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# Transformative Public Service Delivery Through E-Governance in Selected Local Government Units in The Philippine National Capital Region

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## Abstract

This study explored the challenges encountered by Local Government Units (LGUs) in the National Capital Region, specifically in Valenzuela City, Manila City, and Quezon City, as they strived to transform public service delivery through e-government initiatives. The primary objective was to identify and analyze the obstacles that hindered LGUs in effectively adopting and utilizing ICT solutions. The study categorized these challenges into political, organizational, technological, and social dimensions. The study also aimed to explore the correlation between the digital capability of LGUs and their adoption of e-government and the challenges faced in service delivery. To achieve these goals, a comprehensive mixed-methods approach was employed, including surveys and interviews with LGU respondents.

In the political dimension, limited budgets, legal gaps, resistance to change, and leadership issues were identified as obstacles to e-government implementation. Organizational challenges included coordination among departments, change management, and the need to enhance technical capacity. Technological challenges encompassed issues such as inadequate infrastructure, security vulnerabilities, lack of interoperability, and skills gaps. Social challenges involved addressing the digital divide, promoting digital literacy, overcoming cultural barriers, and addressing privacy concerns.

To address these challenges, the study proposed methodologies aligned with the identified dimensions. These methodologies emphasized the importance of improving budget allocation, updating the legal and regulatory framework to support e-government initiatives, enhancing technological infrastructure, mitigating security and privacy concerns, promoting interoperability, providing training and capacity-building programs, bridging the digital divide, fostering change management strategies, and raising public awareness.

**Keywords:** E-Governance, Public Service Delivery, ICT in Local Government

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## Introduction

The integration of Information and Communication Technology (ICT) into government operations has become a cornerstone of modern public administration, enabling transformative shifts in service delivery, transparency, and citizen engagement. As governments worldwide strive to modernize their systems, e-governance emerges not merely as a technological upgrade but as a paradigm shift in how public institutions interact with citizens, businesses, and other government entities (Heeks, 2006; UNDESA, 2022).

E-governance is increasingly viewed as a unified platform where government-held data is secured, standardized, and interoperable. This transformation involves eliminating redundant applications, enforcing shared frameworks, and guiding application providers toward cohesive digital service design (OECD, 2017). It also entails a shift from manual, agency-centric operations to ICT-enabled, citizen-centric systems that track workflows, responsibilities, and outcomes (World Bank, 2016).

The rationale behind e-government lies in the adoption, diffusion, and utilization of ICT to revolutionize public service delivery (OECD, 2003, as cited in Attour & Chaupain-Guillot, 2020). Despite its promise, many governments face persistent challenges in ICT diffusion, including institutional inertia, resource constraints, and uneven digital literacy (Weerakkody et al., 2010; Gil-Garcia & Helbig, 2006). To address these complexities, this study is anchored in Everett Rogers' Diffusion of Innovation (DOI) Theory, which elucidates how innovations spread through social systems over time (Rogers, 2003; Alqahtani & Wamba, 2012).

DOI theory is widely recognized for its applicability in assessing ICT adoption within organizational contexts. It identifies key factors—relative advantage, compatibility, complexity, trialability, and observability—that influence the rate and success of innovation adoption (Rogers, 2003; Zhang et al., 2014). In the context of e-governance, these factors help explain why certain LGUs embrace digital transformation more readily than others.

This study investigates the adoption of e-governance in selected LGUs within the Philippine National Capital Region—specifically Quezon City, Valenzuela City, and Manila City—during the years 2020 to 2022. These cities were chosen based on their recognition in the Digital Governance Awards, signaling a baseline commitment to digital innovation.

The study aims to assess the current digital governance capability of these LGUs using the United Nations Public Administration Network's (UNPAN) Digital Government Capability Assessment (DGCA) framework. This framework revolves and utilizes six core dimensions: Leadership (vision, policy, data stewardship); Strategy (integration, interoperability, data-driven planning); Governance (citizen engagement, partnerships, organizational alignment); Legal Aspects (regulatory compliance, procurement policies); Technical Infrastructure (cybersecurity, service platforms, user access); Workforce Development (capacity building, digital skills training)

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In addition to capability assessment, the study explores the challenges faced by LGUs in adopting ICT, categorized into four thematic domains: political, technological, organizational, and social (Weerakkody et al., 2010; Ndou, 2004). These dimensions are critical in understanding the barriers to effective digital transformation and in formulating responsive strategies.

By examining the relationship between digital capability and ICT adoption, as well as the perceived challenges in service delivery, this research contributes to the broader discourse on public sector innovation. It offers insights into how LGUs can leverage their digital strengths to overcome systemic constraints and enhance public service outcomes.

## Framework and Paradigms

Public administration is a scholarly discipline that encompasses the study of diffusion research, which focuses on the process by which innovation is communicated to individuals within a social system over a period through specific channels. This notion also pertains to the progression of a novel technological concept, object, or procedure from its inception to its implementation (Makovhololo et al., 2017). The concept of the Diffusion of Innovation encompasses four distinct components, namely innovation, communication channels, time, and social system (as depicted in Figure 1). The concept of innovation can be understood as the adoption of alternative units by an individual, and it can be distinguished by its relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995, as quoted in Mbatha et al., 2011).

