E-governance Practice in Tribhuvan University, Nepal

A Dissertation

Submitted to the Central Department of Rural Development
Tribhuvan University, Kirtipur, Nepal
For the Partial Fulfillment of the Requirements of the Degree of
Master of Philosophy in
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- Noda Nath Trital

Abstract

University governance through e-governance practice by using ICT tools has played a vital role to manage and deliver public services effectively and efficiently at university. This study attempts to identify the ICT-based e-governance practices and the capacity development of service delivery in TU and assess the role of e-governance for governance reform in service delivery. The mixed method approach has been applied to collect the data from primary sources and document review to collect secondary data in this study. The survey has been conducted with 277 participants for the quantitative data collection. Key Informant Interviews (KIIs) are taken with nine key administrative authorities and ICT expert. Similarly, Focus Group Discussions (FGDs) are conducted with three major stakeholders' organizations TUTA, TUEA and FSU to triangulate the information collected from survey and KIIs. The finding reveals that a dozen of ICT-based e-governance tools have been used for service delivery in different areas of services in TU. The perception of e-governance in the area of administration, finance, library and examination is positively correlated with the role of e-governance for governance reform in service delivery in terms of gender and educational attainment of the employees. The ITIC has been established, and the major policy of IT and digitalization strategic plan have been developed for establishing infrastructure of e-governance in the university. The budget for infrastructure of e-governance and capacity development of human resources has been regularly allocated from the university's Senate yearly and the capacity development trainings are regularly being conducted by the university. The office management system using e-governance practice has been found in dual nature of record keeping in both computerized and manually filling system. E-governance practices play a vital role to change the existing system of university service delivery and effectively reduce corruption and ensure accountability and transparency for academic integrity. Digital platforms are used for digital communication using ICTs for service delivery. The lack of quality software, trained technical human resources, clearly stated policy and utilization of existing infrastructures are the main challenges in the implication of e-governance for service delivery.

Key words: Digitalization, e-governance, ICT infrastructure, service delivery, university governance,

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Acronyms/Abbreviations

AD	: Anno Domini
AGORA	: Access to Global Online Research in Agriculture
AI	: Artificial Intelligence
AIMS	: Auditing Information Management System
AIT	: Academic Integrity Theory
ARDI	: Access to Research for Development and Innovation
BC	: Before Christ
BIMS	: Budget Information Management System
CCTV	: Closed-circuit Television
CDs	: Central Departments
CD	: Coordination Division
CDC	: Curriculum Development Center
CDSISIS	: Computerized Documentation System/Integrated Set of Information Systems
CEDA	: Center for Economic Development Administration
COVID-19	: Coronavirus disease of 2019
DBS	: Database
DGF	: Digital Governance Framework
EBSCO	: Elton B. Stephens Company
EGDI	: E-government Development Index
EIFMIS	: Electronic Integrated Financial Management Information System
EMIS	: Education Management Information System
EMS	: Electro-magnetic Security
FAD	: Financial Administration Division
G2B	: Government to Business
G2C	: Government to Citizen
G2E	: Government to Employee
G2G	: Government to Government
GAIS	: General Accounting Information System
GIS	: Geographic Information System
GOALI	: Global Online Access to Legal Information

GoN : Government of Nepal
HEI : Higher Education Institution
HEP : Higher Education Project
HINARI : Health Inter-Network Access to Research Initiative
i.e. : id east (that is)
ICT : Information Communication Technology
ID : Identity
IDI : ICT Development Index
IIMS : Income Information Management System
IIS : Internal Information System
IIWNIP : Internet, Internet and Wireless Network Infrastructure Project
IoST : Institute of Science and Technology
IT : Information Technology
ITIC : Information Technology Innovation Center
ITU : International Telecommunication Union
JSTOR : Journal Storage
LMS : Learning Management System
LIMS : Loan Information Management System
MoU : Memorandum of Understanding
MPhil : Master's in philosophy
MS : Microsoft
MUSE : Museums uniting with Schools in Education
NepJol : Nepal Journals Online
NHEP : Nurturing Higher Education Project
NREN : Nepal Research and Education Network
NTC : Nepal Telecom
ODEC : Open and Distance Education Center
OECD : Organization for Economic Cooperation and Development
O&M : Organization and Management
OPRP : Online Presence Reform Project
PC : Personal Computer

PCL	: Proficiency Certificate Level
PGIMS	: Pension and Gratuity Information Management System
PhD	: Doctor of Philosophy
PIMS	: Payroll Information Management System
PSC	: Public Service Commission
QR	: Quick Response
RFID	: Radio Frequency Identification
SDCREMIS	: Supply, Development, Commissioning and Re-engineering of Examination Management Information System
SEE	: Secondary Education Examination
SLC	: School Leaving Certificate
ST	: Stakeholder Theory
TU	: Tribhuvan University
TUCL	: Tribhuvan University Central Library
TUEC	: Tribhuvan University Executive Committee
TUEMIS	: Tribhuvan University Education Management Information System
TUOEC	: Office of the Examination Controller
UGC	: University Grant Commission
UN	: United States
VPN	: Virtual Private Network
WEBGISMS	: Web-based Geospatial Image Streams Information Management System
Wi-Fi	: Wireless Fidelity

CHAPTER I: INTRODUCTION

1.1 Background of the Study

University governance includes the governing processes of a university in decision making process, managing service delivery and participation of stakeholders. E-governance practice refers to the functionality that uses ICTs to enhance quality of services delivered to the stakeholders. The e-governance practice has become an effective tool for university's governance reform and ease to provide efficient and effective service delivery. A University is an institute of higher education and research that awarding academic degrees in a group of subjects and provides both undergraduate and post graduate education (Akash, 2015). The production and application of knowledge and the training of human resources are the major functions of higher education institutions (GoN, 1993).

The objective of the university education is to provide knowledge to needy in changing requirements, to develop the innovative ability and moral values, to develop competent human capital for society, to disseminate scholarship and knowledge to needy to create a useful academic environment, to develop the sense of social responsibilities, to promote equality and social justice etc. (Akash, 2015). Universities have shifted from primarily providing education to emphasizing research (Serger, et. al, 2015). The vital work of university is to produce efficiency of cultivating talents, and the evaluation of university governance is a scientific and reasonable comprehensive evaluation to measure the economy, efficiency (Bian, 2021).

The major functions, duties and powers of universities are teaching, trainings and research works and the academic role of higher education institutions are to set curricula of the subjects of which study, research and training, teaching, trainings and research works, plans and programs for the enhancement of educational and academic standards, exams, internationalization, manage property, budget and program (GoN, 1993).

University governance is a system that gives academics, non-academic support staff and students the right to elect their representatives in university and faculty councils. The university and faculty councils became the centers of power. The role of the councils changed from that of control bodies to that of advisory bodies in Dutch universities and became the centers of power (Maassen, 2000). University governance includes decision making process and participation of stakeholders in the governing process. Educational governance is about policies and legislations

concerned in decision-making for influencers and stakeholders inside and outside the universities (Costandi, et. al, 2018).

The key organizational structures of university provision made by the statute are University Assembly, Academic Council, Executive Council, Service Commission, Institutes, Faculties, Departments, Schools, Constituent Campuses, Affiliated Campuses, Research Centers and other bodies which make the university functional and alive effectively and efficiently. The main office-bearers in university governance system are Vice-chancellor, Chairperson of Service Commission, Rector, Registrar, Dean, Executive Director, and Assistant Dean, Campus Chief, Exam Controller, and other prescribed office-bearers for daily administration. The administrative process in the higher educational sector is known as higher education governance and the arrangement of the administrative part of higher education led by universities is called university governance (Akash, 2015). Higher education in Nepal has been effective to satisfy the different stakeholder as well as to meet the objectives for which it was envisioned in terms of the perspectives of subject matter, students', employers', faculties' and employees' perspectives. (Upadhyay, 2018).

E-governance is an application of ICT which provides citizens to access government services and information by electronic means. E-portal, as a dimension of e-governance, is a specially designed webpage at website which brings all the information together related to specific topic or subject matter from different sources in a uniform way (Dhindsa, et. al, 2013). Benchmarking of e-governance framework would help the HEIs to identify their strengths and weaknesses at an internal level and face threats and opportunities at the external level, to improve the global quality of services and of the efficiency (Dey & Sobhan, 2007).

E-governance is the use of information and communication technologies for the planning, implementation, and monitoring of government activities. It has provided electronic information infrastructure to simplify service delivery, reduce duplication and improve the level and speed of service at a lower cost and it helps to deliver cost-effective and easy-to-access citizen services, and improve processing of transactions both within the government, and between the government and other agencies to achieve the world class standard services. (Shrivastava, et.al, 2014).

The main purpose of introducing e-governance in universities is to promote transparency and efficiency in administration, improve service quality to students and other stake holders,

provide educational access to larger sections of the society, and offer affordable education to the needy. The possible areas of implementation of e-governance in educational sector are e-administration, e-services, e-participation, improved education system, enhanced teaching tools, multi-user centralized information, integrated services, anywhere, anytime information, cost reduction and affordability, improved decision making and protection of information (Koudiki & Janardhanam, 2017).

E-governance is the solution to enable transparency and eliminating arbitrariness in decision-making because rapid growth in enrolment has made governance a challenging task. Leadership and governance practices, teaching and learning practices, professional development of teaching and non-teaching staffs, assessment practices, collaboration and networking; and infrastructure are the six parameters of e-governance which are assessed with the status of ICT integration. (Chopra, 2019). So, e-governance is an emerging trend with the advent of ICT to re-invent the way the government works, becoming a new model of governance. Application of e-governance in education sector is the demand of time to improve students' skill and enhance the quality of education. It increases the management capabilities of the educational institutions enhancing the quality of education as well as human resource development. ICT has been contributing a lot to improve the quality of education and to develop human skills making them fit for the competitive global market (Seddiky & Ara, 2015).

Dar (2022) has explained the successful implementation of e-governance needs proper privacy, security and digital literacy. All e-governed services have made information accessible to citizens 24 hours a day, seven days a week in a convenient, efficient, and transparent manner, resulting in good governance. Similarly, Austin & Jones (2016) states that governance is essential to the functioning of higher education at all levels, from the basic academic unit of the department (micro level) to the level of organization (meso-level) and at the level of the higher education system (macro level).

In the above discussion, it is clearly stated that universities are educational institutions that perform basic functions of producing trained human resources, assigning tasks of combination of cultural, social and educational roles in all societies. So, universities must improve their service delivery using ICTs based e-governance tools and meet the perceived target of governance to be transparent and accountable with the concerned stakeholders for promotion of good governance in the institutions aiming to produce highly skilled manpower for

the nation. The application of e-governance has become an effective tool for university governance reform and fast ease to provide efficient and effective service delivery. Some functional areas of e-governance are useful for the participation in decision making processes of universities and need effective and efficient service delivery tools. So, e-governance practices for higher education institutions are vital for maintaining quality of effective service delivery to the concerned people. The concept of e-government and e-governance are interrelated but two different mechanisms where the concept of e-government is a system that uses ICT to enhance government operations and procedures with the goal of boosting civic engagement and effectiveness. On the other hand, e-governance practice refers to the functionality that uses ICTs to enhance a range and quality of services delivered to the citizens. This study has focused on the later one concept.

1.2 Statement of the Problem

Nepal is still far behind in e-government development index (EGDI) by UN e-government survey though a clear vision on implementation of e-governance by deploying their master plan for e-governance (EGMP) in 2006 (Verma & Bharti, 2019). In the UN EGDI report of 2022, Nepal has ranked in 125th position with the score of 0.5117 out of 1.0 score among 193 countries. This index has been published since 2003. Nepal has improved its status from the beginning year up to 2022. The rank was 130 in 2003, and the rank was 165 in 2014. Though the status has been improving, and the latest status was improved than previous rank of 132 in 2020. According to the latest report published by the International Telecommunication Union (ITU) in 2021, Nepal ranked 142nd out of 193 countries in the ICT Development Index (IDI). It reflects the status of the country for the ICT-sector infrastructure development.

There are seventeen universities established by the federal and provincial governments in the country. Tribhuvan University is the oldest and largest university which has 62 constituent colleges and more than thousand affiliated private and community colleges. The forms of university governance, forming regulatory bodies, using ICTs for e-governance practices, composition of implementing agencies, level of participation of stakeholders in decision making process and leadership of the universities are the major issues to find out in the university governance systems at all levels. To better understand university governance through e-governance tools at Tribhuvan University, this study looks at the level of e-governance

infrastructure, policies and service users' and seekers' opinions in terms of e-governance practices for effective and efficient service delivery in university governance.

E-governance plays a vital role in university governance systems. The first e-Governance initiative was launched from Chile (UN, 1972). After that, developed nations started adopting e-governance to serve their citizens by means of efficient and effective services, with accountability and transparency for growing demand of the society (Dey & Sobhan, 2007). Universities are finding it difficult to bring in transparency, efficiency, economy and good governance and introducing e-governance in university administration holds the promise for, growth and development of universities to promote administrative efficiency. The most important driving force behind e-governance is innovation (Koudiki & Janardhanam, 2017). Political, organizational, structure, demographic, communal and financial factors are the key hurdles in implementation of e-governance in a nation (Verma & Bharti, 2019). These areas of good governance including e-governance are the scopes for research in Nepalese universities.

Good Governance (GG) is an effectiveness and efficiency of government service delivery system. E-governance is a process of enhancing good governance using Information, Communication and Technologies (ICTs) at various levels of government services, public sector and beyond. E-governance in Nepal has been evolved from computerization of government departments to initiatives that encompass the best aspects of good governance as citizen centricity, service orientation and transparency. In this good governance context, the application and role of e-governance at the well-established oldest university has not been extensively studied. There has not been sufficient research carried out on how universities are managed from the outset and what kind of e-governance structure they apply in the administration for promoting effective and efficient service delivery. The history of establishment of TU and digitalization process of university using ICTs may be a first application of e-governance as a model of university good governance. The main things to look out for in university governance systems at service delivery sector are the e-governance practices in different units of the university using ICT tools for good governance and the degree of service users' and receivers' participation in the decision-making process through the e-governance practices.

1.3 Research Questions

The structured research questions regarding e-governance practice applied in the different dimensions of the university governance in the TU which are served as the study's guide, and

these are aid in the identification of more effective governance reform on service delivery in terms of e-governance practice in the administration system of university. This research has been conducted from a mixed method approach. It is guided by the following research questions:

a. What is the existing ICT based e-governance practice for effective and efficient service delivery?
b. Why are ICT based e-governance practices useful for service delivery at university?
c. What has changed in the quality-of-service delivery for university governance through the implementation of e-governance practice and how does the system interact with service receivers?

1.4 Objectives of the Study

The main objective of the study is to identify the ICT based e-governance practice for service delivery in TU. The following are the specific objectives of this study:

a) To identify the ICT based e-governance practices for service delivery.
b) To assess the role of e-governance for governance reform in service delivery.
c) To explore the capacity development of service delivery for e-governance practices.

1.5 Significance of the Study

This research is significant for policy feedback on e-governance practice at university to run and reform the public services of the universities in the future. The findings of this research are useful for the governments, meta-governance bodies, meso-level university governance mechanisms, micro-level e-governance implementing units and all university authorities following the e-governance practices to improve the governance system of the university. This study has revealed that the ICT based e-governance practices in university services are vital for service delivery and the role of e-governance practices for university governance reform for improving service delivery is crucial in TU. Similarly, this study has become significant to identify the capacity development of service delivery for e-governance practices and revealed the implementation status of the ICT and digitalization policies in TU.

1.6 Limitation/Delimitation of the Study

This research is limited to identify the ICT based e-governance practices for service delivery in TU and assess the role of e-governance for university governance reform in service delivery in TU. It tries to identify the capacity development of service delivery for e-governance practices

and assess the application of e-governance, it's policies and practices in TU for university governance. The study is limited to Tribhuvan University and linked with e-governance practices in service delivery for the university governance. This research has its delimitation for not covering all applications of e-governance practices in other universities in Nepal beyond Tribhuvan University.

1.7 Operational Definition of Term Used

The following definitions are useful and relevant for this study:

Mean and Standard Deviation: The mean is a measure of central tendency, or average that is calculated by dividing the sum of all values by the number of values. Similarly, the Standard Deviation (SD) is a measure of variability that shows how spread out the values are from the mean. A large SD indicates that the data points are far from the mean, and a small standard deviation indicates that they are clustered closely around the mean.

Skewness: Skewness always measures symmetry, or more precisely, the lack of symmetry of a given data. A data set or distribution of data is symmetric if it looks the same to the left and right of the center point. The value zero reflects the skewness for a normal distribution, and any symmetric data should have a skewness near zero.

Pearson Correlation (r): The Measurement of Pearson correlation is the strength and direction of the linear relationship between two variables. Values range from +1: Perfect positive correlation, 0: No correlation and −1: Perfect negative correlation. Their significance levels are indicated as "**" Significant at $p \leq 0.01$ (strong evidence of a relationship) and "*" Significant at $p \leq 0.05$ (moderate evidence of a relationship)

1.8 Organization of the Study

The study is organized by systematic way of dissertation writing. It follows TU's dissertation formatting and organization manual. The research has been organized into five chapters following the format given by the department. The first chapter consists of introduction to the study area, a statement of the problem, research questions, objectives, importance, and the limitation/delimitation of the study. Similarly, the second chapter consists of relevant literature review that includes theoretical, conceptual, empirical, and policy reviews as well as conceptual framework. The third chapter covers the research methodology and chapter four presents an analysis, discussion and interpretation of the data. The fifth chapter presents the summary of findings, conclusion and recommendation; followed by references and appendices.

CHAPTER– II: LITERATURE REVIEW

2.1 Conceptual Review

Many public universities have direct interactions with the state and private institutions which are regulated by government frequent interaction using some ways or mechanisms. The mechanisms that facilitate such types of interaction and define levels of authority constitute elements of state-university governance. The state provides universities with funding in exchange for the education of its citizenry, the advancement of knowledge, and the maintenance of society.

The fundamental principle of university declared in the Magna Charta (1988) are described as the university is an autonomous institution at the heart of societies which produces, examines, appraises and hands down culture by research and teaching. Similarly, teaching and research in universities must be inseparable, freedom in research and training are the fundamental principle of university life, and governments and universities must ensure respect for these fundamental principles. Another principle is that university is an ideal meeting-ground for teachers capable of imparting their knowledge and well equipped to develop it by research and innovation and the last principle is that a university is the trustee of the European humanist tradition; its constant care is to attain universal knowledge.

The core of university governance may be visualized as a set of overlapping circles, with faculty, policies related to academic freedom, and research centers in one circle; senior administrators, budgets, and regulations in another; and department heads in an overlapping segment (Birnbaum,1988). Similarly, Tierney (1988) described six cultural concepts in organizational framework which differs institutions of higher education from other organizations and the concepts within the framework are environment, mission, socialization, information, strategy, and leadership. State driven external pressures were the factors within governance structures in the distinct phases of internal balances in British universities governance.

The most sacred task of the university president is to inspire faculty to devote themselves to a cause greater than themselves-the education of their students and the creation of knowledge. Universities have always had to deal with faculty, staff, students, trustees, townspeople, and alumni. Now, they also must deal with foundation and government representatives, other potential donors, political and social activists, as well as the media (Lipman-blumen, 1998).

Bian (2021) has stated that the vital work of university is to produce efficiency of cultivating talents, and the evaluation of university governance is a scientific and reasonable comprehensive evaluation to measure the economy and efficiency. Three models of university governance which are constructed in Chinese universities. The theory of data life cycle, the stakeholder theory and the theory of collaborative governance are the major theories used in overall planning and seamless connection among the theories.

Shattock (2017) identified that British university governance over a period of nearly a century have been considerable changes in the way universities have distributed authority in governance although the legal frameworks, statutory and legislative, have remained largely unchanged. State driven external pressures were the factors within governance structures in the distinct phases of internal balances but Costandi, et. al (2018) have found out the universities that the Arabian Gulf region is imitating Western universities and shifted in governance from academies to the market model of a university which has impacted universities governance system. So, university governance system has been evolving in different countries and regions.

Shrivastava, et. al (2014) have defined e-governance is a set of activities involving the effective contribution of ICTs for strengthening administration and management in higher education system which has become very important for the government to keep track of their functioning. The introduction of e-governance in higher education, as a global phenomenon, empowers the governing bodies to administer the progress of education plans in the whole country and serves various stakeholders in a much better way. The benefits of e-governance in an educational sector are improved efficiency, increase in transparency and accountability of educational administrative activities, convenient and faster access to services, and lower costs for administrative services. Similarly, Mahajan (2015) has stated that the governments in most developing countries have started using e-governance as a mechanism to engender change in their governance systems for achieving development goals and to ensure better service delivery to citizens and other stakeholders.

UN has defined e-governance as the solicitation of electronic resources like internet and other ICT applications in an application perspectives, to abridge and improve self-governing, government and commercial features of governance from a government processes perspective, as a tool that addresses the desire and need of citizens, firms and government to decrease facility rate, increase the speed of facility delivery from service perspectives and it provides the citizen

empowerment through access to information and enables citizens to contribute in the policy making procedure and making administration more responsible, translucent and operative from an online perspectives (Singh & Sahu, 2018).

Costandi, et. al (2018) have identified the main indices of university governance which are democracy in decision-making, transparency in procedures, desire for changing to better, enough academic freedom, efficiency in accomplishing missions, accountability and responsibility. Similarly, Mathew (2018) has revealed the fact that the bureaucratic and government control on university management and functions has systematically eroded its autonomy by packing to majority the university policy, executive and academic bodies with government nominees and representatives of private education managements, by bringing all the vital functions of the university under government control, and by resisting any effort of the universities to curb commercialization of education and enforce their rules and norms, standards and quality of education.

Chopra (2019) has revealed that accuracy and cost saving through using technology have encouraged HEIs to embrace ICT in all its administrative management functions. Top management support, functional autonomy, adequate training and motivation for the staff and students, budgetary support and infrastructural facilities emerge as important factors in determining success in the implementation of ICT in the HEIs. Similarly, Hai & Anh (2022) has investigated academic staff's participation in university governance and found the fact that in the areas of institutional management, staffing, academic programs and research and financial management that the participation level by staffs in university governance is low and the influences of staff participation were reported higher in staffing and academic areas than in organizational and financial sector.

In the above discussion, the conceptual aspect of university governance and e-governance are inseparable and interrelated in higher education institutions. E-governance is the most powerful tool for university good governance and plays vital role for enhancing effective and efficient public service delivery in the university.

2.2 Theoretical Review

Theoretical review provides vital insights into how universities can effectively implement e-governance initiatives using ICTs that fulfill the service users' and receivers' needs. Theoretical frameworks support to understand how e-governance can be effectively implemented for

university governance using information and communication technologies (ICTs) by universities to promote transparency and accountability as well as to enhance service delivery and improve the communicative interaction with service users and receivers. The lens of theories has supported to shape this study to make conceptual and theoretical framework in research work.

Institutional theory explores and explains the fact that the status of organizational communication in terms of shared pre-existing rules, beliefs, and norms in the external environment of institutions. This study also explores the facts of ICT-based e-governance practice in TU. It has been applied in the conceptual framework to emphasize the role of higher education institutions, how infrastructures, policies and cultural norms influence the implementation of e-governance practices using ICT initiatives. It has helped to find out the variables, like infrastructures of e-governance practices for service delivery in the university administration governance mechanism.

Similarly, the Academic Integrity Theory (AIT) is applied in university governance through e-governance practices by informing policy making process for enhancing transparency and accountability measures. This study also explores accountability and transparency to reduce corruption and provide hassle-free services using e-governance practice in different dimensions of universities. It has been promoting literacy education focused on ethics, establishing monitoring mechanisms for misconduct prevention, engaging service users and receivers regarding integrity standards, ensuring data protection compliance with privacy laws while fostering a cultural shift towards valuing ethical conduct in the institutions. It can be assessed on the basis of honesty, fairness, trust, responsibility and respect in the university governance process to control lacking integrity, fraud, misconduct, dishonesty, cheating and collusion.

The Stakeholder Theory (ST) is an inclusive approach to gather diverse perspectives in service delivery process and fosters a sense of ownership among the service users and receivers together with all stakeholders. It proposes that all stakeholders should be carefully considered during effective service delivery in their administrative operations. In the context of higher education institutions, stakeholders include all service receivers and service users, such as, students, faculty, staff, alumni, government bodies, and all societal community. This study has explored the capacity development of service delivery using e-governance practice that enhances all kinds of stakeholder engagement by creating applicable platforms for interaction, communication and feedback through the basis of online platforms. The study tries to find out

the status of digital platform infrastructure for quality service delivery and capacity development of human resources for co-ordination, data protection and collaboration using the lens of the stakeholder theory.

In this regard, this study reflects a pragmatic approach to the e-governance practices for university governance reform, grounded in the belief that change is both desirable and achievable within university. While drawing insights from philosophical principles and theoretical frameworks, the study has offered practical recommendations and actionable strategies for improving service delivery through e-governance practices to university governance. Pragmatism emphasizes the importance of experimentation, adaptation, and interactive learning in the pursuit of effective governance outcomes through e-governance practices.

In the above discussion about theories, the institutional theory, stakeholder theory and the theory of academic integrity are the major theories applied for this study to assess the role of e-governance practices and find out the digital and physical infrastructure of e-governance as well as the development of capacity of service delivery and human resources for university governance and to solve the research questions for fulfilling the objectives of the study.

2.3 Empirical Review

Adhikary (2024) has identified manual processes as major challenges among the challenges of hello effect and political interference, lengthy processes, centralization, lack of security and lack of infrastructure at TU. Adhikary claims that despite advancements in technology, the examination system relies heavily on outdated manual processes and argues that physical submission and documentation increase the risk of errors, misplacement or mishandling of documents as well as consume time and resources. Similarly, the procedure through manual system may be susceptible to biases and inconsistencies, undermining the fairness and reliability of assessments in the examination process.

Shrestha (2024) defined financial administration as a foundation of good governance because it supports achieving the goal effectively and efficiently with financial governance and discipline. TU has started to implement TU Integrated Online Budget Management System, TU Affiliation Service Charge Management System, TU Debt Management Information System, TU Pension Facility Management System and TU Integrated Arrear Record Management System. Similarly, TU has further started to develop e-administrative tools like TU Electronic Integrated Financial Management Information System (TUEIFMIS), TU Online Presence Reform Project

(TUOPRP), TU the Supply, Development, Commissioning and Re-engineering of Exam Management Information System (TUSDCREMIS), TUWEBGISMS (WMS), TUEMIS and TU Internet, Internet and Wireless Network Infrastructure Project etc. The study has drawn a conclusion of need of special work plan for financial discipline, technology-friendly administration and committed work environment in TU. As a pure academic public institution, it is a compulsory condition of disciplinary financial transactions as well as updated and transparent situation which must be reflected from the responsible financial management of TU. Similarly, the major recommendations made by the author are administration efficiencies and re-engineering of it based on electronic integrated administration of academic and general administration.

