JeDEM 14(2): 197-213, 2022
ISSN 2075-9517
http://www.jedem.org
Date of submission: 25.03.2022
Date of acceptance: 26.08.2022
Article DOI: 10.29379/jedem.v14i2.717

A Review of E-Government Assessment Frameworks: E-Readiness, Adoption, Citizen Engagement and Quality

Sudesh Sheoran[1*], Sanket Vij[2]

[1] ORCID Nr: 0000-0001-9981-2807*
Department of Management Studies, Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur Kalan, Sonepat, Haryana 131305, India, sdsh.shrn@gmail.com

[2] ORCID Nr: 0000-0002-0913-6209
Department of Management Studies, Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur Kalan, Sonepat, Haryana 131305, India, sanketvij@gmail.com

Abstract: The rapid development of digitalization has impelled countries to adopt electronic government (e-government) to improve quality and efficiency, reduce costs and establish transparency in their transactions with the citizens, thereby, strengthening the government-citizens relationship. As e-government has become pivotal for development, it is essential to understand various frameworks available in the literature for evaluating a country's e-government at different phases, from e-readiness to the realization of end benefits. Hence, this paper briefly reviews the e-government literature focusing on e-readiness, adoption, citizen engagement and performance and quality assessment frameworks. Further, a thematic analysis of the selected studies is carried out using NVivo and QDA Miner to map the main themes and subthemes and the associations among the selected studies. This paper contributes to the e-government literature with clear academic insights into different variables and dimensions in association with the evaluation of e-government and by setting a future research agenda for developing a holistic evaluation framework.

Keywords: Citizen engagement, e-participation, ICT, smart government, e-service quality

1. Introduction

The introduction of ICT into public service delivery increases operational efficiency (Cordella & Paletti, 2018; Larsson & Grönlund, 2014; Nielsen, 2017). Over the past two decades, electronic government (e-government) has seen tremendous growth across the world, motivated by anticipated payoffs (Jun & Weare, 2011; Srivastava & Teo, 2007). However, countries leverage different strategic paths to develop and implement e-government depending on their social and political structure (Gulati et al., 2014). At the same time, countries have understood the need for continuous assessment

of e-government for better governance (Pappel et al., 2021) and to be on top of their peer group at a global level.

Considering the aims of e-government, its performance relies on how efficiently the services or the projects yield the outcomes as expected. The performance of a country in terms of e-governance could be realized at different levels and perspectives. The literature provides several frameworks to evaluate e-government in different aspects such as technicality, citizen engagement, user experience, cost-benefits, quality and the overall experience of all the stakeholders. Moreover, the development of ICT and the arrival of new technologies, such as the Internet of Things (IoT), cloud and blockchain, opens new avenues for e-government. Even though there are various evaluation frameworks proposed in previous studies for different phases of e-government, the need for a holistic framework adapting to the latest technology still exists, and for this purpose, understanding the existing frameworks becomes essential.

Hence, this paper aims to review the e-government literature with reference to e-readiness, adoption, citizen engagement and performance and quality assessment. This paper follows the six generic steps in literature review as suggested by Templier and Paré (2015): (i) Formulating the problem, (ii) Searching the literature, (iii) Screening for inclusion, (iv) Assessing quality, (v) Extracting data and (vi) Analysing and synthesizing data. The narrative review methodology is adopted for reviewing the selected articles, as it synthesizes and bridges a wide range of literature on a research topic (Baumeister & Leary, 1997) and serves as a starting point for future research developments. Further, a thematic analysis of the selected studies is performed using NVivo and QDA Miner to find out the related sub-themes and association of the studies based on their themes.

2. E-Readiness, adoption and citizen engagement

Electronic readiness (e-readiness) is the extent to which a government is equipped to utilize the ICT in public and administrative services for sustainable development and better participation in the global socio-economic value chain. It is measured in several dimensions, including the extent of ICT infrastructure, ICT access to citizens, e-skills of the stakeholders and legal frameworks on ICT use. There are various studies in literature proposing e-readiness assessment frameworks using different methodologies. Hence, their raking of countries based on e-readiness also differ, resulting in inconsistent findings across the studies.

Bui et al. (2003) proposed an e-readiness assessment framework with eight factors: ICT infrastructure, macro-economy, investment potential, citizens' awareness, competitiveness, availability of skilled manpower, culture and cost of living and pricing. These factors were represented by 52 proxy measures. The study reveals that it is more appropriate to determine e-readiness factors in the economy consistent with business strategy and business priorities, and the degree of e-readiness directly depends on the country's competitiveness in the new economy. The metrics proposed in the study were designed to help in analyzing the specific needs and developing tailored strategies to improve e-readiness by optimizing resources. Further, the framework is considered to correct the area ignored by previous frameworks and to comprehensively measure and monitor e-competitiveness.

Alghamdi et al. (2011) developed an integrated e-readiness assessment framework that includes seven dimensions: program, process and information systems, strategy, architecture, infrastructure, user-access and human resource. While previous tools in literature on e-readiness were generic and focused on technical issues, this framework was built on an organizational perspective incorporating pertinent aspects to e-government. For analysing the e-readiness of a country, they suggested important strategic considerations, such as validating costs, measuring the accomplishment levels of vision and goals, recognizing the potential challenges in terms of technology and online policy.

Axelsson and Melin (2008) proposed a methodology for evaluating the citizens' engagement level in developing e-government projects by considering the citizens' requirement and perspectives through focus groups during the development process of e-services. The framework contains a questionnaire that focuses on citizens' views in future e-government projects and is based on their participation experience in terms of the dimensions, such as type, degree, content, extent, formality, influence, depth and result of participation. These dimensions were based on literature and empirical studies. They suggest that, for the establishment of a holistic and successful e-government application, a conceptual distinction needs to be made between participation and involvement.

Arendsen et al. (2008) assessed the high impact e-service adoption through three categories, namely, external pressure, perceived benefits and organizational readiness in terms of characteristics, IT and finance. The research instrument used was based on the "theory of the management information systems" and "adoption of innovation". It reveals that e-readiness is influencing the implementation of high-performance e-services, and considering the adoption, the ability is more important than its benefits. Also, the disadvantages perceived concerning complexity and interoperability by non-adopters are more than those by adopters. The factors hindering the adoption are deficient knowledge and skills, insufficient IT infrastructure and negative attitude.

