NPRC Journal of Multidisciplinary Research
Volume 2, Issue 10, October, 2025 Pages: 40-63
ISSN: 3059-9148 (Online)
DOI: 10.3126/nprcjmr.v2i10.85865

OPEN ACCESS

Use of Information and Communication Technology (ICT) and E-Governance in Dhangadhi Sub-Metropolitan City, Nepal

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Received: August 16, 2025 Revised & Accepted: October 28, 2025

Abstract

Background: 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. The 2015 National ICT Policy outlines key priorities for leveraging technology across sectors. E-governance, in particular, is envisaged as an enabler of efficient, transparent, and citizen-centered governance, with local municipalities serving as critical platforms for its implementation. However, the journey from policy to practice is often challenged by infrastructural, institutional, and human capacity constraints.

Objectives: This study aims to investigate the role of e-governance in promoting transparency, accountability, and corruption reduction in local governance. Specifically, it explores the use of ICT in e-governance within the context of Dhangadhi Sub-Metropolitan City, an established municipality in Nepal.

Methods: The research adopted a positivist paradigm and a descriptive research design. Data were collected through structured questionnaires and interviews with 130 municipal staff members of Dhangadhi Sub-Metropolitan City, selected via simple random sampling. Secondary data were obtained from government publications, policy documents, and relevant literature. Quantitative data were analyzed to assess the status of ICT infrastructure, software application, and digital service delivery.

Findings: The findings reveal a mixed implementation status. While foundational ICT infrastructure, such as computer availability and maintenance, is reasonably established (mean scores 3.2-3.6), key digital governance features are underdeveloped. Core administrative software for accounting, tax collection, and e-procurement is widely used and well-regarded (mean scores up to 4.2). However, systems for citizen interaction, grievance handling, social mobilization, and office automation are largely absent or poorly implemented (mean scores

NPRC Journal of Multidisciplinary Research
Volume 2, Issue 10, October, 2025 Pages: 40-63
ISSN: 3059-9148 (Online)
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1.2-2.7). Municipalities have official websites and emails, but lack advanced features like content management systems and interactive service portals. Social media is primarily used for one-way information dissemination, not for participatory engagement.

Conclusion: The study concludes that while Nepal has made significant strides in establishing the technological foundations for e-governance at the local level, its 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. For e-governance to fulfill its potential in enhancing transparency and accountability, a shift from a technology-driven to a people-centered approach is necessary.

Implications: The findings imply that future e-governance strategies in Nepal must move beyond infrastructure provision to address deeper institutional and human capacity challenges. Policy should focus on:

i. **Institutional Reform:** Incentivizing digital innovation within the bureaucracy and fostering a culture of accountability and transparency.
ii. **Capacity Building:** Implementing continuous and widespread digital literacy and technical training programs for civil servants.
iii. **Citizen-Centric Design:** Developing interoperable systems that prioritize citizen needs, such as integrated grievance redressal mechanisms, interactive service portals, and open data initiatives.
iv. **Scalable Models:** Replicating successful participatory models, like those initiated by the Rural Urban Partnership Programme (RUPP), which combine technology with community mobilization.

Keywords: E-Governance, ICT, Transparency, Accountability, Local Governance, Nepal, Public Service Delivery, Dhangadhi

Introduction

The Government of Nepal has increasingly recognized the transformative potential of Information and Communication Technology (ICT) in promoting development and improving public service delivery. The 2015 National Information and Communication Technology (ICT) Policy outlines key priorities for the development of ICT in the country, including the expansion of broadband access, strengthening e-commerce, and leveraging technology across sectors such as health, education, and governance (National Cybersecurity Policy, 2016). ICT is thus envisaged not only as a tool for technological advancement but also as an enabler of efficient, transparent, and citizen-centered governance.

The forces of globalization have made governance a central agenda for both developed and developing nations. Rapid advancements in ICT have introduced new possibilities for governance, leading to the emergence of the concept of e-governance. E-governance refers to the use of ICT to deliver government services and information efficiently, transparently, and in a manner that enhances citizen engagement (Subramaniam & Mia, 2018). It has become a vital

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component of modern public administration, helping governments streamline service delivery, reduce administrative costs, and respond quickly to citizens' needs (Jawadekar, 2019). By integrating technology into governance, e-governance offers a platform for improving transparency, accountability, and the overall effectiveness of public administration.

E-government, a subset of e-governance, focuses specifically on digital interactions between governments and citizens or businesses. It can be classified into two types: information-based services and transaction-oriented services. Information-based services involve the dissemination of government information via websites and portals, while transaction-oriented services facilitate direct interactions, including service requests, applications, and financial transactions. Although e-government initiatives provide substantial benefits—such as cost-effective service delivery, better integration across government agencies, and rapid responsiveness—they often face implementation challenges, particularly in developing countries, where infrastructure, capacity, and institutional readiness may be limited (Rodriguez et al., 2020).

The Government of Nepal has emphasized the importance of ICT in achieving long-term goals of efficiency, transparency, and paperless governance. Local bodies, including municipalities, play a central role in public service delivery and represent the first link between the government and citizens (Sarikas, 2021). The promulgation of Nepal's new constitution in 2015 further empowered local governments to serve as agents of development and governance. In this context, municipalities have become critical platforms for implementing e-governance initiatives that aim to enhance service delivery, strengthen accountability, and promote citizen participation.

Nepal's ICT infrastructure has gradually evolved to support such initiatives, with the government investing in nationwide broadband expansion, digital literacy programs, and e-governance portals at central and local levels. Key platforms such as the Government Integrated Data Center, e-Government Management Information Systems, and various online service portals for citizen services (birth registration, taxation, land records, and permits) provide the necessary technological foundation for digital governance. Despite these efforts, challenges persist, including uneven internet access in rural areas, limited technical capacity among government personnel, and varying levels of citizen awareness and engagement. Addressing these gaps is crucial for translating e-governance policies into tangible improvements in transparency, accountability, and service delivery.

