An Architectural Framework for Federalist E- Government in Nepal

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Abstract:- E-governance refers to use of information and technology by the government to deliver and facilitate government services efficiently. E-governance facilitates simple and efficient communication and transaction between citizens and government. Good and effective e-governance has the potential to improve the environment for citizens to have more access to their government. The implementation of e-governance depends upon various factors. System of government is one of the many instances. The purpose of this research is to highlight the influence federalism has made in transitioning into e-governance. Furthermore, the paper suggests a tentative framework that may maximize the functionality of e-governance for federalism of Nepal. The outcome of this paper will be helpful for government officials and people who are actively involved in transitioning the physical system of government into e-governance.

Keywords:- E-Governance, Good Governance, Framework, Government, Transparency, Federalism.

I. INTRODUCTION

A. Background

E-governance is the use of information and communication technology (ICT) to deliver and facilitate the government services efficiently and effectively. With e-governance citizens can have easy and better access to the government. With rapid development of technology and its ease of access, many governments throughout the world have started shifting towards e-governance for governmental operations. E- governance makes it simple and convenient for citizens to perform governmental tasks, while also improving systems efficiency and transparency. Despite the fact that most governments have prioritized smart and proactive governance, few countries continue to fall behind. The major cause for this is the political instability of developing and underdeveloped countries. Poor economic development, inadequate infrastructural development, and political instability all hinder development initiatives such as the transitioning to e-governance. Nepal's vision of e-governance has been clear since 2006, but its implementation has been delayed several times due to various political

transitions. In 2006, Nepal abolished Monarchy and became a federal democratic republican state in 2008. Again, in 2015, because of the devastating earthquake and border blockade between Nepal and India, Nepal transitioned to federalism with the adoption of a new constitution bringing a shared sense of hope and optimism to many after more than a decade of political instability[12]. Nepal, being a developing country facing frequent political transitions, e-governance and other technological sectors are still in its infancy, with issues during its implementation.

B. Problem Statement

Though, starting with a coherent ideology of implementing e-government, Nepal faced major issues in implementing the idea because of various factors. Some major factors include political transition resulting in political instability, poor infrastructure, lack of human resources, lack of awareness among government officials and common people etc. Nepal moved to federalism with the approval of a new constitution in 2015. Federalism has both positive and negative sides to it. Federalism divides power between central government and local government because of which Information and Communication Technology (ICT) can benefit in part by increasing public engagement. Also, federalism along with e- governance promotes transparency and thus can really improve the overall development of the country. On the other hand, federalism can face numerous challenges, including economic harmony, political stability, restructuring state structures, sustainable development and so on. The issue of political instability can really jeopardize the development of every sector of the country.

➢ *Status of E-governance in Nepal*

According to the Government of Nepal, Department of Information technology, e-Governance has rapidly progressed beyond the computerization of government departments to efforts that contain the finer features of governance, such as people centricity, service orientation, and transparency [1]. Lessons learned from earlier e-Governance efforts have played a significant role in establishing the country's progressive e- Governance approach. It has been recognized that in order to accelerate e-Government adoption across the many branches of

government at the national and local levels, a program approach led by a shared vision and strategy must be used. This method has the potential to save significant money and support infrastructure, facilitating interoperability through standards, and providing citizens with a unified image of government.

However, the UN doesn't say so. According to the UN (2010) annual study on e-government, most portals and websites in the South Asian area have been stagnant since 2008. As a result, the whole region has regressed in the 2010 survey with Nepal positioned at 153 from 150 in 2008. The status of Nepal and the South Asian region overall remained significantly below the global average [7].

One of the most prominent reasons for low levels of adoption of e-government services in underdeveloped nations is that citizens' needs and desires are overlooked. The political transition leading to political instability has also impacted its development on a huge level. Also, low per capita income also is another major hindrance to the development as low per capita income signifies inability of a country to provide the needs of its people. These data indicate that, like other South Asian nations, Nepali e-government services are still in the early stages of development. The government must develop its numerous tools in order to attract new customers and identify the significant aspects in existing e-government services.

➤ *Federalism in Nepal*

Federalism is a political framework that divides power between a central governing body and an assortment of smaller, more local governments [4]. This results in closer association of people to the government. Also, Federalism helps in better and rapid development of the country also in the field of digital governance. Decentralization of power allows each province to make proper plans and policies according to their own necessity and comfort. This helps in easy regulation of governance. Federalism also ensures that the voice of every individual is heard and not overlooked. The same goes in the context of e-governance as well. In 2006, Nepal abolished Monarchy and became a federal democratic republican state in 2008. The country was then divided into 75 districts and 14 zones. However, after more than a decade of political turmoil, a deadly earthquake, and a border blockade between India and Nepal, Nepal moved to federalism in 2015 with the approval of a new constitution. As of now, Nepal has 7 provinces and 77 districts. Each province is considered a federal state.

