A CRITICAL EVALUATION OF INDIAN GOVERNMENT'S STRATEGIES TO BRIDGE DIGITAL DIVIDE

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Emergence of Information and Communication Technology (ICT) has been a landmark for India. In one way, this sunshine sector has been instrumental in the economic growth of country and has glorified its image in the whole world but on the other end, it has also created a digital divide in our society. BBC's Jill McGivering reports that the IT revolution is only changing some lives in the world's largest democracy. (Bagla,2005) A small section of society is harnessing it fully for their advantage while the masses are even not aware of it. UNESCO report 1998 also stated that for the majority of the world's population, telephones are a technology beyond reach; food, sanitation and literacy are more urgent needs. How can we reconcile major commitments of energy and funds to ICTs when more basic human needs remain unfulfilled? The conventional, even formulaic, answer to the alleged conflict between investment in ICTs and investment in meeting basic human needs is, "We need to do both. There is no contradiction between ICTs and other critical human and social goals." (Keniston, 2002) ICT sector has potential of reviving the hopes and fortunes of these deprived and hatred section of society. Application of ICT in the form of E-Governance possess the potential to bridge the gulf between the urban 'technology haves' and rural 'have nots', within and among the countries. (Annan, 2002)

1. Digital Divide: An Introduction

Digital divide is the gap between those with regular, effective access to digital technologies and those without. The digital divide is related to social inclusion and equality of opportunity. Larry Irving, a former United States Assistant Secretary of Commerce and technology adviser to the Clinton Administration, made the term digital divide popular in a series of reports in the mid 1990's. (Wikipedia)

In April 1997, a United Nations Committee stated: We are profoundly concerned at the deepening maldistribution of access, resources and opportunities in the information and communication field. The information and technology gap and related inequities between industrialised and developing nations are widening: a new type of poverty – information poverty – looms (United Nations, 1998).

This "information and technology gap" is now better known as the "digital divide". World Summit of Information Society (WSIS) held in Geneva in year 2003 refers 'digital divide' as the gap between those who can effectively use new information and communication tools, such as the internet, and those who can't.

Digital divide refers to a substantial asymmetry between two or more populations in the distribution and effective use of information and communication resources. This term was coined to describe the apparent disparity brought about by the ICT revolution, accessible to and exploitable by only those who are affluent, educated, technology-savvy and well-verse with English language.

2. Literature Review

Review of literature pertaining to digital divide is presented in three sections i.e. framework of digital divide, geography specific digital divide and suggestive model for digital divide.

2.1 Framework of digital divide

Chen & Costa (2005) provided a review of recent trends in the open access (OA) movement, like HINARI, AGORA, PERI etc as well as to discuss the significance of those trends for information access in developing countries.

The advent of information and communications technologies (ICTs), and in particular the www, holds great promise for more equitable distribution of scientific knowledge and the ideal of a global knowledge commons is no longer seen as an unattainable utopia (Global Knowledge Partnership, 1997).

According to Finc & Kenny (2003), the "Widening Digital Divide" has the status of fact in most discussions of the global distributions of Information and Communication Technologies (ICT), and that this divide is a problem is widely accepted but they challenged both these assumptions. First, looking at various measures of the Digital Divide, there is a divide in per capita access to ICTs but developing countries show faster rate of growth in network development than developed countries. Second, the paper examines the precondition that disparities in absolute access in ICTs between countries will lead to reduced development prospects in poor countries. Past experience has shown that it is very difficult to make predictions of this type.

The divide in Internet economy is summed by Rao (2000) in 8 Cs i.e. Connectivity, Commerce, Capacity, Cooperation, Capital, Community, Culture and Content.

Salman (2004) identifies key hurdles to implementing e-commerce and information technology in developing countries with special focus on three crucial vectors of an organization – people, process, and technology.

2.2 Geography Specific Digital Divide
Cullen (2001) examined number of issues related to Digital divide in the USA, Canada, UK, and New Zealand, assessing factors that contribute to it, and evaluating strategies that can reduce it. Relevance of these strategies for developing countries and strategies for reducing international digital divide were also explored.