E-governance is increasingly viewed as a means to combat corruption and improve public sector performance. Studies indicate that digital systems for financial management, procurement, and service delivery can reduce opportunities for misappropriation, increase traceability, and promote transparency (Kim, Kim, & Lee, 2009; Akpan-Obong, 2022). Moreover, e-governance facilitates citizen engagement by providing accessible information and platforms for feedback, thereby creating mechanisms for public oversight. In developing countries, where corruption and bureaucratic inefficiencies remain significant challenges,

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sustainable e-governance can play a transformative role by fostering transparency, accountability, and efficient service delivery.

Despite its potential, e-governance implementation varies widely across countries. While advanced economies have invested significantly in e-government systems and studied their impact on governance, developing countries often lag due to limited infrastructure and resources. For instance, Bangladesh and Pakistan are ranked 119th and 124th, respectively, on the corruption index by Transparency International, reflecting challenges in governance that could potentially be mitigated through effective e-governance (Chandio et al., 2018). In Nepal, understanding the role of ICT in local governance, particularly in municipalities, is essential for designing strategies that enhance transparency, accountability, and citizen-centric service delivery.

This study focuses on the implementation of e-governance in established municipalities, using Dhangadhi Sub-Metropolitan City as a case study. Established municipalities are well-positioned to provide insights into the current state of ICT adoption, as they possess both infrastructure and administrative experience. The study examines the application of e-governance in public service delivery, focusing on government employees as primary respondents. By targeting senior officials familiar with e-government processes, the study seeks to capture strategic perspectives on ICT integration, challenges, and opportunities.

The integration of ICT into governance through e-governance initiatives represents a significant opportunity for Nepal to enhance local governance, promote citizen engagement, and reduce corruption. By studying established municipalities and their ICT infrastructure, this research contributes to understanding the practical challenges and potential benefits of e-governance, offering insights that can inform policy, planning, and implementation of digital governance strategies at the local level.

Research Objectives

The objective of this research is to investigate the role of e-governance in promoting transparency, accountability, and corruption reduction in local governance. Specifically, the study seeks to explore the use of information and communication technology (ICT) and its role in e-governance in the context of Dhangadhi sub-metropolitan city. The findings aim to provide a framework for understanding how ICT-enabled governance can strengthen democracy, improve public service delivery, and foster sustainable development.

Literature Review

This section includes the review of conceptual, theoretical and empirical literature on ICT, its uses and implication in governance. The review is categorized into key dimensions of ICT and its use in e-governance.

Understanding Governance

E-governance refers to application of electronic means in governance with an aim of fulfilling the requirements of common mean at affordable cost and it fastest possible time. The utilization of information technology (IT), Information and communication technologies (ICTs) and other

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web-based telecommunication technologies to improve and /or enhance on the efficiency and effectiveness of services delivery in the public sector (Ahmad, et al; 2013).

E-government refers to the use of information technologies by government agencies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with businesses and industries, citizen empowerment through access of information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions (Adhikari, 2017).

E-government is defined as utilizing the Internet and the world-wide-web for delivering government information and services to citizens (Ahmad, et al; 2013). Global Business Dialogue on Electronic Commerce (GBDe) Electronic government (hereafter e-government) refers to a situation in which administrative, legislative and judicial agencies (including both central and local governments) digitize their internal and external operations and utilize networked systems efficiently to realize better quality in the provision of public services (Shrestha, 2015).

According to Organization for Economic Co-operation and Development (OECD, 2012) e-Government: is more about government than about "e, improves efficiency, improves services, 3) helps achieve specific outcomes, can contribute to broad policy objectives, can be a major contributor to reform, can help build trust between governments and citizens, can open up the policy process, challenges existing ways of working, and seamless government services will drive agencies closer together.

Governance as the rules, processes and behaviors that affect the way public administrations function that is the organization and culture of public administration. Governance itself is much more than the physical authoritative institutions, organizations and process within the public sector (Ahmad, et al; 2013).

The effectiveness of systems of governance he argues is particularly important because if failure occurs, then government will ultimately be held accountable. (Ahmad, et al; (2013) argued for a shift in the terms of reference for government, with the advent of new ideas, organizations and citizens now need to work in relationships and collaborative partnerships with government and there is a strong argument for the pursuit of reciprocal interests and shared values in order to be effective. There is also a strong argument that as governance now enters the twenty-first century, a stronger emphasis for the use of ICT should support collaborative relationships and network forms. Tan et al. (2005) believes that e-Governance should now be at the heart of national ICT strategies to make the development of e-Government sustainable. They state that the concept of e-Governance, is a much broader than e-Government, encompassing the wide-ranging challenges to corporate management brought about by technological advancements. The authors incorporate Pablo and Pan's (2002), cited in Tan et al. (2005) concept of e-governance at four different levels. They are 1) Transforming the

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business of government, 2) Increasing participation, openness, transparency, and communication, 3) Transformation in the interactions between government and its internal and external clients, classified as government to-citizen (G2C), government-to-business (G2B), government-to-internal-employee clients (G2E), government-to-other-government institutional clients (G2G), and citizen-to-citizen (C2C), and 4) Transformation of society through the emergence of e-societies, which comprise networks of relationships such as citizen-to citizen connections and relations between non-government organizations (NGOs).

Gartner, an international e-business research consultancy firm, has formulated a four-phase e-governance model. The system of e-governance will acquire maturity according to these four-phases. This model may serve as a reference for governments in the overall evolution of an e-governance strategy; however, it is not necessary for all the countries to pass through all these phases (Robert and Thierauf, 2018).

In this phase relevant government information will be available on the web, thus providing service to the public (G2C - government to citizen and G2B - government to private sector). These sites would convey the government's plan, information such as official addresses, working hours, forms and applications for public use, economic reviews, corporate regulations for businesses, and budgetary allocations and expenditures (Adhikari, 2017).

