

E-GOVERNANCE REFORMS IN PAKISTAN: A COMPARATIVE STUDY OF FEDERAL AND PROVINCIAL INITIATIVES

Saad Shabir^{*1}, Asad Ali², Basit Aziz³, Muhammad Irfan Syed⁴, Nasr Ullah⁵

^{*1}Department of Computer Science & Information Technology - Mirpur University of Science & Technology

²Anglia Ruskin University Forensic Science

³PhD scholar, Department of management sciences; Comsats university Lahore

⁴Department of Public Administration (DPA), University of Karachi

⁵Department of Political Science Abdul Wali Khan University Mardan

¹saad.shabir63@gmail.com, ²Asadali011220@gmail.com, ³basit396@yahoo.com, ⁴Misyed@hotmail.com,

⁵nasrullahbaj2003@gamil.com

Corresponding Author: *

Saad Shabir

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ABSTRACT

E-governance has emerged as a transformative tool for modern public administration, enabling governments to enhance transparency, efficiency, and citizen engagement. In Pakistan, digital governance initiatives have been implemented at both federal and provincial levels, yet their effectiveness remains uneven due to structural, technical, and socio-economic disparities. This study provides a comparative analysis of federal initiatives, including the Digital Pakistan Policy, Pakistan Citizen Portal (PCP), and Federal Board of Revenue digitalization, alongside provincial reforms in Punjab, Khyber Pakhtunkhwa, Sindh, and Balochistan. Utilizing a qualitative, comparative research design based on secondary data from policy documents, official reports, and international governance indicators, the study evaluates initiatives across five dimensions: policy coherence, institutional capacity, digital infrastructure, service delivery, and citizen engagement. Findings reveal that while Punjab and KP demonstrate strong alignment with federal objectives, institutional readiness, and integrated service delivery, Sindh and Balochistan face fragmented policies, limited infrastructure, and low citizen uptake. Critical challenges include weak interoperability, digital inequality, capacity gaps, and cybersecurity vulnerabilities, which hinder nationwide adoption and efficiency. The study offers recommendations, including enhanced federal-provincial coordination, capacity building, infrastructure expansion, standardized data protocols, cybersecurity measures, and citizen-centric engagement strategies. By addressing these challenges, Pakistan can achieve a more inclusive, efficient and transparent e-governance ecosystem, bridging inter-provincial disparities and improving public trust.

Keywords: E-Governance, Digital Governance, Federalism, Pakistan, Policy Coherence, Institutional Capacity, Digital Infrastructure, Citizen Engagement

INTRODUCTION

E-governance refers to the use of information and communication technologies (ICTs) by government institutions to deliver public services,

enhance transparency, reduce administrative costs, and strengthen the relationship between the state and citizens (UN Department of Economic

and Social Affairs, 2024). It transforms traditional bureaucratic processes into digital platforms, enabling online service delivery, real-time citizen feedback, and data-driven decision-making. The core promise of e-governance lies in improving efficiency and accountability while enhancing citizen participation and access to government services. This shift is often conceptualized as part of smart governance models, where digital tools are integrated into governance processes to make them Seamless, Mobile, Accountable, Responsive, and Transparent (Amin, S. et al (2025)).

Globally, governments have increasingly embraced digital governance and smart government models as a response to rising citizen expectations, fiscal constraints, and the need for more agile public institutions. Advanced economies such as Denmark, Estonia, Singapore, and South Korea have emerged as global leaders in digital governance by integrating digital identity systems, interoperable service platforms, and whole-of-government data infrastructures. These countries consistently achieve near-maximum scores on the United Nations E-Government Development Index (EGDI), reflecting high levels of online service provision, telecommunication infrastructure, and human capital development (UN DESA, 2024). The COVID-19 pandemic further accelerated this global shift, as governments relied heavily on digital platforms for healthcare management, social protection payments, education delivery, and crisis communication. As a result, digital governance has become an essential component of state capacity and administrative resilience worldwide. In Pakistan, the digital transformation of governance has gained momentum over the past decade, driven by rapid growth in ICT usage and mobile connectivity. As of 2024, Pakistan has approximately 87.35 million internet users, while mobile phone subscriptions exceed 190 million, indicating significant potential for mobile-based governance solutions (UNDP, 2024). Broadband penetration has expanded through 3G and 4G services, yet access remains uneven, particularly in rural and remote regions. Despite these limitations, digital platforms have become increasingly central to government operations. Key initiatives include online tax filing systems,

biometric digital identification through the National Database and Registration Authority (NADRA), and citizen-facing service portals. The establishment of the Pakistan Digital Authority under the Digital Nation Pakistan Act 2025 further institutionalizes digital governance by providing a centralized framework to coordinate digital infrastructure, public services, and data governance across government tiers (Pakistan Digital Authority, 2025).

Notwithstanding these developments, Pakistan's overall performance in global digital governance rankings reflects both progress and persistent challenges. According to the United Nations E-Government Development Index 2024, Pakistan improved its ranking from 150th in 2022 to 136th out of 193 countries, with its EGDI score rising from 0.4238 to 0.5095 (Dialogue Pakistan, 2024; SAMAA, 2024). This improvement allowed Pakistan to move into the "high EGDI" category for the first time, signaling advancements in online services and e-participation. Pakistan's E-Participation Index ranking also improved, rising from 106th to 88th, indicating greater use of digital platforms for citizen feedback and engagement (Propakistani, 2024). However, when compared with regional peers such as India, Sri Lanka, and Maldives—each with EGDI scores above 0.66 Pakistan's digital governance performance remains relatively weak, highlighting ongoing structural and institutional constraints.

A critical challenge underlying Pakistan's e-governance trajectory is the uneven implementation of digital reforms across federal and provincial levels. While the federal government has launched several high-profile initiatives, including the Pakistan Citizen Portal and digital revenue administration systems, the effectiveness of these reforms varies significantly at the provincial level. Punjab has emerged as a relative frontrunner due to stronger institutional capacity, sustained political commitment, and proactive digital agencies such as the Punjab Information Technology Board. In contrast, provinces such as Balochistan and parts of Khyber Pakhtunkhwa continue to face serious barriers, including limited broadband infrastructure, low digital literacy, and administrative capacity deficits (UNDP, 2024). National-level improvements

therefore mask deep sub-national disparities, with nearly 54 percent of Pakistan's population still lacking regular internet access, which severely constrains the reach and inclusiveness of e-governance initiatives.

The significance of examining e-governance reforms in Pakistan is further amplified by the country's post-18th Amendment federal structure. The 18th Constitutional Amendment, enacted in 2010, devolved substantial administrative and service delivery responsibilities to provincial governments, including key sectors such as health, education, land administration, and local governance. While this decentralization has enhanced provincial autonomy, it has also increased variation in governance capacity and policy implementation across provinces. In the context of digital governance, this means that federal policy frameworks alone are insufficient to ensure uniform outcomes. Instead, provincial political will, fiscal capacity, and institutional readiness play a decisive role in determining the success of e-governance reforms. Consequently, a comparative analysis of federal and provincial initiatives is essential to understand how digital governance operates within Pakistan's federal system, to identify best practices, and to address structural bottlenecks that limit the transformative potential of e-governance in public administration.

