

# Digital Literacy and Adoption of Online Municipal Services: A Study of Cloud-Based E-Governance in Biratnagar

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**Abstract:** Cloud based public services can improve the accessibility, responsiveness, and efficiency of municipal administration, but the availability of digital infrastructure does not by itself guarantee meaningful use. This study examines the role of digital literacy in the use of online municipal services in Biratnagar Municipality, Nepal. A cross-sectional survey of 75 respondents, comprising 50 citizens and 25 municipal employees, was analyzed using descriptive statistics, Pearson chi-square testing, and multiple regression. The analysis indicates a statistically significant association between digital literacy and cloud service use. In the regression model predicting online municipal service use, digital literacy was the only statistically significant predictor among digital literacy, education, and age, and the model explained approximately one third of the observed variation in service use. By contrast, the model predicting perceived ease of using cloud services was not statistically significant. These findings suggest that digital skills are particularly important for moving citizens and staff from the availability of online services to actual use. The study recommends practical digital literacy training, simplified service interfaces, accessible user support, and continued attention to inclusion when municipal services are digitized.

**Keywords:** Digital Literacy; E-Government; Cloud Computing; Municipal Services; Biratnagar Municipality

## I. INTRODUCTION

Digital government has changed the way citizens obtain information and interact with public institutions. Online portals, digital payments, electronic records, and cloud-supported applications can reduce transaction costs and make public services available beyond conventional office hours. However, the benefits of digital government are not distributed automatically. Research on e-government adoption shows that perceived ease of use, trust, compatibility, and user capability influence whether citizens move from awareness of a digital service to actual use [1], [2]. The digital divide therefore increasingly includes differences in skills and patterns of use, not only differences in access to devices or connectivity [3].

Cloud computing provides a scalable technical foundation for many digital public services. In this study, it is treated as the technical layer through which digital literacy becomes relevant to actual municipal service use. The National Institute of Standards and Technology defines cloud computing as on-demand network access to a shared pool of configurable

computing resources, supported by characteristics such as broad network access, resource pooling, rapid elasticity, and measured service [5]. For municipalities, these characteristics can support shared applications, centralized records, remote access, and flexible resource allocation. Yet a technically capable platform can still produce limited public value when users lack the confidence or practical skills needed to operate it.

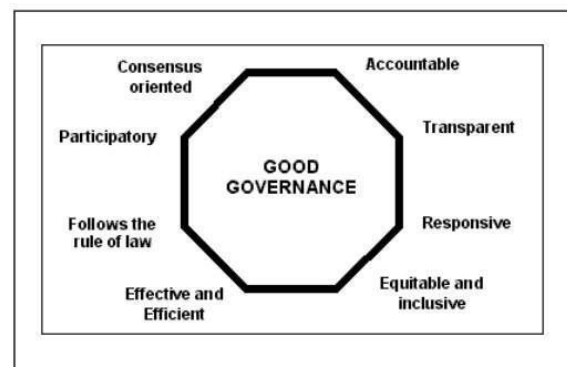


Fig. 1. Characteristics of good governance. Source: Keshav Kharal thesis (2024)

Nepal has made continued progress in digital government. The United Nations E-Government Survey 2024 places Nepal in the high EGDI group, while the national Digital Nepal Framework identifies digital governance, infrastructure, and inclusion as important components of national digital transformation [7], [8]. This national context makes the municipal level an important setting for examining whether digital capability translates into actual use of digital public services. Nepalese e-governance research has also identified implementation, infrastructure, and institutional challenges that remain relevant at the local level [10], [11].

Biratnagar Municipality provides a useful local setting because citizens and municipal staff interact with online services through different levels of digital experience. Evidence from Nepalese municipalities indicates that ICT infrastructure and human-resource capacity are important dimensions of municipal digital governance [12]. The present study focuses on a practical question: does digital literacy meaningfully influence the use of cloud-based municipal services after accounting for age and education? The study also examines whether the same factors explain perceived ease of using cloud services.

The research gap is therefore situated at the intersection of digital capability and local digital service use. Existing literature establishes that digital divides increasingly involve differences in skills and use [1], [3], while technology-acceptance research emphasizes usability and trust [2], [4]. National and international policy documents establish the importance of digital transformation and inclusion [7]-[9]. However, these broad perspectives do not by themselves show how digital literacy is associated with municipal online-service use in the specific context examined here. The present study addresses that gap by combining a user-capability measure with a service-use measure and by controlling for age and education in regression analysis. This provides a focused empirical bridge between the conceptual literature and the practical question facing local government: whether improving user's digital capability is relevant to actual engagement with municipal digital services.

