

Understanding Citizen Adoption of e-Government Services in Pakistan: Challenges and Strategies

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Abstract

Pakistan has made significant investments in digital governance through initiatives such as NADRA and the Federal Board of Revenue (FBR). However, it is observed that there is still a huge rush near these public service centers, indicating that citizen engagement with e-government services remains limited, suggesting that actual utilization has yet to reach its full potential, particularly when compared to global digital advancements. This study offers valuable, context-specific insights into the real-world challenges faced by both government institutions and citizens as users. These insights can inform targeted strategies and regulatory frameworks to enhance the usability, accessibility, and overall adoption rate of e-government services, especially in the regional contexts of Hyderabad and Bahawalpur.

This study utilized a qualitative research approach based on semi-structured interviews with 20 key participants, including regional administrators, ICT professionals, and citizens actively using digital platforms in Hyderabad and Bahawalpur. The thematic analysis identified several interconnected challenges that limited digital literacy, including weak infrastructure, institutional inefficiencies, lack of trust in data security, and low transparency in service delivery. Respondents emphasized that these barriers hinder citizens' confidence and participation in e-government initiatives. To address these issues, they suggested strategies focused on building trust through robust data protection policies, transparent communication, and responsive grievance systems. Strengthening ICT infrastructure, expanding internet access, and providing continuous training to both citizens and staff were viewed as essential for effective adoption. Moreover, promoting citizen-centric service design, ensuring regular feedback mechanisms, and fostering accountability through public dashboards were seen as vital to improving governance performance. Overall, the study highlights that advancing e-government adoption in Pakistan's underserved regions requires not only technological improvements but also human-centered reforms that build trust, inclusivity, and institutional responsiveness.

Keywords: e-Government, citizen adoption, digital governance, transparency, accessibility, Pakistan

1. Introduction

In recent years, Pakistan has made distinguished progress in advancing digital governance, particularly through institutional platforms such as the National Database and Registration Authority (NADRA) and the Federal Board of Revenue (FBR). These initiatives have sought to modernize public service delivery,

enhance transparency, and improve administrative efficiency (Ali B., Salam A., & Ali W., 2023). The overarching objective has been to make government services more efficient, transparent, and accessible to all citizens.

Despite these efforts, the implementation of digital governance initiatives has not fully translated into widespread citizen engagement. Consequently, their overall impact has remained more limited than intended (Busch P. A., Johannessen, M. R., & Pekkola S., 2025). Considerable financial and technological investments have been directed toward facilitating streamlined access to government services; however, citizen participation in e-government platforms continues to be inconsistent, particularly across semi-urban and underserved regions. Field observations at regional service centers indicate that, although digital infrastructure exists, many citizens still prefer in-person visits or rely on intermediaries. This persistent reliance underscores that the full potential of Pakistan's digital systems has yet to be realized (Ali H. & Titah R., 2021).

The limited adoption of e-government services reflects deeper, systemic challenges that extend beyond technological infrastructure. A complex interplay of socio-cultural, institutional, and infrastructural factors, such as low digital literacy, restricted accessibility, bureaucratic inefficiencies, and public mistrust, continues to impede widespread adoption. While existing research has primarily emphasized technical frameworks or national-level policy analyses, there remains a discernible gap in qualitative investigations that explore everyday user experiences and localized barriers, particularly in secondary urban contexts such as Hyderabad and Bahawalpur (Ahmad S. & Siddiqui D. A., 2024).

This study seeks to address this research gap by examining the challenges citizens face in adopting e-government services and by identifying strategies to build trust and enhance user experience. By focusing on regional perspectives often neglected in mainstream discourse, this research contributes practical, evidence-based insights that can inform both policy and system design. Employing a qualitative research design, the study explores the lived experiences of citizens, ICT professionals, and public administrators through semi-structured interviews. Thematic analysis of the collected data uncovers recurring challenges and proposes citizen-centric reforms that are adaptable to Pakistan's evolving digital landscape. Ultimately, this study provides a nuanced understanding of the barriers to e-government adoption in Pakistan and offers actionable policy recommendations aimed at promoting digital inclusivity, accessibility, and public trust within the country's e-governance ecosystem.