C. Objectives of the study

Information and communication technology (ICT) has connected the world and nations and plays a crucial part in the development of a country. E-governance plays a vital role, and the implementation of e-governance is popular and has successfully been established in many countries. The goal of the research is to determine the implementation of e-government in a federalist country and suggest an e-governance architecture framework for federal Nepal. The research questions rise is:

• What are the major factors for an e-governance architecture framework?

• What is Nepal's potential e-government architectural framework?

The architecture framework focuses on various dimensions of Nepal digital e-government framework 2019 and different layers of e-government framework defined in the paper E- government adoption: Architecture and barriers [2,6].

D. Significance of Study

The major reason for the government's inclination towards electronic form is because of the improved flow of information from citizen to government and vice-versa, efficient and effective system, transparency, and better decision-making. In a federation both the federal and state governments are independent and autonomous in the spheres of their powers. "One is not subordinate to the other" [11]. This allows any development work to foster faster and helps in better decision- making process as the federal government can emphasize on the needs of its people.

This paper will try to provide an overview of e-government status of federal countries esp. Nepal. As federalism can affect political stability, the study will also give some understanding of how politics affect in implementing e-government and the paper suggests a tentative framework that may maximize the functionality of e-governance for federalism of Nepal which is the result of study of E-government adoption: Architecture and barriers and different layers of the framework and Nepal digital e-government framework 2019 [2, 6].

II. LITERATURE REVIEW

A. Digital governance in Nepal

The article published by Ashish Sharma has compared the ICT condition of Nepal globally. The paper aims to analyze the development trend of Nepal. Also, he has studied different factors influencing the development index. He has concluded that there is a distinct digital divide in Nepal. According to international telecommunication report published in 2015 the internet user percentage in Asia pacific regions i.e., Nepal is only 36.9% but in developed countries like South Korea the percentage usage is above 80% [10]. Although Nepal is lacking in many aspects of ICT due to infrastructural setbacks, the telecommunication services in Nepal have tremendously prospered. The mobile penetration test in Nepal showed 110.25% which represents every citizen in Nepal has a mobile phone. Similarly, the internet penetration test of Nepal is 46.6% as of 2015.

B. Government structure and E-governance in Nepal

ICT development in Nepal was initiated in the early 2000s through the IT policy of 2000. But significant progress was noticed around 2006 after the e-government master plan was devised with the co-ordination of KIPA (Korean Institution of public administration). From 2006 to 2020, Nepal has come a long way. In the initial years the telecommunication sector had great progress.

In this tenure of 2000 to 2022 Nepal underwent a lot of changes. This includes political alterations and flip in the governmental structures. Nepal saw centralized government

to federal, decentralized structures. During this tenure, it had a different e-government framework.

Each framework had different performance. These frameworks were fit for certain political scenarios but failed in the others. Therefore, there were a lot of amendments in this duration.

C. Challenges to the E-government system of Nepal due to transition to Federalism

Challenges to the E-government system of Nepal due to transition to Federalism comprehensively investigates the effects of the transition of the Nepal government to the Federal Democratic Republic. The fact that there were 11 prime ministers from the tenure of 2008 to 2018 is descriptive of the political instability of Nepal. Not only the ICT but different other areas in Nepal such as socio-economic, environmental, cultural sectors also witnessed a radical change [5]. But every change can be both good and bad, which is explored in this paper.

The legal framework in Nepal is also a challenge to implement effective e-governance. Also, there is a lack of enough budget to invest in digital development. The fickle government is dilly dallying about the next leader which bears no attention to digital development. An unstable government imposes threats like lack of proper project implementation, robust leader and changing perspective of changing government on digital government.

The research paper 'Digital governance in Nepal' by Gajendra Sharma reviews the role of e-governance in the recent COVID-19 crisis of Nepal. The paper reviews the improvement in different fields of e-government and suggests solutions for policy makers.

Proper legislation is important for developing countries like Nepal to successfully transition into e-government models. These include implementing proper privacy and security legislation, rules against different cyber issues and disaster recovery facilities. COVID-19 was a digital challenge in Nepal as there was a sudden shift to online platforms. It enforced digital platforms to many people in different regions. But it has yet to go a long way [3]. Different important websites in Nepal do not even have https extensions.

