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# E-Readiness: A Study of Infrastructure for E-Government of Nepal

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**Abstract**— *ICT Infrastructure is a key ingredient for efficient Information and Communication Technology. Information and Communication Technology plays an important role in rapid development and good governance. E-Government means the use of ICT tools and technology to provide e-services with the help of ICT infrastructure including hardware, software, network and communication channels. This study has been conducted collecting data from national and international organizations report to assess IT infrastructure domain which is required to provide better e-services by Nepal Government. This study presents the current status, e-readiness level of the IT infrastructure and it might be helpful to policy maker and budget planner to provide effective e-services and implement e-government.*

**Keywords**— *E-readiness, ICT Infrastructure, E-government, E-services, E-readiness Assessment, ICT Infrastructure Nepal*

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## I. INTRODUCTION

E-Government may be defined as efficient, speedy, transparent and cost effective government services and administration activities that are accessible and controlled with the electronic means. The government uses information technology and particularly the Internet to support government operation, engage citizen and provide government services [1]. According to World Bank E-government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet and mobile computing) that have the ability to transform relation with citizens, business and other arms of government [2]. E-Government is the use of the information and communication technologies (ICTs) to improve the activities of public sector organizations [3].

For effective use of ICT in any country, the country must be e-ready in terms of needed infrastructure, human capital, accessibility of ICT to the population at large and legal regulatory framework to cater for the emerging new demands.[4].

The ICT infrastructure is first basic thing to implement e-government. The impact of ICT infrastructure is directly related with e-services and e-services will not be effective and efficient without good infrastructure and it is hard to achieve the optimum benefit from the e-government. The basic ICT infrastructure can be fulfilled by public-private partnership and sharing expensive resources among the stake holders of e-government.

Infrastructure readiness includes the hardware, software and other materials that are required for successful implementation of e-government.

E-government readiness study basically includes the

- Organizational Readiness
- Governance and leadership Readiness
- Customer Readiness
- Competency Readiness
- Technology Readiness and Legal Readiness.

Among above readiness, Technology readiness involves all necessary technologies to enable the e-initiative that includes hardware, software, communication and networks infrastructure, Internet penetration, software application, legacy systems and the current organization’s technology and electronic systems [5].

**II. OBJECTIVE**

The main objective of this research is to study and assess Nepal Government’s ICT infrastructure readiness to implement e-government.

**III.LITERATURE REVIEW**

E-readiness (electronic readiness) is a tool to measure the country or organization degree of readiness which shows the willingness or preparedness to obtain the benefit from Information and Communication Technologies (ICTs) [6]. The e-readiness assessment can be the best tool to gauge the country readiness before launching the any e-services. This tool basically includes the physical infrastructure, ICT use, Human Capacity, Policy Environment and ICT economy [7]. Infrastructure plays vital role and it is the backbone of the e-government to connect with citizens, public and private organizations.

ICT infrastructure is the combination of hardware, software, network resources and all the IT services that are required for the existence, management and operation of an enterprise IT environment. It enables organization to deliver successful IT solution and services to its partners, employee and all stakeholders. [18]

There are many readiness assessment tools are developed and International organizations are conducting e-readiness assessment of countries to know the e-readiness level and raking.

*A. E-government Development Index (EGDI):*

EGDI is a weighted average normalized score of three most important dimensions of e-government namely Online Service index, Telecommunication Infrastructure index and Human Capital index. Nepal EGDI is only 0.2321 where 0.4712 is world average and it’s rank is 165 among 193 United Nations Member countries. Telecommunication Infrastructure is also the one of the major dimension of e-government. It shows the country readiness in telecommunication infrastructure to connect with citizens and organization. Below chart depicts that Telecommunication Infrastructure index of SAARC countries where Nepal is in fourth position with 0.16 point and Maldives has the highest value 0.39.[8][9]

