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Digital transformation of local governments in Sudan: A content analysis of e-government adoption

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Abstract: This research paper explores the electronic government adoption and implementation level by local government entities in Sudan. It examines how local governments have embraced and integrated digital technologies, platforms, and services using Layne and Lee four stages model. The study employed a content analysis method to collect data from 18 official websites of Sudanese local government entities. The findings suggest that while local e-government initiatives are still in the informative stages, many governments plan to develop more sophisticated e-government offerings. The key barriers and challenges to adopt and implement e-government identified in the research include technological barriers, lack of resources, digital divide, and legal and regulatory obstacles.

Keywords: *Content analysis, Electronic government, Local government, Sudan.*

1. Introduction

The rapid growth in information and communication technologies has profoundly influenced how governments interact with their citizens, giving rise to electronic government (e-government) initiatives. E-government represents a transformative shift in how public sector organizations use digital tools and platforms to enhance government service delivery, optimize internal operations, and increase citizen engagement and participation [1,2]. This shift towards e-government enabled governments to provide more efficient and accessible public services, improve transparency and accountability, and enable citizens to engage actively with their government [3–6].

Developed countries have been at the forefront of this digital transformation, actively embracing e-government to modernize and update public sector operations [7]. Withing developed countries, the adoption and implementation of e-government has been a critical focus area, as these nations often possess the needed technological infrastructure and resources to implement and maintain digital government platforms [8–11]. Accordingly, developed countries have invested heavily in advanced information and communication technology infrastructure, including high-speed connections, secure data centers, and user-friendly digital interfaces [12]. The foundations of technologies have enabled governments to improve and implement a wide variety of e-services, from online forms filling and social benefit applications to digital identity management and e-voting platforms [13–15]. As a result, citizens in these countries have become increasingly familiar to and reliant on digital government services,

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driving a higher rate of e-government adoption compared to developing nations with less advanced technological capabilities [16,17].

In contrast, implementing e-government in emerging states has faced numerous challenges and obstacles [18–20]. Among these challenges is the lack of necessary technological infrastructure and limited financial resources. These challenges have resulted in an excessive failure percentage of e-government projects in emerging countries [21]. Hence, stopping the government in emerging and developing from harvesting the full prospective of e-government. This has led scholars and to investigate the aspects affecting the adoption and acceptance of e-services from several viewpoints [16,22–29].

However, much of the previous literature focuses on end-user adoption and citizen perspectives, with limited research examining the adoption and implementation of online services by local government entities in developing countries [19,21]. Therefore, the study focused on the supply side of e-government, specifically the readiness and maturity of local government entities in implementing e-government initiatives. Accordingly, the study aims to investigate the current state of e-government adoption and implementation by local governments in Sudan as one of the developing countries in Africa. The study employs a content analysis approach to examine the official websites of 18 local government entities in Sudan, assessing their e-government capabilities, services, and level of digital maturity.

2. Literature Review and Conceptual Model

The existing body of research on e-government adoption and implementation offers valuable insights into the factors that influence the success or failure of these initiatives. Several studies have examined the drivers and benefits of e-government in developing and developed countries, emphasizing the transformative potential of digital technologies in enhancing public service delivery and citizen engagement [13,14,19,21,30–32]. An examination of this literature shows that studies related to e-government adoption can be categorized into two key groups: the demand and supply sides of e-government. Specifically, studies focusing on the government perspective or supply side was centered on topics of managerial practice and implementation strategies [33–37] organizational culture [38–43] and to some degree on measuring and evaluation level of e-services provide by central and local government [44–47,47–50]. On the other hand, studies focusing on the end-user perspective attempted to address the influence of organizational and individual characteristics on e-services acceptance and adoption [12,16,51–60].

This study focuses on the supply side of e-government adoption and implementation by local governments in emerging states. The goal of this research is to identify and measure the effect of government strategies and actions on e-government services adoption and use. Various studies [33–37] have proposed models for the future development stages of e-government adoption and implementation. For instance, Layne and Lee [35] suggest a four-stage model, illustrated in Figure 1, to depict the progression of e-government and the challenges that local government entities encounter during its implementation. These stages are cataloging, transaction, vertical integration, and horizontal integration. Each successive stage reflects increased complexity and integration of e- services.

