

The Role of E-Government Procurement (e-GP) Systems in Mitigating Administrative Corruption and Enhancing Bureaucratic Transparency: An Empirical Assessment of Nepal's Public Sector

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Abstract

Public procurement constitutes a significant portion of national expenditure in developing nations, yet remains highly vulnerable to corruption and administrative inefficiency. Nepal, ranking 108th out of 180 countries on the Corruption Perception Index, allocates approximately 60-70% of its national budget to public procurement, with corruption losses estimated between 10-25% of contract value. Despite the Government of Nepal's introduction of electronic Government Procurement (e-GP) systems, comprehensive empirical assessment of their effectiveness in mitigating corruption and enhancing transparency remains limited. This study addresses this gap through a mixed-methods empirical assessment of Nepal's e-GP implementation across federal, provincial, and local government levels. Using survey data from 384 procurement officials and administrators across all seven provinces, supplemented by secondary analysis of procurement records from 2018-2025, the research evaluates e-GP's impact on corruption reduction, transparency enhancement, and administrative efficiency. Key findings indicate that e-GP implementation has achieved 89.4% effectiveness in reducing direct collusion

opportunities in tender processing, with 82.3% of respondents reporting improved transparency in bid evaluation processes. However, significant implementation barriers persist, including inadequate ICT infrastructure (reported by 67.8% of respondents), limited digital literacy among procurement officials (61.2%), and fragmented system adoption across local governments. The study contributes a validated framework for assessing e-procurement anti-corruption capabilities and provides actionable recommendations for strengthening Nepal's digital governance infrastructure. These findings have significant implications for developing nations pursuing digital transformation as an anti-corruption strategy.

Keywords: E-Government Procurement, Administrative Corruption, Bureaucratic Transparency, Digital Governance, Nepal Public Sector, Anti-Corruption Technology

1. Introduction

1.1 Background

Public procurement serves as the primary mechanism through which governments acquire goods, works, and services essential for public programs and projects. Every government bears the obligation to provide essential services to its citizens, and procurement systems represent the operational backbone of this service delivery (Thakulla, 2021). However, public procurement also represents one of the most lucrative areas for corruption globally, with Transparency International estimating that corruption in procurement can inflate project costs by 20-30% and compromise quality of public infrastructure and services.

Nepal's public procurement landscape reflects these global challenges. The Public Procurement Act of 2007 governs procurement activities that consume approximately 60-70% of the national budget. Despite the existence of this legal framework, corruption in public procurement has been rising steadily, with estimated losses from corruption ranging between 10% to 25%, and in some cases reaching as high as 50% of contract value (Transparency International Nepal, 2025).

Nepal's ranking of 108th out of 180 countries on Transparency International's Corruption Perception Index (2023) underscores the severity of corruption challenges facing the nation.

The Government of Nepal has recognized Information and Communication Technology (ICT) as a transformative tool for promoting development, improving public service delivery, and fostering good governance (Sharma, 2025). The 2015 National ICT Policy and the Digital Nepal Framework 2019 outlined key priorities for leveraging technology across sectors, with e-governance envisaged as an enabler of efficient, transparent, and citizen-centered governance. Within this broader digital governance vision, the electronic Government Procurement (e-GP) system emerged as a strategic intervention to address procurement corruption and inefficiency.

The e-GP system was designed to automate the entire procurement lifecycle—from tender publication and bid submission to evaluation and contract award—thereby reducing opportunities for human interference, collusion, and corruption. By 2025, the e-GP system had been adopted across federal agencies and many provincial and local governments, handling over 80% of procurement electronically (Institute for Government and Public Affairs, 2024). However, the transition from policy to effective implementation has been challenged by infrastructural, institutional, and human capacity constraints that vary significantly across Nepal's federal structure.

1.2 Problem Statement

While the theoretical benefits of e-procurement in reducing corruption and enhancing transparency are well-documented in international literature, empirical evidence specific to Nepal's context remains limited and fragmented. Several factors contribute to this research gap:

First, existing studies have focused primarily on adoption rates and basic implementation metrics without systematically assessing the anti-corruption capabilities of e-GP systems. Neupane, Soar, and Vaidya (2014) examined perceptions of trust in public e-procurement systems in Nepal but did not provide empirical validation of actual corruption reduction outcomes. Similarly, Sharma's (2025) investigation of e-governance in Dhangadhi Sub-Metropolitan City found that while e-procurement software was widely used and well-regarded (mean scores up to 4.2), comprehensive assessment of its anti-corruption impact was beyond the study's scope.

Second, significant geographic and institutional disparities in e-GP implementation have not been systematically documented. Thakulla's (2021) study of procurement practices in Dolpa district identified that due to lack of internet and ICT infrastructure, the e-GP system was not being utilized, representing a major problem for public procurement practices. This finding suggests that e-GP effectiveness may vary substantially across Nepal's diverse geographic and administrative contexts, yet no comprehensive empirical assessment has examined these variations.

Third, the relationship between e-GP adoption and administrative transparency remains undertheorized and inadequately tested. While digital governance proponents argue that electronic systems inherently reduce corruption by eliminating human intermediaries, critics contend that technology alone cannot address deeply embedded institutional and cultural factors that enable corruption (Dangal, 2025; Sharma, 2025). The mechanisms through which e-GP influences transparency—and the conditions under which it succeeds or fails—require systematic empirical investigation.

Fourth, the federalization of Nepal's governance structure introduced in 2015 created new challenges for e-governance implementation. While federal technology adoption has been relatively mature, with systems like the Vital Event Registration System and SuTRA effectively integrated into business processes, the decentralized approach to digitalization at sub-national

levels has resulted in fragmented, duplicative, and often unsustainable systems (Sharma, 2025). This fragmentation undermines the potential for e-GP to serve as a unified anti-corruption mechanism across all levels of government.

Fifth, the academic literature lacks a validated framework for assessing e-procurement's anti-corruption capabilities that accounts for Nepal's specific institutional, infrastructural, and cultural context. Existing frameworks, largely developed in OECD country contexts, may not adequately capture the unique challenges facing developing nations implementing digital governance reforms.

The central problem this study addresses is the absence of comprehensive empirical evidence on whether and how e-GP systems actually mitigate administrative corruption and enhance bureaucratic transparency in Nepal's public sector, and the identification of the contextual factors that moderate these outcomes.

1.3 Objectives of the Study

General objective:

To empirically assess the effectiveness of electronic Government Procurement (e-GP) systems in mitigating administrative corruption and enhancing bureaucratic transparency within Nepal's public sector.

Specific objectives:

1. To evaluate the extent to which e-GP implementation has reduced corruption opportunities in public procurement processes across federal, provincial, and local government levels.
2. To assess the relationship between e-GP adoption and perceived improvements in bureaucratic transparency, accountability, and procedural integrity in procurement administration.
3. To identify and analyze the infrastructural, institutional, and human capacity barriers that moderate e-GP effectiveness in achieving anti-corruption and transparency outcomes.
4. To develop and validate a context-specific framework for assessing e-procurement anti-corruption capabilities in developing country settings.
5. To formulate evidence-based recommendations for strengthening e-GP implementation and addressing implementation barriers in Nepal's public sector.

1.4 Research Questions

Research Question 1: What is the measured effectiveness of e-GP implementation in reducing corruption opportunities in Nepal's public procurement processes, and how does this effectiveness vary across different government levels and institutional contexts?

Research Question 2: What is the relationship between e-GP system adoption and perceived improvements in bureaucratic transparency, accountability, and procedural integrity in procurement administration?

Research Question 3: What are the key infrastructural, institutional, and human capacity barriers that moderate the effectiveness of e-GP systems in achieving anti-corruption and transparency outcomes?

Research Question 4: What contextual factors and implementation conditions differentiate high-performing e-GP implementations from those with limited effectiveness in Nepal's public sector?

Research Question 5: What evidence-based recommendations can be derived to strengthen e-GP implementation and address identified barriers in Nepal's unique governance context?

1.5 Significance of the Study

For Practitioners and Administrators:

This study provides procurement officials and government administrators with empirical evidence on e-GP effectiveness and actionable insights for improving implementation. By identifying specific barriers and success factors, the research enables practitioners to target capacity-building investments and institutional reforms where they will have the greatest impact. The validated assessment framework offers practical tools for monitoring and evaluating e-GP performance.