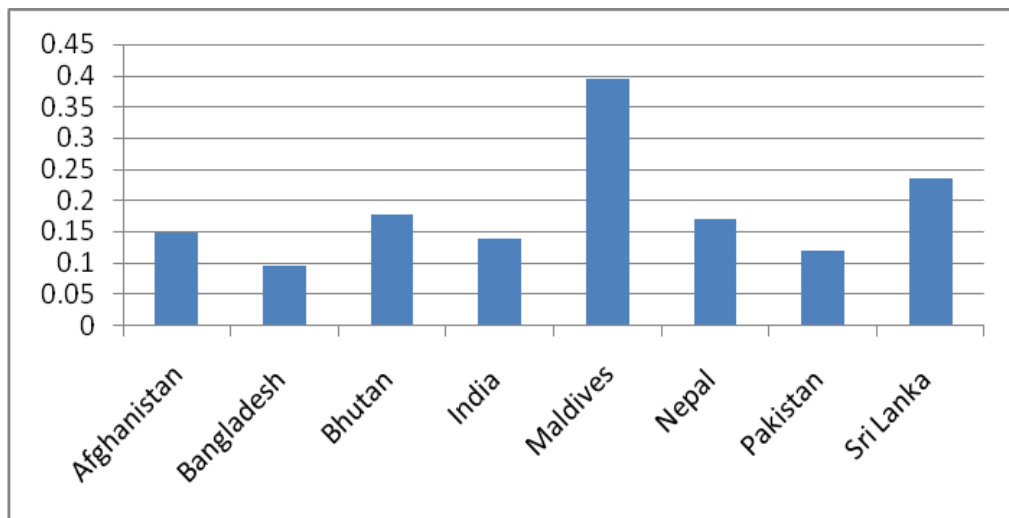


Fig. 1 E-Government Development Index 2014 of SAARC Countries [9]

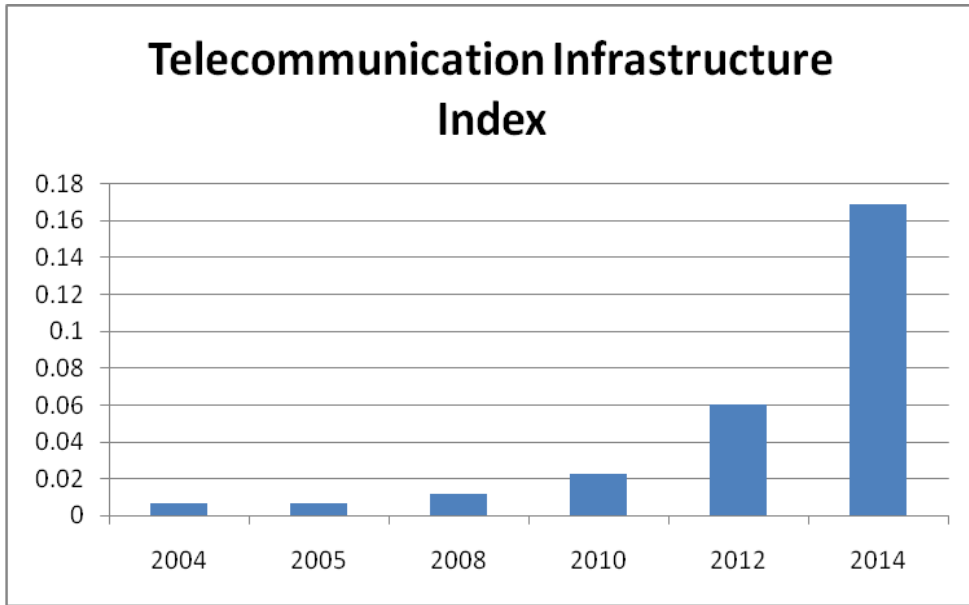


Fig. 2 Nepal Telecommunication Infrastructure Index of last 10 years [10]

The above figures clearly depicts that Nepal has shown progress in Telecommunication infrastructure progress which is the positive sign of ICT infrastructure development in Nepal. The world average index of 2014 is 0.3650 but Nepal has still 0.168. It indicates that Nepal is still poor in Telecommunication Infrastructure.