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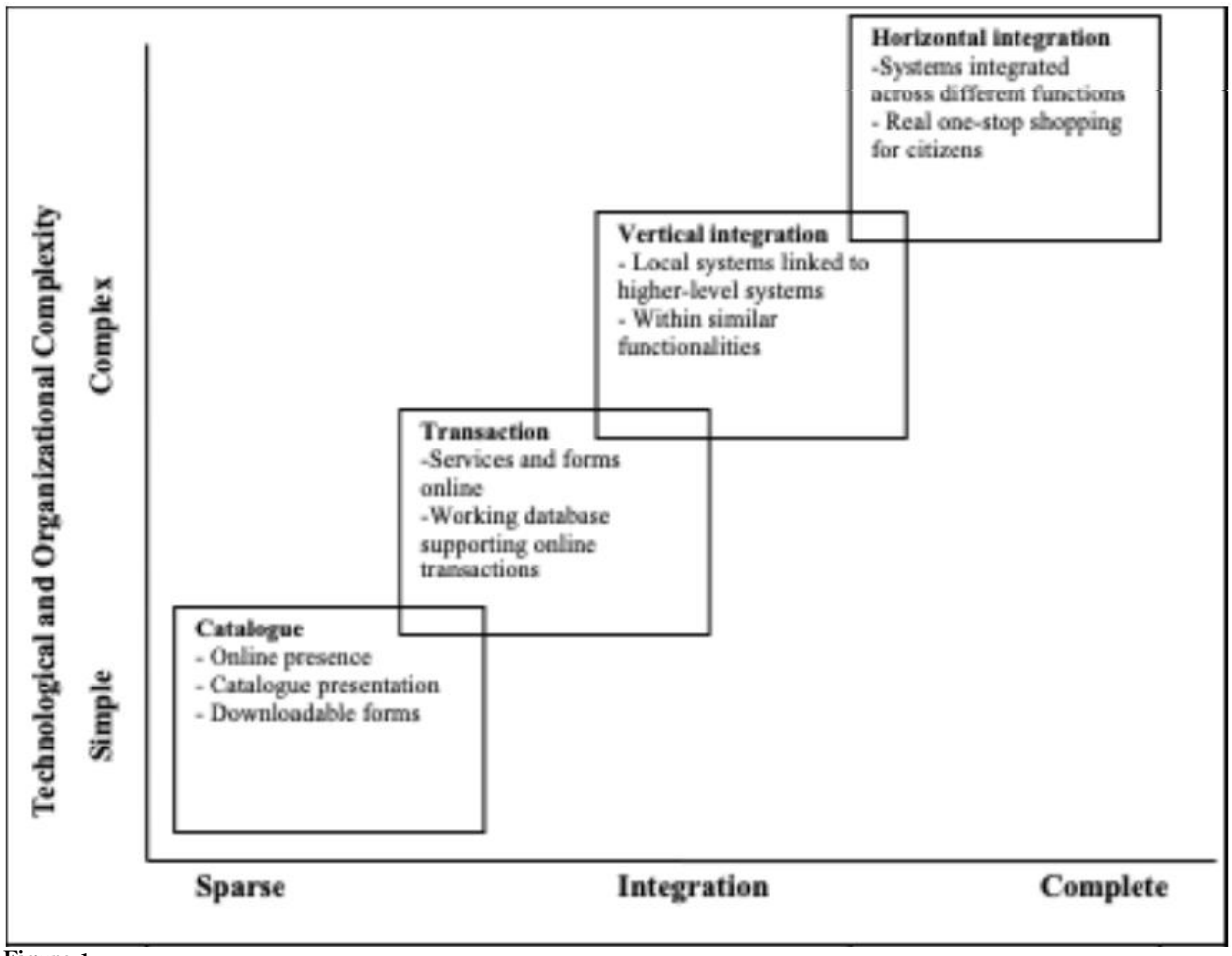

Figure 1.
Dimensions and stages of electronic government development.
Source: Layne and Lee, [35].

This research focuses on identifying and measuring how management strategies and actions influence e-government adoption and use. Several studies have proposed models that outline the stages of e-government development, highlighting various factors that facilitate adoption as well as the barriers and challenges to implementation. For instance, Layne and Lee present a four-stages model that depicts the progress of e-services implementations and the difficulties faced by public entities during its implementation: "cataloging", "transaction", "vertical integration", and "horizontal integration". Each phase denotes an increasing level of complication and integration among e-government services, as clarified in Figure 1. This model represents a framework for understanding the progression of e-government systems adoption from organizational and technical standpoints, while also emphasizing the critical technological and organizational challenges that agencies must navigate to successfully application of e-government.