In a second phase, the government will interact with the public (G2C and G2B). People can ask questions via e-mail, use search engines for information, and download all sorts of forms and documents. Internally (G2G) government organizations use Local Area Networks (LAN), intranet and e-mail to communicate and exchange data (Robert and Thierauf, 2018).

This phase uses little complex technology and would signify direct interaction of the government and relevant entities such as online services, filing income taxes, payment of property taxes, extension/renewal of licenses, visa and passports, and online voting. Phase three is complex because of security and privacy issues - e.g., digital (electronic) signatures are necessary to enable legal transfer of services. On the business side the government can begin with e-procurement applications (Ahmad, et al; 2013).

The final phase achieves the true vision of e-governance. Here all information systems are integrated and the public can get G2C and G2B services virtually at any counter. One single point of contact for all services is the ultimate goal.

E-Governance Implementation Strategies and Plans in Nepal

With the e-Governance Master plan 2006, wireless broadband Master plan 2010 and ICT in the Education Master Plan 2013-2017, there certainly are few strategies plans for implementation of e-Governance that have been used in Nepal. Lot of literatures discuss the e-governance implementation strategy in Nepal. Some articles that are available review the plans that have been formulated by the Government while other further discuss about the issue and challenges in implementing these plans. There also are some additional literatures that have discussed new dimension that need to be added to e-Governance implementation plans (Shrestha, 2015).

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E-governance Initiatives in Nepal

The advent of ICT has brought about a challenge to the developing countries like Nepal to appropriate and adapt the global knowledge available in developed countries. The rapid improvements in information and communication technologies are revolutionizing the way modern governments deliver services to the citizens. Nepal, a developing country has also taken steps towards e-government transformation, similar to the governments in developed countries (Sukla, 2015). This highly leveraged enabling tool has also redefined the fundamentals and changed the institutions and mechanism of delivery, bringing about a fundamental shift in the concept, manner and method by which the State has to deliver services. In 2006, the Nepal Government made public its plan for initiating master plan to reduce cost and time of service recipients by improving public service delivery. The Government and responsible agencies for ICT are making efforts for the successful implementation of this plan. Technology adoption is another barrier while introducing digital devices in Nepalese context. Many senior level officers are nearly blind with computer technology. They do not have adequate awareness and even some of them do not want to know the benefit of ICT. The decision making officers in most of the offices are unaware with the advantage of e-Governance. Most civil servants who are enjoying the traditional non-digital technology have an attitude which is resistive to change. Those who are getting extra benefits think that they will not be able to hold the beneficial position after introducing new technology, hence are not friendly with digital devices (Adhikari, 2017).

Several e-government implementation efforts have been made in development of e-government in Nepal. Literature show that many government, private and NGO and INGOs have been involved in the development and implementation of e-government in Nepal. Primary focus of e-government initiatives have been seen in the local governments of Nepal and particularly focused in municipalities at first phase. Tele-centers established by the collaborative efforts of rural villages and local government are gradually getting priority in their local level action plan so as to flow the information of Nepal government through ICT. These tele-centers are not only disseminating Nepal government information in local level but also trying to pull local content in the central level.

Transparency International - Nepal (TIN) has prepared a website for the government anti-corruption body, National Vigilance Center (NVC) to disseminate basic information about its preventive role, to inform the common people about anti-corruption, and to familiarize individuals and institutions with NVC (20-60/61 BS).

Rural Urban Partnership Program and E-Governance

The Local Self-Governance Act – 1999 (LSGA) consolidated different acts related to the Local Bodies (LBs) and provided a platform for decentralized governance in Nepal.

As per the LSGA, the municipalities, as a municipal government of Nepal, are providing municipal services to their citizens. Most of the municipalities are depending upon the traditional systems and are basically focused on the physical infrastructure development. Still, the planning is carried out with the top down approach in many cases without people's active

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and meaningful participation. With the emergence of Rural Urban Partnership Programme (RUPP), the concept of urban development has taken a new dimension, for e.g., social mobilization, people's participation, enterprise development activities for livelihood options, rural urban linkages for balance development, ICTs, and some affirmative actions to disadvantaged groups (DAG), etc.

Rural Urban Partnership Program (RUPP) brought the concept of implementing e-governance to strengthen good governance and urban development. Since e-governance is one of the major components under ICT (Information and Communication Technology) for strengthening good governance, RUPP together with the Bharatpur municipality have advocated e-governance. After realizing the successful implementation of e-governance in Bharatpur, RUPP is supporting other partner municipalities to replicate the model of Bharatpur e-governance. Municipalities where Internet Service Realizing that recent advances in the ICT domain offered an enormous prospect for augmenting RUPP's efforts in key areas of its broad operational remit, the programme introduced municipal e-governance and e-commerce (B2B) based initiatives in some of its partner municipalities and RMC's. For providing easy access of these ICT based services and with the objective of bridging the digital divide, the Programme also contributed in the establishment of Tele Centers/e-Community Centers (Ahmad, et al; 2013).

Providers (ISPs) are available at the present time have shown their interest in implementing e-governance and have vigorously started the awareness of e-governance in municipalities through RUPP's community mobilization process.

The HRDC have organized trainings on Social Mobilization, Leadership, Gender, Saving & Credit Mobilization, Enterprise Management, Skill Training, Technology Transfer, PMDP, Local Governance, HIV/AIDS, Computer, B2B e-Commerce, Info Mobilization, Tele Center Operation and Management, etc. to more than 69,000 participants including community members and municipal/VDC staffs. Apart from this, the Agricultural Market Information System and National B2B e-Commerce Services were established in partnership with Agro Enterprise Center/Federation of Nepalese Chambers of Commerce & Industry in close coordination with High Level Commission for Information Technology. Similarly, Tele Centers and Cyber Cafes were established with the support of UN Habitat and the World Bank supported TSRP executed by the Nepal Telecom Authority, which is playing a key role in digital divide without any discrimination between the rich and poor (Adhikari, 2017).