Research Objectives of the Study

1. To examine how e-governance reforms have been designed and implemented at the federal and provincial levels in Pakistan, with particular attention to major digital initiatives.
2. To compare federal and provincial e-governance initiatives in Pakistan by analyzing differences in policy alignment, institutional capacity, digital infrastructure, service delivery, and citizen participation across Punjab, Khyber Pakhtunkhwa, Sindh, and Balochistan.
3. To identify the key challenges that affect the effective implementation of e-governance reforms in Pakistan's federal system and to highlight areas where coordination and digital governance practices can be improved.

Literature Review

E-governance, as a global reform agenda, represents a fundamental shift from traditional bureaucratic systems toward digitally enabled governance structures that leverage information and communication technologies (ICTs) to improve public sector performance. Traditional bureaucratic models of public administration were characterized by paper-based processes, hierarchical information flows, and limited citizen interaction. The evolution toward digital governance involves embedding ICTs into core administrative functions to automate workflows, facilitate real-time information exchange, and create citizen-centric services that are accessible, efficient, and transparent. In the global context, e-governance has been associated with improved public sector transparency and accountability through online service delivery portals, open data initiatives, and digital feedback mechanisms, which reduce the opportunities for corruption and bureaucratic inefficiency (Atiq, Salim, & Mahmood, 2023; Seiam & Salman, 2024). Research has shown that e-governance interventions strengthen transparency and accountability by enabling citizens to access information and monitor government performance, thus contributing to more open and responsive systems of governance (Bhatti, Hashmi, Hussain, & Ahmad, 2024).

In developing countries, e-governance presents a mixture of opportunities and constraints. On the opportunity side, ICTs can bridge gaps in administrative capacity, enhance public service delivery, and expand access to government services for marginalized populations. Digital platforms, for example, can reduce transaction costs for citizens, simplify service processes, and offer new channels for citizen participation. However, the digital divide defined by disparities in access to technology between urban and rural populations as well as socioeconomic groups represents a major barrier to equitable e-governance adoption. Many developing nations face challenges related to limited broadband coverage, low levels of digital literacy, and lack of institutional capacity to design and manage digital systems effectively. Institutional capacity constraints also manifest in insufficient ICT skills among public servants,

limited fiscal resources for technology investments, and fragmented governance arrangements that impede cross-departmental data integration (Taufiqurokhman et al., 2024). Political commitment is another critical factor; without consistent leadership support and policy continuity, digital initiatives may stagnate or fail to achieve their intended outcomes.

Within federal governance systems, the coordination of e-governance initiatives poses unique challenges. Federal and sub-national governments often operate under different institutional mandates, resource constraints, and policy priorities, which can lead to fragmentation in digital strategies. Effective intergovernmental coordination becomes essential for harmonizing standards, ensuring interoperability between digital systems, and promoting seamless service delivery across jurisdictions. International comparative experiences illustrate how federal systems can either impede or enhance e-governance depending on governance design. For example, in countries where central governments provide overarching digital frameworks and technical standards, sub-national units tend to implement more coherent and interoperable systems. Conversely, weak coordination results in siloed digital platforms with limited data sharing, duplicate investments, and inconsistent user experiences. The literature emphasizes the importance of governance structures that facilitate collaborative planning, shared digital standards, and fiscal mechanisms that support coordinated ICT investments across government levels.

In the Pakistan context, several studies have examined the current state of digital governance, highlighting both achievements and persistent shortcomings. Research reveals that while Pakistan has initiated numerous digital reform policies including online service portals and citizen feedback mechanisms there remains a persistent gap between policy intent and implementation outcomes. For instance, digital transformation efforts have often been constrained by underutilized ICT infrastructure, human resource limitations, cybersecurity vulnerabilities, and a lack of integrated service design (Amin, Ali, & Zafar, 2025). Systematic literature reviews focusing on Pakistan's e-governance landscape further

underscore the role of digital trust and governance frameworks as critical determinants of citizen adoption and continued use of digital services (Springer, 2025). Despite the proliferation of digital policies, practical adoption is limited by concerns regarding data privacy, security, and public confidence in government platforms, particularly in rural and underserved regions. Additionally, existing research tends to concentrate on individual aspects of e-governance adoption such as technology acceptance, digital literacy, or citizen trust, rather than conducting holistic evaluations of federal and provincial e-governance frameworks.

Research Methodology

This study employs a comparative, qualitative research design to examine e-governance reforms in Pakistan, with a specific focus on differences and similarities between federal and provincial initiatives. The qualitative orientation is appropriate given the study's emphasis on policy design, institutional arrangements, governance capacity, and implementation outcomes rather than hypothesis testing or causal modeling. In public administration and governance research, qualitative comparative designs are widely used to assess reform trajectories, institutional performance, and policy effectiveness across administrative units (Qureshi et al., 2017).

A case study approach is adopted to enable in-depth and context-sensitive analysis. The study covers five cases: the federal government of Pakistan and the four provinces Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan. These cases were selected purposively to reflect Pakistan's post-18th Amendment federal structure, where substantial administrative and service-delivery responsibilities have been devolved to provincial governments. The federal case represents national-level policy formulation, coordination mechanisms, and flagship digital platforms, while provincial cases illustrate variation in implementation capacity, institutional readiness, and service delivery performance.

The study relies exclusively on secondary data, which is appropriate for policy-oriented governance research where official records, institutional reports, and international indices

constitute primary evidence. Secondary data are drawn from three main categories. First, policy documents are analyzed to assess reform intent, strategic priorities, and regulatory frameworks. These include the *Digital Pakistan Policy*, federal ICT strategies, and provincial digital governance or e-government policies issued by provincial information technology boards and planning departments (Government of Pakistan, 2021).

Second, official government reports and administrative publications form a core data source for evaluating implementation outcomes. These include annual reports of federal and provincial IT departments, performance summaries of digital platforms, budget documents, and public sector reform reports. Such documents provide authoritative evidence on institutional arrangements, resource allocation, service coverage, and operational progress of e-governance initiatives across different levels of government.

Third, the study incorporates international governance indicators to contextualize Pakistan's performance within global and regional benchmarks. Data from the *United Nations E-Government Development Index (EGDI)* and its sub-indices on online service delivery, telecommunications infrastructure, and human capital are used to support comparative assessment and longitudinal analysis.

For analytical consistency, the study applies a structured analytical framework based on six key dimensions of e-governance reform. The first dimension, policy framework, examines the clarity, coherence, and scope of federal and provincial e-governance policies, including legal mandates and strategic alignment with broader administrative reforms. The second dimension, institutional capacity, assesses the organizational structures, coordination mechanisms, and administrative capabilities responsible for implementing digital initiatives at each level of government. The third dimension, digital infrastructure, focuses on the availability and adequacy of ICT infrastructure supporting e-governance, such as broadband penetration, data management systems, and platform interoperability, using officially reported

indicators. The fourth dimension, service delivery, evaluates the range and maturity of digital public services, emphasizing accessibility, integration, and transactional capacity rather than mere platform existence. The fifth dimension, citizen engagement, analyzes the extent to which digital initiatives facilitate citizen interaction, feedback, and participation through online portals and grievance redress mechanisms. The final dimension, transparency mechanisms, assesses the use of digital tools to enhance openness, access to information, and accountability through reporting systems and publicly available data.

Data analysis is conducted through qualitative content analysis, involving systematic review and comparison of documents, reports, and indicators across cases. This approach enables identification of patterns, divergences, and institutional factors shaping e-governance performance at federal and provincial levels.