In a recent study, Pokhrel (2024) attempted to explore the framework of re-engineering for examination management information system and to analyze the experiences and practices of existing and newly initiated examination software used in the examination administration system of the office of the Controller of Examination (OCoE) of TU. The study has explored some major challenges and problems at the OCoE, TU including IT, administration, decentralization, and human resource management. It has concluded that the success of the OCoE is evaluated by its service delivery which can be achieved through integrated IT system and found that the OCoE is less administrative and more technical. So, a total of twenty-two modules are designed along with other ten supporting modules that remain milestone to establish the OCoE as a paperless and complete automated examination administration system. Regarding re-engineering of examination process, Pokhrel (2024) has found that the project on re-engineering of the Examination Management Information System (EMIS) has initiated software infrastructure as a modular phase-wise delivery and implementation of e-governance practices that includes campus profiling, student registration, transcript, migration, examination form, data migration and old student service model in first modular group. Similarly, second, third, and fourth modular groups provide service delivery of Teacher Roster Management, Question Bank Management, Exam Center Management, Exam Answer sheets Collection Management, Answer sheets Packaging, Dispatch and Collection, Scrutiny Management, Result Processing and Publication and Certificate Management, Transcript and Provisional Certificate Management,, Convocation Management, Finance Management, Store Management, Administration Management, Transport Management, Integration with Dean Office Examination System, Notice Board and Chatbot,

Mobile Apps, Online Certificate Verification System and Business Intelligence. These software tools are designed for effective and efficient service delivery to students.

In research, Malla, et. al. (2023) reveals that universities and colleges have started to use their websites as information centers and found that effective website design and functionality are very important for higher education institutions to attract students and share information regarding academic activities and they explored the effectiveness of portals and websites in academic institutions. On the other hand, Dar (2022) has defined that e-government is regarded as critical to improved governance. Institutions around the world are launching e-governance initiatives in order to provide their constituents with more transparent, efficient, and cost-effective services. In this regard, Ayode (2019) explained the uses of e-governance that enables staffs and students to have access to timely information, participated effectively in governance, promote assurance, trust and confidence, increase accessibility of the institution's service to the staffs/students, repositioned the governance and improve service delivery to them. Hence, Ayoade (2019) focused on improving service delivery to service users and receivers than Dar (2022) has explained e-government as critical to improved governance.

Singh & Sahu (2018) explained the area of e-government and e-governance practices that e-government comprises strategies and course of actions; carried out through person, substantial technology and procedures. E-government is a narrower area dealing with the improvement of online services, but e-governance covers a wider area and deals with the entire gamut of the connection and system within government about the usage of an ICT application. Though, there is no universally accepted definition of e-governance. Regarding this concept of e-governance, Bala & Verma (2018) have clearly revealed electronic delivery of government services via e-government which refers to processes and structures to the electronic delivery of government services to the public that involves the use of ICTs to support government operations and provide government services in three dimensions like e-services, e-commerce and e-management.

In the views of Bala & Verma (2018), E-governance fosters all elements of good governance for service delivery, and it makes interaction between G2C, G2B and G2G models which is the back-office processes. It is the use of ICTs to facilitate the processes of government and public administration for achieving all elements of good governance. E-governance includes integration of several stand-alone systems and services between Government-to-Citizens (G2C), Government-to-Business (G2B), and Government-to-Government (G2G) as well as back-office

processes and interactions within entire government framework. E-governance allows real-time participation in the governmental and democratic process, and it ensures better policy outcomes, higher quality services and greater engagement with citizens using online services and information that increase democratic participation, accountability, transparency, and the quality and speed of services.

Gupta, et. al (2018) have focused on major dimensions of benefit of e-governance and they revealed that economic benefits, quality of service benefits, quality of governance benefits and personal development are the major dimensions of benefit of e-governance. E-governance services are most beneficial in terms of economic benefits, followed by benefits in terms of quality of service and quality of governance benefits. Citizens appreciate the economic benefits of using e-governance services which are accessible to them at any time and place, saving travelling cost and time because of availing services online. In another study, Koudiki, & Janardhanam (2017) has defined e-governance as the most important driving force behind e-governance is innovation. The main purpose of introducing e-governance in universities is to promote transparency and efficiency in administration, improve service quality to students and other stakeholders, provide educational access to larger sections of the society, and offer affordable education to the needy.

Similarly, Mahajan (2015) has revealed the successful adoption of e-governments in public sectors that e-governance ensures improved public sector efficiency, accountability and responsiveness. The successful adoption of e-governments has the potential to provide better service delivery at reduced costs, increase public sector efficiency, minimize corruption and improve the accountability, transparency and responsiveness of the public sector. E-government is much more than a tool for improving cost-quality ratios in public services. It is an instrument of reform and a tool to transform government. E-government is not primarily about automation of existing procedures but about changing the way in which government conducts business and delivers services. On the other hand, Mandal & Husssain (2015) has focused on democratization of governance mechanism that a practical dynamic governance mechanism having openness, participation, accountability, effectiveness, uniformity and coherence is must for democratizing the governance structures of educational establishments. Political considerations in governance matter of universities are the root cause for keeping the best academic talents to face the challenges for getting the university global recognition.

Similarly, Mukonza (2014) has revealed the fact that the use of ICTs in governance has become entrenched and impossible to imagine how government offices used to operate without ICTs. Government to citizens and citizens to government interaction is still challenges and need movement by governments to enhance communication using government websites, social media and other forms of ICTs. The introduction of ICTs in governance has improved the image of government in the eyes of citizens.

Shrivastava, et. al (2014) have revealed a new model of governance and described the benefits of e-governance that it is an emerging trend to re-invent the way the government works, becoming a new model of governance requires completely new infrastructure, procedures, policies and working skills for producing and collection online information. The benefits to university are less paperwork, improved decision making, private public participation, inventive teaching tools, increase clearness, provide quality e-services, e-participation, increase in student enrollment ratio and centralized information access from anywhere anytime. It is the use of ICTs for the planning, implementation, and monitoring of government activities which is expected to help deliver cost-effective and easy-to-access citizen services and improve processing of transactions both within the government and between the government and other agencies. On the other hand, Kumar (2012) has described the supporting components of e-governance that it helps in improving transparency, providing speedy information, dissemination, improving administrative efficiency and public services. The planning of efficient administration of educational institutions, increased global communication skill; to achieve the world class standard, e-governance is necessary to have an improved collaboration and access to information available in all parts of the world which is possible only by introducing IT with e-governance as a security for maintaining standard.

Mukonza (2014) has described new ways of e-governance as representation of a new paradigm in public administration. The introduction of ICTs in governance has redefined relationships that exist between government and a variety of stakeholders including citizens and business. E-governance introduces a new way of coordinating, planning, formulating and implementing decisions and operations related to governance challenges. On the other hand, Talpur, et. al (2014) have explained that e-governance means flow and implication of knowledge to carry out governmental, semi-governmental or non-governmental services fully describing interrelated and mutual coordination among the various sectors.

Suklabaidya & Sen (2013) have provided their argument that e-governance initiates programs and policies which promote the usage of ICT in education, and it facilitates a better opportunity for the educational institution to grow and prosper. E-governance and education is an institutional thinking that seeks to entrust in building, managing and sustaining students, teachers, learners and others for achieving the larger benefits of e-government system. Similarly, the benefits of e-governance are for service users in terms of reduced cost of transmitting information and resources accesses, lesser time and cost for services; for service providers, reduced processing time, error rates, complaints; and for government, improved service constituency and equality; and these benefits lead to enhance the outcomes and performance criteria to improve delivery of objective and greater information. On the similar kind of study, Kumar (2012) has found that e-governance helps in improving transparency, providing speedy information, dissemination, improving administrative efficiency and public services. The planning of efficient administration of educational institutions, increased global communication skill; to achieve the world class standard, e-governance is necessary to have an improved collaboration and access to information available in all parts of the world which is possible only by introducing IT with e-governance as a security for maintaining standard.

Similarly, Balasubramanian & Govindaraju (2012) have focused on integrated model of e-governance with the concept of governance applied to universities in India. It is related to the exercise of controlling the power based on drawing adequate system of different center and departments which are part of an Indian affiliating universities. Different levels of institutional and relational power are integrated in a model of electronic governance which is structured in different Internal Information Systems (IIS). On the other hand, Kumar (2012) has revealed that e-governance includes computerization and management of processes where the e-governance solution which is designed to make the system user-friendly, time saving, and cost saving as well as that incorporates whole data and processes of an educational institution into a unified system, making the process uncomplicated, well-organized and error-proof, in the field of educational sector has changed the way administration is being done now. Similarly, Bala & Verma (2018) have discussed creative use of ICTs to reform in governance for citizens that e-governance is all about reform in governance facilitated by the creative use of ICTs. It is the process of enabling governance experts using ICTs to make governance effective for citizens in terms of efficiency, transparency, and cost-effectiveness.

Ayoade (2019) has revealed that e-governance has significant positive effect on the effectiveness and efficiency of service delivery, the quality services delivery, and reduces transaction costs and unnecessary expenditure of the people in the service delivery. The use of e-governance promotes good governance and increases customers' satisfaction level of service delivery in tertiary institutions. Ibrahim, et. al (2021) have focused on participation in an electronic form that the university sector is interested in being accountable by electronic means and concerned with applying the principle of participation in an electronic form. The implementation of e-governance in universities is considered a crucial matter because of integrating roles and achieving community development and institutional excellence.

Phuel (2081) has pointed out some challenges on implementing online teaching in TU as physical infrastructure of electricity, internet facility and other electrical instrument. Similarly, discipline, willingness of professor, technical literacy, teaching of empirical knowledge and plagiarism are as human behavior, health of professor and student for teaching readiness and using teaching method and process of student enrolment as an administrative part. The conclusion of this research is that the attraction of students has been increased, and enrolment has been increased in online classes and decreased in physical classes for three years.

Joshi (2081) has described the budget for the IT sector that TU has allocated budget Rs. 4 crores in FY 2078-79 and 6 crores in FY 2079-80 for management of information technology, purchasing software and management of equipment. Government of Nepal has extended the relationship with G2B (Government to Business) and G2E (Government to Employees) model to the business sector and employees. Similarly, TU should follow this model to extend the relationship using information technology. TU had managed online classes during COVID-19 using Microsoft Office 365 AI Free Educational Package and had developed 141 domains and 3 lakhs email IDs for professors, employees and students. Similarly, 175 Zoom IDs provided free of cost to TU by NREN which had supported conducting online classes and had made record of 2 lakhs 41 thousand students' participation on class in a same day. Centralized Attendance System has been used by 41 constituent campuses for implementing Electronic Attendance System.

Sharma (2024) identified four roles of librarians in user engagement in digital library environment. Modern libraries can provide priority to the user engagement by using modern technology and best practices of digital library, empower users, and strengthen communities and

building indispensable hub of knowledge, innovation and inclusivity in the digital age. These major roles are information supporter, technology champions, community connectors and educators and mentors to empower users, strengthen communities and focus on effective modern library services. Modern librarianship's vital task is to transform library services from traditional to modern ones using information technology. User empowerment, building stronger communities and preparing for the future of work are the importance of user engagement in digital library environment. Virtual programming, digital displays, user-focused interface and artificial intelligence, big data and data visualization, mobile apps, user-centered design and continuous learning and professional development are the ways to engage users in digital platform of library.

Tiwari (2071) has identified some improving aspects of TU. Implementation of academic calendar and semester system in master's level since 2070-071, enabling constituent colleges, establishing research cells in each campus and department for empowering human resources, revised new curriculum for bachelor and master level and organized orientation, and starting open and distance education program for expanding access to education are the major academic improvement aspects. Similarly, master plan of university campus and five year's strategic plan for university development are the major planning to development of institution. Integrated accounting and auditing, settlement of arrears campaign, single accounting system, internal resource management, financial administration, pension fund, management of provident fund, health treatment and insurance fund are major financial improvement initiatives. Created administrative service group, open advertisement, improving organizational structure, job description, promotion scheme, discipline and fire policy are the major administrative improvements in TU. Developing TUCL data base is started for e-library infrastructure to create networking with TU central library for access to all campuses.

Singh (2024) has concluded that RFID technology is a wireless communication media between RFID tags and RFID readers which is used to reduce human labor and to assist in the automation of the library. RFID tags are the receivers and responders in the RFID system and the RFID reader is the signal generator that has the ability to produce an electromagnetic pulse. RFID technology revolutionizes library operations by automating the tracking and management of books and other materials. It enhances inventory management, enabling real-time tracking of

items and quick location of misplaced books and also improves security by monitoring the unauthorized removal of materials.

The Planning Directorate (2076) has described TUCL activities in a yearly report that TUCL has about 4 lakhs books and other information instruments. Among them, one lakh books are computerized and 8 hundred 77 new theses are uploaded in websites. JSTOR, Project MUSE, EBSCO host, Cambridge University Press Journals, OECD, Emerald are available databases for online full texts in the library service. It has provided the facility to use international data bases like OARE, AGORA, GOALI, ARDI, HINARI etc. It also provides Nepal Journals Online (NepJol) services which is supported by INASP, UK. Similarly, it is an ISBN National Agency for International Standard Book Number (ISBN) in Nepal. It has planned to replace Barcode and EM (Electro-magnetic Security) System with RFID (Radio Frequency Identification) System (Planning Directorate, 2076). Similarly, TU (2076) has established a technology-friendly library and managed electric cards and D-space as repository for digitalization of reading resources. A total of 971 theses are already digitalized for open access.

Maassen (2000) has briefly explained about university governance as a system that gave academics, non-academic support staff and students the right to elect their representatives in university and faculty councils. The university and faculty councils became the centers of power. The role of the councils changed from that of control bodies to that of advisory bodies in Dutch universities and became the centers of power.

2.4 Policy Review

Government policies are reviewed when conducting this research. All university policies adopted for e-governance initiatives are analyzed to find out the application of e-governance in the university administrative management under the governance system of the university. The following are some policy review of government documents:

The implementation of this budget, presented with the aim of achieving prosperity through economic and social development and building a prosperous Nepal by ensuring good governance and social justice. The objective of the budget is to fortify federalism and uphold good governance. Service delivery will be simplified, convenient, and technology-friendly by interconnecting digital systems used for service delivery. A zero-tolerance policy will be adopted to combat corruption. Individuals involved in corruption, irregularities, and misuse of government property will be brought under legal action. The concept of a paperless government

will be realized by gradually implementing the integrated office management system in all federal central agencies of the Government of Nepal (Ministry of Finance, 2024).

UGC is applying and using EMIS and a web-based scholarship portal to administer scholarships to the students, but it does not have IT policy yet. It has not been able to move with effective and efficient digitalization and information technology systems and processes. Software update and utilization of the existing tools and resources are also some other issues that need to be considered for impactful results of the ICT. There are problems in data security and facing problem of inadequate skilled manpower in IT unit (UGC, 2023).

Baral (2024) has published a vision paper to operation and management of TU after appointed as a Vice Chancellor of Tribhuvan University. It has focused on university governance, and it should be transparent. TU authorities, professors and employees should be accountable with stakeholders. Policy will be made and implemented for information sharing through educational information system. Financial, educational and all other activities of university will be published through official websites and yearly reports of constituent and affiliated campuses will be informed to the stakeholders using educational information system. The application of information technology should be effective in the university and all constituent campuses, central departments, institutes, faculties, research centers, libraries, central administrative office and office of the examination controller to provide services for the students and other stakeholders.

A policy will be adopted to spend at least one percent of the government's total capital budget on research, innovation and invention. Budget has been allocated one billion for establishment of a separate fund for research, innovation and invention. Necessary legislation will be formulated to operate the fund. Various government agency programs focused on research, invention, and innovation will be linked to it. Provinces and local levels will be encouraged to contribute to this fund. A separate unit will be established in the Ministry of Education, Science and Technology to coordinate and facilitate work related to innovation, invention and research. Similarly, a digital economy will be promoted for the country's economic transformation. To this end, the development of communication infrastructure, establishment of digital banks, promotion of the IT industry, and the use of internet, mobile applications, and other networks in economic activities will be encouraged. This approach is expected to lower the cost of financial transactions, save time, enhance efficiency, foster transparency and good

governance, and improve competitiveness (Budget speech, 2024). Similarly, advancement of technology has brought significant change in the higher education sphere as there is a growing use of digital tools and resources, blended and online learning and digitalization of education. The HEIs have been investing huge number of resources in digital infrastructure and human resource development (UGC, 2023).

IT policy establishes a university-wide comprehensive strategy of safeguarding the confidentiality, integrity, and availability of its information assets. The policy aims to create an effective, professional, legal, ethical, and equitable environment to have an access to IT facilities across TU in order to improve education quality and to guide ethical development, maintenance, and security of various IT resources and services, including computers, works, servers, software, and online platforms like e-learning, emails, and web-hosting. The university will improve and oversee IT resources to boost its services and improve global-centric teaching and learning experiences. TU intends to adopt cutting-edge technology to provide students and other stakeholders with access to its services as demanded by the time and technical evolution (Planning Directorates, 2023).

Accounting Directive (2080 B.S.) has been implemented since fiscal year 2080-081 that replaced previous Account Working System, 2051 B.S. The first Account Working System of TU was introduced and implemented in 2033 B.S. Tribhuvan University Integrated Online Accounting Management System (TUIOAMS) has incorporated General Accounting Information System (GAIS), Payroll Information Management System (PIMS), Income Information Management System (IIMS), Budget Information Management System (BIMS), Pension and Gratuity Information Management System (PGIMS), Loan Information Management System (LIMS), Auditing Information Management System (AIMS), etc. (Poudyal, 2081).

The digitalization strategy aims to create an inclusive and interconnected educational environment that empowers students, faculty, and staff in the digital age by adopting digital tools and platforms. It highlights the integration of technology to improve teaching, learning and administrative processes, including online platforms, virtual classrooms, digital libraries, research tools, connectivity, and student engagement platforms. Universities can enhance the accessibility and flexibility of education, facilitate collaboration and knowledge sharing, and enable personalized and interactive learning experiences. The digitalization process streamlines

administrative processes, improves operational efficiency, and provides valuable data for informed decision-making. Universities must embrace digitalization to remain competitive, relevant, and efficiently prepare students for the challenges and opportunity of the 21st century in a rapidly evolving digital landscape (Planning Directorates, 2023a.).

Higher Education Reform Project (2018) has published TU vision 2023 and introduced Information Management and Decision Support System (EMIS) as an area of reform and it suggests strategy to implement effective EMIS in place integrating the institutes, faculties, CDs and constituent campuses capturing detailed information concerning the students, personnel, physical and digital facilities and use of EMIS on planning, decision making and implementation. Promoting criteria-based leadership and detailing terms of reference for all administrative positions are also strategies for leadership areas.

Ministry of Education, Information and Technology (2018) has published a report of high-level national education commission which stated that Information and Communication Technology (ICT) refers to the use of printed, audio, visual, audio-visual, multi-media and web-based teaching learning materials in the classrooms which assists administrative tasks and encourage self-study to searching and learning process. It supports the use and exchange the learner-centric materials through web-portals. ICT tools are multimedia devices which help e-learning processes not only to change the teaching learning styles but also help to achieve the targets of nation development. There are three stages of use of ICT in literacy on ICT at first stage, use of ICT in classrooms at second stage and creation of learning materials based on ICT. It has suggested policies to develop national educational technology plan, evolve Open University to Virtual University, develop paperless teaching learning material at communication houses, establish e-libraries, and manage the online based educational information management system for educational data using cloud technology.

Government of Nepal has initiated Digital Nepal Framework (DNF) in 2019 which encompasses one nation, eight sectors and 80 digital initiatives. The digital initiatives have been selected on the basis of alignment with the vision of prosperous Nepal, happy Nepali, demonstrated success in other similar developing markets and ability to execute in the local environment. The DNF is a blueprint that provides a roadmap to how digital initiatives can contribute to economic growth, find innovative ways to solve major challenges facing society in a shorter period with fewer resources and identify opportunities for Nepal to participate in the

global economy. Among the eight sectors, digital foundation and education have been identified as major sectors in this framework. The first 19 initiatives out of 80 are under digital foundation and eight initiatives are incorporated in the education sector. High-speed internet connectivity for efficient delivery of public services, paperless government to promote collaboration, digital signature, government e-learning platforms and ICT in education are the major initiatives among 19 initiatives of digital foundation. Smart classrooms, online learning platform, centralized admission system, biometric attendance systems and CCTV cameras, mobile learning centers in rural areas are the major initiatives under the education sector (Digital Nepal Framework, 2019).

UGC (2080) has planned to strengthening governance and financing of higher education to fulfil the targets of sustainable development through higher education providing equal access of students by maintaining good governance on operating HEIs and developing research culture for quality enhancement. The target is to reconstitute five Higher Education Institutions (HEIs) as deemed universities or equivalent TU chapter. It has supported extending digitalization of higher education on data system development, digitalization and connectivity, virtual learning environment along with online teaching, learning and digital administration. It is targeted to design and approve standards, operational policies and guidelines for higher education digitalization, connectivity and implementation procedures.

Similarly, UGC itself is going to establish a digital learning platform and online administration system. Another target is to increase students in online/blended teaching methods by up to fifty percent. In another provision, O&M directive (2080) has incorporated a provision of use of Information Technology (IT) for Human Resource (HR) management and survey in universities. The basis of HR survey is organization, administration, record management and service delivery based on IT with increasing working capacity of employees in the universities. The Stakeholder Theory (ST), The Institutional Theory (IT) and The Theory of Academic Integrity (TAI) are the major theoretical lens to observe the role of e-governance practices for governance reform and the status of effective and efficient service delivery at TU.

2.5 Methodological Review

E-governance in universities reveals the methodology by which governance systems are established and managed to run effectively. Government model for universities is proposed as university to administration, university to academics, university to parents and university to

students. E-governance is a pre-requisite for not only academic excellence but also for positive development of useful effects on national level (Talpur, et. al, 2014).

Posthumus, et. al (2010) have described the importance of corporate governance, the impact of information technology on enabling an organization to achieve business goals. IT governance is an aspect of the broader corporate governance function aligned with business goals and delivers value using its investments. The triple bottom line in corporate governance is described as economic prosperity, environmental sustainability and social responsibility. The conclusion is that the board of any organization needs to be involved in IT governance, and it should focus on the 'What', 'Who' and 'How' factors which are an integral part of enterprise governance, leadership, organizational structures and processes. The board should address 'What' factor in five focus areas as strategic alignment, value delivery, risk management, resource management and performance measurement. The 'Who' factor is related to responsibility of IT governance in the organization. The 'How' factor approach is related to their IT strategic stances and vital to drive and support its main objectives on IT governance. To implement IT governance, the major two strategies may apply in an organization: A defensive IT strategy which support IT systems continue to function normally and without interruption and an offensive IT strategy that focuses more on strategic issues to enhancing its competitiveness and adjust its technology strategy.

2.6 Summary of Literature Review

Theoretical review has applied different theories to enhance university governance system through the application of e-governance practices. Empirical review has also cooperated to elaborate the concept of e-governance for university governance, its dimensions and components that are linked to each other. Policy review has suggested the status of implementation of e-governance mechanism to deliver effective and efficient public services to the citizens as well as to further research about the e-governance technological tools based on the government policy and university information technology and digitalization policy. Conceptual framework also clearly stated the way of research using theories and models for this study. All tasks of review have supported identifying the research gap in the field of e-governance practice for university governance. Different e-governance applications are applied to strengthen the university governance system and make public service delivery effective and efficient to the stakeholders. Different theories are relevant to link the university governance using ICT-based e-

governance tools and support to advance the governance system. Institutional Theory (IT), Theory of Academic Integrity (TAI) and Stakeholder Theory (ST) are the major relevant theories for the implementation of e-governance practices for service delivery. So, applying these theories, this study has focused on those variables of the status of e-governance practice for effective and efficient service delivery to enhance university governance.

2.7 Research Gap

Different countries have pragmatically implemented governance models using e-governance applications at different levels of university governance. Various studies have been conducted by researchers worldwide but there has been few research focused on university governance using e-governance applications perspective. TU has implemented IT policy and digitalization policy in the last two years ago, though the use of ICTs and e-governance has been implemented for quality service delivery in administrative tasks. The research gap on the application of e-governance for service delivery using ICTs has been found in Nepalese context. Until the observation during this research, the researcher has got few research on university governance through the application of e-governance as a thematic area especially in the administration, public services, examination, library in Tribhuvan University. So, it is an endeavor to fill the gap of exploring the status of e-governance practice for delivering quality public services to university governance system in Tribhuvan University.