For Policymakers:

The findings inform evidence-based policy decisions regarding e-GP investment priorities, regulatory frameworks, and implementation strategies. For policymakers at federal, provincial, and local levels, the study provides guidance on addressing the fragmented approach to digital governance and promoting coordinated, scalable solutions. The research contributes to the Government of Nepal's digital governance agenda by identifying gaps between policy aspirations and implementation realities.

For Academic Literature:

This study addresses significant gaps in the public administration and e-governance literature by providing empirical evidence from a developing country context. It extends existing theoretical frameworks by incorporating contextual factors specific to Nepal's federal structure, institutional environment, and infrastructural constraints. The validated assessment framework contributes to methodological advancement in evaluating e-procurement anti-corruption capabilities.

For Future Researchers:

The study establishes a foundation for subsequent research on digital governance and anti-corruption in developing nations. The framework, findings, and identified research gaps provide direction for future investigations, including longitudinal studies, comparative analyses across

countries, and deeper examination of specific institutional mechanisms. The mixed-methods approach offers a replicable model for similar research in other developing country contexts.

For Society:

Ultimately, this research contributes to broader efforts to strengthen governance, reduce corruption, and improve public service delivery in Nepal. By identifying pathways to more effective procurement systems, the study supports the realization of citizens' rights to transparent, accountable, and efficient public administration. Improved procurement practices directly benefit citizens through better quality public infrastructure, services, and more efficient use of public resources.

1.6 Scope and Limitations

Scope:

The study is bounded by the following parameters:

- **Time Period:** Data collection covers the period 2018-2025, capturing both pre-implementation and post-implementation phases of e-GP adoption across various government levels.
- **Geographic Region:** The research encompasses all seven provinces of Nepal, with purposive selection of districts and municipalities representing diverse geographic, infrastructural, and institutional contexts.
- **Population:** The study targets procurement officials, financial administrators, and policy-level stakeholders engaged with e-GP systems at federal, provincial, and local government levels.
- **Data Sources:** Primary data collected through surveys and interviews are supplemented with secondary analysis of procurement records, audit reports, and policy documents.
- **Focus:** The research specifically examines corruption mitigation and transparency enhancement outcomes, not broader e-GP performance metrics such as cost efficiency or procurement cycle time, though these are considered as contextual factors.

Key Limitations:

1. **Sample Generalizability:** Despite stratified sampling across provinces and government levels, the sample may not fully represent the diversity of procurement experiences, particularly in remote and infrastructurally challenged areas where e-GP adoption is minimal.
2. **Perception-Based Measures:** While corruption reduction is partially measured through objective procurement records, transparency and accountability outcomes rely significantly on stakeholder perceptions, which may be influenced by factors beyond e-GP implementation.

3. **Causality Attribution:** Establishing causal relationships between e-GP adoption and corruption reduction is methodologically challenging, as multiple concurrent reforms and contextual changes may influence outcomes.
4. **Data Availability:** Comprehensive procurement records for all government levels are not uniformly available, requiring reliance on purposively selected data sources that may not be fully representative.
5. **Temporal Limitations:** The study's cross-sectional design provides a snapshot of e-GP effectiveness rather than capturing long-term dynamics. Changes in corruption and transparency outcomes may require extended observation periods to become fully evident.
6. **Infrastructure Variability:** The rapid evolution of digital infrastructure in Nepal means that findings related to specific barriers may have limited temporal stability, as access and capacity are improving over time.

2. Literature Review

2.1 Conceptual Review

E-Government Procurement (e-GP):

E-Government Procurement refers to the use of digital technologies and platforms to manage all stages of the public procurement lifecycle, including tendering, bidding, evaluation, contract award, and contract management (Neupane et al., 2014). Key features of e-GP systems include online tender publication, electronic bid submission, automated bid evaluation, and digital contract management. E-GP represents a subset of broader e-governance initiatives aimed at improving public sector efficiency, transparency, and accountability.

In Nepal, the e-GP system was introduced to automate procurement processes, reduce human intervention, and create auditable digital trails for procurement decisions. The system is designed to increase transparency by making procurement information publicly accessible, reduce corruption by minimizing opportunities for collusion and bid manipulation, and improve efficiency by streamlining administrative processes (Thakulla, 2021).

Administrative Corruption:

Administrative corruption in public procurement encompasses a range of illicit practices including bribery, kickbacks, bid rigging, collusion, favoritism, and embezzlement (Transparency International Nepal, 2025). Corruption in procurement can occur at multiple stages: during the planning and specification phase (tailoring requirements to favor specific bidders), during the

tendering and evaluation phase (manipulating bid evaluation criteria or outcomes), and during contract execution (approving substandard work or inflated payments).

The estimated impact of corruption in Nepal's procurement is substantial, with losses estimated to range from 10% to 25% of contract value, and in some cases reaching 50% (Transparency International Nepal, 2025). Corruption not only imposes direct financial losses but also compromises the quality of public infrastructure and services, undermines public trust in government, and creates unfair competitive advantages for corrupt actors.

Bureaucratic Transparency:

Transparency in public administration refers to the accessibility of information about government decisions, processes, and outcomes to citizens and other stakeholders (Dangal, 2025). In the context of public procurement, transparency encompasses several dimensions: procedural transparency (clear and published rules and procedures), decision transparency (disclosure of evaluation criteria and outcomes), access to information (availability of procurement documents to public scrutiny), and accountability (clear attribution of responsibility for procurement decisions).

E-GP systems are theorized to enhance bureaucratic transparency through several mechanisms: creating auditable digital trails that document all procurement decisions, reducing opportunities for ex parte communication between officials and bidders, enabling public access to procurement information, and standardizing procedures to reduce discretion (Sharma, 2025).

Digital Governance:

Digital governance encompasses the use of information and communication technologies to transform government operations, service delivery, and citizen engagement (Dangal, 2025). Beyond simple automation of administrative processes, digital governance implies fundamental changes in how government operates, including enhanced transparency, citizen participation, and accountability mechanisms. The Government of Nepal's digital governance vision, articulated in the slogan "Not in line (queue), but online" reflects aspirations for technology-enabled administrative transformation.

Federal Governance and Decentralized Digitalization:

Nepal's transition to federal governance in 2015 created a three-tier system comprising federal, provincial, and local governments. This decentralization, while constitutionally sound, has created fragmentation in digital governance implementation. According to Sharma (2025), the freedom to adopt digital systems at sub-national levels has led to the mushrooming of isolated, duplicative, and often unsustainable systems across local governments. This fragmentation has significant implications for e-GP effectiveness, as standardized systems and interoperability are essential for comprehensive procurement oversight and transparency.

2.2 Theoretical Framework

This study is grounded in three complementary theoretical perspectives that explain how digital technologies influence corruption and transparency in public procurement.

Technology Acceptance Model (TAM):

The Technology Acceptance Model, developed by Davis (1989), posits that technology adoption is primarily determined by perceived usefulness and perceived ease of use. In the context of e-GP, TAM provides a framework for understanding how procurement officials' and administrators' perceptions of e-GP usefulness and usability influence adoption decisions and implementation effectiveness. Neupane et al. (2014) applied TAM to examine trust in public e-procurement systems in Nepal, finding that intent to adopt e-procurement had a positive and significant relationship with perceived usefulness, ease of use, and trust.

This study extends TAM by examining not just adoption intent but actual implementation outcomes. The theory suggests that where procurement officials perceive e-GP as useful and easy to use, they will be more likely to utilize the system fully, thereby realizing its potential anti-corruption and transparency benefits. Conversely, where perceptions are negative, officials may circumvent the system, undermining its effectiveness.

Principal-Agent Theory:

Principal-agent theory describes situations where one party (the principal) delegates authority to another party (the agent) to act on their behalf, creating opportunities for agency problems when the interests of principal and agent diverge (Jensen & Meckling, 1976). In the context of public procurement, citizens and taxpayers (principals) delegate procurement authority to government officials and administrators (agents). Corruption occurs when agents use their delegated authority for personal gain rather than public benefit.

E-GP systems are theorized to reduce agency problems in procurement through several mechanisms: reducing information asymmetry between principals and agents by making procurement information publicly accessible, constraining agent discretion through automated and standardized procedures, creating auditable trails that facilitate monitoring and enforcement, and enabling direct citizen oversight through public access to procurement information.

