

# Exploring the Conceptual Dimensions of Proposed E-Government Innovation in the Philippine Local Government Unit

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## ABSTRACT

This study developed a framework to enhance e-government implementation in selected local government units (LGUs) in Davao del Norte. Using an exploratory sequential mixed-methods design, qualitative data were gathered through 9 key informant interviews, followed by a quantitative survey involving 235 participants. Exploratory Factor Analysis (EFA) revealed six core dimensions of e-government: (1) Institutional Digital Readiness, (2) Citizen Engagement Mechanisms, (3) Digital Infrastructure Accessibility, (4) E-employment Enablement, (5) Digital Capacity Building, and (6) Secure and Equitable Digital Access. These dimensions accounted for 49.37% of the total variance, affirming the multifaceted nature of e-government in local governance. The results point out the value of digital literacy, successful electronic governance involving institutional support, inclusive access and citizen response. The framework is consistent with international digital governance frameworks, but specific to respond to the requirements of issues facing the Philippine LGUs like insufficient infrastructure and digital divides. This framework provides a practical guide for local policymakers, IT personnel, and stakeholders aiming to improve digital service delivery. Future studies are recommended to apply Confirmatory Factor Analysis (CFA) to validate the framework further and support its application across other regions.

**Keywords:** E-Government, Digital Governance, Exploratory Factor Analysis, Citizen Engagement, Davao del Norte SDG: 16 Peace, Justice, and Strong Institutions

## INTRODUCTION

The wide use of e-government as a key element of modern public administration is the result of not only the implementation of information and communication technology (ICT). The innovations are still transforming governance through efficient, transparent, and cost-effective services (S, Rocha & Cota, 2016). The governments around the globe are changing their system of providing people with public services by adopting digital standards.

The digital governance is already present in the Philippines especially in Quezon City, Cebu City and Davao City. These metropolises have implemented notable initiatives, including QC E-Services and Davao City Central 911, promoting transparency and efficient emergency response can be cut as it's a restatement, many local government units (LGUs) still find themselves struggling. The current studies are mainly working in national or macro contexts overlooking local challenges. This leaves some gap in literature regarding LGU specific implementation strategies. Thus, this research addresses this gap by proposing the framework that fits the e-government capabilities of Philippine LGUs, particularly Davao del Norte.

The qualitative phase will offer the opportunity to study the lived experience of the LGU staff and the stakeholders who are involved; the quantitative stage guarantees the statistical rigor required to endorse some essential themes. Singapore, South Korea, or Malaysia is an example of countries that have achieved great success in digital governance in the world. Singapore emphasizes technology and citizen participation (Sukarno et al., 2024). The efforts of South Korea lay focus on digital infrastructure and citizen-centred services (Belakhdar, 2021), with Malaysia providing online systems in tax submission and procurement systems (Siddiquee & Mohamed, 2020).

However, issues like the digital divide, instability, and poor infrastructure hinder adoption in developing countries (Shakya, 2018; Rarhoui, 2024). In this study the degree of the implementation of E-government

involving progressive tiers of the e-government adoption is also based on the EGovernment Maturity Level Model (Okan et al., 2024) stage levels. In this context, the model is customized to the Philippine situation, and it focuses on inclusivity, digital readiness and accessibility to the marginalized. Citizen engagement, local governance, and policing are also incorporated as key concepts, and Arabacca and Base (2022) identify them as the vital elements of digital governance. The idea of better digitalization strategies at the local level is further supported by the fact that the Philippines has gone down significantly in terms of its 2024 E-Government Development Index rank, placed at the 89th position, compared to 73rd in 2024.