2.0 Literature Review

2.1 Overview of E-Government Adoption in Developing Contexts

E-government has emerged globally as a transformative mechanism for enhancing transparency, administrative efficiency, and the quality of public service delivery. In developing countries such as Pakistan, the establishment of institutional platforms like the National Database and Registration Authority (NADRA) and the Federal Board of Revenue (FBR) represents a significant milestone in the digitalization of governance. However, research indicates that the success of these initiatives depends not only on technological infrastructure but also on citizens' awareness, trust, and equitable access to digital resources (Ahmad et al., 2021; Aman, 2022).

2.2 Challenges in Citizen Adoption

Despite notable advancements, the adoption of e-government services in Pakistan remains uneven and generally below expectations. Empirical studies highlight multiple barriers, including limited digital literacy, weak internet infrastructure, bureaucratic inefficiencies, and pervasive mistrust of government systems (Isyaku, 2024; Parvez, 2025). These challenges are particularly pronounced in semi-urban and peripheral areas, where digital access and literacy lag behind those of major metropolitan regions. Busch et al. (2025) emphasize that usability, trust, and institutional support are fundamental to successful adoption.

Yet, regional contexts such as Hyderabad and Bahawalpur remain largely underexplored in existing scholarship. Furthermore, while national digital policies emphasize modernization and efficiency, many citizens continue to prefer traditional, face-to-face service interactions, suggesting a persistent gap between policy design and user realities.

2.3 Theoretical Frameworks Supporting E-Government Research

To explain variations in e-government adoption, researchers frequently apply technology acceptance models that examine user attitudes and behaviors in digital contexts. The Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use are key determinants of technology adoption (Mogaji et al., 2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) extends this framework by incorporating social influence and facilitating conditions as additional explanatory variables (de Freitas & da Rosa, 2022). While these models have been widely applied in global e-government research, they are seldom contextualized to reflect Pakistan's diverse socio-economic realities. When integrated with public administration principles such as transparency, accountability, and citizen-centricity, they provide a more holistic foundation for analyzing both behavioral and institutional barriers to digital adoption.

2.4 Regional Gaps and Empirical Studies

Existing literature on e-government adoption in Pakistan tends to concentrate on national-level surveys or studies centered in capital cities, overlooking the socio-cultural and infrastructural nuances of smaller urban centers. Comparative studies across South Asia, including India and Bangladesh, demonstrate that localized approaches such as community-based ICT training, mobile service delivery, and localized digital literacy programs can significantly enhance adoption rates (Yuan et al., 2023). However, Pakistan-specific qualitative research remains limited, particularly studies that capture the lived experiences of citizens and administrators in secondary cities. Bhanye and Shayamunda (2025) argue that civic technologies must be context-sensitive and inclusive to strengthen public confidence in digital governance. Similarly, Ahmad et al. (2025) contend that successful smart governance depends on continuous citizen feedback, institutional capacity-building, and the accommodation of local constraints.

2.5 Identified Gaps in the Literature

The reviewed literature highlights several critical research gaps:

- Lack of regional focus: Existing studies overwhelmingly prioritize metropolitan areas, neglecting mid-sized cities such as Hyderabad and Bahawalpur.
- Limited qualitative insights: The perspectives of citizens and administrators remain underrepresented in the literature.
- Context-insensitive strategies: Many adoption frameworks are generic and fail to address the unique socio-cultural dynamics of local communities.
- Weak linkage to governance principles: Few studies explicitly connect technology adoption challenges to governance values such as accountability, transparency, and citizen trust.