## II. RELATED WORK

### A. Digital Literacy and E-Government Use

Digital literacy can be understood as the practical ability to access, navigate, evaluate, communicate, and complete tasks through digital technologies. In public service settings, this includes activities such as locating the correct municipal service, completing an online form, uploading information, making a digital payment, and resolving common access problems. These capabilities matter because the digital divide can persist after physical access has improved. A literature review of e-governance implementation similarly identifies awareness, literacy level, user acceptability, legal issues, and digitalization as recurring research dimensions [14]. van Deursen and van Dijk show that differences in internet use remain associated with education, age, experience, and other social characteristics [3].

Citizen adoption is also shaped by perceived usability and trust. Carter and Bélanger found that perceived ease of use, compatibility, and trustworthiness are important predictors of citizens' intention to use e-government services [2]. Davis's Technology Acceptance Model similarly identifies perceived usefulness and perceived ease of use as central determinants of technology acceptance [4]. These perspectives support treating digital literacy as a capability that can influence actual engagement with municipal systems. Broader technology-acceptance research also emphasizes that adoption and use should be examined in relation to the context in which the technology is deployed [15].

but meaningful participation requires the user to recognize the appropriate service, understand the information presented by the system, and complete the transaction successfully. In municipal environments, this process can be particularly important because users may approach a digital service only when they have an immediate administrative need. Unlike entertainment or social applications, municipal platforms are often task-specific and may be used infrequently. A user can therefore possess general digital experience while still lacking familiarity with a particular government workflow. This reinforces the value of task-oriented literacy interventions and clear service design. The thesis similarly frames digital literacy as an important condition for the adoption and effective utilization of cloud-based municipal services [16].

Digital inclusion requires more than making a service technically available. The World Bank emphasizes that digital technologies can improve services while their benefits remain uneven when complementary skills, institutions, and access conditions are weak [9]. Evidence from government IT training also indicates that participation in digital skills programs can be associated with greater e-government use, particularly among groups that traditionally use such services less often [6]. This suggests that municipal digital transformation should combine platform development with user capability building. Framework-based studies of e-governance in developing countries likewise emphasize the interaction between technical architecture, institutional conditions, and practical e-service use [13].

### C. Cloud Computing in Public Services

For Nepalese local government, the relationship between infrastructure and human capability is especially relevant because digital transformation is occurring across different institutional and user contexts. National strategies establish a broad direction for digital transformation, but municipal implementation requires the translation of that direction into services that residents can actually use [8]. The literature on Nepalese e-governance points to implementation and institutional challenges, while municipal governance research highlights the importance of ICT and human resources [10]-[12]. These observations support the present study's decision to examine both citizens and municipal employees. The objective is not to evaluate national digital policy or compare municipalities, but to examine whether the capability of users is reflected in patterns of service engagement within one municipal setting.

Cloud computing can support public administration through shared infrastructure, scalable capacity, remote access, and centralized service delivery [5]. Its value in municipal governance is therefore partly technical and partly organizational. The present study does not evaluate cloud architecture or cybersecurity controls directly; instead, it focuses on the human capability needed to use services delivered through online and cloud-supported municipal platforms.

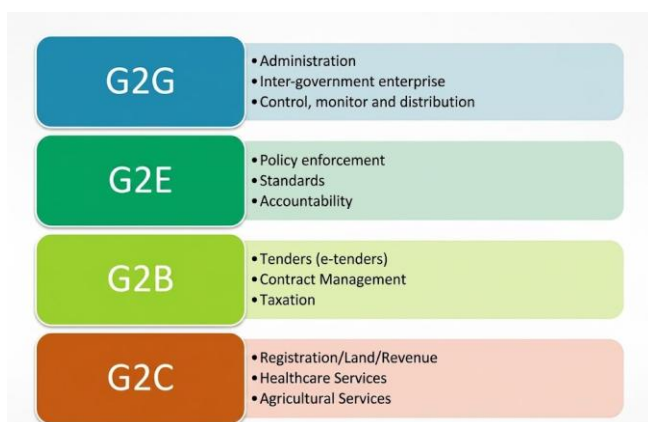


Fig. 2. Major e-governance interaction types. Source: Keshav Kharal thesis (2024).