Federal E-Governance Reforms in Pakistan

Pakistan's federal government has undertaken a series of e-governance reforms aimed at modernizing public administration and improving service delivery through digital technologies. These reforms reflect a broader transition from traditional bureaucratic governance toward citizen-centric, technology-enabled systems designed to enhance efficiency, accountability, and transparency. Central to this transformation is the Digital Pakistan agenda, which provides an overarching policy framework for integrating information and communication technologies (ICTs) into governance processes.

Digital Pakistan Policy: Vision, Pillars, and Implementation Status

The Digital Pakistan Policy articulates a national vision for leveraging digital technologies to promote inclusive growth, strengthen governance, and modernize public service delivery. The policy is structured around key pillars including digital infrastructure development, digital skills and human capital, e-government and digital public services, innovation and entrepreneurship, and data governance. It emphasizes expanding broadband connectivity, developing interoperable government platforms, and strengthening

institutional capacity for digital service delivery (Government of Pakistan, 2021).

While the policy reflects a shift from fragmented ICT initiatives toward a more coordinated federal approach, implementation has progressed unevenly. Challenges related to infrastructure gaps, fiscal constraints, and inter-institutional coordination have slowed comprehensive realization of policy objectives.

A significant milestone in Pakistan's digital reform trajectory is the establishment of the Pakistan Digital Authority (PDA) under the Digital Nation Pakistan Act 2025. The PDA serves as the apex body for digital governance and innovation, with a mandate to lead the implementation of the National Digital Masterplan a comprehensive roadmap to transform Pakistan into a digital nation by 2030. The Masterplan emphasizes building secure and interoperable digital public infrastructure, strengthening connectivity, enhancing citizen experience, and promoting data governance, among other priorities. The PDA's responsibilities include coordinating federal and provincial digital initiatives, setting regulatory frameworks for data protection and privacy, and fostering digital inclusion across urban and rural populations. This centralized approach marks a shift from fragmented project-based initiatives toward a unified federal vision for digital governance.

While precise implementation data for the overall Digital Pakistan framework is still emerging, official sources highlight comprehensive objectives such as nationwide broadband expansion, data interoperability across government departments, and capacity building for digital service delivery. These strategic objectives are particularly important in a country where digital access remains uneven, with approximately 54.3% of the population lacking reliable internet access at the national level, posing challenges for universal adoption of e-services.

Institutional Framework: Role of the Ministry of IT and National IT Board

Institutional leadership for federal e-governance reforms has primarily rested with the Ministry of Information Technology and Telecommunication (MoITT), which is responsible for policy

formulation, ICT sector regulation, and coordination of digital initiatives across federal ministries. Complementing this role, the National Information Technology Board (NITB) has served as the principal implementing agency for federal digital platforms.

One of NITB's major contributions has been the rollout of the federal e-office system, designed to replace paper-based workflows with digital file management and communication processes. The e-office system aims to reduce administrative delays, improve record transparency, and enhance inter-departmental coordination (National Information Technology Board, 2023). Despite measurable progress, uneven adoption and limited staff training have constrained its full potential.

Pakistan Citizen Portal: Grievance Redressal and Accountability

Among federal digital platforms, the Pakistan Citizen Portal (PCP) stands out as a key instrument of participatory governance and accountability. Originally launched in October 2018 under the Prime Minister's Performance Delivery Unit, PCP allows citizens to lodge complaints, grievances, and service requests directly with government departments using a mobile app or web interface. As of recent official dashboard statistics, the portal has registered over 4.9 million complaints, with approximately 4.82 million resolved cases, demonstrating the scale and reach of the initiative in engaging citizens with government processes. PCP's design enables direct interaction with multiple government offices without requiring physical visits, simplifying grievance procedures and enhancing transparency in public service delivery (Prime Minister's Performance Delivery Unit, 2023).

The PCP's significance lies not only in complaint resolution but also in its role in fostering performance management and accountability across federal agencies. It provides a real-time tracking mechanism that holds government entities responsible for addressing citizen issues within defined time frames. The portal has thus become a central tool for the federal government to monitor service delivery performance and surface systemic bottlenecks requiring policy intervention.

Digitalization of the Federal Board of Revenue

The Federal Board of Revenue (FBR) has similarly undertaken ambitious digital reforms aligned with broader federal e-governance goals. With the approval of the Prime Minister, the FBR is developing a comprehensive digital ecosystem aimed at transforming the tax administration into a fully digital, end-to-end system. The federal government's strategy involves integrating data across the import, production, and consumption value chains, enabling real-time monitoring and analytics that can inform strategic economic decision making. Such integration is expected to enhance revenue collection, reduce compliance costs, and broaden the taxpayer base through automated processes and risk-based auditing.

To support these reforms, FBR signed an agreement with Karandaz Pakistan in March 2024 to co-develop a digitalization strategy focused on service-oriented design and tax-payer centric use cases. This collaboration aims to assess existing IT infrastructure, business processes, and digital service needs, thereby laying the groundwork for a resilient and inclusive digital tax administration. Such federal–non-state partnerships signal an evolving approach in which public institutions leverage external expertise to accelerate digital transformation.

Strengths of Federal E-Governance Initiatives

Federal initiatives have also included digitization efforts across other areas such as census data collection, where the Self-enumeration Portal was launched to enable Pakistanis to participate in the 2023 population census digitally. This represents one of the first large-scale federal applications of digital public infrastructure for national statistical purposes, showcasing how e-platforms can enhance data accuracy and reduce fieldwork costs. Underlying these efforts is the role of federal institutions responsible for policy coordination and technology deployment. Previously, the Ministry of Information Technology and Telecommunication (MoITT) led e-governance policy development and ICT sector regulation, while the National Information Technology Board (NITB) was instrumental in implementing digital platforms such as the federal e-office system that automates internal government record-keeping

and communication. The e-office transition is expected to reduce paper-based processes, streamline internal workflows, and minimize administrative delays a persistent issue in traditional bureaucracy (Federal Board of Revenue. (2024).

Federal e-governance reforms demonstrate several notable strengths. First, the existence of a comprehensive policy framework provides strategic direction and coherence for digital transformation. Second, flagship platforms such as the Pakistan Citizen Portal have institutionalized citizen feedback mechanisms and strengthened accountability. Third, sector-specific digitalization efforts, particularly in revenue administration, indicate a growing emphasis on data-driven governance and automation.

Limitations and Implementation Challenges

These initiatives reflect the federal government's attempt to integrate digital technology into public administration comprehensively. However, despite progress in platform deployments and digital strategies, several limitations constrain the overall effectiveness of federal e-governance reforms. First, infrastructural deficits including low internet penetration in rural areas, intermittent connectivity, and limited high-speed broadband continue to restrict equitable access to digital services. Second, institutional capacity gaps in data governance frameworks and interoperability standards have resulted in siloed systems that lack seamless data exchange across departments. Experts have emphasized the urgent need for unified data protection laws and standardized policy frameworks to ensure secure and efficient data sharing between federal and provincial entities.