Cullen (2003) reviewed recent researches concerning the Digital Divide in New Zealand and the factors that alienate people from enjoying the benefits of Information Technology and participation in the knowledge economy. He also examined strategies used in the USA and the UK at national and regional level to address similar issues, including the use of libraries to reduce the Digital Divide, and compared these with New Zealand initiatives, to identify positive

means of participation in the knowledge economy.

Hubregte (2005) attempts to examine the significant differences in and implications of the extent of internet connectivity both globally and more specifically within the European Union (EU).

Mutula (2005) sought to argue that the peculiarities of sub-Saharan Africa, in terms of its socio-cultural diversity, low economic development, linguistic factors, HIV/AIDS pandemic, gender discrimination, low ICT awareness and so on, demand a new model of addressing the digital divide

Paul (2002) made an attempt to provide understanding of digital divide and described how ASEAN has addressed at regional level. It is not an attempt to provide an exhaustive treatment of initiatives undertaken by ASEAN regional groupings but aims to provide sufficient information as to where it is heading and the limitations at the regional level in undertaking this Mammoth task.

2.3 Suggestive Models of Digital Divide
Chaudhary (2002) suggested to study and apply China government's model for providing universal digital access in India within next 10 years. He also emphasized the need to improve affordability through competitive environment, encouraging the use of radio technology, upgrading the village public telephones to public tele information centres (PTICs). Obstacles such as illiteracy and lack of computer skills also must be tackled.

World Summit on Information Society (WSIS) held in Geneva in 2003, drafted an action plan to address the issue of digital divide by closing the infrastructure bottlenecks. It was proposed to establish wide deployment of new generation broadband satellites. A new model of International Telecommunication Satellite Organisation (ITSO) is required that can provide proper regulatory incentives and conditions that will allow market forces to meet the requirements of the action plan. (Bernard, 2003)

The Gartner Group report (1998), "The Digital Divide and American Society" argues that there is a very strong correlation between socio-economic status and participation in digital economy that suggest cause and effect. This report suggests addressing four potential barriers into account for bridging digital divide. These are physical access to

ICT, ICT skills & support, attitude and content.

Nikam, Ganesh & Tamizhchelvan (2004) stressed that efforts should be made to preserve the culture and social history of country while entering the digital age.

By establishing reliable internet infrastructure in least developed countries (LDCs) that can provide access to international internet capacity at low cost, part of the vicious circle can be modified in a way that will have an impact throughout the entire internet market, thereby transforming a market failure into new opportunities for development. (Sarrocco, 2002)

Sidorenko & Findlay placed discussion of the Digital Divide on much broader economic context, linking it with the theory of economic growth and technological change. They also discussed appropriate policy environment for bridging the Digital Divide and concluded that the East Asian region has much to gain from complementarities of its economies, their openness to trade in ICT products and policy cooperation.

3. Digital Divide in India

India is a country of various heterogeneous groups in terms of income, education, caste, religion, geography etc. This diversity can be manifested from the sheer fact that satellites, high-speed rockets and bullock carts run in India simultaneously. Country also boasts of huge 1.1 billion population, out of which, about 70 % people living in villages, with 26% in below poverty line category. Approximately, 23 million children per year take up primary education but only about 15 million are fortunate to get the secondary education. This figure gets drastically reduced at the undergraduate level with only about 2.3 million students per year. With average INR 21000 per capita income and poor literacy rate of 65 %, India is an excellent example of great digital divide in the world. (Indian Census Report, 2001)

Due to the above mentioned abysmal socio-economic condition, priorities of people as well as the government has been on fulfilling the basic needs. Nonetheless, last decade witnessed significant efforts at both the levels on improving the overall ICT climate in country. Due to these efforts, teledensity in India has increased from mere 3% in 2001 to 17 % in year 2007. (www.trai.gov.in) Penetration of PCs and internet is also increasing. Following tables clearly represent this scenario:

Table 1: Internet Fact file-Indian Case

Population (2007 Est.)	Internet Users (Year 2000)	Internet Users, Latest Data	Penetration (% Population)	Use Growth (2000-2007)
1,129,667,528	5,000,000	40,000,000	3.5 %	700.0 %

Table 2: Internet Growth in India

YEAR	% Penetration
1998	0.1 %
1999	0.3 %
2000	0.5 %
2001	0.7 %
2002	1.6 %
2003	2.1 %
2004	3.6 %
2005	4.5 %
2006	3.6 %

Source: www.internetworldstats.com

Data given above clearly reveals that internet penetration is increasing every year but looking into the PC penetration of other developing countries, much need to be done.