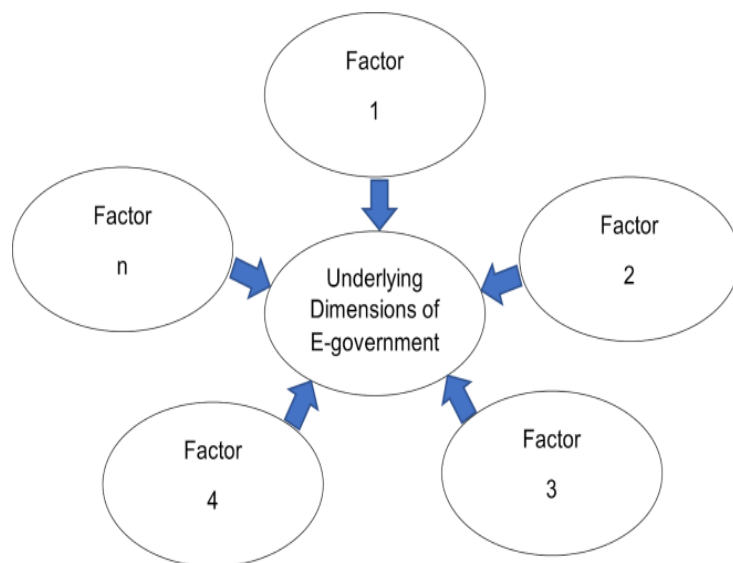
According to several studies (Bhatt & Kumar, 2023; Lagura, 2025), there is an absence of customized framework and the difference in performance between highly urbanized city websites and other LGUs. The results highlight the need for a much more inclusive, context-sensitive model of digital governance. To this effect, the research prepares tailor-made framework to the LGUs in Davao del Norte; Panabo City, Tagum City, and the Island Garden City of Samal. The study should derive based on using exploratory factor analysis (EFA) to define the discouraging dimensions behind the success behind the e-government initiative with parameters like accessibility, technological infrastructure, transparency, usability and citizen participation.

The proposed framework would help LGUs to adopt the adoption of effective digital services that would encourage transparency and civic participation. It is aimed to bring profit not only to the local officials and IT staff but also to researchers, community leaders, and locals. The results have the possibility of digital policy development, the need to lower the obstacles of using services by the underserved groups, and the opportunity to empower the citizens by providing online platforms that are convenient and accountable. Despite progress, infrastructure gaps and limited capacity remain (Bhatt & Kumar, 2023).

Accordingly, this study is the answer to the demand of the grounded and locally responsive frameworks, which has been allegedly proven by the views of Okan et al. (2024) and Belakhdar (2021).

### Conceptual Framework

Figure 1 displays the conceptual framework of the proposed study going to be used, which is aimed at exploring the latent dimensions of e-government in the local government unit (LGU). The conceptualization of e-government by the framework is that of a latent construct constituted by several interrelated factors and which can be provisionally referred to as Factor 1, Factor 2, Factor 3, etc., and as the major variables bearing on successful implementation of digital governance.



**Figure 1. Showing the Conceptual framework of the Study**

The main aim of the study was to define and assess the underlying dimensions of e-government among the local government units of Davao Del Norte, and toward the development of a custom framework on successful digital governance under the setting of LGU Philippines. Through exploratory factor analysis (EFA), the study will identify the key variables that drive the e-government initiatives success. This

framework will respond to specific challenges and needs of the local government units in Panabo City, Tagum City, and Island Garden City of Samal, to offer a systematic model that can be used to promote E-government initiatives.

The research implication has great expectations for several parties such as local government authorities, community leaders, advocates, researchers, and residents of these cities. As local officials and planners, it is those factors that either ease or inhibit the workability of e-governance in which they are provided with the insights with which to create more accommodating and responsive online communities which will lead them to create digital policies which will respond to the demands of citizens. To researchers, the study proves a methodological reference, adding to the body of digital governance research which can be altered and advanced to other, local contexts. Finally, to the citizens of Davao Del Norte, the conclusions will allow them to have a better picture of the potential and challenges of e-government, which would enable them to be more active in the government through convenient and transparent digitized services.

## METHODS

### Study Participants

#### Qualitative Phase

This research used purposive sampling to select LGU staff directly involved in e-governance, concentrating on those whose divisions use digital governance tools. Roles, responsibilities, and familiarity with e-government systems were taken into consideration when selecting participants. This strategy made sure that a variety of viewpoints and experiences were included, which contributed to the creation of thorough insights into the difficulties and application of digital governance in Davao del Norte.

Participants in the qualitative phase comprised LGBTQIA+ people and residents of Samal, Panabo, and Tagum in Davao del Norte who were at least 21 years old. Many participants came from government offices or city IT centers that were active in e-governance, offering a variety of localized perspectives on how it was being implemented.

#### Quantitative Phase

In the quantitative phase, 235 participants were selected using simple random sampling, as recommended by de Winter (2009) and Watkins (2021) to ensure consistency in factor recovery. This method gave all eligible residents an equal chance to participate, enhancing data representativeness and supporting the qualitative findings on LGU staff’s e-government experiences.

A wide perspective of e-government across sectors was provided by the participation of both residents and government employees participating in e-government. In all, 80 eligible respondents who were at least 18 years old and from each of the three rapidly expanding cities of Samal, Panabo, and Tagum were chosen at random to provide a range of viewpoints on e-government procedures and citizen participation in Davao del Norte. Consistent factor recovery was ensured by 235 participants or more (de Winter, 2009; Watkins, 2021). In the quantitative phase, simple random sampling was employed, which gave every member of the target population an equal chance of being selected, as advised by Jawale (2012) and Cruciani (2023).