Third, citizen trust remains a significant challenge. Empirical assessment suggests that although platforms like PCP have facilitated millions of interactions, technical reliability issues, user interface limitations, and inconsistent follow-up by relevant departments often undermine citizen confidence in digital systems. In some cases, complaints may be registered but delayed or inadequately addressed, leading to frustration and limited long-term engagement. Finally, policy implementation has been uneven, partially due to

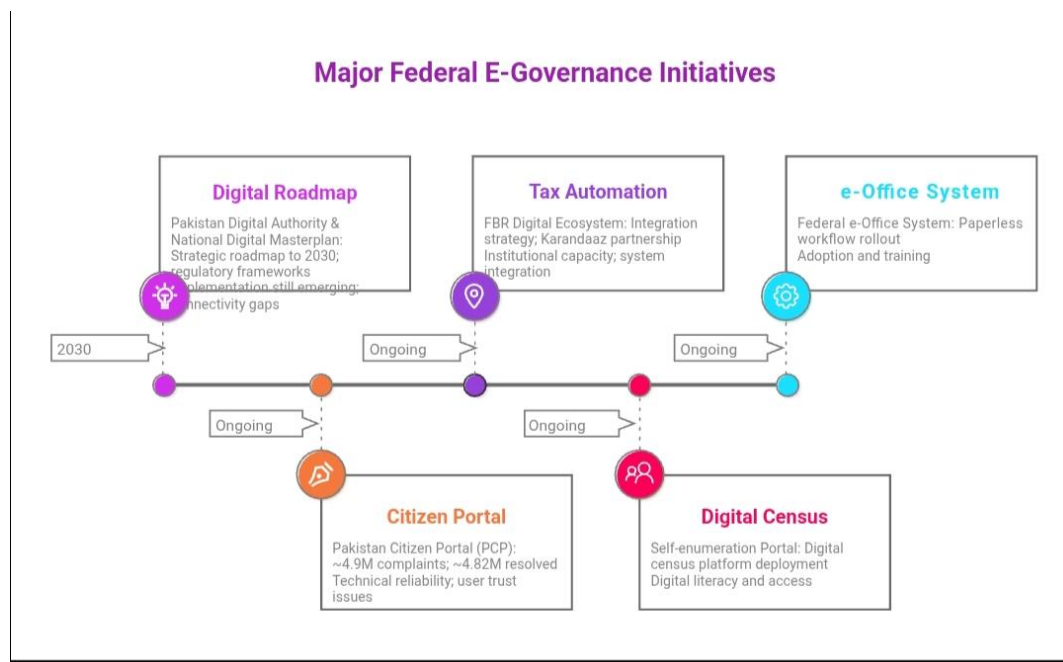
political transitions and administrative discontinuities that affect strategic continuity across governments. As one analysis notes, digital governance initiatives are frequently launched with political momentum but lack sustained commitment to maintenance, evaluation, and incremental improvement.

In summary, Pakistan's federal e-governance reforms encompass a broad spectrum of initiatives from institutional policy frameworks like Digital Pakistan through citizen engagement platforms like the Pakistan Citizen Portal to targeted sectoral

modernization like FBR's digitalization efforts. These initiatives have generated measurable outputs in citizen interactions and process automation. Yet systemic challenges in infrastructure, governance frameworks, and institutional continuity underscore the need for deeper integration of policy design and implementation, especially in coordination with provincial counterparts a key theme that will be further explored in comparative sections of this research.

Table: Major Federal E-Governance Initiatives and Key Features

Initiative	Purpose	Key Outputs & Indicators	Challenges
Pakistan Digital Authority & National Digital Masterplan	Policy coordination; digital governance strategy	Strategic roadmap to 2030; regulatory frameworks	Implementation still emerging; connectivity gaps
Pakistan Citizen Portal (PCP)	Citizen grievance redressal	~4.9M complaints; ~4.82M resolved	Technical reliability; user trust issues
FBR Digital Ecosystem	Tax automation and revenue growth	Integration strategy; Karandaaz partnership	Institutional capacity; system integration
Self-enumeration Portal	Digital census participation	Digital census platform deployment	Digital literacy and access
Federal e-Office System	Internal automation	Paperless workflow rollout	Adoption and training



Provincial E-Governance Reforms in Pakistan

The evolution of e-governance in Pakistan has been significantly shaped by provincial efforts that complement federal initiatives. Post-18th Amendment decentralization empowered provinces to pursue digital governance tailored to local needs, resulting in a variety of innovative platforms, institutional reforms, and service delivery enhancements. However, levels of progress and adoption vary considerably among provinces, reflecting differences in institutional capacity, infrastructure readiness, and implementation commitment.

Punjab: A Leader in Provincial Digital Governance

Punjab is widely regarded as the most advanced province in Pakistan in terms of e-governance initiatives, largely driven by the Punjab Information Technology Board (PITB), which functions as the principal implementing agency for digital transformation in the province (PITB, 2025). Established to modernize governance, the PITB has orchestrated hundreds of digital projects aimed at enhancing transparency, efficiency, and citizen engagement. Key platforms and initiatives include:

Integrated Service Delivery and Digital Platforms

Punjab has developed a comprehensive digital ecosystem accessible through the PITB Portal, which aggregates a wide range of public services, data dashboards, complaint mechanisms, and administrative tools (PITB, 2025). The portal enables citizens to request services such as domicile certificates, driving licenses, land record access, and business registrations digitally, significantly reducing dependency on physical government offices and paper-based processes (PITB Portal, 2025).

Sector-Specific Digital Systems

- **Digital Land Records Management:** The province has digitized land records, facilitating transparency in property transactions and reducing disputes (SDPI, 2025).
- **Computerization of Police Stations:** Police data and case records have been automated

across 36 districts, enabling digital tracking of cases and personnel files (SDPI, 2025).

- **Healthcare Tracking Platforms:** Punjab has implemented digital health systems such as the **eVaccs platform** for immunization tracking and biometric attendance systems for health staff (SDPI, 2025).

- **Education Data Systems:** Student performance data and learning outcomes are monitored through digital education dashboards, supporting informed policy decisions (SDPI, 2025).

Capacity Building and Innovation

Punjab has promoted digital skills and entrepreneurship through initiatives like e-Rozgaar and National Freelance Training Program (NFTP) to equip youth with digital and freelancing competencies, while platforms such as Plan9 and PlanX incubate technology startups (e-Rozgaar Program, 2025; National Freelance Training Program, 2022). These programs have enhanced digital literacy and employment opportunities, contributing to the province's broader digital ecosystem.

Sindh: Progress and Challenges in Digital Services

Sindh province has also adopted significant e-governance reforms, focusing on business facilitation, service digitization, and administrative automation. As part of its digital agenda, Sindh launched the e-Services Sindh app, developed with support from provincial departments to provide citizens with streamlined access to land, industrial, and revenue services (Profit by Pakistan Today, 2023; SDPI, 2025).

This mobile application allows users to access digitized land and industrial records, apply for land-related certificates, and deliver documents online without visiting government offices, thus reducing bureaucratic delays and enhancing transparency (Profit by Pakistan Today, 2023; SDPI, 2025).

In addition to mobile applications, Sindh has taken steps toward broader digital service infrastructure through the establishment of formal ICT boards and pilot programs in health, education, and safety. For example, Sindh Safe Cities Authority (SSCA) has been institutionalized

to enhance urban safety through integrated command, control, and surveillance systems, reflecting a broader application of technology for governance (Sindh Safe Cities Authority, 2025). Despite these advancements, Sindh's e-governance implementation faces interoperability challenges, inconsistent adoption across departments, and limited scaling of successful pilots to province-wide platforms. The absence of a unified provincial strategy has contributed to fragmented initiatives with variable impact on citizens.