Becker et al. (2008) assessed the gaps in e-inclusion at various levels, leading to gaps in e-services adoption. The model includes four levels of usage measurements that are internet, e-commerce, -government for information and e-government for transactions. The E-Inclusion Gap Model assesses the disparity among the usage levels of these factors. Despite the service's accessibility, security, and complexity challenges, out of the population, 38 percent use e-commerce. However, 28 percent use e-government for information, and nine percent use e-governance for transactions. They suggest that the gap can be bridged by improving service delivery and raising awareness of e-government services through marketing campaigns.

Colesca and Dobrica (2008) proposed an e-government adoption model, modifying the Technology Acceptance Model (TAM) with factors inducing citizens for e-services adoption in the six dimensions. The perceived usefulness, ease of use, quality and trust directly were found to influence the satisfaction with e-services and indirectly influence their acceptance. They also suggested that awareness campaigns showcasing the benefits of e-service could enhance the adoption.

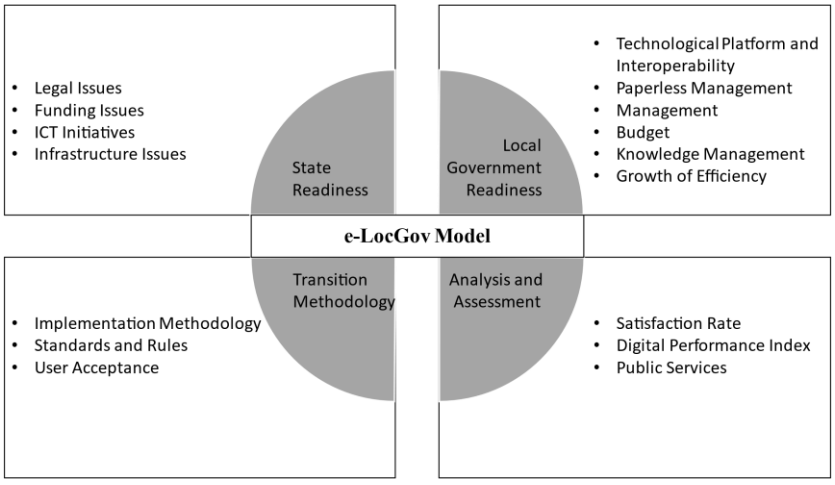
Based on comprehensive literature research, Rana et al. (2013) assessed various challenges, obstacles and key factors of e-government adoption. Common obstacles are technical obstacles, security risk and privacy risk, trust issues, resource deficiency, digital divide, lack of management and

infrastructure, ignorance, legal impediments, insufficient IT infrastructure and inflexibility. In addition, they found that challenges and obstacles in implementation were three times higher than those in adoption. Sharma (2015) developed an assessment framework for e-government adoption based on service quality factors and demographic factors and found that the service quality, reliability, security, efficiency and responsiveness affect e-government adoption.

Solvak et al. (2019) studied e-service usage patterns and their development in Estonia using 10-year behavioural data logs of all the users, and measured the cumulative nominal and relative adoption rates. The cumulative adoption rate was found to be growing rapidly, and the peak adoption rate increased when age decreased. The peak adoption rate and the number of services used were higher in women.

Pappel et al. (2021) researched, for more than one decade, on developing a reusable model for the systematic implementation of e-government in Local government (e-LocGov model). The e-LocGov model incorporates areas such as state-level readiness, organizational readiness, transition methodology and assessment of feedback, statistics and the satisfaction of the citizens. The e-LocGov model, with four areas, is shown in Figure 2. The model gives a platform for digital interaction among the state, local governments, and citizens. The transition methodology was developed considering the organizational change and giving room for an efficient learning environment. The framework makes the local government effective and enhances the efficiency of government-citizen-enterprise cooperation.

Figure 1: The Four Areas in e-LocGov model by Pappel et al. (2021) (2019)



3. Performance and quality

Dawes et al. (2003) assessed the e-services by Government in terms of users, suppliers, content dimension, and program dimension. They grouped the dimensions into two categories: users-uses-suppliers-content dimensions and access-program dimensions. They proposed a suite of tools for assessment, companion diagnosis, program design and cost estimation.

Banerjee (2004) proposed a framework for the e-government convergence capability. The framework is based on the factors in the context of environment (political, social, economic and demographic), resource (funding and human capital) and infrastructure (connectivity, and software and services). The factors are realized by e-leadership into policies or regulations and administrative reforms. The assessment of the e-government convergence capability of the selected countries reveals the quality and array of information and services through e-government vary across countries. The factors such as literacy, awareness and living standards are critical for e-government convergence, and e-leadership may not readily alleviate the social maladies and economic hindrances to improve these factors.

Montagna (2005) developed a tool to assess the pros and cons of e-government project proposals, in terms of "efficiency, effectiveness, strategic benefits, and transparency and institutional value" in the dimensions, "Product, Time Distance, Interaction, and Procedures." The advantages and benefits are assessed in terms of both governmental and societal perspectives. This framework provides e-government policymakers with a simple and reliable tool for evaluating and validating the proposals.

Agrawal et al. (2007) carried out an extensive literature review across eight research areas, "Service Quality Measurement, e-S ervice Quality Measurement, System Quality, Information Quality, Technology Adoption Model (TAM), End user satisfaction, Self Service Technologies and e-governance assessment models" followed by focus groups and in-depth interviews. Further, they carried out empirical survey and proposed "e-government Online Service Quality (EGOSQ)", combining the qualitative and quantitative approaches, to measures e-government services across seven dimensions: reliability, resourcefulness, utility, assurance, accountability, convenience and appealing websites.

