly, the government should empower individuals or communities to support the government agenda regarding e-government inclusion in terms of publication, social influence, social network, and social support to distribute access to technology and knowledge in using e-government [38,40,41,44,47]. Thirdly, the government could exploit digital tools to improve citizens' awareness of e-government services through mobile phone proliferation and telecenters [48]. This strategy, indeed, would be effective for digitally literate citizens. Finally, to address cultural norms issues, governments should give appropriate attention to cultural infrastructure [41], generating trust in the government that using e-government would not interrupt cultural norms [36].

Organizational Perspectives

Apriliyanti et al. [49] indicate that organizational factors regarding the digital divide of e-government services are rarely investigated. Therefore, Apriliyanti et al. [49] propose that the government should give appropriate attention to institutions, leadership, resources, and organizational factors in the e-government project and its implementation that promotes e-government inclusion. The government should develop a clear strategy for e-government implementation, addressing specific aspects that certain areas face [50]. To do this effectively, governments should conduct evaluation studies to identify the root causes of the digital divide based on their unique circumstances. This approach will help the government develop targeted strategies to enhance e-government inclusivity. Finally, Chatfield and Alhujran [51] highlight the critical role of the government in managing knowledge-based resources effectively to create e-government services that meet the needs of citizens.

4 Future Research Agenda

According to the co-citation analysis and SLR findings, we formulate four research agendas outlined as follows:

1. *Policy research of e-government service implementation*. The digital divide issue in the existing e-government services needs to be identified beyond the theoretical point of view. Government bodies and stakeholders should conduct evaluation research to identify the root of problems, followed by policy studies to develop appropriate regulations and strategies for delivering access to e-government to all groups of citizens. This study should address the information system, infrastructure, end-user, and organizational perspectives. The government and stakeholders can highlight the specific problem from one of those perspectives so that the strategic solution is specific and right on target.
2. *Exploring strategies to distribute technology access through multiple channels of e-government services that address diverse targeted users*. In developing countries, socio-economic factors are the main challenges to bridging the inclusion of e-government services. However, a massive investment in digital infrastructure is expensive and time-consuming. Meanwhile, e-government services can help the

government carry out specific tasks, and their accessibility is crucial. Therefore, providing e-government service channels through e-government service centers in village offices and social mobilization to provide access to e-government services can be an alternative while waiting for the digital infrastructure to cover rural areas. In this case, a practical strategy should be explored to ensure that it effectively encourages social inclusion in accessing e-government services. Scholars and the government could collaboratively apply action research to design the strategic implementation of hybrid services of e-government and continuously improve the service during the study cycle through the evaluation and revision phases until the best practices are discovered.

3. *Exploring social mobilization strategy enabling communities to deliver social influences in improving e-government adoption.* Individual and community empowerment is one of the alternative strategies to improve digital inclusion. At the same time, we also found that social influence is a critical factor in encouraging end-users to adopt e-government services. In this case, governments need specific strategies to mobilize the community to help them influence citizens to adopt e-government services. Researchers could adopt digital marketing and soft marketing strategies for this agenda. For example, further researchers could investigate the strategic role of the community task force in helping the government deliver access to e-government services. Community task force could function as social support to help digitally illiterate citizens utilize e-government services through home services or ambassadors in promoting the e-government services to the communities. However, the effectiveness of this approach should be further investigated through action research or an experimental research agenda.
4. *Developing a training strategy for e-government usage through social media platforms.* One of the problems identified in the SLR findings is that users or citizens are unaware of the availability of e-government services, and there is low technical knowledge of how to use e-government services and their benefits. Even though digital literacy becomes a problem in developing countries. However, the unoptimized use of personal digital devices also becomes a significant problem regarding e-government adoption. Therefore, distributing knowledge through soft training would facilitate the publication, introduction, and learning process of certain e-government services. In this case, social media would be a potential platform as it facilitates broad access to citizens. Design research in developing appropriate infographics, user guidance, tutorials, and service features of certain e-government services is needed to teach the prospective user to operate the e-government feature appropriately.

5 Conclusion

The current studies consistently found that socioeconomic demographic and geographical factors become significant constraints of e-government services inclusion, and their impact on the digital divide escalates linearly in developing countries with the escalation of socioeconomic demographic and geographical problems themselves. Furthermore, the problem of infrastructure availability, digital literacy, and technology acceptance has also been found to be a constraint to e-government adoption among

citizens in developing countries. We also found that gender gap and cultural norm issues contribute to the resistance to adopting e-government services. In this case, we categorized the problem into four perspectives, including: information systems, infrastructure, end-user, and organizational perspective, and proposed the related strategic solution. Based on those findings, we proposed four research agendas focusing on an evaluation study to identify relevant problems of the digital divide faced by the government, encourage multiple channels of e-government services to facilitate social inclusion, social mobilization strategy as community empowerment to facilitate e-government inclusion, and social media utilization to facilitate publication, introduction, and training strategy for e-government usage. This research agenda is critical to developing appropriate strategies for bridging the digital divide regarding the implementation of e-government services. The inclusion of e-government services is critical to ensuring the benefits of public goods investment.

This study contributes to organizing knowledge regarding the digital divide problem and its alternative solution that could be followed up through various research agendas. This study has limitations in the method that limits the research findings to published literature. This study needs further validation of the proposed concept and further empirical research to ensure the proposed solution effectively works in specific communities and addresses e-government service inclusion problems.

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