2.8 Conceptual and Theoretical Framework

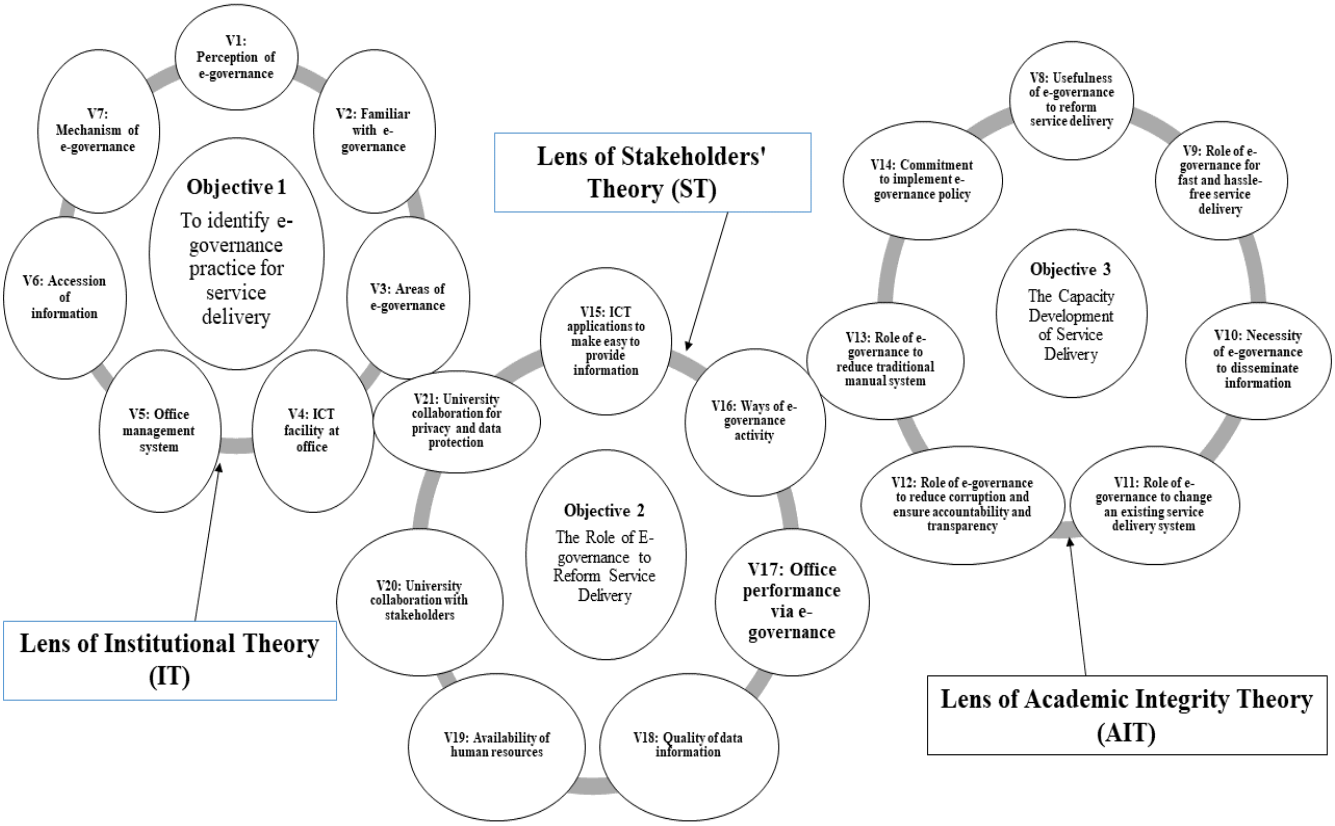
The conceptual framework is designed based on objectives in the lens of different theories and their variables. To identify the variables of e-governance practice which is concerned with institutional theory in the universities for service delivery. Similarly, use of e-governance practice to reform the governance system using e-governance tools has been assessed by using the lens of stakeholder theory. The capacity development of service delivery is another concept to explore using e-governance practice in the lens of academic integrity theory.

Similarly, three dimensions of university governance are strengthened by using e-governance practice to deliver services to the public. The perception of e-governance, areas and infrastructure of it, service delivery mechanism and office management systems are major variables for managing cost efficiency and time saving during service delivery through e-governance practice. The role of e-governance tools is associated with usefulness and effectiveness of services, fast and hassle-free services, effectiveness of information

dissemination for changing existing service delivery system, reducing traditional manual system, commitment and circulation for implementation and for maintaining academic integrity. It is vital to make changes in the capacity of institutional information dissemination, quality of data information, availability of technical human resources and collaboration for stakeholder-friendly service delivery as well as for privacy of individual data and data security. The e-governance practice may result the fast services with low cost and time; and minimize the distance of service stations with the academic integrity in the institution. This study aims to find out the role of different variables associated with e-governance tools for governance reform to service delivery at TU. The conceptual framework is presented in the following figure:

Figure 1

Conceptual and theoretical framework of e-governance practice



Source: Researcher's self-designed conceptual framework.

CHAPTER III RESEARCH METHODOLOGY

3.1 Philosophical Standpoint

The study acknowledges that e-governance practices for university governance systems within university, as any public institution, are socially constructed for effective and efficient public service delivery. This concept of e-governance is ontologically multiple reality perspective which suggests that the structures, processes, norms, values, and capacities governing university governance are products of human interactions through the application of ICTs based e-governance tools based on different governance theories. The system can be varied and multiple on the basis of the purpose of governance reform for service delivery. This study is based on social constructivism which highlights the importance of understanding the contextual factors of university governance that shape e-governance practices in the University for the Performance of service delivery at university.

3.2 Research Design

This research has been designed in five phases. The first phase starts with selection of topic, objectives, identifying the problems and research questions. In the second phase, conceptual framework is designed based on literature review of conceptual, theoretical and empirical research as well as policy review. Similarly, Mixed method approach is used to collect information about the perception, knowledge and development of e-governance practices by TU teachers, employees, students and other stakeholders in third phase. The explanatory sequential design has been used for this study. The fourth phase is related to data collection with sample population of the universe. First, participants of ICT based trainings and other non-technical participants, and teaching and non-teaching staffs are participated in survey and second, the number of students represented at Free Student Union (FSU) and ICT and administrative experts are interviewed with structured questionnaire to identify results for follow up of survey result during the research. Qualitative and quantitative approaches are used to collect the data during this study. University governance structures through e-governance practices are identified by document reviews, website observation, and all processes of establishing university governance mechanism are analyzed. Key Informant Interviews (KIIs) are conducted with the key leaders of university governance mechanism and ICT experts from TU using checklist questionnaire. Focus Group Discussions (FGDs) are held for triangulating the information. The fifth phase is for data

analysis using SPSS software for quantitative data and MAXQDA software for qualitative data and prepare the draft of the thesis.

3.3 Rationale of Study Area Selection

The study area is selected from the point of view on purposive selection. Altogether sixteen universities have been established and function in the country. Among them, TU was an oldest university, and it has a history of a system of higher education in Nepal. The governance system of TU has been gradually developed using e-governance practices for public service delivery beyond the traditional way of teaching learning process and traditionally deliver the public services from the beginning. Now TU has gradually improved its services using ICTs based e-governance practices from recent years. TU has made IT policy and digitalization policy to implement ICT based e-governance system. Participants of this study are selected from TU as a sample size to represent all kinds of stakeholders' participation, such as teachers, technical staffs, experts, students, administrative staffs, etc. for effective and efficient service delivery through the e-governance practices. The ultimate goal of using e-governance is to establish and manage university governance systems for quality service delivery. Therefore, it is relevant to choose the study area for this research.

3.4 Nature and Sources of Data

The primary as well as the secondary data are used in this study. The primary data are collected in both quantitative and qualitative approaches and some secondary data are collected using mixed method approach to validate the data. Secondary sources of data are gathered during the desk study. Document review of statutes of the universities, government strategies, plans, directives, rules and regulations are analyzed to collect the data. Authentic publications and websites of universities are visited and observed for necessary information. The selected key respondents from governing authority bodies are interviewed from the university governance mechanism. Checklists and questionnaires are used for interviews.

3.5 Universe, Sampling Procedure and Sample Size

The total number of universities established in the country is sixteen. Among the universities, Tribhuvan University is selected for this study purposively because Tribhuvan University has its large structure, processes and capacity as the dimensions to deliver public services in the higher education sector which occupies more than 80 percent of higher education of the nation. Tribhuvan University is a universe for this research. Similarly, the main thematic

areas of e-governance are automation or e-administration, e-finance, e-library, e-examination and ICT based software tools at university.

3.5.1 Sample Size for Survey

The number of employees working in TU varies in different reports. According to OAG report, there are total number of 7938 posts for teachers and the total number of 8124 posts for employees in Tribhuvan University. There are 35.32 percent of posts for teacher are vacant (i.e., 2904) and 33.99 percent of posts are vacant (i.e., 2761). Among the employees, there are 2856 people who are office helpers as working staff in the university. So, the official number of staff for service delivery is only 2507 except office helpers and 5134 teaching staff are permanently working as teaching staff. Additionally, part-time teachers are also teaching in the university (OAG report, 2081). However, the university hasn't determined the actual number of technical and non-technical staff yet.

According to the Personal Administration Division (PAD), there are a total number of 4033 posts for teachers and a total number of 2386 posts for employees who are working in Tribhuvan University. Among the number of teachers, there are 302 professors, 781 associate professors, and 2813 Assistant Professors working in teaching. Similarly, 38 trainers, 19 special trainers and 40 personals who are deputy trainers and 40 assistant trainers. On the other hand, 5 special class administrators, 24 first class associate administrators, 97 second class deputy administrators and 435 third class officers who are working in the administration of TU.

On the same way, number of first-class employees as assistant level are 1169, second class assistant level employee number is 656 who are working in administration of TU. Among them, only 688 employees are working as technical staffs in different sectors of TU. The number of office helpers is 1260 who are supporting hands for the service delivery process. (PAD, 2081)

Table 1

Summarize the sample size

Particulars	Total number of teaching and non-teaching staffs		
	Teachers	Employees	Total
Total Post (TU Today 2081)	8340	7674	16014
Total Post (OAG Report, 2081)	7938	8124	16062
Total Working (PAD, 2077)	5094	5507	10601
Total working (OAG Report, 2081)	5134	5255	10389

Particulars	Total number of teaching and non-teaching staffs		
	Teachers	Employees	Total
Total Working (PAD, 2081)	4033	3646	7679
Percentage	52.52	47.48	100.00
ICT Literate Sampling Population			
Participants of ICT Training	260	719	979
Percentage from working population:	6.45	19.72	11.06
Total selected sample size:	86	191	277
Percentage of sample size:	31.05	68.95	100.00

Source: TU Today, Personal Administration Division (PAD), and OAG report, 2081.

In table 1, the total number of teachers working in the university is 4033 and number of employees is 3646 among 7679, the total number of working population (PAD, 2081). The number of teachers is 52.52 percent, and the number of employees is 47.48 percent. Among the working teachers' population, 260 teachers including the number of 50 authority teachers are identified as participants of enhancing capacity building training organized by dean offices from Institute of Science and Technology (IoST) and Faculty of Education (FoE). The number of trainings teachers obtained is 6.45 percent of total working teachers. Similarly, TU Coordination Division (CD), Financial Administrative Division (FAD) and TU Information Technology Innovation Center (ITIC) has provided training for employees about service delivery, ICT use and integrated website management training for capacity building. The identified number of employees is 589 which is 16.15 percent of total working employee at administration. So, the total number of 979 training obtained ICT literate teachers and employees are identified as target population which is 11.06 percent of total working population included for sampling process as universe to this research. Among the total 979 population, the representation of teachers at training is 30.62 percent and employee representation are 69.38 percent. So, the representation of teacher and employee for sample size is as same proportion as the representation of them at capacity enhancing trainings.

Similarly, the standard minimum sample size for 979 population is identified as 277 sample population that are purposively selected from the universe using online portal of calculator dot net. The calculator computes the minimum number of necessary samples to meet the desired statistical constraints. So, the sample size 277 from the total of 979-universe are

needed to have a confidence level of 95 percent and the amount of error that can be tolerate is within 5 percent positive or negative margin that is the critical value for the normal distribution of the data. Among the total sample of 277, the number of teachers is 86 which is 31.05 percent of sample size, and 191 employees are selected which is 68.95 percent of total sample size.

3.5.2 Sample Size for Key Informant Interview (KII)

Similarly, the respondents for Key Informant Interview (KII) to collect qualitative data are also purposively selected in the thematic areas of e-governance.

Table 2

Characteristic of Respondents in KII Interview

S.N.	Respondent Code	Gender	Designation	Office Category	Experience
1.	P1	Male	Associate Administrator	Office of the Dean, Institute of Engineering	19yrs
2.	P2	Female	Finance Deputy Controller	Finance Administration Division, TU Central Office	26yrs
3.	P3	Male	Associate Librarian	TU Central Library	19yrs
4.	P4	Male	Associate Administrator and Chief	Examination Control Division, Office of the Examination Controller	34yrs
5.	P5	Male	Computer Engineer	Office of the Examination Controller	20yrs
6.	P6	Male	Lecturer and Chief	Information Technology Education Department, Central Department of Education	15yrs

S.N.	Respondent Code	Gender	Designation	Office Category	Experience
7.	P7	Male	Professor and Dean	Institute of Science and Technology	30yrs
8.	P8	Male	President and Senator	Free Student Union, University Campus, TU (Student)	10yrs
9.	P9	Male	President and Senator	Free Student Union, Nepal Law Campus (Student)	10yrs

Source: Field research, 2024

Table 2 shows that the number of KII is nine. Among the nine respondents, five persons including one female respondent are selected from employees and two persons are selected from teachers. Similarly, two student leaders who have represented at Senate and they are elected president of Free Student Union (FSU) in two separate campuses. All respondents for KII have more than 10 years' experience in their respective fields. The associate administrator is selected for the in-depth interview about e-administration and automation process. Finance deputy controller is selected for an in-depth interview about the e-finance process. Similarly, the Chief of TU Central Library has been selected for an in-depth interview about the e-library. Chief of Division of Examination Administration and Computer Engineer and Chief of Computer Unit at Office of the Examination Controller are selected for collecting the information about the e-examination and infrastructure of ICT-based e-governance practice. In a same way, Chief of ICT Education Department as an expert of IT and Professor and Dean from an Office of the Dean are selected for the representation of teacher and two presidents of Free Student Union (FSU) as a senator are selected for the representation of student.

Three Focus Group Discussions (FGDs) are conducted after completing the collection of primary data through survey and KII tools for the data triangulation. The leadership with representatives of FSU, TUEA and TUTA are participated in FGD separately. Three representatives from each group participated during the FGD. The researcher presented the

findings of primary data in the first session and the participants shared their opinions towards the findings and suggested further plans to implement e-governance tools in TU.

3.6 Data Collection Methods, Techniques and Tools

The data are collected from primary sources using structured questionnaire and deploying the questionnaire to the purposefully selected sample participants. Online e-library access has supported reviewing the documents for the secondary source of data. The statutes of universities, all levels of e-governance practice for service delivery mechanisms are analyzed in the provisions of acts, rules and regulations. As a research tool, questionnaires and checklists are used online as well as physically deploying to the respondents to gather the information. Literature is reviewed for supporting research with theoretical aspect. The following are the major techniques and tools for this study:

3.6.1 Questionnaire

The research is based on mixed method approach and the questionnaire is a main instrument for primary quantitative data collection process. This has been prepared using KoboToolBox and deploying online basis with the respondents through mobile device. Similarly, some questionnaires are deployed by sharing the link of questionnaire via email and collecting the responses. Survey questionnaire is used to collect the perception of respondents about e-governance practice. The survey has been conducted from 2nd September up to 5th November 2024. The survey form is prepared and deployed to 277 respondents at TU which is standard sample size for the total number of 979 target population. (See: Annex-1)

3.6.2 Key Informant Interview (KII)

The KII instrument is used for qualitative approach to collect data from the officials, authorities and experts. Authorities and experts as respondents are participated during KII for in-depth study to gain reliability and validity during and after the analysis of the data. The checklist is developed for KII processes. The structured questionnaire has been administered for KII with the five senior officers and two teachers as well as two student leaders who are elected president in FUS and member of the Senate at TU. Five senior officers are purposively selected based on thematic areas of e-governance and two teachers are represented from an expert of IT who was a facilitator of employees' capacity development training and the chief of an institution who

organized trainings for capacity enhancement to the teachers. Two students are selected for the representation of major stakeholder of the university from the service receivers and they are representatives of students in Senate of TU. (See: Annex-2)

3.6.3 Focus Group Discussion (FGD)

This FGD instrument is used to discuss and collect the information for case stories. This tool is used for triangulation of data from quantitative and qualitative approaches and validating the data from the stakeholders' perspectives. Focus Group Discussion (FGD) is done with TU Employee Association (TUEA), TU Teacher Association (TUTA) and the Free Student Union (FSU) which represents all students from the colleges. The summary of finding has been shared during FGD processes. Focus Group Discussion (FGD) has been used for triangulation of the information and validating the data taken from the survey and KII.

3.7 Reliability and Validity

Reliability and validity have been checked through the triangulation process. KII is a tool for collecting the verifying opinion of IT experts and training facilitators to validate the data collected from the students, employees, teachers and technical and non-technical staff. Focus Group Discussion (FGD) with TU Employee Association (TUEA), TU Teacher Association (TUTA) and group of Free Student Union (FSU) have supported to triangulate the information from the perception of stakeholders and make the research output more reliable and valid to achieve the target goals. SPSS software is also used for calculating the reliability and validity of the variables of the data.

3.7.1 Reliability Test

Focus Group Discussion (FGD) with the representatives of TU Employee Association (TUEA), TU Teacher Association (TUTA) and group of Free Student Union (FSU) has been held to triangulate and validate the information from the perception of service providers and stakeholders. This process has made the research findings more reliable and valid to achieve the target goals. Similarly, Cronbach's alpha is used to measure the reliability of the dataset in SPSS software.

3.7.2 Content Validity

Content validity is important for ensuring the quality of assessment in any tests. It assesses whether a study's variables are relevant, and representative of the construct being

measured. The content validity is tested to find out the correlation of the variables. The value of 0.30 and above indicates strong correlation of the content validity. The Content validity is assessed using SPSS software during data analysis.

3.7.3 Construct Validity

Construct validity assesses whether a test accurately measures the concept it's intended to measure. The significant positive correlation indicates the construct validity of the research objectives. The construct validity is accessed using SPSS software during data analysis.

3.8 Methods of Data Analysis and Interpretation

The collected data has been analyzed and interpreted using different statistical tools, data analysis software and present the results through tables, figures and charts. The quantitative data analysis software SPSS is used for quantitative data analysis and the qualitative data analysis software MAXQDA is used for qualitative thematic analysis during the data analysis and interpretation. Independent variables and dependent variables are compared and analyzed to obtain the required information from the study. Both methods of data analysis have been used to analyze the data. Separate findings are mixed purposefully and appropriately in the report and obtain the goal of the study. Focus Group Discussion (FGD) and mixed method approach are used for validating the data taken from the primary source. The following process has been adopted for data analysis and interpretation:

3.8.1 Descriptive Analysis

Descriptive analysis has been done for each objective to find out the mean and standard deviation of the data set. The combined means and standard deviation of data set of objectives with the mean of each variable has been analyzed during the data analysis. Similarly, the skewness of data is observed from this analysis.

Mean and standard deviation tools are used to describe measurement of the variables for descriptive analysis. The mean is a measure of central tendency, or average that is calculated by dividing the sum of all values by the number of values. Mean is calculated in the descriptive analysis of data. Similarly, the standard deviation (SD) is a measure of variability that shows how spread out the values are from the mean. A large standard deviation indicates that the data points are far from the mean, and a small standard deviation indicates that they are clustered closely around the mean.

3.8.2 Correlation of Variables

A correlation test has been done to see the relation among the objectives of the study if they are strongly correlated or not. Correlation test has shown the relationship of the variables to achieve the objective of the study. In the same way, the correlation coefficient among the objective-wise dependent variables is analyzed and interpreted through the use of SPSS. The assumption of correlation for all the dependent variables with independent variables is positive. A correlation coefficient value is a number between 1 and -1 that indicates the strength and direction of a relationship between dependent and independent variables. It reflects how similar the measurements of two or more variables are across a dataset in research. When one variable changes, the other variables change in the same direction in a dataset.

3.8.3 Normality Test

A normality test has been done before regression analysis to find out if the data set is normally distributed or not. It supports finding out the status of data for multiple linear regression. Similarly, the value zero reflects the skewness for a normal distribution, and any symmetric data should have a skewness near zero during the normality test. Skewness always measures symmetry, or more precisely, the lack of symmetry of a given data. A data set or distribution of data is symmetric if it looks the same to the left and right of the center point. Data are skewed left if the values for the skewness are negative and positive values for the skewness indicate data that are skewed right. The left tail is long relative to the right tail by skewed left and the skewed right means that the right tail is long relative to the left tail. Similarly, skewness values that are more than twice its standard error indicate a significant departure from symmetry. The values of skewness between -0.5 and 0.5 indicate approximate symmetry and the values of skewness between the range of -1 and -0.5 of 0.5 and 1 indicate slightly skewed data. The values of skewness that are less than -1 or greater than 1 indicate highly skewed data.

3.8.4 Multiple Linear Regression Analysis

In SPSS software, after entering the data set, some dummy variables are created and tested. Multiple linear regression has been done to find out the relation of object two with the other objectives and independent variables. The positive and negative association of independent variables towards the dependent variable are observed.

3.8.5 Thematic Analysis

Thematic analysis of qualitative data has been done during the data analysis. The KII interviews are transcribed from audio records and uploaded PDF files in MAXQDA software. The themes and codes are created and analyzed, and relevant quotes are carried out to the report using MAXQDA software.

3.9 Ethical Considerations

The study underscores the ethical dimensions of writing academic dissertations. University governance itself has recognized the moral responsibilities of academic institutions to uphold principles of integrity, fairness, and social justice. It calls attention to ethical dilemmas and considerations inherent in governance processes, such as conflicts of interest, academic freedom, and protection of human rights. Ethical considerations are maintained during this study. The approval letter as 'To Whom It May Concern' from the department is received before going to the field survey, KII and FGD to gather the authentic data.

The consent from the participants has been ensured before participating in the research process for minimizing the burden of research for the participants. It has followed the code of ethics for professional associations in this discipline. Personal conflict of interest and personal bias are not entertained and avoiding collection of harmful information to participants during the study. It ensures that all participants receive equal treatment when confirming them to be a participant in this study. The researcher has been aware of the credit given to the original authors when citing the work and always aware of the plagiarism of the other literature.

3.10 Novelty and Contribution of the Study in Disciplinary Areas

The findings are helpful to manage higher education institutions technology-friendly and maintain governance standards in the university using the prescribed practices of e-governance in the university. The utilization of e-governance tools is vital requirement for the government, governing bodies of university and whole authority of university to adopt the governance mechanism to reform the university governance system for effective and efficient service delivery now and in the future.

CHAPTER– IV: DATA ANALYSIS AND INTERPRETATION

This chapter deals with an analysis and interpretation of collected data from both quantitative and qualitative approaches. The demographic analysis of the respondents has been analyzed and interpreted. Descriptive analysis, correlation among variables and regression analysis of the data have been done for quantitative data to fulfil the objectives.

4. Data Analysis

This chapter deals with data analysis and interpretation using different data analysis tools for quantitative and qualitative data. The first part of this section deals with the demographic characteristic of the respondents in terms of office category, staff category, sex, age and educational attainment of the respondents. Similarly, the second part of this section analyzes the data with descriptive analysis of the variables of the first objective and then analyzes the variables of second and third objective respectively. Both quantitative and qualitative data are analyzed together to find out the outcome level of the research.

4.1 Demographic Analysis of the Respondents

The representation of respondents has varied from different units of TU. All respondents are working in different offices with different responsibility of TU.

4.1.1 Type of Offices

The category of office is analyzed from central office to constituent campuses. The structure of TU is hierarchical. Central office, Departments, Office of Dean, Constituent Campus, Hospital, Health Center, and other administrative offices. The category of office is presented as follows:

Table 3

Type of offices

Type of Offices	Frequency	Percent
Constituent campus	96	34.7
Central office	51	18.4
Department	35	12.6
Dean office	31	11.2
Hospital & Health centers	19	6.9
Another office/unit	19	6.9
TUCL/Library	15	5.4

Type of Offices	Frequency	Percent
Office of Exam Controller	11	4.0
Total	277	100.0

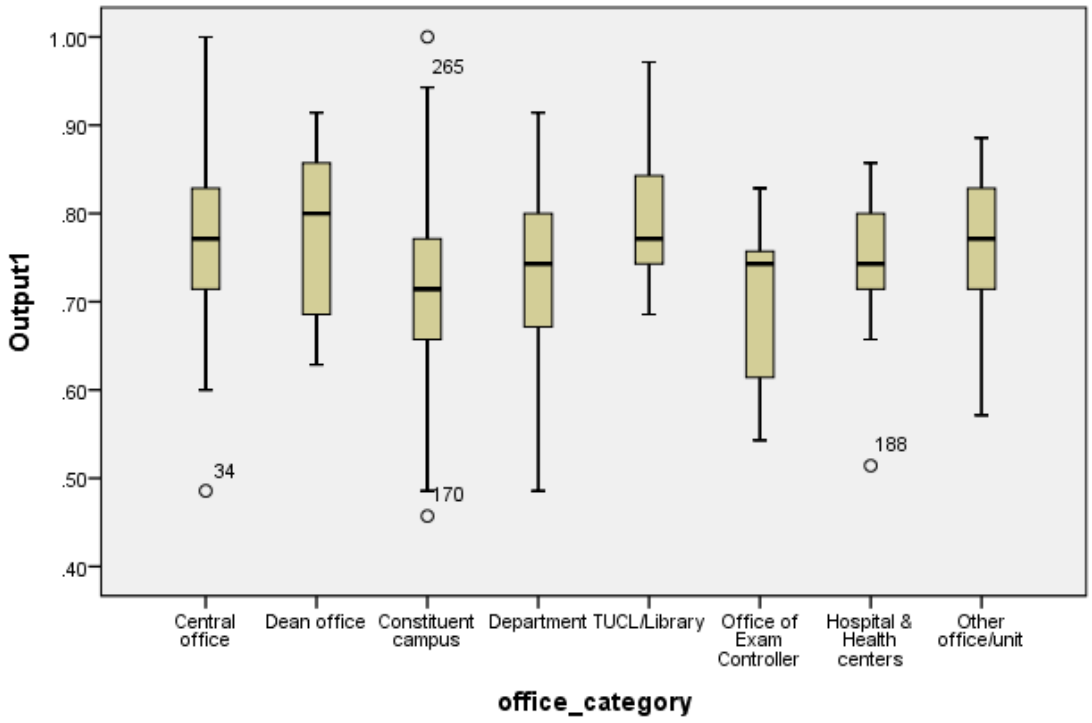
Source: Field survey, 2024

The respondents are participated from different office and unit of TU. The number of 34.7 percent respondents are participated from constituent campus and 18.4 percent respondents are from central office. 12.6 percent are from the department and 11.2 percent are from the office of the dean. Similarly, 6.9 percent of respondents each from hospital and other units and 5.4 percent of library staff participated.

The inter-quartile range of category of office with e-governance practice for service delivery has been seen positive in the following whisper box analysis in SPSS. It reflects the data is fine for statistical test.