2.1. Cataloging

In this stage, government agencies focus on establishing an online presence by posting information and downloadable forms that users and businesses can use. The functionality of this stage is mainly limited to providing information to users, and the cataloging should be organized first by the department and then by service, action, or event. According to Layne and Lee [35], this stage will

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mainly respond to pressure from stakeholders, technology-literate employees, the media, demanding. Since governments do not yet have Internet expertise, launching a fully functional e-government service will carry a high risk; therefore, they prefer to minimize this risk by providing non-transactional information. This stage is regarded as the Basic level of e-government.

Although this stage is considered a simple form of e-government, governments must overcome several technical and managerial challenges to secure project success; for example, the main technical challenges at this stage are maintaining and sustaining the web pages and privacy issues [34,35,61,62]. On the other hand, since different departments require different degrees of online presence, allocating and securing the required resources will emerge as a major issue that the management team needs to deal with when implementing e-government [35].

2.2. The Transactional

In this stage, government agencies are expected to have the experience required to increase the complexity of their services. With the increasing number of citizens connected to the Internet, governments will start interacting with citizens by utilizing new electronic communication channels, enabling citizens to complete forms and receive official confirmation online. Further, citizens can enter through a portal that acts as a proxy for all government services instead of traversing numerous sites to find the correct information [35].

At this stage, government agencies' most crucial challenge is integrating the existing electronic databases with the online interface. Hence, the existing databases need be prepared to handle these changes [38]. This will mainly require internal committees to assess user demand and to consider a user interface with the current system. Furthermore, several legal features, including security and privacy, need be contemplated, as personal data are handled and kept, and financial transactions requirement should be accurately executed. To cope with these requirements, suitable technical decisions must be made [35,38,61,62].

2.3. Vertical integration

At this stage, the government will prioritize transforming services instead of merely automating and digitizing existing processes. This transformation involves achieving vertical integration among local, regional, and national systems, enabling them to communicate effectively with one another. Currently, government agencies often sustain distinct databases that are not interconnected, either within the similar level of government or with comparable agencies at local or regional levels. Therefore, progress at this stage will come from integrating these various databases across different levels of government to facilitate cross-referencing and checking of information [15,35].

The goal of this stage is to present services from the customer's perspective. Achieving this will require significant organizational change and extensive collaboration among government agencies to integrate their information systems and processes effectively

2.4. Horizontal Integration

The last stage of the e-government progress model is horizontal integration, which involves connecting and sharing information across various functions and services at the same level of government. This stage represents a digital one-stop environment where citizens can access government services online, with transparency between different levels and functions of government. While this integration—both horizontal and vertical—tends to benefit government agencies more than citizens, it also presents challenges for the government[35,63]. For example, collaborating with other agencies raises issues related to accountability, jurisdiction, and control hierarchy. Additionally, it can undermine the monopoly that bureaucratic administrations have on the information they usually gather and manage[62,64]. Moreover, most government databases were originally created separately, without the intention of sharing data with other agencies. As a result, these databases are devised in various formats and for diverse computer systems. To enable data sharing, agencies must convert their databases into a standardized format[62].

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The Layne and Lee four-stage model provides a framework for understanding the development of e-government adoption from both organizational and technical perspectives. It highlights the technological and organizational challenges that affect the adoption and acceptance of e-government services. Lee et al. [65] stated that countries implementing e-government initiatives are at varying stages of development, with very few governments having advanced to the horizontal and vertical stages. Several other researchers have reached similar conclusions [45,66]. Nonetheless, there is some evidence of such integration, particularly in larger cities [45]

3. Research Design and Methods

This research implemented a content analysis approach to explore the level of government adoption by the local government in Sudan. More precisely, the existing local government portals of the subnational governments (states) were examined to determine service delivery and integration levels. Data were collected through interviews with local government officials, websites, and mobile applications. The data collection and analysis were guided by the four-stage e-government model proposed by Layne and Lee [35]. The analysis examines the presence and functionality of various e-services features, such as information provision, form downloads, online payments, integrated services, and cross-agency data sharing.

Table 1.
Study sample.