**Table 1: Distribution of Research Participants**

LOCALE	Qualitative Phase	Quantitative Phase
Island Garden City of Samal	3	79
Panabo City	3	78
Tagum City	3	78
Total	9	235

Two instruments were used in this exploratory sequential mixed method study to develop a comprehensive view of e-government and guide the framework design.

### Qualitative Phase

In the qualitative study, an interview guide was the primary tool used to conduct key informant interviews (KII) with the chosen participants in Davao del Norte cities. Using interviews as the primary method, the study was able to record opinions and contextual factors that were essential to the creation of a successful e-government framework.

### Quantitative Phase

In the quantitative phase, using a 7-point Likert scale (7 = Strongly Agree, 1 = Strongly Disagree), a 47-item survey questionnaire was created based on themes found in the qualitative data to measure insights, evaluate satisfaction, and spot trends in e- government. Reliability was evaluated via pilot testing and Cronbach's alpha, which yielded an outstanding internal consistency score of 0.916. This maintained consistency with standardized items, demonstrating the validity of the instrument. Stronger internal consistency is indicated by higher Cronbach's alpha values, which range from 0 to 1 (Tavakol & Dennick, 2011).

### Design and Procedure

This study used an exploratory sequential mixed-method design (Creswell & Clark, 2017), first gathering and analyzing qualitative data, then moving on to a quantitative stage (Fetters, Curry, & Creswell, 2013). The two-phase technique is appropriate for investigating e-government aspects in Davao del Norte LGUs because the first qualitative phase served as a reference for the creation of the survey for the quantitative stage. Deeper comprehension and the ability to address more general research topics that could not be adequately addressed with a single methodology were made possible by this strategy.

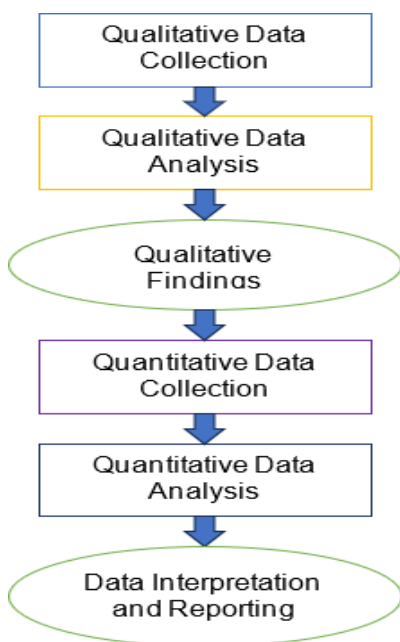


Figure 2: The Exploratory Sequential Mixed-methods Process (Patel & Moitra, 2021)

Approval was secured from the research adviser and DNSC–Institute of Leadership, Entrepreneurship, and Good Governance. To get authorization and find eligible interview subjects, formal letters were issued to the LGUs in Panabo, Tagum, and Samal. Interviews were recorded with consent and kept private, and consent papers were given. Following thematic saturation and transcription, a survey was created and put through a validity and reliability pilot test. The survey was distributed to current e- government users, and letters were addressed to city mayors for permission. To guarantee a high response and complete retrieval, participation was optional and had variable completion dates.

## Data Analysis

This study employed several statistical methods to better understand the underlying factors that affected the full utilization of E-government within the selected Local Government Units.

### Qualitative Phase

The method of analyzing the qualitative data was planned and started with gathering information while constructing a compelling case, finished with distilling vast volumes of data, and concluded with identifying significant trends. To filter and organize the data, identify key ideas and concepts, verify the validity and accuracy of the analysis and results, and investigate potential causes, this study used Gibbson and O'Connors' (2003) approach for data analysis.

### Quantitative Phase

To identify important e-government domains, the survey results were tabulated and analyzed using data reduction methods. With an eigenvalue cutoff of 1.0, Principal Component Analysis (PCA) was employed, and Varimax rotation revealed significant coefficients above +0.40, as Kaiser (1958) recommended. Investigative Factor Analysis (EFA) assisted in identifying latent variables or underlying factors. This technique, according to Carpenter (2006), validates the instrument's structure by reducing the complexity of big data sets to comprehensible dimensions.

