e-Readiness of India with Reference to National e-Governance Plan

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ABSTRACT
These days, Indian Government is coming up with the formula of 'minimum government and maximum governance'. This means providing a citizen centric and transparent but fast and simple governance which is only possible through the extensive use of information technology and leveraging digital government. In this direction, India has been harnessing the benefits of ICTs through their intensive program of National e-Governance Plan in 2006 with its 27 Mission Mode Projects (MMPs). The present paper is an attempt to evaluate India's e-readiness through different world class reports and indexes, and compare the status with the world leader to find out the areas of concern as the obstacles and challenges for being e-ready. The paper further describes the initiatives taken by the govt. of India to overcome these issues.

Keywords
e-Readiness, Information and Communication Technologies (ICTs), e-Governance.

1. INTRODUCTION
The evolution of Information and communication technologies (ICTs) has changed the world into an increasingly networked society, where the development of any nation depends on the strength of its information system and connectivity to the world. ICTs have become the source of opportunities for economic and social development.

Harvard University presented an e—Readiness Guide explaining that getting e-readiness creates new opportunities for firms and individuals in the developing world, eliminates barriers that have traditionally stifled flows of information and goods to and from developing nations, and promotes efficiency in a host of activities. In the information age countries without high levels of resources cannot hope to accelerate development if they are able to develop knowledge, which, combined with adequate ICT-related infrastructure, can allow successful integration into knowledge-based economies. E-governance is the use of Information and Communication Technologies to facilitate the processes of Government and Public Administration for achieving Good Governance. There are various facets of Good Governance which are needed to be like transparency, efficiency and simplicity. It is very important to make changes to government processes to achieved the decentralization, so that the government can reach to the last deprived of the sections and make them a part of the development. E-government is no longer an experiment in administrative reform but a permanent part of the governing process. It is an interactive system of communication and coordination between a government and its citizens, business entities, and other governmental units through the use of web-based and other electronic technologies. e-Governance allows real-time participation in the governmental and democratic process. E-governance ensures better policy outcomes, higher quality services and greater engagement with citizens. These could be online services and information that increase democratic participation, accountability, transparency, and the quality and speed of services (Kalsi et al, 2008).

India has done a remarkable start by manifesting the Information communication technology to improve the government services delivery and to strengthen its approach to the excluded communities by introducing National e-Governance Plan in 2006 and m-governance in 2012 as an extension to this program. Several states in India – Andhra Pradesh and Karnataka being the pioneers – have been attempting e-governance solutions to improve information management and governance. States have set up Information Technology and Communication (IT&C) Departments to guide and coordinate the implementation of e-governance program and projects. These Departments also provide guidance for procurement of hardware and software by government agencies. IT&C Departments have made commendable progress in the development of e-governance applications (Mohanty P.K., 2005). But these efforts are not enough to connect the widespread of populations of different deprived societies like poor, women, disabled and people of remote areas who are still untouched from this information system and seem to be very less in comparison to the other nations of the world terms of the position of India in e-governance initiative internationally. To fulfill the vision of e-governance, it becomes very necessary to assess the e-readiness of India and compare it with respect to other Countries. So that, the scope for improvement in the concern areas, can be assessed. The e- readiness reveals the position of India with respect to the other countries.

2. WHAT DOES e-READINESS MEANS?
e-Readiness does not shows only the number of computers, internet connections, telephones and mobiles, etc. in the country but rather it is a multidimensional concept. It measures the ability to participate in an increasingly networked world. It also can be viewed as the ability to pursue value creation opportunities facilitated by ICTs. The value to a community of assessing its readiness lies in evaluating its opportunities and challenges. For developing countries, an e-Readiness assessment can help establish basic benchmarks for regional comparison by market verticals and for national planning (Zaied et al. 2007). The Harvard University prepared a guide for measuring e-Readiness for the developing countries which defines e-Readiness as the degree to which a community is prepared to participate in the Networked World.