Halaris et al. (2007) suggested an e-government quality evaluation framework, which comprises performance in terms of process, technology, quality and citizen satisfaction, and suggested that ordinary citizens did not possess the essential knowledge and skills to conduct technical evaluations of quality indicators and targets, and citizens' assessment of electronic services was unrealistic. Balog et al. (2008) developed the e-services quality evaluation system (e-ServEval). The components of e-ServEval are User Interface Manager (UIM), Authorization and Access Manager (AAM), Evaluation Process Manager (EPM), Evaluation Report Manager (ERM), Questionnaires Structure Manager (QSM) and Measurement Models Evaluator (MME). They concluded that the proposed system could solve important problems related to the measurement, evaluation, and improvement of services offered under e-government.

Yu (2008) proposed a value-centric framework considering "public beneficiaries, government internal organization and process, government service chain, and society and national environments", for developing, managing, and delivering e-government services, based on the business model as represented in Figure 2. This framework is helpful in effective and efficient development, execution and assessment of e-government services.

Grounded on a systematic review, H. Singh et al. (2020) identified and analysed the factors influencing the outcomes of e-government projects, and found the significant factors: "ease of use, usefulness, user satisfaction, infrastructure, website maturity, security, trust, transparency, authorization, operational efficiency, service quality and information quality."

Figure 2: Value-centric framework by Yu (2008, p. 165)

Public Beneficiaries Perspective		**Society and National Environment Perspective**	
Value	Citizen Values, Business Values	Value	Scoiety values, Nation values
Users	Citizens, Businesses	Users	Communities, Social groups, Non-profit organisations, etc.
Systems	G2C, G2B	Systems	G2S
Services	Information, Taxation	Services	Society partiicpation/collaboration, national learning, etc.
Performances	Service availability, Levels of satisfaction, Personalisation, Participation, etc.	Performances	Info society index, Levels of learning/growth, etc.

	e-Gov Services	
	Value	Quality, Efficiency, Effectiveness, Trust

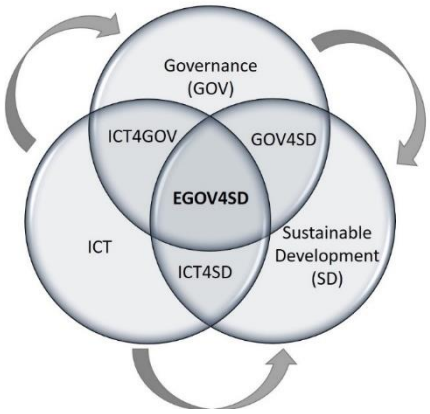
Government Service Chain Perspective		**Government Internal Org. and Process Perspective**	
Value	SC Values, Institution values, Administration values	Value	Employee values, Organisation values
Users	Government agencies	Users	Employees, Staff
Systems	G2G	Systems	G2E, GIP
Services	Document interchange, DB integration	Services	Payroll benefits, Internal audit and security control, etc.
Performances	Levels of services integration, Time reduction, etc.	Performances	Levels of employee satisfaction, organisationalcapability, cost-saving, etc.

Magoutas and Mentzas (2010) developed "Self-Adaptive quality monitoring model (SALT)" for assessing the technicalities and architecture of e-service portals by capturing the citizen behaviour and data collected from users through questionnaires, problems faced and metadata of the page visits. The framework is more dynamic in monitoring the e-service quality. The comparative evaluation of the framework with a similar statistic framework proves that it benefits both citizens and public administration. The framework enables more focused and relevant quality improvement decisions with fewer resources.

D'Agostino et al. (2011) evaluated the e-service sites of municipal corporations in the United States using a derivative of "E- Governance Performance Index" (Holzer & Kim, 2003) by adding 40 additional measures on service and citizen participation. They suggested that with the advanced internet-based technologies, the full advantage of the e-government could be reaped along with transparency and participation. Further, the e-government needs citizens, public-service officials, and other stakeholders to redefine their roles in democratic governance in first place. Estevez and Janowski (2013) proposed "Electronic Governance for Sustainable Development" (EGOV4SD), a convergence of e-government and sustainable development. According to them, "EGOV4SD is the

use of ICT to support public services, public administration, and the interaction between government and the public, while making possible public participation in government decision making, promoting social equity and socio-economic development, and protecting natural resources for future generations." The representation of this definition is shown in Figure 3.

Figure 3: EGOV4SD primary and secondary domains by Estevez and Janowski (2013, p. 597)



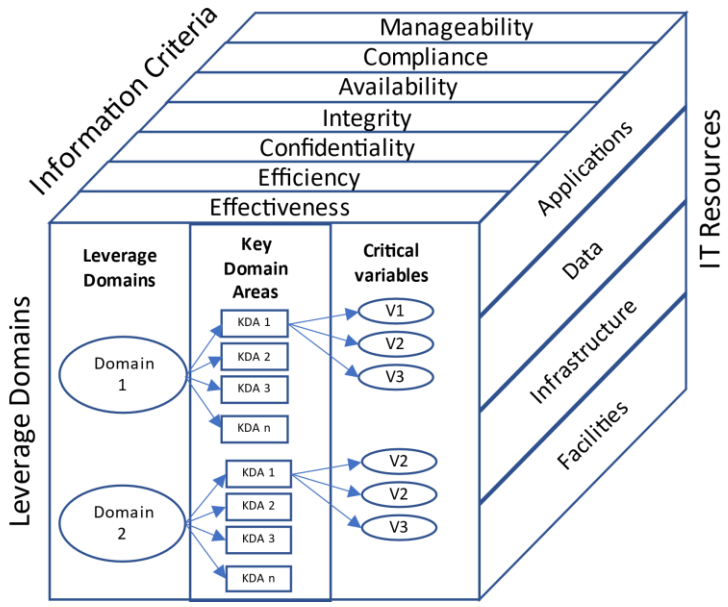
Osman et al. (2014) studied the key factors of user satisfaction on e-government services and developed a quantitative framework, "Cost-Opportunity-Benefit-Risk Analysis (COBRA)". The COBRA undertakes citizens' view, to measure the success of various e-government. It is more comprehensive that SERVQUAL model. De Andrade Soares et al. (2019), supported by the Brazilian government, through a Grounded Theory analysis, developed Br-GovQual for assessing mainly, the user experience on partially digitalized services, in terms of agility, information, tangibles, usability, and effort.