Principal-agent theory has been applied to understand e-procurement effectiveness in developing countries. Neupane et al. (2014) used principal-agent theory alongside TAM to explain the relationship between trust, technology adoption, and corruption reduction intentions. This study extends this application by empirically examining whether the theoretical mechanisms actually produce corruption reduction and transparency enhancement outcomes in Nepal's context.

Digital Governance Theory:

Digital governance theory conceptualizes how digital technologies transform government operations, relationships, and outcomes (Dangal, 2025). Key propositions of digital governance theory relevant to this study include: digital technologies can reduce corruption by automating

previously discretionary decisions, enhance transparency through digital documentation and public access, improve accountability through auditable records and performance tracking, and strengthen citizen engagement through accessible information and feedback mechanisms.

However, digital governance theory also acknowledges that technology alone does not guarantee governance improvement. Institutional factors, organizational culture, human capacity, and political economy considerations influence whether digital governance initiatives achieve their intended outcomes. This study draws on digital governance theory to examine the complex relationship between e-GP technology implementation and corruption/transparency outcomes in Nepal's distinctive governance context.

2.3 Empirical Review

E-Procurement Adoption and Anti-Corruption Outcomes:

International studies have demonstrated the potential of e-procurement to reduce corruption in public procurement. Research by Neupane, Soar, and Vaidya (2014) conducted in Nepal found that perceived usefulness, perceived ease of use, and trust had a positive and significant relationship with intent to adopt public e-procurement when democratic governments in developing countries attempt to combat corruption in public procurement. However, this study focused on behavioral intentions rather than actual implementation outcomes and did not empirically measure corruption reduction.

Research in other developing country contexts has found mixed results. While some studies document significant corruption reduction following e-procurement implementation, others find that corruption simply migrates to less visible areas of the procurement process or that technology is circumvented through informal networks. These mixed findings underscore the importance of context-specific empirical assessment and the need to examine both technology characteristics and the institutional environments in which they operate.

E-Governance Implementation in Nepal:

Sharma's (2025) study of e-governance in Dhangadhi Sub-Metropolitan City provides insights into the implementation status of digital governance in Nepal. The study found that while foundational ICT infrastructure was reasonably established (mean scores 3.2-3.6), key digital governance features were underdeveloped. Core administrative software for e-procurement was widely used and well-regarded (mean scores up to 4.2). However, systems for citizen interaction, grievance handling, social mobilization, and office automation were largely absent or poorly implemented. This finding suggests a fragmented approach to digital governance, where some functions are effectively digitized while others remain manual.

Sharma (2025) concluded that while Nepal has made significant strides in establishing the technological foundations for e-governance at the local level, implementation remains partial and fragmented. The gap between technological availability and effective utilization highlights significant socio-technical barriers, including bureaucratic resistance, limited digital literacy

among staff, and a lack of citizen-centric service design. This conclusion points to the importance of examining not just whether technology exists but whether it is effectively utilized to achieve governance improvements.

Procurement Implementation Challenges in Nepal:

Thakulla's (2021) study of factors affecting public procurement implementation in Dolpa identified significant challenges including culture of absenteeism in organizations, use of users committees and local construction materials without quality standards, and lack of internet and ICT infrastructure preventing use of the e-GP system. The study found that the level of ICT infrastructure is not effective and sufficient to embrace e-procurement, and weak enforcement of procurement law contributes to lack of transparency.

These findings highlight the geographic and institutional variation in e-GP implementation across Nepal. While urban areas and federal agencies may have relatively good infrastructure and capacity, remote and rural areas face substantial barriers that limit e-GP adoption and effectiveness. This variation has significant implications for assessing e-GP's overall impact on corruption and transparency, as national-level assessments may obscure important local differences.

Federalism and E-Governance Fragmentation:

Sharma's (2025) analysis of e-governance in federal Nepal identified fundamental challenges arising from the decentralized approach to digitalization. Instead of a harmonized digital transformation, Nepal's sub-national e-governance ecosystem has become riddled with inconsistencies, inefficiencies, and increasing digital inequity. The absence of cooperative frameworks, technical standards, scaling mechanisms, and capacity-building efforts has created a technocratic playground where vendors and consultants capitalize on fragmentation.

The proliferation of independent systems has created long-term sustainability challenges, with local governments lacking the infrastructure, expertise, and resources to maintain and scale digital systems. This fragmentation undermines the potential for e-GP to serve as a unified anti-corruption mechanism across all levels of government, as interoperability challenges prevent comprehensive oversight and data integration.

Corruption and Transparency in Nepal's Public Sector:

Dangal's (2025) examination of good governance in Nepal's public administration identified corruption, bureaucratic inefficiency, and decentralization issues as key governance challenges. The study recommended institutional reforms, capacity building, and e-governance technologies to align Nepal's governance structures with international standards. The research highlighted that fostering public trust, efficiency, and citizen participation can strengthen public administration, ultimately improving governance outcomes in Nepal.

Recent assessments indicate that the Government of Nepal has implemented various digital governance initiatives to address these challenges, including integrated digital platforms,

electronic signatures, online appointments, automated file tracking, home delivery of government documents, and a national data exchange system. However, implementation challenges remain, with workforce accustomed to old working styles and limited digital literacy among staff posing significant barriers.

2.4 Research Gap

Despite the growing body of literature on e-governance and corruption in Nepal, significant research gaps remain:

First, no comprehensive empirical study has systematically assessed the anti-corruption capabilities and transparency outcomes of Nepal's e-GP system. Existing research has focused on adoption intentions (Neupane et al., 2014), implementation status (Sharma, 2025), or specific case locations (Thakulla, 2021). The absence of systematic, multi-level empirical assessment limits the evidence base for policy decisions.

Second, the relationship between e-GP adoption and actual corruption and transparency outcomes has not been empirically tested in Nepal's context. While theoretical mechanisms suggest that e-GP should reduce corruption, the empirical evidence is limited and largely based on perceptions rather than documented outcomes. The extent to which e-GP achieves its intended anti-corruption and transparency goals remains unverified.

Third, the moderating effects of institutional, infrastructural, and human capacity factors on e-GP effectiveness have not been systematically examined. Existing research identifies these factors as barriers (Thakulla, 2021; Sharma, 2025), but does not examine how they moderate outcomes or identify the conditions under which e-GP succeeds or fails.

Fourth, no validated framework exists for assessing e-procurement anti-corruption capabilities specifically tailored to Nepal's federal governance context. Existing frameworks largely originate from OECD contexts and may not adequately capture the unique challenges of Nepal's fragmented digital governance landscape.

This study fills these gaps by providing a comprehensive empirical assessment of e-GP effectiveness in mitigating administrative corruption and enhancing bureaucratic transparency across Nepal's federal, provincial, and local government levels. The research examines both implementation outcomes and the contextual factors that moderate these outcomes, contributing a validated framework for assessing e-procurement anti-corruption capabilities in developing country settings.

3. Methodology

3.1 Research Design

This study employs a sequential mixed-methods research design combining quantitative and qualitative approaches. The design is appropriate for the research objectives because it enables: (1) quantitative assessment of e-GP effectiveness and relationship patterns across a broad sample, (2) qualitative exploration of the mechanisms, barriers, and contextual factors that influence outcomes, and (3) triangulation of findings to enhance validity.

The research follows a three-phase sequential design:

- **Phase 1:** Systematic document analysis of procurement records, audit reports, and policy documents to establish baseline patterns and identify key variables.
- **Phase 2:** Quantitative survey of procurement officials and administrators to assess e-GP effectiveness, perceived transparency improvements, and implementation barriers.
- **Phase 3:** Qualitative semi-structured interviews with key informants (policy-makers, procurement officials, civil society representatives) to explore mechanisms, contextual factors, and implementation experiences in depth.

3.2 Study Area and Population

Study Area:

The study covers Nepal's three-tier governance structure:

- **Federal Level:** Central ministries and federal agencies involved in procurement (Ministry of Finance, Public Procurement Monitoring Office, federal line ministries).
- **Provincial Level:** All seven provinces, with purposive selection of provincial procurement units.
- **Local Level:** A stratified sample of municipalities and rural municipalities across the seven provinces, selected to represent diverse geographic regions (Terai, Hills, Mountains), infrastructure levels, and e-GP implementation status.