Innovation also intends to reduce ambiguity in the cause-and-effect connection that is involved in reaching the intended outcome. Meanwhile, communication channels are how messages or information are transmitted from one person to another. These may include the mass media or interpersonal connections and can be characterized depending on the degree of homophily and heterophily. Homophily factor implies the common characteristics of two persons in terms of their views, education, or socioeconomic status; the opposite of heterophily, on the other hand, indicates the disparities among them such as their location, access to resources, and so forth (Ashcraft, 2021).

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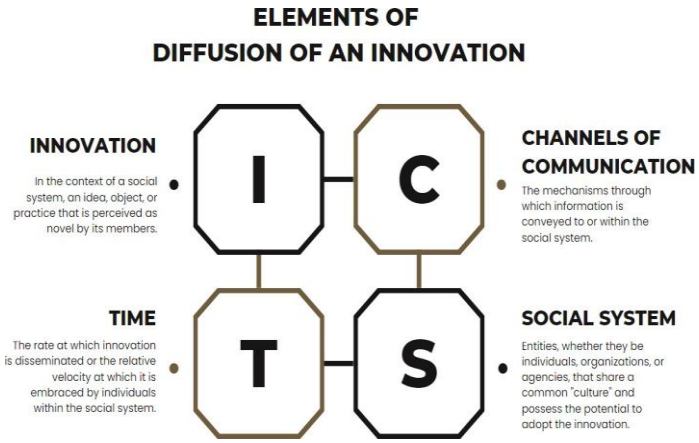


Figure 1. Elements of Diffusion of an Innovation

Another crucial factor to consider is the temporal dimension, which encompasses the duration of the innovation process as it progresses through the innovation-decision process, as well as the extent and speed at which the innovation is adopted within a given social system. The innovation-decision process encompasses several stages, namely knowledge or awareness, interest or persuasion, options and evaluation, implementation or execution, and final assessment of adaption or confirmation. These stages are instrumental in determining the level of acceptance within the social system, which can be classified into distinct categories such as innovators, early adopters, early and late majority, and laggards (Ashcraft, 2021). Lastly, the members of the social system, more likely the end users and potential beneficiaries of the innovation, are the interconnected entities that work together to formulate and accomplish the same purpose and are mostly distinct from one another. For the most part, the social system's structure influences the flow and course of the dissemination of information (Ashcraft, 2021).

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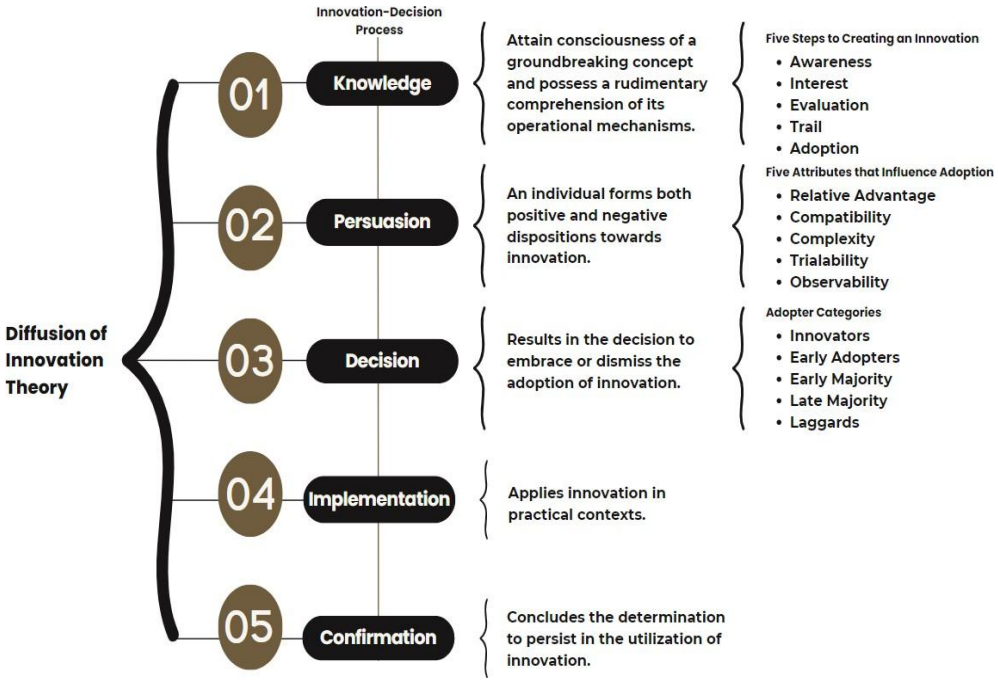


Figure 2. Diffusion of Innovation Theory

In a nutshell, the Diffusion of Innovation (DOI) Theory is anticipated to provide the fundamental framework for comprehensively assessing the present state of e-governance in the chosen Local Government Units within the National Capital Region. The goal of this study, which uses DOI theory, is to pinpoint the crucial elements that might have a big influence on how e-government is implemented. These elements include the criteria outlined by the United Nations Public Administration Network (2021) to assess the capabilities of digital government, such as leadership, strategy, governance, legal concerns, technology, and professional and workforce development. Governments may find these depictions in the Development Governance Composite Assessment of United Nations Development Programme (DGCA-UNDP) helpful in figuring out challenges and entry points for policies. Therefore, in this study, the digital government capability of the LGUs will serve as an independent variable.