### B. Digital Inclusion and Training

The literature also suggests that digital inclusion should be understood as a process rather than a one-time condition. Access to a device or connection creates the possibility of participation,

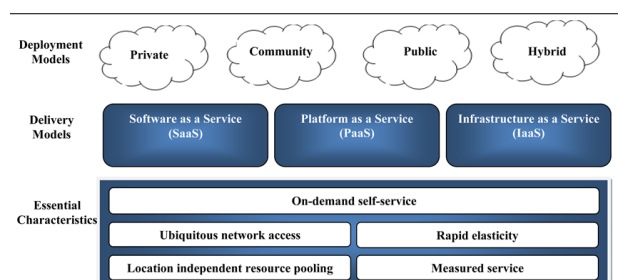


Fig. 3. Cloud deployment, service models, and essential characteristics. Source: Keshav Kharal thesis (2024).

### III. METHODOLOGY

#### A. Research Design and Participants

The study used a cross-sectional quantitative design, consistent with the objective of examining measurable associations among digital literacy, service use, age, and education at one point in time. The original research instrument was structured for two stakeholder groups: municipal employees who deliver or support digital services and citizens who use municipal services. The final analyzed sample contained 75 respondents, including 25 employees and 50 citizens. The thesis describes a broader mixed-method design and includes open-ended questions; however, the inferential results reported in this journal article are based on the quantitative survey data available in the completed study.

Participants were selected from the Biratnagar municipal context. The questionnaire collected demographic information and items concerning general digital literacy, awareness and use of online municipal services, experience with cloud-based services, perceived ease of use, barriers, and preferred forms of digital support. The survey instrument was administered as part of the field survey reported in 2024.

The two stakeholder groups provide complementary perspectives on municipal digital transformation. Citizens represent the demand side of service delivery and their responses indicate how users interact with digital channels. Municipal employees represent the institutional side and work within the processes through which digital services are delivered or supported. Including both groups therefore provides contextual breadth, although the relatively small employee subgroup means that the study does not treat employee-versus-citizen comparison as a primary inferential objective. The original thesis identifies informed consent, confidentiality, and anonymity as ethical considerations; these principles remain applicable to the survey evidence reported here [16].

#### B. Measures and Variables

The measurement approach follows the questionnaire structure used in the thesis and is intentionally focused on practical digital interaction. Rather than treating educational attainment as a substitute for digital literacy, the analysis considers education separately and enters it as a control variable. This is important because formal education and practical digital capability are related concepts but are not equivalent. Similarly, age is included as a contextual predictor without assuming that older or younger participants are inherently more or less capable. The purpose of the model is to determine whether digital literacy retains an association with the outcomes after these characteristics are taken into account. This approach follows the study's central research questions and keeps the analysis aligned with the empirical variables available in the completed survey [16].

Digital literacy was operationalized from responses to practical digital skill and confidence items in the questionnaire. Online municipal service use was represented by the study's coded service use measure. Perceived ease of using cloud services was analyzed as a second dependent variable. Education and age were included as control predictors in the regression models. The analytical framework is shown in Fig. 4.

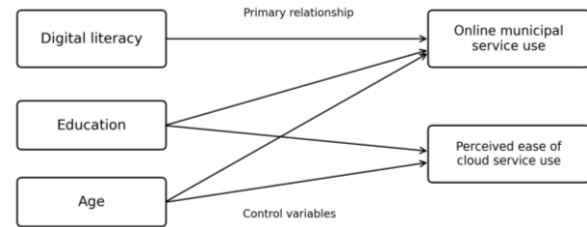


Fig. 4. Analytical framework linking digital literacy with online municipal service use and perceived ease of cloud service use.

The research instrument and initial analytical framework were developed from the author's master's research on digital literacy and cloud-based e-governance in Biratnagar Municipality [16]. The present article refines those materials into a focused empirical analysis and reports only the quantitative relationships supported by the completed survey.

#### C. Statistical Analysis

Descriptive statistics were used to summarize respondent characteristics. Pearson chi-square testing examined the association between categorized digital literacy and cloud service use. Multiple linear regression was then used to estimate the relationship of digital literacy, education, and age with two outcomes: online municipal service use and perceived ease of using cloud services. Statistical significance was evaluated at the five percent level. The regression results below reproduce the numerical results reported in the thesis, while the interpretation has been aligned with the reported significance values.