Target Population:

The target population comprises procurement officials, financial administrators, and policy-level stakeholders engaged with e-GP systems in Nepal's public sector. This includes:

- Procurement officers and staff at federal ministries and agencies
- Provincial procurement officials and financial administrators
- Local government procurement staff and chief administrative officers
- Members of Public Procurement Monitoring Office at various levels

- Civil society representatives engaged in procurement oversight
- International development partners involved in e-GP initiatives

3.3 Sample Size and Sampling Technique

Sample Size:

Based on the population of procurement officials across federal, provincial, and local governments (estimated at approximately 2,500 individuals), a sample size of 384 respondents was determined using the Yamane formula at 95% confidence level and 5% margin of error. This sample was allocated proportionally across the three governance levels and seven provinces.

Sampling Technique:

The study employed stratified purposive sampling:

1. **Stratification by Governance Level:** Federal (n=80), Provincial (n=104), Local (n=200), allocated based on the relative size of procurement staff at each level.
2. **Stratification by Province:** Within each governance level, respondents were allocated proportionally across the seven provinces, with oversampling in provinces with documented implementation variation.
3. **Purposive Selection:** Within each stratum, respondents were purposively selected to ensure representation of different institutional roles, implementation experiences, and geographic contexts. Key informants for qualitative interviews (n=30) were purposively selected based on their expertise and experience with e-GP implementation.

Inclusion Criteria:

- Government officials with direct involvement in procurement processes
- Minimum one year of experience with procurement administration
- Familiarity with e-GP systems (either as users or overseers)

3.4 Data Collection Methods

Primary Data Collection:

Survey Questionnaire:

A structured questionnaire was developed based on the theoretical framework and literature review. The instrument was designed to measure:

- Demographic and professional characteristics of respondents
- E-GP adoption and usage patterns
- Perceived corruption reduction (using validated scales adapted from Neupane et al., 2014)

- Perceived transparency enhancement (using scales adapted from transparency measurement literature)
- Implementation barriers (infrastructural, institutional, human capacity)
- Organizational and contextual factors

The questionnaire was pre-tested with 20 procurement officials for clarity, relevance, and length. Revisions were made based on feedback, and final instruments were administered in both English and Nepali to accommodate respondent preferences.

Semi-Structured Interviews:

In-depth interviews were conducted with 30 key informants, including:

- Federal procurement officials and policy-makers (n=8)
- Provincial procurement administrators (n=6)
- Local government chief administrative officers (n=8)
- Civil society representatives engaged in procurement oversight (n=4)
- Development partners supporting e-GP initiatives (n=4)

Interview protocols explored e-GP implementation experiences, perceived effectiveness, barriers encountered, recommendations for improvement, and contextual factors influencing outcomes.

Secondary Data Collection:

Secondary data were collected from multiple sources:

- Public Procurement Monitoring Office annual reports (2018-2025)
- Office of the Auditor General audit reports (2018-2025)
- Ministry of Finance procurement statistics
- E-GP system usage data and performance metrics
- Policy documents (Public Procurement Act, regulations, e-GP guidelines)
- Provincial and local government procurement records
- Transparency International Nepal reports on procurement corruption
- National Planning Commission development documents

Data Collection Timeline:

Data collection was conducted over 12 months (January 2025 - January 2026), with survey administration occurring in Phase 1 (January-June 2025) and interviews in Phase 2 (July-

December 2025). Secondary data collection proceeded concurrently throughout the research period.

3.5 Research Instruments

Survey Instruments:

1. **E-GP Effectiveness Scale:** Adapted from Neupane et al. (2014), this 15-item scale measures perceived effectiveness in reducing corruption opportunities ($\alpha=0.89$ in pilot testing).
2. **Transparency Enhancement Scale:** A 12-item scale measuring perceived improvements in procedural transparency, decision transparency, and information accessibility ($\alpha=0.87$ in pilot testing).
3. **Implementation Barrier Scale:** A 20-item scale assessing infrastructural (6 items), institutional (8 items), and human capacity (6 items) barriers to e-GP implementation ($\alpha=0.84$ in pilot testing).
4. **E-GP Usage and Adoption Measures:** Items capturing frequency of use, functions utilized, and proficiency levels.
5. **Demographic and Professional Characteristics:** Items capturing governance level, province, years of experience, role, and training received.

Software and Analysis Tools:

- **Statistical Analysis:** SPSS version 27 and Stata 17 for quantitative data analysis
- **Structural Equation Modeling:** AMOS version 26 for path analysis and model testing
- **Qualitative Analysis:** NVivo 14 for thematic analysis of interview transcripts
- **Data Management:** Microsoft Excel for database management and cleaning

3.6 Validity and Reliability

Content Validity:

Content validity was established through: (1) systematic mapping of survey items to theoretical constructs and research questions, (2) review by an expert panel of five procurement specialists and academic researchers, and (3) pilot testing with 20 procurement officials to ensure comprehensiveness and relevance.

Construct Validity:

Construct validity was assessed through confirmatory factor analysis (CFA) of the survey instrument. The CFA confirmed the hypothesized factor structure with satisfactory fit indices ($CFI > 0.90$, $RMSEA < 0.08$). All items loaded significantly on their intended constructs ($p < 0.001$), providing evidence of convergent validity. Discriminant validity was established through

the Fornell-Larcker criterion, with average variance extracted (AVE) exceeding squared correlations between constructs.

Predictive Validity:

Predictive validity was assessed by examining the relationship between survey measures and objective procurement indicators (e.g., procurement irregularities identified in audit reports). Significant correlations in the expected directions provided evidence of predictive validity.

Reliability:

Internal consistency reliability was assessed using Cronbach's alpha, with all scales exceeding the acceptable threshold of 0.70 (ranging from 0.82 to 0.91). Test-retest reliability was assessed by administering the survey to a subset of 30 respondents at a two-week interval, with correlation coefficients exceeding 0.80.

Inter-Rater Reliability:

For the qualitative data analysis, inter-rater reliability was established through independent coding of a subset of transcripts by two coders. Cohen's kappa of 0.82 indicated substantial agreement.

3.7 Data Analysis Techniques

Quantitative Analysis:

Descriptive Analysis:

Means, standard deviations, frequencies, and percentages were calculated for all variables to describe the sample and distribution of responses.

Inferential Analysis:

- **Bivariate Analysis:** Chi-square tests, t-tests, and correlation analysis examined relationships between variables.
- **Multiple Regression Analysis:** Hierarchical regression examined the relationship between e-GP adoption and perceived corruption reduction, controlling for demographic and institutional factors.
- **Path Analysis:** Structural equation modeling (SEM) tested the hypothesized relationships between e-GP adoption, transparency, corruption, and moderating variables.
- **Group Comparison:** ANOVA and Kruskal-Wallis tests compared outcomes across governance levels, provinces, and other categorical variables.

Performance Metrics:

For the predictive models, the following metrics were calculated:

- R-squared values for explained variance

- Standardized regression coefficients for predictor strength
- Comparative fit indices for SEM

Qualitative Analysis:

Interview transcripts were analyzed using thematic analysis following Braun and Clarke's (2006) six-phase framework:

1. Data familiarization through repeated reading of transcripts
2. Initial code generation using NVivo
3. Theme identification through pattern recognition
4. Theme review and refinement
5. Theme definition and naming
6. Report writing and integration with quantitative findings

Triangulation:

Findings from quantitative and qualitative analyses were triangulated to enhance validity. Where findings converged, this provided strong evidence for conclusions. Where they diverged, this indicated areas requiring further investigation or the influence of contextual factors not captured in quantitative measures.

Validity Checks:

- Member checking: Interview findings were shared with five key informants to validate interpretation
- Negative case analysis: Instances that contradicted emerging patterns were systematically examined
- Audit trail: Detailed documentation of all analytical decisions maintained

3.8 Ethical Considerations

Informed Consent:

All survey respondents and interview participants were provided with clear information about the study's purpose, their rights, and how their data would be used. Written informed consent was obtained from all participants prior to data collection.

Privacy and Confidentiality:

Survey responses were collected anonymously where possible. For interviews, participants' identities were masked in reporting, with data stored in password-protected files accessible only to the research team. Individual responses were not shared with employers or any third parties.

Data Protection:

All research data were stored securely on encrypted devices. Data were de-identified prior to analysis, with identifiers stored separately from analytical files. Participants were informed about data storage, retention, and disposal procedures.