It is gauged by assessing a community's relative advancement in the areas that are most critical for ICT adoption and the most important applications of ICTs.

Budhiraja and Sachdeva (2002) refers to the definition given by World Economic Forum Consultation Report on E-Readiness which defines E-Readiness as the ability of the ICT networks to effectively adapt to the social and economic advancement. They also quoted a definition given by The Asian Pacific Economic Cooperation (APEC) group which defines a country as e-ready that is 'ready' for e-commerce, has free trade, industry self-regulation, ease of exports, and compliance with international standards and trade agreements.

On the basis of the above definitions, e-readiness can be seen as the ability to provide the government services through ICTs so that the maximum benefits can be grasped from the advanced information system.

3. INDIA'S e-READINESS ASSESSMENT

3.1 United Nation's e-Government Survey, 2014

The Department of Economic and Social Affairs, United Nations Public Administration Network conducts e-Government survey which includes a section titled e-Government Readiness. It is the only report in the world that assesses the e-government development status of the 193 United Nations Member States. It serves as a tool for decision-makers to identify their areas of strength and challenges in e-government and to guide e-government policies and strategies. It is a comparative ranking of the countries of the world according to two primary indicators: i) the state of e-government readiness; and ii) the extent of e-participation. Constructing a model for the measurement of digitized services, the Survey assesses the 193 member states of the UN according to a quantitative composite index of e-government readiness based on website assessment; telecommunication infrastructure and human resource endowment.

The EGDI is a composite measure of three important dimensions of e-government, namely: provision of online services, telecommunication connectivity and human capacity. Each one of these sets of indices is in itself a composite measure that can be extracted and analyzed independently. The global e-government ranking, as derived from the EGDI, is not designed to capture e-government development in an absolute sense; rather, it aims to give a performance rating of national governments relative to one another.

The UN e-government readiness index is an internationally agreed-upon composite index that measures the capacity of governments to develop and implement e-government services. The index ranges from 0 (low level of readiness) to 1 (high level of readiness). Constructed within the framework of the UN global e-government survey, the indicator consists of three sub-indices: the web measure index, the telecommunication infrastructure index and the human capital index.

The web measure index ranks countries based on the coverage, sophistication and availability of e-services and e-products. The index categorises countries as having an emerging, enhanced, interactive, transactional or networked e-government presence.

The telecommunication infrastructure index is a weighted average of 5 measures of ICT infrastructure capacity per 100 persons: number of personal computers, number of Internet users, number of telephone lines, number of broad-band subscriptions and number of mobile phones.

The human capital index is a weighted average of the adult literacy rate (two-thirds weight) and the combined primary, secondary and tertiary gross enrolment ratio (one-third weight). For more information on the methodology used to construct this index, see the source listed below. Note that it does not take into account other potentially important aspects of readiness, such as laws on privacy and data protection

Table 1. e-Government Development Index: Comparison of India with the world leader

Country (Out of 193)	e-Government Development Index		Web-measured Index	Tele-communication Infrastructure Index	Human Capital Index
	Rank	Value	Value	Value	Value
India	118	0.3834	0.5433	0.1372	0.4698
World Leader	Republic of Korea	0.9462	0.9764	0.9350	0.9273

In the EGDI report, India is ranked 118 with the score of 0.3834 out of 193 countries, which is very low in comparison of the leading nation Republic of Korea (0.9462). India is valued the least (0.1372) in Telecommunication Infrastructure sub-index, which indicates the lacking of the proper digital infrastructures in India. While the difference of score value of rest two sub-indexes (web-measured Index and Human Capital Index is also very) of both countries is very high. That shows that India is far behind in terms of availability of e-services and e-products and skilled population also.