No.	State	Formal state name	Population	%
1	Al-Baḥr al-Aḥmar	Red Sea	1,482,100	4%
2	Al-Jazīrah	Al Gezira	5,096,900	12%
3	Al-Kharṭūm	Khartoum	7,993,900	19%
4	Al-Qaḍārif	Gadaref	2,208,400	5%
5	An-Nīl al-Abyḍ	White Nile	2,493,900	6%
6	An-Nīl al-Azrq	Blue Nile	1,108,400	3%
7	Ash-Shamālīyah	Northern	936,300	2%
8	Gharb al-Dārfūr"	West Darfur	1,024,500	2%
9	Gharb Kurdufān	West Kordofan	1,764,800	4%
10	Janūb Dārfūr	South Darfur	3,765,800	9%
11	Janūb Kurdufān	South Kordofan	1,300,700	3%
12	Kassalā	Kassala	2,519,100	6%
13	Nahr an-Nīl	River Nile	1,511,400	4%
14	Sannār	Sennar	1,918,700	5%
15	Shamāl Dārfūr	North Darfur	2,305,000	5%
16	Shamāl Kurdufān	North Kordofan	2,216,200	5%
17	Sharq Dārfūr	East Darfur	1,587,200	4%
18	Wasaṭ Dārfūr	Central Darfur	751,400	2%

Source: https://www.citypopulation.de/en/sudan/

3.1. Sampling and Population

Sudan has a federal system of government with 18 states. Accordingly, this study selected all 18 central municipality-level local governments as the target population shown in Table 1. Data was collected from February to April 2024.

3.2. Research Measurement

The parameters used in content analysis to assess local government based on the following stages will be as follows. The scorecard was used to systematically evaluate the selected local government portals and decide the degree to which they have implemented e-government services and achieved

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various levels of integration, ranging from the presence of basic informational and transactional services to more advanced stages of vertical and horizontal [67,68].

Table 2.
Content parameters.

Stage	Parameters	
Cataloging stage:	presence	The presence of a government website
	Visibility	Determined by whether the website could reached and used at the time of the study
	Starting date	The year the website was created
	Information	The types of information provided (e.g., organizational structure, contact information, news, forms, etc.) (e.g., government structure, contact information, forms)
	Forms	The availability of downloadable forms
	Last updated	How up-to-date the website content was
Transaction stage	Transactions online	Ability to complete transactions online (e.g., payment of fees, fines, or taxes)
	Secure transaction	Secure financial transactions
Vertical integration	Integration	"Integration between local, regional, and national level systems"
	Access	Ability to access services across different government entities
Horizontal integration	Integration	Integration of e-services for variance functions of the local government
	Access	Ability to access a one portal for services provided by all governmental entities

Based on the above parameters, the present study used procedures and frameworks recommended by previous research to compute the e-government index and provide a numerical rank based on this index. Accordingly, the following two equations are used to in calculating and ranking local government s-services in Sudan:

$$\text{Index of e–Government website } i;\ e_i = 4y_i + x_i \quad (1)$$

Where,

y_i = captures the number of services existed in the i, $0 \leq f_i \leq 18$

x_i = captures the number of executable services provided by the website i, $0 \leq xi \leq 5$

4. Analysis of the Local Government Website

The analysis of the e-government portals of the selected state municipalities revealed that the adoption and implementation of e-government at the local level are still in their early stages. The websites of the local governments in the study sample showed significant variations in terms of the information provided, the availability of online services, and the level of integration across different agencies and functions.

5. Results

5.1. Description of E-Government Websites and Services

5.1.1. Cataloging Stage

All 18 local governments had an official website, and the majority (89%) of these websites were accessible at the time of the study. However, only a few websites provided comprehensive information about the local government's services, departments, and activities. Most websites focused on providing general information about the state and its history, with limited information on government services

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and programs. Most websites offered the ability to download forms, but the forms were often not interactive or integrated with online submission capabilities.

Table 2.
Number of local governments at the four levels of e- service development (n = 18).

Stage	Min.	Max.	Mean	SD	Total	%
Cataloging stage	0	18	4.21	2.15	18	98%
Transaction	0	1	2.38	3.12	1	2%
Vertical integration	-	-	-	-	-	-
Horizontal integration	-	-	-	-	-	-
Total					18	100

Table 3.
e-services index and ranking.