Furthermore, the study sought to examine the relationship between the cities' positions in the criteria of DGCA and two key aspects. Firstly, the study sought to understand how the current position of the Local Government Unit in the DGCA criteria influences the adoption and utilization of ICT initiatives in public service delivery. By analyzing survey data and conducting statistical analyses, the study aimed to identify patterns and trends in the adoption of ICT initiatives among the respondent cities. This analysis will shed light on how the LGUs' digital governance capabilities, as measured by the DGCA, impact the extent to which employees involved in public service delivery adopt and use ICT initiatives.

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In addition, the study aimed to explore how the LGUs' positions in the DGCA criteria affect the perceived challenges faced by the cities in their efforts to effectively deliver public services. Through the analysis of survey responses and their comparison with the DGCA scores, the study sought to identify potential correlations or associations between the LGUs' digital governance capabilities and the challenges they encounter in their facilitation of public service delivery. This examination will provide insights into how the strengths and weaknesses of the LGUs' digital governance capabilities may influence the difficulties they face in delivering public services efficiently.

Information and communication technology are employed by the government to enhance the efficiency of government operations, foster greater public engagement, and facilitate the provision of electronic services (e- services). The involvement of individuals is crucial for the efficacy of electronic government initiatives. The utilization of e-government services by citizens is observed, however government involvement in such initiatives remains constrained, hence resulting in the failure of e-government endeavors.

## Literature Review

### *Fundamentals of E-Government*

E-government refers to the strategic use of Information and Communication Technologies (ICTs) by government institutions to enhance internal operations, engage stakeholders, and deliver public services more efficiently (UNDESA, 2014; OECD, 2017; World Bank, 2019). It encompasses the digital transformation of traditional bureaucratic processes, aiming to improve transparency, responsiveness, and accessibility (ITU, 2015; European Commission, 2016).

The integration of digital technologies—such as cloud computing, mobile applications, and big data analytics—has revolutionized governance by enabling real-time service delivery, predictive policy modeling, and participatory decision-making (Janssen & Estevez, 2013; Scholl, 2010). E-government initiatives also support open government principles, fostering citizen trust through accountability and inclusive governance (UNPAN, 2021; Bertot, Jaeger & Grimes, 2010).

### *Pillars of E-Government*

E-government is built upon four foundational pillars: **Leadership**: Strategic vision and policy direction are essential for sustained digital transformation (OECD, 2017; UNDESA, 2022); **Governance/Administration**: Requires legal reforms, institutional restructuring, and policy alignment (Heeks, 2006); **Integration/Collaboration**: Promotes cross-sectoral partnerships among government, academia, and private entities (Gil-Garcia, 2012); **Technology/Infrastructure**: Involves robust ICT systems, cybersecurity protocols, and interoperability standards (Krimmer et al., 2020).

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These pillars collectively enable governments to reengineer processes and deliver services that are citizen-centric, efficient, and resilient.

*Interactions in E-Government*

E-government operates through four key interaction models:

- **G2C (Government-to-Citizen)**: Enhances service delivery and civic engagement (Layne & Lee, 2001).
- **G2B (Government-to-Business)**: Streamlines regulatory compliance and fosters economic development (Ndou, 2004).
- **G2G (Government-to-Government)**: Facilitates inter-agency coordination and data sharing (Moon, 2002).
- **G2E (Government-to-Employee)**: Improves HR management and internal communication (Al-Shafi & Weerakkody, 2009).

These models reflect the multidimensional nature of digital governance and its potential to transform public administration holistically.

*Diffusion of Innovation Theory and E-Government Adoption*

Everett Rogers' Diffusion of Innovation (DOI) Theory provides a robust framework for understanding how new technologies are adopted across social systems (Rogers, 2003). The theory categorizes adopters into five groups—innovators, early adopters, early majority, late majority, and laggards—and outlines five stages of adoption: knowledge, persuasion, decision, implementation, and confirmation (Zhang et al., 2014).

DOI has been widely applied to e-government research, helping explain adoption patterns, barriers, and success factors (Carter & Bélanger, 2005; Alqahtani & Wamba, 2012). Key determinants of adoption include:

- **Relative Advantage**: Perceived benefits over existing systems.
- **Compatibility**: Alignment with existing values and practices.
- **Complexity**: Ease of use and understanding.
- **Trialability**: Opportunities for experimentation.
- **Observability**: Visibility of outcomes and benefits.