3.2 Networked Readiness Index (NRI), World Economic Forum, 2014

This report presents the latest findings of the Networked Readiness Index (NRI), offering a comprehensive assessment of the present state of networked readiness of 148 countries in the world. This index includes following four sub-indexes on the basis of 10 pillars:

Table 2: Components and Pillars of Sub-indexes of NRI

Component Sub-Indexes	Pillars
Environment	a) Political and regulatory environment b) Business and innovation environment
Readiness	a) Infrastructure and digital content b) Affordability c) Skills
Usage	a) Individual usage b) Business usage c) Government usage
Impact	a) Economic Impact b) Social Impact

On the basis of these components and pillars, the NRI 2014 assessed the e-readiness of 148 countries. The comparison of India with the world leader is as the following-

Table 3. Comparison of India's NRI sub-indexes scores with world leaders

NRI		India		World Leader	
Overall NRI Rank		Rank	Score	Rank	Score
		83	3.8	Finland (1)	5.98
Environment Sub-Index	Overall	91	3.8	Singapore (1)	5.89
	Political and regulatory environment	73	3.6	1	5.97
	Business and innovation environment	103	3.9	1	5.80
Readiness Sub-Index	Overall	85	4.6	Finland (1)	6.51
	Infrastructure and digital content	119	2.7	2	6.87
	Affordability	1	7.0	19	6.22
	Skills	101	4.0	1	6.43
Usage Sub-Index	Overall	91	3.4	Sweden (1)	6.00
	Individual usage	121	2.1	3	6.53
	Business usage	51	3.8	4	5.89
	Government usage	41	4.5	8	5.56
Impact Sub-Index	Overall	60	3.6	Singapore (1)	6.13
	Economic Impact	50	3.5	2	5.98
	Social Impact	73	3.7	1	6.28

According to this index, it can be said that India is unable to provide a suitable environment for e-governance as it is ranked very low (91) in the environment sub-index. While the readiness sub-index indicates that providing the infrastructure and digital content is the biggest challenge before India. Although India is ranked number one in the affordability but in skills it is again ranked very low (101), which may be affected by the low education rate and low ICTs literacy rate of Indian Population. The Usage sub-index shows the low individual usage (121) which is hindered by the low skills and poor infrastructure.

3.3 Measuring the Information Society: ICT Development Index, 2014

This report is presented by the International Telecommunication Union which presents the key information and communication technology (ICT) developments and tracks the cost and affordability of ICT services according to the internationally agreed methodologies. The ICT Development Index (IDI) ranks countries performance based on the following indicators which are categorized within three Dimensions:

The first is ICT access, in which Fixed-telephone subscriptions per 100 inhabitants

1. Mobile-cellular telephone subscriptions per 100 inhabitants
2. International Internet bandwidth (bit/s) per Internet user
3. Percentage of households with a computer
4. Percentage of households with Internet access

The second category is ICT Use

5. Percentage of individuals using the Internet
6. Fixed (wired)-broadband subscriptions per 100 inhabitants
7. Wireless-broadband subscriptions per 100 inhabitants

The third is ICT skills which include:

8. Adult literacy rate
9. Secondary gross enrolment ratio
10. Tertiary gross enrolment ratio

Thus on the basis of these indicators, the IDI measured India at the rank of 129 out of the 166 countries with 2.53 IDI value. This report significantly shows a low score in Use Sub-index (0.68) which indicates low percentage of individuals using the Internet, less subscription of fixed (wired)-broadband options per 100 inhabitants and less subscription of wireless-Broadband, per 100 inhabitants. Secondly, the report shows poor access to the ICTs (score, 3.01).

Table 4: Comparison of India's ICT Development sub-indexes with the world leader

Country (Out of 166)	Overall IDI		IDI Access Sub-index		IDI Use Sub-index		IDI Skill Sub-index	
	Rank	Value	Rank	Value	Rank	Value	Rank	Value
India	129	2.59	132	3.01	133	0.68	121	5.20
World Leader	Denmark	8.86	Luxembourg	9.46	Denmark	8.71	Greece	9.90

3.4 e-Readiness report of India, 2008

The e-Readiness Assessment Report 2008 is the fifth in this series. The Department of Information Technology and the National Council of applied Economic Research have collaborated in producing the India e-readiness reports since 2006. For the first time, NCAER's e-Readiness Report 2008 provides an assessment of Indian states/UTs in the area of e-Governance. It is an attempt to keep track of the progress in ICT adoption in the governance unit and to benchmark this progress to the leaders and best practices.