Khyber Pakhtunkhwa: Digital Transformation with Strategic Momentum

Khyber Pakhtunkhwa (KP) has aggressively pursued e-governance reforms through the Khyber Pakhtunkhwa Information Technology Board (KPITB), which has spearheaded a digital transformation agenda emphasizing institutional innovation, service integration, and automation (KPITB, 2025). KP's digital agenda is framed by a Digital Transformation Policy and Roadmap 2030, intended to institutionalize digital governance across sectors such as fintech, public services, cybersecurity, and digital infrastructure (KP CM News, 2024).

Notable provincial e-governance projects include:

- **Public Service Delivery Portal (Dastak):** A centralized digital portal facilitating access to multiple government services.
- **Digital Revenue Collection and Payment Platforms:** Financial systems that have processed millions of transactions for services such as arms licenses and vehicle registration, generating significant revenue (KP CM News, 2024).
- **Integrated IT Portal for Public Sector Entities:** Launched in 2025, this portal consolidates financial, operational, and performance data of 181 public sector entities, improving oversight and accountability (Business Recorder, 2025; UrduPoint, 2025).
- **Paperless Governance System:** A province-wide initiative to digitize 170 processes and make departmental operations paperless, thus

enhancing efficiency and accountability (KPITB, 2025; Nation, 2025).

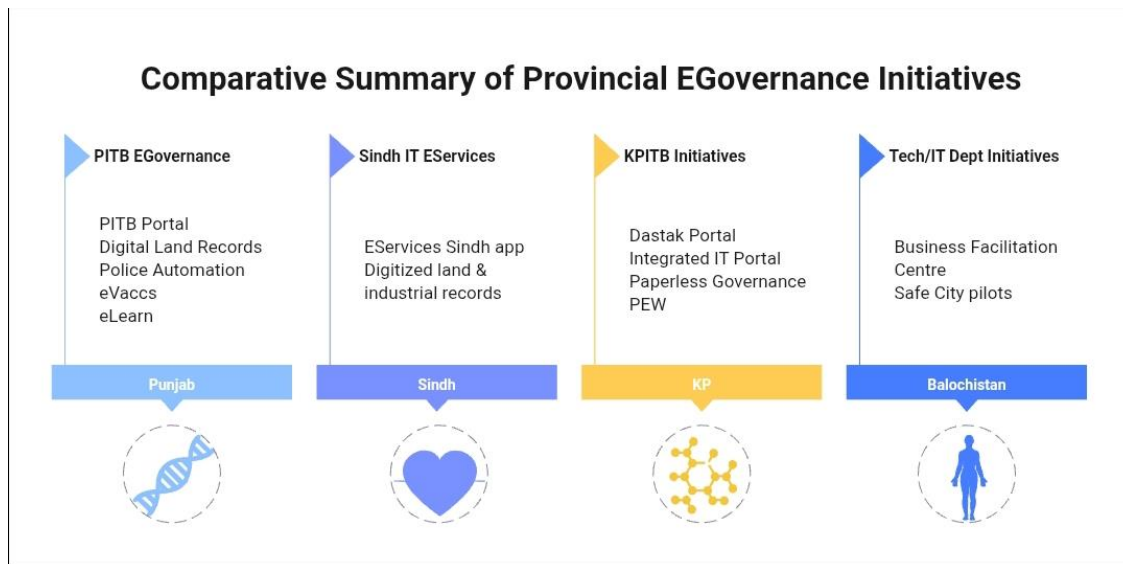
- **Provincial Election Workspace (PEW):** A mobile app to support election administration, streamlining procedural tasks for thousands of officers (KPITB Digital Governance, 2025). Additionally, KPITB has launched systems such as the Prisoners Visit Management System and a modern housing registration platform for government employees, demonstrating the breadth of digital applications beyond traditional service delivery (KPITB, 2025; KPITB Happenings, 2025). While KP's initiatives show technological ambition, challenges persist in scaling services in remote and merged districts, where infrastructure gaps and lower digital literacy constrain adoption.

Balochistan: Early-Stage Reforms with Significant Constraints

Balochistan's e-governance landscape remains in an early developmental phase relative to other provinces. The province has articulated intentions to digitize business facilitation services, such as establishing a Business Facilitation Centre for transparent and efficient investor services, drawing on best practices from PITB's experience (Punjab Information Technology Board Meeting, 2025). Historical data also indicates projects such as the Quetta Safe City Project and establishment of digital libraries and data centres under the Department of Science and Technology (Profit Today, 2018). However, these initiatives have not yet matured into robust e-governance ecosystems comparable to those in Punjab or KP. Balochistan continues to grapple with limited ICT infrastructure, low broadband penetration, and constrained institutional capacity, which reduce the reach and effectiveness of e-governance efforts. Low levels of citizen adoption are further compounded by rural isolation, digital literacy gaps, and financial constraints that hinder scaling of digital platforms province-wide. As a result, e-governance in Balochistan remains fragmented and reactive rather than comprehensive and integrated.

Comparative Summary of Provincial E-Governance Initiatives

Province	Key E-Governance Bodies	Major Platforms/Initiatives	Institutional Strengths	Key Challenges
Punjab	PITB	PITB Portal, Digital Land Records, Police Automation, eVaccs, eLearn	Comprehensive digital ecosystem, youth programs	Urban-rural divide
Sindh	Sindh IT/Board of Revenue	E-Services Sindh app, digitized land & industrial records	Digital record access, business facilitation	Fragmented adoption
KP	KPITB	Dastak Portal, Integrated IT Portal, Paperless Governance, PEW	Strategic roadmap, sector integration	Remote district access
Balochistan	Tech/IT Dept (emerging)	Business Facilitation Centre, Safe City pilots	Early digital reform vision	Infrastructure & capacity limitations



Comparative Analysis: Federal vs. Provincial E-Governance Reforms

E-governance in Pakistan has evolved in a multi-tiered federal structure, with the federal government setting broad policy frameworks and provinces implementing context-specific digital initiatives. A comparative assessment of federal and provincial e-governance efforts reveals both synergies and disparities in policy coherence, institutional readiness, infrastructure, service delivery, and citizen adoption.

Policy Coherence

At the federal level, the Digital Pakistan Policy provides a comprehensive national vision for digital transformation, outlining pillars such as digital infrastructure, citizen-centric services, data governance, and innovation promotion (Government of Pakistan, 2021). This policy offers a strategic framework intended to guide provincial initiatives.

In provinces, policy coherence varies. Punjab aligns closely with federal directives through PITB's integrated platforms, digitization of land records, health, education, and police systems,

demonstrating strong federal-provincial alignment. Khyber Pakhtunkhwa also exhibits strategic alignment through KPITB's Digital Transformation Policy 2030, integrating service delivery and administrative automation. In contrast, Sindh and Balochistan display fragmented policy implementation, with numerous pilot initiatives that often lack integration into a unified provincial strategy (Profit by Pakistan Today, 2023; Punjab IT Board, 2025).

Institutional Readiness

Institutional readiness refers to the capacity of agencies to plan, implement, and sustain e-governance initiatives. The federal government relies on MoITT, NITB, and specialized bodies like the Pakistan Digital Authority to coordinate initiatives. Federal institutions possess strong administrative and technical capacity but face challenges in interdepartmental integration.