4. Government's strategic moves for bridging digital divide in India

IT initiatives at national level were started in the year 1981 with establishment of National Informatics Center (NIC) at all the district head quarters in our country. Under the aegis of NIC, many projects like computerization of land records, Public Grievance Redress Monitoring System, Distance learning programme, computerization upto taluka level, creation of State Wide Area Network, video-conferencing, training programme for creating awareness etc have been undertaken. India's political leadership is aware "that IT is vital for the future growth of the nation, and its successful implementation will enhance the flavors of four E's - education, employment, entrepreneurship and e-governance." (Singh, 2000) Some of the major government initiatives are given below:

4.1 Formation of new ministry for IT

In year 1999, Ministry of Information & Communication Technology (MCIT) was formed. Ministry adopted ICT for promoting literacy, improving quality of education, producing thousands of qualified professionals for direction of and supply of IT and IT enabled jobs for Indians. It is also using IT for good governance, for empowerment of people and their participation in shaping polices of governments and overseeing it. To ensure that the benefits of an IT based economy reach the masses, MICT undertook a two pronged strategy. On one hand many steps are taken to ensure growth of Indian IT industry at a fast pace following the international trends, while on the other hand, numerous measures have been adopted to ensure that benefits of technology reach the common man residing in the remotest part of the country. Some of such initiatives are IT for masses, digital library, Indian language computing and content development, Media Lab Asia (MLA) corporation project. A separate department under MICT; 'Department of Information Technology (DIT)' has been set-up with the objectives of creation of wealth, employment generation and IT led economic growth.

4.2 Regulatory Framework

Passage of 'Information Technology Act' in the year 2000 gave fillip to information technology and E-Governance activities and projects countrywide. Further enactment of 'Right of Information Bill' in year 2002 and 'Right to Information Act 2004' by the Parliament in May 2005 sets out the practical regime for people to secure access to information under the control of public authorities in order to promote openness, transparency and accountability. Till now, 60 public departments have published their citizen charters and put them on their website. (Vittal, 2001)

4.3 Information Technology for Masses

Continuing on the similar lines, in May 2000, government constituted a working group on 'Information Technology for Masses'. Its objective was to formulate a set of policy initiatives to be implemented by various departments of central government, industry and entrepreneurs to achieve widespread applications of IT in all possible areas in the shortest possible time.

4.4 Establishment of Center for E-Governance

Further, in an initiative to promote procedural simplicity, speed, convenience and to facilitate E-Governance, Department of Information Technology (DIT) has constituted a special cell 'Center for E-Governance' at its head office in New Delhi. In order to support various State level E-Governance initiatives, Department of Information Technology (DIT), along with National Association of Software and Service Companies (NASSCOM) has floated National Institute of Smart Governance (NISG) for consultation on E-Governance projects.

4.5 e-Readiness Assessment

DIT, under the multi-donor grant programme of Word Bank named 'Information for Development Programme (InfoDev)', regularly does the assessment of e-Readiness of each State, Union Territory, Central Ministries and Departments. The objective of this programme is to support innovative projects demonstrating the development opportunities offered by ICT.

4.6 ICT & India Millennium 2020

Hon'ble President of India *Dr. A.P.J. Abdul Kalam Azad* has also identified the potential of Information and Communication Technology (ICT) to transform India into developed country. Therefore ICT sector has been included in the five major projects, named as "India Millennium 2020", for putting India into development front.

4.7 IT Spending

In the 10th five-year plan (2002-2007); the target was set to allocate three to four percent of every department budget on Information

Technology spending. The Planning Commission of Government of India has also recommended the government to earmark Rs. 3000 crore (US $587 million) in addition to the 3 percent plan outlay of each ministry for E-Governance and convergence projects during the 10th Five Year Plan (2002-2007). Commission has highlighted the need to conduct at least 25 percent of every department's operations through computers.