Research Methodology

Methods and procedures are fundamental elements of any research, guiding the researcher in systematically achieving the study objectives. This study adopted a structured methodology encompassing research design, data sources, population, sampling procedures, data collection, and analysis techniques. The research followed a positivist paradigm, which emphasizes objective measurement and the establishment of cause-and-effect relationships. Knowledge under this paradigm is considered neutral, measurable, and verifiable through observation and reason. The study employed a descriptive research design, which provides a systematic approach to describe the current status of e-governance in Dhangadi Sub-Metropolitan City

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and to analyze its effects on public service delivery. Quantitative methods, including scaling and measurement tools, were primarily used to collect and analyze data.

The study relied on both primary and secondary data sources. Primary data were collected through structured questionnaires and interviews with municipal staff, providing first-hand information about the implementation and application of e-governance services. Secondary data were obtained from published and unpublished literature, including books, articles, research reports, and official government websites, such as the Ministries of Nepal, National Planning Commission, Central Bureau of Statistics, and municipal portals. Both qualitative and quantitative data were collected, with measurement scales including nominal and ordinal types. Direct interviews conducted at municipal offices enabled the researcher to obtain detailed and contextually relevant information from respondents.

The population of the study comprised all municipalities in Kailali District where e-governance services are implemented, with the application status of e-governance in Dhangadi Sub-Metropolitan City selected as the study sample using purposive sampling. Out of 491 municipal staff, 130 respondents were selected through simple random sampling, deemed sufficient for the study objectives. Respondents were primarily senior officials familiar with e-governance operations, ensuring informed and strategic responses. The sample included respondents aged 29 to 56 years, with the majority in their 40s; 85% were male and 15% female, reflecting the demographic composition of the municipal workforce.

Empirical Studies

E-government is generally characterized as the use of Information and Communication Technologies by the government in conjunction with institutional transformation to enhance administration structures and procedures. E-government deployment is also believed to assist municipalities in functioning effectively and reshaping relationships with residents, corporate entities, and other federal sectors. E-government is considered to optimize web-based applications to promote adaptable communication between state entities with citizens and various general sector organizations by redesigning conventional government services to strengthen service delivery and security. With the persistent concerns of the United Nations (UN), E-government implementation has become common throughout the world, occurring in 193 countries. Furthermore, as an extraneous objective, E-government tremendously promotes public engagement since it encourages citizens to interact with the government (Twizeyimana & Andersson, 2019).

Regarding the E-Government, Transparency, and Behavioral Intention, transparency is considered a phenomenon that provides valuable knowledge with appropriate information in line with citizens' expectations. Currently, transparency advances as public interactions with government increase and conflicts decline. Transparency in government can be defined as the understanding, assessments, and significance of public service in executing continuous improvements to generate results. Transparency, engagement, and public engagement were three fundamental components of a strong E-government system. Kwak and Lee presented perfect open government phenomena with five essential steps: starting circumstances, data

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transparency, civic engagement, collaboration with government entities, and, most importantly, global engagement (Bokhari & Myeong, 2022).

The application of ICT with social media integration capabilities can improve transparency in the government sector, according to a survey among several EU domains. Through the E-government survey, IT professionals conducted numerous ICT-based analyses and concluded that E-government is not a fiction, but a necessity for citizens to satisfy their demands in a more transparent, accessible, and accountable manner. Transparency is simply a notion in a government body that obtains momentum through a variety of public sector programs. Such initiatives may incorporate long-term gradual implementation and accomplish E-government objectives through the ICT department. Furthermore, government and non-government entities must make such information publicly available to be acknowledged in information authentication, which is the essence of transparency (Wikhamn & Hall, 2014).

Regarding the E-Government, Accountability, and Behavioral Intention, Accountability is considered one of the most important factors in determining people's engagement with any institution. The UN's advanced nations primarily compensate underdeveloped countries for their deficits through financial assistance. Therefore, delegates from developing nations are made accountable amongst themselves with that approach. Moreover, open data must be used to monitor the conduct of government entities to reduce extremism and corruption in order to strengthen the accountability conceptual framework. Hence, in recent times, bureaucrats have designed the continual shift of technological innovation with sensible interfering concerns for transparency and accountability. Numerous previous scholars suggested several conceptual frameworks for determining accountability; however, the universally acknowledged definition of accountability in public administration is explained by managing different prospects undertaken by public agencies and their employees to satisfy the needs of citizens (Gürlek, 2020).

Various studies have focused on the mechanisms of accountability, which are considered as governments or institutional bodies that hold representatives accountable for their participation in policy formulation, which may occur in a variety of situations. Most of them are concerned with the relationship between citizens and elected or appointed authorities, or corporate sector lessees. To summarize, E-government has consistently been regarded as an effective channel for strengthening the accountability of public services and establishing citizens' rights. Consequently, it made the government more sensitive to the advantages and drawbacks of individual citizen engagement (Dubnick & Frederickson, 2014).

Regarding the Mediating Role of Behavioral Intention, corruption is a widespread issue that is concealed in different departments. Bribery is the most widespread type of corruption in developing countries, when it comes to government incentives and other favors such as corporate licenses and approvals. The sort of corruption is determined by the amount of money changing hands and the sector where it originates. The three fundamental forms of corruption are petty corruption, grand corruption, and political corruption. E-government is a technological marvel for combating corruption. There is dedicated literature on E-government

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institutions that emphasize corruption. Digital delivery of services (for instance, tax returns for computer processing and submitting web applications) might reduce moral deterioration and corruption. Furthermore, accountability, transparency, eliminating the middlemen, and connectivity can contribute to bridging the gap between governments and citizens (Han & Hong, 2019).