Figure 2

Inter-quartile range of type of offices



Source: Data analysis in SPSS

4.1.2 Classification of Staffs

Different categories of teaching and non-teaching staff participated in this study. Different hierarchical posts are classified for the responsibility of teaching and administration. Similarly, representatives from FSU, TUEA and TUTA participated in Focus Group Discussion (FGD). The following is the classification of staffs participated in this study:

Table 4

Classification of staffs

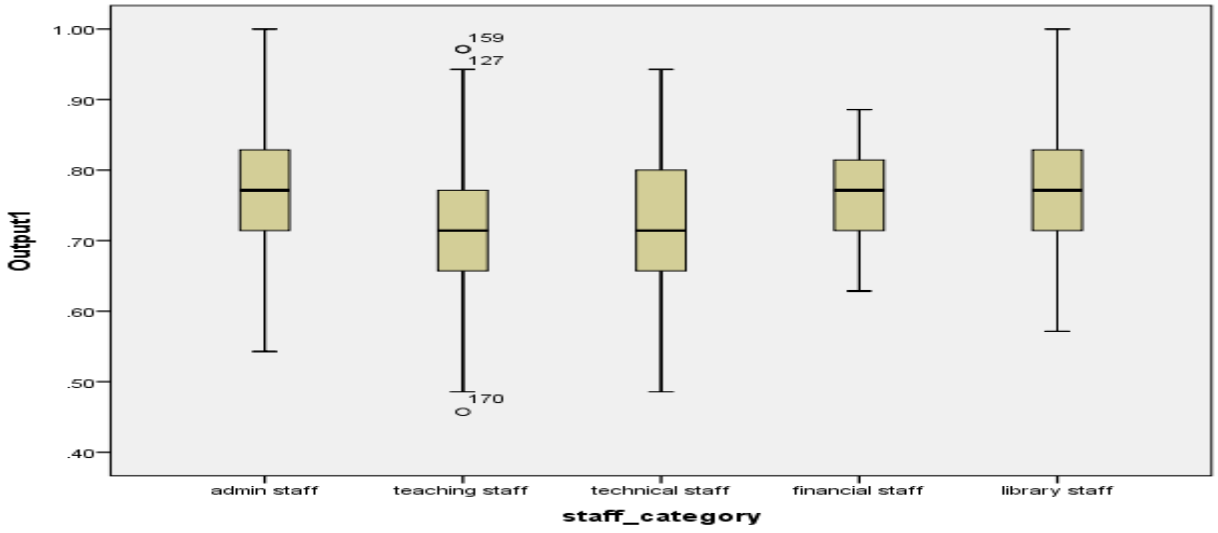
Staff classification	Frequency	Percent
Administrative staff	108	39.0
Teaching staff	86	31.0
Technical staff	45	16.2
Financial staff	24	8.7
Library staff	14	5.1
Total	277	100.0

Note. Field survey, 2024.

The number of 39 percent respondents are administrative staff. The number of teaching staff is 31 percent, and 16.2 percent are technical staff. Similarly, 8.7 percent respondents are financial staff, and the remaining 5.1 percent respondents are library staff. Five administrative staff, two teaching staff and two student representatives are interviewed in-depth to collect the required information while conducting KII.

Figure 3

Inter-quartile range of classification of staffs



Source: Data analysis in SPSS

On the basis of data analysis in SPSS, the inter-quartile range of staff category has been seen positive with e-governance practice for service delivery in the whisper box analysis in SPSS. The three respondents are laid out of quartile range because they have given unique respond beyond the rest of the respondents. However, this figure reflects the data is overall fine for statistical analysis.

4.1.3 Age Group of Respondents

The age group of the respondents is analyzed. There are five age groups with ten years' interval from age of 20 year up to above the age of 60 year. The age group of the respondents in this study is presented in the following table:

Table 5
Age group of respondents

Age group	Frequency	Percent
40-50 yrs	110	39.7
30-40 yrs	99	35.7
50-60 yrs	45	16.2
20-30 yrs	18	6.5
60 yrs & above	5	1.8
Total	277	100.0

Source: Field survey, 2024.

The participants' age group is varied. The age group of 40-50 years' respondents is 39.7 percent and the age group of 30-40 years' respondents is 35.7 percent. Similarly, the age group of 50-60 years is 16.2 percent, and the age group of 20-30 years is 6.5 percent. The age group of 60 years and above is only 1.8 percent.

4.1.4 Characteristics of Respondents

The gender perspective, location of office and the designation level of respondent has been analyzed. There are 33.9 percent of female respondents and 66.10 percent of male respondent in this study. The participation of female and male respondents, level of their designation and location of offices are described and analyzed in the following table:

Table 6
Category of respondents

Particulars	Gender			Level of respondents			Office location		
	Male	Female	Total	Officer	Assistant	Total	Inside valley	Outside valley	Total
Frequency	183	94	277	148	129	277	217	60	277
Percent	66.1	33.9	100.0	53.4	46.6	100.0	78.3	21.7	100.0

Source: Field survey, 2024.

Table 6 shows that one third respondents are female and two third respondents are male. The officer level staff are 53.4 percent respondents and 46.6 percent respondents are assistant level staff. The number of 78.3 percent respondents are selected from inside the valley and 21.7 percent respondents are participated from outside valley.

4.1.5 Educational Attainment of Respondents

The educational attainment of the respondents reflects their working capacity and competence towards service delivery. Educational attainment is categorized into five categories. SLC/SEE, Proficiency, Bachelor, Master and MPhil/PhD are the categories that are analyzed in this study.

Table 7
Status of education attainment of respondents

Education attainment	Frequency	Percent
Master level	188	67.9
MPhil/PhD	54	19.5
Bachelor level	24	8.7
PCL level	9	3.2
SLC/SEE	2	0.7
Total	277	100.0

Source: Field survey, 2024.

The number of master level educational attainment is 67.9 percent which is the highest number among respondents. MPhil/PhD level educational attainment of respondent is 19.5 percent and bachelor level respondents are 8.7 percent. The educational attainment of PCL level and SEE are 3.2 percent and 0.7 percent respectively.

4.2 E-governance Practice for Service Delivery

E-governance practice is vital to implement for service delivery. The perception of e-governance, its areas, ICT based software infrastructure, service delivery mechanism, office management system, accession to information of policy and strategy and effectiveness of e-governance for managing cost efficient and time saving mechanism are discussed in this section. Both quantitative and qualitative information are presented, described, analyzed and interpreted in this section.

4.2.1 Perception of E-governance Practice

During a survey for this study, the majority of respondents are found familiar with e-governance practice at TU. This shows the perception of e-governance practice has been familiar with teachers and employees in the university.

Table 8

Perception of e-governance practice

Attributes	Frequency	Percent
Yes, I know	174	62.8
Partially, I know	87	31.4
Neutral	7	2.5
I have heard	9	3.5
Total	277	100.0

Source: Field survey, 2024.

Table 8 shows that 62.8 percent among the total number of 277 have been familiar with the e-governance practice at office and 31.4 percent partially know about this practice. Only 2.5 percent of responses found as neutral, and 3.5 percent have heard about e-governance practice. This survey shows the majority of human resources those who are working in the university are familiar with e-governance practices. In the view of Chopra (2019), leadership and governance practices, teaching and learning practices, professional development of teaching and non-teaching staffs, assessment practices, collaboration and networking; and infrastructure are the six parameters of e-governance that are assessed with the status of ICT integration. So, e-governance is an emerging trend with the advent of ICT to re-invent the way the government works, becoming a new model of governance.

Regarding the perception about e-governance practice, P1 states that the practice of e-governance in administration has been partly implemented but not integrated way of system and mechanism but the view of P2 has a different perception of e-governance practice that TU had started the e-governance practice at first in financial sector.

P2 argues that the output of e-governance practice and software have minimized and replaced the full-time staff in each section to do the same task and made the services easy to deliver. In the argument of P3, TU central library had already managed the book record and circulation system as needed by the students using e-governance techniques before TU brought e-governance policy in 2022. Similarly, P4 has different opinions from other's opinions. Regarding the e-governance, P4 states that computer typing and e-governance are different things because an e-governance system needs two-way communication and takes an e-governance system that is the better way to provide services without alternation and it supports for work performance and evaluation process of the employees. P6 has an experience about e-governance practice that the e-governance process is found at the beginning of the online process from the office of examination controller and another certain level of the digitalization process and they realized the importance of ICT and started to use massively e-governance practices after COVID-19. P7 states that e-governance practice was started at the beginning of COVID-19 and become well about e-governance practice because they have used e-governance tools a lot which has made a change at office.

From the perspective of students, P8 states that the matter of devices for e-governance is the centralized process of the data center at Kirtipur and personal mobiles, laptops, projectors and digital boards are used for e-governance practice in the classroom. Some examination forms fill-up, online notices and the provision of online responses by the students are managed at TU. Online classes were run during COVID-19 and still some online classes with blended mode for different courses and classes are running at TU. Similarly, P9 states that the computer is the main device of information and data for student-centric e-governance practice. They found some software and internet practice at the office and some activities like e-banking, online forms etc. for effective and efficient service delivery to easy access of the students.

Regarding the perception of e-governance, P4 argues that the University can show the e-governance practice of the country. So, whole services must be through e-governance tools. They should change the concept of the traditional service delivery process in the past and need to

change the concept of effective and efficient service delivery system in the current situation. They have to manage the human resources for technological counseling of the impact of e-governance practices on the service delivery where one employee can help to convince the stakeholders together with other employees.

4.2.2 Areas of E-governance

The respondents, during the survey, have chosen multiple areas that are practiced at their office. Automation and e-administration are the highest areas of e-governance at TU and the second area is e-library to use e-governance practice.

Table 9

Areas of e-governance applied and practiced at offices

Area of e-governance	Frequency	Percent
Automation/e-administration	224	80.9
E-library	88	31.8
E-services: External & Internal eservices	85	30.7
E-finance	84	30.3
E-examination	47	17.0

Source: Field survey, 2024.

80.9 percent of respondents among the total number of 277 chose automation and e-administration area of e-governance at office. The number of 30.7 percent respondents have said that there are both external and internal e-services at their office. The number of 30 percent respondents have found the area of e-finance and 17 percent have found the area of e-examination. Similarly, 31.8 percent respondents have found the e-library at the office. Koudiki & Janardhanam (2017) have revealed that the possible areas of implementation of e-governance in educational sector are e-administration, e-services, e-participation, improved education system, enhanced teaching tools, multi-user centralized information, integrated services, anywhere, anytime information, cost reduction and affordability, improved decision making and protection of information.

The five thematic areas are identified in this study. Automation and e-administration are the first areas of e-governance which are used in the offices for service delivery. E-library, external and internal e-services, e-finance and e-examination are the core areas of e-governance.

Regarding the initiation of automation, P1 states that e-attendance had already been started to 22-23 offices since 2072-73 FY and the central office decided to extend the system to 52-54 offices at that time but P2 argues that automation software has been started for two years. So, it is a transitional phase of automation where both manual and physical systems are used at offices. Similarly, regarding automation system, P3 states that TU has started office automation system software since 2022 AD which is being run at central library too.

P1 states that automation system is started for communication and exchange of letters that has been planned for a quick decision-making process and providing fast services to the stakeholders through e-governance practice. Similarly, P2 argues that some of the endeavor and efforts in the financial sections of all offices have been made to the digitalization process. However, it has not been integrated into all systems yet. E-governance practices have been followed more in administration of examination and generally started to be used in other sectors at offices when the Quality Assurance Accreditation (QAA) made a provision of compulsory e-governance for all campuses. Similarly, P1 argues that this automation system has stopped hiding and missing official files with intentional behavior and controlled the back dated decisions. Similarly, e-attendance is best practice for administrative tasks. P2 has a similar view to P1 and argued that in the TU central office, they have started automation in administration and e-attendance software which has made good progress for the university administration, but it is not fully implemented yet. In this regard, P4 argues that they have started an e-attendance system to connect office to office. Automation software was implemented for one and half years and e-governance practices started from the initiation. The understanding of P8 says that a single software under e-governance practice has been governed at the TU central office.

P6 argues that universities are the mirror for using e-governance practice as a role model in the world practice. When a university has invented and practiced a new sample thing, then the government learns and takes the knowledge because the university has lots of programs to teach and produce different sector human resources with available more faculties. However, they found the inverted culture of e-governance practice in Nepal though the universities have supported the state. They are now hopeful with the students who are developing new portals, supporting UGC tasks, etc. It reflects that the future of e-governance practice is bright, although they must work a lot in the present. Similarly, P6 added that:

We have been involved directly and indirectly to implement e-governance for three or four years and found positive vibration in campuses which have taken the online automation process with automated technology as a great achievement of digital communication, transparency and discipline maintaining process.

From the perspectives of service receivers, P8 says that the automation process is implemented in many countries worldwide. The software and system should be developed for managing administrative information, exam-related information, students' class records, their homework and other activities as a profile of a student in the higher education system like the details of the job description of the employee which may be the student's profile for higher education. Personal access to the profile of a person should be given to the student concerned to find out the concerned data of the university like the information of student's admission to exit processes, class records, assignments and other administrative data.

During the KII, all respondents in KII have focused on e-governance, automation and e-administration as a core thematic area. The qualitative data analysis shows the focused areas highlighted in the word cloud in MAXQDA as follows:

Figure 2

Focused areas highlighted in Word Cloud

Source: Data analysis in MAXQDA

Figure 5 shows that the priority of e-governance and its' focused areas are relevant issues to study and all participants highlighted the issue during the KIIs. Regarding areas of

e-governance, P3 argues that this digitalization process has developed the library into an e-library form and the library has been run not only physically but also virtually to provide the services. Similarly, P4 describes about the software used for automation in the initial phase that the Database System (DBS) was used as software in examination for reducing data error, greater efficiency, enhance efficiency and security, automation of processes, and improved accessibility. After that, TUEMIS is the main software at this office which has been applied in the examination since 2069 BS.

During the FGD with TUTA, the representatives are agreed with the change of service delivery status through e-governance practices than the prior status of service delivery in TU. They said that there was no digital attendance system at TU before starting e-governance practice. E-attendance system has made a change in the service delivery of TU. The representatives of TUTA added that, *' E-attendance system is an international standard that regulates and monitors on the duties of all teachers and employees for checks and balances which makes the obligation of time and duty and builds the integrity of the teachers and employees at the office.'*

4.2.3 Infrastructure of E-governance

Most of the respondents have computer and internet facilities at their places. ICT-based facilities are utilized to implement e-governance at offices. Digital platform is used for digital communication using ICT for service delivery.

Table 10
ICT-based e-governance facilities at offices

ICT-based e-governance facility	Frequency	Percent
Computer and internet facility in the working place	242	87.4
Website available for information sharing	143	51.6
ICT orientation training available	64	23.1
Poor infrastructure for e-governance	58	20.9
No any idea	12	4.3

Source: Field survey, 2024.

Among the number of 277 respondents, 87.4 percent have such a facility and 51.6 percent respondents have a website available for information sharing. Similarly, 23.1 percent of respondents have ICT orientation training available, but 20.9 percent respondents have claimed

their offices with poor infrastructure for e-governance practice. Malla, V., Diyal, S. B., & Pandey, R. (2023) reveals that universities and colleges have started to use their websites as information centers. Korea International Cooperation Agency (KOICA)-Nepal had provided assistance to initiate the establishment of Information and Communication Technology (ICT-Center) in the Department of Electronics and Computer Engineering (DECE) of Pulchowk Campus, Institute of Engineering, TU in 2010 AD (*Program and Budget Book, FY 2067/68).*

Regarding digital infrastructure of e-governance, P1 argues that website portals have played vital role in accessing the information by uploading notices on time, but the problems have been created by those offices which do not update the notices via website. Times Higher Education (THE) has used it to verify the information from the websites. Other instruments like the right to information have played the role of making the system accountable. Similarly, it is necessary to increase access by developing the infrastructure of e-governance and e-governance practice has increased transparency in the offices, though this level of transparency is not sufficient for governance. P1 states that:

> *We should integrate teaching, learning, and internal administration to deliver services, and reduce the duplication of the same work. The solution is that policy should guide the behaviors, and policy should be strictly implemented in the organization.*

P3 has pointed out the problem that arises inside the valley and central office to send letters from one campus to another campus or from one division to another division of the office. The reason for the problems is caused by some institutional infrastructures and some personal interests. The difficulties need to be minimized for implementing e-governance. Similarly, P3 has pointed out some problems that they have main problem of basic infrastructure to implement e-governance. The second challenge is to disseminate knowledge about e-governance through training massively. The mechanism of training is not suitable for the library sector rather than haphazardly organizing the training without a proper geographical location.

Similarly, P5 has an experience of establishment of IT center at TU. In the context of increasing the importance of information technology for office administration, P5 says:

> *TU had established an IT center at the CEDA building, Kirtipur in 13th Poush, 2073 BS together with ODEC, a distance learning office. The IT center has been established with a data center as a starting of the physical infrastructure of IT in TU. However, the infrastructure was not sufficient for TU.*

According to P5, they had started work to support students, teachers, and employees for reading, teaching, research, and administration work at offices by providing free Wi-Fi internet services to make an information technology-friendly environment in for TU premises, the center office, the university campus area, and the office of the examination controller. P9 argues that TU is going to be positive for good governance activities like an appointment of authorities from open competition and other budgeting processes. Similarly, websites and software are effective for updating university, disseminating information and other research activities of the students. For example, a student at Biratnagar does not visit the college from around ten km periphery or a corner of Kathmandu valley or over the country to find a notice about the exam center while s/he finds that in the website at home. We do not go to college through public vehicles to get a notice rather we get a notice on the website.

Regarding physical infrastructure for effective and efficient service delivery through e-governance practices, P1 says that they have a data center at central level as an institutional infrastructure for e-governance. The IT center has made a networking system for the Wi-Fi zone and a technology is developing to integrate the data of the central office and examination office. In this area, P2 argues that TU has its own physical structure of IT center, and they have some technologies to use but technology never be perfect, today's technology, tomorrow will be quick change absolutely.

Similarly, P3 says that we do not do well enough infrastructure development for e-governance and P4 argues that there are computers and internet facilities in each campus and offices, but we could not utilize them properly. P6 tells that the institutional infrastructure of e-governance is still poor in TU, but we are not in poor condition compared to other organizations. However, they can't rate the top-level physical infrastructure. They have a major lack in official infrastructure of information technology division in the central office. The Wi-Fi zone in the TU premises is the largest area of the country and our Wi-Fi system is the largest system in a particular organization.

P7 argues that the main institutional infrastructure is the Information Technology Innovation Center (ITIC) which is working on the area of e-mail administration and connectivity. E-governance practice has supported employees indescribably for enhancing their capacity and career development. Similarly, P8 says that we have a lot of infrastructure for e-governance practices because the capacity of the data center is highly equipped, but we could not utilize it

very well. However, P9 argues that they are dissatisfied with the infrastructure of e-governance practice and claims that TU has no such mechanism that governs the whole process of entry up to exit period of students at a campus which makes it easy for the students.

The following are the list of software infrastructure developed, purchased and utilized in different areas of e-governance practice that are identified during the KII in-depth interview:

Table 11

List of software infrastructure used in TU

Area of e-governance	List of software
E-administration	1. Automation software 2. E-attendance software 3. WEBGISMS : Web-based Geospatial Image Streams Information Management System 4. Website/Email 5. MS Office 365 6. Midas health management software for hospital
E-finance	1. AIMS : Auditing Information Management System 2. EIFMIS: Electronic Integrated Financial Management Information System 3. GAIS : General Accounting Information System 4. BIMS : Budget Information Management System 5. IIMS : Income Information Management System 6. IIS : Internal Information System 7. LIMS : Loan Information Management System 8. PGIMS: Pension and Gratuity Information Management System 9. PIMS : Payroll Information Management System
E-library	1. Automation 2. E-attendance 3. ISBN Online services

Area of e-governance	List of software
	4. RFID : Radio Frequency Identification 5. DBASE: Database software 6. MUSE : Museums uniting with Schools in Education 7. NepJol : Nepal Journals Online 8. NREN : Nepal Research and Education Network 9. EBSCO : Elton B. Stephens Company 10. JSTOR : Journal Storage 11. Anti-plagiarism Software 12. Koha software 13. CDSISIS: Computerized Documentation System/Integrated Set of Information Systems
E-examination	1. Automation 2. E-attendance 3. Database 4. SDCREMIS: Supply, Development, Commissioning and Re-engineering of Examination Management Information System 5. TUEMIS: Tribhuvan University Examination Management Information System

Source: KII in-depth interview, 2081

The area of e-library has used more software than other areas. E-finance sector also uses different software. Multiple software has been used for e-administration. P1 says about the tools of e-governance that the software of financial administration and personal administration is also developing in an integrated way. The physical examination management system has been integrated in the same software.

Regarding the status of yearly budget allocation for e-governance infrastructures, TU has allocated budget for information technology management to purchase equipment since FY 2078-79 and regularly allocated some grant to this heading. Regarding budget allocation, P2 says that

they allocate budget for IT every year. They provide a huge amount for annual costs and procurement of instruments or equipment. However, the utilization of the instruments is not regularly monitored, which may become an issue of new research.

Table 12
Fiscal Year-wise Budget Allocation for Information Technology Management in TU

Description	2081-082	2080-081	2079-080	2078-079	2077-078	2076-077	Total (Amt. in thousand)	Percentage
Information Technology Management (Office Equipment)				40000	0	0	40000	11.14
Information Technology Management (Software & Equipment)	40000	97000	60000		0	0	197000	54.87
University Campus, Kirtipur								
Centre of Excellence Development Program	40000	40000	27000		0	0	107000	29.81
Capital Budget for Library Automation (Prioritized project by GoN)	15000				0	0	15000	4.18
Total:	95000	137000	87000	40000	0	0	359000	100.00

Source: Program and budget book, Financial Administration Division, TU

The amount of 400 lakhs was allocated for office equipment in FY 2078-79. Similarly, 600 lakhs, 970 lakhs and 400 lakhs budget allocated for IT management to purchase software and equipment in FY 2079-80, FY 2080-81 and FY 2081-82 respectively. Additionally, 270

lakhs for center for excellence development program at university campus, Kirtipur is allocated in FY 2079-80 and 400 lakhs each year is regularly allocated for the same heading to center of excellence development program in FY 2080-81 and FY 2081-82. Capital budget of amount 150 lakhs is allocated for library automation which is prioritized project by Government of Nepal. So, TU has started to invest in information technology to enhance the capacity of e-governance for quality service delivery.

Regarding digital and physical infrastructure of e-governance, P1 argues that each office has some servers and back-up systems. Institute of Engineering (IoE) has a different and large set-up of e-governance technology than the e-governance system of the central office. Internet access has been reached in all areas of the university. Nepal Government also has supported to use of their data center.

P6 argues that the IT center has been established to form the mechanism but has no structures of IT in the administration and no governing mechanism has been built. IT center is not converted into an organizational mechanism but P5 says that the main task of the IT center is the responsibility to provide IT services in TU premises, university campus premises, the TU center office, and the office of the examination controller. They designed and worked on piloting the Wi-Fi zone in the first phase and selected 20/22 departments that had linked the TU central office with departments and the services of the Office of Examination Controller (OEC). So, e-governance mechanisms have been used in any form in a section on all campuses, however, the system may be secure or unsecure. They have their own data center, but they have to enhance the capacity of the center and operational modality even though they have made infrastructure for e-governance. Similarly, P8 argues that they can use the backup of our data center which is in the infrastructure of Government of Nepal in the ministry. The backup of the data center is hosted at the infrastructure of Government of Nepal in the ministry. We have not utilized the capacity of the data center as required.

P3 says that the system can be continued when the target group of users become habitual to use the software that the office purchases and installs with the running method. TUCL has kept a remotex software and spends around seven lakhs per year which manages databases to search from anywhere. Another software is Koha software that works for database of books, students' database and task of circulation of books to the readers. Koha is free software but yearly 2 lakhs 50 thousand operating cost is spent for this software. Another software is anti-

plagiarism software which is somehow expensive for us. TUCL is now spending one hundred lakhs for 60 thousand documents. TUCL has another ISBN software which has become online to apply. They are providing ISBN number 10 minutes after receiving application online. They are using another software for website hosting for D-space and other sites. So, TUCL spends around 150 lakhs a year on this software. Regarding the investment on infrastructure of e-governance, P4 says that they do not have any disturbance to purchase exam-related instruments, and they have no lack of internet, but some instruments need to be purchased for e-governance infrastructure development. They have recently published a tender process of around three crores for a new data center, especially for exam purposes.

P9 argues that they are still in line for fee payment at banks in different campuses. We are asking for an e-payment system, but the authority does not take seriously showing the simple complexity of technical things. We made entrance exam forms online but still not able to make an exam form online. Campus authority always shows some technicalities and causes about the permission from above and there is a clear policy gap about this technicality to implement the concept of a digital governance system. The IT policy and strategic plan are not informed to the students because the mechanism of information dissemination is very poor at TU. The major problem is that TU has developed a policy or plan or initiation, but the information is not conveyed to the concerned offices, though we are trying to bring the policies to the campus level.

4.2.4 Service Delivery Mechanism

During the survey, participants viewed multiple mechanisms used to disseminate ICT-based information for service delivery at the office. Websites and email communication are major tools to implement e-governance. 74.4 percent of respondents have a website at the office.

Table 13

Mechanism of disseminating information

Mechanism of information sharing	Frequency	Percent
Website	206	74.4
E-mail	161	58.1
Social media	124	44.8
Notice board	110	39.7
Manually	46	16.6

Source: Field survey, 2024.

The number of 74.4 percent respondents have chosen website as a main e-governance tool to disseminate information. E-mail is the second highest tool with 58.1 percent of respondents for sharing information. The number of 44.8 percent respondents have chosen notice boards for information sharing and 16.6 percent of respondents have chosen manually to record and information sharing system at their office. In this regard, Malla, V., Diyal, S. B., & Pandey, R. (2023) stated that effective website design and functionality are very important for higher education institutions to attract students and share information regarding academic activities and they explored the effectiveness of portals and websites in academic institutions. In the findings of Dhindsa, Narang, & Choudhary (2013), e-portal, as a dimension of e-governance, is specially designed webpage at website which brings all the information together related to specific topic or subject matter from different sources in a uniform way

Regarding service delivery mechanism through e-governance at TU, different mechanisms for implementing e-governance practices is found in service delivery. In this context of implementation of e-governance, P1 argues that agendas are sent through email for input before a decision which increased the participatory approach to the decision process. Similarly, P2 claims that e-governance practice has been started from financial administration in TU. Provident fund is a part of financial management where the digitalization process was started from 2048 BS up to 2050 BS. P2 added that:

> *When I was entered in the job in 2052 BS, our seniors had used LOTUS software which was a spreadsheet application and DBASE database management system for fund management. It had extended and used to accounting system and income system as well as hospital administration.*

P2 says that they have used two software. First, web-based software and second, PC software which has a server under a person. Hospitals have used Midas health management software which is set up only for hospitals and not linked with central server. This software runs in two layers with a private VPN model and linked to the TU central server.