2.6 Summary of Key Studies

Author(s) & Year	Country/Context	Focus/Topic	Methodology	Key Findings	Gap Identified
Ali B., Salam A., & Ali W. (2023)	Pakistan	E-government adoption and policy	Qualitative case study	Significant ICT investments exist, but citizen adoption remains low	Limited focus on citizen perspectives in regional areas
Busch P. A., Johannessen M. R., & Pekkola S. (2025)	Developing countries	Technology adoption frameworks	Literature review	Adoption depends on usability, trust, and institutional support	Few empirical studies in smaller cities like Hyderabad and Bahawalpur
Ali H. & Titah R. (2021)	Canada & Developing contexts	Application of TAM and UTAUT in e-government	Quantitative survey	Digital literacy and perceived ease of use influence adoption	Lack of qualitative exploration of citizen experiences
Ahmad S. & Siddiqui D. A. (2024)	Pakistan	Citizen engagement and digital governance	Mixed-methods study	Trust, accountability, and institutional coordination are critical	Regional disparities are insufficiently examined
Rana N. P. & Dwivedi Y. K. (2020)	South Asia	E-government services in developing nations	Systematic review	Adoption is influenced by socio-economic and cultural factors	Limited attention to context-specific strategies

Literature on e-government adoption underscores a persistent gap between digital policy intentions and citizen-level realities in developing contexts such as Pakistan. While significant institutional investments have been made to digitalize governance, the success of these initiatives depends on more than technological advancement; it requires citizen trust, accessibility, and engagement. The reviewed studies collectively highlight that structural barriers, including digital illiteracy, infrastructural inequality, and limited institutional responsiveness, continue to constrain adoption, particularly in non-metropolitan settings. Moreover, the predominance of quantitative and macro-level analyses in existing scholarship has left qualitative, context-specific insights underexplored. There is an evident need to understand how everyday users and local administrators experience and navigate digital governance systems in smaller urban centers. Addressing these gaps is critical for designing inclusive, citizen-centered frameworks that bridge the divide between policy formulation and practical implementation. Building upon these insights, the present study adopts a qualitative approach to explore the lived experiences of citizens, ICT professionals, and administrators in Hyderabad and Bahawalpur. By examining the socio-cultural and institutional dynamics shaping e-government adoption at the regional level, this research seeks to contribute

evidence-based recommendations for enhancing trust, inclusivity, and accessibility within Pakistan's evolving digital governance landscape.

Research Questions

RQ1. What are the key challenges that hinder citizen adoption of e-Government services in Pakistan, especially in Hyderabad (Sindh) and Bahawalpur (Punjab)?

RQ2. What strategies can be employed to enhance citizen adoption of e-Government services in Pakistan, and how can the implementation of public administration principles improve transparency and strengthen citizen commitment in Hyderabad and Bahawalpur?

Research Objectives

RO1: To identify and analyze the structural, social, and technological barriers that hinder citizen adoption of e-Government services in Hyderabad and Bahawalpur.

RO2: To explore and evaluate strategies, including awareness campaigns, digital literacy programs, and public-private partnerships, and to assess how integrating public administration principles can enhance transparency and strengthen citizen adoption of e-Government services in both districts.

Methodology

Research Design

This study adopts a qualitative, exploratory research design to examine the barriers to citizen adoption of e-government services in semi-urban Pakistan. A qualitative approach is particularly suited to capturing nuanced, lived experiences and perceptions that are often overlooked in large-scale quantitative surveys. The exploratory orientation reflects the limited prior research on e-government adoption in regional contexts such as Hyderabad and Bahawalpur, enabling the study to generate context-specific insights. By focusing on these two representative secondary cities, the research contributes a localized understanding of how digital governance initiatives are perceived and utilized at the community level.

Sampling Strategy

A purposive sampling strategy was employed to ensure the inclusion of participants directly engaged with, or affected by, e-government services. The sample consisted of 20 participants, divided among three key stakeholder groups:

- Regional government administrators
- ICT professionals affiliated with or working alongside NADRA and FBR
- Citizens who regularly engage with digital service centers or reside nearby

This composition provided a balanced representation of both service providers and end users, enabling the study to capture a holistic perspective of the opportunities and challenges associated with digital governance.

Data Collection

Data were collected through semi-structured interviews, a method that combines structure with flexibility to explore emerging themes. Interviews were conducted in English or Urdu, depending on participant preference, and each session lasted approximately 30 to 45 minutes. All participants provided informed consent before participation. Confidentiality and anonymity were strictly maintained throughout the research process to ensure ethical integrity.