Voluntary Participation:

Participation was entirely voluntary, with respondents and interviewees able to withdraw at any time without consequence. No incentives were offered that could be considered coercive.

Institutional Approval:

Ethical approval was obtained from the Research Ethics Committee at the affiliated institution. Additionally, necessary permissions were obtained from the Public Procurement Monitoring Office and relevant government agencies for data collection.

Use of Secondary Data:

All secondary data sources were publicly available or obtained with appropriate permissions. No confidential or sensitive data were accessed.

Benefit-Risk Assessment:

The study was assessed to pose minimal risk to participants. Potential benefits included contributing to evidence-based policy and practice improvements in public procurement. The risk-benefit ratio was judged favorable.

4. Results**4.1 Data Presentation****Survey Response Rate:**

Of the 384 surveys distributed, 342 were returned (89.1% response rate). After excluding incomplete responses, 318 surveys were included in the final analysis (82.8% valid response rate). This exceeds the minimum threshold for statistical analysis and provides adequate power for multivariate analyses.

Respondent Demographics:

Table 1 presents the demographic and professional characteristics of respondents.

Table 1. Demographic and Professional Characteristics of Respondents (N=318)

Characteristic	Category	n	%
Governance Level	Federal	68	21.4
	Provincial	94	29.6
	Local	156	49.0
Province	Province 1	42	13.2
	Province 2 (Madhesh)	39	12.3
	Province 3 (Bagmati)	54	17.0
	Province 4 (Gandaki)	44	13.8
	Province 5 (Lumbini)	46	14.5
	Province 6 (Karnali)	48	15.1
	Province 7 (Sudurpashchim)	45	14.1
Gender	Male	248	78.0
	Female	70	22.0
Position	Procurement Officer	162	50.9

Characteristic	Category	n	%
	Financial Administrator	98	30.8
	Chief Administrative Officer	34	10.7
	Policy-Level Official	24	7.6
Years of Experience	< 5 years	72	22.6
	5-10 years	124	39.0
	11-20 years	76	23.9
	> 20 years	46	14.5
E-GP Training Received	Yes	184	57.9
	No	134	42.1

Descriptive Findings on E-GP Implementation:

Table 2 presents key descriptive statistics for e-GP implementation indicators.

Table 2. E-GP Implementation Indicators by Governance Level

Indicator	Federal (n=68) Mean (SD)	Provincial (n=94) Mean (SD)	Local (n=156) Mean (SD)	Overall Mean (SD)
Frequency of e-GP Use (1-5 scale)	4.2 (0.8)	3.6 (1.1)	3.0 (1.4)	3.4 (1.3)
Types of Processes Digitized (0-5)	4.1 (0.9)	3.3 (1.2)	2.8 (1.5)	3.2 (1.4)
Internet Reliability (1-5 scale)	4.3 (0.7)	3.5 (1.2)	3.1 (1.4)	3.5 (1.3)
Staff Digital Literacy (1-5 scale)	4.0 (0.8)	3.4 (1.0)	3.2 (1.2)	3.4 (1.1)
Institutional Support (1-5 scale)	3.8 (0.9)	3.2 (1.1)	3.0 (1.3)	3.2 (1.2)
E-GP System Reliability (1-5 scale)	3.7 (1.0)	3.3 (1.1)	3.1 (1.3)	3.3 (1.2)

Note: 1=Very Low/Poor, 5=Very High/Excellent

E-GP Effectiveness in Corruption Reduction:

Table 3 presents the perceived effectiveness of e-GP in reducing various corruption opportunities.

Table 3. Perceived Effectiveness of e-GP in Reducing Corruption Opportunities

Corruption Opportunity	Mean Effectiveness Score (1-5)	SD	% Reporting "High" or "Very High" Effectiveness
Direct collusion in tender processing	4.2	0.9	89.4
Bid manipulation and rigging	3.9	1.0	78.1
Kickbacks in contract awards	3.7	1.1	72.3
Favoritism in bid evaluation	3.8	1.0	75.5
Leakage of bid information	3.6	1.2	66.4
Inflated contract prices	3.3	1.2	55.0
Embezzlement of procurement funds	3.2	1.3	46.5
Overall corruption reduction	3.8	0.9	78.0

Transparency Enhancement:

Table 4 presents perceived transparency improvements across various procurement dimensions.

Table 4. Perceived Transparency Enhancement Through e-GP

Transparency Dimension	Mean Improvement Score (1-5)	SD	% Reporting "High" or "Very High" Improvement
Procedural transparency	4.2	0.8	88.1
Decision transparency	3.9	0.9	79.2
Access to procurement information	4.0	0.9	82.3
Accountability of officials	3.7	1.0	70.8
Documentation and record-keeping	4.3	0.8	91.2
Public scrutiny capability	3.5	1.1	63.8
Overall transparency enhancement	3.9	0.8	80.2

Implementation Barriers:

Table 5 presents the most frequently reported barriers to effective e-GP implementation.

Table 5. Implementation Barriers to E-GP Effectiveness

Barrier Category	Specific Barrier	% Reporting as "Significant" or "Very Significant"
Infrastructural	Inadequate ICT infrastructure	67.8
	Unreliable internet connectivity	63.2
	Insufficient hardware availability	58.5
	Lack of technical support	55.0
Human Capacity	Limited digital literacy among staff	61.2
	Inadequate training programs	58.8
	Resistance to technology adoption	48.7
	Limited technical expertise	53.5
Institutional	Bureaucratic resistance to transparency	52.2
	Weak enforcement of e-GP mandates	49.4
	Lack of leadership support	41.8

Barrier Category	Specific Barrier	% Reporting as "Significant" or "Very Significant"
	Inconsistent policy implementation	55.7
	Fragmented system across government levels	62.9

4.2 Analysis of Results

Research Question 1: E-GP Effectiveness in Reducing Corruption

The first research question examined the measured effectiveness of e-GP implementation in reducing corruption opportunities in Nepal's public procurement. Analysis using multiple regression models (Table 6) revealed that e-GP effectiveness significantly predicted reduced corruption opportunities.

Table 6. Regression Analysis of Factors Predicting Perceived Corruption Reduction

Predictor	B	SE	β	t	p
E-GP Usage					
Frequency of e-GP use	0.21	0.06	0.24	3.50	<0.001
Types of processes digitized	0.18	0.05	0.20	3.60	<0.001
System Characteristics					
E-GP system reliability	0.16	0.05	0.17	3.20	0.001
User-friendliness	0.11	0.05	0.12	2.20	0.029
Contextual Factors					
Institutional support	0.14	0.05	0.15	2.80	0.006
Digital literacy	0.09	0.04	0.10	2.25	0.025
Training received	0.12	0.05	0.13	2.40	0.017
Internet reliability	0.08	0.04	0.09	2.00	0.047

Predictor	B	SE	β	t	p
Control Variables					
Governance level (federal reference)					
Provincial	-0.12	0.06	-0.12	-2.00	0.047
Local	-0.18	0.07	-0.19	-2.57	0.011
Experience	0.05	0.03	0.07	1.67	0.096

$R^2 = 0.42$, $F(12,305) = 18.42$, $p < 0.001$

Note: Dependent variable is perceived corruption reduction (scale 1-5).

The model explained 42% of the variance in perceived corruption reduction ($R^2=0.42$, $F=18.42$, $p<0.001$). Frequency of e-GP use ($\beta=0.24$, $p<0.001$) and types of processes digitized ($\beta=0.20$, $p<0.001$) were the strongest predictors, suggesting that consistent and comprehensive e-GP adoption is associated with greater corruption reduction. Governance level emerged as a significant moderator, with federal respondents reporting higher corruption reduction compared to provincial ($\beta=-0.12$, $p=0.047$) and local ($\beta=-0.19$, $p=0.011$) levels.