G. Singh et al. (2010) explored the effect of e-government on corruption in India, Ethiopia and Fiji through correlation and regression, and pointed out that e-government adoption is significant in improving the government-citizen relationship and reducing corruption. Hatsu and Ngassam (2017) identified core and contextual socio-economic indicators of the impact of e-government in three aspects: client, agency and the government/society, and assessed the socio-economic impact of e-government in emerging economies. The expert appraisal and case-study based validation revealed that the relevance and significance of the framework has been widely recognized and sufficiently validated. Esteves and Joseph (2008) carried out an ex-post assessment of e-government services based on maturity level, stakeholders, and assessment dimensions. The assessment dimensions were oriented by strategy, technology, organization, economy, operation and service. This framework contributes in improving the accountability and definition of e-government strategies. It can be used at local, regional and national levels. The assessment can be done in the stages before the implementation, during the operation and after the completion of the projects.

Iribarren et al. (2008) developed eGov-MM (eGovernment Maturity Model), which is for evaluating the capabilities and maturity of government organizations. The framework, as represented in Figure 4, is based on the dimensions, information criteria, IT resources, and leverage domains.

Among them, information criteria and IT resources are based on internationally recognized IT governance practices. The leverage domains include "e-strategy, IT governance, process management, and personnel and organizational capabilities" (Iribarren et al., 2008).

Figure 4: Three dimensions of eGovernment Maturity Model by Iribarren et al. (2008, p. 139)

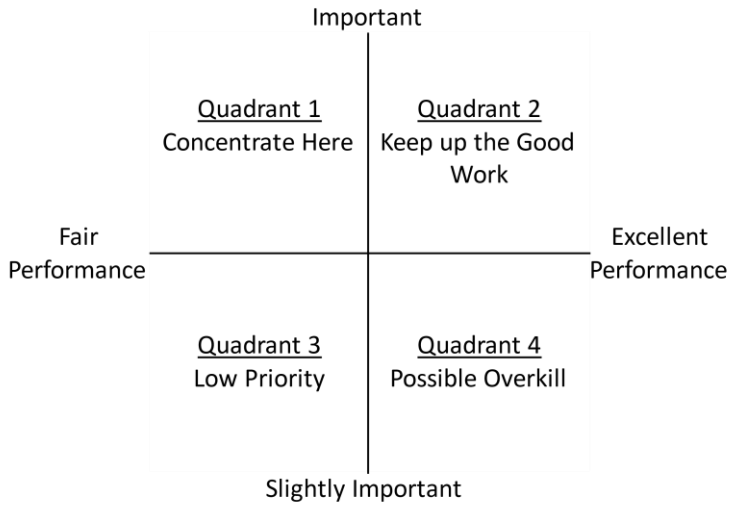


4. Evaluation of E-Government projects

Bhatia et al. (2009) proposed a user-centric evaluation framework for e-government services. Using this framework, they analysed five projects in India, "Bhoomi, Karnataka Valuation and E-Registration (KAVERI), Computer-aided Administration of Registration Department (CARD), eSeva, and Ahmedabad Municipal Corporation (AMC) Civic Centers." They found that the role of service centres is significant for the success of the projects, as most of the users do not have internet facilities at home. It makes the service centres essential for a seamless delivery of the services. It is also essential to analyse users' needs and demands and incorporate the related attributes during the project design stage, in order to guarantee public support. They also found that, as an outcome of the discretionary power, the service centre reduces corruption in service delivery. Bhatnagar and Singh (2010) assessed the e-government projects in the context of cost, quality, governance, and comparison of projects. They analysed, in addition to the projects analysed by Bhatia et al. (2009), Khajane, eProcurement and Computerized Inter-State Check Posts. They found that the users who have availed of the services, both manually and electronically, prefer e-services. Interestingly, the adoption of e-service does not create any loss of job. The cost of accessing the services is found to be significantly reduced, because of the significant reduction of the transportation cost involved in manual service delivery. The waiting time or the response time has also found a significant reduction up to 50 percent. Further, the assessment provided a way to evaluate the potential of public-private cooperation in e-government.

Wong et al. (2011) identified 27 e-government benefits through a literature review and measured those benefits from a Japanese e-government project using an Importance-Performance Analysis (IPA) grid (Martilla & James, 1977). In addition to measuring the benefits, they also measured the satisfaction level from the user perspective and highlighted the key improvement areas. As shown in Figure 5, the IPA grid consists of four quadrants: 'Concentrate Here', 'Keep Up the Good Work', 'Low Priority' and 'Possible Overkill'. Using the IPA grid makes it easier to evaluate the level of importance the users attribute to the benefits and their perceived level of satisfaction. They also highlighted the key areas of improvement required, such as data privacy, prompt service, and accessibility. Further, they suggested disinvestments in the 'possible overkill' quadrant and increasing the allocation in the 'concentrate here' quadrant.

Figure 5: Importance-Performance Analysis (IPA) Grid by Martilla and James (1977, p. 78)



Goel et al. (2012) carried out a case study of e-government adoption at "Haryana Urban Development Authority" (HUDA) using a dynamic "SAP-LAP (Situation, Actors, Process, Learning, Action and Performance)" framework. They compared the situations before and after the implementation and identified critical e-government implementation factors: "Leadership, Process alignment, Availability of technology and infrastructure, Skills and competency, Program management, Change management, End-User involvement, and Knowledge management." They suggested the inclusion of long-term and short-term objectives and active participation of executives and leaders during the planning of e-government. In addition, the executives and leaders must also put forward a vision for e-government adoption, and the objectives should be updated to all the stakeholders and there should be a feedback mechanism.

