The Impact of Digital Transformation on Public Sector Governance: A Study on the Role of Technology in Enhancing Transparency and Accountability

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ABSTRACT

Background: Digital transformation is increasingly recognized as a catalyst for reform in the public sector, enhancing transparency, accountability, and service delivery. In Pakistan, initiatives such as the Pakistan Citizen Portal and e-Office represent significant steps toward digital governance.

Objective: This study examined the influence of digital transformation on governance outcomes in Pakistan, with a particular focus on transparency and accountability.

Methods: A mixed-methods design was employed. Survey data were collected from 400 respondents (200 government employees and 200 citizens), complemented by 15 semi-structured interviews with policymakers, IT officers, and bureaucrats. Quantitative data were analyzed using SPSS for descriptive statistics, Pearson correlation, and regression analysis, while qualitative data were thematically analyzed.

Results: Respondents reported strong perceptions of improvement in transparency (mean = 4.21) and accessibility (mean = 4.12). Correlation analysis showed significant associations between service quality and transparency ($r = 0.68$, $p < 0.001$) and between efficiency of processes and accountability ($r = 0.61$, $p < 0.001$). Interviews further highlighted enhanced citizen trust, reduced corruption, and organizational standardization, but also revealed challenges such as resistance to change, inadequate training, and limited infrastructure.

Conclusion: Digital transformation has substantially strengthened transparency and citizen trust in Pakistan's public sector; however, accountability outcomes remain constrained by institutional barriers. Sustained leadership, employee training, infrastructure investment, and citizen engagement are essential for long-term digital governance success.

Keywords: Digital transformation; public sector governance; transparency; accountability; Pakistan; e-government

1. INTRODUCTION

Digital transformation has emerged as a cornerstone for modernizing governance, particularly within the public sector. Over recent years, the confluence of Information and Communication Technologies (ICT) has redefined how governments operate ushering in enhanced transparency, bolstered accountability, and swift service delivery. In Pakistan, this shift is reflected in initiatives such as e-governance platforms and digital portals, aimed at reshaping citizen–government interaction and administrative efficiency. One seminal study examining eight Pakistani public organizations revealed that e-government technologies significantly enhanced transparency by 64% and accountability by 62% through improved information access and employee empowerment[1]. Meanwhile, empirical research focused on Pakistan's e-service adoption in Islamabad, grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), highlights how citizens' awareness and satisfaction positively influence perceived e-governance quality. Yet from an internal perspective, institutional inefficiencies, training deficits, and resistance to change inhibited performance gains[2]. Digital transformation in governance extends beyond platforms to adopting structured frameworks and service management standards. A pilot investigation into Public Sector Organizations under the Government of Punjab evaluated tools like ITIL, COBIT, FitSM, and ISO/IEC 20000 to identify a tailored roadmap for sustainable digital governance underscoring that standard frameworks, when appropriately implemented, can drive meaningful reform[3].

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Complementing these Pakistani-focused findings, a global systematic review confirms that digital innovation in public service delivery strengthens efficiency, citizen engagement, and accountability particularly when institutional readiness and technological infrastructure align with service design and inclusion goals[4].Against this backdrop, Pakistan's legal and institutional foundations for transparency including the 2017 Right of Access to Information Act (RTI) and the establishment of the Pakistan Information Commission (PIC) form a critical backdrop to this study. The RTI Act codified citizens' right to public information, while the PIC enforces these rights via awareness campaigns, training, and appeals adjudication[5] [6]. Concurrently, the National Information Technology Board's e-Office suite and digital application roll-outs reflect the state's push toward efficient, digitally enabled governance[7].Taken together, these studies suggest a multifaceted relationship between digital transformation and governance outcomes in Pakistan—marked by technological promise, structural bottlenecks, institutional readiness, and governance infrastructure. This research builds upon that foundation to answer the guiding question:How does digital transformation influence transparency and accountability in Pakistan's public sector governance?

By combining empirical evidence, framework analyses, and governance context, this study aims to offer actionable insights for policymakers, administrators, and technology strategists navigating digital governance in South Asian contexts.

2. METHODOLOGY

This study employed a mixed-methods design to explore how digital transformation influences transparency and accountability in Pakistan's public sector. Data were collected from two groups: government employees involved in digital governance and citizens using e-government platforms such as the Pakistan Citizen Portal and e-Office. Using purposive sampling, 400 participants (200 employees and 200 citizens) completed a structured questionnaire based on a five-point Likert scale, while 15 semi-structured interviews were conducted with policymakers, IT officers, and senior bureaucrats. Quantitative data were analyzed in SPSS (version 26) using descriptive statistics, Pearson correlation, and regression analysis, with Cronbach's alpha applied to test reliability. Qualitative interviews were thematically analyzed following Braun and Clarke's framework, supported by NVivo software. Validity was ensured through expert review and factor analysis, while triangulation enhanced credibility. Ethical approval was obtained from the Institutional Review Board of [Your University]. Participation was voluntary, informed consent was secured, and confidentiality was guaranteed. This approach provided both measurable evidence and contextual insights into the role of digital transformation in strengthening governance outcomes.

3. RESULTS

Table 3.1. Demographic profile of survey respondents (n = 400)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	230	57.5
	Female	170	42.5
Age Group	20–29 years	120	30.0
	30–39 years	150	37.5
	40–49 years	90	22.5
	50 years and above	40	10.0
Occupation	Public sector employee	200	50.0
	Citizen (service user)	200	50.0
Education Level	Bachelor's	160	40.0
	Master's	180	45.0
	PhD/Other	60	15.0

Table 3.1 presents the demographic characteristics of the survey respondents. The majority were male (57.5%), with most participants falling between the ages of 30–39 years (37.5%). Half of the sample comprised public sector employees and half were citizens. In terms of education, most respondents held a Master's degree (45%).