If proper legislation is provided in digital fields, Nepal will certainly change its digital face. It is best if the policy makers focus on developing proper privacy and security plans to ensure a safe digital environment.

D. Federalism and e-governance

Federalism is a constitutional construct where the government is divided into three levels of government i.e., national, provincial, and local level. These levels all have separation of executive, judicial and legislative powers. Federalism has vertical division of executive power in these branches, horizontal separation of subnational legislative and judicial federalism.

E-governance supports easy communication amongst the horizontal and vertical structures in the federal system. The technologies that come with e-governance certifies that there are effective communication channels in both vertical and horizontal manners. It develops interoperability amongst different provinces and reduces the digital divide to some extent.

Currently, technology and communication development has mitigated the cross-country borders while conducting business. The same pattern can be witnessed in government bodies as 'borderless world' is boosting the concept of globalization. But the federal framework of diving the country into different levels of power has imposed an invisible distinction within the country itself. The transformative impact of ICT can impose threat on the territorial foundation and jurisdictional preoccupation of federal states [9]. So, it is best to embrace technological transformation steadily.

A comparative study of e-government and federalism between Italy and Canada by Ubaldi and Roy concluded that development of e-government is highly dependable on the political leadership. They also shed light on the better alignment in e-government, federalist arrangement and territorial development efforts.

The study of e-governance in Kazakhstan i.e., completely following e-centralism makes e-governance a central governance approach. It follows the main slogans like "E- government as a single platform for all ICT -driven public sector reforms" [8]. The constants of e-centralism are monopoly and singularity of the central government and top-down decision making. Similarly, the presidential system of government, single partisanship and absence of developed democratic institutions, distinction in languages, etc.

But e-governance can also have a federalist approach. The extreme federalist governance of the USA has implemented e- federalism through slogans like "E-government as a collaborative project" and "decentralization of e-government politics" [8]. This approach decentralizes power amongst the federal states and brings a framework that invigorates collaboration within these federal states.

III. RESEARCH METHODOLOGY

The research is entirely based on secondary data. Secondary data collection was found to be the best alternative for the research since the data needs to be free from any biases. As the concept of federalism affects a large time span as well as broader geographical area and the research question orients around the analysis of change in e-governance after transitioning to federalism. Secondary research seemed to be more suitable and approachable. The data were gathered through a review of literature, journals, textbooks, papers, review of governmental and non-governmental organizations and materials from the internet. The data is limited to ICT development in federal countries and the influence of politics in the field of ICT in Nepal. As federalism can be a shelter or a revile in the field of a country's development, understanding its idea in the case of

e-governance can be of great help. Next, the e-governance framework in the paper E-government adoption: Architecture and barriers is analyzed to propose a tentative framework that may maximize the functionality of e- governance for federalism of Nepal.
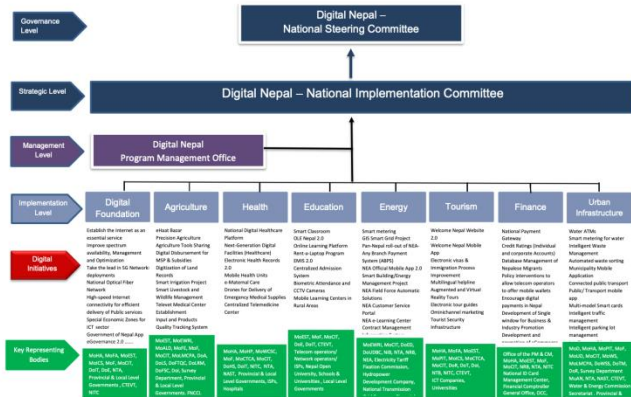
I.   RESULTS

Fig. 1: 2019 Digital Nepal Framework

Figure 1 represents 2019 Digital Nepal Framework[6]. The Nepal digital e-government framework 2019 is a blueprint that provides a roadmap to digital Nepal [6]. The framework provides a roadmap to how digital initiatives can contribute to economic growth, identify opportunities for Nepal to participate in the global economy and find innovative ways to solve major challenges facing society in a shorter period with fewer resources. The Digital Nepal Framework 1-8-80 represents one nation, 8 sections and 80 digital initiatives.

A. Dimensions of digital Nepal framework

Fig. 2: Dimensions of Digital Nepal Framework

Figure 2 represents Dimensions of Digital Nepal Framework [6]. The Digital Nepal framework incorporates eight major dimensions. They are digital foundation, agriculture, healthcare, education, energy, tourism, finance and urban infrastructure.