4.8 Rural Prosperity Through Connectivity

Further, in an effort to empower the villages of India and make them a part of the Knowledge Society, the Technology Information Forecasting and Assessment Council (TIFAC), an autonomous body under the Ministry of Science and Technology (MST) was created. It has developed a Rs. 700 crore integrated rural connectivity and linkage plan called 'Rural Prosperity Through Connectivity' (RTPC). The RTPC plan entails creating a loop of villages of connected with both basic infrastructure and IT facilities to support a variety of modern services.

4.9 National e-Governance plan

Government has also announced firming-up of the National e-Governance plan (NeGP) in October 2004 and released notification on technical and financial support for the establishment of a State Wide Area Network (SWAN). In February 2005, government also announced budgetary support from the Planning Commission as Additional Central Assistance to all the states for initiating the NeGP. In addition, the National eGovernance Plan (NeGP) envisages over 100,000 common service centres to serve the citizens with adequate support from the government machinery strengthened through the mission-mode projects.

4.10 Setting up of National Knowledge Commission

On October 2, 2005, government decided to set up a National Knowledge Commission, headed by Mr. Sam Pitroda, with a definite objective of transforming India into a knowledge power within a span of thirty six months.

4.11 Local content development

Announcement has also been made for financial support for local content development to the North Eastern states for the creation and sustenance of 487 government supported Community Informatics Centres (CICs).

4.12 E-Governance at Each State

In addition, almost every State has its own E-Governance projects. Some of the Government to Citizen E-Governance projects like Bhoomi in Karnataka, Akshaya in Kerala, e-Seva in Andhra Pradesh, Gyandoot in M.P. have become global benchmarks. Prof. Subhash Bhatnagar, eGovernment Advisor, World Bank, Washington DC in a paper 'Indian National eGovernment Plan Focus on Service Delivery' says that transactions at e-Seva CSCs have increased from 289087 in year 2001 to 16480500 in year 2004 while the revenue collection increased from 33.43 crore in year 2001 to 5466.86 crore in year 2004.

4.13 Telecommunication Revolution

The Telecom Regulatory Authority of India (TRAI) puts the total telephone subscriber base in India at 153.42 million at the end of the quarter ending June 2006. The mobile subscriber base is growing at a scorching pace in country. India is now the 5th country in the world to have crossed the 100 million mark in subscriber base and has in the last two months become the fastest growing mobile market in the world. The number of PCO's in the country increased to 4.5 million registering a growth of 7.22% during the quarter. (http://www.iamai.in/mobile.pdf)

It indicates that the mobile industry is picking up steam and is gearing up to meet the government target of 250 million telephone connections by the year 2007. TRAI as well several state governments, have developed strategies for accelerating the growth of the Internet and broadband connectivity in rural India. In all, 670,000 km of fibre has been deployed across the country. Bharat Sanchar Nigam Limited (BSNL) has laid fibre cables capable of reaching nearly 70 per cent of our villages.

4.14 FDI Support

The Government has been viewing with growing concern the increasing divide between the tele density in rural and urban areas. As a result of this growing digital divide, Rural India has so far remained almost entirely isolated from the telecom revolution that is sweeping the rest of the country. Thus improved rural connectivity is one of the highest priority items for our Government. The Government recognized that Foreign Direct Investment in telecom would bring a rich flow of new technology and business methods and thus enhanced the

FDI Limit in telecom from 49% to 74%. (Maran, 2006)

5. Non-State efforts for bridging digital divide

Digital divide is a prime concern for the non-state actors too. On one end, it is the social responsibility for them while on the other end, it also makes a business sense as it also generates large business opportunity for these players. Government has also facilitated these organizations and academic institutions for bridging the digital divide. Some of these efforts are summarised below:

5.1 Media Lab Asia (MLA), based in Mumbai, is setting up a wireless, 802.11 standard-compliant network to take Internet and voice connectivity to India's rural masses. Set up by the Massachusetts Institute of Technology (MIT)'s Media Laboratory in Cambridge, Massachusetts, in tandem with the Indian government, MLA is focused on developing and deploying technology solutions appropriate to bridging the digital divide in developing economies. Media Lab Asia has also set up a mobile Internet kiosk mounted on a bicycle; the onboard computer is equipped with an omni directional antenna for Internet service and is powered by a specially designed all-day battery. Ten such carts, known as "info-thelas", provide support to the villages around the IIT campus.