### Ethical Consideration

This study prioritized participant safety and well-being while adhering to ethical norms. Respondents and participants received an explanation of the study and their role prior to the actual data collection. To emphasize that participation was entirely voluntary and that they could withdraw at any time, they were provided with an informed consent form. In accordance with RA 10173, the Data Privacy Act of 2012, code names were employed for the study's qualitative analysis to protect the confidentiality of the informants. The participants in the quantitative phase received a letter guaranteeing that their personal information would be kept private and that the data would only be utilized for research.

## RESULTS AND DISCUSSIONS

### Findings of Qualitative Phase

The key-informant interview (KII) yielded substantial qualitative insights into the dimensions and factors that form the underlying dimensions of e-government initiatives. Using the KII approach, data from nine transcripts were carefully evaluated and synthesized, resulting in forty-seven key statements that classify and describe the different aspects influencing e-government initiatives into making. These statements reflect the personal, social, and institutional statements of ICT Heads and Staff. As shown in Table 2, these 47 statements serve as measures of e-governance initiatives.

Table 2. Formulated meaning for the dimensions of E-governance initiatives

1.	Provision of available and reliable internet connection in the service area.
2.	Internet access that would allow residents in remote areas to submit grievances, complaints, and requests directly to government agencies without needing to travel.
3.	A city-wide network to remote areas to help reduce inequality in access to government services.
4.	Internet connectivity is essential to improve the efficiency of government operations in remote areas.

5.	Secure online platforms for citizens to submit feedback and suggestions for improving e-government services.
6.	Online feedback tools should be simple to use and available on both websites and mobile apps.
7.	The government's online platforms should have easy ways for citizens to give feedback and suggestions to improve e-government services.
8.	Online tools for citizens to submit complaints or requests for accessibility improvements in public spaces
9.	Providing centralized online feedback portals where citizens can easily submit feedback on their experiences with e-government services.
10.	Online courses and training programs for citizens on how to use technology effectively in their daily lives.
11.	Free or low-cost digital literacy training programs to empower citizens to use e-government services effectively.
12.	Regular training and support for government employees for successful e-government implementation.
13.	Online training programs and resources on digital accessibility and inclusive technology for government officials and service providers.
14.	Online tax filing for convenient and efficient tax compliance.
15.	Secure online payment options include credit cards, debit cards, and mobile payment systems.
16.	Digital birth, marriage, and death certificate requests and processing.
17.	Online services for citizens to apply for building permits and other construction-related approvals.
18.	Mobile app that allows citizens to track the status of their government applications and permits, providing real-time updates.
19.	Investing in developing user-friendly mobile applications for accessing government services is essential.
20.	The development of e-government services that cater to the needs of marginalized communities, such as those in rural areas or with disabilities
21.	Clear and concise information about available government services.
22.	E-government initiatives to help promote transparency and accountability in government operations.
23.	Online payment options for government services improve convenience and efficiency.
24.	User-friendly websites and mobile apps that provide clear, concise information with FAQs and step-by-step guides about general government services.
25.	Government agencies should invest in robust IT infrastructure to support e-government initiatives.

26.	Online system for citizens to schedule appointments with government agencies, eliminating the need for long wait times and in-person visits.
27.	Promoting collaboration with private sector partners to develop innovative and efficient e- government solutions.
28.	Regular audits to ensure that e-government services are functioning efficiently and meeting citizen needs.
29.	E-government platforms to provide real-time updates and notifications to citizens about important government announcements and service changes.
30.	Online platform for job seekers to create profiles and upload their resumes for potential employers to access.
31.	Online feature that allows job seekers to save job postings they are interested in, creating a personalized list for easy reference.
32.	Official group that will enable employers to post job openings directly on the calendar, making it a one-stop shop for job seekers.
33.	Online job boards or employment platforms to expand its reach and visibility for job seekers.
34.	Allocating a specific and consistent annual budget for the development of e-governance services.
35.	Hiring more qualified IT professionals for fast delivery of e-government initiatives.
36.	Online platform for citizens to schedule appointments, access medical records, and receive reminders for preventative health screenings.
37.	Mobile applications that allow citizens to locate nearby free healthcare clinics and facilities.
38.	Online training programs and resources on digital accessibility and inclusive technology for government officials and service providers.
39.	Online platform for citizens to report healthcare-related issues or concerns to the relevant authorities, ensuring transparency and accountability.
40.	Accessible online platform for citizens to access information about disability-related services, programs, and benefits.
41.	Mobile applications accessible to citizens with different disabilities, providing information about transportation, accessibility features in public spaces, and support services
42.	Online platform that allows citizens to track the progress of government projects and initiatives, ensuring transparency and accountability.
43.	Investment in cybersecurity measures to protect citizen data and prevent cyberattacks on e- government platforms.
44.	Campaign and support to help citizens adapt to new e-government systems and reduce resistance to change.