The sequence of analysis follows the conceptual direction of the study. Descriptive results establish the composition of the participants; the chi-square test then examines the association between categorized digital literacy and cloud service use; regression analysis subsequently evaluates whether digital literacy remains related to the two outcomes when age and education are entered simultaneously. This progression moves from description to bivariate association and then to adjusted association. Because the design is observational and cross-sectional, the analysis is intentionally framed around relationships and prediction rather than causal effects.

### IV. RESULTS AND DISCUSSION

#### A. Respondent Profile

The sample consisted of 59 male and 16 female respondents; no respondent was recorded in the 'other' category. Employees were concentrated in the 31–40 and 41–50 age groups, while citizens were distributed across four age groups, with the largest citizen group aged 36–45.

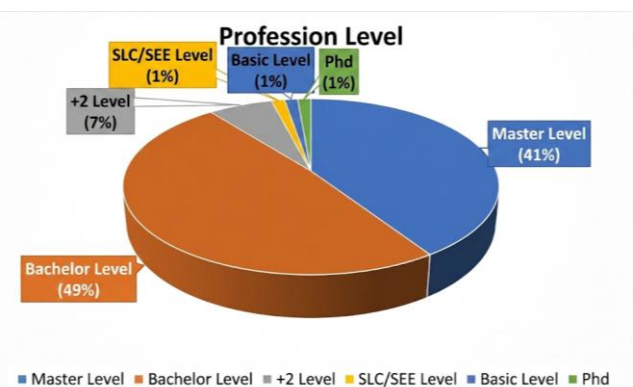


Fig. 5. Educational/profession-level profile of respondents. Source: Field Survey 2024.

Table 1. Age distribution of respondents. Source: field survey 2024.

| Group     | Age range | n  | Percent |
|-----------|-----------|----|---------|
| Employees | 21–30     | 5  | 20      |
| Employees | 31–40     | 10 | 40      |
| Employees | 41–50     | 10 | 40      |
| Citizens  | 16–25     | 7  | 14      |
| Citizens  | 26–35     | 18 | 36      |
| Citizens  | 36–45     | 19 | 38      |
| Citizens  | 46–55     | 6  | 12      |

### B. Association Between Digital Literacy and Cloud Service Use

The cross tabulation reported in the thesis indicates that respondents classified as having higher digital literacy were more concentrated in the higher categories of cloud service use. The Pearson chi-square statistic was 8.847 with three degrees of freedom and a p value of 0.031. The association is therefore statistically significant at the five percent level.

Table 2. Cross tabulation of cloud service use by digital literacy. Source: field survey 2024.

| Cloud service use category | Low digital literacy | High digital literacy | Total                    |
|----------------------------|----------------------|-----------------------|--------------------------|
| 0                          | 6                    | 10                    | 16                       |
| 1                          | 8                    | 7                     | 15                       |
| 2                          | 11                   | 13                    | 24                       |
| 3                          | 2                    | 18                    | 20                       |
| Total                      | 27                   | 48                    | 75                       |
| Pearson chi square         |                      |                       | 8.847; p = 0.031; df = 3 |

The result supports the central argument of the study: digital capability is associated with greater engagement with cloud-supported municipal services. This is consistent with prior work showing that skills and perceived usability shape e-government participation [2], [3]. The result should nevertheless be interpreted as an association rather than proof of causality because the survey is cross-sectional.

From a municipal management perspective, the finding can be understood through the sequence of a digital transaction. A user must first know that a service is available online, identify the appropriate channel, understand what information is required, and then complete the prescribed steps. Failure at any stage can lead the user back to a conventional office-based process or to dependence on another person. Digital literacy can therefore be relevant even when the underlying service is technically simple. The importance of this sequence is consistent with the thesis rationale, which emphasizes the need to understand barriers to successful use as municipalities move toward cloud-based service delivery [16]. The finding should not be interpreted as evidence that every element of this sequence is explained by digital literacy, but it does indicate that user capability deserves explicit attention in municipal digital-service planning.