Data Analysis

Data were analyzed using thematic analysis, allowing for the systematic identification of patterns and recurring issues across interviews. Responses were transcribed, coded, and categorized manually to ensure

close engagement with the data. The analysis was guided by five key thematic categories: - Data were analyzed in answer to the following Research Questions.

RQ: What are the key challenges that hinder citizen adoption of e-Government services in Pakistan, especially in Hyderabad (Sindh) and Bahawalpur (Punjab)?

RQ: What strategies can be employed to enhance citizen adoption of e-Government services in Pakistan, and how can the implementation of public administration principles improve transparency and strengthen citizen commitment in Hyderabad and Bahawalpur?

Ethical Considerations

All research activities complied with established ethical guidelines for qualitative research. Participants were briefed on the study's objectives, the voluntary nature of their participation, and their right to withdraw at any time without penalty. Informed consent was obtained before each interview. To ensure confidentiality, all identifying information was anonymized, and data were securely stored. The researcher maintained reflexivity throughout the process to minimize bias and ensure that participants' voices were represented authentically.

4.0 Qualitative Data Thematic Analysis

Comprehensive Thematic Analysis Challenges

All respondents collectively emphasized that digital transformation in Bahawalpur and Hyderabad is constrained by interconnected barriers that combine technical weaknesses, institutional inefficiencies, and deep-rooted social behaviors. The findings reveal that low digital literacy, weak infrastructure, bureaucratic rigidity, lack of trust in online systems, absence of citizen support, and cultural resistance all contribute to citizens' reluctance to adopt e-government services. Respondents agreed that these challenges are not merely technical but reflect a broader need for awareness, transparency, and behavioral adaptation.

Low digital literacy and a lack of awareness among citizens

Respondents' views:

Respondents from both Bahawalpur and Hyderabad consistently expressed concern over citizens' low levels of digital literacy. Officials from Nadra and Inland Revenue departments reported that most people, especially in rural areas, are unaware of online facilities such as CNIC renewal, tax filing, or registration services. Citizens continue to depend on intermediaries due to fear of making mistakes or misusing online systems. Tax officers observed that many users visit offices for services that could easily be completed online, as no effective communication or public education campaigns exist to promote digital literacy. Respondents also mentioned that the lack of government-led awareness programs and digital education at the community level contributes to the slow adoption of online services.

Technological and infrastructure barriers

Respondents' views:

All respondents highlighted the weak technological infrastructure as a major obstacle to effective e-governance. Frequent power outages, slow internet speed, and outdated hardware, such as biometric systems, disrupt service delivery. Tax officers mentioned that uploading documents is often delayed due to limited server capacity and system downtime. NADRA officials also shared that technical errors frustrate citizens, causing overcrowding at physical offices. Respondents emphasized the urgent need for regular maintenance and timely system upgrades to enhance efficiency and restore public confidence.

Institutional rigidities and inefficiency

Respondents' views:

Respondents pointed to entrenched bureaucratic habits and rigid administrative processes as key challenges. Senior staff members often resist the transition to digital systems, preferring traditional paperwork. NADRA officials highlighted poor inter-departmental coordination, where local offices depend heavily on central servers for data access and updates. Similarly, inland revenue officers observed that centralization of control delays decision-making and discourages innovation at the local level.

Trust deficit and data security concerns

Respondents' views:

Respondents unanimously expressed concern about citizens' lack of trust in government digital systems. Many users fear that their personal data could be misused or leaked, influenced by reports of data breaches in other institutions. Officials recounted incidents where small technical errors, such as incorrect name entries, caused citizens to lose confidence in the system. Respondents also observed that the absence of visible cybersecurity measures or transparency regarding data use further deepens public skepticism. They emphasized that citizens need not only secure systems but also visible assurances of data protection and accountability.