45.	Public information about E-governance initiatives to build trust and reduce hesitation in using digital government platforms.
46.	Web-based systems that significantly reduce processing time and improve the speed of service delivery.
47.	Data Security and Privacy Protections to ensure the safety and confidentiality of personal information in digital transactions.

**Findings of Quantitative Phase**

The KMO value in this analysis was 0.961 which is greater than 0.6 recommended by Kaiser (1974) and belongs to the range of marvelous (0.900 to 1.000) sampling adequacy. This is a very high figure which indicates the absence of partial correlations between variables and indicates the excellent fitness of the data in relation to factor analysis.

Table 3. KMO and Bartlett's Test

Test	Value
<b>Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy</b>	0.961
<b>Bartlett's Test of Sphericity</b>	
Approx. Chi-Square	5990.536
df	1081
Sig.	0.000

Additionally, Bartlett's Test of Sphericity yielded a Chi-Square of 5990.536 (df = 1081, p < .001), indicating that the correlation matrix is not an identity matrix. This confirms that the 47 items are sufficiently interrelated for factor analysis. Combined with a high KMO value of 0.961, the data is deemed highly suitable for EFA.

**Latent Roots Criterion.** Table 4 indicates that the number of factors to be retained based on eigenvalue-greater-than-one rule also referred to as Kaiser criterion is in this case 6 (Kaiser, 1960). The first factor had a dominant eigenvalue of 17.056 and explained 36.289 per cent of the total variance which shows that the first factor had very strong underlying construct. All the other factors, i.e. Factor 2 (2.874%), Factor 3 (2.780%), Factor 4 (2.635%), Factor 5 (2.484%), and Factor 6 (2.303%) have a minor role in the total variance. The combination of the six factors accounted to a total variance of 49.365 per cent. The identified factors represent the multidimensional aspect of e- government implementation by LGUs in accordance with qualitative results and in line with the existing frameworks (Okan et al., 2024; Belakhdar, 2021; Bhatt & Kumar, 2023).

Table 4. Latent Roots Criterion

	Eigenvalues	Proportion Variance	Cumulative Variance
Factor 1	17.056	36.289	36.289
Factor 2	1.351	2.874	39.163
Factor 3	1.307	2.780	41.943
Factor 4	1.238	2.635	44.578
Factor 5	1.168	2.484	47.062
Factor 6	1.083	2.303	49.365

Catell’s Scree Plot. In support of the factor extraction process, a scree plot was generated to visually assess the number of factors to retain in the exploratory factor analysis (EFA). As shown in Figure 3 (next page), the scree plot presents the eigenvalues plotted against the component numbers, providing a clear visual representation of the variance explained by each successive factor. The graph demonstrates a distinct steep slope that sharply declines after the first component, followed by a clear leveling off beginning from the second component onward. This visual pattern indicates the presence of a strong dominant factor, which accounts for a substantial portion of the total variance, consistent with the eigenvalue of 17.056 for Factor 1 observed in the latent roots criterion.

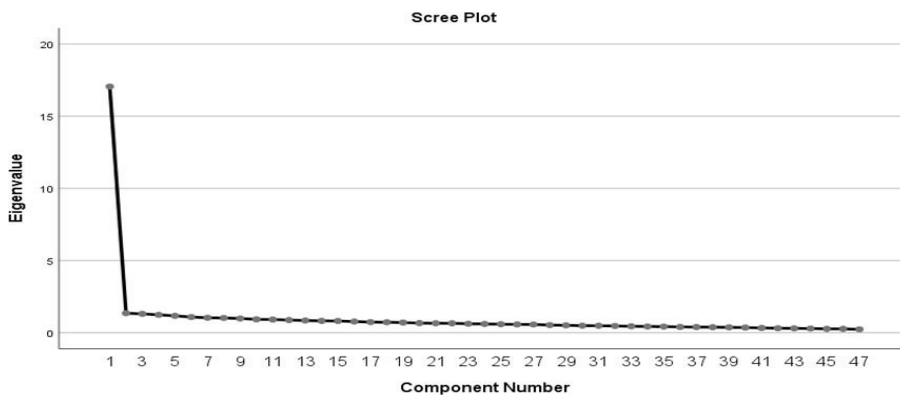


Figure 3. Scree Plot

**Rotated Component Matrix.** This rotated solution simplified the hidden structure by maximizing variance of factors loadings through the components, hence, allowed easy interpretation of each factor (Kaiser, 1958).