No.	State	Index	Rank
1	Red Sea	6	4
2	Al Gezira	5	5
3	Khartoum	13	1
4	Gadaref	8	2
5	White Nile	7	3
6	Blue Nile	8	2
7	Northern	7	3
8	West Darfur	7	3
9	West Kordofan	8	2
10	South Darfur	7	3
11	South Kordofan	7	3
12	Kassala	7	3
13	River Nile	6	4
14	Sennar	8	2
15	North Darfur	5	5
16	North Kordofan	5	5
17	East Darfur	5	5
18	Central Darfur	6	4

5.2. Transaction Stage

Only a few local government websites allowed for online transactions, such as the payment of utility bills or other fees. Most websites were limited to providing information and did not offer any transactional services.

5.3. Vertical Integration Stage and Horizontal Integration Stage

The analysis found minimal evidence of vertical integration between the local, regional, and national government systems. There were no clear linkages or integration between the local government websites and the websites of the state or federal governments.

The local government websites showed little to no evidence of horizontal integration across different government functions and services. Users were generally required to navigate to separate websites or portals to access different services, with no unified, one-stop-shop approach. The findings of this study suggest that the adoption and implementation of e-government at the local level in Sudan are still in the early stages, with significant room for improvement. The local governments have made progress in establishing an online presence and providing basic information. Still, they have not yet fully leveraged the potential of e-government to enhance service delivery, improve transparency, and increase citizen engagement. To address these gaps, local governments in Sudan should prioritize the development of more comprehensive and integrated e-government platforms, focusing on enhancing

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online transactional capabilities, improving vertical and horizontal integration, and ensuring the regular updating and maintenance of website content.

Khartoum, being the capital and most developed state, has the most advanced e-government services among the three. The Khartoum state government portal provides a wide range of information about the state, including its organizational structure, laws and regulations, and public services. Citizens can download various forms and applications, such as business licenses and property tax payments, though the ability to submit these online is limited. The portal also offers limited transactional services, such as paying specific fees and fines. However, there is little evidence of vertical or horizontal integration with other government agencies, either at the state or national level.

6. Conclusion

The study findings suggest that the adoption and implementation of e-government at the local level in Sudan are still in the early stages, with significant room for improvement. While all the local governments in the study sample had an online presence, the websites were primarily informational in nature, with limited transactional capabilities and a lack of vertical and horizontal integration.

To fully realize the benefits of e-government, local governments in Sudan should prioritize the development of more comprehensive and integrated e-government platforms, with a focus on enhancing online transactional capabilities, improving vertical and horizontal integration, and ensuring the regular updating and maintenance of website content.

6.1. Practical Implications

The findings of this study have important practical implications for developing and improving e-government initiatives at the local level in Sudan. First, the study highlights the need for local governments to prioritize the adoption and implementation of e-government to enhance service delivery, improve transparency, and increase citizen engagement. Second, the study identifies specific areas for improvement, such as the need to develop more comprehensive and integrated e-government platforms, enhance online transactional capabilities, and improve vertical and horizontal integration across different government agencies and functions. Third, the study underscores the importance of regular website maintenance and content updating to ensure citizens can access accurate and up-to-date information about government services and programs.

6.2. Limitations

The study focused on a limited sample of local governments in Sudan, and the findings may not be generalizable to all local governments. The data collection was limited to the analysis of the local government websites, and other sources of information, such as interviews or surveys with government officials and citizens, were not included. The study design did not allow for an in-depth assessment of the factors influencing the adoption and implementation of e-government at the local level, such as political, economic, or technological factors.

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References

[1] Balkrishna, A. E-Governance Paradigm in the Indian Agricultural Sector 2024.

[2] Carrizales, T. Functions of E-Government: A Study of Municipal Practices. *SAGE Publishing* 2008, *40*, 12–26, doi:10.1177/0160323x0804000102.

[3] Levesque, R.; V., B.; P, K.; Johnson, S.; E. The Role of Municipal Digital Services in Advancing Rural Resilience. *Elsevier BV* 2023, *41*, 101883–101883, doi:10.1016/j.giq.2023.101883.

[4] Manoharan, A.; Melitski, J.; Holzer, M. Digital Governance: An Assessment of Performance and Best Practices 2022, *23*, 265–283.

[5] Tives, A.; H.; Canedo, D.; E. Best Practices and Methodologies to Promote the Digitization of Public Services Citizen-Driven: A Systematic Literature Review. *Multidisciplinary Digital Publishing Institute* 2018, *9*, 197–197, doi:10.3390/info9080197.

[6] Twizeyimana, D.; J.; Andersson, A. The Public Value of E-Government – A Literature Review. *Elsevier BV* 2019, *36*, 167–178, doi:10.1016/j.giq.2019.01.001.