According to this report e-Readiness can be considered as the ability to pursue value creation opportunities for inclusive economic development facilitated by ICT. Therefore, it is not simply a matter of the number of computers, websites, internet service providers, internet connections, telephones and mobiles in the state/UT, but also the ability or readiness to use technology skillfully at the level of the individual, business and government. For the broad framework of analysis, this assessment considers three major components of e-Readiness for its ranking.

a) A sound environment needs to be put into place at the initial stage for effective use of ICT. This environment would include the policy environment, the market environment and the infrastructural environment. It includes market environment, political and regulatory environment, and infrastructural environment.

b) Readiness deals with those characteristics of the players that enable them to respond to a conducive environment. This includes capacity building or skill formation for the different stakeholders as well as their access to the infrastructure which have been put in place either by the public or the private sector. It includes Individual readiness, business readiness and government readiness.

c) Usage in the other hand is the actual utilisation of IT given a conducive environment and positive state of readiness. It includes individual usage and governmental usage.

On the basis of these components, the states have been classified in terms of their e-readiness on the basis of index value as follow:

Table 5: E-readiness of the States and UTs of India

Classification	Index Value	States
Leaders (L1)	>1.0	Karnataka, Chandigarh, Maharashtra, Tamilnadu, Delhi, Andhra Pradesh
Aspiring Leaders (L2)	0.5 to 1.0	West Bengal, Kerala, Haryana, Gujarat, Punjab
Expectants (L3)	0 to 0.5	Andaman and Nicobar, Madhya Pradesh, Goa, Orissa, Assam, Himachal Pradesh, Uttar Pradesh, Bihar
Average Achievers (L4)	-0.5 to 0.00	Chhattisgarh, Uttarakhand, Jharkhand, Sikkim, Rajasthan
Below-average achievers (L5)	-1.0 to -0.5	Tripura, Nagaland, Puducherry, Meghalaya
Least Achievers (L6)	<-1.0	Manipur, Mizoram, Jammu and Kashmir, Arunachal Pradesh, Lakshadweep, Dader and Nagar Haveli, Daman and Dui.

The e-Readiness Assessment Report 2008 found the states Karnataka, Chandigarh, Maharashtra, Tamilnadu, Delhi and Andhra Pradesh as the leader states where e-governance programmes are being run for the different government service deliveries. While, West Bengal, Kerala, Haryana, Gujarat, Punjab are the aspiring leaders. Manipur, Mizoram, Jammu and Kashmir, Arunachal Pradesh, Lakshadweep, Dader and Nagar Haveli, Daman and Dui are among the least achievers. Although, this report is quite old but we can still get the somewhat idea of the status.

4. CHALLENGES AND OBSTACLES FOR e-RESDINESS OF INDIA

Barrier is anything preventing the citizens from the adoption of e-Governance services (Delopoulos, 2011). India does have an inspiring vision of where e-governance is going; there is a gap between service delivery and reality in that country. The challenge of e-governance in India lies in providing the service to about a billion people (Sharma et al. 2011). At the moment, India is ranked 118th out of 193 countries in the United Nations e-Governance Readiness Index and 83 out of 184 countries in Networked Readiness Index (NRI), World Economic forum 2014, which indicates significant room for improvement. Delopoulos (2011) stated in his study that it is important to point out that in order for India to materialize its strategic plans. He described that barriers have been recorded concerning both the side of supply of e-Gov services and the side of demand. If the barriers are pinpointed, it will be possible to take them into consideration while designing e-Gov services which the citizens are likely to use, if the obstacles are raised. The barriers will thus be converted in opportunities that will facilitate the adoption. So, barriers and opportunities for the adoption of e-Gov services are the two sides of the same coin.

