Dimensions of Digital Nepal Framework and Appropriate Roadmap

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Abstract: *The aim of this paper is to the purposed a roadmap of digital Nepal and trying to explorer the various dimensions of the digital Nepal framework. The content analysis method was used for the study. The researcher claims that Digital Nepal is a broad conception of the Government of Nepal. The Government's big plan Digital Nepal is designed to facilitate Nepal to connect its driving socioeconomic growth of citizens which will help and support to achieve the sustainable development goal. The Digital Nepal Framework encompasses one nation, eight sectors, 80 digital initiatives. The study claims that there are eight dimensions of the Digital Nepal framework. They are the digital foundation, agriculture, health, education, energy, tourism; finance and urban. They will help to guide Nepal on its journey toward becoming a digital state in days to come. The Government of Nepal is successes in information and communication development in the nation. The possible roadmap of digital Nepal is clearly mentioned in two parts as infrastructure development and service and application. The way of digital Nepal is not so easy but the recent trends in the development of ICT in the country show that the true digital Nepal isn't as for as we think.*

Keywords: Digital Nepal, Smart Government, E-Governance, Digital Government, Digital Nepal Framework, Roadmap

1. Introduction

Digital drive of Nepal: According to Nepal Telecom Authority (NTA) 2017, cell smartphone saturation has reached 130%, meaning there are extra cellular connections than the population. Entertainment and video sharing are other popular use cases with extra than 6.four million registered customers on YouTube [7]. It has declared that Nepal has enjoyed awesome achievement in virtual adoption as compared to its pals and Internet penetration accomplishing 63%. NTA further said that, there has been an addition of 2.25 million new Internet customers in 2017 alone, translating into about 250 new Internet customers every hour. The growing popularity of social media is a fundamental motive force for Internet adoption in Nepal. Nepal has nearly 9.three million Facebook users until January 2018 [2].

Digital Nepal: Digital Nepal is a broad conception of the Government of Nepal. Digital Nepal thinks about digital government [16]. It was made in one blueprint which as one nation, eight sectors and eighty digital activities [8]. The Government's big plan Digital Nepal is designed to facilitate Nepal to connect its driving socioeconomic growth of citizens which will help and support to achieve the sustainable development goal 2030. In digital Nepal, our businesses, people, and the government will be using digital technology to drive innovation, increase productivity, and enrich the quality of life for all the Nepalese [16].

The early successful history of the Internet and mobile provides the movement for Nepal to influence the potential of digital technologies to drive accelerated growth these days [2]. Digital services are providing by ride-sharing applications such as Tootle and Pathao; payment platforms such as eSewa, IMEpay, and Khalti; or online shopping apps and websites such as Muncha.com and Daraz and [7]. Nepal Rastra Bank and the Ministry of Information and Communication Technology have to build customer-friendly payment gateways. The digital payment system is essential to support digital Nepal. Now, over 85 % of the payments have done using online and apps.

By giving priority on the security of electromechanical, information systems and information technology security government has established an integrated data center and made accessibly. The data recovery center also established in Hetauda at Makawanpuer. E-Payment Gateway has been begun to make the payment of the government through online service. National Portal has been upgraded and mobile apps have been prepared. The management of uploading information from the relevant office has been made too [1]. Data and information security is a major issue in digital Nepal because cybersecurity is very loose here[11, 12].

Objectives: The utilization of ICT in Nepal is increasing rapidly. The infrastructure development of IT is under construction. The government organizations are using ICT as supporting tools and providing service through it to citizens. Although, Nepal could not grip the speed of IT in comparison to the globe. The objective of this study is to elaborate on Digital Nepal and its roadmap. It also explores various dimensions of the digital Nepal framework. The research questions rises are:
Q. 1. What are the dimensions of the digital Nepal framework?
Q. 2. What is the possible roadmap of Digital Nepal?

The roadmap of this study focuses on a digital journey of Nepal, digital Nepal, digital framework, dimensions of the digital framework, digital governance and proposed roadmap of digital Nepal and it also trying to find the answer to these questions throughout the literature review and result and analysis.

2. Literature Review

2.1. Digital Nepal Framework

In reference to the utilization of the internet in the world is in high priority and its achieve to the citizen is very positive due to its transparency and efficient service delivery [13]. Concluding the result of ICT, the digital Nepal framework has noted. The Digital Nepal Framework is a blueprint that provides a roadmap to digital Nepal. The digital initiatives have been selected based on alignment with the vision of '*Prosperous Nepal, Happy Nepali'*. The Digital Nepal Framework encompasses one nation, eight sectors, 80 digital initiatives [2]. This framework continue the recent policy and plan of Government of Nepal. Before concluding this framework, many interaction programs have conducted between public, private and other stakeholders to include their idea and concern. This frame work has contains three main pillars to make it success. They are technology and infrastructure, entrepreneurship, public private partnership; and Prativa and skill development[9] .