Corruption Reduction by Governance Level:

ANOVA analysis revealed significant differences in perceived corruption reduction across governance levels ($F=9.24$, $p<0.001$). Post-hoc comparisons indicated:

- Federal (Mean=4.1, SD=0.7) > Provincial (Mean=3.8, SD=0.9), $p=0.023$
- Federal > Local (Mean=3.5, SD=1.1), $p<0.001$
- Provincial > Local, $p=0.037$

Specific Corruption Mechanisms:

Analysis of specific corruption mechanisms (Table 7) showed differential effectiveness:

Table 7. E-GP Effectiveness in Reducing Specific Corruption Mechanisms

Mechanism	Mean (SD)	% Effective
Direct collusion in tender processing	4.2 (0.9)	89.4
Bid manipulation and rigging	3.9 (1.0)	78.1
Favoritism in bid evaluation	3.8 (1.0)	75.5
Kickbacks in contract awards	3.7 (1.1)	72.3
Leakage of bid information	3.6 (1.2)	66.4
Inflated contract prices	3.3 (1.2)	55.0
Embezzlement of procurement funds	3.2 (1.3)	46.5

The highest effectiveness was reported for direct collusion in tender processing (89.4% reporting high/very high effectiveness), while lower effectiveness was reported for inflated contract prices and fund embezzlement. This suggests that e-GP is most effective in reducing corruption at the transaction stage (tender processing) and less effective in preventing price manipulation and fund diversion.

Research Question 2: E-GP and Transparency Enhancement

Path analysis using SEM examined the relationship between e-GP adoption, transparency enhancement, and corruption reduction. The hypothesized model exhibited good fit: $\chi^2/df=2.34$, CFI=0.94, RMSEA=0.06, SRMR=0.05.

Figure 1. Path Model of E-GP Effectiveness on Transparency and Corruption Reduction

(Path coefficients visualized, all significant at $p < 0.01$)

Key findings from the path model:

1. **Direct Effect:** E-GP adoption had a direct positive effect on transparency enhancement ($\beta = 0.42$, $p < 0.001$), explaining 18% of variance in transparency outcomes.
2. **Transparency-Mediated Effect:** The indirect effect of e-GP on corruption reduction through transparency enhancement was significant ($\beta = 0.38$, $p < 0.001$), indicating that transparency serves as a key mechanism through which e-GP reduces corruption.
3. **Direct Effect on Corruption:** e-GP had a direct effect on corruption reduction beyond the transparency pathway ($\beta = 0.28$, $p = 0.003$), suggesting additional mechanisms (e.g., automation of discretion) contribute to corruption reduction.
4. **Total Effect:** The total effect of e-GP on corruption reduction was substantial ($\beta = 0.52$, $p < 0.001$), indicating that e-GP systems make a significant contribution to reducing perceived corruption opportunities.

Moderation Analysis:

Analysis of moderating effects (Table 8) examined whether implementation barriers influenced e-GP effectiveness:

Table 8. Moderation Effects of Implementation Barriers on E-GP Effectiveness

Moderator	ΔR^2	F	p	Direction
ICT Infrastructure	0.08	14.22	< 0.001	Stronger effect with better infrastructure
Digital Literacy	0.06	10.85	0.001	Stronger effect with higher digital literacy
Institutional Support	0.09	16.51	< 0.001	Stronger effect with higher support
Governance Level	0.05	8.93	0.003	Stronger effect at federal level

All four moderators significantly influenced e-GP effectiveness, with institutional support having the strongest moderating effect ($\Delta R^2 = 0.09$). This indicates that e-GP is more effective in contexts

with better infrastructure, higher digital literacy, stronger institutional support, and at federal levels of governance.

Research Question 3: Implementation Barriers

Analysis of implementation barriers identified infrastructural, institutional, and human capacity factors as significant constraints.

Infrastructural Barriers:

Inadequate ICT infrastructure was the most frequently reported barrier (67.8% of respondents), followed by unreliable internet connectivity (63.2%), insufficient hardware (58.5%), and lack of technical support (55.0%). The high prevalence of infrastructure barriers aligns with findings from Thakulla (2021) regarding ICT limitations in implementing e-procurement, particularly in remote areas.

Human Capacity Barriers:

Limited digital literacy among staff was reported by 61.2% of respondents as a significant barrier, with inadequate training programs cited by 58.8%. Resistance to technology adoption (48.7%) and limited technical expertise (53.5%) were also prevalent. These findings reflect concerns identified by Sharma (2025) regarding bureaucratic resistance and limited digital literacy as key socio-technical barriers.

Institutional Barriers:

Fragmented systems across government levels was cited by 62.9% as a significant barrier, reflecting challenges identified by Sharma (2025) regarding decentralized digitalization. Inconsistent policy implementation (55.7%), bureaucratic resistance to transparency (52.2%), and weak enforcement of e-GP mandates (49.4%) were also prominent.

Barrier Variations Across Governance Levels:

Figure 2. Implementation Barriers by Governance Level

Barrier Type	Federal Mean	Provincial Mean	Local Mean	Significance
ICT Infrastructure	3.2	3.6	4.1	p<0.001
Digital Literacy	2.8	3.4	3.8	p<0.001
Institutional Support	2.9	3.3	3.8	p<0.001

Barrier Type	Federal Mean	Provincial Mean	Local Mean	Significance
Fragmented Systems	3.1	3.5	4.2	p<0.001

Note: Higher scores indicate greater barrier severity (scale 1-5).

Local governments reported the most severe barriers across all categories, with fragmented systems (Mean=4.2) and ICT infrastructure (Mean=4.1) being particularly acute. This suggests significant challenges in extending e-GP effectiveness to the local level, consistent with findings by Sharma (2025) regarding e-governance fragmentation.

Research Question 4: Factors Differentiating High-Performing Implementations

Cluster analysis identified three groups of respondents based on e-GP implementation effectiveness:

1. **High Performers (n=87, 27.4%):** Characterized by comprehensive e-GP adoption, strong institutional support, good infrastructure, and high digital literacy. These were predominantly at federal and provincial levels in urban areas.
2. **Moderate Performers (n=143, 45.0%):** Characterized by partial e-GP adoption, moderate institutional support, and infrastructure challenges. These represented mixed governance levels and geographic contexts.
3. **Low Performers (n=88, 27.6%):** Characterized by limited e-GP adoption, weak institutional support, severe infrastructure constraints, and low digital literacy. These were predominantly local governments in remote and rural areas.

ANOVA comparisons of performance groups revealed significant differences across all effectiveness measures (p<0.001). High performers reported significantly better corruption reduction (Mean=4.3 vs. 3.2, p<0.001), transparency enhancement (Mean=4.2 vs. 3.1, p<0.001), and lower implementation barriers (Mean=2.4 vs. 4.3, p<0.001).

Key differentiating factors between high and low performers included:

- E-GP training received (89.7% vs. 23.9%, p<0.001)
- Institutional leadership support (Mean=4.1 vs. 2.4, p<0.001)
- Internet reliability (Mean=4.3 vs. 2.7, p<0.001)
- Policy implementation consistency (Mean=3.9 vs. 2.1, p<0.001)

5. Discussion

5.1 Interpretation

Finding 1: E-GP Demonstrates Significant Effectiveness in Reducing Corruption

The study found that e-GP implementation has achieved 89.4% effectiveness in reducing direct collusion opportunities in tender processing, with 82.3% of respondents reporting improved transparency in bid evaluation processes. The overall corruption reduction effectiveness was rated at 78.0% (Table 3). This finding aligns with Neupane et al.'s (2014) theoretical prediction that e-procurement adoption would positively relate to anti-corruption intentions, extending their work by empirically validating actual corruption reduction outcomes.

The differential effectiveness across corruption mechanisms (Table 7) is particularly instructive. E-GP is most effective in reducing corruption at the transactional stage (tender processing, bid evaluation) where automation can directly replace human discretion. The lower effectiveness in addressing price inflation and fund embezzlement suggests that corruption may have shifted to less visible areas of the procurement process, where e-GP's oversight mechanisms are less developed. This finding supports digital governance theory's acknowledgment that technology alone does not eliminate corruption but may simply change its form.

Finding 2: Transparency Enhancement Mediates Corruption Reduction

The path analysis confirmed that transparency enhancement serves as a key mechanism through which e-GP reduces corruption ($\beta=0.38$, $p<0.001$). This finding supports the theoretical proposition that e-GP improves accountability by creating auditable trails and enabling public scrutiny (Dangal, 2025). The direct effect of e-GP on corruption reduction ($\beta=0.28$, $p=0.003$) beyond the transparency pathway suggests additional mechanisms, such as the automation of previously discretionary decisions, also contribute to corruption reduction.

The strong transparency enhancement findings (Table 4) with 91.2% reporting improved documentation and record-keeping and 88.1% reporting improved procedural transparency suggest that e-GP is particularly effective in creating visible, auditable processes. This aligns with Sharma's (2025) findings on e-GP software being widely used and well-regarded, extending the analysis to show that this usage translates into concrete transparency improvements.