Different endeavors are seen for e-examination process. P1 argues that TU Office of the Examination Controller (TUOEC) started to work using software 2053/54 at the beginning. Similarly, TU Examination automation was started in 2053/54 BS. Regarding e-examination in KII, P4 expresses the view as:

*Our digitalization system started from **a litho** based typing system. We have found typing records with the name of the student in 2022 BS, but it has not found the prior such record. The new software has aimed that all exam forms will be filled in by the students, easily send the triplicate to the campuses and e-attendance records will be generated.*

P8 argues that the examination controller office has started a new automation system separately and new software is developing for student registration and examination forms. It has been a good initiative that started for some years to e-governance practices, but we could not show enough capacity of ourselves. Similarly, P9 argues that mails are confidential, a reliable mode of communication and are used to send questions online at the district level too. Some formal and informal interaction has been done using mobile phones.

4.2.5 Office Management System

Most respondents are found with the view of both computerized and filing system for office management. It reflects that the offices are trying to make the services technology-friendly using computerized systems.

Table 14

Office management system

Office management system	Frequency	Percent
Both computerized and filling system	201	72.6
Computerized system	41	14.8
Filling system	14	5.1
Traditional way of record keeping	13	4.7
Not systematic way	8	2.9
Total:	277	100.0

Source: Field survey, 2024.

In table 14, both computerized and filling system are used at office. The number of 72.6 percent respondents have chosen the office management system using both computerized and filing system. The number of 14.8 percent respondents have computerized systems at the office and 5.1 percent respondents have only a filling system. The number of 4.7 percent respondents have thought their office with traditional way of record keeping.

Regarding the ways to record keeping managing office, P2 argues that TU must prepare a directive with the right track to define workload and work timetable for cost-effective service delivery possible through the digitalization process, otherwise it will be a burden in the institution. It is so challenging job to maintain digitalization process, if they keep the records in both models, then the double human resource requires for same work, one is technical person to keep a digital record, and another is a trained employee for record keeping manually. If they don't change their mentality of manual system, then the cost burden will be increased than decreased. They need balance for this kind of working procedure.

Regarding the e-library automation process, P1 argues that the management of library automation has sped up since 2062/63 BS. The Higher Education Project (HEP) had started a library automation project by providing 6 to 12 computers for each library. The software for library is different from integrated software which was planned to integrate by higher education project but later, library software is designed for open-source software and accessible to all campuses and provide special training for the users of that software. Most libraries have used KOHA software and D-space software to manage digital content. Similarly, P3 argues that TUCL is established under the office of the Rector and the main person responsible for all activities is the rector of TU. The students are getting services through software in all areas at the central library. They have managed more than twenty thousand theses of master, MPhil. Level and PhD level and all kinds of journals published in Nepal are kept in the mechanism of full text accessible through online portal if NepJol. TUCL has purchased some databases to provide free online access from any place to different kinds of journal articles for researchers and scholars in the country or abroad.

Similarly, P2 claims that they are following three or four different software for accounting system which work for accounting, income accounting, etc. but a new process of developing integrated software has been forwarded to make a great change in the financial management. P3 states that the online system has been started but only received the data but could not answer through the system. TU Curriculum Development Center also started online software but not full-fledged services, only one-way service but in the Office of Examination Controller (OEC), they have started to fill up the forms online which is an initial phase of one-way communication governance system.

Similarly, P3 argues that they brought Koha software with a circulation system that was lacking in using CDS/ISIS software. Circulation system means the record of books issued and returned are kept by the software. They managed Koha software in 2005 AD which has been user-friendly for libraries. They have started to provide and return books and take fines as well as book search techniques through online and automation systems. Generally, students may look for the necessary books, and purchase and carry the books from the computer records.

Regarding database system, P4 says that a database system is a software or system that manages a database and performs operations on data requested by multiple clients, but the software would be auditable, but the DBS was not auditable, it was only an editable system. After 2072 BS, we started to collect answer sheets, packaging, dispatching, appointment for teachers, and minutes of the scrutinized process through the TUEMIS system. But P7 expresses the view that TU has declared a module in 2022 AD. However, current TU authorities have no interest due to lacking understanding about the systems. They are not encouraging us to implement the system that has already been designed and implemented. P3 argues that they have a vision of keeping all resources in digital form and keeping all theses, and dissertations received in digital form with full text online accessible anywhere on the website. About re-engineering of examination process, Pokhrel (2024) has found that re-engineering of examination process is the software development for complete automation process of examination system at OCoE and integration of examination division of Office of the Dean which makes a solution to IT issues.

During the KII, P1 argues that the software was sufficient at that time to fulfill the need, and the second phase of the higher education project supported to develop EMIS software with six modules in the sectors of exam, administration, financial administration, library etc.

Regarding the use of e-governance, P1 claims that the psychology of conveying the agenda through email has been developed and started sending the agenda which has made the decision process fast, sharp, and participatory. The matter of participatory is depended upon the psychology of the leadership if we become ready to make the decision participatory or not, otherwise it is also a challenging, and difficult task.

4.2.6 Accession to Information of Policy and Strategy

Similarly, the Policies and strategies of university and accession to information are found accessible in-service delivery at TU. In a survey, the half of the respondents have accession of information of policies and strategies at TU.

Table 15
Accession of information of policies and strategies

Accession of information	Frequency	Percent
Accessible	135	48.74
Neutral	62	22.38
Difficult to access	40	14.44
Easily accessible	39	14.08
No accessible	1	0.36

Source: Field survey, 2024.

Table 15 shows that the number of 48.74 percent respondents have got accessible information, 14.08 percent have easily accessible, and 14.44 percent found it difficult to access the information. The number of 22.38 percent respondents have neutral view about the accession to information on service delivery at TU. Dar (2022) stated that all e-governed services have made information accessible to citizens twenty-four hours a day, seven days a week in a convenient, efficient, and transparent manner, resulting in good governance.

Regarding accession to information of policy and strategy on service delivery, P1 says that the regulation of the establishment of an IT center-2073 has guided for policies and mechanisms that a central-level committee led by the registrar has formulated for the policy-level decisions. The committee decides what kind of information technology can be used at which level and how it works for e-governance. P2 argues that they do not have any rules to make digitalization process and electronic working procedure yet and they are working to prepare directives for financial management which is a policy gap in the university.

P3 says that they develop policies under the leadership of the Rector. There is a system in which some committees are formed under the chairmanship of the library chief, and some committees' formation and work are held under the office of the Rector. Regarding the accession of information, P4 says that they have no committee to implement e-governance for the office of the examination controller, though a committee has been made for the use of software and the office enters a new phase of using e-governance practice through a new software providing printing access to the students after a certain time when the office starts to publish the result using the new software. P6 argues that IT policy-2015 is implemented for e-governance, and a year of e-governance master plan is being planned. Integrated platforms of e-governance are also

developed. E-attendance working procedure, working procedure for online classes, library resource management, and anti-plagiarism software are separately formulated and implemented in e-governance practice. P7 says that the first legal provision for e-governance was a directive of electronic communication which was revised and built as a regulation of electronic communication and now it has been implemented.

Similarly, P2 argues that they could not bring a strong policy for e-governance which creates challenges on physical infrastructure development, human resource development. The major challenge is related to dynamic technology which creates the problems of speeding up physical infrastructure upgradation and additional updates. Another main problem is the policy gap in TU which the authority should address, and the readiness of human resources is also another challenge to prepare for service delivery using ITC-based e-governance tools.

According to P1, they have developed policy and strategy in 2023 AD and now the way forward is clearly defined and guided by policy and strategy to operate by formatting committees for e-governance practices. The IT center was established and worked for e-governance practices but the rest of the work for e-governance is applied during the COVID-19. Policy-level provisions have been addressed by the regulation of information technology.

P6 says that TU is an autonomous government agency, and this institution should accept and apply the acts, rules, regulations, etc. implemented by the Government of Nepal. Government of Nepal has brought an IT policy in 2000 which aimed a lot of e-governance practices. Government of Nepal had also developed an e-governance master plan in which a lot of educational policies, plans, and practices were included. Regarding the policy of TU, P6 added that TU has made different regulations, and working procedures for system running. They found six working procedures on the website of TU. TU has developed its policy of IT in 2023 which is supported by Nurturing Higher Education Project (NHEP). This project has supported the development of a year strategic plan for digitalization that talks about the different parts of e-governance. Second, we have a strategic plan document that talks about a five-year plan. We have made working procedures to support the plans. Some working procedures fully advocate e-governance and in some points, clauses only raised the issues of e-governance.

P1 argues that a work-based attendance system should be maintained for technical staff. For this scheme, they should provide flexy time for work like a 'work from home' policy. So,

they may become flexible at the policy level to give a chance to work at home for certain jobs. If they offer one or two hundred employees to utilize flexy time and give opportunity to work from home, then it results in their performance equal to the performance of five hundred employees. The main way forward is policy reform to solve the problems. First, which institutional provision takes and injects IT into a university should be determined. Information technology policy has made a committee which needs to be active for the policy making process. The dysfunctionality of committees hinders the process, even though we have resources and capable human staff for software implementation.

P2 states that the immediate need is to develop strong policy and strong structure for working with IT and following e-governance concept. Similarly, P7 claims that regulation of electronic communication has been developed and implemented to manage all e-governance activities. However, one generation of teachers and employees does not become serious about this e-governance system. They had tried to minimize the number of that generation but could not become successful. They have some weaknesses in the system and policy gap for reward and punishment as well as not implementing the scheme of the golden handshake. Regarding policy gap, P4 stated that e-governance practice is essential for the database because the Office of the Examination Controller (OEC) is the heart of the university which reflects the accountability and the quality of services in the university. Automation, website, and EMIS are the major three software that are using in the office but they do not have a separate working procedure for e-governance implementation, especially for EMIS in examination which is a major policy gap. So, the organization should make a policy to address the digital signature and the validity of digital mark sheets and other documents.

About policy of IT sector, P1 states that directive of electronic communication has covered not only communication but also the governance of services. They started open and distance education for online teaching learning mechanisms in 2073 and decided to conduct online classes all over the country but P2 argues that TU Senate has formally passed the yearly policy and program addressing electronic governance since four/five years. However, separate electronic administration directives are necessary.

P2 expressed a different argument on the policy development process that they get different committees formed for e-governance implementation, but these structures are still beyond the directives. The IT policy has been prepared by a project, funded by the World Bank

but the ownership should be taken from the TU Senate. If the policy is passed by the Senate, then it works only within the structure of university. All policies have been prepared by a project without taking ownership by the TU Senate. So, TU should pass the policy from the Senate for the ownership of the policy.

P4 has suggested to the policy makers that they should change their feelings and thoughts about what they are for and understand that they are not for themselves, but for others first and hope that what they do and leave the task is easily followed by others for knowledge transformation. Another solution is the e-governance-related policy they should develop and implement. Similarly, P9 has suggested that the authority should be informative first and should deliver information as needed. They should create the information and circulate it to all units of the university, such as campuses, departments, divisions, research centers and other offices. P9 added that:

> *If we don't apply new technology, we become backward. We have no option of adapting to technology. If we follow the new technology, we should hire trained human resources, empowering the existing human resources by training, then we can successfully overcome the challenges in the coming days ahead.*

P4 argues that they have to make clear policy in the future that regulates all works legally. They are providing a mark sheet, and transcript physically but they are planning to provide printing access to those documents to the students soon.

P1 argues that the major policy gap is lack of work-based attendance system and flexy time management for work from home model to technical staffs in TU. They have a policy gap for implementing e-governance and lack of attitude to adaptive change or unwillingness attitude toward change is highly in existing administration.

P6 argues that they are not poor based on policy and infrastructures for e-governance though the policy gap they found. The change in technology, our interests, and our professors who returned from abroad study and apply the knowledge in teaching-learning process in their respective organizations are beyond our policy. So, technology that is in practice is not incorporated into policy. We have utilized Artificial Intelligence (AI) in our teaching-learning and laboratory process as an integral part of teaching-learning, but TU authority has recently issued a notice to watch out for AI in the examination process. The authorities have not

understood the importance of AI and more agencies, laboratories, and other parts have been using AI for the evaluation process and management process of their task.

On the other hand, P7 states that the background of this directive is vital for three major things: a. Contract with NREN for zoom technology license, b. Discussion with Nepal representatives of MS 365 A1 for a license, and c. the team of TU and a team of NTC and NCELL has made dialogue and Contract for a special SIM package with a discount. Similarly, a 7-member high-level committee led by the Rector was formed by TU Executive Committee (TUEC) which had worked for policy-level decisions for two years. This committee had finalized the policy of using plagiarism software and administering the final board exam online.

4.2.7 Managing Cost Efficiency and Time Saving of Service Delivery System

Regarding the effectiveness of e-governance practices for managing cost efficiency and time saving of service delivery system, the average respondents have found with the response of effective management at office.

Table 16

Managing cost efficiency and time saving service delivery

Effectiveness of e-governance practice	Frequency	Percent
Effective	129	46.57
Moderate	71	25.63
Normal	39	14.08
Strongly effective	33	11.91
Not effective	5	1.81

Source: Field survey, 2024.

The number of 11.91 percent respondents have rated strongly effective e-governance practices and the number of 46.57 respondents have rated the effectiveness of e-governance practices for managing cost-effective and time saving of service delivery system at the offices. 25.63 percent have rated moderate level of effectiveness and 14.08 percent have rated the offices at normal status. Shrivastava, Raizada, & Saxena (2014) revealed that e-governance helps to deliver cost-effective and easy-to-access citizen services, and improve processing of transactions both within the government, and between the government and other agencies to achieve the world class standard services.

Similarly, during KII, P1 argues that Institute of Engineering has launched a technology-friendly standard and controlled examination system for 12/13 years without any questioning though many questions arise in other institutions' examinations in Nepal. It has resulted in cost efficiency and time savings for the examination process. P2 argues that IT-based e-governance practices in an administration have resulted in cost effectiveness and efficiency on service delivery through the use of technology. It runs the administration transparently for fast and sharp service delivery to the stakeholders. However, we are now applying both manual and digital e-governance system in a parallel way due to the traditional human resources.

P2 argues that digitalization is dependent on IT technology and TU has to develop IT-friendly human resources to minimize challenges in making the service delivery cost-effective and cost efficient. The university should provide market-oriented facilities like a QR code for fee payment system, otherwise no students come to study with us staying in line for payment in a bank counter. P3 says that the teachers, researchers and students have access to the library services from home that decreases the crowded at office which save the time and easy to get services from home.

P6 argues that we have implemented equivalence software in the Curriculum Development Center (CDC) that students use unique IDs for application and get information about the completeness of documents in remarks which made service delivery interactive, effective and more changes than the prior processes. It supports saving time and cost for traveling. If the e-governance system does not work, then students should visit the central office for documents and need to stay for some days. It makes them financially burdened and takes more time to travel from outside the valley using public vehicles and expenses the money to stay at hotels too. We do not get confirmation for the tasks.

4.2.8 Descriptive Analysis of Variables

There are seven variables for each objective. All variables are normally distributed in the data set. The value of mean, standard deviation and their skewness are described for first objective as follows:

Table 17
Descriptive analysis of variables for e-governance practice for service delivery

Variables	Mean	Std. Deviation	Skewness
Perception of e-governance	**.7470**	**.09990**	**-.239**
Familiar with e-governance	4.52	.764	-2.129
Areas of e-governance	3.97	1.101	-.982
ICT facility at office	3.65	.915	-.335
Office management system	3.24	.866	.625
Accession of information	3.62	.912	-.439
Mechanism of e-governance	3.61	1.042	-.412
Effectiveness of e-governance	3.53	.938	-.490

Source: Field survey, 2024.

The above table shows that the data set of objective follows a normal distribution with a mean score of 0.7470 and a standard deviation of 0.09990 with the standard error of 0.146. It analyzes the skewness of the data. The value of skewness is normally in the range of 1.0 up to -1.0. The skewness value of e-governance practice for service delivery and all variables other than variable 4 of this objective are negative. Variable 4 is a positive one. So, the data of variables in e-governance practice for service delivery are skewed to the left except variable 4. However, these variables are in the position of normal distribution, and it indicates that the majority of the variables of the data set are skewed in left.

4.3 The Role of E-governance to Reform Service Delivery

Shrivastava, et. al (2014) revealed that e-governance has provided electronic information infrastructure to simplify service delivery, reduce duplication and improve the level and speed of service at a lower cost. The discussion with KII participants, they argue that integrates all system where all the things held from one place or device. TU should remove the duplication of similar tasks in the account, library, administration, and examination sections. They claim that if they work in a team to dedicate training, all human resources can be well trained within one and half years and they can manage human resources to minimize the quantity and maximize the work.

Similarly, if they change their work attitude, then they can feel and provide good governance using e-governance practices. P9 argues that TU authorities should think broadly about change and serious work should be done at the Office of the Examination Controller (OEC) to develop a system of students' profiles with entry and exit details to solve the majority of the problems.

4.3.1 Useful and Effective Role for Efficient Service Delivery

Regarding office administration through e-governance practices which plays useful and effective role for efficient service delivery, 52.71 percent respondents expressed the view of effective role for efficient service delivery.

Table 18

Useful and effective role for efficient service delivery

Effectiveness for effective and efficient service delivery	Frequency	Percent
Effective	146	52.71
Strongly effective	112	40.43
Moderate	16	5.78
Not effective	3	1.08

Source: Field survey, 2024.

The number of 52.71 percent respondents agree, 40.43 percent strongly agreed, and 5.78 percent are neutral about the useful role of e-governance practices for effective and efficient service delivery of the office administration system. Only 1.08 percent of responses found disagreement about it. Dhindsa, Narang, & Choudhary (2013) revealed that e-governance is an application of ICT which provides citizens to access government services and information by electronic means.

P1 argues that the challenge is to make integrated system for useful and effective role of e-governance to efficient service delivery. The IT center was formed for e-governance practice, but the center could not work properly at this level. P1 has pointed out the major two challenges that are human resources and the infrastructure respectively. The first one is the appointment of quality human resources, and another is the retention of employees in the organization. University has to appoint qualified human resources, to retain them and train them regularly. They could not advertise on time and maintain the promotion processes for the career of the employees from which the employees have left the organization. Another challenge is

sustainable infrastructure for e-governance which is needed based on capacity with backup systems and supportive instrument because technology is regularly phasing out and regular updating process is necessary for operation of software and hardware both.

Regarding this variable, P3 says that there is a binding provision to use theses, and dissertations online only for education and all teachers, researchers, and students use these materials only for teaching learning, and research purposes. So, e-governance practices have become useful to make the quality services of international standards and started to rank the journals with one-star, two-star, three-star, etc. which have a positive impact on its quality services. Similarly, P4 argues about the impact of e-governance that they have identified errors committed by the teachers in the evaluation system in the packages that are selected for re-checking through e-governance system.

4.3.2 Fast and Hassle-Free Tool to Deliver Services

Most respondents during the survey have expressed their view of effectiveness of e-governance practice as a fast and hassle-free tool for service delivery. Some of the respondents strongly agreed about this tool for fast and hassle-free tool to deliver services.

Table 19

Effectiveness of e-governance as a fast and hassle-free tool

Effectiveness of e-governance as a fast and hassle-free tool	Frequency	Percent
Effective	152	54.87
Strongly effective	95	34.3
Moderate	22	7.94
Not effective	8	2.89

Source: Field survey, 2024.

Table 19 shows that the number of 34.3 percent are strongly agreed, and the number of 54.87 percent respondents are agreed on the role of e-governance becomes fast and hassle-free tool at office to deliver services for service receivers in university administration. 7.94 percent of respondents have a neutral view about it. Only 2.89 percent of respondents disagreed with this.

In this regard, Pokhrel (2024) has explored the decentralized functionalities in a re-engineering project of EMIS that exam conduct, copies collection, packaging and dispatch, receive, scrutiny, marks entry, central processing and publishing results are the major

decentralized functions found at OCoE regional offices which can reduce cost, decentralize examination administration, reduce time required to answer sheets collection, dispatch and re-collection, enhance efficiency, less time consuming, and add convenience to service delivery.

Regarding the role of e-governance becoming a fast and hassle-free tool to deliver services, P2 says that the service delivery has been made quickly through e-governance practices based on cost comparison than physical service delivery in the past. In a similar way, P6 says that e-governance has minimized the time volume of result processing, data collection, analysis, and evaluation process and they are working on a vital project for examination automation process in Balkhu from which positive changes arise that the campus administration has been involved to correct the mistakes in the information of students in the software and students themselves participate in filling up the registration form. This has reflected the positive change in the quality of services in TU. Similarly, P8 argues that students also benefited from websites to find notices about the examination without visiting the college. So, automation systems through e-governance practice have supported fast and hassle-free service provided to the stakeholders. We should fulfill the lapses to implement the system. The experience of P7 says that staffs were not ready to forward the letter fast, the process of services was time-consuming and expensive and personal relationship with employees is also become worse due to the frequently follow up the letter in a traditional way of services but the ways of service delivery is changed through e-governance practices now a days. For example, if a letter is sent to a unit from another unit, it is not a fast process to forward the letter from one office to another office and the letter is not to be out at the office.

Similarly, the argument, during the FGD with TUTA, was that e-governance practice has reduced the grievances about TU and helps to make services fast and hassle-free than the previous status of the grievances of slow service mechanism which has supported quick and timely service delivery and all teachers and staffs are regularly attending the office on time.

4.3.3 Effectiveness of Information Dissemination

Dey & Sobhan (2007) has found that benchmarking of e-governance framework would help the HEIs to identify their strengths and weaknesses at an internal level and face threats and opportunities at the external level, in order to improve the global quality of services and of the efficiency. In this study, the respondents have expressed their view on the dissemination of

information through e-governance which is effective for service delivery on university governance.

Table 20

Effectiveness of information dissemination for service delivery

Effectiveness of information dissemination for service delivery	Frequency	Percent
Effective	147	53.07
Strongly effective	111	40.07
Moderate	15	5.42
Normal	3	1.08
Not effective	1	0.36

Source: Field survey, 2024.

Table 20 shows that 40.07 percent strongly agreed, and the number of 53.07 percent respondents agreed on disseminating information through e-governance practices necessary, effective and useful for service delivery at office. 5.42 percent of respondents have a neutral view about it. Only 1.44 percent of respondents disagree about this e-governance practice. Shrivastava, Raizada, & Saxena (2014) revealed that e-governance is the use of information and communication technologies for the planning, implementation, and monitoring of government activities. So, the necessity of information dissemination for service delivery through e-governance practice is useful for university governance.

E-governance practices show the change in the quality of services. TU had found many errors in examination processes and financial balance sheets in the past when writing manually by hand, but now the errors are minimized from computerized system in the reports taken from the database. The view of P1 is similar with others that e-governance practice has made easy to service delivery and has shown a positive change in service delivery. It has made it easy to fill out online forms, publish the online results, and do other official tasks. P3 says that the quality of service is gradually enhanced through e-governance practices. The trend of duplicating the theses of others in TU was found in the past and widely rumored the theses sold by the book and photocopy shops. This trend is controlled by using anti-plagiarism software. Another view of P4 is that after using e-governance, the system has identified the cases and controlled the irregularities which has increased the reliability and public trust of the university. There was no

tracking system in the past, but the system can track the regular status of students' appearance in the exam and all processes which are legal or not. The system tracks the status at the beginning of the process which has increased the quality and reliability of services at the office. It has improved the publishing process and record system. This is a level of positive change that many things in the past could not be found in records, but the record system has been improved and updated to get records easily nowadays.

P5 says that the IT center had played a vital role in supporting virtual classes during the pandemic while the situation was not physically present in the classroom and prohibited for the mobility of persons from one place to another. There is no doubt that the IT center played a vital role in making the regular opening of the university possible by running classes and other programs during the COVID period. P6 says that e-governance practice has played a positive role in building the public image towards TU nowadays compared to the prior condition. E-governance practice has no meaning if the delivery of quality of services is not enhanced. So, the quality of services has enhanced and increased through e-governance practices.

A similar view is found from service providers', users' and receivers' perspectives. P7 argues that they have felt lots of differences from e-governance practice. All work was stopped when the office closed due to some issues in the past but recently the e-governance practice has supported 75 percent of works completed through e-governance online official work. All official tasks were held online when the office was padlocked by the different groups. So, e-governance practice has brought positive vibes to every college, examination office, and office of the dean. Students in the current situation want ICT-friendly physical education, but not traditional guru-discipline education.

P8 says that they found many differences in the current condition of quality-of-service delivery from the traditional way before starting e-governance practices. E-governance practice makes the colleges more responsible, and it supports the students in filling up online forms themselves, colleges become self-responsible for filling up exam forms and other information. E-governance practice is a facility for students to use the services at home which minimizes the workload at university. In a view of P9, technology makes a difference in the quality-of-service delivery than the traditional way. Technology is a machinery application used for timesaving to large output from few resources which makes a difference.

4.3.4 Role of E-governance for Changing Existing Service Delivery System

Regarding the role of e-governance for changing existing service delivery system, most of the respondents have agreed for the effective role of e-governance.

Table 21
Role of e-governance for changing existing service delivery system

Role of e-governance for changing existing service delivery system	Frequency	Percent
Strongly Effective	138	49.82
Effective	120	43.32
Moderate	19	6.86

Source: Field survey, 2024.

The number of 49.82 percent respondents are strongly agreed that e-governance practices play a vital role to change the existing system of university service delivery in TU. The number of 43.32 percent respondents are agreed on the role of e-governance and the 6.86 percent respondents have neutral view about it. In the finding of Koudiki & Janardhanam (2017), the main purpose of introducing e-governance in universities is to promote transparency and efficiency in administration, improve service quality to students and other stake holders, provide educational access to larger sections of the society, and offer affordable education to the needy.

Educational and organization rule, 2050 has ensured that no one can appear the multiple exams in the same year and compulsory to attend the regular exams in all years of any level without a gap, but the students were appearing in multiple exams as a regular or a back in a same year. P4 says that when the e-governance system was not set up at the office in the past and it could not find a regular or back status of a student. So, it became effective to find out the status of the students. P4 argues that the e-governance practice has controlled the quality and correctness of data to find out the errors in comparison with the past and the work efficiency has been increased nine times for a work. The same information would be repeatedly kept in a form first, then written in the transcript, ledger, etc., and e-governance practice has minimized nine processes into one-time data entry in the computer for the examination administration processes.

In this regard, P4 argues that about nine processes in examination, they receive a packet of answer sheets at the office, then write the name and packet number, register it and enter the record for dispatch, make an appointment for checking, write a reference to send to campus, again register after return from campus, write minute for scrutiny and another minute for payment, again prepare the result and another minute after publishing the result. These whole

processes are integrated into a software, and they enter the data once in the software and the whole nine processes can be completed from the same entry at a time. So, a great change has arisen in service delivery through e-governance practices.