➢ Digital Foundation
The digital foundation sector aims to help benefit from the ongoing digital revolution by concentrating on quality and reliability of connectivity and digital services, digital skills among Nepalese and digital governance.

➢ Agriculture
Agriculture sector includes technology solutions targeted at increasing production while reducing agricultural input. The adoption of agriculture generating solutions is projected to promote farm productivity and sustainability in order to satisfy growing food consumption and, as a result, farmers' earnings.

➢ Healthcare
Healthcare sector aims to meet the goal of delivering great basic healthcare to all inhabitants. The software seeks to harness virtual technologies (e.g., videoconferencing, e-learning, and mobile health) to address issues with access, affordability, and quality of healthcare for Nepalese.

➢ Education
Education sector's aim is to equip human capital to grab new financial possibilities by introducing a better coaching and learning environment. This comprises utilizing digital technology to aid in teaching, improve the learning experience, and improve academic achievements.

➢ Energy
Energy sector aims to build a long-term power infrastructure that not only reduces costs but also strengthens energy networks. Customer-centric solutions, smart transmissions, and distribution networks are all part of smart solutions, with interconnectivity playing a critical role.

➢ Tourism
Tourism sector seeks to promote Nepal worldwide, attract visitors, and generate job possibilities for Nepalese. It entails the use of e-commerce, disruptive technologies, and augmented reality to promote tourism, create human capital capabilities in the tourist sector, and improve visitor experiences.

➢ Finance
Finance sector aims to reach a vast population by promoting the financial services industry with the use of digital generation and telecoms infrastructure.

➢ Urban Infrastructure
Urban infrastructure sector seeks to use disruptive technology to improve the quality of life in Nepal's cities. By enhancing critical services such as water management, reliable waste management, public transportation, and traffic management.

The e-government architecture should define the standards, infrastructure components, applications, technologies, and guidelines for electronic communication among and between organizations, facilitating government contact and promoting group productivity. The existing framework fails to define the technologies, guidelines for communication among and between organizations.

II. DISCUSSION

Although Nepal is growing digitally in different sectors, implementing it throughout the country is a difficult task. Due to a lack of ICT infrastructure, financial resources, geographical diversity, low skilled human resources, technology import, upgrading, and maintenance, the digital divide between citizens, critical and rude bureaucratic nature, unsystematic working process, weak policy, gaps, and lapses; and a lack of proper government monitoring, supervision, political instability, and control mechanisms. During the procedure, it may confront several problems.

The e-government architecture should describe the standards, infrastructure components, applications, technologies, and rules for electronic communication within and across organizations, facilitating government engagement and boosting group productivity. The current framework does not define the technologies or procedures for communication among and across organizations. Thus, a new tentative framework has been designed with the provision of both central and local level authorization from the existing framework of Nepal digital e-government framework 2019 and architecture framework defined in paper E-government adoption: Architecture and barriers, resulting in parallel and rapid fostering of the development works [2,6]. The framework is based on the architecture defined in paper E-government adoption: Architecture and barriers, which emphasizes that, despite significant differences in organizational composition, there are several technologies and system infrastructure that many organizations must adopt to provide facilities for the integration of their systems in a way that allows them to build a platform for sharing their knowledge resources.

Figure 3 represents framework of e-government architecture[2]. Architecture framework is divided into following four layers:

➢ *Access Layer*

This layer involves the government services users and channels to access those services.

➢ *E-government Layer*

This layer is concerned with merging digital data from diverse organizations into web-portals of government services. In the proposed architecture framework, different provinces provide different access points to their respective digital data and a global central access point to access the central level of digital data. And, based on the Digital Nepal Framework 2019, eight different specific digital dimensions of digital data are accessible to the users.

➢ *E-Business/Data Layer*

This layer focuses on using ICT applications and tools for sharing data within and between organizations, and integration of frontend layers to backend activities such as databases and data warehouses. In the proposed architecture framework, each province is assigned with data warehouses for multiple parallel execution of the activities. And a central data warehouse for the central level of data, which requires a special central level of authorization for data access. Also, central data warehouse might contain multiple databases for long term backup of central and province level data.