Lack of citizen support and follow-up mechanisms

Respondents' views:

All respondents highlighted the post-service gap in digital processes. Citizens often submit online applications but receive no updates or confirmations, leading to confusion and repeated office visits. Tax officers and NADRA officials described the digital complaint portals as ineffective due to a lack of tracking systems and manpower. Respondents noted that there are no dedicated helpdesks or automated dashboards to guide users through the process, leaving citizens feeling unsupported and frustrated. They suggested the establishment of dedicated digital facilitation units to assist users and ensure consistent follow-up.

Cultural and behavioral resistance to change

Respondents' views:

Respondents observed that societal attitudes and behaviors strongly influence citizens' resistance to digital platforms. Older generations, in particular, continue to associate physical interaction, paper documents, and official stamps with authenticity and reliability. Even after submitting applications online, many citizens print physical copies "just in case." Rumors about lost applications or system failures further strengthen this mistrust. Respondents agreed that these attitudes stem from decades of bureaucratic practices and can only change through consistent awareness efforts and visible proof of system reliability.

Thematic Analysis of the Strategies for E-Government Services

The respondents across Bahawalpur and Hyderabad unanimously agreed that citizen adoption of e-government services can only be strengthened through a multidimensional strategy rooted in public administration principles such as transparency, accountability, participation, and responsiveness. While digital transformation holds tremendous potential for efficient and inclusive governance, its success depends on rebuilding public trust, ensuring robust institutional support, strengthening infrastructure, and fostering a culture of openness and learning. Based on the analysis of the interviews, seven strategic themes emerged as crucial pathways to improve citizen adoption of e-government systems.

Trust Building Through Data Privacy and Cybersecurity Assurance

Respondents' Views

Respondents agreed that citizen trust in e-government services can only grow when data security is visibly ensured. They emphasized clear communication on how citizens' information is stored and protected, public awareness campaigns about cybersecurity standards, and the introduction of government-endorsed "verified safe" seals or dashboards. Regular third-party audits and public transparency reports were also proposed to strengthen citizens' confidence in digital systems.

Establishing Robust Follow-Up and Digital Support Mechanisms

Respondent's Views

All participants highlighted the need for consistent communication and user support after online submissions. Citizens often feel ignored once they file a request or complaint. Respondents recommended SMS updates, real-time tracking systems, live chat helpdesks, and appointment-based digital assistance to make users feel supported. Dedicated facilitation desks and centralized helplines were also seen as vital to improving trust and satisfaction.

Cultural and Behavioral Change Management

Respondent's Views

Respondents emphasized that digital adoption is not only technical but cultural. Many citizens, especially seniors, still prefer face-to-face services due to habit and mistrust. To address this, a gradual digital transition with personal guidance, digital literacy campaigns, and storytelling through local influencers was suggested. Building emotional comfort and familiarity was viewed as key to long-term acceptance of e-services.

Strengthening Ict Infrastructure and Connectivity Access

Respondents' Views

Respondents identified weak connectivity, system crashes, and power outages as major barriers. They proposed expanding broadband access to rural areas, upgrading portal bandwidth, and installing backup energy systems like solar power. Setting up digital facilitation centers and public internet kiosks was recommended to make e-governance accessible, especially for women and marginalized groups.

Enhancing Staff Capacity and Digital Literacy

Respondent's Views

According to the respondents, well-trained staff is the backbone of digital transformation. Many frontline employees still lack the skills or confidence to assist citizens effectively. Continuous digital training, hands-on troubleshooting workshops, and peer mentoring were recommended to turn staff into digital ambassadors who can build user confidence and ensure smooth service delivery.

Institutionalizing Citizen Feedback in Digital Governance

Respondent's Views

All respondents agreed that citizen input should guide digital reforms. They proposed introducing digital feedback forms, post-service surveys, and virtual town halls to collect user experiences. Making feedback visible through public dashboards and acting upon it would not only improve services but also make governance participatory and responsive.

Promoting Transparency and Accountability in Service Delivery

Respondent's Views

Respondents unanimously highlighted the role of transparency in building public trust. They suggested visible application tracking systems, automated service updates, and public performance reports. Establishing centralized grievance redressal portals and publishing service statistics regularly would enhance accountability and demonstrate that institutions are answerable to the public.