P6 says that they have not evaluated the status of change before and after the practice of e-governance and have not defined indicators for the measurement of e-governance practices yet. They have not researched these concerns and couldn't show the particular point of status. E-governance and information technology are for quality control, transparency, and efficiency which are continuously practiced. They used technology that has been connected with services and has a positive impact on service delivery.

P9 argues that service delivery has been very drastically changed, and it has become comfortable for students to get information digitally through computerized processes rather than paper-based written documents in the traditional way. However, TU has no calendar for the entry and exit of a student at an academic level. TU does not maintain basic information and a calendar of the entry process, study period, exam schedule, result and certification process yet. The authority is trying to improve the services and has started province-wise answer sheets checking process and result preparation model which is the positive endeavor of the office.

Similar views found in KII and FGD about capacity development of human resources for service delivery using e-governance practice. They argue that human resources are not enough and satisfactory at TU because there are a lot of traditional staff and a lack of trained human resources who can handle the IT software. Many of the employees at the campus level do not handle the computer work among the staff and we cannot provide IT-friendly services to the students. They are realizing the condition of poor performance in Kathmandu Valley and can easily imagine the reality of campuses of remote districts outside the valley. They argue that TU has around five lakh students and has to maintain the record of these students. If there is reliable software and builds a system with high security, it works better and runs ahead. It gives us an attraction towards the university to build the situation of further study. However, students have been facing complicated processes for the same services. For example, the convocation forms fill-up process, getting graduation certificates, mistakes on certificates and waiting a long time for transcripts and certificates are the major complaints from the students. We are not satisfied with the current digital platforms and e-governance practices used by TU which are not greater than the services that a ward-level office can provide for the general system.

P4 says that although we had kept manual records on one side and another side, the data in DBS were not symmetrical and unique. The same word has been entered with different spelling errors as the spelling error of Kathmandu was found in eight hundred different places. Now, the previous digital data and current software are trying to match and found some errors in student registration. Student's double registration and using a registration number for multiple students are the major errors found through e-governance which was not found in the past.

P6 argues that they are experiencing that a campus from Dhankuta or Doti would send a single letter for correspondence and the receiver would wait for a long time but today the corresponding service is successful in a click from the respective offices and reply to the decision back to them which we feel the quality and fast services. TU planning directorate has imagined a GIS mapping tracking system that shows the status of running campuses, and their services, and develops the control mechanism of their administration. P7 argues that the application of service receivers was received through email and the work was completed through an online service-providing process which has made them fully satisfied and feeling of happiness.

About the effective service delivery, P8 and P9 state that the authority and leaders of the university should make their central offices digitalized with external services. The information should reach all teachers, students, employees and other stakeholders. If they take all digital platforms as an opportunity, then they have to make a clear policy, and then provide special training to the concerned authorities, teachers and employees to implement the policy effectively. The need for teachers and employees is special training for IT. Regarding the improvement of services, P9 suggests that the examination controller office should be digitalized as soon as possible and fill the gap in information through the online system. So, the main suggestion to the authority is that a policy gap is identified, and they should develop a clear policy to implement e-governance at TU which positively guides the institution in future. If they do not enhance the capacity of employees, then the performance of service delivery becomes weak and never improves. So, the responsibility of TU is either to identify the senior employees who need the training and enhance their capacity to deliver effective services or to bring the scheme of farewell and recruit new updated human resources from free competition as soon as possible. TU has to work seriously on developing a policy to implement e-governance practices. The policy

should be clear with a strategic plan for five or eight years. They should make their target to the capacity of e-governance implementation and project for the further process.

In this regard, the argument of TUTA representatives during the FGD about human resources that there is lack of human resources for e-governance implementation. The employees working in the IT sector are limited. So, the number of human resources needs to increase for e-governance practice. For this reason, Universities can hire students as volunteers for certain periods and need to provide opportunities to the students to earn and learn for their careers in the future. University may utilize the manpower from its product as students want to work. Universities should implement e-governance practices using the students who are produced by self-colleges.

4.3.5 Role of E-governance for Academic Integrity

Most of the respondents have the view that e-governance practices effectively reduce corruption and ensure accountability and transparency for academic integrity in TU.

Table 22

Role of e-governance for academic integrity

Role of e-governance for academic integrity	Frequency	Percent
Effective	128	46.21
Strongly Effective	116	41.88
Moderate	120	43.32
Normal	7	2.53
Not effective	1	0.36

Source: Field survey, 2024.

The number of 41.88 percent respondents are strongly agreed that e-governance practices reduce corruption and ensure accountability and transparency for academic integrity in TU. The number of 46.21 percent respondents are become agree on the usefulness of e-governance and the 9.03 percent respondents have neutral view about it. The number of 2.53 percent respondents are disagreed about it.

In the research, Chopra (2019) has revealed that e-governance is the solution to enable transparency and eliminating arbitrariness in decision-making. Similarly, in the analysis of KII information, P1 argues that the employees cannot lie, steal, and cheat with technology and these parameters of integrity are used for good governance. Technology only can control these three things like the e-attendance system has been working. Technology has recorded the tasks on the

screen like an e-attendance system, then the employee does not try to lie, steal, and cheat the office and the office can maintain good governance through e-governance. It brings enhancement and quality of service delivery. E-governance has directly impacted the system of organization. E-governance practices have been focused on administration which is applicable for teaching, learning and research sharing. The resources are equally available and accessible to read in Kathmandu and Jumla due to e-governance tools.

P2 states that digitalization process is an automatization of manual information in electronic form by robotics. So, the manual process was also transparent in the past. We can connect the digitalization process and transparency. Transparency process gives the right information as required to any person based on the rules of the organization and e-governance makes the data access ease for finding the required information fast on time which facilitates the transparency. Similarly, service delivery as an external aspect has become easier to receive for the students who are main stakeholders of the university than the hassled process of staying in line to pay the fees in the manual system. So, we realized that the service delivery has become a quick and sharp process now. P3 says that e-governance practices have given great support to provide fast and sharp services with participation, transparent and accountable management. The reality is that the authorities should manage themselves but some of the authorities are not technology-friendly and some are very familiar with technology. The authorities who are familiar with technology have provided fast services and taken quick decisions but who have kept personal assistant to support the technology use, have the decision delay and slow performance.

On the other hand, P3 explains that the provisions of the e-governance system have increased the quality and authenticity of the publications. TU has decided the level of toleration of plagiarism in the theses. The similarity index of 20 percent has been allowed in master-level theses and 15 percent and 10 percent similarity indexes have been allowed in M.Phil. & Ph.D. level thesis respectively in TU. Research articles are allowed with a fifteen percent similarity index and peer-reviewed in the provision of TU. We could not publish an article in nepjol.org without the quality. They look at the quality of an article and Ubiquity Press Network, London also reviews the quality, design, and author of the journal and citation of the articles before publishing the articles. These are the ingredients to keep academic integrity in the institution.

Similarly, P4 says that our systems are so transparent. The area was found in large volume in the attendance of employees in the past years before using the e-attendance system. The E-attendance system has recorded and shown the timing of the arrival and departure of the employees. We have started an automation system which has clearly shown the timely completed tasks and pending jobs. We are trying to provide services for issuing online transcripts that supports us to find the pending status of how many days the work becomes pending, and the work completed which becomes transparent and systematic ways without source and force process.

During the KII, P6 says that the main purpose of e-governance is transparency and responsibility practice in service delivery. The employees have received the message from the software that the number of pending works are seen in the portal and zero pending has been seen in the table through e-governance practice. We could not identify the pending task manually in the past, but we can identify the pending tasks through e-governance now at the office. In the opinion of P7, e-governance practice has supported for decision-making process, but it has not become fast and sharp. The main reason for this happening is due to the paper-based process at the highest level of TU authority. It means that all online works and processes are only valid in paper-based records. So, it made the dual criteria of digital and manual systems. For example, e-attendance using online software has been recorded in paper too. E-attendance is not authentic in the practice until the document is printed and recorded in files.

P8 says that e-governance practice has connected well with the stakeholders, no matter the distance of the students' residential area. A person who lives in Ilam or Darchula, gets facilities provided by the university and may provide feedback and raise the fault issue of the university from there. S/he may point out the strengths and weaknesses of the university. If the e-governance practice does not exist, the student could not give suggestions to the university and should visit the central office for the services. So, e-governance has supported with broad coverage for transparency and accountability of the university. In this regard, P8 argues that:

> *It is a misfortune situation that this university which teaches ICT courses at the master level, performs poor working performance in service delivery. The reason for poor work performance is that the university has not absorbed quality human resources and has not provided enough facilities for human resources. The major challenge is the thinking of the authority. Another challenge is not the utilization of the investment of the university*

because the investment in students who study the IT sector is not practically utilized for developing software. University should not only teach theoretical knowledge but also practically teach them and should utilize the knowledge of the students in practice. If universities do not invest in software, the output result is also not so good. The institution needs to change the traditional intention for e-governance practices. They can achieve great results from minimum investment by changing our thinking. They should work on some activities by changing their thinking to enhance the e-governance practices on small projects rather than the large tendering process with big companies. We should collaborate with the government for external resources. University has to change the working trends from the traditional way and need to bring new policies to fill the policy gaps in this area.

P9 says that e-governance has a very important role in the decision-making process. Access to data is the first thing to reach out to the services. The e-governance practice finds who reaches the data and maintains the services because the system records the data of opening software and accesses the information. The major thing is an online record system that shows information about the access to data digitally which makes the process transparent. Online record system supports services that employees change at the offices, and it increases the reliability of the services.

P3 said that they are organizing training, seminars to run the software and organizing online training workshops for the staff as well as research cells at campuses and departments. The team of TUCL is visiting many campuses for orientation from where they are approaching TUCL to organize orientation programs. Similarly, P5 argues that they are working only on infrastructure development, but they should transfer the knowledge of technology together with the technology that goes ahead every day by organizing training because the human resources should be familiar with the technology.

Regarding the knowledge sharing culture, P4 argues that they are weak in the knowledge exchange process in the office. They could not send the employees on training courses because of the full daily workload. If the employees leave the office a day, then the regular work becomes pending. They should organize training for their technical staff to enhance their capacity and career development for seven or fifteen days or more, however the work at the office becomes disturbed. Training is not only for formality and mass-based training, but it must

be practical training for specific software and other topics. They are investing in software and making thousands or millions of payments to other parties, but they cannot invest in the employees for motivation. We should be trained and able to get incentives for extra capacity in the work. The salary and incentives of technical persons may be greater than the administrator for motivation and the administrator also needs to accept the reality of the IT staff to take the output. The provision would be for reward allowances with salary and punishment both to appreciate the positive work and to control the cheating work.

Regarding job assignment to the technical staff, in the opinion of P6, TU has not developed a mechanism that can provide regular training and regular job assignments to the technical staff. If the organization provides the duty of technical part to the technical persons, then the job assignment becomes meaningful to them. They have assigned different roles to these technical staff and provided better roles as a division chief, but the nature of the assigned role is not matched as a technical one.

The discussion with TUTA during FGD, the conclusion was that there is no hard and fast rule to attend the classes at campuses, but teachers must visit the campus regularly for digital attendance if they have no class schedule for a day. So, it has provided a positive message for academic integrity in the university.

4.3.6 Role of E-governance for Reducing Traditional Manual System

Regarding the role of e-governance, respondents found an effective role has been played for reducing traditional manual systems.

Table 23

Role of e-governance for reducing traditional manual system

Role of e-governance for reducing traditional manual system	Frequency	Percent
Effective	154	55.6
Strongly Effective	97	35.02
Moderate	22	7.94
Normal	3	1.08
Not effective	1	0.36

Source: Field survey, 2024.

In table 23, 35.02 percent respondents are strongly agreed that e-governance practices reduce the traditional manual system at offices in TU. The number of 55.6 percent respondents are become agree on this system. The number of 7.94 percent respondents have a neutral view about it. The number of 1.08 percent respondents are disagreed about it.

P3 says that I found certainly differences between the prior manual status and the current digital status of the services because we had difficulty in communicating through a letter from one place to another place in the past, but it has become easy nowadays. We can send a letter with one click and get responses back recently using e-governance tools which help us to provide services fast without procrastination. Students can have access to download and read at home by using online resource facilities which has saved the labor, cost, and value of the students. Similarly, we search the books online using the online catalog and only visit the library when there are the books available, which we need, which saves the time of the students. These things are different between the traditional manual system and the current e-governance system.

P3 argues that their e-governance mechanism displays the multiple downloads of an article by a person, and we track the reason as well as communicate with the person by using user ID. They inform the users in the orientations for full usage of e-library only in the educational and research sector. In the same way, P4 says that they have provided the information of exam centers, student numbers in the centers with roll numbers, and student seat planning to the colleges only for 5-7 colleges as piloting from which Dhankuta campus was better than other campuses. However, they couldn't make the services fully automated and completely replaced the manual system till now from which no expected effective service delivery with maintaining both manual and digitalization systems.

Similarly, P4 says that TU must digitalize the system for service delivery and should provide the services that stop the compulsion to run at the office for transcripts and other services in Balkhu. The way that we are using the system to make payment and to fill up a form physically is not right in the current era which has made a minimum cost burden of 25-30 thousand for accommodation and more than two weeks of time consumed for travelling.

P5 argues that the IT center was established in 2073. The strength and the benefit of this center was seen during the COVID-19 after 2076 BS. The center University, at first, had started online classes in different departments with the support of the IT center which was impossible at that time without the support from the IT data center. Similarly, maintaining both manual and

digital records is the reality of administration, but e-attendance software is fully implemented and completely replaced the manual system that makes the services comfortable for users which has made drastic changes in administrative service delivery. Similarly, P6 argues that the entrance exam of the Pulchowk Engineering Campus is an example of e-governance in which the result of a large number of students is immediately published on the day of the examination. We are successful in this field.

P8 and P9 argue that students should become accustomed to e-governance practice when we think to being admitted to college because we must fill up entrance forms and log in to another registration process themselves to adjust in the college environment. Students have set their minds to entering their data correctly which has minimized mistakes and errors in the documents, mark sheets, registration, certificates and transcripts. The mistakes and errors were found like the wrong spelling of names, and wrong names and addresses written in manual systems where the students, in their absence, would request their friends to fill up the forms at campuses in a manual system. All notices are uploaded to websites and TU information pages which made students less deprived of information than the previous traditional system. Students have got the opportunity to read in the blended mode and e-governance practice has fulfilled the interest of students to read and stopped them becoming deprived from getting an education.

4.3.7 Commitment and Circular from the University for E-governance Practice

Regarding the commitment and circular of e-governance practice from TU authority, most respondents agree to implement the circulation with positive commitment.

Table 24

Commitment and circular from university for e-governance practice

Commitment and Circular for e-governance practice	Frequency	Percent
Agree	172	62.09
Strongly agree	50	18.05
Neutral	48	17.33
Disagree	6	2.17
Strongly disagree	1	0.36

Source: Field survey, 2024.

In table 24, 18.05 percent respondents are strongly agreed that any commitment or circular from the university to implement e-governance practices at the offices in TU. The number of 62.09 percent respondents are become agree for this commitment or circular. The number of 17.33 percent respondents have a neutral view about it. The number of 2.17 percent respondents are become disagree about it. Seddiky & Ara (2015) stated that application of e-governance in education sector is the demand of time to improve students' skill and enhance the quality of education. Similarly, Austin & Jones (2016) claims that governance is essential to the functioning of higher education at all levels, from the basic academic unit of the department (micro level) to the level of organization (meso-level) and at the level of the higher education system (macro level). In TU, e-governance practice has supported to build the environment of university governance for service delivery.

During the KII, P6 argues that the problems that arise in the implementation of e-governance in Nepal are like worldwide problems. The major challenge for the implementation of e-governance is the commitment of top-level management. The leadership says one thing, but the work plan and real work are different which we are facing in our organization that is how the leadership gives priority to this sector. Similarly, they found the level of commitment is very poor in the level of management from university to campus level. The second challenge is to be too afraid of investing in the infrastructure of e-governance. We see the old systems and structures without updating them. We cannot afford the investment ourselves and need collaboration with others.

P7 argues that how they might convince, if they discussed this issue, the authorities would not pay attention to the problem. The reality is that the hard-working person always feels pain with the thinking of a worse tomorrow. Similarly, P8 says from service receiver's perspectives that the existing human resources are also not committed and updated for e-governance practice. New recruitment is not being held due to the passive role and delayed process of service commission. The existing employees are working to provide services with their capacity, they should salute them for the services, though the number of employees is very low. The university has not recruited new human resources with updated versions for a long time, which is a major problem for the university now. In the same way, P5 argues that the first thing for any program is related to its parameters. The first parameter of the IT sector is budget and then the second is human resources. Physical infrastructure is also a major parameter of IT.

Similarly, the situation of the country has also affected this sector because the sustainable government makes the policy which guides long term.

P6 argues that the reason for leaving the IT-related task is that we could not enhance their knowledge though the number of technical staff is large. The knowledge of IT subjects has been lost gradually. So, the major challenge or problem is skill transfer or skill enhancement in the office which is the weak part of e-governance. Similarly, P8 claims that the younger generation cannot wait for two minutes. The youths who are waiting for an advertisement for a job opportunity cannot wait for a long time and leave their interest to join the university and go to search for another opportunity. They plan to leave the country or join another institution with a new mission.

Above mentioned arguments and discussion conclude that commitment and circulars are necessary to solve the challenges to implement e-governance using existing infrastructure and human resources for effective and efficient service delivery.

4.3.8 Interpretation of Variables for the Role of E-governance to Reform Service Delivery

The descriptive analysis of the variables of the role of e-governance to reform service delivery for mean values are positive. The skewness value is all negative to second objective. E-governance perception is analyzed for all variables using SPSS software as shown in the following table:

Table 25

The descriptive table for the role of e-governance to reform service delivery and its variables

Variables	Mean	Std. Deviation	Skewness
Reform service delivery (Obj-2)	**.8498**	**.08848**	**-.301**
Usefulness of e-governance	4.32	.633	-.653
Role of e-governance for fast service	4.21	.705	-.813
Necessity of e-governance to disseminate information	4.31	.658	-.976
Role of e-governance to change an existing service delivery system	4.43	.619	-.605

Role of e-governance to reduce corruption and ensure accountability and transparency	4.27	.757	-1.043
Role of e-governance to reduce traditional manual system	4.24	.671	-.828
Commitment to implement e-governance policy	3.96	.691	-.617

Source: Data analysis in SPSS, 2024

Table 25 shows that all data are skewed in the right and they are normally distributed. The data set of objective-2 follows a normal distribution with a mean score of 0.8498 and a standard deviation of 0.08848. The skewness value of the role of e-governance to reform service delivery and all variables are also negative. It reveals that all variables are skewed in the left. However, these variables are in the position of normal distribution, and it indicates that the majority of the variables of the data set are skewed in left.

4.3.9 Correlation of the Variables for the Role of E-governance

Regarding the correlation of the variables for the role of e-governance to reform service delivery among the three objectives, ICT-based e-governance practice (objective 1) and capacity development of service delivery for e-governance practice (objective 3) have the statistically positive relationship (r=0.464**). The role of e-governance (objective2) is positively correlated with both Objective1 (r=0.236**) and Objective3 (r=0.253**). Dummy male variable is positively correlated with objective2 (r=0.172**) but negatively correlated with master level educational attainment (r=−0.183**). Among the educational attainment variables, strong negative correlations between higher education levels (e.g., Master and MPhil/PhD). Some correlations are very close to zero, suggesting no meaningful linear relationship, e.g., Inside Valley and most variables (r values around 000). The significant correlation summary is given in the following correlation table:

Table 26
Pearson Correlation Summary

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Objective1	1										
2. Objective2	.236**	1									
3. Objective3	.464**	.253**	1								
4. Male	-.080	.172**	-.085	1							
5. Technical Staff	-.088	.198**	-.176**	.047	1						
6. Inside Valley	.002	-.001	-.033	-.099	.018	1					
7. SLC/SEE	.009	-.186**	.061	.061	-.038	.045	1				
8. PCL	-.002	-.077	.042	.002	.030	-.052	-.016	1			
9. Bachelor	.035	.013	.052	.058	.073	.006	-.026	-.056	1		
10. Master	.059	-.007	-.005	-.183**	.072	-.062	-.124*	-.266**	-.448**	1	
11. MPhil/PhD	-.096	.073	-.062	.160**	-.143*	.082	-.042	-.090	-.152*	-.715**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Data analysis in SPSS

Table 26 shows that the correlation of e-governance practice for service delivery is positive with the role of e-governance to reform service delivery and capacity development of service delivery at the 0.01 level in 2-tailed significance. Similarly, the role of e-governance to reform service delivery is positively correlated with male and technical staff variable and negative correlated with SLC/SEE educational attainment variable. Technical staff variable is negatively correlated with the capacity development of service delivery. Male variable and Master level educational attainment variable also negatively correlated. Master level educational attainment is negatively correlated with bachelor level and PCL level educational attainment at the 0.01 two-tailed level. MPhil/PhD level educational attainment is positively correlated with male variable. These indicators reveal that the independent variables significantly correlate with each other to obtain the outcomes for the objectives.

Some variables are seen as significant positive correlations which reveals the strong relationships between the variables. Objective-1 and objective-3 (r=0.464**) have a moderate positive relationship; higher values in objective1 are associated with higher values in objective3 but objective1 and Objective2 (r=0.236**) have a small positive correlation. Objective2 and technical Staff (r=0.198**) have positive correlation that technical staff are slightly associated with higher objective2 scores. Similarly, objective2 and male variable (r=0.172**) is positively

correlated that reveals that being male is slightly associated with higher objective2 scores. Male and MPhil/PhD variable (r=0.160**) reflects positive correlation that males are slightly more likely to have higher education.

In the similar way, significant negative correlations reflect inverse relationships that Master and MPhil/PhD variables (r=−0.715**) have a strong negative relationship, likely reflecting a progression where individuals with MPhil/PhD do not identify with "Master" as their highest education. Master and Bachelor (r=−0.448**) are strongly negatively correlated where those with master's education are inversely correlated with Bachelor's education, as expected. Objective2 and SLC/SEE (r=−0.186**) have also negative correlation where lower objective2 scores are associated with individuals with SLC/SEE education. Objective3 and technical staff (r=−0.176**) have also negative correlation that technical staffs are slightly associated with lower objective3 scores. Master and male variables (r=−0.183**) are also negatively correlated and those males are less likely to have a master's degree. Technical staff and MPhil/PhD (r=−0.143*) have a small negative association between being technical staff and holding an MPhil/PhD.

So, the insights found in the analysis of correlation among the objectives are the strongest correlation in the data is between Master and MPhil/PhD (r=−0.715**), reflecting the educational hierarchy, the positive relationships between Objectives 1, 2, and 3 suggest these objectives may measure related aspects or outcomes and gender (Male) and educational attainment have mixed relationships, with males positively associated with higher education (MPhil/PhD) but negatively with Master's degrees.

4.3.10 Regression analysis for the role of e-governance to reform service delivery

According to Montgomery, et. al (2012), a multiple linear regression model can be expressed as:

$Y=\beta_0 +\beta_1 X_1 +\beta_2 X_2+\epsilon$.

Where Y: Dependent variable (the outcome you're trying to predict or explain).

β_0 : Intercept (the value of Y when all X X-variables are 0).

β_1, $\beta_{2\ldots}$, : Coefficients (represent the change in Y for a one-unit change in the corresponding X-variable).

$X_{1, 2,\ldots}$, X_k: Independent variable(s) (predictors or explanatory variables).

ϵ: Error term (captures the variation in Y not explained by the model).

Then, the following table presents the regression analysis of dependent variable the role of e-governance to reform service delivery (objective2) with other objectives and independent variables.

Table 27
Coefficients[a]

Model 1 Variables	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	.567	.041		13.724	.000
Male	.037	.010	.199	3.606	.000
Inside Valley	.004	.012	.020	.371	.711
Technical Staff	.062	.013	.259	4.703	.000
SLC/SEE	-.215	.056	-.206	-3.824	.000
PCL	-.046	.027	-.092	-1.716	.087
Bachelor	-.011	.017	-.034	-.632	.528
MPhil/PhD	.019	.013	.087	1.542	.124
Objective1	.145	.054	.163	2.705	.007
Objective3	.199	.046	.264	4.307	.000

a. Dependent Variable: The role of e-governance (Objective2)
Source: Data analysis in SPSS, 2024.

Table 27 shows that the constant value of unstandardized coefficients is 0.567 at significant 0.000. The independent variables male, inside valley, technical staff and MPhil/PhD variable are positively important in this model. The independent variables SLC/SEE, PCL and Bachelor level educational attainment are negatively associated with dependent variable the role of e-governance to reform service delivery (objective2). Dependent variable the role of e-governance to reform service delivery (objective2) is positively significant with e-governance practice for service delivery (objective1) and capacity development of service delivery (objective3) in this regression model. Similarly, independent variable technical staff (t=4.703) and the capacity development of service delivery (t=4.307) are more associated with the role of e-governance to reform service delivery with significant level 0.000.

4.4 The Capacity Development of Service Delivery

Two major things have influenced the capacity development of service delivery to e-governance practice. One of them is the capacity of human resources and another one is the capacity of infrastructure of service delivery. Seddiky & Ara (2015) discussed e-governance

which increases the management capabilities of educational institutions enhancing the quality of education as well as human resource development.

Service providers and receivers both have different views about the capacity development of service delivery for e-governance. P1 argues that e-governance practices make it easy to fill up the form from the home. Examination-related documents like mark sheets, transcripts, and triplicates can be easily carried out to the concerned campuses and started digital transactions. E-governance tools have made these processes easy to conduct from computer technology by putting questions in computer, providing a login address, and allocating time for exams by the system default the system determines the allocated time and make automatic system-off after the completion of time. So, the technology became very helpful for administration.

4.4.1 Capacity of Information Dissemination for Service User and Receiver

Regarding the capacity of information dissemination for service users and receivers, the major view of respondent is agreed and strongly agreed.

Table 28

Capacity of information dissemination for service user and receiver

Capacity of information dissemination for service user and receiver	Frequency	Percent
Agree	165	59.57
Strongly agree	93	33.57
Neutral	19	6.86

Source: Field survey, 2024.