**B. Network Readiness Index (NRI)**

According to The World Economic Forum (WEF) network readiness index (NRI) 2015 Nepal Network Readiness index has shown positive progress with 118th rank and 3.2 values in 2015 where as 126th rank, 2.9 values and 123th rank, 3.1 values in 2013 and 2014 respectively.

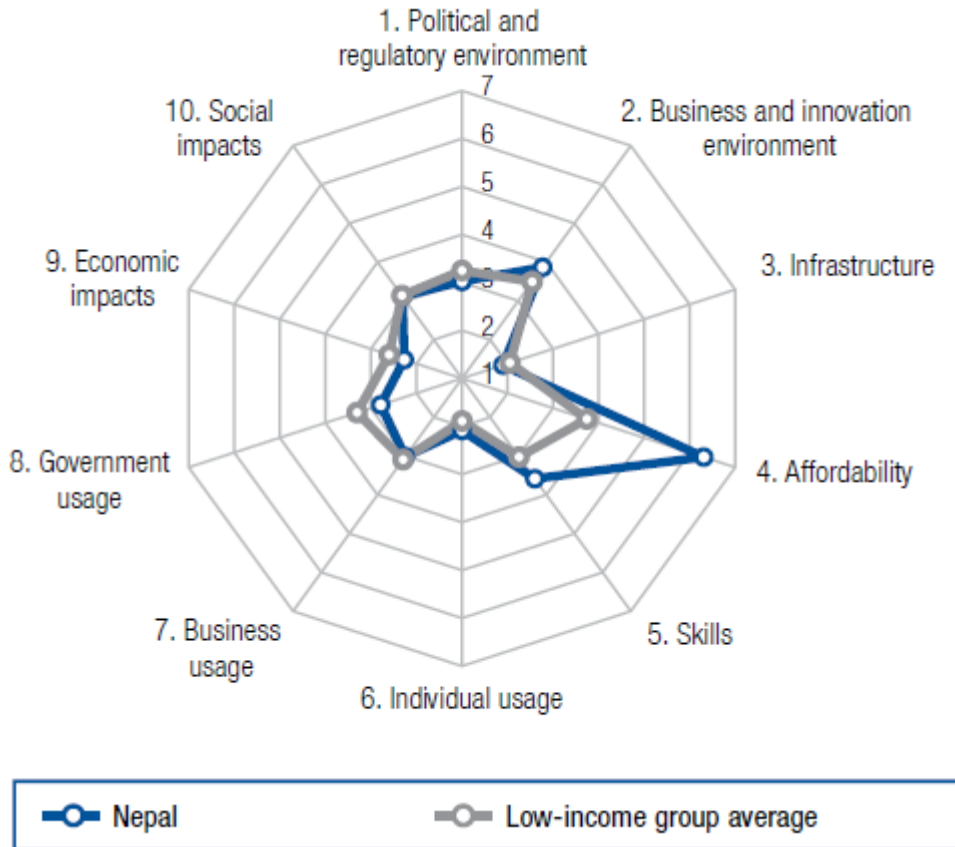


Fig. 3 Networked Readiness Index 2015 [12]

Above figure show the NRI index 2015 value of 10 different pillars. Infrastructure pillar is one of the most important pillar of e-government which shows the country readiness how much country is ready to provide the basic quality infrastructure. This NRI report shows that Nepal has 133th rank and 1.9 values in infrastructure readiness. Infrastructure readiness index includes the Electricity production, kWh/capita, Mobile network coverage, Int'l Internet bandwidth, kb/s per user and Secure Internet servers/million pop. [11].