### C. Regression Model for Online Municipal Service Use

The first regression model examined online municipal service use as a function of digital literacy, education, and age. The model explained approximately 32.3 percent of the variance in the dependent variable and was statistically significant,

$F(3,71) = 11.283$ ,  $p < 0.001$ . Digital literacy was the only statistically significant predictor, with  $B = 0.766$ ,  $t = 5.745$ ,  $p < 0.001$ . Education and age were not statistically significant.

The regression result also helps clarify the role of the control variables. Education was included because formal educational attainment may be associated with opportunities to acquire and practice digital skills, while age was included because the ability and experience to use digital services may vary across life stages. Neither variable was statistically significant in the first model once digital literacy was included. Within this sample, therefore, the evidence does not support treating education or age as substitutes for the direct digital-literacy measure. This is a useful practical point: a municipality should not assume that a person's educational level automatically indicates whether that person can complete a digital service transaction. Direct capability assessment and task-specific support may be more informative for service planning.

Table 3. Regression model for online municipal service use. Source: field survey 2024.

| Predictor        | B             | t                  | p      |
|------------------|---------------|--------------------|--------|
| Constant         | -0.348        | -0.599             | 0.551  |
| Education        | -0.108        | -0.793             | 0.431  |
| Digital literacy | 0.766         | 5.745              | <0.001 |
| Age              | -0.002        | -0.198             | 0.843  |
| Model            | $R^2 = 0.323$ | $F(3,71) = 11.283$ | <0.001 |

The coefficient for digital literacy indicates a positive relationship between digital capability and service use after accounting for age and education. The result is practically important for municipalities because improving access to a portal may have limited effect when users cannot confidently complete the tasks required by the portal. It also reinforces the argument that digital inclusion should be treated as a service delivery issue rather than only an infrastructure issue.

The  $R^2$  value of approximately 0.323 should also be interpreted carefully. It means that the predictors included in the first model collectively account for about 32.3 percent of the observed variance in the online municipal service-use measure within this sample. It does not mean that digital literacy alone accounts for 32.3 percent, because the model contains digital literacy, education, and age together. Likewise, it does not imply that the remaining variation is caused by any particular omitted variable. Factors such as access conditions, previous experience, trust, platform reliability, language, service awareness, and the specific requirements of individual transactions may contribute to the unexplained portion. The model is therefore useful as evidence that digital literacy has a meaningful statistical relationship with the measured outcome, while still leaving substantial room for other explanations.

### D. Regression Model for Perceived Ease of Cloud Service Use

Table 4. Regression model for perceived ease of using cloud services. Source: field survey 2024.

| Predictor        | B             | Std. Error | Beta   | t           | p     |
|------------------|---------------|------------|--------|-------------|-------|
| Constant         | 0.771         | 0.859      |        | 0.898       | 0.372 |
| Education        | -0.005        | 0.202      | -0.003 | -0.025      | 0.980 |
| Digital literacy | 0.379         | 0.197      | 0.229  | 1.919       | 0.059 |
| Age              | -0.002        | 0.017      | -0.017 | -0.144      | 0.886 |
| Model            | $R^2 = 0.051$ |            |        | $F = 1.270$ | 0.291 |

A second regression examined perceived ease of using cloud services. The model explained about 5.1 percent of the variance and was not statistically significant,  $F(3,71) = 1.270$ ,  $p = 0.291$ . Digital literacy showed a positive coefficient of 0.379, but this effect did not reach statistical significance at the five percent level ( $p = 0.059$ ). Education and age were also non-significant.

The difference between the two models is informative. Digital literacy is strongly related to whether respondents use online municipal services, but the evidence is insufficient to conclude that digital literacy, age, and education determine how easy the cloud services feel once they are being used. Perceived ease of use may depend more directly on interface design, language, service workflow, reliability, technical assistance, or trust. This interpretation is compatible with technology acceptance research, in which perceived ease of use is a distinct construct rather than a simple proxy for user skill [4].

The contrast is also useful for interpreting what a municipality should measure in future evaluations. A service-use indicator answers a behavioral question: whether users engage with the digital channel. An ease-of-use indicator answers a perceptual question: how manageable the system feels to users. These outcomes can diverge. A person may use a service because it is necessary even when the process is difficult, while another person may find the interface easy but rarely have a reason to use it. Consequently, improving municipal digital performance requires multiple indicators rather than a single measure of success. The present study contributes to this distinction by testing both outcomes within the same analytical framework.