Kalsi and Kiran (2013) evaluated e-government projects by ten Indian states: "Haryana, Punjab, Andhra Pradesh, Rajasthan, Madhya Pradesh, Maharashtra, Tamil Nadu, Karnataka, Kerala and West Bengal" through ICT and e-government policy frameworks, from policy documents and personal interviews and discussions with various officials. They assessed the states on various policy parameters. They found the presence of gaps in policy framework and implementation framework

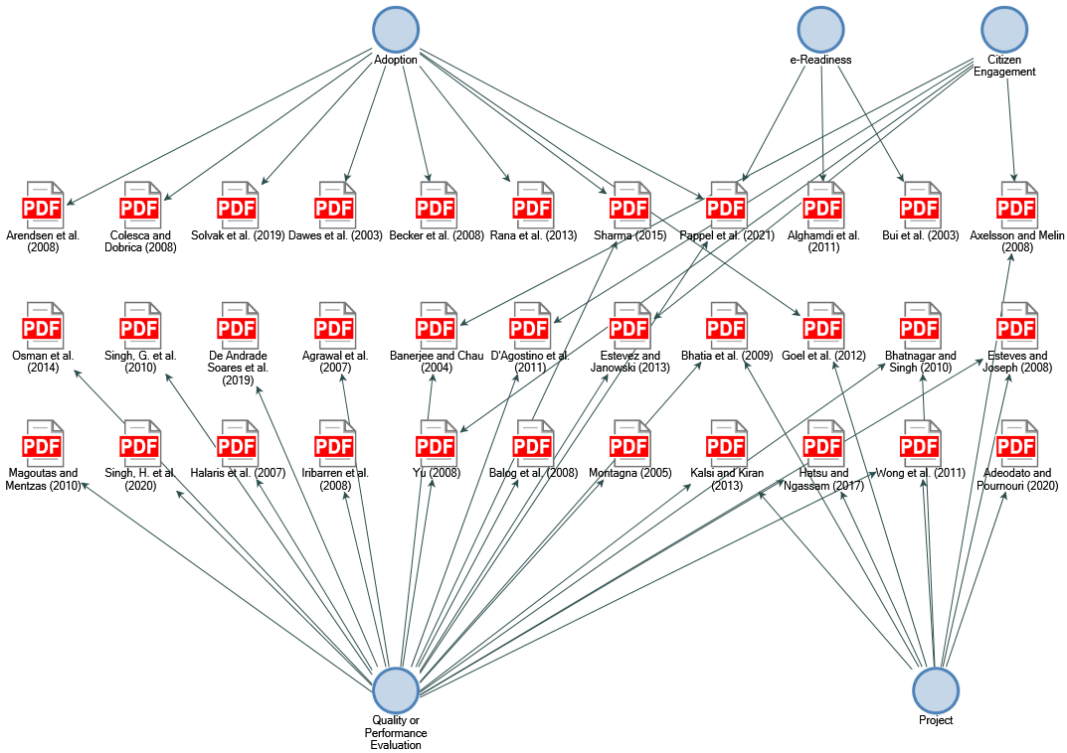
and highlighted the need for improving the factors: capacity building, common standards, security guidelines, quality, completeness, depth and spread of services, coordination and mindset.

Adeodato and Pournouri (2020) studied the secure and effective implementation of e-governance projects in developed countries, by establishing a direct relationship between e-government and digital security and compared the level of readiness in cybersecurity in Estonia with other countries. They suggested that implementing the Cyber Situational Awareness (CSA) program could protect three significant elements: the financial sector, the healthcare industry and the critical infrastructure. They found that citizens' trust was one of the major benefits of high-level e-government, and citizens' adoption rate was increased by improving the perception of trustworthiness. Moreover, major security breaches in the past did not impact the citizens' trust in the e-government system.

5. Thematic analysis of the selected studies

A content analysis has been performed with the 33 studies selected in this paper using NVivo[1]. The contents of the documents are coded with the themes such as e-readiness, adoption, citizen engagement, e-government evaluation framework, and other sub themes. The associations of the selected studies with the themes and other sub themes are represented in Figure 6.