The number of 33.57 percent respondents are strongly agreed that ICT-based applications make service delivery ease to disseminate information through e-governance practices for service users and receivers in TU. The number of 59.57 percent respondents are become agree for this role of ICT-based applications. The number of 6.86 percent respondents have a neutral view about it. It shows that TU has the capacity of information dissemination through e-governance practices for service users and receivers. In the word of Seddiky & Ara (2015), ICT has been contributing a lot to improve the quality of education and to develop human skills making them fit for the competitive global market.

Regarding the capacity of information dissemination for service users and receivers, P2 says that TU employees, those providing services from the counters, should be IT-friendly. They could provide IT-friendly services to stakeholders if we could manage the speedy services using technology as technology goes in speed itself in the world. They have no alternation of digitalization process for reducing cost and cost-effective service delivery. They are hearing the fact that cost-effective service delivery is possible with few employees today rather than the number of employees in the past which became possible through e-governance practices.

4.4.2 Ways of E-governance Practice

The participants in the survey agreed on the ways of e-governance practices that are effective during the service delivery process. Some of them realized e-governance practice to make the services technology-friendly. Similarly, they have felt these tools as practical orientation as well as improve understanding level and develop creativity. The following table shows the perception of the participants during the survey:

Table 29

Ways of e-governance practice

Ways of e-governance practice	Frequency	Percent
Make the services technology-friendly	81	29.24
Practical orientation	60	21.66
Easy to service delivery	57	20.58
Improve understanding level	51	18.41
Develop creativity	28	10.11

Source: Field survey, 2024.

The number of 29.24 percent respondents have got the way of e-governance activity to make the services technology-friendly and the number of 21.66 percent respondents have given the view of practical orientation as another way of e-governance activity to reform the services at university. Easy to service delivery is another way of e-governance activity marked by the 20.58 percent respondent during the survey. The number of 18.41 percent respondents found the way of e-governance activity to improve the understanding level to reform the services and 10.11 percent respondents found it to develop creativity to reform the services at university.

P9 says that administrative leadership should make a policy to launch integrated software for ways of e-governance practices as per need to all institutions. In the global tendency of higher education, universities should follow IT-friendly e-governance tools, and the institution should adopt the IT technology because of globalization. They also should create an environment for connectivity with all services to the students from top to bottom and need to think about how paper pencil work is being minimized. So, university should follow the paperless system without being late. The policy gap should be filled by developing a clear policy for this area.

4.4.3 Performance of Service Delivery Through E-governance Practice

Performance regarding the user-oriented services through e-governance practice is observed by the respondents. The finding of this index is good and average status than excellent. The following table shows the performance of service delivery through e-governance practice:

Table 30

Performance of service delivery through e-governance practice

Performance of service delivery	Frequency	Percent
Good	129	46.57
Average	104	37.55
Excellent	20	7.22
Fair	14	5.05
Poor	10	3.61

Source: Field survey, 2024.

Table 30 shows that the number of 46.57 percent respondents have rated good for the performance regarding the user-oriented services through e-governance practices at offices. The number of 37.55 percent respondents have rated the average status of the offices. The number of 7.22 percent respondents have rated excellent of their offices. The number of 5.05 percent respondents have rated fair, and 3.61 percent have rated their services poor.

Regarding the performance of the user-oriented services through e-governance practice, P3 states that the e-library developed by TUCL is being used by other faculties and institutes of TU as well as other agencies and other universities running autonomously. So, it is a part of the e-governance system in TU. However, P4 has a different view regarding the concept of e-governance that the office had started typing system rather than an e-governance system in 2054 BS after receiving computers from the higher education project of the World Bank. The computers were already set up in other sections before that time. The typing system was started

in computers and the system was launched through DBS to move the organization into the digitalization process. P3 further explains that the use of computers was started in TU in the decade of 1990. The library staff also started a database for books electronically to manage library instruments after the 1990's decade. They had Computerized Documentation System/Integrated Set of Information Systems (CDS-ISIS) software for the bibliographical database in Nepal collection and they had developed a database of all books from the Nepal collection which had supported searching books and getting a whole bibliographical database for a long time. Regarding two way communication system, P4 states that the status of the computer typing system had not gradually evolved into an e-governance system before 2054 BS. After that, they had an increasing number of emails, and they had entered the e-governance practices with a two-way communication system through email and the internet. Similarly, they had started digitalization process in five campuses in Pokhara, Biratnagar, Nepalgunj, and Butwal and one private college Lumbini Banijya College was from Lumbini province in FY 2072/73 as an initial phase though they could not continue the project because of the lack of infrastructure of VPN and optical fiber of Nepal Telecom at campus level. But the situation has changed now, and they are re-engineering the same TUEMIS into new software to implement e-governance practices.

Similarly, P6 stated that when the Higher Education Project (HEP) under UGC was started in TU, it had started in large-scale of digitalization process in TU. HEP phases I and II promoted and invested in the digitalization process in TU. They have exercised e-governance practices in any form in the structures of all 44 central departments, 62 constituent campuses, and central units. Most campuses have completely started e-governance practices in their system. They founded Enterprise Resource Planning (ERP), a model of an e-governance system in the PN Campus, Pokhara and Institute of Forestry. They were practicing e-governance tools using ICT in different forms in central financial administration, financial system, accounting system, auditing, human resources management, and e-attendance in central offices. They are practicing e-governance only in a single service at a low level, but many organizations are using e-governance practice in the dominating area of financial management and accounting systems.

P7 states that departmental meetings in Zoom technology, subject committee meetings, faculty board meetings, and academic council were started online at first. After that online classes, internal exams, viva of theses, and project works at the bachelor and master levels were

started using online tools. Similarly, official e-mail accounts were created to manage these online activities. Similarly, P2 states that TU provident fund was changed from manual technology into fully digitalized technology, and it has been merged into the employee provident fund based on the trust of the Government of Nepal (GoN). It has been possible to merge the fund through e-governance practice. P6 argues that they saw the records of e-governance practice prior than the use of Government of Nepal (GoN). Different units and faculties have also used the systems, and the research centers have used ICT for research work.

4.4.4 The Quality of Data Information

Regarding the quality of data information in terms of accuracy, completeness, timeliness and trustfulness, P4 says that drastic change has been found in the quality-of-service delivery. We can easily find the errors in the record. Data accuracy has become high through the use of e-governance tools. When the e-governance system was not set up at the office in the past and it could not find a regular or back status of a student. Educational and organization rule has ensured that no one can appear the multiple exams in the same year and compulsory to attend the regular exams in all years of any level without a gap, but the students were appearing in multiple exams as a regular or a back in a same year. So, it became effective.

Table 31

Rating of quality of data information

Rating of quality of data information in terms of accuracy, completeness, timeliness and trustfulness	Frequency	Percent
Average	131	47.29
Good	98	35.38
Fair	19	6.86
Poor	16	5.78
Excellent	13	4.69

Source: Field survey, 2024.

The number of 47.29 percent respondents have rated average for the quality of university data information in terms of accuracy, completeness, timeliness and trustfulness. The number of 35.38 percent respondents have rated good status of the quality. The number of 6.86 percent respondents have rated fair, the number of 5.78 percent respondents have rated poor status and 4.69 percent have rated the quality of university data information excellent.

Regarding the status of handling software, P3 argues that the challenge is that limited persons handle the software and do not want to increase the human resources to handle the software, and the person left the office and the system brings problems. We are still working in a traditional way. This kind of problem is facing in the university from the past for the reason of personal interest. However, some students want to visit the library and read physical books due to the pressure in their eyes while reading digital materials and we enjoy reading physical books rather than digital ones. Some of the staffs are afraid of with our software, though we have easily used their mobile and face book application. New employees are easily adjusted to the new situation of technology use, but some senior staff have felt difficulties using the ICT tools and gradually improve their skills. They have also a policy lacking that should be fulfilled by the university because we should follow the policy to go ahead. For example, automation software is well implemented outside the valley but unable to implement this system in some offices inside the valley.

Regarding the status of services, P9 states that e-governance practice has supported the stakeholder-friendly service delivery of the university. The university is very late and back to anticipate e-governance practice. The responsibility of the university is to maintain the record of a student from entry date up to date of exit and the processes, activities and facilities given to the students, either the entrance process, admission process, exam process or identity card and other processes to get graduation certificates, during the whole study period at a college.

4.4.5 Availability of Technical Human Resources

Regarding human resources for e-governance initiatives, average views about the clear and well-defined manpower are presented by the respondents during the survey.

Table 32
Human resources for e-governance initiatives

Human resources for e-governance initiatives	Frequency	Percent
Average	151	54.51
Somewhat clear and well defined	48	17.33
Somewhat unclear and loosely defined	48	17.33

Human resources for e-governance initiatives	Frequency	Percent
Very clear and well-defined manpower	23	8.3
Very unclear and poorly defined	7	2.53

Source: Field survey, 2024.

The number of 54.51 percent respondents have rated average status for the situation regarding the availability of skilled personnel and resources within university to support e-governance initiatives. The number of 17.33 percent respondents have viewed somewhat clear and well defined and somewhat unclear and loosely defined human resources and other resources for e-governance initiatives at TU. The number of 8.3 percent respondents have found very clear and well-defined manpower, and the number of 2.53 percent respondents have rated very unclear and poorly defined human resources at TU.

Pokhrel (2024) presented the data of human resource management in a re-engineering project of EMIS at the OCoE that should be managed as ten percent academicians, twenty percent admin-account-based staffs and seventy percent technical staffs for its examination and result processing functions led by IT experts and professional as well as carried out by IT technicians.

Regarding the availability of technical human resources to improve quality of services, P1 says that they brought technology before the management of human resources. P2 says that TU has enough human resources, not enough weak for necessary human resources. But cultural development is yet to be built through strong policy. Technology-friendly employees are recruited through a service commission applying a syllabus of computer practices.

P2 argues that an existing manpower and new input employees do not develop any new software and programming, but they should use the computer, software, and programming to provide services. However, the tendency of manually working systems should be broken from the employees by using software and programming.

P3 argues that the main problem is human resources. TU service commission is not functioning now, and we could not recruit human resources. The system is being handled all software by few human resources at library services. They are facing the same problem of human resources in the library. P4 argues that they have no lack of technical human resources in the examination office, but they could not motivate the technical staff and utilize the proper capacity.

There is no official culture to share technical knowledge with others because we cannot teach them the culture of knowledge transfer, but the main challenge is to retain the technical staff with a low salary scheme in the university. It is difficult to retain them and get a change in work from the current service facility. So, universities must get their services by providing enough service facilities for motivation to effective service delivery. Some brokers want to play in the process of service providing and the system controls the illegal plays and their existence. So, the authorities should remove these types of feelings and emotions. But the problem is not transferring the knowledge among the employees to each other at the office.

P5 argues that the condition of the office is a digital divide among teachers, employees, and students. The digital divide refers to the gap between regions and demographics that have access to modern ICTs. Some teachers, students, and employees are so kind and technology-friendly and are using new applications, software, and their uses in the right direction in TU. Some people who are perfect and experts in IT, but the condition is that those people must learn a lot. P6 argues that the employees who are said to be technical persons have left the IT-related duty for ten years or more and they are not working in the field of IT. So, the knowledge of technical human resources is gradually declining and disappearing from the university. The number of such passive IT staff is large at TU.

The view of P6 is the same as P4 that the training organized by the Coordination Division (CD) is only for non-technical human resources. All staff are IT users, and they use e-governance tools. P7 argues that human resources should have integrity for classified works through e-governance if the university classifies the online and physical work. P8 says that human resources are not enough available because the university could not activate the service commission for a long time. This is a competitive era, and humans are living in a transferring age.

Regarding budget for capacity development of human resources, TU has allocated budget each year for capacity development of human resources. P1 argues that the Coordination Division has organized training without the proper coordination with the need and concerned authority. P4 also argues that it is a highly made agreement of around seven crore budgets from the allocation of 13 crore budget. If we spend a huge amount in the IT sector, then gradually the expenses will be minimized for service delivery in future. P6 informed that they had allocated a 9 crores budget for the IT sector from which they could not expense all budget, but TU has

started to allocate budget in its structure with the heading of IT and all campuses have also started to allocate budget to the IT sector. They have started though the systems of e-governance are too expensive. Similarly, P7 has experience of e-governance practice through online system which has preserved 20 to 25 percent of budget for meetings, conferences, seminars, etc. in the Dean office of Institute of Science and Technology (IoST).

The P8 & P9, as a member of TU senate, claim that for the purpose of capacity development of human resource, they have been allocating huge amount of budget for training and other facilities for the employees from the Senate meeting every year. They have allocated about a hundred lakhs at the beginning, then three hundred lakhs in another year and around one million budgets allocated in recent year which has still being increased each year. So, TU has to provide capacity development training for employees to make them IT-friendly and provide services through e-governance effectively. The document review also shows the budget allocation for training, workshops and seminars in TU.

Table 33

Fiscal year-wise budget allocation for training, workshop and seminar in TU

Fiscal Year	Budget Allocation	Funded by HERP	Total (Amt. in thousand)	Percentage
2076-77	115667	1950	117617	13.94
2077-78	82134	600	82734	9.81
2078-79	142310		142310	16.87
2079-80	146348		146348	17.35
2080-81	220764		220764	26.17
2081-82	133677		133677	15.85
Total:	840900	2550	843450	100.00

Source: Program and budget book, Financial Administration Division, TU

Table 33 shows that the total amount of 84 crore 34 lakh 50 thousand has been allocated for training, workshop and seminars in budget code 9.031 at TU since FY 2076-77 up to now. Budget code 9.031 is determined to allocate the budget for this purpose. Higher education reform project had also funded 19 lakhs 50 thousand budget in FY 2076-77 and 6 lakhs in FY 2077-78 for this purpose. The total of 26.17 percent budget, which is highest allocation since FY 2076-77 has been allocated for training, workshop and seminar in FY 2080-81. So, TU has started to

invest in capacity enhancement training, workshops and seminars for human resources to promote e-governance practices for quality service delivery at TU.

The argument of P2 is that Coordination Division (CD) has provided regular training to employees, but they still do not get change and transformation of work culture in the university. Training for employees in in-service course content is conducted regularly not only by the Coordination Division but also by the Financial Administration Division (FAD) to provide orientation for installing new software and its practices. FAD has also provided orientation and training for the new software launching process and awareness. They have already provided training two to four times for the whole units of TU inside the valley and outside the valley.

P4 suggests to the managers that they should understand the technical human resources, their technical subjects and not enough knowledge about the software, hardware, and networking systems that are practiced in the office. So, they need updates about the job description. But P6 argues that the training is not necessary for technical staff because they have been appointed when entering the service with a test for computer skill. It is useful for the personal life of all staff. Among the 169 technical staff, more staff have left the technical field and engaged in the administrative part because they are losing their technical knowledge gradually during the period of 5 to 10 years. The staff should ask for technical duty though the organization could not provide the duty related to their skill.

P7 states that many trainings have been conducted for knowledge sharing about ICT. Some training courses are ritual, but they have provided a message, and some employees have become the best staff. The state itself is in the learning phase of e-governance practice. The related rules and regulations are still developing. They are trying to understand the use of the system. The university urgently does one thing which is work classification. Works that can be online are to be classified and separated the physical tasks. They should have integrity for these works.

P1 argues that they would have prepared a plan to manage human resources first only for central office but the human resources that they want to bring, are not sufficient and targeted human resources. Technical posts they have created for each office and recruited 67 technical human resources on the fast track from the advertisement in the service commission within three months during the COVID-19. This was a very remarkable task for e-governance. Similarly, they had organized some training massively for the employees which is still needed to continue. Technical and other employees couldn't make updates and implement governance tools without

regular training. Regular refreshment training based on the employee's need should be organized regularly.

Regarding the enhancement of human resources, P2 argues that if any teacher or employee do not use computers and proudly say that they were not taken a practical exam on computer applications during the service commission examination, then they, forcefully want to apply the traditional way of manual system at any sectors. At that situation, TU should bring the policy to provide golden handshake or token money and farewell them from the job and recruit the updated human resources. Similarly, P6 argues that they should empower 50 percent of human resources to enhance capacity to upgrade the system in the organization. The rest of the senior human resources should have got farewell with a golden handshake or any other voluntary retirement opportunity. Because senior employees are also users for service delivery in the e-governance system through the server. So, university should empower the existing human resources and check the IT service delivery skills and capacity when entering new human resources in the organization as the Public Service Commission (PSC) and other agencies adopted the policy. Policy, investment, and human resources are major challenges rather than technology as a big problem. Similarly, P9 argues that they have no alternatives of e-governance, but they should make infrastructure and readiness of human resources correctly and should apply technology. Government of Nepal (GoN) has already directed to implement EMIS in the university. TU is now facing a forceful situation from the government to implement EMIS for all sectors like examination, administration and account etc.

P5 states that training should be regularly organized with yearly calendar and on the basis of the need to implement e-governance practice. They must provide equipment after training to get the right impact of the training as well as encourage the employees for the responsibility. It will be an encouraging activity to organize training as a tool for those employees who are working outside the valley. TU is a physical university. All teaching-learning processes should be physical. However, the Learning Management System (LMS) should be necessary for the physical teaching-learning process which has been adopted by other universities worldwide. The solution of the policy implementation is that the project that they completely need to continue and sustain the project in the IT sector. They should have matched the components of IT like budget, policy, human resources, budgetary system, and all cost involvements to face the challenges to the IT sector and make the projects successful in the university.

Regarding the availability of human resources, P3 argues that one staff works for handling orientation program, plagiarism check, remotex software due to the lack of staffs. Adequate human resources are essential to run the e-governance system at the office. Similarly, P6 argues that not enough technical human resources in TU. They have around 169 IT-related supportive technical staff for e-governance practice. One first-class officer, two second-class officers, five third-class officers, and another assistant level 76 technical staff are working in TU. However, limited human resources have made governing mechanisms in the institution.

In the above discussion, the university should create a cycle of work for implementing effective and efficient service delivery through e-governance. The authorities are expected to create inter-section relationships to join and participate in successful work. The cycle of a training work is seen in TU that the planning directorate makes plan, the finance division provides budget, account section releases budget and the coordination division organize training, after successfully completed training, the monitoring division monitors the effectiveness of the program and recommend the further activities. If personal interest dominates the activity, then the training is not meaningful for all participants. So, the cycle should be active for successful training for human resources.

4.4.6 Collaboration for Stakeholder-friendly Service Delivery

Regarding collaboration with stakeholders for e-governance initiatives, average views are found during the survey. The number of 45.49 percent respondents have rated average for the collaboration with government agencies, private sector and other stakeholders to leverage expertise and resources for digital transformation.

Table 34

Collaboration with stakeholders for e-governance initiatives

Collaboration with stakeholders for e-governance initiatives	Frequency	Percent
Average	126	45.49
Somewhat clear and well-defined policy	94	33.94
Somewhat unclear and loosely defined	22	7.94
Very clear and well-defined manpower	19	6.86
Very unclear and poorly defined	16	5.78

Source: Field survey, 2024.

The number of 33.94 percent respondents have rated the good status of collaboration with somewhat clear and loosely defined policy. The number of 7.94 percent respondents have rated fair, the number of 6.86 percent respondents have rated poor status and 5.78 percent have rated excellent for the collaboration with government agencies and other stakeholders.

P3 says that Curriculum Development Center (CDC) and Examination office have also started online services for applying the services online and interaction with the service receivers through online mode for document verification which reflects the stakeholder-friendly services of our offices. Similarly, P4 says that governance practice has supported stakeholder-friendly service delivery. Students can see the status of their application in their free time from home. The role of e-governance is to make stakeholder-friendly service delivery. It is time-saving that the task is accomplished within five minutes from the time duration of 15 days.

P5 says that the major challenge is the quick changing of the government as well as the policy change together with the government which affects the university too. P5 views about collaboration with other agencies that they started to connect the optical fiber network by doing MoU with Nepal Telecom (NTC) for using the network of telecommunication and providing access to the network to all constituent campuses. The third phase of the work plan was to connect affiliation campuses with this network which is continuing. They had a major target on establishing a data center while they established the IT center. The concept of the data center was to store all data of TU at a center. Similarly, P8 says that the backup of the data center is established under the IT center of Government of Nepal, and it governs the automation system and examination system too. TU is accustomed to new technology using e-governance practices through the data center of Kirtipur.

P6 says that the purpose of e-governance is the satisfaction of the service receivers. They are in a citizen-centric e-governance model in the current situation. Whatever they make, either e-governance or governance should impact the citizens for the solution of the traditional service-providing system which has been indicated by the latest model of governance. Their major stakeholders are students who have the services of filling up forms, printing admit cards and making payments online from home which save time and costs but need more improvements for service delivery. Similarly, P7 says that e-governance practice has well supported to make stakeholder-friendly service delivery of university and enhance quality of services. It became cost-effective and timesaving. In the automation system, we can find out the status of the letters

in a system who is not forwarding the file, employees also know the days we hold the task, and we feel the responsibility to fulfill the task soon.

P8 says that an automation system that is practiced at the central level has supported to promote quality of services, cost-effectiveness and timesaving as well as stakeholder-friendly service delivery of the university. The staff should become responsible for their task, which helps to save time and money too. Similarly, P9 has expressed the view that TU authority can collaborate with the state for the digitalization of around five lakh students' records each year. If they work out an effective examination system, the expenses can be minimized from other sectors, and it runs easily though the essential number of employees is minimal.

Regarding the revision of ICT policy, P5 has suggested to the Government of Nepal (GoN) that e-governance policy need to revise a lot because many stakeholders are still unknown about Information Communication Technology (ICT). Many officials take different platforms to speak about the support of IT for administration and announce the development of the university and nation cannot go forward without the contribution of the IT sector but the reality in practice is that the attention to IT sector needs to be more. The solution to face the challenges in implementing e-governance practices is that the organization should increase the investment to build the infrastructure and enhance the technical human resources for high motivation. The solution to solve the problem is to increase the high morale of technical human resources and get output in the organization from their skill and capacity.

4.4.7 Collaboration for Privacy of Individual Data and Data Security

Regarding personal data security, P4 says that they have built up connectivity with VPN technology for data security because recently the website of examination office was hacked and they are working with the use of VPN for data security, not using the cloud-based software.

Table 35

Collaboration for privacy of individual data and data protection

Collaboration for privacy of individual data and data protection	Frequency	Percent
Average	105	37.91
Strong strategic collaboration	102	36.82
Limited collaboration	30	10.83
No collaboration	25	9.03

Collaboration for privacy of individual data and data protection	Frequency	Percent
Extensive collaboration	7	2.53

Source: Field survey, 2024.

The number of 37.91 percent respondents have an average perception that university has managed digital space to secure privacy of individual data and data protection in e-governance practices for digitalization process. The number of 36.82 percent respondents have rated good status for it. Similarly, the number of 10.83 percent respondents have rated it fair, 9.03 percent have rated it poor status and only 5.42 percent respondents have rated it excellent for digitalization process. In the words of Dar (2022), the successful implementation of e-governance needs proper privacy, security and digital literacy.

The representative of students, during the KII interview, suggests that TU must improve a lot for the implementation of e-governance and needs to assimilate the digital platforms with high security soon that perform speedy services to the students. It is possible that the university should maintain a separate profile for each student and should provide access to that separate identity profile for all records to the concerned student making all facilities easy to receive and the university becomes worthy and respectful.

Regarding records keeping, P9 argues that they can expect the change through e-governance practice, but it becomes minor in the international context. They found an online system abroad to regulate homework and meet with professors too. It becomes regular work to make the online system of entry, exit and all regular activities of a student which brings a kind of attraction to the university. TU is a typical university because it covers overall higher education from around the country with access to general people from backward communities. So, they can't compare with private universities like Purbanchal and Kathmandu University and other international institutions. It is not an easy task to maintain the records of five lakh students each year. It becomes a big challenge for the authority, but they can do and need to start a 5-7-year plan to develop a special software to create profiles of each student for more than 20 lakhs students.

4.4.8 Descriptive Analysis of Variables for the Capacity Development of Service Delivery

The mean, standard deviation and skewness are observed for describing variables for the third objective. The following are the positive status of mean and standard deviation and

negative status of skewness of all variables together with the capacity development of service delivery:

Table 36

Descriptive analysis of variables for the capacity development of service delivery

Index	Mean	Std. Deviation	Skewness
Capacity development (objective 3)	.6874	.11741	-.238
ICT applications to make easy to provide information	4.27	.578	-.098
Ways of e-governance activity	3.50	.845	-.719
Office performance via e-governance	3.49	.845	-.758
Quality of data information	3.26	.880	-.638
Availability of human resources	3.12	.877	.292
University collaboration with stakeholders	3.24	.933	-.573
University collaboration for privacy	3.19	1.011	-.596

Source: Field survey, 2024.

The data set follows a normal distribution with a mean score of 0.687 and a standard deviation of 0.117 with the standard error of 0.146. The mean value and value of standard deviation of all variables are positive. The skewness value of objective 3 and all variables rather than variable 19 are negative. Variables 4 and 19 are skewed in right relative to other variables. It indicates that all variables are smaller and normally distributed. So, the study is not spread out far from the mean but clustered closely around the mean. However, these variables are in the position of normal distribution, and it indicates that most of the variables of the data set are skewed in left.

Regarding this capacity development issue, P9 argues that TU has followed few technologies now, but they cannot fully trust the university to do better on service delivery. There is a challenge of hacking the system. in the university and should be aware of it.

CHAPTER– V: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter deals with the summary of findings, the conclusion of the study and the recommendations for the concern authorities by the respondents during survey, in-depth KII interview and focus group discussion. It also extends its knowledge contribution from the insights and further possible research areas related to this topic.

5.1 Summary of the Findings

The major findings of this study are related to the ICT-based infrastructure of e-governance practice, status of effectiveness of e-governance practice to service delivery for university governance and the capacity development of human resource and e-governance practice to reform university governance for effective and efficient service delivery at TU.

The number of 62 percent respondents expressed their view of knowing e-governance practice and more than 31 percent respondents have partially known the e-governance practice at office. Automation and e-administration, e-library, external internal e-services, e-finance and e-examination are the core areas of e-governance practice. 80 percent above respondents said that an area of automation and e-administration are the major areas using e-governance practice at offices. More than 87 percent of respondents have computer and internet facilities at their places. ICT-based facilities are utilized to implement e-governance practices at offices and digital platforms are used for digital communication using ICT for service delivery.