The fidelity of construct and conceptual clarity of the identified factors were affirmed in the rotated component matrix as confirming the multidimensional construct of the e-government implementation in Davao del Norte LGUs. All the factors met the following criteria: had thematic coherence and no big cross-loadings above 0.40, which meant good discriminant validity (Costello & Osborne, 2005).

Table 5. Rotated Component Matrix

Item Number	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Dimension 6
44	0.615					
19	0.582					
39	0.549					
27	0.434					
26	0.433					
21		0.604				
22		0.604				
6		0.594				
5		0.558				
4		0.553				
1			0.681			

2			0.582			
3			0.579			
25			0.525			
11			0.483			
38			0.436			
34			0.411			
24				0.693		
32				0.543		
31				0.519		
36				0.425		
30				0.415		
17					0.678	
9					0.621	
47					0.615	
41						0.662
37						0.54
28						0.432
43						0.418

Dimension 1: Organizational Capacity Readiness. It emphasizes on the areas of resource deployment, institutional readiness, digitalization, and coordination controls. The above dimension highlights the role played by organizational readiness in laying the foundation of effective implementation of e-government. Such results correspond with the international literature and, in particular, with the study conducted by Okan et al. (2024), who notes that the effectiveness of the e government implementation is predetermined by the strength of the local government institutions and the strategy of their functioning.

**Table 6. Constructs and loadings under dimension 1**

Item Number	Item Statements	Factor Loading	New Item Number
Factor 1 – Organizational Capacity Readiness			
44	Campaign and support to help citizens adapt to new e- government systems and reduce resistance to change.	0.615	1
19	Investing in developing user-friendly mobile applications for accessing government services is essential.	0.582	2
39	Online platform for citizens to report healthcare-related issues or concerns to the relevant authorities, ensuring transparency and accountability.	0.549	3

27	Promoting collaboration with private sector partners to develop innovative and efficient e-government solutions.	0.434	4
26	Online system for citizens to schedule appointments with government agencies, eliminating the need for long wait times and in-person visits.	0.433	

Dimension 2: Citizen Engagement Mechanism. This dimension can be noted as the means of citizens to directly engage in the process of governance via online feedback systems, complaint systems, and digital systems of engagement. This is one of the reasons why e-government platforms are not just a service delivery tool but also a participative platform where citizens may participate in making the government responsive to them hence this promotes transparency and accountability. This is consistent with the democratic principles of e-governance literature, according to which technology-based platforms need to be participatory in order to enhance the sense of citizens who trust them and the positive results of governance (Belakhdar, 2021; Bhatt & Kumar, 2023).

Table 7. Constructs and loadings under dimension 2

Item Number	Item Statements	Factor Loading	New Item Number
<i>Factor 2 – Citizen Engagement Mechanisms</i>			
21	Clear and concise information about available government services.	0.604	6
22	E-government initiatives to help promote transparency and accountability in government operations.	0.604	7
6	Online feedback tools should be simple to use and available on both websites and mobile apps.	0.594	8
5	Secure online platforms for citizens to submit feedback and suggestions for improving e-government services.	0.558	9
4	Internet connectivity is essential to improve the efficiency of government operations in remote areas.	0.553	10

Dimension 3: Digital Infrastructure Accessibility. *These* components signify the technical and infra-structural facilitators of e-government services, such as sustained internet connectivity, steady ICT framework, and vast reach to distant and marginal communities. The addition of such items signifies the importance of the availability of digital infrastructure in determining the preparedness of e-government especially among decentralized LGUs where digital divides are usually more apparent (Shakya, 2018; Sukarno et al., 2024).

Table 8. Constructs and loadings under dimension 3

Item Number	Item Statements	Factor Loading	New Item Number
<i>Factor 3 – Digital Infrastructure Accessibility</i>			
1	Provision of available and reliable internet connection in the service area.	0.681	11
2	Internet access that would allow residents in remote areas to submit grievances, complaints, and requests directly to government agencies without needing to travel.	0.582	12

3	A city-wide network to remote areas to help reduce inequality in access to government services.	0.579	13
25	Government agencies should invest in robust IT infrastructure to support e-government initiatives.	0.525	14
11	Free or low-cost digital literacy training programs to empower citizens to use e-government services effectively.	0.483	15
38	Online training programs and resources on digital accessibility and inclusive technology for government officials and service providers.	0.436	16
34	Allocating a specific and consistent annual budget for the development of e-governance services.	0.411	17

**Dimension 4: Digital Services for Employment.** This dimension reflects the expansion of e-government’s role into the domain of employment facilitation and economic opportunities. Through job matching platforms, employment boards, and digital career services, e-government contributes to livelihood support mechanisms and fosters inclusive economic participation. These findings support emerging international perspectives on the evolving functions of e-government platforms, which not only facilitate administrative transactions but also serve as digital tools for local economic development (Siddiquee & Mohamed, 2020).