Figure 6: Association of Studies to the Themes identified

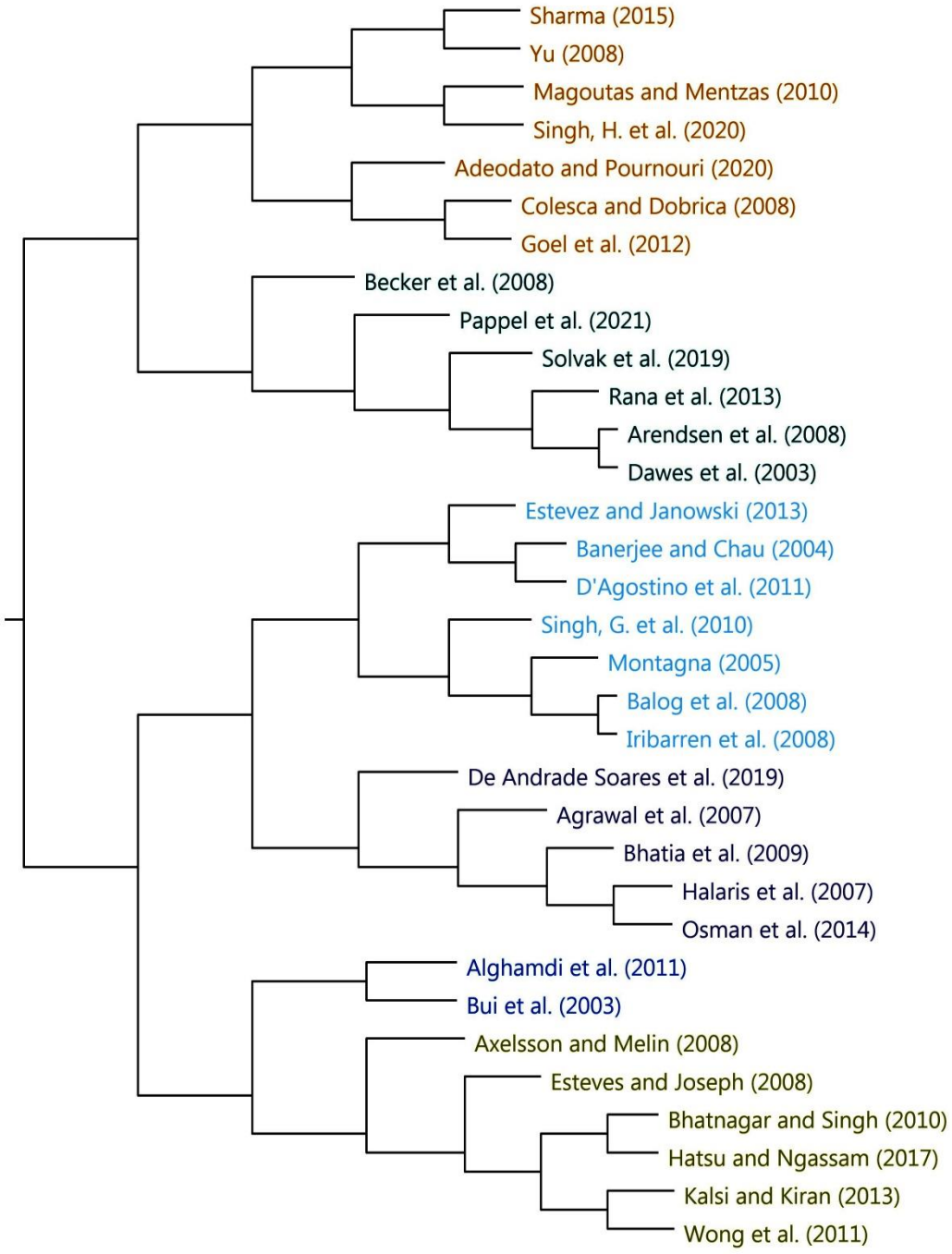


[1] https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

It is observed that even though some of studies mainly focus on a particular theme, they also discuss other themes. For example, the main themes of Bui et al. (2003) and Arendsen et al. (2008) being e-readiness with their sub themes including adoption and citizen engagement.

Based on the similarity of the coded themes and sub themes, the selected studies are clustered using divisive hierarchical clustering. The hierarchical clustering of the selected studies is represented as a dendrogram in Figure 7.

Figure 7: Hierarchical clustering of the selected studies based on theme



The hierarchical clustering helps it to identify the related studies at each level of the hierarchy. The articles in the same colour denote a cluster with similarities in themes. The similarity is calculated, not only in main themes but also in sub-themes. For example, the article by D'Agostino et al. (2011) and the article by Banerjee and Chau (2004) are closely related, compared to other studies based on the theme similarity. The number of clusters depends on the level in the hierarchy. For the representative purpose, the studies are classified into six clusters, and the clusters are differentiated by colour. Further, a phrase cloud (Figure 8) is generated with the help of QDA Miner[2] based on the frequency of phrases in the selected studies. The phrase cloud helps identify the sub themes such as service quality, e-government adoption, digital divide, sustainable development, user satisfaction, citizen participation, change management and corruption reduction.

Figure 8: Phrase-cloud from the selected studies

6. Conclusion

Advances in technology have transformed the form of communication and transaction between government and citizens. Governments have begun to use the potential of ICT to deliver services that were traditionally delivered by physical means. They are striving to tune conventional service delivery into smart services. This paper aimed to review the e-government literature, focusing on e-readiness, adoption, citizen engagement, and assessment of quality and performance and to conduct a thematic analysis of the selected studies.

This paper finds that although the e-readiness of a country can be improved through optimized resource allocation, the e-government adoption faces challenges in terms of IT infrastructure, accessibility of ICT to citizens, e-skills of the stakeholders, negative attitude of the stakeholders and policy and legal frameworks governing the use of ICT in public services. While measuring the e-readiness

[2] https://provalisresearch.com/products/qualitative-data-analysis-software/

of a country, it is also necessary to consider factors, such as validating costs, macro-economic factors, culture, accomplishment levels of vision and goals, and potential challenges. Further, a conceptual distinction needs to be made between participation and involvement and is essential for developing an e-government project or service. The outcomes of citizen engagement in e-government depend on the factors type, degree, content, extent, formality, influence, depth and result of participation.

This paper also finds several factors influencing e-government adoption, such as external pressure, readiness (IT infrastructure, finance, flexibility), transition methodology, citizens' awareness, perceived usefulness, ease of use, service quality, trust, reliability, security, efficiency, responsiveness, legal framework. The e-government adoption can be enhanced through rigorous awareness campaigns that demonstrate the benefits of e-government. At the same time, the challenges and barriers in e-government implementation are higher than those in its adoption.

The studies reviewed in this paper suggest several assessment frameworks concerning the performance and quality of e-government projects and services in different dimensions, based on the type of service delivered. Some prominent dimensions are strategic, technological, organizational, economic, operational, services, user experience, and information specific. The factors such as efficiency, effectiveness, transparency, reliability, security, responsiveness, strategic benefits, institutional value and user satisfaction are indicators of e-government performance. In the user-centric approach to quality assessment, the users consider the factors, such as reliability, resourcefulness and utility of the e-government services as influencing factors on quality. In addition, the paper reveals that service availability, assurance, and transparency strengthen the government-citizen relationship. With the advanced internet-based technologies, the full advantage of e-government could be reaped along with transparency and participation. The adoption of e-government significantly improves government-citizen relationships and reduces corruption. For e-government convergence, factors, such as literacy, awareness and living standards are essential. However, e-leadership may not readily alleviate the social maladies and economic hindrances against improving these factors. Further, the quality and array of e-services by governments vary across countries. The thematic analysis shows the main themes and sub themes of the selected studies and the associations among the studies, revealing related studies in each theme and sub theme.

This paper has the potential to contribute to the e-government literature by enumerating the essential factors for enhancing e-readiness, strengthening citizen engagement and easing e-government adoption. Further, the review of assessment frameworks gives researchers exploration of the influencing factors of e-government performance and quality. For the internal stakeholders of e-government projects or services, this will facilitate decision-making, to enhance the quality of e-government and citizen satisfaction, thereby, achieving the ultimate goals of e-government. This paper has a limitation that since the aim was to encompass the aspects, such as e-readiness, adoption, citizen engagement and evaluation of e-government, a relevant but smaller number of studies in each sub theme was selected from the literature. Each of these sub themes could be studied extensively as a separate research area. For future research, a systematic and critical analysis of the frameworks discussed in this paper may be carried out, to develop a holistic evaluation framework.