These factors influence the rate and extent of ICT adoption in public sector organizations.

*E-Government and Public Administration*

The rise of e-governance marks a paradigmatic shift in public administration, moving from traditional bureaucratic models to more agile, citizen-focused frameworks (Ikeanyibe, Ori & Okoye, 2017). This evolution reflects broader transitions from the

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Politics-Administration Dichotomy to New Public Management (NPM) and now toward digital governance paradigms (Osborne, 2006).

ICTs have enabled governments to:

- Improve data management and analytics (Roy, 2017).
- Enhance transparency and reduce corruption (Bertot et al., 2010).
- Foster participatory governance and co-creation of services (Nam, 2012).

At the local level, digital platforms have become essential tools for service delivery, trust-building, and civic engagement (Sayimer, 2015; Misuraca & Viscusi, 2015).

*Challenges in E-Governance Adoption*

Despite its potential, e-governance in the Philippines faces multifaceted challenges:

| Theme | Key Issues |
|---|---|
| Political | Budget constraints, corruption, resistance to change, weak leadership (PhilStar, 2022; Transparency International, 2020) |
| Organizational | Limited ICT skills, poor inter-agency coordination, lack of R&D investment (UNDP, 2020; House of Representatives, 2022) |
| Technological | Slow internet, inadequate infrastructure, cybersecurity risks (Speedtest Global Index, 2023; PSA, 2022) |
| Social | Digital divide, low digital literacy, regional disparities (NDCC, 2020; Open Government Asia, 2022) |

Addressing these barriers requires a comprehensive strategy involving policy reform, capacity building, infrastructure investment, and inclusive digital literacy programs (Weerakkody et al., 2010; Bannister & Connolly, 2012).

## Methods

This study employed a descriptive research design to explore the digital governance capabilities of cities that received National Digital Governance Awards. The selected cities—Quezon City, Valenzuela City, and Manila—were chosen based on their proven commitment to e-governance, ensuring that the study focused on local government units (LGUs) with established digital initiatives.

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The research targeted individuals who played key roles in implementing e-governance within the three cities. A total of eleven respondents participated: three each from Quezon City and Valenzuela City, and five from Manila. These individuals possessed substantial expertise in digital governance, offering critical insights into both the successes and challenges of ICT adoption in public service.

Data collection involved *survey instruments* distributed to the selected respondents; and *supplemental interviews* conducted with senior IT department officials to uncover specific challenges and operational insights.

The qualitative data from interviews were analyzed using thematic analysis, which allowed the researchers to identify recurring patterns and themes. This method provided a nuanced understanding of the complexities involved in transforming public service delivery through digital means.

The study aimed to assess how the digital governance capability of a Local Government Unit (LGUs), as measured by the United Nations Public Administration Network (UNPAN) Digital Government Capability Assessment, influenced the adoption and use of ICT by public service employees and; examine how the LGU's standing in the Development Governance Composite Assessment (DGCA) correlated with the challenges they faced in delivering services effectively.

By achieving these objectives, the research sought to generate actionable insights for improving ICT adoption and overcoming barriers in public service transformation.

## Results and Discussion

After collecting, classifying and analyzing data, the following premises came out:

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Table 1. Digital Governance Awards E-Government Initiatives Lists

| Manila | Valenzuela | Quezon City |
|---|---|---|
| | **2020** | |
| **Go! Manila App** – 2nd Place (G2C) | **3S Plus Valenzuela City Online Services** – 1st Place (G2B) / Huawei Special Award for Best in Business Empowerment | **Intelligent, Resilient, and Integrated Systems for the Urban Population (iRISE UP)** – 2nd Place (G2G) |
| **Occupational Permit and Health Certificate Integrated System (OPHCis)** – 2nd Place (G2I) | **ValTrace app** - Best in COVID-19 Pandemic Response | |
| | **2021** | |
| **COVID-19 Testing Center Web Lab Information System** – 1st Place (G2G) | | **Automated Inspection Audit System** – 2nd Place (G2C) |
| **Connection for Inclusion** – 1st Place (G2C) | **Valenzuela Live Online Stream School** – 3rd Place (G2C) | **Intelligent, Resilient, and Integrated Systems for the Urban Population (iRISE UP) of QCDRRMO** – 3rd Place (G2G) |
| **Business Permit Licensing Service (BPLS)** – 2nd Place (G2B) | | |
| | **2022** | |
| | | **QC eServices** – 3rd Place (G2C) |
| **Digitalizing Cold Chain Principle: (Dickson-One Software) Ensuring Vaccine Safety** – 1st Place (G2I) | | **QC Delivers: Automated Document Delivery System** – 1st Place (G2B) / Transformational and Disruptive Solutions special citation |
| **Go! BPLS!** – 2nd Place (G2B) | | **QC Biz Easy: Online Unified Business Permit Application System** – 2nd Place (G2G) |

In the contemporary era, cities across the globe have embarked on a significant journey towards digital transformation, aiming to optimize service delivery, enhance citizen engagement, and streamline administrative processes. As a result, numerous ground-breaking e-government initiatives emerged, garnering widespread recognition and acclaim for their transformative impact. In this context, we delve into the distinguished e-government endeavors undertaken by Manila City, Quezon City, and Valenzuela City, which earned commendation and accolades for their exceptional contributions to the realm of digital governance. Thus, Table 1 indicates the summary of citations of the respondent-LGUs in the context of E-Governance and ICT.