[7] Survey, U.N.E.-G. 2016.

[8] Apleni, A.; Smuts, H. An E-Government Implementation Framework: A Developing Country Case Study 2020, 15–27.

[9] Chandra, G.; Sahu, S.; Dwivedi, K.; S. A Reengineering Based Framework for Integration of E-Governance Portal of Various State. 2022, *14*, 11–20, doi:10.5815/ijieeb.2022.04.02.

[10] Mustaf, A.; Ibrahim, O.; Mohammed, F. E-Government Adoption: A Systematic Review in the Context of Developing Nations. *Universidade Nove de Julho* 2020, *8*, 59–76, doi:10.5585/iji.v8i1.16479.

[11] Nguyen, T.; T. The Determinants of Citizens' Satisfaction of E-Government: An Empirical Study in Vietnam. *Korean Distribution Science Association* 2020, *7*, 519–531, doi:10.13106/jafeb.2020.vol7.no8.519.

[12] Alrawad, M.; Lutfi, A.; Almaiah, M.A.; Elshaer, I.A. Examining the Influence of Trust and Perceived Risk on Customers Intention to Use NFC Mobile Payment System. *Journal of Open Innovation: Technology, Market, and Complexity* 2023, *9*, 100070, doi:10.1016/j.joitmc.2023.100070.

[13] Basu, S. E-government and Developing Countries: An Overview. *Taylor & Francis* 2004, *18*, 109–132, doi:10.1080/13600804100016747 79.

[14] Haldenwang, v; C. Electronic Government (E-Government) and Development 2004.

[15] Ndou, V. E – Government for Developing Countries: Opportunities and Challenges. *Wiley* 2004, *18*, 1–24, doi:10.1002/j.1681-4835.2004.tb00117.x.

[16] Ghareeb, M.; A., R.; N.; Hefny, A.; H. E-Government Adoption: Literature Review and a Proposed Citizen-Centric Model. *Inderscience Publishers* 2019, *15*, 392–392, doi:10.1504/eg.2019.102592.

[17] Nguyen, T.; T. The Determinants of Citizens' Satisfaction of E-Government: An Empirical Study in Vietnam. *Korean Distribution Science Association* 2020, *7*, 519–531, doi:10.13106/jafeb.2020.vol7.no8.519.

[18] Aftab, F.; M.; Myeong, S. Challenges for Developing Countries to Adopt ICT in Government Services 2018.

[19] Apleni, A.; Smuts, H. An E-Government Implementation Framework: A Developing Country Case Study 2020, 15–27.

[20] Khalid, A.; S.; Lavilles, Q.; R. Maturity Assessment of Local E-Government Websites in the Philippines. *Elsevier BV* 2019, *161,p*, 99–106, doi:10.1016/j.procs.2019.11.104.

[21] Twizeyimana, D.; J.; Andersson, A. The Public Value of E-Government – A Literature Review. *Elsevier BV* 2019, *36*, 167–178, doi:10.1016/j.giq.2019.01.001.

[22] Akram, S.; M.; Malik, A. Evaluating Citizens' Readiness to Embrace e-Government Services 2012.

[23] AlNuaimi, M. Barriers to Electronic Government Citizens' Adoption: A Case of Municipal Sector in the Emirate of Abu Dhabi 2011.

[24] AlSuwaidi, A.; M.; Rajan, A. E-Government Failure and Success Factors Rank Model an Extension of Heeks Factor Model 2013.

[25] El–Ebiary, B.; A, Y. The Effect of the Organization Factors, Technology and Social Influences on E-Government Adoption in Jordan 2018.

[26] Hrestak, D. Technology Adoption Model of Electronic Public Administration Services in Croatia - Research Framework Proposition. In *RELX Group (Netherlands*; 2016.

[27] Mensah, K.; I.; Mi, J. Exploring the Impact of Demographic Factors on E-Government Services Adoption. *IGI Global* 2018, *31*, 1–16, doi:10.4018/irmj.2018070101.

[28] Mustaf, A.; Ibrahim, O.; Mohammed, F. E-Government Adoption: A Systematic Review in the Context of Developing Nations. *Universidade Nove de Julho* 2020, *8*, 59–76, doi:10.5585/iji.v8i1.16479.

[29] Rana, P.; N., D.; K, Y.; Williams, D.; M. Analysing Challenges, Barriers and CSF of Egov Adoption. *Emerald Publishing Limited* 2013, *7*, 177–198, doi:10.1108/17506161311325350.