Some research has been documented on the relationship between E-government and governmental corruption, while others employed correlation analysis and data acquisition to exemplify that a country's propensity to use E-government and its corruption levels are strongly connected. The evidence suggests the existence of a positive association between E-government and corruption eradication. In general, every institution must be governed in such a way that its constitution can eliminate corruption and corrupt government officials can be wiped out from the origin simultaneously, as a consequence of redesigning the corporate structure to alleviate cancer known as corruption (Wangrow et al; 2019). The problem is similar to the context of Nepal and analyzed in terms of integration of ICT in governance and its implication in service delivery which is discussed in results and findings section.

Results and Findings

This section focuses on the presentation and interpretation of the collected data. The primary data obtained from the field survey have been compiled into tables, and a comprehensive interpretation has been provided. In this chapter, the surveyed data are analyzed and described in detail. The current status of e-government is examined through document reviews, surveys, and interviews.

A key part of this analysis involves evaluating and presenting the websites of municipalities responsible for delivering e-government services, which serve as the primary service delivery portals. The published municipal websites were reviewed and assessed to determine their quality based on the indicators and variables identified in the literature review. Additionally, correlations among several important variables have been identified and discussed.

Application of E-Governance Tools by Municipal Employees

E-Governance applications encompass data management tools designed for government agencies. These tools facilitate the collection, storage, and analysis of data, thereby supporting informed decision-making and effective policy formulation.

In this subsection, the focus is on the essential components of ICT infrastructure that enable the functioning of e-governance. These include the availability of computers, their proper maintenance and technical support, as well as backup systems, servers (application servers, file servers, and printer servers), all of which form the fundamental backbone for sustaining e-governance services. The detail of infrastructure available in the municipality which support e-governance is show in Table 1.

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Table 1

ICT Infrastructure Available to Support E-Governance

ICT Infrastructure	Level of Extent?						
	1= Not at all	2= Somehow Agree	3= Moderate Agree	4= Agree t	5= Highly Agree	Total Value	Mean
Computer available	-	-	70	30	30	480	3.6
Computer maintained and supported	-	-	75	55	-	445	3.4
Computer backup system	○	30	30	70	○	430	3.3
server as application server/file server and or printer server	○	○	95	35	○	320	3.2

Source: Field Survey, 2024

The results in Table 1 provide a clear insight into the ICT infrastructure available to support e-governance. Regarding the availability of computers, 70 respondents moderately agreed, 30 agreed, and another 30 highly agreed with the statement. The mean value of 3.6 indicates that most respondents actively use computers in their official work, reflecting a positive perception. For the statement on computer maintenance and support, 75 respondents moderately agreed, while 55 agreed. The mean value of 3.4 suggests that the majority of respondents are satisfied with the maintenance and support provided for computers, indicating a generally positive response.

Concerning the computer backup system, 30 respondents somewhat agreed, 30 moderately agreed, and 70 agreed. The mean value of 3.3 shows that most respondents are satisfied with the computer backup system, again reflecting a positive perception. Finally, regarding the statement about servers functioning as application servers, file servers, or printer servers, 95 respondents moderately agreed, and 35 agreed. The mean value of 3.2 indicates that respondents generally have a positive view of the server infrastructure supporting e-governance applications.

Status of Official Websites and Email

The status of official websites and email in municipalities highlights several important aspects. Municipalities have official email addresses under the “gov.np” domain and maintain official websites. Key features of these websites include the implementation of a Content Management

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System (CMS), document archival with instant search functionality, uniform domain names, and hosting within the Nepal Government Data Center. Additionally, municipalities retain ownership of their data and have full control over access within their respective organizations. These elements are crucial in assessing the effectiveness and readiness of municipal e-governance platforms. The status of official websites and email is shown in Table 2.

Table 2

Status of Official Websites and Email

Official websites and email	**1= Not at all**	**2= Some how agree**	**3= Moderate agree**	**4= Agree**	**5= Highly Agree**	**Total Value**	**Mean**
Municipality has official email in "gov.np" domain					130	650	5
Municipality has official websites					130	650	5
Key feature of new websites : Content Management System, document archival and instant search, uniform domain names, hosted in Nepal Government Data center, ownership of data, control and access to respective organization themselves	25	25	50	30	○	345	2.6

Source: Field Survey, 2024

Table 2 presents the status of official websites and email in municipalities. Regarding the statement that municipalities have official emails in the “gov.np” domain, all 130 respondents highly agreed. The mean value of 5 indicates unanimous agreement, reflecting a very positive perception among respondents.

Similarly, for the statement that municipalities maintain official websites, all 130 respondents highly agreed. The mean value of 5 confirms that respondents perceive this aspect very positively.

However, for the statement concerning the key features of new municipal websites—such as Content Management System (CMS), document archival with instant search, uniform domain names, hosting in the Nepal Government Data Center, ownership of data, and control and

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DOI: 10.3126/nprcjmr.v2i10.85865

access by respective organizations—the responses were more varied. Twenty-five respondents indicated "Not at all," 25 "Somehow agree," 50 "Moderately agree," and 30 "Agree." The mean value of 2.6 suggests that most respondents are less positive about the implementation of these features, indicating that these key aspects are not yet fully satisfactory.

Use of Software

The use of software in municipalities encompasses a range of fundamental applications that support efficient governance and administrative functions. These include Social Security (Online System of the Ministry), Municipal Accounting (SUTRA), Vital Registration (Online System of the Ministry), Revenue/Tax Collection, Planning (Online System of the Municipality), Ward-level Accounting, E-Procurement System, Personnel/Staff Information, Assets Management/Store (PAMS), Office Automation, NGO Management, Disaster Management, Social Mobilization, Mapping/Electric Building Permit System (EBPS), and Drawing and Structural Analysis. These software applications constitute the core attributes of municipal digital service delivery and administrative management. Use of software in different areas are shown in Table 3.