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Table 2. Digital Capability of Local Government Units across Various Dimensions

| | | | | | |
|---|---|---|---|---|---|
| **Leadership** | *Vision* | | 4.25 | 4.75 | 4.25 |
| | *Policy* | | 4.25 | 4.50 | 3.75 |
| | *Data* | | 4.00 | 4.67 | 3.33 |
| | ***Average Score*** | **4.2** | **4.6** | | **3.8** |
| **Strategy** | *General* | | 4.50 | 4.75 | 4.13 |
| | *Integration and Interoperability* | | 4.33 | 4.67 | 4.00 |
| | *Data* | | 4.50 | 4.25 | 4.00 |
| | ***Average Score*** | **4.5** | **4.6** | | **4.1** |
| **Governance** | *General* | | 3.67 | 4.83 | 3.83 |
| | *Citizen and Business* | | 4.20 | 4.60 | 4.00 |
| | *Partnership* | | 3.00 | 4.00 | 3.00 |
| | *Data* | | 2.67 | 5.00 | 3.33 |
| | *Organization* | | 4.00 | 4.25 | 3.00 |
| | ***Average Score*** | **3.7** | **4.6** | | **3.6** |
| **Legal** | *Laws and Regulations* | | 3.40 | 4.80 | 3.60 |
| | *Policies and Procedures* | | 3.79 | 4.50 | 3.86 |
| | *Data and Procurement* | | 3.67 | 4.67 | 3.67 |
| | ***Average Score*** | **3.7** | **4.7** | | **3.7** |
| **Technology** | *General* | | 3.75 | 5.00 | 3.75 |
| | *Citizen and Business* | | 4.20 | 5.00 | 4.20 |
| | *Public Servants* | | 3.67 | 5.00 | 3.67 |
| | *Cybersecurity* | | 3.00 | 4.11 | 3.33 |
| | ***Average Score*** | **3.5** | **4.6** | | **3.7** |
| **Professional and Workforce Development** | *Capacity Development* | | 3.67 | 4.22 | 2.78 |
| | ***Average Score*** | **3.7** | **4.2** | | **2.8** |

Table 2 reflects the assessment of the digital governance capabilities of Manila City, Quezon City, and Valenzuela City, revealing distinct levels of performance in various dimensions such as leadership, strategy, governance, legal frameworks, technology, and professional development. Each city demonstrated unique strengths and areas for improvement in their digital governance initiatives. By evaluating these dimensions, a comprehensive understanding of the digital governance landscape in these cities was obtained, providing insights into their efforts to drive digital transformation and deliver efficient and effective digital government services. The assessment provided valuable information on the strengths and weaknesses of each city's digital governance practices, allowing for targeted interventions and improvements in specific areas.

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The survey results of the Digital Government Capability Assessment conducted in Manila City, Quezon City, and Valenzuela City provide a comprehensive overview of the strengths and areas for improvement in each city's digital government capabilities, as defined by the United Nations Public Administration Network (UNPAN).

The literature described the foundations of e-government, including leadership, governance/administration, integration/collaboration, and technology/infrastructure. These foundations were observed to varying degrees in the localities of Manila City, Quezon City, and Valenzuela City. According to the survey results, all three cities demonstrated leadership in their digital government initiatives. Manila City received the highest rating, indicating strong leadership with a clear vision, well-defined policies, and effective data management. Quezon City and Valenzuela City also showed some level of leadership but had room for improvement. The presence of governance structures and practices could be seen in all three localities, with Manila City receiving high ratings, indicating effective governance structures and practices. However, Quezon City and Valenzuela City showed gaps in governance structures, particularly in areas such as citizen and business engagement, partnership development, and data and organizational governance. The concept of integration and collaboration was recognized in the assessed localities, with efforts made to foster partnerships and collaborations with different sectors. However, there was still room for improvement in terms of integration and collaboration. In terms of technology and infrastructure, the localities embraced digital technologies to varying degrees. Manila City demonstrated a proactive approach in this area, while Quezon City and Valenzuela City faced some challenges but showed potential for improvement.