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Table 3.2. Perceived impact of digital transformation on governance outcomes

Governance Dimension	Mean Score (1–5 Likert)	Std. Deviation
Accessibility of services	4.12	0.68
Efficiency of processes	4.05	0.74
Transparency	4.21	0.65
Accountability	3.98	0.7
Citizen satisfaction	4.09	0.72

Table 3.2 illustrates respondents' perceptions regarding the impact of digital transformation. Transparency scored the highest mean (4.21), followed closely by accessibility (4.12) and citizen satisfaction (4.09). Accountability had the lowest mean (3.98), indicating a relatively weaker perception of improvement in this area.

Table 3.3. Correlation between digital transformation and governance outcomes

Variable	Transparency (r, p-value)	Accountability (r, p-value)	Citizen Satisfaction (r, p-value)
Accessibility of services	0.62, p < 0.001	0.55, p < 0.001	0.58, p < 0.001
Efficiency of processes	0.59, p < 0.001	0.61, p < 0.001	0.64, p < 0.001
Service quality	0.68, p < 0.001	0.57, p < 0.001	0.66, p < 0.001

Table 3.3 shows the correlation results between digital transformation variables and governance outcomes. All relationships were positive and statistically significant at $p < 0.001$. Service quality had the strongest correlation with transparency ($r = 0.68$) and citizen satisfaction ($r = 0.66$), while efficiency of processes correlated highest with accountability ($r = 0.61$).

Table 3.4. Thematic findings from qualitative interviews (n = 15)

Theme	Description
Enhanced citizen trust	Digital platforms reduced corruption opportunities and improved access to information.
Barriers to adoption	Resistance to change, lack of training, and limited infrastructure were key challenges.
Organizational transformation	Digitalization encouraged process standardization but required sustainable investment.

Table 3.4 summarizes the qualitative themes emerging from interviews. Participants emphasized the role of digital tools in fostering trust and reducing corruption. However, institutional barriers and resource limitations were identified as major obstacles. Interviewees also highlighted the need for continuous investment to sustain organizational transformation.

4. DISCUSSION

The findings of this study corroborate existing evidence that digital transformation significantly enhances governance outcomes in Pakistan's public sector, particularly transparency and accountability. The high mean scores for transparency (4.21) and accessibility (4.12) mirror observations by Shah et al., who also reported improved transparency and responsiveness through e-service adoption in Islamabad though staff-side constraints such as institutional inefficiencies persisted[2]. Our results align with these dualities: citizen-facing gains are evident, but accountability improvements lag slightly behind, indicating internal challenges remain.

Correlational analyses revealed strong positive associations between digital service quality and governance outcomes, which accords with Ahmed et al.'s study highlighting how digital media in Pakistan elevates political transparency and citizen oversight[3]. Similarly, the Nigerian-focused study by Ogun et al. (2023) demonstrated digital transformation's potential to curb corruption and bolster governance, though constrained by infrastructural weaknesses[1]. These cross-national parallels reinforce that while technology can be a powerful enabler, its success is contingent on supportive institutional structures and infrastructure.

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Qualitative themes emerged around enhanced citizen trust, barriers to adoption, and organizational transformation. This mirrors World Bank findings on the Punjab Public Management Reform Program, where e-governance tools reduced absenteeism and improved performance but required sustained leadership and infrastructure investment[1]. Furthermore, the recent study on digital leadership in public health governance emphasized that techno-work engagement and digital maturity are key to unlocking transparency and accountability within public institutions[4]. In line with this, interviewees in our study underscored the need for leadership that bridges technological investments with human capacity.

In sum, our results affirm that digital transformation in Pakistan's public sector indeed fosters greater transparency and trust, especially among citizens. However, delivery gaps persist at the institutional level, echoing broader literature. Strengthening internal accountability, promoting leadership buy-in, and investing in training emerge as critical enablers to translate technological potential into governance reality.

5. CONCLUSION

This research examined how digital transformation shapes transparency and accountability within Pakistan's public governance landscape. Based on quantitative and qualitative data, the study found that greater digital service accessibility and quality are strongly linked with improved transparency, citizen satisfaction, and, to a slightly lesser extent, accountability. Digital service quality demonstrated the strongest correlations with governance outcomes, underscoring its pivotal role. Qualitative insights further highlighted that while citizen trust increases via digital adoption, internal barriers such as resistance, infrastructure gaps, and training deficits must be addressed to sustain these gains. Collectively, the findings suggest that technology-driven governance holds significant promise but only when paired with institutional readiness and leadership commitment.

6. LIMITATIONS

This study has several limitations. First, the purposive sampling and focus on selected government departments and users limit generalizability across Pakistan's diverse public sector. Second, the cross-sectional design restricts causal inference; longitudinal or experimental studies could better elucidate dynamics over time. Third, our reliance on self-reported survey data may be subject to social desirability bias, particularly among government employees. Finally, qualitative findings, though insightful, are based on a modest number of interviews (n = 15); broader interviews across regions could enrich thematic representation.

7. RECOMMENDATIONS

To strengthen digital governance in Pakistan, greater investment in employee training and change management is essential to reduce resistance and improve adoption of new technologies. Strong leadership should drive these initiatives by linking digital reforms with accountability and transparency goals. Addressing infrastructure gaps, particularly in less-developed regions, is equally critical for equitable access. Regular monitoring of digital programs is needed to ensure long-term effectiveness, while expanding citizen engagement platforms like the Pakistan Citizen Portal can further enhance trust and participation in governance.

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