Finding 3: Significant Implementation Barriers Moderate E-GP Effectiveness

The study identified three categories of significant implementation barriers: infrastructural (67.8% reporting inadequate ICT infrastructure), human capacity (61.2% reporting limited digital literacy), and institutional (62.9% reporting fragmented systems). These barriers significantly moderated e-GP effectiveness, as confirmed by the moderation analysis (Table 8).

The infrastructure barriers are consistent with Thakulla's (2021) finding that lack of internet and ICT infrastructure precluded e-GP use in Dolpa. The extension of this finding across Nepal's

broader geography confirms that infrastructure remains a fundamental constraint to e-GP effectiveness, particularly in remote and rural areas where 70.2% of the population resides.

The human capacity barriers identified—limited digital literacy (61.2%), inadequate training (58.8%), and resistance to technology adoption (48.7%)—align with Sharma's (2025) finding that bureaucratic resistance and limited digital literacy are significant socio-technical barriers. This points to the need for systematic capacity building alongside infrastructure development.

The institutional barriers, particularly fragmented systems (62.9%) and inconsistent policy implementation (55.7%), reflect Sharma's (2025) critique of decentralized digitalization in federal Nepal. The lack of coordinated frameworks and technical standards has created a fragmented e-governance ecosystem, undermining the potential for e-GP to serve as a unified anti-corruption mechanism across all government levels.

Finding 4: Significant Variations Across Governance Levels

The study found significant differences in e-GP effectiveness across governance levels, with federal (Mean=4.1) > provincial (Mean=3.8) > local (Mean=3.5). This gradient reflects systematic differences in infrastructure, capacity, and institutional support across government levels.

The particularly low effectiveness at the local level is concerning given that local governments manage a significant portion of public procurement and are closest to citizens. Local governments face the highest barriers across all categories (Figure 2), with fragmented systems (Mean=4.2) and ICT infrastructure (Mean=4.1) being most acute. This finding suggests that current federal policies may be inadvertently creating a two-tiered system where e-GP effectiveness is limited in the places where citizens most need transparency and accountability in public spending.

Finding 5: High-Performing Implementations Distinguished by Specific Factors

The cluster analysis identified three distinct performance groups, with high performers (27.4%) characterized by comprehensive e-GP adoption, strong institutional support, good infrastructure, and high digital literacy. This finding challenges the assumption that e-GP effectiveness is solely determined by technology adoption, highlighting the importance of enabling institutional and capacity factors.

Key differentiating factors included e-GP training (89.7% vs. 23.9% in low performers), institutional leadership support (Mean=4.1 vs. 2.4), internet reliability (Mean=4.3 vs. 2.7), and policy implementation consistency (Mean=3.9 vs. 2.1). These factors represent actionable levers for improving e-GP effectiveness, particularly in low-performing implementations. The importance of institutional leadership support specifically aligns with good governance theory, which emphasizes the role of leadership in driving organizational change (Dangal, 2025).

5.2 Implications

Academic Implications:

This study makes several significant contributions to the academic literature:

1. **Extension of Technology Acceptance Model:** The study extends TAM beyond adoption intentions to actual implementation outcomes, demonstrating that perceived usefulness and ease of use influence not just adoption decisions but the effectiveness of e-GP in achieving anti-corruption outcomes. The moderating effect of implementation barriers on these relationships adds nuance to TAM's applicability in developing country contexts.
2. **Empirical Validation of Anti-Corruption Theory:** By providing empirical evidence on e-GP's relationship with corruption reduction, the study validates theoretical mechanisms posited by principal-agent theory and digital governance theory. The finding that transparency mediates the e-GP-corruption relationship confirms the theoretical logic that visibility and accountability mechanisms reduce corruption opportunities.
3. **Context-Specific Framework Contribution:** The validated assessment framework offers a replicable model for evaluating e-procurement anti-corruption capabilities in developing country settings, addressing a gap in the literature where most frameworks originate from OECD contexts.
4. **Governance Level Analysis:** By examining e-GP effectiveness across federal, provincial, and local levels, the study contributes to the literature on federalism and e-governance, highlighting the challenges of implementing unified digital governance in decentralized systems. This extends Sharma's (2025) critique of fragmented e-governance in federal Nepal.
5. **Mixed-Methods Methodological Contribution:** The sequential mixed-methods design demonstrates how quantitative and qualitative methods can be integrated to provide comprehensive assessment of digital governance interventions, offering a methodological template for future research.

Practical Implications:

1. **For Procurement Administrators:**
 - Prioritize comprehensive e-GP adoption, as frequency of use and breadth of digitized processes were the strongest predictors of corruption reduction ($\beta=0.24$ and $\beta=0.20$ respectively).
 - Invest in systematic training programs, as training received significantly predicted corruption reduction ($\beta=0.13$, $p=0.017$) and distinguished high performers from low performers (89.7% vs. 23.9%).

- Strengthen institutional leadership support, as this was a key differentiator between high and low performers and significantly moderated e-GP effectiveness ($\Delta R^2=0.09$).
- Focus on addressing price inflation and embezzlement, where e-GP showed lower effectiveness, potentially through additional oversight mechanisms.

2. For Policymakers:

- Address the infrastructure gap as a foundational requirement for e-GP effectiveness. With 67.8% reporting inadequate ICT infrastructure, investment in connectivity and hardware is essential for extending e-GP benefits to all regions.
- Develop coordinated frameworks for e-GP implementation across governance levels. The finding that 62.9% report fragmented systems as a barrier suggests that Nepal's e-GP policy requires stronger federal coordination and technical standards.
- Mandate consistent e-GP training across all government levels, as training received significantly predicts implementation effectiveness. Ensure that training extends beyond basic technical skills to include understanding of anti-corruption mechanisms and transparency principles.
- Strengthen enforcement mechanisms for e-GP compliance, as weak enforcement was cited by 49.4% as a significant barrier.
- Consider a phased approach to expanding e-GP to local governments, prioritizing areas with better infrastructure while simultaneously building capacity in more challenging contexts.

3. For Civil Society and Citizens:

- Leverage e-GP's public access features for procurement oversight, as 82.3% reported improved access to procurement information.
- Advocate for strengthening e-GP systems where effectiveness is lower, particularly in addressing price inflation and embezzlement.
- Engage in capacity building initiatives to complement government training efforts.

Specific Metrics to Monitor:

Based on the findings, the following metrics are recommended for monitoring e-GP effectiveness:

- Percentage of procurement processes conducted through e-GP (target: >80%)

- Frequency of e-GP use by officials (target: mean >4.0 on 1-5 scale)
- Training coverage and frequency (target: >80% of procurement staff trained)
- Internet reliability and ICT infrastructure availability (target: mean >4.0 on 1-5 scale)
- Perceived corruption reduction scores (target: mean >4.0 on 1-5 scale)
- Perceived transparency enhancement scores (target: mean >4.0 on 1-5 scale)
- Audit clearance rates and procurement irregularities identified (target: year-on-year reduction)

Expected Lead Times for Improvement:

Based on the study's findings and the literature on organizational change, the following lead times are estimated:

- Infrastructure improvements: 2-3 years (significant investment required)
- Digital literacy and training: 1-2 years (if systematic programs implemented)
- Institutional reform: 3-5 years (requires regulatory change and cultural shift)
- Transparency improvements: 1-2 years (as e-GP systems mature)

5.3 Limitations

Limitation 1: Sample Size and Representativeness

While the study achieved a sample of 318 respondents, which exceeds the minimum requirement for statistical analysis, the sample may not fully represent the diversity of procurement experiences across all 753 local governments in Nepal. The sampling strategy, while stratified, necessarily focused on selected local governments that may not reflect the full range of implementation experiences.

Limitation 2: Geographic Coverage

The study's geographic coverage, though spanning all seven provinces, may underrepresent the most remote and infrastructurally challenged areas where e-GP adoption is minimal. Access constraints and limited availability of procurement officials in these areas may have introduced geographic selection bias.

Limitation 3: Perception-Based Measures

While the study attempted to incorporate objective procurement records, the reliance on perception-based measures for many constructs (particularly transparency and corruption reduction) introduces potential measurement limitations. Perceptions may be influenced by factors beyond actual e-GP effectiveness, such as organizational culture, political climate, or personal experience.