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Table 3. Key Challenges Impeding ICT Adoption and Digital Transformation in Local Government Units

| DIMENSION | CHALLENGES | VALENZUELA CITY | MANILA CITY | QUEZON CITY |
|---|---|---|---|---|
| Political Challenges | Limited Budget | ✓ | ✓ | ✓ |
| | Legal and Regulatory Framework | ✓ | ✓ | ✓ |
| | Resistance to Change | ✓ | ✓ | ✓ |
| | Political Will and Leadership | ✓ | ✓ | ✓ |
| Technological Challenges | Technological Infrastructure | ✓ | ✓ | ✓ |
| | Security and Privacy Concerns | ✓ | ✓ | ✓ |
| | Interoperability | ✓ | ✗ | ✓ |
| | Technical Skills and Capacity | ✓ | ✗ | ✓ |
| Organizational Challenges | Limited Budget | ✓ | ✓ | ✓ |
| | Change Management | ✓ | ✗ | ✓ |
| | Resistance to Change | ✓ | ✓ | ✓ |
| | Lack of coordination and collaboration among different government departments and agencies | ✗ | ✓ | ✗ |
| | Inefficient legacy systems and outdated infrastructure | ✗ | ✓ | ✗ |
| | Technical Skills and Capacity | ✓ | ✗ | ✓ |
| Social Challenges | Digital Divide | ✓ | ✓ | ✓ |
| | Resistance to Change | ✓ | ✓ | ✓ |
| | Insufficient digital literacy and technical skills among the population | ✓ | ✗ | ✗ |
| | Cultural and mindset barriers to embracing digital technologies | ✓ | ✗ | ✗ |
| | Privacy concerns and data protection issues | ✓ | ✗ | ✗ |

Table 3 summarizes the challenges encountered by each LGU in the adoption of E-Governance in terms of political, technological, organizational and social dimensions. The table was drawn from the thematic codes of various resource persons who participated in the interview.

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The political challenges faced by Valenzuela City, Manila City, and Quezon City exhibit commonalities and variations. Limited budgets pose a significant obstacle to all three cities, restricting their capacity to implement development projects and deliver essential services. Inadequate revenue sources, competing priorities, and economic fluctuations contribute to this challenge. However, the severity of the budget constraint differs based on factors such as population size and economic conditions. Larger populations and weaker economic conditions can strain resources more significantly, impeding service delivery and development initiatives.

In the context of technological infrastructure, all three cities face challenges that impede the effective implementation of digital solutions and services. These challenges may include limited connectivity, outdated network infrastructure, or inadequate hardware resources. However, the specific nature and severity of these infrastructure challenges may vary between the cities, requiring tailored approaches for improvement.

In terms of organizational challenges, all of the respondent-LGUs share a similar sentiment, but they also have notable differences. One common challenge among these cities is a limited budget, which hampers their ability to implement new initiatives, upgrade infrastructure, and improve services. Additionally, all three cities face resistance to change, indicating that some stakeholders within the organizations may be hesitant or resistant to adopting new practices or policies.

As for social challenges, the City of Valenzuela is experiencing greater issues and circumstances as compared to the LGUs of Manila and Quezon City.

Table 4. Digital Governance Capability Assessment Scores

| **Digital Governance Capability Assessment Scores** | |
|---|---|
| *Manila City* | 4.6 |
| *Valenzuela City* | 3.6 |
| *Quezon City* | 3.8 |

The digital capability scores of local government units (LGUs) represented the level of digital capability or readiness of each LGU. This could be seen as an indicator of their position in the adoption curve proposed by Rogers' theory (Ashcraft, 2021). LGUs with higher digital capability scores could be considered as early adopters or early majority, indicating that they were more willing to adopt and utilize ICT initiatives for public service delivery.

However, the figures indicated in Table 4 represent the mere current state of E-Governance capability but are not projective nor predictive implying the contingencies of other factors and externalities surrounding the said subject matter.

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Ergo, from the quantitative and qualitative inputs, it can be surmised that:

-The National Government-Recognized LGU E-Government Initiatives in the Philippines have had a positive impact on local governance and service delivery, improving efficiency, transparency, and citizen engagement.

-The digital capability assessment of Manila City, Quezon City, and Valenzuela City revealed strengths and areas for improvement in various dimensions of digital governance, indicating progress in their digital transformation efforts.

-Local Government Units in Manila City, Quezon City, and Valenzuela City faced challenges in the political, technological, organizational, and social domains that need to be addressed for successful e-government implementation and improved public service delivery.

From what has been drawn, E-Governance and full realization of ICT in LGUs can be hasten with the adoption of prospective methodologies and interventions as implied by the resource persons who took part on the interview phase of this paper.