Table 3

Use of Software

Various Software	1=Not at all	2=Somehow agree	3=Moderate agree	4=Agree	5= Highly Agree	Total Value	Mean
Social Security (Online System of Ministry)	-	-	35	95	○	485	3.8
Municipal Accounting (SUTRA)	-	-	○	95	35	555	4.2
Vital Registration (Online System of Ministry)	-	-	30	70	30	520	4.0
Revenue/Tax Collection	-	-	35	95	-	485	3.8
Planning (Online System of Municipality)	-	-	75	55	-	445	3.4
Ward level Accounting	-	-	55	75	-	465	3.6
E-Procurement System	-	-	30	70	30	520	4.0

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Various Software	1=Not at all	2=Somehow agree	3=Moderate agree	4=Agree	5= Highly Agree	Total Value	Mean
Personnel/Staffs Information	25	25	50	30	-	345	2.6
Assets Management/Store - (PAMS)	-	30	70	30	-	390	3.00
Office Automation	95	35	-	-	-	165	1.2
NGO Management	75	55	-	-	-	185	1.42
Disaster related	95	35	-	-	-	165	1.2
Social Mobilization	95	35	-	-	-	65	1.2
Mapping/Electric Building Permit System (EBPS)	-	-	30	70	30	520	4.0
Drawing and Structural Analysis		25	25	50	30	475	3.6

Source: Field Survey, 2024

Table 3 illustrates the use of various software applications within municipalities. The findings indicate that key administrative and service delivery systems, such as Social Security (Online System of the Ministry), Municipal Accounting (SUTRA), Vital Registration (Online System of the Ministry), Revenue/Tax Collection, Planning (Online System of the Municipality), Ward-level Accounting, E-Procurement System, Assets Management/Store (PAMS), Mapping/Electric Building Permit System (EBPS), and Drawing and Structural Analysis, are widely used, with mean values ranging from 3.0 to 4.2. These results suggest that respondents perceive these applications positively and consider them integral to municipal operations. In contrast, software applications related to Personnel/Staff Information, Office Automation, NGO Management, Disaster Management, and Social Mobilization show limited usage, with mean values between 1.2 and 2.6, reflecting gaps in digital implementation in these areas. Overall, while municipalities have successfully adopted core administrative and service-oriented software, certain management and social engagement applications remain underutilized, indicating areas for future development and digital capacity enhancement. The status of new system developed in the municipality is presented in Table 4.

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Table 4

Status of New System Developed

New System Developed	1= Not at all	2= Somehow agree	3= Moderate agree	4= Agree	5= Highly Agree	Total Value	Mean
Online Budget Authorization	-	-	52	48	30	498	3.8
Online Reporting System	37	39	28	26	-	303	2.3
Digital Letterhead	50	50	30	-	-	240	1.8
Mobile App	30	50	50	-	-	280	2.1
Office Automation System	70	60	-	-	-	170	**1.4**

Source: Field Survey, 2024

Table 4 presents the status of newly developed systems in municipalities. Regarding Online Budget Authorization, 52 respondents moderately agreed, 48 agreed, and 30 highly agreed. The mean value of 3.8 indicates that most respondents perceive this system positively, suggesting that municipalities have effectively implemented Online Budget Authorization.

In contrast, the Online Reporting System received more varied and lower responses: 37 respondents indicated “Not at all,” 39 “Somehow agree,” 28 “Moderately agree,” and 26 “Agree.” The mean value of 2.3 reflects a generally negative perception, indicating limited adoption of this system.

Similarly, for Digital Letterhead, 50 respondents selected “Not at all,” 50 “Somehow agree,” and 30 “Moderately agree,” resulting in a mean value of 1.8, showing that respondents largely perceive this system as unavailable.

Regarding the Mobile App, 30 respondents indicated “Not at all,” 50 “Somehow agree,” and 50 “Moderately agree,” with a mean value of 2.1, suggesting limited usage. Finally, the Office Automation System received 70 “Not at all” and 60 “Somehow agree” responses, with a mean of 1.4, indicating minimal implementation. Overall, while Online Budget Authorization is widely recognized, other new systems remain underdeveloped or underutilized in municipalities. Another important aspect is social networking status which is shown in Table 5.

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Table 5

Social Networking Status

New System Developed	1= Not at all	2= Somehow agree	3= Moderate agree	4= Agree	5= Highly Agree	Total Value	Mean
Official Facebook page for information dissemination	-	-	55	75	--	465	3.6
Municipal Facebook Page for Grievance Handling	75	55	-	-	-	185	1.4
Municipality has official twitter page	130	-	-	-	-	130	1.0
Municipality has official YouTube Account	95	35	-	-	-	165	1.2
Live telecast of local events from social media	75	55	-	-	-	185	1.4

Source: Field Survey, 2024

Table 5 presents the social networking status of municipalities. Regarding the existence of an official Facebook page for information dissemination, 55 respondents moderately agreed and 75 agreed, with a mean value of 3.6, indicating a generally positive perception of its availability and use.

In contrast, the municipal Facebook page for grievance handling received predominantly negative responses, with 75 respondents indicating “Not at all” and 55 “Somehow agree,” resulting in a mean value of 1.4. Similarly, the presence of an official Twitter account was rated very low, with all 130 respondents indicating “Not at all,” yielding a mean of 1. This demonstrates a clear lack of adoption.

Other social media services, such as live telecasting of local events, also received low ratings (75 “Not at all,” 55 “Somehow agree,” mean 1.4), as did official YouTube accounts (95 “Not at all,” 35 “Somehow agree,” mean 1.2), reflecting limited implementation. Overall, while official Facebook pages for information dissemination are somewhat functional, other social networking platforms and interactive services remain largely underdeveloped in municipalities. The status of service delivery is also associated with the information service available to the public which is shown in Table 6.