Farooquie, 2011, refers to Stojanovic et al. who said that there are four major players who constitute the e-governance chain of a country. At the extreme upstream side are the lawmakers of the country, whereas, the citizens are at the extreme downstream. These barriers have multiple aspects. Many scholars (Sharm et al. 2011 , Delopoulos 2011 , Hwan et al. 2004, Dwivedi and Bharati 2009, and Signore et al. 2005) have classified these aspects as different categories:

4.1 Appropriate Environment of e-readiness:

Developing the suitable and positive environment is must to meet the vision of e- government implementation. This environment includes both internal and external as the above indexes are showing that India is ranked very low in the reference to the environment for e-governance. Hence, there is a need to create a more favourable environment for strengthen e-governance. This environment includes political and regulatory environment, business and innovation environment, Infrastructure and digital content.

Although, Indian govt. has taken many initiatives in this regarding but still the fact remains that the country is a long way short of the computing and telecommunications infrastructure. With compare to population in India there is scarcity of technological resources which support the e-governance for adequate implementation (Sharma et al. 2011).

4.1.1 Data System Infrastructure

To move e-governance quantitative and qualitative data support system is required through which facilitates appropriate information for timely updating the portals. In India data quality and data security are still undeniably not strong.

4.1.2 Legal Infrastructure

For appropriate implementation laws and regulations are required for stopping the illegal activities through e-governance. For example digital signature cannot be accepted in India as compare to developed countries. However, the majority of e-governance initiatives in India have failed to materialize, due to poor implementation and absence of proper laws. For instance, there is neither a privacy law nor any data protection law in India. On the contrary, draconian and outdated laws like cyber law and telegraph law have been retained by Indian government despite suggestions to the contrary (Bharati 2009, and Signore et al. 2005).

4.1.3 Institutional Infrastructure

E-Governance can only be progressed if the organizations exist to act as a focus for awareness and to act as a means for facilitation of e-governance. In India there are many institutions are those are not maintaining their website and if they are having their website but running without essential information which has been made mandatory by the law improper planning (Sharma et al. 2011).

4.2 Developing e-skills of the society

For success of any e-governance initiatives, adoption of the techniques is very important. To enable people adopting the techniques is become essential to enhance the quality of education system, adult literacy, and computer literacy.

Barriers of adoption of e-Gov services can be detected concerning some population group characteristics or the citizens in general, such as education and sex, the lack of knowledge, the low level of access to technology (Dwivedi and Sahu, 2008). In India literacy level is still very poor, and if we will talk about the computer literacy level it is not o good in percentage of overall population. Factors behind these conditions are literacy level, language barriers, and limited infrastructure resources provided by the government (Sharma et al. 2011).

4.3 Increasing the Individual usage of ICTs

The individual access to the ICTs hinders by the lack of knowledge and awareness lead to the low. The issues related to privacy and safeties create mistrust to the technologies. This affects the firm-level technology adoption, capacity for innovation, business to business internet use, business to consumer internet use. Dwivedi and Sahu (2008) described other barriers in the adoption of e-Gov services. According to them less confidence and the unwillingness of citizens to use e-Gov services lies on security and privacy of information systems. Great importance is given to the protection of citizen privacy. Barriers concerning whether e-Gov services will be adopted or not, is interrelated to the income, access to the internet, and the saving of time by the citizens.

5. INITIATIVES TAKEN BY THE GOVERNMENT OF INDIA

These challenges need to be defeated for the efficient functioning of e-government. In this regarding recently (2015) the govt of India has started a project called Digital India. Digital India comprises of various initiatives under the single programme each targeted to prepare India for becoming a knowledge economy and for bringing good governance to citizens through synchronized and co-ordinated engagement of the entire Government.