Table 9. Constructs and loadings under dimension 4

Item Number	Item Statements	Factor Loading	New Item Number
<i>Factor 4 – Digital Services for Employment</i>			
24	User-friendly websites and mobile apps that provide clear, concise information with FAQs and step-by-step guides about general government services.	0.693	18
32	Official group that will enable employers to post job openings directly on the calendar, making it a one-stop shop for job seekers.	0.543	19
31	Online feature that allows job seekers to save job postings they are interested in, creating a personalized list for easy reference.	0.519	20
36	Online platform for citizens to schedule appointments, access medical records, and receive reminders for preventative health screenings.	0.425	21
30	Online platform for job seekers to create profiles and upload their resumes for potential employers to access.	0.415	22

**Dimension 5: Digital Capacity Building.** This dimension centers on the provision of training programs and digital literacy initiatives aimed at both government personnel and the general public. Digital literacy plays a pivotal role in ensuring effective adoption of e-government systems, reducing resistance to technological change, and empowering both citizens and staff to fully utilize e-government services. The need for sustained investment in digital literacy aligns with previous literature highlighting digital competency as a significant predictor of successful e-government utilization in developing countries (Bhatt & Kumar, 2023).

**Table 10. Constructs and loadings under dimension 5**

Item Number	Item Statements	Factor Loading	New Item Number
Factor 5 – Digital Capacity Building			
17	Online services for citizens to apply for building permits and other construction-related approvals.	0.678	23
9	Providing centralized online feedback portals where citizens can easily submit feedback on their experiences with e-government services.	0.621	24
47	Data Security and Privacy Protections to ensure the safety and confidentiality of personal information in digital transactions.	0.615	25

Lastly, Dimension 6: Secure and Equitable Digital Access. This factor addresses the growing concerns about cybersecurity, data protection, and digital inclusivity. Item 41 specifically reflects the importance of developing mobile applications that are accessible to citizens with disabilities, emphasizing e-government’s commitment to inclusivity. Meanwhile, items 37, 28, and 43 underscore the necessity of robust data security protocols to safeguard personal information and maintain public trust in digital platforms. The emergence of this factor demonstrates that citizens are increasingly concerned not

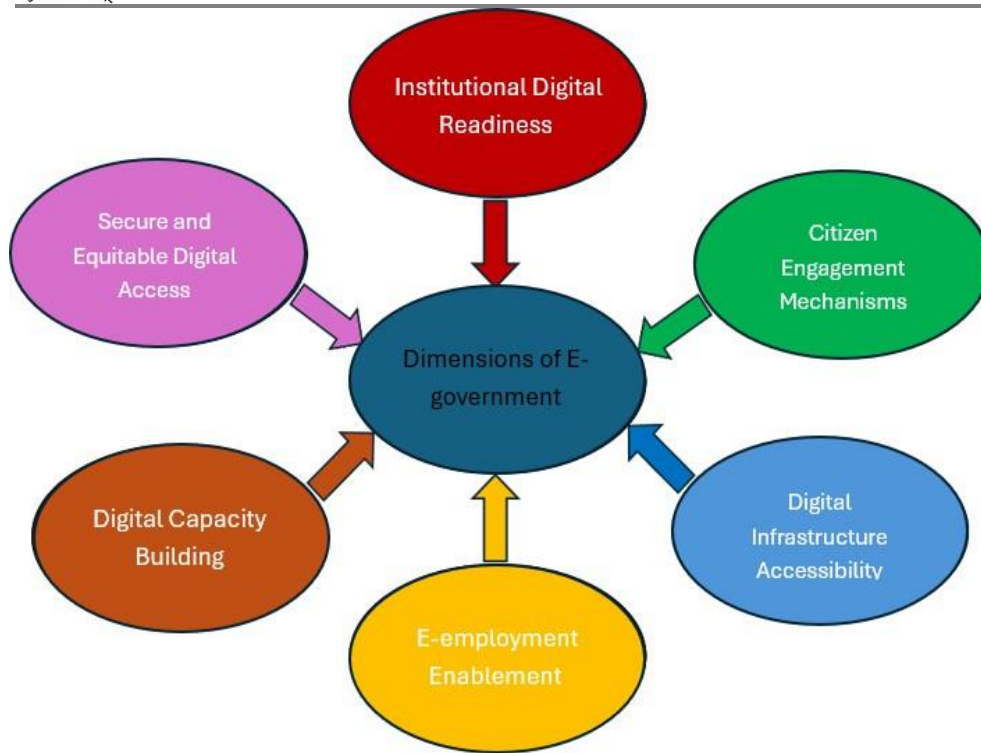
only with access to e-government but also with its ethical handling of personal data and equitable design for vulnerable populations (Rarhoui, 2024; Arabacca & Base, 2022).