Taken together, the two models suggest that the most consequential barrier captured by the present data may occur at the point of attempting to use a digital municipal service rather than solely at the point of judging whether its interface is easy or difficult. This distinction has direct policy relevance. If digital literacy is related to actual service use, training and assisted-digital support can reasonably form part of an adoption strategy. If perceived ease of use is not explained by the same predictors, however, the municipality must also examine interface design, language, workflow, reliability, and technical support. The findings therefore point toward a combined user-and-system perspective rather than a single-factor explanation.

### **E. Practical Implications**

The results suggest four practical priorities for Biratnagar Municipality. First, digital literacy initiatives should be task-oriented rather than limited to generic computer awareness. Training should demonstrate the actual sequence of finding a service, completing a form, uploading documents, making a payment, and checking the status of a request. Second, municipal platforms should use clear language, predictable navigation, and accessible instructions. Third, citizens should have low-barrier support through help desks, telephone assistance, or short visual guides. Fourth, employee training should be continuous so that municipal staff can assist citizens as services and interfaces change. These priorities are consistent with evidence that government IT training can support more inclusive e-government use [6].

Implementation should be staged around actual municipal tasks. A municipality could begin by identifying frequently used online transactions and documenting the points at which users commonly need assistance. Training material can then be organized around those transactions rather than around generic software concepts. In parallel, service teams can review whether forms, instructions, error messages, and confirmation steps are

understandable to first-time users. This approach is consistent with the finding that digital literacy is important for service use but does not, by itself, explain perceived ease of use. It also reflects the wider argument that digital transformation requires complementary skills and institutional capacity alongside technology [6], [9]-[11].

### **F. Limitations**

The study has several limitations. The sample is relatively small and is restricted to one municipality, limiting generalizability. The design is cross-sectional, so the regression results should not be interpreted as causal effects. The measures were derived from questionnaire responses and therefore may include self-report bias. In addition, the available thesis does not provide the raw respondent-level dataset, reliability statistics for each constructed measure, or a full record of the qualitative analysis. Future studies should use larger samples, validated digital literacy scales, and longitudinal or multi-municipality designs.

There are also measurement considerations for future replication. The coded cloud-service-use categories reported in the thesis are retained in the article because the available documentation does not provide sufficiently clear semantic labels for every code. Re-labeling those categories from inference would risk changing the original measurement. A future study should document the exact response scale, coding scheme, item wording, and reliability statistics so that the relationship can be reproduced and independently evaluated. Similarly, future work could distinguish between frequency of use, successful completion, satisfaction, and perceived ease, since these represent different stages of the digital-service experience. These improvements would make it possible to examine not only whether digital literacy is associated with use, but also which specific digital tasks create the greatest barriers.

## **CONCLUSION**

This study examined whether digital literacy is associated with effective use of cloud-based e-governance services in Biratnagar Municipality. The evidence indicates a statistically significant relationship between digital literacy and cloud service use. More importantly, the multiple regression model shows that digital literacy is a significant positive predictor of online municipal service use and accounts for a substantial share of the variation explained by the model. Age and education did not make significant independent contributions in that model.

The contribution of the study is consequently both empirical and practical. Empirically, it provides municipality-level evidence connecting digital literacy with online service engagement while separating that relationship from a non-significant model of perceived ease of cloud-service use. Practically, it indicates that local digital transformation should be designed around the complete user journey, from awareness and access to successful completion and follow-up. The article does not claim that digital literacy is the only barrier, nor that training alone will solve usability problems. Rather, the evidence supports a balanced direction in which digital capability, accessible service design, and institutional support are developed together.

At the same time, the second regression model did not establish a statistically significant relationship between digital literacy, age, education, and perceived ease of cloud service use. This distinction indicates that user capability and system usability should be treated as related but separate dimensions of digital government. Municipalities should therefore invest not only in infrastructure and cloud platforms but also in practical

digital skills, user assistance, and service design. A citizen-centered approach that combines these elements can improve the likelihood that digital services are used in practice and that the benefits of municipal digitalization are distributed more broadly.

The practical lesson is therefore not simply to provide more training or more technology. Digital government works as a chain in which infrastructure, institutional processes, service design, user capability, and support mechanisms interact. Weakness at any point can reduce the value of the overall service. The present findings identify user capability as an important part of that chain because digital literacy remains a significant predictor of online municipal service use. At the same time, the non-significant ease-of-use model indicates that capability cannot be treated as a complete explanation. A sustainable municipal strategy should consequently combine capability building with continuous review of the digital service experience.