Limitation 4: Cross-Sectional Design

The cross-sectional design provides a snapshot of e-GP effectiveness at a single point in time rather than capturing longitudinal changes. Given that e-GP systems are evolving and adoption is increasing, longitudinal analysis would provide stronger evidence on causal relationships and long-term trends.

Limitation 5: Self-Report Bias

Survey responses may be subject to social desirability bias, where respondents overstate e-GP effectiveness or under-report corruption. The research attempted to mitigate this through anonymity, but this bias cannot be completely eliminated.

Limitation 6: Causal Attribution

Establishing causal relationships between e-GP adoption and corruption reduction is methodologically challenging. Multiple concurrent reforms and contextual changes may influence outcomes, making it difficult to attribute improvements specifically to e-GP implementation.

Limitation 7: Data Quality

Secondary data sources, while comprehensive, may have quality issues including incomplete records, reporting inconsistencies, and audit lag. The study attempted to triangulate multiple data sources to mitigate these concerns.

5.4 Future Research Directions

Based on the study's findings and identified gaps, the following future research directions are recommended:

1. Longitudinal Assessment of E-GP Effectiveness:

Conduct a longitudinal study tracking e-GP effectiveness and corruption outcomes over 5-10 years to establish causal relationships and assess whether improvements are sustained over time. This would provide stronger evidence for policy decisions and enable assessment of whether corruption simply migrates to less visible areas or is genuinely reduced.

2. Comparative Analysis Across Provinces:

Conduct detailed comparative case studies of high-performing and low-performing provinces to understand the contextual factors, institutional arrangements, and implementation strategies that drive differential effectiveness. This would provide insights into how successful implementation models can be scaled.

3. Examination of Local Government Implementation Challenges:

Given the significant variation in e-GP effectiveness at the local level, in-depth research is needed to understand local government implementation challenges, including institutional

capacity, resource constraints, and political economy factors. This research would be particularly valuable for developing targeted interventions.

4. Assessment of Citizens' Perspectives:

Examine citizens' perspectives on e-GP effectiveness and its impact on public trust and perceptions of governance. While this study focused on officials' perspectives, understanding citizen experiences is essential for fully assessing e-GP's governance impact.

5. Corruption Migration Analysis:

Investigate whether e-GP implementation has led to corruption migrating to less visible areas of the procurement process, such as contract execution or price determination. This would address the concerning finding that e-GP is less effective in preventing price inflation and embezzlement.

6. Cost-Benefit Analysis of E-GP Implementation:

Conduct a comprehensive cost-benefit analysis comparing investment in e-GP infrastructure and capacity building against the economic costs of corruption. This would provide evidence for budget allocation and prioritization decisions.

7. Technology-Enhanced Anti-Corruption Mechanisms:

Examine the potential of emerging technologies (blockchain, AI, data analytics) to further strengthen e-GP's anti-corruption capabilities. Research could explore specific applications for price validation, anomaly detection, and fraud identification.

8. Comparative International Analysis:

Compare Nepal's e-GP implementation and outcomes with similar developing countries to identify best practices and lessons for Nepal's digital governance strategy. This would provide Nepal with evidence from comparable contexts to inform policy decisions.

9. Institutional Reform Pathways:

Investigate the institutional reform pathways needed to address the institutional barriers identified in this study, particularly fragmented systems and inconsistent policy implementation. This research could examine how federal structures can support coordinated digital governance.

10. Implementation of the Validated Assessment Framework:

Apply the validated assessment framework developed in this study to other e-governance initiatives in Nepal, such as digital service delivery, tax administration, or land records management, to test its generalizability and contribute to a broader understanding of digital governance effectiveness.

6. Conclusion

This research provides comprehensive empirical evidence on the role of e-Government Procurement systems in mitigating administrative corruption and enhancing bureaucratic transparency in Nepal's public sector. The study's key finding is that e-GP implementation has achieved 89.4% effectiveness in reducing direct collusion opportunities in tender processing, with 82.3% of respondents reporting improved transparency in bid evaluation processes. The overall corruption reduction effectiveness was rated at 78.0%, with transparency enhancement serving as a key mediating mechanism through which e-GP reduces corruption opportunities.

The study contributes a validated assessment framework for evaluating e-procurement anti-corruption capabilities in developing country settings, extending theoretical models through empirical validation in Nepal's distinctive governance context. The path analysis confirmed the theoretical logic that e-GP reduces corruption through both direct automation of discretionary decisions and indirect enhancement of transparency that enables public scrutiny and accountability.

However, significant implementation barriers—infrastructural (67.8% reporting inadequate ICT infrastructure), human capacity (61.2% reporting limited digital literacy), and institutional (62.9% reporting fragmented systems)—substantially moderate e-GP effectiveness. These barriers are most severe at the local government level, where e-GP effectiveness is lowest (Mean=3.5 compared to federal Mean=4.1). This creates a concerning two-tiered system where transparency and accountability improvements are concentrated at federal and provincial levels, while local governments—closest to citizens and managing significant procurement portfolios—lag behind.

For procurement administrators, the findings underscore the importance of comprehensive e-GP adoption, systematic training programs (training received significantly predicted corruption reduction with $\beta=0.13$), and strong institutional leadership support (key differentiator between high and low performers). For policymakers, addressing the infrastructure gap, developing coordinated frameworks for e-GP implementation across governance levels, mandating consistent training, and strengthening enforcement mechanisms are essential priorities.

The study's limitations—including cross-sectional design, perception-based measures, and geographic coverage constraints—point to important directions for future research, including longitudinal analysis, citizen perspectives, and investigation of corruption migration to less visible procurement areas.

Ultimately, this study demonstrates that e-GP systems, when effectively implemented, can significantly reduce corruption opportunities and enhance transparency in public procurement. However, technology alone is insufficient; addressing the institutional, infrastructural, and human capacity barriers that moderate e-GP effectiveness is essential for realizing the full potential of digital governance as an anti-corruption strategy. As Nepal continues its digital

governance journey, evidence from this study provides a foundation for strengthening e-GP implementation and extending its benefits to all citizens, regardless of where they live.

The vision of "Not in line (queue), but online" reflects the transformative potential of digital governance. This research suggests that realizing this vision requires not just technological deployment but systematic investment in infrastructure, capacity building, and institutional reform. For developing nations pursuing digital transformation as an anti-corruption strategy, Nepal's experience offers both encouragement and caution: e-GP can work, but its effectiveness depends on the enabling environment in which it operates.

References

1. Dangal, J. (2025). The Role of Good Governance in Strengthening Public Administration Nepalese Perspectives. *PAAN Journal*, 31(01), 1793–1803. <https://doi.org/10.3126/paanj.v31i01.73605>
2. Institute for Government and Public Affairs. (2024, August 12). Nepal's Procurement Act 2007 governs a significant portion of the national budget—60-70% [LinkedIn post]. LinkedIn. https://www.linkedin.com/posts/igpanepal_nepal-procurement-transparency-activity-7229066364366278656-gGgr
3. Neupane, A., Soar, J., & Vaidya, K. (2014). Evaluating the anti-corruption capabilities of public e-procurement in developing countries. *Journal of Information Systems*, 28(2), 1-18.
4. Sharma, B. P. (2025). Use of Information and Communication Technology (ICT) and E-Governance in Dhangadhi Sub-Metropolitan City, Nepal. *NPRC Journal of Multidisciplinary Research*, 2(10), 40–63. <https://doi.org/10.3126/nprejmr.v2i10.85865>
5. Sharma, S. (2025, July 18). E-governance in Federal Nepal: The failure of decentralised digitalisation. *The Himalayan Times*. <https://thehimalayantimes.com/opinion/e-governance-in-federal-nepal-the-failure-of-decentralised-digitalisation>
6. Thakulla, R. (2021). *Assessment of Factors Affecting Implementation of Public Procurement Practices in Dolpa* [Master's thesis, Tribhuvan University]. TUCL Repository. <https://elibrary.tucl.edu.np/items/bd9ad85d-a410-43e8-92a4-8fa6db9d3674>
7. Transparency International Nepal. (2025). *Open Contracting for Health (OC4H) Project*. Transparency International Global Health. <https://healthworks.ti-health.org/projects/open-contracting-for-health-oc4h/>
8. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
9. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
10. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
11. Government of Nepal. (2007). *Public Procurement Act, 2007*. Nepal Law Commission.