5.0 Discussion

5.1 Interpretation of Findings

The findings demonstrate that barriers to e-government adoption in Pakistan extend beyond technical constraints, reflecting deeper socio-cultural and institutional dynamics. Despite the availability of online platforms, many citizens in semi-urban areas remain excluded due to limited skills, low trust, and procedural inefficiencies. The persistence of manual verification, bureaucratic delays, and fragmented systems indicates a partial, not transformative digital transition.

5.2 Alignment with Existing Literature

These insights align with prior South Asian research emphasizing that successful e-government initiatives depend on trust, user-centered design, and institutional support (Rana & Dwivedi, 2020; Ahmad & Siddiqui, 2024). However, this study contributes unique regional depth by exploring semi-urban contexts like Hyderabad and Bahawalpur, which are often underrepresented in national e-governance assessments. By foregrounding lived experiences, it reveals a gap between policy ambitions and implementation realities.

5.3 Comparative Insights from other Developing Countries

Comparable studies from India, Bangladesh, and Nigeria highlight that localized digital literacy programs and simplified mobile platforms significantly enhance citizen adoption. For instance, Bangladesh's "Union Digital Centers" and Nigeria's community ICT hubs demonstrate how participatory training models can reduce digital exclusion. Such experiences provide actionable lessons for Pakistan, where similar socio-economic conditions prevail.

5.4 Implications for Governance Principles

From a governance standpoint, these findings reaffirm that technological tools must be embedded within frameworks of transparency, accountability, and inclusivity. Without these principles, digital systems risk replicating existing bureaucratic inequities rather than resolving them. Hence, Pakistan's digital transformation must evolve from a technology-driven to a citizen-driven paradigm.

6.0 Conclusion and Recommendations

6.1 Summary of the Findings: Challenges and Strategies of E-Government Service Adoption

The findings of this study highlight that citizens' adoption of e-government services in Hyderabad and Bahawalpur faces a mix of technological, institutional, and cultural challenges. Many people, especially in rural areas, lack digital literacy and awareness of available online platforms, while weak internet connectivity, frequent power outages, and outdated systems further discourage their use. Bureaucratic resistance, poor coordination, and limited follow-up mechanisms make the process slow and frustrating. Citizens also expressed low trust in data security and a preference for traditional paper-based interactions, which they associate with authenticity. To overcome these issues, respondents emphasized the need to rebuild trust through clear data protection policies, visible cybersecurity measures, and transparent communication.

They also recommended user-friendly support systems such as SMS alerts, tracking tools, and digital

helpdesks to ensure citizens feel guided and valued. Improving infrastructure, expanding internet access, and ensuring energy backup were viewed as critical to making digital services reliable and accessible. Respondents highlighted that government staff must be trained and confident in digital systems to guide citizens effectively, while citizen feedback should be regularly collected and acted upon to improve performance. Finally, promoting transparency through public dashboards, service reports, and grievance redressal mechanisms can enhance accountability and strengthen citizens' confidence. Overall, the study suggests that successful e-government adoption requires not only better technology but also trust-building, cultural adaptation, and institutional reform to make governance more inclusive, transparent, and people-centered.

6.2 Policy Recommendations

1. Digital Literacy Campaigns

Launch community-based training programs targeting women, older adults, and low-income groups.

2. User-Centric Service Design

Develop simplified, mobile-compatible platforms in Urdu and regional languages with visual navigation aids.

3. Integrated Service Platforms

Promote data interoperability among agencies (e.g., NADRA, FBR) to streamline service delivery.

4. Trust-Building Mechanisms

Ensure real-time application tracking, defined service timelines, and transparent grievance redressal systems.

5. Local Support Hubs

Establish physical help desks in district offices to assist citizens transitioning from manual to digital processes.

6.3 Directions for Future Research

- Employ mixed methods to correlate qualitative perceptions with quantitative adoption rates;
- Expand geographically to include rural districts for broader generalization;
- Conduct longitudinal studies assessing the impact of reforms on adoption over time; and
- Examine the role of private-sector partnerships in strengthening e-government delivery and citizen trust

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