The same reasoning has implications for evaluation. If a municipality introduces a new online service, success should not be judged only by whether the platform is operational or by the number of registered users. Evaluation can also examine whether users understand the service, can complete common tasks without assistance, receive clear confirmation, and can recover when an error occurs. These measures would connect technical deployment with meaningful service outcomes. They would also provide stronger evidence for determining whether training programs are effective. In future intervention research, a baseline measure of digital literacy could be collected before training and compared with later measures of service completion. Such a design would move beyond the present cross-sectional association and provide a stronger basis for causal inference.

### References

- [1] F. Bélanger and L. D. Carter, "The impact of the digital divide on e-government use," *Communications of the ACM*, vol. 52, no. 4, pp. 132–135, 2009, doi: 10.1145/1498765.1498801.
- [2] L. Carter and F. Bélanger, "The utilization of e-government services: citizen trust, innovation and acceptance factors," *Information Systems Journal*, vol. 15, no. 1, pp. 5–25, 2005, doi: 10.1111/j.1365-2575.2005.00183.x.
- [3] A. J. A. M. van Deursen and J. A. G. M. van Dijk, "The digital divide shifts to differences in usage," *New Media & Society*, vol. 16, no. 3, pp. 507–526, 2014, doi: 10.1177/1461444813487959.
- [4] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319–340, 1989, doi: 10.2307/249008.
- [5] P. Mell and T. Grance, *The NIST Definition of Cloud Computing*, NIST Special Publication 800-145, National Institute of Standards and Technology, 2011, doi: 10.6028/NIST.SP.800-145.
- [6] J. B. Lee and G. A. Porumbescu, "Engendering inclusive e-government use through citizen IT training programs," *Government Information Quarterly*, vol. 36, no. 1, pp. 69–76, 2019, doi: 10.1016/j.giq.2018.11.007.
- [7] United Nations Department of Economic and Social Affairs, *United Nations E-Government Survey 2024: Accelerating Digital Transformation for Sustainable Development*, New York, NY, USA, 2024.
- [8] Government of Nepal, Ministry of Communication and Information Technology, 2019 Digital Nepal Framework: Unlocking Nepal's Growth Potential, Kathmandu, Nepal, 2019.
- [9] World Bank, *World Development Report 2016: Digital Dividends*, Washington, DC, USA: World Bank, 2016, doi: 10.1596/978-1-4648-0671-1.
- [10] G. P. Adhikari, "Key issues in implementing e-governance in Nepal," in *Proceedings of the 1st International Conference on Theory and Practice of Electronic Governance (ICEGOV 2007)*, pp. 243–245, 2007, doi: 10.1145/1328057.1328107.
- [11] S. Shakya, "E-governance in Nepal: Progress, challenges and possibilities," *Public Affairs and Governance*, vol. 6, no. 1, pp. 1–22, 2018, doi: 10.5958/2321-2136.2018.00001.2.
- [12] R. Gyawali, "Nepalese municipal governance: A comparative case study of Kathmandu and Lalitpur metropolitan cities," *Research Nepal Journal of Development Studies*, vol. 1, no. 1, pp. 66–72, 2018, doi: 10.3126/rnjds.v1i1.21275.
- [13] M. M. Rahman and S. A. A. Rajon, "An effective framework for implementing electronic governance in developing countries: Bangladesh perspective," in *Proc. 14th International Conference on Computer and Information Technology (ICCIT)*, 2011, doi: 10.1109/ICCITech.2011.6164814.
- [14] M. Singh and G. P. Sahu, "Study of e-governance implementation: A literature review using classification approach," *International Journal of Electronic Governance*, vol. 10, no. 3, pp. 237–260, 2018, doi: 10.1504/IJEG.2018.095954.
- [15] Venkatesh, J. Y. L. Thong, and X. Xu, "Unified theory of acceptance and use of technology: A synthesis and the road ahead," *Journal of the Association for Information Systems*, vol. 17, no. 5, pp. 328–376, 2016, doi: 10.17705/1jais.00428.
- [16] K. Kharal, "Digital Literacy for Effective Cloud-Based E-Governance in Biratnagar Municipality," Master's Thesis, Purbanchal University School of Science and Technology, Biratnagar, Nepal, 2024.