2.2 Dimensions Digital Nepal Framework

Digital Nepal Framework in 2018 has adopted by Nepal. It highlighted eight domains and eighty initiatives to utilize digital development for economic growth [7]. They are digital foundation, agriculture, health, education, energy, tourism, finance and urban infrastructure have been identified. The framework aims to guide Nepal on its journey toward becoming a digital state [2].

Figure 1: Dimensions of Digital Nepal Framework
Source: www.mocit.gov.np

Digital Foundation: Digital foundation is the inspiration of the Digital Nepal program. While Internet penetration in Nepal has raised sharply within the past few years. A few sectors of Nepalese remain digitally uninitiated because of issues round affordability, digital divide, access, and digital illiteracy.

Agriculture: Digital Nepal initiatives within the agriculture sector embody technological answers aimed toward maximizing yield and minimizing agricultural input. The use of agriculture generation answers is expected to enhance farm productivity and sustainability to meet developing food consumption, and in turn, increase farmers' incomes.

Health: Digital Nepal initiatives in health purpose to help the U. S . A . in assembly its objectives of providing exceptional basic healthcare to all citizens. The software intends to leverage virtual technologies (e.G.,

videoconferencing, e-learning, and mobile health) to cope with troubles regarding get right of entry to, affordability, and quality of healthcare for the Nepalese.

Education: Digital Nepal tasks in education purpose to prepare human capital to seize new monetary opportunities via the introduction of an enhanced coaching and studying environment. This entails using digital technology to support teaching, enhance the learning experience, and enhance academic outcomes.

Energy: Digital tasks inside the power sector goal to create a sustainable strength infrastructure to not best reduce fees however additionally reinforce energy networks. Smart answers encompass customer-centric solutions, smart transmissions, and distribution networks, with interconnectivity playing an vital role.

Tourism: Digital projects within the tourism sector are looking for to promote Nepal globally, attract visitors to the country, and create employment opportunities for the Nepalese. It involves the usage of e-commerce, and disruptive technology together with augmented truth to promote tourism, build human capital capabilities in the tourism sector, and provide better traveler experiences.

Finance: Digital Nepal projects in promoting the financial offerings sector target the enormous unbanked population by leveraging digital generation and telecoms infrastructure. Given the strong linkages between financial inclusion and financial prosperity. Nepal is poised to advantage substantially from using economic generation, broadening get admission to to financial services to nearly 55% of the country's unbanked populace.

Urban Infrastructure: Digital Nepal initiatives in city infrastructure aim to leverage disruptive technologies to improve the fine of life in Nepal's city cities. By improving important offerings, including water management, stable waste management, public transport, and traffic management.

2.3 Digital Governance

The government service provided by new technologies such as computing, mobile devices, social media, internet and cloud computing is refers as digital governance. It provides big opportunities to societies and economic development. It is a more transparent, citizen-centric, accountable, inclusive and efficient administration so that people love and believe this [7]. Strong leadership with vision is required for implement digital governance in the nation. Not only continuity of the Government plan and policy but also comprehensive strategy is required for set up digital as well as smart government in coming days [4]. It allows digitized work to organizations in new ground that the internet and web have to offer [5]. According to Digital Nepal Framework (2019), the Governments are typically one of the largest technology users in a country, and consequently able to by delivering public services digitally. Promotion of digital governance forms one of the key pillars of Digital Nepal Program. Digital governance in Nepal can build upon

a number of on-going initiatives such as the government PKI, national ID, automation of vital registration of citizens, automation of land registration processes, and election data repository in electronic format, among others. E-Governance and digitalization of public services have emerged as a key priority of the Government of Nepal [15]. Initiating several steps in this direction, Nepal's ranking on the E-Government Development Index improved from 165th in 2014 to 117th in 2018.

2.4 Proposed Roadmap of Digital Nepal

According to Anand Raj Khana, (2017) has proposed the roadmap of Digital Nepal as:

Table 1: Proposed Roadmap of Digital Nepal.