Punjab's PITB exhibits high institutional capacity, with dedicated project management units, technical staff, and digital monitoring dashboards. KPITB also demonstrates robust readiness, particularly in digitizing administrative processes and enabling integrated platforms for service delivery. Sindh has functional IT bodies but suffers from fragmented leadership and coordination gaps, whereas Balochistan faces significant capacity constraints, limiting both program scale and sustainability (SDPI, 2025; KPITB, 2025).

Infrastructure Disparities and Digital Divide

Digital infrastructure is a critical determinant of e-governance effectiveness. Federal initiatives, such as national portals and FBR digital systems, rely on nationwide connectivity and data centers. However, broadband penetration across Pakistan remains uneven: urban centers typically report 65–70% internet access, while rural areas fall below 35%, highlighting a persistent digital divide (Pakistan Telecommunication Authority, 2024). Among provinces:

- **Punjab:** Extensive broadband coverage supports integrated platforms.
- **KP:** Moderate coverage, improving in urban hubs but limited in merged districts.
- **Sindh:** Urban-centric digital infrastructure; rural districts lag significantly.
- **Balochistan:** Lowest broadband and ICT infrastructure penetration, hindering adoption (SDPI, 2025).

Service Delivery Performance Comparison

Federal initiatives such as the Pakistan Citizen Portal have demonstrated high transactional capacity, with over 4.9 million complaints registered and a resolution rate of 95%, reflecting strong central oversight (Prime Minister's Performance Delivery Unit, 2023). FBR digitalization has improved efficiency in revenue collection and monitoring, but integration across departments remains incomplete.

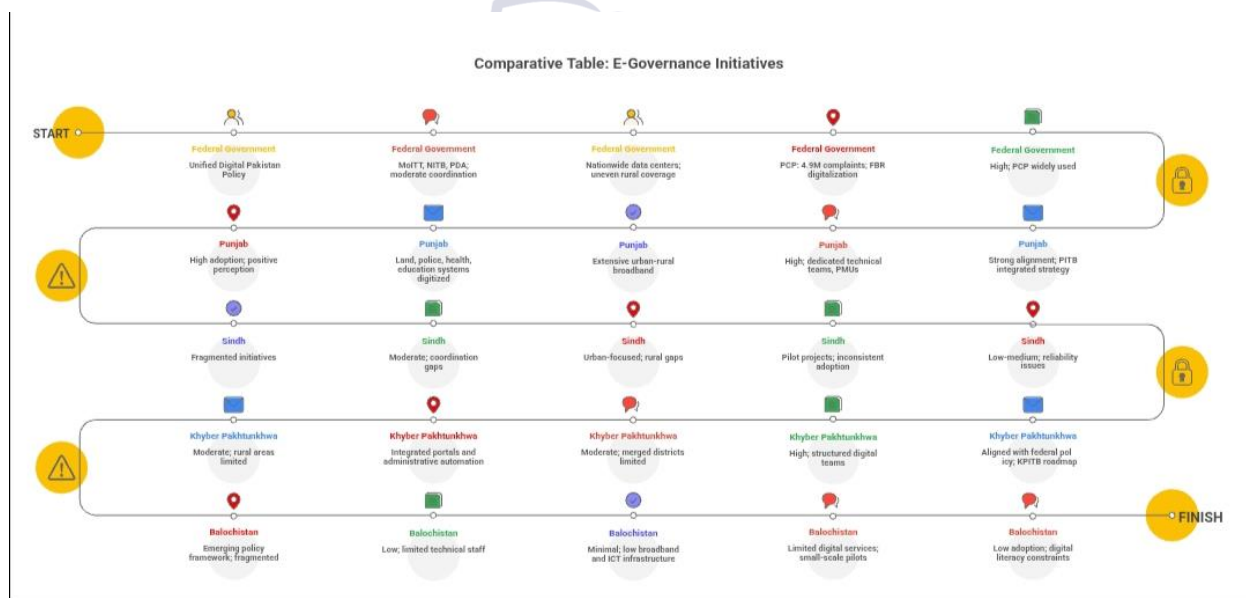
Provincially, Punjab excels in service delivery, providing digital access to land records, health services, police case tracking, and education dashboards, resulting in substantial citizen utilization. KP shows strong performance in administrative automation and integrated portals, though remote areas experience service gaps. Sindh and Balochistan lag in operational coverage and consistency, particularly in rural districts (PITB, 2025; KPITB, 2025; Profit by Pakistan Today, 2023).

Citizen Uptake and Trust

Citizen adoption of e-governance platforms depends on accessibility, reliability, and transparency. PCP demonstrates high adoption at the federal level, with millions of users engaged. Punjab's digital systems, including PITB portals, enjoy strong user uptake due to comprehensive services and outreach programs. KP's services are growing but uneven in remote and merged districts. Sindh and Balochistan face low citizen adoption, influenced by limited infrastructure, digital literacy, and fragmented services (SDPI, 2025).

Comparative Table: Federal vs. Provincial E-Governance Initiatives

Dimension	Federal Government	Punjab	Sindh	Khyber Pakhtunkhwa	Balochistan
Policy Coherence	Unified Digital Pakistan Policy	Strong alignment; PITB integrated strategy	Fragmented initiatives	Aligned with federal policy; KPITB roadmap	Emerging policy framework; fragmented
Institutional Readiness	MoITT, NITB, PDA; moderate coordination	High; dedicated technical teams, PMUs	Moderate; coordination gaps	High; structured digital teams	Low; limited technical staff
Infrastructure & Digital Divide	Nationwide data centers; uneven rural coverage	Extensive urban-rural broadband	Urban-focused; rural gaps	Moderate; merged districts limited	Minimal; low broadband and ICT infrastructure
Service Delivery Performance	PCP: 4.9M complaints; FBR digitalization	Land, police, health, education systems digitized	Pilot projects; inconsistent adoption	Integrated portals and administrative automation	Limited digital services; small-scale pilots
Citizen Uptake & Trust	High; PCP widely used	High adoption; positive perception	Low-medium; reliability issues	Moderate; rural areas limited	Low adoption; digital literacy constraints



Key Challenges in E-Governance Reforms in Pakistan

Despite notable progress at both federal and provincial levels, Pakistan's e-governance

initiatives face systemic challenges that constrain their effectiveness, sustainability, and citizen impact. These challenges can be categorized into

structural, technical, and socio-economic dimensions.

1. Fragmented Governance Structure

Pakistan's federal system, particularly after the 18th Amendment (2010), devolved significant administrative powers to provinces. While this decentralization allowed provinces to tailor digital governance initiatives to local needs, it also created a fragmented e-governance landscape.

For instance, the Digital Pakistan Policy provides a federal framework, but provinces such as Sindh and Balochistan often pursue independent projects with limited integration or coordination with federal systems (Government of Pakistan, 2021; SDPI, 2025). This fragmentation results in duplication of efforts, inconsistent service delivery standards, and difficulty in tracking outcomes at the national level.

Case Study: The Pakistan Citizen Portal (PCP) exemplifies a federally-driven platform intended for nationwide grievance redressal. While Punjab's integrated provincial services allow seamless interaction with PCP, Sindh's fragmented land record systems and limited adoption in rural districts lead to complaints being delayed or unresolved, highlighting the coordination gap between federal and provincial initiatives (Prime Minister's Performance Delivery Unit, 2023).