[30] Ali, A.; M., H.; R, M.; Alam, K. An Empirical Investigation of the Relationship between E-Government Development and the Digital Economy: The Case of Asian Countries. *Emerald Publishing Limited* 2018, *22*, 1176–1200, doi:10.1108/jkm-10-2017-0477.

[31] Maragno, G.; Gastaldi, L.; Corso, M. E-Government for Public Values Creation: A Systematic Literature Review 2021.

[32] Müller, D.; S.; Skau, A.; S. Success Factors Influencing Implementation of E-Government at Different Stages of Maturity: A Literature Review. *Inderscience Publishers* 2015, *7*, 136–136, doi:10.1504/ijeg.2015.069495.

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DOI: 10.55214/25768484.v8i6.3004

[33] Davison, R.M.; Wagner, C.; Ma, L.C.K. From Government to E-Government: A Transition Model. *Information Technology and People* 2005, *18*, *(3*, 280–299.

[34] *Privacy Strategies for Electronic Government*, *in e-Government*; Hiller, J.S., Bélanger, F., Eds.; Rowman & Littlefield Publishers Inc: Oxford, 2001;

[35] Layne, K.; Lee, J. Developing Fully Functional E-Government: A Four Stage Model. *Government Information Quarterly* 2001, *18*, *(2*, 122–136.

[36] Reddick, C.G. A Two-Stage Model of e-Government Growth: Theories and Empirical Evidence for U.S. Cities. *Government Information Quarterly* 2004, *21*, *(1*, 51–64.

[37] Tan, C.W.; Pan, S.L.; Lim, E.T.K. Towards the Restoration of Public Trust in Electronic Governments: A Case Study of the e-Filing System in Singapore. In Proceedings of the Proceedings of the 38th Hawaii International Conference on System Sciences; Hawaii, 2005.

[38] Beaumaster, S. Local Government IT Implementation Issues: A Challenge for Public Administration. In Proceedings of the Proceedings of the 35th Hawaii International Conference on System Sciences; 2002.

[39] Bouaziz, F. Public Administration Presence on the Web: A Cultural Explanation. *Electronic Journal of e-Government* 2008, 11–22.

[40] Coursey, D.H.; Welch, E.W.; Pandey, S.K. Organizational Determinants of Internally Perceived Website Effectiveness in State Health and Human Service Agencies. In Proceedings of the Proceedings of the 38th Hawaii International Conference on System Sciences; Hawaii, 2005.

[41] Drake, D.B.; Stecklem, N.A.; Koch, M.J. Information Sharing in and across Government Agencies: The Role and Influence of Scientist, Politician and Bureaucratic Subcultures. *Social Science Computer Review* 2004, *22*, *(1*, 67–84.

[42] Schedler, K.; Scharf, M.C. Exploring the Interrelations between Electronic Government and the New Public Management a Managerial Framework for Electronic Government. In Proceedings of the I3E Conference Zurich; Zurich, 2001.

[43] Scholl, H.J. Interoperability in E-Government: More than Just Smart Middleware. In Proceedings of the Proceedings of the 38th Hawaii International Conference on System Sciences; Hawaii, 2005.

[44] Criado, J.I.; Ramilo, M.C. E-Government in Practice: Analysis of Web Site Orientation to the Citizens in Spanish Municipalities. *The International Journal of Public Sector Management* 2003, *16*, *(3*, 191–218.

[45] Ho, A.T. Reinventing Local Governments and the E-Government Initiative. *Public Administration Review* 2002, *62*, *(4*, 434–444.

[46] Kaylor, C.; Deshazo, R.; Eck, D. Gauging E-Government: A Report on Implementing Services among American Cities. *Government Information Quarterly* 2001, *18*, *(4*, 293–307.

[47] Norris, D.F. Building the Virtual State ... or Not: A Critical Appraisal. *Social Science Computer Review* 2003, *21*, *(4*, 417–424.

[48] Stowers, G.N.L. Becoming Cyberactive: State and Local Governments on the World Wide Web. *Government Information Quarterly* 1999, *16*, *(2*, 111–127.

[49] West, D.M. E-Government and the Transformation of Service Delivery and Citizen Attitudes. *Public Administration Review* 2004, *64*, *(1*, 15–27.

[50] West, D.M. Urban e-government: an assessment of city government websites. In *Inside Politics*; 2001.

