

DIGITAL READINESS AND E-GOVERNANCE MATURITY IN MADHESH PROVINCE, NEPAL: ASSESSING INSTITUTIONAL READINESS, ADOPTION FACTORS, AND PATHWAYS TO DIGITAL TRANSFORMATION

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Abstract— Digital transformation has become a key priority for governments worldwide. In Nepal, federal restructuring has created new opportunities and challenges for digital governance at the provincial level. Madhesh Province has experienced increasing internet penetration and mobile connectivity; however, the adoption of digital public services remains limited. This study assesses the digital readiness and e-governance maturity of Madhesh Province using evidence from the E-Governance Master Plan (EGMP) developed for the provincial government. A mixed-methods approach combining surveys, key informant interviews (KIIs), focus group discussions (FGDs), and institutional assessments was employed. The Gartner E-Government Maturity Model was used to evaluate the province's position in the digital transformation journey. Findings indicate that Madhesh Province has achieved partial readiness in infrastructure, policy, and organizational arrangements but remains at the interaction stage of e-governance maturity. Weak institutional coordination, inadequate digital skills, fragmented systems, and limited cybersecurity preparedness continue to hinder progress toward transactional and transformational governance. The study proposes a Provincial Digital Governance Maturity Framework for developing regions and offers policy recommendations for accelerating digital transformation. The findings contribute to both theory and practice by extending e-readiness research from the national level to subnational governments in emerging federal systems.

Keywords— *E-Governance, Digital Readiness, E-Government Maturity, Madhesh Province, Nepal, Digital Transformation, Provincial Governance*

I. INTRODUCTION

Governments across the world are increasingly adopting digital technologies to improve public service delivery, enhance transparency, and strengthen citizen engagement. E-governance has evolved from simple information dissemination through websites to integrated digital ecosystems that support online transactions, data-driven decision-making, and citizen-centered services [1].

In developing countries, however, the transition toward digital government remains uneven. Many governments face challenges related to infrastructure, institutional capacity, policy implementation, and digital literacy. These

challenges are particularly significant in federal systems where responsibilities are distributed across multiple levels of government.

Nepal's transition to federalism in 2015 created three tiers of government: federal, provincial, and local. While this restructuring offers opportunities for decentralized governance, it has also generated new challenges in coordinating digital initiatives. Madhesh Province, one of Nepal's most populous provinces, presents an important case for understanding digital transformation at the subnational level.

Despite increasing internet penetration and mobile phone usage, digital public service adoption in Madhesh Province remains relatively low. Many government services continue to rely on manual processes, fragmented information systems, and paper-based workflows. Furthermore, there is no standardized framework for measuring e-governance maturity at the provincial level.

The United Nations E-Government Development Index (EGDI) shows that Nepal has made steady progress in digital governance over the past decade. Nepal's improvement in online service delivery, telecommunications infrastructure, and human capital demonstrates growing national readiness for digital transformation (United Nations Department of Economic and Social Affairs [2]). However, national-level indicators do not adequately capture provincial disparities.

This study addresses three research questions:

- What is the current level of digital readiness in Madhesh Province?
- What factors influence e-governance adoption at the provincial level?
- How far is Madhesh Province from achieving transformational e-governance?

The study contributes to the literature by proposing a provincial-level maturity assessment

framework and by extending earlier research on e-readiness and information system governance conducted in Nepal [3] [4].

II. LITERATURE REVIEW

A. *E-Governance and Digital Readiness Page Layout*

Digital readiness refers to the preparedness of institutions, infrastructure, policies, and human resources to adopt and sustain digital technologies. E-readiness assessments help governments identify strengths and weaknesses before implementing digital transformation initiatives.

Several studies have highlighted the importance of organizational readiness, infrastructure availability, leadership commitment, and policy support for successful e-government implementation [1] [5]

Gupta, Marasini, and Shakya conducted one of the earliest e-readiness assessments of Nepalese ministries and found significant variations in institutional preparedness across government agencies. Their study emphasized the importance of ICT infrastructure, human resources, and strategic planning in achieving successful e-government implementation. The findings remain relevant today, particularly for provincial governments that are building digital governance capabilities. [3]

B. *E-Government Maturity Models E-Governance and Digital Readiness*

E-government maturity models provide frameworks for assessing the evolution of digital government. Among these, the Gartner Maturity Model is widely used and identifies four stages:

1. Information
2. Interaction
3. Transaction
4. Transformation

The transformational stage represents fully integrated services, citizen-centric governance, and seamless inter-agency collaboration.

Research suggests that many developing countries remain trapped between the interaction and transaction stages due to institutional and technological barriers. [6]

C. *Governance, Security, and Digital Transformation E-Governance and Digital Readiness*

Successful digital governance depends not only on technology but also on governance mechanisms, accountability structures, and cybersecurity preparedness.

Gupta and Shakya examined information system auditing in Nepal's e-government environment and highlighted weaknesses in security governance, monitoring, and risk management [4]. Similarly, Gupta and Shakya identified cybersecurity challenges associated with cloud computing adoption and emphasized the need for stronger institutional controls [7].

Another study by Gupta and Shakya further demonstrated that inadequate security auditing frameworks can undermine public trust in digital government systems. These findings are particularly relevant for provincial governments that are increasingly adopting cloud-based and web-enabled services. [8]

D. *Digital Governance beyond service delivery E-Governance and Digital Readiness*

Recent research by Gupta and Marasini argues that digital technologies have expanded beyond administrative functions and now influence diplomacy, international cooperation, and global governance. Their work on cyber diplomacy demonstrates how digital infrastructure has become a strategic national asset.