Table 5. Prospective Methodologies in Overcoming Challenges in E-Governance

| STEP | Intervention / Activity | Issues Targeted to be Addressed | Personnel in Charge | Methodology |
|---|---|---|---|---|
| 1 | Assess the Current Situation and Identify Priorities | Limited Budget (Political and Organizational), Technological Infrastructure (Technological), Digital Divide (Social) | A cross-functional team involving representatives from relevant government departments, IT specialists, and external consultants for assessment and priority identification. | • Conduct a comprehensive assessment of the current ICT infrastructure, systems, and processes in place in each city.<br>• Identify the key challenges and prioritize them based on their impact and urgency. |

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| | | | | |
|---|---|---|---|---|
| *2* | *Allocate Sufficient Budget and Resources* | *Limited Budget (Political & Organizationa l)* | Budget and Finance Department, in coordination with relevant government officials and departments. | • *Ensure that an adequate budget is allocated to address the ICT adoption challenges.*<br>• *Allocate resources, including funds, skilled personnel, and necessary equipment, to implement the solutions effectively.* |
| *3* | *Establish a Legal and Regulatory Framework* | *Legal and Regulatory Framework (Political)* | Legal and Regulatory Affairs Department, in collaboration with legal experts and policymakers. | • *Review existing laws and regulations related to e-government and identify any gaps or areas that need updating.*<br>• *Develop and implement a clear legal and regulatory framework that supports the implementation of ICT in public service delivery while ensuring security and privacy.* |
| *4* | *Enhance Political Will and Leadership* | *Resistance to Change (Political)* | Top-level government officials, policymakers, and change management experts. | • *Engage and involve political leaders and decision-makers to prioritize ICT adoption and ensure their active support.*<br>• *Create awareness among political leaders about the benefits of ICT in public service delivery and its potential to improve governance.* |

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| | | | | |
|---|---|---|---|---|
| *5* | *Improve Technological Infrastructure* | *Technological Infrastructure (Technologica l)* | IT Department, in collaboration with infrastructure providers and technology experts. | • *Assess the existing technological infrastructure and identify areas that require improvement, such as broadband connectivity and communication networks.*<br>• *Develop a plan to upgrade and enhance* the technological infrastructure to support efficient and effective ICT adoption. |
| **6** | Address Security and Privacy Concerns | Security and Privacy Concerns (Technologica l), Privacy concerns, and data protection issues (Social) | IT Department, Data Protection Officer, Security and Privacy Experts. | • Develop and implement robust security measures to protect sensitive data and ensure the integrity and confidentiality of e-government systems and services.<br>• Establish clear privacy policies and guidelines to address citizen concerns and build trust in the use of ICT in public service delivery. |
| **7** | Enhance Interoperability | Interoperabilit y (Technologica l), Lack of coordination and collaboration among different government departments and agencies (Organization al) | IT Department, Interdepartment al Coordination Committee. | • Develop a roadmap for achieving interoperability among different government systems and platforms.<br>• Foster collaboration and coordination among government departments and agencies to ensure seamless delivery of services and data sharing. |

| | | | | |
|---|---|---|---|---|
| **8** | Provide Training and Capacity Building | Technical Skills and Capacity (Technological), Technical Skills and Capacity (Organizational), Insufficient digital literacy and technical skills among the population (Social) | Human Resources Department, Training and Development Specialists, IT Department, and partnerships with educational institutions and training providers. | • Conduct training programs to enhance the technical skills and capacity of government employees in ICT adoption and usage.<br>• Develop initiatives to promote digital literacy among the population, ensuring that citizens have the necessary skills to access and utilize e-government services. |
| 9 | Bridge the Digital Divide | Digital Divide (Social) | IT Department, Telecommunications Providers, Partnerships with NGOs and community organizations. | • Develop strategies to address the digital divide and ensure equal access to technology and reliable internet connectivity, particularly in underserved areas.<br>• Implement initiatives to provide digital infrastructure and support to marginalized sectors and rural areas. |
| 10 | Promote Change Management and Awareness | Resistance to Change (Political & Organizational), Resistance to Change (Social), Cultural and mindset barriers towards embracing digital technologies (Social) | Change Management Team, Communication and Public Relations Department, Community Engagement Specialists. | • Develop a change management plan to address resistance to change among government employees and citizens.<br>• Conduct awareness campaigns to educate stakeholders about the benefits and importance of ICT adoption in public service delivery. |

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| 11 | Monitor and Evaluate Progress | This step involves assessing progress and making necessary adjustments. | Project Management Office, Monitoring and Evaluation Team, Cross-functional team involving relevant stakeholders. | • Regularly monitor and evaluate the progress of ICT adoption initiatives and assess their impact on public service delivery.<br>• Make necessary adjustments and improvements based on feedback and lessons learned. |

These proposed methodologies, as presented in Table 5, provide comprehensive and systematic approaches to address the constraints and challenges encountered in the utilization of information and communication technology in public service delivery. The methodologies underscored the significance of conducting thorough assessment of the current situation and identifying priorities to effectively allocate budget and resources.

Prioritizing the enhancement of technological infrastructure, the mitigation of security and privacy concerns, and the promotion of interoperability among government systems, the methodologies acknowledged the necessity of providing training and capacity building initiatives to empower government employees and citizens in utilizing ICT proficiently. Additionally, bridging the digital divide and fostering change management and awareness were highlighted to address resistance and promote inclusivity.