A dozen software infrastructures have been developed, purchased and utilized in different areas of e-governance practice that are identified during this study. TU has started to invest in information technology to enhance capacity of service delivery through e-governance for university governance. Most of the respondents (i.e. 87.4 percent) have computer and internet facilities at their places. ICT-based facilities are utilized to implement e-governance at offices. Digital platforms are used for digital communication using ICT for service delivery. University has been providing a huge amount for annual cost and procurement of instruments or equipment for e-governance infrastructure. Around 75 percent of respondents have website facilities and email service is the second highest tool of e-governance practice with 58 percent responses. The office management system using e-governance practice is dual nature of record keeping in both computerized and manually filling system at office. 72 percent of respondents expressed their view of both computerized and manually filling system for office management. Similarly, more

than 48 percent respondents have expressed their view of accession to information of policy and strategy and around 47 percent have found effective managing cost efficiency and time saving of service delivery at TU. All variables and item variables are normally distributed with a mean score of 0.7470 for e-governance practice for service delivery. The skewness value of e-governance practice for service delivery and all variables other than variable 4 of this objective are negative. However, these variables are in the position of normal distribution, and it indicates that the majority of the variables of the data set are skewed in left.

Similarly, e-governance practices show the change in the quality of services. Most respondents (i.e. 54.87 percent) during the survey have expressed their view of the effectiveness of e-governance practice as a fast and hassle-free tool for service delivery. The number of 53.07 percent respondents agree on disseminating information through e-governance practices necessary, effective and useful for service delivery at the office. Similarly, the number of 49.82 percent are strongly agreed that e-governance practices play a vital role to change the existing system of university service delivery in TU and the majority of the respondents (i.e. 46.21 percent) have the view that e-governance practices effectively reduce corruption and ensure accountability and transparency for academic integrity in TU. Regarding budget for capacity development of human resources, TU has allocated budget each year for capacity development of human resources.

E-governance practice has become a fast and hassle-free tool to disseminate information for service delivery in the university governance system and it has a very important role in the decision-making process for university governance mechanism. Similarly, e-governance tools have become effective for reducing traditional manual systems and more than 62 percent respondents agree regarding commitment and circular from the authority to implement e-governance practice for service delivery. Among the objectives, the role of e-governance to reform service delivery is associated with strongly positive relationship with other objectives and independent item variables. The independent variables are strongly and significantly correlated with dependent variables the role of e-governance to reform service delivery. The indicators reveal that the independent variables and item variables are significantly correlate with each other to obtain the outcomes for the objectives. Similarly, in regression analysis model for the role of e-governance to reform service delivery with independent, dependent and item variables,

dependent variable the role of e-governance to reform service delivery is positively significant with e-governance practice for service delivery and the capacity development of service delivery.

The capacity development of service delivery to e-governance practice has been influenced by the capacity of human resources and the physical infrastructure for service delivery. The number of 54.51 percent respondents have rated average status for the situation regarding the availability of skilled personnel and resources within university to support e-governance initiatives. The 59.57 percent respondents claims that ICT-based applications make service delivery ease to disseminate information through e-governance practices for service users and receivers in TU. The number of 29.24 percent respondents have got the way of e-governance activity to make the services technology-friendly and the number of 21.66 percent respondents have given the view of practical orientation as another way of e-governance activity to reform the services at university. The number of 46.57 percent respondents rated good for the performance regarding the user-oriented services through e-governance practices at offices. Similarly, the association of academic integrity is seen in this survey. The number of 47.29 percent respondents have rated average status and 35.38 percent respondents rated good status for the quality of university data information in terms of accuracy, completeness, timeliness and trustfulness. Regarding the budget for capacity development of human resources, TU has allocated a budget each year for capacity development of human resources for five years. The collaboration with stakeholders for e-governance initiatives is seen in average status with somewhat clear and well-defined collaboration policy. TU has also collaborated with government agencies, private sector and other stakeholders to leverage expertise and resources for digital transformation. Finally, the number of 37.91 percent respondents have an average perception that university has managed digital space to secure privacy of individual data and data protection in e-governance practices for digitalization process.

5.2 Conclusion

The main purpose of e-governance is transparency and responsibility practice in service delivery. E-governance practice has connected well with the stakeholders, no matter the distance of the students' residential area. In this study, e-governance practices for university governance at TU are investigated. Using a mixed method approach, it focuses on three dimensions, namely, e-governance structures, process and policy; and the capacity of service delivery for university governance. It explores how e-governance practices for service delivery are useful and what the

role of e-governance practices plays for governance reform to service delivery at TU. The methodology is used as mixed method and survey questionnaire, key informant interview and focus group discussion are major data collection tools and techniques for the study. It finds a dozen of e-governance practices for university governance reform at TU. It draws thematic analysis of qualitative data relating to the e-governance practices at TU and data from in-depth interviews with seven senior teachers and employees as well as two student leaders. Through the lenses of institutional theory, stakeholder theory and theory of academic integrity, e-governance infrastructure, role of e-governance practices, use of digital governance framework and technology acceptance model at TU are explored. The infrastructure of e-governance and e-governance practices are identified. The study fills a gap in the study of the university governance through e-governance practices at TU. It provides insights into practice for university's authority, policymakers, and government agencies in the field of e-governance practices at university.

5.3 Recommendations

The recommendations are discussed during the data analysis of both quantitative and qualitative information in this study. The major recommendations are categorized in the following sub-headings:

5.3.1 General Recommendations

The recommendation for university governance through e-governance practice to TU is to develop policy, create infrastructure, and implement it effectively for effective and efficient service delivery. The regular trainings for capacity development of infrastructure and human resources are recommended for empowering to delivery effective services.

5.3.2 Policy Recommendations

The major demand of service users and receivers is to implement e-governance practice and policy in the effective and efficient ways for service delivery for university governance at the university. The university should develop ICT policy and implement the policy in each unit of university.

5.3.3 Knowledge Contribution

This study insights the new knowledge about the e-governance practice in the lens of institutional theory, stakeholder theory and the theory of academic integrity at TU. The theories are relevant to apply for university governance reform to delivery effective and efficient service

delivery at university. The majority of the respondents have their experience of e-governance practices which have become effective during service delivery using ICT-based tools and clearly stated that the e-governance tools are effective and efficient to save time and resources of both service providers and receivers for university governance. This reflects the need and usefulness of e-governance practice for changing traditional way of service delivery into modern technology-friendly e-governance practice. The findings are helpful to manage higher education institutions technology-friendly and maintain governance standards in the university using the prescribed practices of e-governance in the university.

5.3.4 Research for Further Study

The utilization of e-governance tools is vital requirement for the government, governing bodies of university and whole authority of university to adopt the governance mechanism to reform the university governance system for effective and efficient service delivery now and in the future. This study is an initiative of research about e-governance practice at university and it has opened the scope of further research in this area in higher education institutions.

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APPENDICES

I. Questionnaire for Survey
II. Interview Questionnaire for KII
III. To Whom It may Concerns
IV. Letter of Personal Administration Division
V. Table of Correlation Analysis
VI. List of Dummy variables

Annex-I

Survey Questionnaire

This questionnaire has been prepared for MPhil research work, conducted by Mr. Noda Nath Trital, MPhil scholar of Central Department of Rural Development, Tribhuvan University. The names of the respondents answering the questions included in it will be kept confidential. Kindly answer the following questions in the given form. If you have any questions about this research study, you may contact the researcher.

Researcher:

Name: Noda Nath Trital

Email: noda.trital@tu.edu.np; nodanath.767930@cdrd.tu.edu.np

Contact Number: +9779852050103

Department: Central Department of Rural Development, TU.

Section A Personal Information (Demographic Information)

Name of Respondent: ……. **Designation:** ……

Gender: Male/Female **Level:** Officer/Assistant

Name of the Office: …… **Location:** Inside/Outside Valley

Office category: Central/Dean/Constituent campus/department/library/hospital/exam controller

Staff category: Admin/Account/Library/Technical staff/Teaching

Age group: 20-30 years 30-40 years 40-50 years 50-60 years 60 years & above

Educational Attainment: SEE/Proficiency/bachelor/master/MPhil-PhD

Contact No.: …… **Email Address**: ……

Section B Questions for objective-One

Objective-1: To identify the ICT based e-governance practices for service delivery in TU.

Questions (with rating scale)	Rating scale				
I. Perception Scale	5	4	3	2	1
Q. No. 1 Do you familiar with the e-governance practice effective at office administration? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)*					
II. Office Management Scale	5	4	3	2	1

Questions (with rating scale)	Rating scale				
Q. No. 2 Are the areas of e-governance system effectively applied and practiced in your office administration? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)* **Please, mention the following areas that are applied and practiced?** *(5. Automation/E-administration 4. E-services: External Services, Internal Services, 3. E-finance, 2. E-examination, 1. E-library)*					
III. ICT facilities at office for service delivery via e-governance	5	4	3	2	1
Q. No. 3 Do ICT-based e-governance facilities effective at office for service delivery via e-governance practices? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)* **Please, mention the following facilities that are available at the office?** *(5. Computer and internet facility in the working place, 4. Website available for information, 3. ICT orientation training available, 2. Poor infrastructure for e-governance, 1. No idea)*					
IV. Office Management Scale	5	4	3	2	1
Q. No. 4 Does the office management system work effectively for managing office related information in your office? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)* **Please, mention the following management system that is practiced at the office?** (5. Computerized system 4. Filling system 3. Both filling and computerized system, 2. Traditional way, 1. Not systematic)					
V. Access Scale	5	4	3	2	1
Q. No. 5 Is their effective accession to information on service delivery of university and its' policies and strategies? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)*					
VI. Knowledge about ICT based mechanism	5	4	3	2	1

Questions (with rating scale)	Rating scale				
Q. No. 6 Is e-governance mechanism applied by your office effective to disseminate ICT based information? *(5. Strongly effective. 4. Effective, 3. Neutral 2. Normal 1. No effective)* **Please, mention the following ICT tool that is used at the office?** *(5. Website 4. E-mail 3. Notice board, 2. social media, 1. Manually)*					
VII. Knowledge about effectiveness of e-governance practices	5	4	3	2	1
Q. No. 7 Rate the effectiveness of e-governance practices at your office for managing cost efficiency and time saving of service delivery system? (5. Strongly effective 4. Effective 3. Moderate, 2. Normal, 1. Not effective)					

Section C Questions for objective-Two

Objective-2: To assess the role of e-governance for university governance reform in service delivery of TU.

VIII. Access Scale: 5. Strongly Agree, 4. Agree 3. Neutral, 2. Disagree, 1. Strongly disagree	**Rating scale**				
	5	4	3	2	1
Q. No. 8 Do e-governance practices play a useful role for effective and efficient service delivery of the office administration system?					
Q. No. 9 Is the role of e-governance becoming a fast and hassle-free tool to deliver services for service receivers in university administration at office?					
Q. No. 10 Is disseminating information through e-governance practices necessary and useful for service delivery at the office?					
Q. No. 11 Do e-governance practices play a vital role in changing the existing university service delivery system in TU?					
Q. No. 12 Do e-governance practices useful to reduce corruption and ensure accountability and transparency for academic integrity?					
Q. No. 13 Does e-governance practices reduce the traditional manual system at your office?					
Q. No. 14 Is there any commitment from the university to implement e-governance services in your office?					

Section D Questions for objective-Three

Objective-3: To identify the capacity development of service delivery for e-governance practices in TU.

Questions with rating	**Rating scale**				
IX. Ways of e-governance practices	**5**	**4**	**3**	**2**	**1**
Q. No. 15 Does application of ICTs make service delivery easy to provide information through e-governance applications for service users and receivers?					
Q. No. 16 Are the e-governance activities excellent to reform the services at university? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)* **Please, mention the ways of e-governance activity at the office?** *(5. Develop creativity, 4. Improve understanding level, 3. Practical orientation; 2. Easy to service delivery, 1. make the services technology-friendly)*					
X. Performance of service delivery					
Q. No. 17 Rate your office's performance regarding the user-oriented services through e-governance practices? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)*	**5**	**4**	**3**	**2**	**1**
Q. No. 18 How would you rate the quality of university data information in terms of accuracy, completeness, timeliness and trustfulness? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)*	**5**	**4**	**3**	**2**	**1**
XI. Skilled human resources for e-governance					
Q. No. 19 What is the status of the availability of skilled personnel and resources within university to support e-governance initiatives? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)* **Please mention the following status of human resources at the office?** *(5. Very clear and well-defined manpower, 4. Somewhat clear*	**5**	**4**	**3**	**2**	**1**

Questions with rating	Rating scale				
and well defined, 3. Average, 2. Somewhat unclear and loosely defined, 1. Very unclear and poorly defined.)					
XII. Collaboration/Security/Privacy scale					
Q. No. 20 To what extent does university collaborate with government agencies, private sector and other stakeholders to leverage expertise and resources for digital transformation? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)* **Please, mention the following collaboration status of TU with government and private sectors.** 5. Extensive collaboration with deep integration and partnership, 4. Strong strategic collaboration, 3. Moderate collaboration with some formal agreements, 2. Limited informal collaboration, 1. No collaboration.	**5**	**4**	**3**	**2**	**1**
Q. No. 21 To what extent has university managed digital space to secure privacy of individual data and data protection in e-governance practices for digitalization process? *(5. Excellent, 4. Good, 3. Average, 2. Fair 1. Poor)* **Please, mention the following status of digital data protection:** 5. Extensive collaboration. 4. Strong strategic collaboration, 3. Moderate collaboration, 2. Limited collaboration, 1. No collaboration.	**5**	**4**	**3**	**2**	**1**

Annex-II

KII Questionnaire

This questionnaire has been prepared for MPhil research work, conducted by Mr. Noda Nath Trital, MPhil scholar of Central Department of Rural Development, Tribhuvan University. The names of the respondents answering the questions included in it will be kept confidential. Kindly answer the following questions in the given form. If you have any questions about this research study, you may contact the researcher.

Researcher:

Name: Noda Nath Trital

Email: noda.trital@tu.edu.np; nodanath.767930@cdrd.tu.edu.np

Contact Number: +9779852050103

Institution: Central Department of Rural Development, TU.

Section A Personal Information (Demographic Information)

Name of Respondent: ……. **Designation:** ……

Name of the Office: …… **Address:** ……

Sector of working: Teaching/Administrative **Teaching Staff**: Authority/Teacher

Administrative Staff: Admin/Account/Library/Technical staff/IT Expert

Age group: 20-30 years 30-40 years 40-50 years 50-60 years 60 years & above

Educational Attainment: SEE/Proficiency/bachelor/master/MPhil-PhD

Contact No.: …… **Email Address**: ……

First of All, I would like to thank you for your valuable time to this research work. First, I kindly request you to inform about how long and in which sectors you have got working experience in Tribhuvan University.

Your Answer:

……

Section B Questions for objective-One

Objective-1: To identify the ICT based e-governance practices for service delivery in TU.

1. When does an e-governance practice start in service delivery of TU? What is ICT based tools, and their areas of practices used in e-governance practice?

   Your Answer:

   ……

2. What are the legal policies for service delivery through e-governance practices in TU? What are the mechanisms formed for implementing e-governance practices in service delivery?
   Your Answer:……
3. What are the differences between quality-of-service delivery in the traditional way in your office before starting e-governance practices and current condition of e-governance practices using ICT tools?
   Your Answer:……

Section C Questions for objective-Two

Objective-2: To assess the role of e-governance for university governance reform in service delivery of TU.

4. What do you find the change in the quality-of-service delivery through the e-governance practice at your office?
   Your Answer:
   ……
5. How does the e-governance practice play the role for fast and participatory decision-making process and maintain transparency and accountability at university with the stakeholders?
   Your Answer:
   ……
   ……
6. What kind of support do e-governance practices provide to make stakeholder friendly service delivery of university, enhance quality of services, cost effectiveness and time saving of stakeholders?
   Your Answer:
   ……
   ……

Section D Questions for objective-Three

Objective-3: To identify the capacity development of service delivery for e-governance practices in TU.

7. What kind of physical infrastructure has been created by the University for effectively and efficient service delivery through e-governance practices? What are the provisions of yearly budget allocation and expenditure for e-governance infrastructures in TU?

Your Answer:

……

……

8. What is the situation of human resources available for ICT based e-governance practices and their role to improve quality of services in TU?
   Your Answer:

   ……

   ……

9. What can be the expectation of change in quality-of-service delivery through e-governance practices using ICT tools in the overall higher education sector including university? What are the problems, challenges and difficulties to implement e-governance practices and what will be the suggestion to the university authorities for tackling the problems and minimizing challenges and difficulties for implementing e-governance practices?
   Your Answer:

   ……

   ……

Thank you once again for your valuable time to this research work.

Annex-III

TRIBHUVAN UNIVERSITY
त्रिभुवन विश्वविद्यालय
CENTRAL DEPARTMENT OF RURAL DEVELOPMENT
ग्रामीण विकास केन्द्रीय विभाग

विभागीय प्रमुखको कार्यालय
कीर्तिपुर, काठमाडौं, नेपाल ।
Office of the Head of Department
Kirtipur, Kathmandu, Nepal.

Ref. No. :.....

२०८१-०५-१३

Date मिति.....

जो-जससग सम्बन्धित छ ।

यस विभागमा एमफिल-पिएचडी ब्याच-२०७९ मा अध्ययनरत शोधार्थी श्री **नोदनाथ वितालले** एमफिल तहको शोध कार्य गर्ने प्रयोजनार्थ *University Governance Through E-governance Practices in Tribhuvan University, Nepal* शीर्षकमा शोध अनुसन्धान गर्न प्रस्ताव गर्नु भएको हुदा निजलाई आ-आफ्नो निकायमा रहेका अभिलेख, तथ्य, तथ्याङ्क र सूचना विवरणहरु आवश्यकतानुसार उपलब्ध गराई सहयोग गरिदिनुहुन सिफारिस साथ अनुरोध छ ।

.....

सह-प्रा. विष्णु बहादुर खत्री
विभागीय प्रमुख

Tel.: 977-1- 4333581, 977-1- 4331383, Website: www.cdrd.edu.np, E-mail : contact@cdrd.edu.np

Annex-IV

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P.O. Box 8212,Kirtipur
Kathmandu, Nepal.
Phone No. 4330439

रजिष्ट्रारको कार्यालय
OFFICE OF THE REGISTRAR
कर्मचारी प्रशासन महाशाखा

२३३१

Ref. / पत्र संख्या: क.प्र.म.शा.(क) च.नं. /०८१-०८२ मिति: २०८१/०५/२६

श्री नवराज विताल,
शाखा अधिकृत,
पाठ्यक्रम विकास केन्द्र, त्रि.वि., कीर्तिपुर ।

विषय: विवरणहरु उपलब्ध गराईएको बारे ।

उपरोक्त विषयमा तपाईले मिति २०८१/०५/२६ गते दिनु भएको निवेदनमा त्रिभुवन विश्वविद्यालय अन्तर्गत विभिन्न तहमा कार्यरत शिक्षक/कर्मचारीहरुको विवरणहरु एमफिल तहको अनुसन्धान प्रयोजनको लागि माग गर्नु भएकोले संख्यात्मक विवरण यसै पत्रसाथ संलग्न गरी जानकारीको लागि पठाइएको बेहोरा आदेशानुसार अनुरोध गर्दछु ।

रवि वस्नेत
शाखा अधिकृत

त्रिभुवन विश्वविद्यालय अन्तर्गत कार्यरत प्राध्यापकहरुको संख्यात्मक विवरण :

स न	पद	संख्या
१	प्राध्यापक	३०२
२	सह प्राध्यापक	७८१
३	उप प्राध्यापक	२८१३
४	प्रशिक्षक	३८
५	वरिष्ठ प्रशिक्षक	१९
६	उप प्रशिक्षक	४०
७	सहायक प्रशिक्षक	४०
	कुल जम्मा	४०३३

त्रिभुवन विश्वविद्यालय अन्तर्गत कार्यरत प्रशासक देखि कार्यालय सहायक स्तरसम्मका कर्मचारीहरुको संख्यात्मक विवरण :

य न	पद तथा श्रेणी	संख्या
१	अधिकृत (विशिष्ट श्रेणी)	५
२	अधिकृत (प्रथम श्रेणी)	२४
३	अधिकृत (द्वितीय श्रेणी)	९७
४	अधिकृत (तृतीय श्रेणी)	४३५
५	सहायक (प्रथम श्रेणी)	११६९
६	सहायक(द्वितीय श्रेणी)	६५६
७	कार्यालय सहयोगी	१२६०
	कुल जम्मा	३६४६

नोट: कार्यरत कमचारीहरु मध्ये प्राविधिक पदहरुमा ६८८ जना प्राविधिक कार्यरत रहेको ।

शाखा - अधिकृत
कर्मचारी
त्रिभुवन विश्वविद्यालय, कीर्तिपुर

त्रिभुवन विश्वविद्यालय
रजिष्ट्रारको कार्यालय
कर्मचारी प्रशासन शाखा

Annex-V

Correlations among objectives and variables

Variables/Particulars		Obj-1	Obj-2	Obj-3	Male Dummy	Technical Staff	Inside Valley	SLC/ SEE	PCL	Bachelor	Master	MPhil/ PhD
Objective1	Pearson Correlation	1	.236**	.464**	-.080	-.088	.002	.009	-.002	.035	.059	-.096
	Sig. (2-tailed)		.000	.000	.187	.143	.978	.886	.977	.561	.324	.111
	N	277	277	277	277	277	277	277	277	277	277	277
Objective2	Pearson Correlation	.236**	1	.253**	.172**	.198**	-.001	-.186**	-.077	.013	-.007	.073
	Sig. (2-tailed)	.000		.000	.004	.001	.986	.002	.201	.828	.907	.224
	N	277	277	277	277	277	277	277	277	277	277	277
Objective3	Pearson Correlation	.464**	.253**	1	-.085	-.176**	-.033	.061	.042	.052	-.005	-.062
	Sig. (2-tailed)	.000	.000		.160	.003	.582	.310	.485	.389	.929	.300
	N	277	277	277	277	277	277	277	277	277	277	277
Male Dummy	Pearson Correlation	-.080	.172**	-.085	1	.047	-.099	.061	.002	.058	-.183**	.160**
	Sig. (2-tailed)	.187	.004	.160		.437	.099	.311	.969	.335	.002	.008
	N	277	277	277	277	277	277	277	277	277	277	277
Technical Staff	Pearson Correlation	-.088	.198**	-.176**	.047	1	.018	-.038	.030	.073	.072	-.143*
	Sig. (2-tailed)	.143	.001	.003	.437		.769	.534	.623	.225	.229	.018
	N	277	277	277	277	277	277	277	277	277	277	277
Inside Valley	Pearson Correlation	.002	-.001	-.033	-.099	.018	1	.045	-.052	.006	-.062	.082
	Sig. (2-tailed)	.978	.986	.582	.099	.769		.457	.389	.918	.308	.175
	N	277	277	277	277	277	277	277	277	277	277	277

Variables/Particulars		Obj-1	Obj-2	Obj-3	Male Dummy	Technical Staff	Inside Valley	SLC/ SEE	PCL	Bachelor	Master	MPhil/ PhD
SLC/SEE	Pearson Correlation	.009	-.186**	.061	.061	-.038	.045	1	-.016	-.026	-.124*	-.042
	Sig. (2-tailed)	.886	.002	.310	.311	.534	.457		.796	.663	.039	.487
	N	277	277	277	277	277	277	277	277	277	277	277
PCL	Pearson Correlation	-.002	-.077	.042	.002	.030	-.052	-.016	1	-.056	-.266**	-.090
	Sig. (2-tailed)	.977	.201	.485	.969	.623	.389	.796		.349	.000	.134
	N	277	277	277	277	277	277	277	277	277	277	277
Bachelor	Pearson Correlation	.035	.013	.052	.058	.073	.006	-.026	-.056	1	-.448**	-.152*
	Sig. (2-tailed)	.561	.828	.389	.335	.225	.918	.663	.349		.000	.012
	N	277	277	277	277	277	277	277	277	277	277	277
Master	Pearson Correlation	.059	-.007	-.005	-.183**	.072	-.062	-.124*	-.266**	-.448**	1	-.715**
	Sig. (2-tailed)	.324	.907	.929	.002	.229	.308	.039	.000	.000		.000
	N	277	277	277	277	277	277	277	277	277	277	277
Mphil/PhD	Pearson Correlation	-.096	.073	-.062	.160**	-.143*	.082	-.042	-.090	-.152*	-.715**	1
	Sig. (2-tailed)	.111	.224	.300	.008	.018	.175	.487	.134	.012	.000	
	N	277	277	277	277	277	277	277	277	277	277	277

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Annex-VI

Making dummy variables

Original	Dummy
Gender	
Male =1 Female=2	Male = 1, Otherwise = 0 Female = 1, Otherwise =0
Staff_Level	
Officer = 1 Assistant = 2	Officer = 1, Otherwise =0 Assistant =1, Otherwise =0
Staff Category	
Admin staff=1 Teaching staff=2 Technical staff=3 Financial staff =4 Library staff =5	Admin staff =1, otherwise =0 Teaching staff = 1 otherwise = 0 Technical staff =1, otherwise = 0 Financial staff = 1, otherwise = 0 Library staff = 1, otherwise = 0
Location	
Inside valley = 1 Outside valley = 2	Inside valley =1, otherwise = 0 Outside valley = 1, otherwise = 0
Age Group	
20-30 yrs = 1 30-40 yrs = 2 40-50 yrs = 3 50-60 yrs = 4 60 yrs & above = 5	20-30 yrs = 1, Otherwise = 0 30-40 yrs = 1, Otherwise = 0 40-50 yrs = 1, Otherwise = 0 50-60 yrs = 1, Otherwise = 0 60 yrs & above = 1, Otherwise = 0
Education Level	
MPhil/PhD =1 PCL level = 2 Bachelor level = 3 Master Level = 4 SLC/SEE Level = 5	

Original	Dummy
Revised Education Level	
SLC/SEE Level = 1 PCL level = 2 Bachelor level = 3 Master Level = 4 MPhil/PhD =5	SLC/SEE Level = 1, Otherwise = 0 PCL level = 1, Otherwise = 0 Bachelor level = 1, Otherwise = 0 Master Level = 1, Otherwise = 0 MPhil/PhD =1, Otherwise = 0
Office Category	
Central office = 1 Dean office = 2 Constituent campus = 3 Department = 4 TUCL/Library =5 Office of Exam Controller = 6 Hospital & Health centers = 7 Other office/Unit = 8	Central office = 1, Otherwise = 0 Dean office = 1, Otherwise = 0 Constituent campus = 1, Otherwise = 0 Department = 1, Otherwise = 0 TUCL/Library =1, Otherwise = 0 Office of Exam Controller = 1, Otherwise = 0 Hospital & Health centers = 1, Otherwise = 0 Other office/Unit = 1, Otherwise = 0