2. Weak Interoperability Among Systems

A critical technical challenge is the lack of interoperability across federal and provincial e-governance systems. Many platforms operate in silos, limiting the exchange of information between departments.

For example:

- The Federal Board of Revenue (FBR) has digitized customs, sales tax, and income tax data, but integration with provincial tax or land records is limited, preventing full visibility into taxpayer compliance (Federal Board of Revenue, 2024).
- Similarly, KPITB's integrated service portal does not yet exchange data efficiently with federal platforms such as PCP or Digital Pakistan dashboards (KPITB, 2025).

This systemic fragmentation undermines the potential of big data analytics, predictive governance, and citizen-centric service delivery.

Without interoperable platforms, citizens often face repeated verification requests, delayed services, and administrative inefficiencies.

Interoperability is essential for cost efficiency and trust. Countries such as Estonia have demonstrated that fully integrated digital governance ecosystems reduce administrative overhead, prevent fraud, and enhance public confidence in e-services (OECD, 2022). Pakistan's fragmented approach limits these benefits.

3. Digital Inequality (Urban-Rural and Inter-Provincial)

Digital inequality is one of the most significant constraints to equitable e-governance in Pakistan. Access to digital platforms is uneven, with urban areas enjoying high-speed internet and IT infrastructure, while rural and remote areas remain underconnected. According to the Pakistan Telecommunication Authority (2024), internet penetration in rural areas is below 35%, compared to 65–70% in urban centers.

Inter-provincial disparities exacerbate this divide. Punjab has achieved broad coverage of digital land records and education dashboards, while Balochistan's initiatives, such as the Quetta Safe City pilot and Business Facilitation Centre, remain geographically and institutionally limited (SDPI, 2025). KP's merged districts also face connectivity challenges that hinder citizen uptake of e-governance services (KPITB, 2025).

Case Study: During the COVID-19 pandemic, Punjab's telemedicine and education dashboards reached millions of users online, ensuring continuity of health and learning services. In contrast, rural communities in Balochistan and KP merged districts were largely excluded due to low digital access, highlighting the stark urban-rural digital divide (SDPI, 2025).

Digital inequality not only limits access but also reinforces socio-economic disparities, undermining the inclusive intent of e-governance policies. Addressing these disparities is essential to achieving nationwide digital transformation.

4. Capacity and Skills Gaps

Effective e-governance requires skilled human resources, technical expertise, and administrative capacity. Pakistan faces persistent gaps in IT

literacy among government staff, limited training programs, and shortage of certified digital professionals in both federal and provincial bureaucracies.

For instance:

- PITB and KPITB have developed training programs, but the scale is insufficient to meet the growing demand for IT expertise across ministries and departments (PITB, 2025; KPITB, 2025).
- In Balochistan, many digital initiatives struggle due to insufficient staff, inadequate technical support, and weak project management frameworks (SDPI, 2025).

Case Study: The Federal e-Office system faced delays in adoption because many ministries lacked staff with sufficient digital literacy, necessitating retraining and phased implementation. Similarly, the PCP relies on departmental staff to respond to complaints, and limited capacity in less-developed regions results in delayed response times, undermining citizen trust (Prime Minister’s Performance Delivery Unit, 2023).

Without adequate capacity building, digital platforms cannot achieve their intended impact, leading to underutilized investments and citizen dissatisfaction.

5. Cybersecurity and Data Protection Concerns

As Pakistan increasingly digitizes citizen data, cybersecurity risks and data protection gaps emerge as critical challenges. Weak cybersecurity frameworks, absence of standardized data protection laws, and siloed data storage create vulnerabilities to breaches, identity theft, and misuse of information.

Case Study: The FBR digitalization initiative involves sensitive taxpayer data, including income and property details. Any compromise of this data could result in financial fraud or privacy violations. Similarly, the PCP collects personal grievance information, but inconsistent data protection protocols across federal and provincial systems risk undermining public confidence (Federal Board of Revenue, 2024; Prime Minister’s Performance Delivery Unit, 2023).

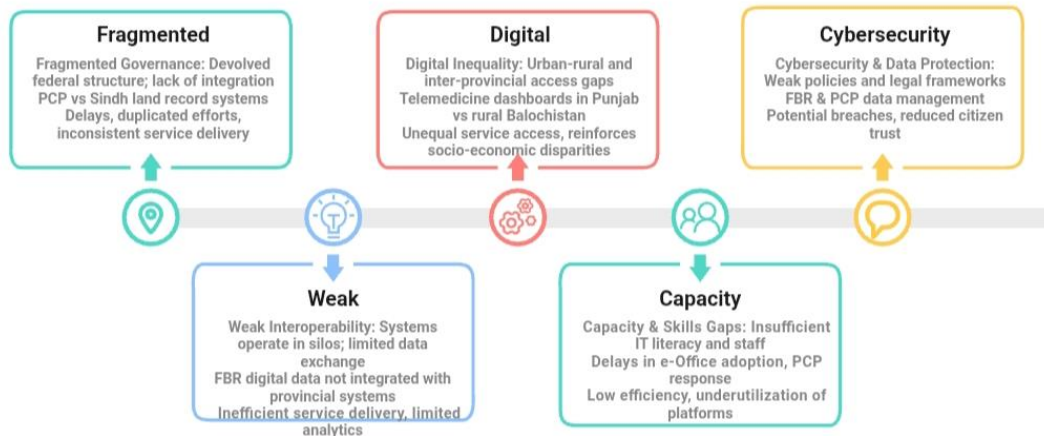
Cybersecurity and legal safeguards are central to citizen trust. Countries with strong data protection laws (e.g., GDPR in the EU) demonstrate higher citizen engagement in e-governance. Pakistan’s fragmented cybersecurity policies reduce resilience and public confidence in digital systems (World Bank, 2022).



Summary Table: Key Challenges in Pakistan’s E-Governance Reforms

Challenge	Description	Case Study / Example	Implication
Fragmented Governance	Devolved federal structure; lack of integration	PCP vs Sindh land record systems	Delays, duplicated efforts, inconsistent service delivery
Weak Interoperability	Systems operate in silos; limited data exchange	FBR digital data not integrated with provincial systems	Inefficient service delivery, limited analytics
Digital Inequality	Urban-rural and inter-provincial access gaps	Telemedicine dashboards in Punjab vs rural Balochistan	Unequal service access, reinforces socio-economic disparities
Capacity & Skills Gaps	Insufficient IT literacy and staff	Delays in e-Office adoption, PCP response	Low efficiency, underutilization of platforms
Cybersecurity & Data Protection	Weak policies and legal frameworks	FBR & PCP data management	Potential breaches, reduced citizen trust