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Table 6

Information Service Request from Public

Information Service Request from Public	1= Not at all	2= Somehow agree	3= Moderate agree	4= Agree	5= Highly Agree	Total Value	Mean
Websites	130		-	-	-	130	1.0
Digital front office	75	55	-	-	-	185	1.4
Citizen Interaction System	70	30	30	-	-	220	1.6
Grievance Handling System	70	25	35	-	-	225	**1.7**

Source: Field Survey, 2024

Table 6 presents the status of information service requests from the public. Regarding the availability of municipal websites, all 130 respondents indicated "Not at all," resulting in a mean value of 1. This reflects a clear absence of functional websites for public service requests. Similarly, for the Digital Front Office, 75 respondents reported "Not at all" and 55 "Somehow agree," with a mean value of 1.4, indicating that respondents perceive the system as poorly implemented. The Citizen Interaction System also received low ratings: in one instance, 70 respondents selected "Not at all," 30 "Somehow agree," and 30 "Moderate agree," yielding a mean value of 1.6; in another instance, 70 respondents indicated "Not at all," 25 "Somehow agree," and 35 "Moderate agree," with a mean of 1.7. These results suggest that municipalities have not effectively established mechanisms for citizen interaction and information service requests. In addition, the service delivery status of any organization depends on organization, its functions and resource mobilization which is shown in Table 7.

Table 7

Organization (Function and Resource Mobilization)

Organization (Function and Resource Mobilization)	1= Not at all	2= Somehow agree	3= Moderate agree	4= Agree	5= Highly Agree	Total Value	Mean
MARS (Office Automation System and Staffs Management System)	25	30	50	25	-	390	**3**
Effective Attendance	-	30	70	30	-	390	**3**
CCTV Surveillance		30	35	45	20	390	**3**

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Digitization of paper records	95	35	-	-	-	165	1.2

Source: Field Survey, 2024

Table 7 presents the status of organizational functions and resource mobilization in municipalities. Regarding MARS (Office Automation System and Staff Management System), 25 respondents indicated "Not at all," 30 "Somehow agree," 50 "Moderate agree," and 25 "Agree," resulting in a mean value of 3. This indicates that most respondents perceive MARS positively and consider it effective.

Similarly, for Effective Attendance, 30 respondents selected "Somehow agree," 70 "Moderate agree," and 30 "Agree," with a mean value of 3, suggesting that respondents view the system as functioning well. The assessment of CCTV Surveillance showed 30 respondents "Somehow agree," 35 "Moderate agree," 45 "Agree," and 20 "Highly agree," yielding a mean value of 3, which reflects a generally positive perception.

In contrast, Digitization of Paper Records received lower ratings, with 95 respondents indicating "Somehow agree" and 35 "Moderate agree," resulting in a mean value of 1.2. This indicates that respondents consider the digitization of paper records to be inadequate.

Overall, while systems such as MARS, Effective Attendance, and CCTV Surveillance are positively perceived, the digitization of paper records remains a significant area for improvement. The overall status of information and service delivery is presented in Table 8.

Table 8

Status of Information /Service Delivery

Information /Service Delivery	**1= Not at all**	**2= Somehow agree**	**3= Moderate agree**	**4= Agree**	**5= Highly Agree**	**Total Value**	**Mean**
Queue Management System	-	25	70	35	-	400	3.0
Group SMS	32	25	48	25	-	326	2.6
Digital Display Boards	-	54	76	-	-	260	**2.5**
Digital Citizen Charter	24	51	75	-	-	351	**2.7**
Free Wi-Fi Zone	-	72	28	30	-	348	2.6

Source: Field Survey, 2024

Table 8 presents the status of information and service delivery in municipalities. Regarding the Queue Management System, 25 respondents indicated "Somehow agree," 70 "Moderate agree," and 35 "Agree," resulting in a mean value of 3. This suggests that respondents perceive the Queue Management System positively and consider it functional.

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In contrast, several other service delivery mechanisms received lower ratings. For Group SMS, 32 respondents reported "Not at all," 25 "Somehow agree," 48 "Moderate agree," and 25 "Agree," with a mean value of 2.6, indicating limited implementation. Similarly, Digital Display Boards received 54 "Somehow agree" and 76 "Moderate agree" responses, with a mean of 2.6, reflecting a generally negative perception. The Digital Citizen Charter, rated by 24 respondents as "Not at all," 51 as "Somehow agree," and 75 as "Moderate agree," yielded a mean value of 2.7, showing limited adoption. Free Wi-Fi Zones were also rated low, with 72 "Somehow agree," 28 "Moderate agree," and 30 "Agree," producing a mean of 2.6.

Overall, while the Queue Management System is positively perceived, other digital service delivery mechanisms such as Group SMS, Digital Display Boards, Digital Citizen Charter, and Free Wi-Fi Zones remain underdeveloped in municipalities.

Discussion

The implementation of e-governance in Nepal reflects an evolving but uneven process shaped by institutional readiness, technological infrastructure, and human capacity. The review of strategic plans—including the *E-Governance Master Plan (2006)*, *Wireless Broadband Master Plan (2010)*, and *ICT in Education Master Plan (2013–2017)*—illustrates that Nepal has made policy-level commitments toward digital transformation. However, as the findings show, the translation of these plans into practice has been constrained by limited institutional capacity, infrastructural disparities, and cultural resistance to change within the bureaucracy. These challenges echo the broader experiences of developing nations where e-governance reform often encounters socio-technical barriers (Heeks, 2002).

From the theoretical standpoint of Sustainable Development and Institutional Theory, e-governance can be interpreted as an enabling mechanism to promote transparency, accountability, and efficiency in governance. Yet, in Nepal's context, these intended outcomes have been partially realized. While technological infrastructures such as telecenters, municipal websites, and foundational administrative software (e.g., SUTRA, Social Security Information Systems) have been established, their integration into routine administrative processes remains inconsistent. The gap between technological availability and effective utilization points to a lack of *institutional adaptation*—where rules, practices, and incentives remain aligned with traditional bureaucratic modes rather than the digital paradigm.

A key barrier identified in the findings concerns technology adoption among senior-level officials (Adhikari, 2017). The persistence of hierarchical and rigid bureaucratic culture, characterized by resistance to innovation and fear of accountability, inhibits digital transformation. Many senior officials remain digitally illiterate or disinterested in ICT-based systems, leading to a form of *technological inertia*. This finding supports earlier scholarship emphasizing that e-governance failures in developing countries are less about hardware and more about "software of governance"—that is, human attitudes, capacity, and institutional culture (Ndou, 2004). Thus, effective e-governance requires not only digital infrastructure but also *social and cultural readiness* within public institutions.