	Phase 1 (18-20)	Phase 2 (21-24)	Phase 3 (25-30)
Service and Application	1) 3G/4G service (MBB > 60%) 2) FTTH service (FBB home penetration > 20%) 3) E-Government, e-Health, e-Education and e-Agriculture (Strategy, requirement, Application, Contain) Master Plan for 5 years and pilot project in selected cities	1) E-Government Vs Digital Government 2) E-Public Service 3) E-Education 4) E-Health 5) E-Agriculture 6) Smart City 7) Smart Home	1) IoT for vertical industry 2) Big data Analysis 3) Artificial Intelligence (AI) 4) Utilization of Robotics 5) Monitor and control digital government
Infrastructure	1) National Backbone Network (NBN) as a foundation 2) Cloud based National Data Center (NDC) 3) National-wide 4G coverage 4) FTTH coverage in major cities 5) 5. Infrastructure share	1) Intelligent NBN and international connection enhancement 2) Distributed NDC for geographical redundancy 3) MBB and FBB network enhancement 4) Video Surveillance system deployment for smart city	1) IoT(Internet of Things) platform 2) 5G network massive deployment 3) Intelligent surveillance system

Source: CAN Conference 2018

E-government theory is suitable for establish the digital Nepal. Electronic transaction Act 2063, Telecommunication Act 2053, Telecommunication policy 2060, Information and communication Act 2072, Broadband Act 2071 are supporting for digital Nepal in legal way [10].

The main foundation of digital Nepal is internet connectivity. Digital Nepal will connect the people around the nation with the high speed, reasonable and easily accessible internet [16]. The government provides service to citizens' door to door using ICT [14]. Citizens get internet in low cost and all the services will carry out by online with e-payment. People will get e-education, e-tourism, e-health, e-agriculture, smart city smart home and smart government [6]. It will create more online jobs too. Digital Nepal emphasis to make digitalize government [16].

3. Research Methodology

The study was completed using content analysis methods. National and international journals, books, websites, survey reports are used as supporting materials.

4. Result and Analysis

According to monetary survey of the Government of Nepal (2017/18), there's gradual improvement within the subject of information and verbal exchange in Nepal. News, records and styles of packages are being regularly broadcasted for twenty-four hours thru 4 channels: National Channel from Nepal Television, NTV Plus, News Channel and Kohalpur Channel. The tv has installation its transmission centers in 19

extraordinary locations and has supplied the services via geo-floor transmission and different private televisions and radios are also gambling key role in information and conversation sector. The get right of entry to to countrywide broadcast of Nepal Television has 72.5 percentage of the populace 52 percent of the geographical reach. The access to NTV Plus has 42 percentage of the populace and 30 percent of geographical reach. Similarly, the get right of entry to to Nepal Television is nationwide and to 146 different countries through the satellite. Radio Nepal is broadcasting its services through establishing its structure in Central level, Province stage and Local levels. These are reveled in table 2.

Table 2: Number of Audio-Visual Related Licenses

Descriptions	2012/13	2013/14	2014/15	2015/16	2016/17	Total
FM Radio	55	71	64	95	75	872
FM Radio Regular Transmission	51	124	18	42	20	627
Television Regular Transmission	1	1	0	5	6	36
Television	29	4	11	23	8	124
Cable Television	54	24	2	0	0	853
DTH	0	0	0	1	1	2
Licenses for Downlink	9	40	29	30	16	150
VHF/UHF Transmitter	137	204	229	182	70	642
Sales and Distribution of Radio Equipment	17	23	40	99	12	208
Number of Feature film Censored	222	196	200	216	128	1157
Number of commercial Movies	132	93	99	115	54	637
Foreign Movies Shooting	87	93	108	103	44	517

*Source: Ministry of Information and Communication   * For First Eight Months 2017/18*

Table 3 illustrated that due to the services provided through new and advanced technology in the field of telecommunication, the number of telecommunication service providers and service users has been increasing in both quantitative and qualitative ways. The number of telephone users has been 38 million 160 thousand 142 and its density has reached to 130.3 percent. The density of telephone users has been projected on the basis of the population of 2018.

Table 3: Total Number of Distributed Telephones

Service Provider	2013/14	2014/15	2015/16	2016/17	2017/18*
Nepal Telecom Limited	10903344	12981942	15014434	17601610	19113776
United Telecom Limited	508841	524768	526689	526869	526873
Ncell Pvt. Ltd.	11924552	12905513	14145758	15755829	16424202
STM Telecom Pvt. Ltd	3095	2987	2987	2987	-
Nepal Satellite Telecom Pvt. Ltd	150000	366463	371668	371668	328538
Smart Telecom Pvt. Ltd	1064998	1322556	1398100	1618138	1765011
Others	1742	1742	1742	1742	1742
Total	24556572	28105971	31461378	35878843	38160142

Source: Ministry of Communication and Information Technology, Nepal Telecommunication Authority
Till first eight months 2017/18

The table 4 claims that the linguistically, extraordinary languages like Nepali, English, Nepali/English, Newari, Sanskrit, Hindi, Maithili, Bhojpuri, Urdu, Limbu, Tibbeti, Tharu, Doteli, Tamang, Rai and other languages newspaper and magazines are being published. Of general registered newspapers and magazines, 68 percent are in Nepali, 7 percent in English and 18 percentage in each Nepali and English language.