References

Adeodato, R., & Pournouri, S. (2020). Secure Implementation of E-Governance: A Case Study About Estonia. In H. Jahankhani, S. Kendzierskyj, N. Chelvachandran, & J. Ibarra (Eds.), *Cyber Defence in the Age of AI, Smart Societies and Augmented Humanity* (pp. 397–429). Springer International Publishing. https://doi.org/10.1007/978-3-030-35746-7_18

Agrawal, A., Shah, P., & Wadhwa, V. (2007). EGOSQ-users' assessment of e-governance online-services: A quality measurement instrumentation. *International Conference on E-Governance*, 231–244.

Alghamdi, I. A., Goodwin, R., & Rampersad, G. (2011). E-Government Readiness Assessment for Government Organizations in Developing Countries. *Computer and Information Science*, *4*(3), p3. https://doi.org/10.5539/cis.v4n3p3

Arendsen, R., Engers, T. M. van, & Schurink, W. (2008). Adoption of High Impact Governmental eServices: Seduce or Enforce? *Electronic Government*, 73–84. https://doi.org/10.1007/978-3-540-85204-9_7

Axelsson, K., & Melin, U. (2008). Citizen Participation and Involvement in eGovernment Projects: An Emergent Framework. *Electronic Government*, 207–218. https://doi.org/10.1007/978-3-540-85204-9_18

Balog, A., Badulescu, G., Badulescu, R., & Petrescu, F. (2008). E-ServEval: A system for quality evaluation of the on-line public services. *Informatica Economica*, *XII*(2), 18–21.

Banerjee, P., & Chau, P. Y. K. (2004). An evaluative framework for analysing e-government convergence capability in developing countries. *Electronic Government, an International Journal*, *1*(1), 29–48. https://doi.org/10.1504/EG.2004.004135

Baumeister, R. F., & Leary, M. R. (1997). Writing Narrative Literature Reviews. *Review of General Psychology*, *1*(3), 311–320. https://doi.org/10.1037/1089-2680.1.3.311

Becker, J., Niehaves, B., Bergener, P., & Räckers, M. (2008). Digital Divide in eGovernment: The eInclusion Gap Model. *Electronic Government*, 231–242. https://doi.org/10.1007/978-3-540-85204-9_20

Bhatia, D., Bhatnagar, S. C., & Tominaga, J. (2009). How do manual and e-government services compare? Experiences from India. *Information and Communications for Development 2009: Extending Reach and Increasing Impact*, 67–82.

Bhatnagar, S. C., & Singh, N. (2010). Assessing the Impact of E-government: A Study of Projects in India. *Information Technologies & International Development*, *6*(2), 109.

Bui, T. X., Sankaran, S., & Sebastian, I. M. (2003). A framework for measuring national e-readiness. *International Journal of Electronic Business*, *1*(1), 3–22. https://doi.org/10.1504/IJEB.2003.002162

Colesca, S. E., & Dobrica, L. (2008). Adoption and use of E-Government services: The case of Romania. *Journal of Applied Research and Technology*, *6*(03). https://doi.org/10.22201/icat.16656423.2008.6.03.526

Cordella, A., & Paletti, A. (2018). ICTs and value creation in public sector: Manufacturing logic vs service logic. *Information Polity*, *23*(2), 125–141. https://doi.org/10.3233/IP-170061

D'Agostino, M. J., Schwester, R., Carrizales, T., & Melitski, J. (2011). A Study of e-Government and e-Governance: An empirical examination of municipal websites. *Public Administration Quarterly*, *35*(1), 3–25.

Dawes, S. S., Pardo, T. A., & Cresswell, A. M. (2003). Designing government information access programs: A holistic approach. *36th Annual Hawaii International Conference on System Sciences, 2003. Proceedings of The*, 1–9. https://doi.org/10.1109/HICSS.2003.1174326

De Andrade Soares, V., Yukari Iwama, G., Gomes Menezes, V., Miranda Forte Gomes, M., Vitor Pedrosa, G., C. M. Pereira da Silva, W., & Maria Da Costa Figueiredo, R. (2019). Evaluating Government Services Based on User Perspective. *Proceedings of the 20th Annual International Conference on Digital Government Research*, 425–432. https://doi.org/10.1145/3325112.3325224

Esteves, J., & Joseph, R. C. (2008). A comprehensive framework for the assessment of eGovernment projects. *Government Information Quarterly*, *25*(1), 118–132. https://doi.org/10.1016/j.giq.2007.04.009

Estevez, E., & Janowski, T. (2013). Electronic Governance for Sustainable Development—Conceptual framework and state of research. *Government Information Quarterly*, *30*, S94–S109. https://doi.org/10.1016/j.giq.2012.11.001

Goel, S., Dwivedi, R., & Sherry, A. M. (2012). Critical Factors for Successful Implementation of E-governance Programs: A Case Study of HUDA. *Global Journal of Flexible Systems Management*, *13*(4), 233–244. https://doi.org/10.1007/s40171-013-0021-1

Gulati, G. J. "Jeff," Williams, C. B., & Yates, D. J. (2014). Predictors of on-line services and e-participation: A cross-national comparison. *Government Information Quarterly*, *31*(4), 526–533. https://doi.org/10.1016/j.giq.2014.07.005

Halaris, C., Magoutas, B., Papadomichelaki, X., & Mentzas, G. (2007). Classification and synthesis of quality approaches in e-government services. *Internet Research*, *17*(4), 378–401. https://doi.org/10.1108/10662240710828058

Hatsu, S., & Ngassam, E. K. (2017). A framework for assessing the socio-economic impact of e-governance projects in developing countries. *2017 Conference on Information Communication Technology and Society (ICTAS)*, 1–7. https://doi.org/10.1109/ICTAS.2017.7920648

Holzer, M., & Kim, S.-T. (2003). Digital Governance in Municipalities Worldwide: An assessment of municipal web sites throughout the world. In *Digital governance in municipalities worldwide: An assessment of municipal web sites throughout the world.* National Center for Public Productivity.