[51] Bélanger, F.; Carter, L. Trust and Risk in E-Government Adoption. *Journal of Strategic Information Systems* 2008, *17*, *(2*, 165–179.

[52] Bélanger, F.; Carter, L. Trust and Risk in E-Government Adoption. In Proceedings of the Proceedings of the Eleventh Americas Conference on Information Systems; Omaha, NE, USA, 2005.

[53] Carter, L.; Bélanger, F. The Utilization of E-Government Services: Citizen Trust, Innovation and Acceptance. *Information Systems Journal* 2005, *15*, *(1*, 5–25.

[54] Huff, R.; Kleeman, L. The Digital Divide's Devaluing of Local e-Government 2012.

[55] Lee, J.; T., L.; B.; Lee-Geiller, S. The Effects of Information Literacy on Trust in Government Websites: Evidence from an Online Experiment. *Elsevier BV* 2020, *52*,*p*, 102098–102098, doi:10.1016/j.ijinfomgt.2020.102098.

[56] Piderit, R.; Jojozi, N. Enhancing Citizen Participation in South African E-Government: Technology, Organisation and Environment Factors. *Inderscience Publishers* 2017, *8*, 162–162, doi:10.1504/ijeed.2017.086506.

[57] Shareef, A.; M., A.; N.; Dwivedi, K.; Y. An Empirical Investigation of Electronic Government Service Quality: From the Demand-Side Stakeholder Perspective. *Taylor & Francis* 2013, *26*, 339–354, doi:10.1080/14783363.2013.832477.

[58] Singh, M.; P., S.; D, D.; Pittachayawan, S. Diffusion of E-Government Services in Australia: Citizens' Perspectives. In Proceedings of the 16th European Conference on Information Systems; W, A.T.G., K, C., H, H., Vk, T., Eds.; Galway, Ireland, 2008.

[59] Laradi, S.; Lutfi, A.; Agag, G. Understanding Factors Affecting Social Commerce Purchase Behavior: A Longitudinal Perspective. *Journal of Retailing and Consumer Services* 2024, *78*, 103751.

[60] Alrawad, M.; Lutfi, A.; Alyatama, S.; Al Khattab, A.; Alsoboa, S.S.; Almaiah, M.A.; Ramadan, M.H.; Arafa, H.M.; Ahmed, N.A.; Alsyouf, A.; et al. Assessing Customers Perception of Online Shopping Risks: A Structural Equation Modeling–Based Multigroup Analysis. *Journal of Retailing and Consumer Services* 2023, *71*, 103188, doi:10.1016/j.jretconser.2022.103188.

[61] Chen, Y.; Chen, M.; H.; Huang, W.; W. Electronic Government Implementation: A Comparison between Developed and Developing Countries XXXX.

[62] Fountain, J.E. *Building the Virtual State: Information Technology and Institutional Change*; Brookings Institution Press: Washington, 2001;

Edelweiss Applied Science and Technology
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DOI: 10.55214/25768484.v8i6.3004

[63] Irani, Z.; Love, P.E.D.; Jones, S. Learning Lessons from Evaluating eGovernment: Reflective Case Experiences That Support Transformational Government. *Journal of Strategic Information Systems* 2008, *17*, *(2*, 155–164.
[64] Nye, J. *Information technology and democratic governance*; S.; Brookings: Washington, DC, USA, 2002;
[65] Lee, J.; Rao, H.R.; Kim, D.J. An Examination of Trust Effects and Pre-Existing Relational Risks in e-Government Services. In Proceedings of the Proceedings of the Eleventh Americas Conference on Information Systems; Omaha, 2005.
[66] Thomas, J.C.; Streib, G. The New Face of Government: Citizen-Initiated Contacts in the Era of e-Government. *Journal of Public Administration Research and Theory* 2003, *13*, *(1*, 83–102.
[67] Mapanoo, D.; E, M.; Caballero, M.; J. E-Government for Human Capability Development Program: An Implementation of G2E System for Enhanced Government Services. *EDP Sciences* 2018, *189*,*p*, 10005–10005, doi:10.1051/matecconf/201818910005.
[68] Nookhao, S.; Kiattisin, S. Achieving a Successful E-Government: Determinants of Behavioral Intention from Thai Citizens' Perspective. *Elsevier BV* 2023, *9*, 18944–18944, doi:10.1016/j.heliyon.2023.e18944.

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