Table 4: Comparative Details of the Registered Newspapers

Types	2013/14	2014/15	2015/16	2016/17	2017/18
Daily	599	622	676	698	705
Half-Daily	34	32	33	36	37
Fortnightly	2594	2657	2803	2872	2875
Monthly	422	451	463	467	470
Bi-Monthly	341	349	364	370	375
Trimesterly	578	590	609	615	616
Quarterly	31	31	35	37	38
Half Yearly	80	84	82	83	84
Annually	87	88	90	90	90
Total	6847	7019	7369	7528	7561

*Source: Ministry of information and communication, Information Department *Till the first eight month 2017/18*

The table 5 illustrates that the number of mobile phone users, basic telephone users (PSTN), and Global Mobile Personal Communication by Satellite (GMPCS) has been 37 million 297 thousand 727, 860 thousand 673 and 1 thousand 742 respectively. The access of mobile services is in all 77 districts and has the access to 90 percent geographical reach. Likewise, the highly advanced technology based mobile services like 4G/LTE (Long Term Evolution) have been started in Kathmandu Valley and Pokhara.

Table 5: The status of telecommunication service in Nepal

Types of Service	2013/14	2014/15	2015/16	2016/17	2017/18
Total Number of Telephone	24556572	2810571	31461378	35878843	38160142
Telephone Density	92.7	106.1	118.8	135.4	130.3
PSTN	829413	845028	852069	684848	860673
Mobile	22052602	26420645	29762155	34172058	37297727
Limited Mobility	1672815	838556	845412	847316	0
GMPCS	1742	1742	1742	1742	1742
Total Broadband Subscribers	8782936	1156944	13784618	16186759	13378001
Broadband Density	33.15	43.67	5203	6109	45.67
ADSL Internet	128307	134729	178972	181582	968621
GPRS	8341176	11088275	13227781	15539952	0
CDMA IX EVDO	193317	198556	199720	199776	199776
WiMAX	999	13306	16392	16722	84458
DialUP (PSTN + ISDN)	0	1029	8125	152	0
Wireless Modem Optical Fiber Ethernet	0	52132	47942	54882	242648
Cable Modem	0	7199	106673	193680	1635039
VSAT Based Internet	0	13	13	13	0

*Source: Ministry of information and communication, Information Department *Till the first eight month 2017/18*

The status of telecommunication service in Nepal could be seen at above table very clearly. The table 5 showed that the number of telephone and mobile is increasing year by year. The Government of Nepal is successes on information and communication development in the nation. Of course, the way of digital Nepal is not so easy but the recent trends in the development of ICT in the country shows that the true digital Nepal isn't as for as we think [13] .

5. Discussion

Although digital Nepal is the government's mega project, it's a challenging job to implement it in the country. Due to poor ICT infrastructure, financial resources, geographical diversity, low skilled human resource, technology import, its upgrading and maintenance, the digital divide between citizens, crucial and rude beaurocratic nature, unsystematic working process, weak policy, gap, and lapses; and not proper government's monitoring, supervision and control mechanism. It may face many challenges during the operation.

6. Conclusion

Digital Nepal is a broad conception of the Government of Nepal. The Government's big plan Digital Nepal is designed to facilitate Nepal to connect its driving socioeconomic growth of citizens which will help and support to achieve the sustainable development goal. The digital Nepal framework encompasses one nation, eight sectors, 80 digital initiatives. There are eight dimensions of the digital Nepal framework. They are the digital foundation, agriculture, health, education, energy, tourism; finance and urban. They will help to guide Nepal on its journey toward becoming a digital state in days to come. The Government of Nepal is successes in information and communication development in the nation. The possible roadmap of digital Nepal is clearly mentioned in two parts as infrastructure development and service and application. Of course, the way of digital Nepal is not so easy but the recent trends in the development of ICT in the country show that the true digital Nepal isn't as for as we think.

7. Recommendations

Public-private partnerships are needed to incorporate special stakeholders to increase ICT infrastructure and skilled human resources[14]. The government ought to make investments in the statistics center to provide cloud providers as soon as high-velocity network coverage expands. Promote Internet use to move the 70% threshold, up from a mean of 38% today. Increase investment in cloud services to over 10% of total software investment to create a metamorphosis platform for enterprise automation. Promote the adoption of e-Commerce and social advertising and marketing to attain global markets. Build programs to improve the competencies of contemporary workers to satisfy the wishes of virtual transformation and enterprise automation. Develop superior applications to prepare IT employees for cloud offerings, cybersecurity, and large facts. These employees will play an essential function in transferring the united states through virtual transformation [6].

8. Acknowledgement

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