Similarly, Gupta and Marasini show that digital transformation is increasingly linked to national competitiveness and strategic engagement. Gupta further argues that technology-enabled governance requires coordinated national strategies, institutional leadership, and digital resilience.

These studies suggest that provincial digital readiness should be viewed not only as an administrative issue but also as a strategic governance challenge.

E. *Research Gap E-Governance and Digital Readiness*

While previous studies have examined e-readiness at the national level, limited research has focused on provincial governments in federal systems. There is a lack of empirical evidence regarding digital readiness and e-governance maturity in Nepal's provinces. This study addresses this gap through a comprehensive assessment of Madhesh Province.

III.METHODOLOGY AND CONCEPTUAL FRAMEWORK

A. Research Design

The study employed a mixed-methods approach combining quantitative and qualitative techniques.

B. Data Sources:

The analysis utilized data collected during the preparation of the E-Governance Master Plan for Madhesh Province, including:

- Survey responses from government officials
- Key Informant Interviews (KIIs)
- Focus Group Discussions (FGDs)
- ICT infrastructure assessments
- Policy and document reviews

C. Analytical Framework

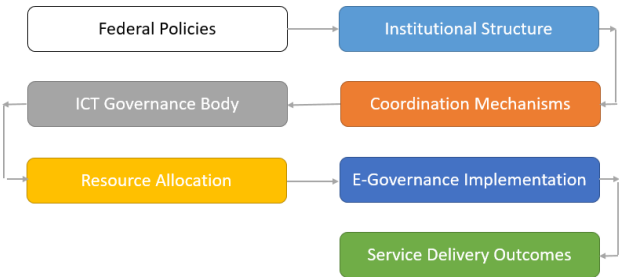
The study assessed digital readiness across five dimensions:

TABLE I
DIGITAL READINESS

Dimension	Indicators
Technology	Infrastructure, connectivity, systems
Organization	Governance, structure, leadership
Human Capacity	Skills, training, digital literacy
Policy	Regulations, strategies, standards
Resources	Budget, investments, sustainability

D. Proposed Conceptual Framework

The framework assumes that digital readiness influences e-governance maturity through institutional capacity and governance effectiveness.



The Gartner Maturity Model was then used to evaluate the province's maturity level.

IV.ANALYSIS AND DISCUSSION

A. Digital Readiness Assessment

The findings reveal uneven digital readiness across government institutions.

Infrastructure availability has improved significantly due to increasing internet access and mobile connectivity. However, many agencies continue to rely on standalone systems that are not interoperable.

Organizational readiness remains moderate. While several agencies have initiated digital projects, governance structures remain fragmented. No dedicated provincial ICT authority currently exists to coordinate digital transformation initiatives.

Human resource capacity also remains a challenge. Many government employees possess basic ICT skills but lack specialized expertise in cybersecurity, enterprise architecture, data governance, and digital service design.

B. E-Governance Maturity Assessment

Using Gartner's model, Madhesh Province appears to be in the Interaction Stage.

Characteristics observed include:

- Government websites providing information
- Downloadable forms and documents
- Basic communication channels
- Limited online transactions

Characteristics largely absent include:

- Integrated service portals
- Online payment systems
- Single sign-on services
- Cross-agency data sharing

This indicates that the province remains significantly distant from transformational governance.

C. Factors Affecting Adoption

The analysis identified five major factors influencing e-governance adoption:

- Infrastructure availability
- Leadership commitment
- Institutional coordination
- Human resource capacity
- Cybersecurity readiness

These findings align with previous e-readiness research conducted by Gupta et al. (2015), which identified infrastructure and institutional preparedness as critical determinants of e-government success. [3]

D. Security and Trust Considerations

Cybersecurity emerged as a recurring concern during interviews and discussions.

The findings reinforce earlier conclusions by Gupta and Shakya [4] [7] [8] that information security governance remains an underdeveloped area within Nepal's public sector. Without robust security mechanisms, citizens may be reluctant to trust digital services.

V. CASE EXAMPLES FROM MADHESH PROVINCE

Several initiatives demonstrate progress toward digital governance.

A. Provincial Websites

Most ministries maintain websites that provide organizational information and public notices. However, functionality remains largely informational.

B. Digital Record Management

Some agencies have begun digitizing records, improving information accessibility and administrative efficiency.

C. Emerging Citizen Services

Pilot initiatives involving online registration and information dissemination indicate growing institutional interest in digital service delivery.

Despite these developments, integration across agencies remains limited.

VI. POLICY RECOMMENDATION

The findings suggest five priority actions.

First, Madhesh Province should establish a Provincial ICT Council responsible for digital governance coordination, policy oversight, and strategic planning.

Second, interoperability standards should be developed to facilitate data sharing across government agencies.

Third, dedicated ICT budget allocations should be institutionalized to ensure sustainable investment in digital infrastructure and capacity development.

Fourth, public-private partnerships should be encouraged to leverage technical expertise and innovation.

Finally, cybersecurity governance frameworks and information system auditing mechanisms should be strengthened to enhance trust and resilience.

VII. CONCLUSION

Madhesh Province has made notable progress in digital readiness but remains at the interaction stage of e-governance maturity. While infrastructure and policy foundations exist, significant challenges remain in institutional coordination, human capacity, interoperability, and cybersecurity.

The study demonstrates that digital transformation requires more than technology. Effective governance structures, leadership commitment, and strategic investment are equally important. The proposed Provincial Digital Governance Maturity Framework offers a practical tool for assessing and guiding digital transformation in developing regions.

As Nepal continues its federalization journey, provincial governments will play an increasingly important role in advancing digital governance. Strengthening digital readiness at the provincial level is therefore essential for achieving inclusive, efficient, and citizen-centered public service delivery.

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