➢ *Infrastructure Layer*

This layer focuses on the technologies that must be in place before government services may be provided to the public in a reliable and effective manner.
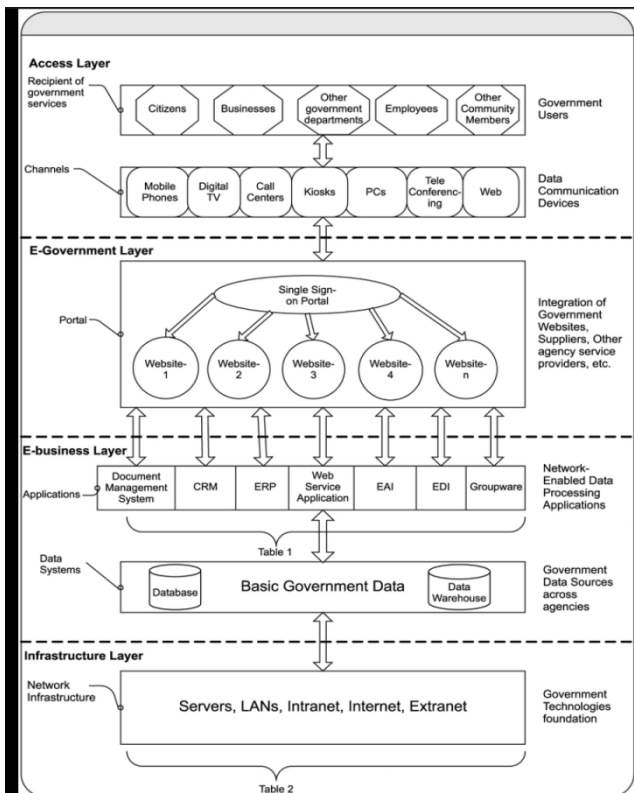

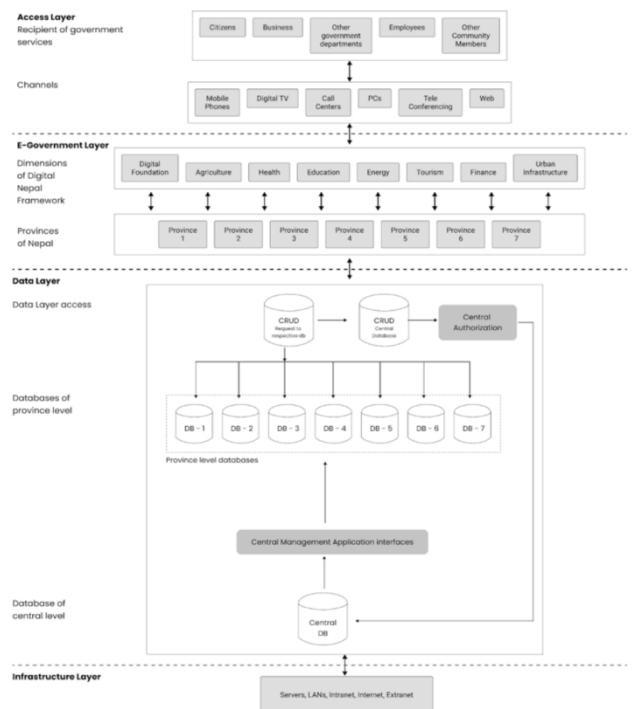*Fig. 3: Framework of E-government architecture*

Fig. 4: Tentative proposed framework of E-government for Nepal

The paper suggests an e-government architecture framework to implement e-governance throughout the country in all the federal states of Nepal, with the central level authorization and provincial level authorization to carry out different levels of tasks in different levels of government.

III. CONCLUSION

The ICT development in Nepal started in the early 2000s. The governmental structure changed from monarchy to federal republic state. The political instability and dilly-dallying adversely affected the digital development in Nepal. There is an existing e-governance framework in Nepal. But the existing framework fails to define the technologies, guidelines for both vertical i.e., executive communication and the horizontal i.e., legislative communication of different governmental bodies. The pre-existing digital Nepal framework has a centralized structure that is incompatible to the decentralized governmental structure of the federal structure. The proposed framework has the provision of both central and local level authorization. It facilitates both the vertical and horizontal communication of different governmental bodies. It addresses the differences in organizational compositions but finds a common ground of operation through common system infrastructures and technologies. This framework has four distinct layers i.e., access layer, e-government layer, e-business or data layer and infrastructure layer. Access layer is designed for the government services users and channels to avail governmental services. E-government layer merges digital data from different sources. It has unique access points for each federal state. The data layer focuses on ICT applications and tools for sharing data between and with the organizations and integration of frontend layers to backend activities. It provides each province data warehouses and a singular central data warehouse with central level of authorization. The fourth layer i.e., infrastructure layer focuses on technologies that must be in place before public government services may be provided to the public in a reliable and effective manner.

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