Iribarren, M., Concha, G., Valdes, G., Solar, M., Villarroel, M. T., Gutiérrez, P., & Vásquez, Á. (2008). Capability Maturity Framework for eGovernment: A Multi-dimensional Model and Assessing Tool. *Electronic Government*, 136–147. https://doi.org/10.1007/978-3-540-85204-9_12

Jun, K.-N., & Weare, C. (2011). Institutional Motivations in the Adoption of Innovations: The Case of E-Government. *Journal of Public Administration Research and Theory*, *21*(3), 495–519. https://doi.org/10.1093/jopart/muq020

Kalsi, N. S., & Kiran, R. (2013). E-governance success factors: An analysis of e-governance initiatives of ten major states of India. *International Journal of Public Sector Management*, *26*(4), 320–336. https://doi.org/10.1108/IJPSM-08-2011-0101

Larsson, H., & Grönlund, Å. (2014). Future-oriented eGovernance: The sustainability concept in eGov research, and ways forward. *Government Information Quarterly*, *31*(1), 137–149. https://doi.org/10.1016/j.giq.2013.07.004

Magoutas, B., & Mentzas, G. (2010). SALT: A semantic adaptive framework for monitoring citizen satisfaction from e-government services. *Expert Systems with Applications*, *37*(6), 4292–4300. https://doi.org/10.1016/j.eswa.2009.11.071

Martilla, J. A., & James, J. C. (1977). Importance-Performance Analysis. *Journal of Marketing*, *41*(1), 77–79. https://doi.org/10.1177/002224297704100112

Montagna, J. M. (2005). A framework for the assessment and analysis of electronic government proposals. *Electronic Commerce Research and Applications*, *4*(3), 204–219. https://doi.org/10.1016/j.elerap.2005.01.003

Nielsen, M. M. (2017). eGovernance frameworks for successful citizen use of online services: A Danish-Japanese comparative analysis. *JeDEM - EJournal of EDemocracy and Open Government*, *9*(2), 68–109. https://doi.org/10.29379/jedem.v9i2.462

Osman, I. H., Anouze, A. L., Irani, Z., Al-Ayoubi, B., Lee, H., Balcı, A., Medeni, T. D., & Weerakkody, V. (2014). COBRA framework to evaluate e-government services: A citizen-centric perspective. *Government Information Quarterly*, *31*(2), 243–256. https://doi.org/10.1016/j.giq.2013.10.009

Pappel, I., Tsap, V., & Draheim, D. (2021). The e-LocGov Model for Introducing e-Governance into Local Governments: An Estonian Case Study. *IEEE Transactions on Emerging Topics in Computing*, *9*(2), 597–611. https://doi.org/10.1109/TETC.2019.2910199

Rana, N. P., Dwivedi, Y. K., & Williams, M. D. (2013). Analysing challenges, barriers and CSF of egov adoption. *Transforming Government: People, Process and Policy*, *7*(2), 177–198. https://doi.org/10.1108/17506161311325350

Sharma, S. K. (2015). Adoption of e-government services: The role of service quality dimensions and demographic variables. *Transforming Government: People, Process and Policy*, *9*(2), 207–222. https://doi.org/10.1108/TG-10-2014-0046

Singh, G., Pathak, R. D., Naz, R., & Belwal, R. (2010). E-governance for improved public sector service delivery in India, Ethiopia and Fiji. *International Journal of Public Sector Management*, *23*(3), 254–275. https://doi.org/10.1108/09513551011032473

Singh, H., Grover, P., Kar, A. K., & Ilavarasan, P. V. (2020). Review of performance assessment frameworks of e-government projects. *Transforming Government: People, Process and Policy*, *14*(1), 31–64. https://doi.org/10.1108/TG-02-2019-0011

Solvak, M., Unt, T., Rozgonjuk, D., Võrk, A., Veskimäe, M., & Vassil, K. (2019). E-governance diffusion: Population level e-service adoption rates and usage patterns. *Telematics and Informatics*, *36*, 39–54. https://doi.org/10.1016/j.tele.2018.11.005

Srivastava, S. C., & Teo, T. S. H. (2007). E-Government Payoffs: Evidence from Cross-Country Data. *Journal of Global Information Management (JGIM)*, *15*(4), 20–40. https://doi.org/10.4018/jgim.2007100102

Templier, M., & Paré, G. (2015). A Framework for Guiding and Evaluating Literature Reviews. *Communications of the Association for Information Systems*, *37*(1). https://doi.org/10.17705/1CAIS.03706

Wong, M. S., Hideki, N., & George, P. (2011). The Use of Importance-Performance Analysis (IPA) in Evaluating Japan's E-government Services. *Journal of Theoretical and Applied Electronic Commerce Research*, *6*(2), 17–30. https://doi.org/10.4067/S0718-18762011000200003

Yu, C.-C. (2008). Building a Value-Centric e-Government Service Framework Based on a Business Model Perspective. *Electronic Government*, 160–171. https://doi.org/10.1007/978-3-540-85204-9_14

About the Authors

Sudesh Sheoran

Sudesh Sheoran is a Ph.D. scholar at the Department of Management Studies, Bhagat Phool Singh Mahila Vishwavidyalaya (BPSMV), Khanpur Kalan, Haryana, India. She has done B.Tech. with MBA integrated degree from the same university. She is a student member of the American Finance Association. Her area of research includes e-government and Internet of Things.

Sanket Vij

Professor Sanket Vij, a University Grants Commission (UGC) Research Awardee, is presently serving as Dean, Faculty of Commerce & Management and Chairperson, Department of Management Studies, Bhagat Phool Singh Mahila Vishwavidyalaya (BPSMV), Khanpur Kalan, Haryana, India. He has been a visiting faculty at various institutions of national importance. Besides publishing more than 50 research papers, he has been felicitated with Prof. Manubhai M. Shah Memorial Research Award, 2015 & Best Business Academic of The Year Award, 2013 (Gold Medals).