**Table 11. Constructs and loadings under dimension 6**

Item Number	Item Statements	Factor Loading	New Item Number
Factor 6 – Secure and Equitable Digital Access			
41	Mobile applications accessible to citizens with different disabilities, providing information about transportation, accessibility features in public spaces, and support services	0.662	26
37	Mobile applications that allow citizens to locate nearby free healthcare clinics and facilities.	0.54	27
28	Regular audits to ensure that e-government services are functioning efficiently and meeting citizen needs.	0.432	28
43	Investment in cybersecurity measures to protect citizen data and prevent cyberattacks on e-government platforms.	0.418	29

**Conceptual Dimensions of Proposed E-Government Innovations in Davao del Norte**

Figure 4 illustrates the final framework developed from the exploratory factor analysis, which identified six core dimensions shaping e-government implementation in Davao del Norte. These dimensions are (1) Institutional Digital Readiness, (2) Citizen Engagement Mechanisms, (3) Digital Infrastructure Accessibility, (4) E-employment Enablement, (5) Digital Capacity Building, and (6) Secure and Equitable Digital Access.



**Figure 4. Conceptual Dimensions of Proposed E-Government Innovation in Philippine LGUs**

## CONCLUSION AND RECOMMENDATION

### Conclusion

This paper explored the confusing context of e-government implementation within the local government units (LGUs) of Davao del Norte and strengthened the six dimensions that support digital. The findings indicated that both investments in technology and an inclusive policy of digitalization, responsiveness of systems, and sound institutional framework are pertinent factors in the effective implementation of e- government initiatives.

The results of the Inference, especially the Exploratory Factor Analysis (EFA), confirmed the internal consistency and the reliability of the framework proposed. The proportion of total variance represented by six- factor structure was 49.37 and kaiser - Meyer-olkin was 0.961 which was statistically significant by Bartlett test of sphericity. The dimensions were both highly loaded in several factors demonstrating the complexity of the institutional capacity, access to digital, and engagement with the community, which are mutually relational factors to digital governance.

The present research relies on the concept of E-Government Maturity Level Model (Okan et al., 2024) according to which the evolution of the digital government can be considered a sequential process that moves beyond the availability of basic services to full incorporation. The named dimensions present a local adaptation of the model, in this case, the issues of the digital divide and different capabilities of IT in the Philippine environment. The study will add to the emerging literature of localized digital governance and can be a useful guide to enhancing E-government initiatives. The framework can be further improved and generalized in future researches.

### Recommendation

This study may be used to advise on how to enhance e-government services in the local governments of the Philippines. Both the qualitative and quantitative-based results show six key dimensions supporting effective delivery of e-government, which includes the following Institutional Digital Readiness, Citizen Engagement Mechanisms, Digital Infrastructure Accessibility, E-employment Enablement, Digital Capacity Builders, and Secure and Equitable Digital Access.

For the *Local Government Units (LGUs)*. The study can be employed to advise the Philippines governing bodies on how to improve e-government services in the local governments.

For the *Department of the Interior and Local Government (DILG)*. Findings support its role in guiding LGUs through technical assistance, policy alignment, and capacity building. Cross-agency and public-private partnerships are essential for innovation (Siddiquee & Mohamed, 2020; Sukarno et al., 2024). DILG's standardized assessment tools and alignment with models like that of Okan et al. (2024) help track progress in digital maturity and cybersecurity readiness.

For the *Citizens*. The study highlights their active role in accessing services, providing feedback, and joining consultations. As Arabacca & Base (2022) noted, citizen participation is vital in digital governance. Supported by LGU and DILG initiatives, digital literacy programs and data privacy education empower citizens for responsible online engagement (Rarhoui, 2024).

For *Future Researchers*. In finding out the key dimensions of e- government readiness, the research used the Exploratory Factor Analysis (EFA). Research in the future to conduct confirmatory factor analysis (CFA) to confirm the validity of these dimensions and the reliability of the instrument was recommended.

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