This program has been envisaged and coordinated by the Department of Electronics and Information Technology (DeitY) in collaboration with various Central Ministries/Departments and State Governments. All the existing and ongoing e-Governance initiatives have been revamped to align them with the principles of Digital India.
The vision of Digital India program aims at inclusive growth in areas of electronic services, products, manufacturing and job opportunities etc. It is centered on three key areas

- Digital Infrastructure as a Utility to Every Citizen
- Governance & Services on Demand and
- Digital Empowerment of Citizens

With the above vision, the Digital India program aims to provide Broadband Highways, Universal Access to Mobile Connectivity, Public Internet Access Program, E-Governance: Reforming Government through Technology, eKranti – Electronic Delivery of Services, Information for All, Electronics Manufacturing: Target Net Zero Imports, IT for Jobs and Early Harvest Programs. For this, Govt of India has taken following initiatives

1. **MyGov.in** has been implemented as a platform for citizen engagement in governance, through a "Discuss", "Do" and "Disseminate" approach. The mobile App for MyGov would bring these features to users on a mobile phone.

2. The Government of India has undertaken an initiative namely **Bharat Net**, a high speed digital highway to connect all 2.5 lakh Gram Panchayats of country. This would be the world's largest rural broadband connectivity project using optical fibre.

3. BSNL has introduced **Next Generation Network (NGN)**, to replace 30 year old exchanges, which is an IP based technology to manage all types of services like voice, data, multimedia/ video and other types of packet switched communication services.

4. BSNL has undertaken large scale deployment of Wi-Fi hotspots throughout the country. The user can latch on the BSNL Wi-Fi network through their mobile devices.

5. To deliver citizen services electronically and improve the way citizens and authorities transact with each other, it is imperative to have ubiquitous connectivity. The government also realises this need as reflected by including '**broadband highways**' as one of the pillars of Digital India. While connectivity is one criterion, enabling and providing technologies to facilitate delivery of services to citizens forms the other.

Policy initiatives have also been undertaken (by DeitY) in the e- Governance domain like e-Kranti Framework, Policy on Adoption of Open Source Software for Government of India, Framework for Adoption of Open Source Software in e-Governance Systems, Policy on Open Application Programming Interfaces (APIs) for Government of India, E-mail Policy of Government of India, Policy on Use of IT Resources of Government of India, Policy on Collaborative Application Development by Opening the Source Code of Government Applications, Application Development & Re-Engineering Guidelines for Cloud Ready Applications.

BPO Policy has been approved to create BPO centres in different North Eastern states and also in smaller / mofussil towns of other states.

Electronics Development Fund (EDF) Policy aims to promote Innovation, R&D, and Product Development and to create a resource pool of IP within the country to create a self-sustaining eco-system of Venture Funds.

National Centre for Flexible Electronics (NCFlexE) is an initiative of Government of India to promote research and innovation in the emerging area of Flexible Electronics.

Centre of Excellence on Internet on Things (IoT) is a joint initiative of Department of Electronics & Information Technology (DeitY), ERNET and NASSCOM.

The estimated impact of Digital India by 2019 would be cross cutting, ranging from broadband connectivity in all Panchayats, Wi-fi in schools and universities and Public Wi-Fi hotspots. Success of this programme will make India Digitally empowered and the leader in usage of IT in delivery of services related to various domains such as health, education, agriculture, banking, etc.

6. CONCLUSION

It can be concluded that in achieving a fast and simple e-governance in India, developing the favourable environment and digitally skilled citizens are the challenges to be overcome. Although in the past years India has been among the lowest achiever countries and it has a long way to achieve the status of e-readiness but with the efforts made by Indian govt., we can hope with a better tomorrow.

7. ACKNOWLEDGMENTS

Our gratitude and thanks to the Indian Council of Social Science Research, New Delhi who funded the present study.

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