Recognizing stakeholder engagement and consultation as crucial throughout the ICT implementation process, the methodologies encouraged collaboration between government agencies, private sector entities, and academic institutions to foster innovation and leverage expertise. Furthermore, the methodologies stressed the importance of ensuring accessibility and catering to diverse user groups, including individuals with disabilities and marginalized communities. Universal design principles and assistive technologies were recommended to make ICT services and platforms accessible to all.The methodologies underscored the significance of monitoring and evaluating progress regularly to facilitate necessary adjustments and improvements. They also highlighted the importance of continuous research and development in ICT, as well as fostering a culture of learning and adaptation within government organizations.

## Conclusion

Drawing from the findings of the study, several key conclusions can be articulated regarding the state of e-governance in selected Local Government Units (LGUs) within the National Capital Region (NCR) of the Philippines:

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1. Positive Impact of Nationally Recognized E-Government Initiatives The implementation of e-government initiatives recognized by the National Government has significantly enhanced local governance. These initiatives have led to measurable improvements in administrative efficiency, transparency, and citizen engagement. The Digital Governance Awards (DGAs) served as a credible benchmark, affirming that cities like Manila, Quezon City, and Valenzuela have made substantial strides in digital transformation. These LGUs demonstrated the capacity to deliver services more responsively and inclusively through ICT-enabled platforms.

2. Digital Capability Assessment Reveals Strengths and Gaps The assessment of digital governance capabilities using the United Nations Public Administration Network (UNPAN) framework revealed that each LGU possesses distinct strengths across dimensions such as leadership, strategy, governance, legal infrastructure, technology, and workforce development. However, disparities in integration, interoperability, and cybersecurity readiness suggest that while progress is evident, further refinement is needed to achieve holistic digital maturity.

3. Persistent Multi-Dimensional Challenges in E-Governance Implementation Despite recognition and progress, LGUs continue to face complex challenges across four thematic domains:

Political: Budgetary constraints, policy fragmentation, and leadership turnover hinder continuity.

Technological: Infrastructure limitations, slow internet speeds, and cybersecurity vulnerabilities impede scalability.

Organizational: Resistance to change, siloed departments, and insufficient ICT training affect adoption.

Social: Digital divide, low digital literacy, and uneven access to e-services limit inclusivity.

4. Correlation Between Digital Capability and ICT Adoption Statistical analysis revealed a significant relationship between an LGU’s digital capability and the rate of ICT adoption among public service facilitators. LGUs with stronger leadership, strategic planning, and technological infrastructure were more likely to exhibit higher levels of ICT utilization in service delivery.

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5. Digital Capability Influences Perceived Service Delivery Challenges The study also found a meaningful correlation between digital capability scores and the nature and intensity of challenges perceived by LGU personnel. Cities with lower scores in governance and workforce development reported greater difficulty in implementing e-government solutions effectively.

**Recommendations**

To advance e-governance and optimize public service delivery, the following multi-stakeholder recommendations are proposed:

*For Local Government Units (LGUs)*

- **Institutionalize Digital Governance Frameworks**: Adopt and localize the UNPAN Digital Government Capability Assessment to guide strategic planning and performance monitoring.
- **Invest in Infrastructure and Cybersecurity**: Prioritize funding for high-speed internet, secure data centers, and interoperable systems to support scalable digital services.
- **Strengthen Capacity Building**: Implement continuous ICT training programs for employees, focusing on digital literacy, change management, and data ethics.
- **Promote Citizen-Centric Design**: Develop platforms that are accessible, multilingual, and responsive to diverse citizen needs, especially marginalized groups.

*For Citizens*

- **Participate in Digital Governance Platforms**: Engage actively through feedback mechanisms, online consultations, and digital service portals to co-create better public services.
- **Advocate for Inclusive Access**: Support initiatives that bridge the digital divide, such as community Wi-Fi, digital literacy workshops, and mobile service units.

*For Government Agencies*

- **Align National and Local Digital Strategies**: Ensure coherence between national ICT policies and LGU-level implementation through shared standards and collaborative platforms.
- **Provide Technical and Financial Support**: Facilitate grants, technical assistance, and shared services to help LGUs overcome resource limitations.

*For Academic Institutions*

- **Conduct Longitudinal Research**: Explore the long-term impact of e-governance on service delivery, governance quality, and citizen satisfaction.
- **Develop Case Studies and Best Practices**: Document successful LGU initiatives to inform policy and practice across other regions.

*For the Private Sector*

- **Co-Develop Innovative Solutions**: Partner with LGUs to design and deploy smart city technologies, mobile applications, and data analytics tools tailored to local contexts.
- **Support Public-Private Partnerships (PPPs)**: Engage in PPPs that promote sustainable digital infrastructure and service innovation.

*For Future Researchers*

- **Explore Causal Relationships**: Investigate the causal links between digital capability dimensions and specific service delivery outcomes.
- **Examine Regional Variations**: Compare LGUs across different regions to identify contextual factors influencing e-governance success.
- **Integrate Emerging Technologies**: Study the role of AI, blockchain, and IoT in enhancing transparency, efficiency, and citizen trust in local governance.

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