### *C. Readiness Assessment for Establishing a National CIRT.*

Readiness Assessment for Establishing a National CIRT (Afghanistan, Bangladesh, Bhutan, Maldives and Nepal) Jan 2012 has done the e-readiness assessment to Establish National CIRT (Computer Incident Response Team). This assessment component focuses on identifying whether there is sufficient ICT infrastructure to justify the formation of a national CIRT and whether there is a high level of usage and reliance on ICT and Internet to support basic communications in Nepal. In 2009 only 2.1 % of entire population have internet access and Internet connection in rural area is very limited. Nepal has two national optical fibre backbones from east to west and Kathmandu to Khasa which is the great achievement. It enhances the capability to link with major communication gateway of the world [12].

## **IV. RESEARCH METHODOLOGY**

This research paper follows explanatory research methodology seeking explanations of observed phenomena, behaviours or problems [13]. The researcher has reviewed different relevant research paper and report to seek the problems, behaviours and to sum up the E-readiness of Nepal focusing on ICT infrastructure and its assessment. This research has explored ICT infrastructure availability, accessibility, affordability, usability and quality to launch the any e-services by Nepal Government. The e-readiness index rank has been compared with South Asian Association of Regional Cooperation and other International and National report that are related to Nepal e-readiness study and related to ICT infrastructure.

## **V. RESULTS, ANALYSIS AND DISCUSSION**

E-Readiness assessment helps to know degree of readiness level of country or organization. It is generally defined as the degree to which a society is prepared to participate in the digital economy with the underlying concept that the digital economy can help to build a better society [14]. According to United Nations E-government Survey of last 10 years Nepal has tremendous progress in ICT infrastructure readiness index with 0.167 in 2014 but only 0.00632 was in 2004. But this progress is still not satisfactory with comparison of world average index value 0.3650. The Infrastructure e-readiness index among SAARC countries Nepal is in the 4<sup>th</sup> position. The E-government Development Index 2014 is 0.2344 and rank is 165<sup>th</sup> among 193 United Nations member countries. This value indicates that Nepal need to more focus to increase the e-government development index.

The report published by International Telecommunication Union in 2012 shows that lack of basic infrastructure is the major problem of Nepal to provide the e-services. The basic infrastructure like reliable supply of electricity is the major challenge to provide the ICT services in rural area and even in urban area power back up has become the major problem. The ICT infrastructures are more concerted in urban area but the major population of Nepal is in rural areas. The telecommunication companies are not using the latest technology to provide the better and reliable communication. ISPs (Internet Service provider) are only focused to provide services in urban areas. Nepal government needs to encourage private sector to participate in development of infrastructure in rural and remote areas by providing incentives for investments such as tax rebates, license fee rebate, and infrastructure sharing for stimulating investment. [12]

Networked Readiness Index (NRI) has included 10 pillars and under the Readiness subindex Infrastructure is one of them is shows the infrastructure readiness. This report shows that Nepal has poor infrastructure with only 1.9 values in 1-7 scales and 118<sup>th</sup> ranks out of 148 countries. This report clearly shows that Nepal need to improve the infrastructure readiness to implement e-government. [11]

Internet access is the major communication medium to provide the e-services. Nepal has only 15.4 % Internet Penetration [15] but country telecommunication penetration has crossed the 100% [16] which is very good sign or progress. Nepal has only one government Data Center in Kathmandu and Hetauda has been chosen for the DR(Disaster Recover) zone but the DR zone has not completed yet and it is still being constructed [17].

## **VI. CONCLUSION**

ICT infrastructure is very important pillar of e-readiness assessment of any government or organization. E-readiness assessment needs to conduct to gauge the readiness level. Past reports and International organization readiness assessment shows that Nepal need to improve the e-government development index. ICT infrastructure is the major component that needs to be ready to go into the next level. Government should have clear vision, policies and investment plan in ICT infrastructure. Public Private Partnership model can be the

alternative option for investment in infrastructure. Infrastructure readiness includes the hardware, software and other materials that are required for successful implementation of e-government. So first of all government should have reliable and latest ICT infrastructure to adopt the latest technology. Government need to focus not only in hardware but also software infrastructure like National Identification Number, legal framework, reliable power supply etc.

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