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At the local level, the Rural Urban Partnership Programme (RUPP) emerges as a critical model for participatory and decentralized e-governance. Through initiatives in municipalities such as Bharatpur, RUPP demonstrates that localized interventions—grounded in community mobilization, ICT literacy, and participatory planning—can effectively bridge the digital divide (Ahmad et al., 2013). The replication of these initiatives in other municipalities shows the potential for scalability when local ownership, capacity building, and citizen engagement are prioritized. This aligns with Cultural Landscape and Social Capital Theories, which stress the importance of leveraging local social networks and community resources in development interventions. RUPP's integration of social mobilization with digital governance represents a hybrid approach, combining technological modernization with social empowerment.

However, despite such promising examples, the overall implementation of e-governance in Nepal remains fragmented. The findings indicate that most municipalities continue to rely on manual systems for service delivery and record management. Advanced ICT tools—such as real-time digital portals, mobile applications, and citizen feedback mechanisms—are yet to be mainstreamed. Moreover, while transparency initiatives such as the Transparency International–Nepal (TIN) collaboration with the National Vigilance Center (NVC) have expanded access to information, they have not yet matured into comprehensive anti-corruption digital systems. This fragmentation underscores the absence of a coherent institutional framework for inter-agency coordination and interoperability—an issue identified in multiple studies on South Asian e-governance ecosystems (Bhatnagar, 2014).

The findings also reaffirm that capacity development and digital literacy remain central to e-governance success. Training programs under RUPP and the Human Resource Development Centre (HRDC), which targeted over 69,000 participants, illustrate a growing recognition of human capital as a key driver of digital governance. Yet, the scale of need far exceeds the coverage of such initiatives. Inadequate human-resource development continues to limit the sustainability and local ownership of e-governance projects. Addressing this requires integrating ICT training into regular civil service capacity-building programs and linking performance incentives to digital innovation and service efficiency.

From a policy perspective, the findings suggest that the next phase of e-governance in Nepal must move beyond pilot projects toward systemic integration and citizen-centric service design. Municipalities should focus on developing interoperable systems that connect local databases with provincial and national information frameworks. Moreover, public engagement through social media, open data portals, and digital grievance mechanisms could strengthen accountability and rebuild trust in local governance. These directions align with global trends in *Open Government* and *Digital Democracy*, which emphasize participatory governance and data transparency.

In summary, while Nepal has made commendable progress in establishing the foundations for e-governance, its success is contingent upon the synergy of three interdependent factors: technological investment, human-resource development, and institutional reform. Without addressing the socio-cultural barriers within the bureaucracy and enhancing local-level

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ownership, e-governance initiatives risk remaining symbolic rather than transformative. The findings thus call for a shift from technology-driven to *people-centered digital governance*, emphasizing inclusivity, participation, and institutional learning as the true pillars of sustainable e-governance in Nepal.

Conclusion

The evolution of e-governance in Nepal demonstrates a gradual but incomplete transition from traditional administrative practices toward digitally enabled public service delivery. The strategic frameworks—the *E-Governance Master Plan (2006)*, *Wireless Broadband Master Plan (2010)*, and *ICT in Education Master Plan (2013–2017)*—have laid an essential policy foundation for digital transformation. However, the empirical and literature-based evidence reveals a persistent gap between policy intent and practical implementation. Institutional inertia, limited digital literacy among civil servants, and uneven technological infrastructure have constrained the realization of e-governance's full potential.

The analysis confirms that e-governance is not solely a technological intervention but an institutional and cultural transformation process. The resistance of senior bureaucrats to digital change, as well as inadequate capacity development mechanisms, underscores the importance of *human and social capital* in determining the success of technological reform. Therefore, capacity building, awareness generation, and digital literacy must be prioritized alongside infrastructure development. This aligns with the theoretical perspective that sustainable e-governance requires the co-evolution of technology, institutions, and human behavior.

The case of the Rural Urban Partnership Programme (RUPP) provides a valuable model of how community-based and participatory approaches can localize and sustain e-governance practices. By integrating social mobilization, ICT capacity, and decentralized planning, RUPP has demonstrated that local ownership and contextual adaptation are essential for bridging the digital divide. This reinforces the argument that e-governance must evolve as a *bottom-up process* rooted in local needs and participatory governance rather than as a top-down imposition of technology.

Despite the progress achieved in infrastructure and pilot programs, the findings indicate that most municipalities in Nepal still depend on conventional service delivery systems, with only partial adoption of digital tools. To move beyond symbolic reform, Nepal's e-governance initiatives must now prioritize interoperability, citizen-centric design, and integration across all levels of government. Institutionalizing e-governance within the broader framework of local governance reform and sustainable development will be crucial for ensuring continuity and scalability.

In conclusion, the future of e-governance in Nepal hinges on the synergy of technological innovation, institutional reform, and human resource development. Without cultivating digital competency, fostering participatory culture, and ensuring policy coherence, e-governance risks remaining fragmented and underutilized. Conversely, if Nepal succeeds in harmonizing these three dimensions, e-governance can become a transformative instrument for transparency,

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ISSN: 3059-9148 (Online)
DOI: 10.3126/nprcjmr.v2i10.85865

efficiency, and inclusive development—contributing meaningfully to the broader goals of good governance and national prosperity.

Funding Statement: No fund available from any institution
Transparency Statement: The author confirms that this study has been conducted with honesty and in full adherence to ethical guidelines.
Data Availability Statement: Author can provide data.
Conflict of Interest: The author declares there is no conflicts of interest.
Authors' Contributions: The author solely conducted all research activities i.e., concept, data collecting, drafting and final review of manuscript.

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