Key Challenges in Pakistan's E-Governance Reforms



Conclusion

E-governance has become a cornerstone of modern public administration, offering opportunities to enhance transparency, efficiency, and citizen engagement. Pakistan's journey toward digital governance demonstrates significant progress, particularly through federal initiatives such as the Digital Pakistan Policy, the Pakistan Citizen Portal, and FBR digitalization, which have improved service delivery, accountability, and administrative efficiency. At the provincial level, disparities in implementation reflect differences in institutional capacity, infrastructure, and policy alignment. Punjab, through the PITB, has developed integrated platforms across land records, health, education, and police services, ensuring widespread citizen uptake. Khyber Pakhtunkhwa has advanced administrative automation and mobile governance initiatives, while Sindh and Balochistan continue to operate fragmented and early-stage digital platforms, with limited reach and adoption, particularly in rural areas. Comparative analysis reveals critical gaps, including inconsistent policy coherence, weak interoperability of digital systems, infrastructure disparities, uneven service delivery, and varying levels of citizen trust and engagement. Key challenges such as fragmented governance structures, digital inequality, capacity and skills deficits, and cybersecurity vulnerabilities further

constrain the potential of e-governance reforms. Addressing these challenges requires a coordinated approach that strengthens federal-provincial alignment, enhances institutional capacity, expands infrastructure and digital access, promotes interoperability, ensures robust cybersecurity frameworks, and fosters citizen participation. Sustainable financing and public-private partnerships are essential to maintain and scale these initiatives. By implementing these strategies, Pakistan can create a more inclusive, efficient, and transparent e-governance ecosystem, bridging urban-rural and inter-provincial divides, improving citizen trust, and positioning itself competitively in global e-government rankings. Ultimately, the success of e-governance in Pakistan will depend on the country's ability to integrate federal and provincial efforts, develop human and technical capacity, and prioritize citizen-centric solutions, ensuring that digital governance becomes a driver for sustainable development and effective public service delivery.

Recommendations and Policy Implications for E-Governance Reforms in Pakistan

Pakistan's digital governance journey has shown progress through federal and provincial initiatives; however, persistent challenges require targeted interventions. These recommendations aim to strengthen policy coherence, institutional

capacity, service delivery, and citizen trust while addressing digital inequality and cybersecurity concerns.

1. Strengthen Policy Coherence Across Federal and Provincial Levels

A unified policy framework that aligns federal visions with provincial initiatives is critical. Currently, provinces such as Sindh and Balochistan operate fragmented initiatives, whereas Punjab and KP demonstrate stronger alignment with federal directives.

Recommendations:

- Develop a National E-Governance Coordination Council comprising federal and provincial representatives to harmonize strategies, share best practices, and ensure integrated service delivery (OECD, 2022).
- Establish standardized policy guidelines for platform design, data management, and citizen engagement, ensuring provincial systems are interoperable with federal systems like the Pakistan Citizen Portal.

Case Example: Estonia's X-Road platform enables cross-agency data sharing nationwide, ensuring all regional and national e-services operate under a coherent digital ecosystem (OECD, 2022). Pakistan can adopt similar interoperability standards across provinces.

2. Enhance Institutional Readiness and Human Capacity

Institutional capacity remains uneven, with Balochistan and parts of KP facing shortages of trained IT staff and project managers.

Recommendations:

- Introduce structured e-governance training programs across federal and provincial bureaucracies, focusing on digital literacy, project management, and data analytics (World Bank, 2022).
- Create provincial IT cadre streams for dedicated e-governance staff, as exemplified by Punjab's PITB model, ensuring long-term sustainability.
- Promote knowledge-sharing platforms between provinces, facilitating learning from

successful initiatives such as PITB's Land Records Digitization and KPITB's Dastak Portal.

Skilled personnel are essential for platform adoption, maintenance, and expansion. Countries like Singapore have successfully institutionalized digital talent pipelines, leading to highly responsive and resilient e-governance systems (OECD, 2022).

3. Address Infrastructure Gaps and Digital Inequality

Urban-rural and inter-provincial disparities limit citizen access to digital services. Balochistan and merged districts of KP are particularly underserved.

Recommendations:

- Expand broadband coverage in rural and remote areas, prioritizing underserved districts and leveraging public-private partnerships.
- Implement digital access hubs in rural centers, enabling citizens to use e-services without personal internet connectivity.
- Encourage mobile-first platforms, as mobile penetration is higher than broadband in rural Pakistan, ensuring broader inclusivity.

Case Example: During the COVID-19 pandemic, Punjab's telemedicine and education dashboards successfully reached millions online. Replicating such mobile-friendly platforms in Balochistan and KP's remote districts can reduce inequality (SDPI, 2025).

4. Improve Interoperability and Data Integration

Fragmented systems hinder efficiency and reduce transparency. Integrating federal and provincial platforms is vital for end-to-end service delivery.

Recommendations:

- Develop interoperability protocols for all new digital platforms, using standardized APIs and data exchange formats.
- Create a central data repository, ensuring secure sharing of non-sensitive administrative data across federal and provincial platforms.
- Mandate cross-departmental pilot projects to test data integration before scaling, reducing duplication and optimizing resource utilization.

Integrated systems allow real-time analytics, predictive governance, and evidence-based policy-making, enhancing citizen trust and government efficiency (OECD, 2022).

5. Strengthen Cybersecurity and Data Protection Frameworks

Digital platforms handle sensitive personal, financial, and administrative data. Weak cybersecurity protocols risk breaches, fraud, and erosion of citizen trust.

Recommendations:

- Enact comprehensive data protection and privacy legislation, setting clear standards for data collection, storage, and sharing.
- Establish provincial cybersecurity units linked to federal oversight for monitoring, threat assessment, and rapid incident response.
- Conduct regular cybersecurity audits and penetration testing across e-governance platforms.

Case Example: The European Union’s General Data Protection Regulation (GDPR) enhances citizen trust and compliance. Pakistan can adopt a similar legal framework to ensure transparency and accountability (World Bank, 2022).

6. Promote Citizen Engagement and Trust

Citizen adoption is uneven due to low digital literacy, lack of awareness, and inconsistent service quality.

Recommendations:

- Launch digital literacy campaigns, including awareness drives, community

workshops, and online tutorials, particularly targeting women and rural populations.

- Establish feedback and grievance mechanisms in all e-governance platforms, ensuring timely response and resolution.
- Monitor user satisfaction metrics regularly and adapt services based on citizen feedback.

Case Example: Punjab’s PITB e-services and Pakistan Citizen Portal use real-time dashboards to monitor complaint resolution, which has increased citizen trust and engagement (Prime Minister’s Performance Delivery Unit, 2023).

7. Ensure Sustainable Financing and Public-Private Partnerships

Many e-governance initiatives face funding constraints, especially in provinces with limited budgets.

Recommendations:

- Introduce multi-year funding models for digital governance projects to ensure continuity.
- Leverage public-private partnerships (PPPs) for technical expertise, infrastructure development, and innovation.
- Explore international grants and development funding for digital inclusion and rural connectivity projects.

Sustained financing ensures platforms are maintained, upgraded, and resilient to technological and political changes. Countries like India and Estonia use PPPs successfully to scale digital services across diverse regions (OECD, 2022).

Summary Table: Recommendations Linked to Key Challenges

Challenge	Recommendation	Expected Outcome
Fragmented Governance	National E-Governance Coordination Council	Integrated federal-provincial alignment
Weak Interoperability	Standardized APIs, central data repository	Seamless service delivery, reduced duplication
Digital Inequality	Expand broadband, mobile-first platforms, access hubs	Inclusive access across urban-rural divide
Capacity & Skills Gaps	Structured training, IT cadre, knowledge sharing	Efficient adoption and management of platforms
Cybersecurity & Data Protection	Data protection laws, cybersecurity units, audits	Secure platforms, increased citizen trust

Low Citizen Uptake	Digital literacy campaigns, feedback systems	Higher adoption, improved public satisfaction
Funding & Sustainability	Multi-year budgets, PPPs, international funding	Continuity and expansion of initiatives

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