5.2 The **Telecommunications and Computer Networks (TeNeT) Group** in the Chennai-based Indian Institute of Technology, Madras, has used its in-house developed corDECT Wireless Local Loop (WLL) technology to provide Internet and voice connectivity to numerous community kiosks that offer these services to over 700,000 people in rural India.

5.3 Professors of **Indian Institute of Science**, Bangalore and engineers at the Bangalore-based **Encore Software** have designed a handheld Simputer, which will provide Internet and email access in local languages with touch-screen functions and micro-banking applications. Future versions even promise speech recognition and text-to-speech software for illiterate users. They targeted its price point to $200 price point for those who can not afford expensive PCs.

5.4 All sorts of development, requires effective collaboration of private players. In India, **National Association of Software Companies** (NASSCOM) has played a pivotal role in narrowing the digital divide in India and enabling its citizens to enjoy the benefits of IT. NASSCOM is achieving its objectives by actively partnering with the Government of India and State Governments in formulating IT policies and legislation.

5.5 The corporate sector too is discovering that bridging this digital divide could translate into new market opportunities. For example, **HP Labs India**, which was set up in Bangalore earlier this year by Palo Alto, California, Hewlett-Packard Co., is developing products appropriate for India's rural markets. (Ribeiro, 2002)

5.6 Global Software Giant, **Microsoft** has also played a key role in bridging the digital divide in India by partnering with central governments and various State governments for various academic and other development projects. It also plans to setup IT kiosks for citizens' convenience.

5.7 E-Chaupal of Indian MNC ITC is an excellent example of citizen service centre, which provides updated and timely information about agriculture commodities, weather and other relevant information in addition to solving the queries of farmers and fishermen of many Indian States, thereby assisting them to live a dignified and quality life. These centres also make the poor farmers free from shackles of middlemen.

5.8 In Pondicherry, the **MS Swaminathan Research Foundation** (MSRRF) has set up rural information centres for local communication and Internet access using solar and electric power and wired and wireless communications. Mission 2007 is a nation-wide initiative launched by MSRRF in New Delhi in July 2004 which now has more than 240 member organizations. It has an aim to facilitate setting up of knowledge centres in each of India's 600,000 villages by the year 2007, the 60th anniversary of country's independence. The mission's objective is to facilitate and accelerate, through multi-stakeholder collaborations, the provision of knowledge centres in each village. Each of this centres would be a centre for knowledge based livelihoods and income generation opportunities for poor women and men, farming communities and all disadvantaged people.

Shri. P Chidambaram, the Union Finance Minister also supported this national initiative in his budget speech in Feb 2005 by joining the alliance and routing its support by providing Rs. 100 crore out of the Rural

Infrastructure Development Fund (RIDF) to the National Bank for Agriculture and Rural Development (NABARD) for Mission 2007. Honorable President of India, Dr A P J Abdul Kalam, Union IT Minister - Shri Dayanidhi Maran, the Union Minister for Panchayati Raj - Shri Mani Shankar Aiyer and the Minister of State for Planning - Dr M V Rajasekharan, the Chief Ministers of Delhi-Smt. Sheela Dixit and Chief Ministers of Rajasthan – Smt. Vasundhara Raje Sindhia and many other leading ministers, politicians also endorse the objectives of Mission 2007.
5.9 In terms of access, in 1999 the **IIT (Chennai)** created a high speed, low cost Internet access system, which would do away with the need for modems and copper wires, thus enabling cheap access for developing countries. (Ghosh & Kamath, 2002)

6. Critical Evaluation: It is clear from the facts given above that a large number of initiatives have been undertaken both at the government as well as the non-State actors' level. Many of these efforts have delivered desired results both quantitatively and qualitatively. Thousands of citizen service centres and cyber cafes have fostered the growth of internet by allowing access to those who can't afford it at home or workplace.

According to Bhatnagar (2005), a large number of pilot projects have been initiated in India to bridge the digital divide by NGOs, Government, cooperatives, private sector, and individual entrepreneurs. Due to these about 10,000 villages have telecenters or computers being used for processing transactions. Number of experiments is large but only few have scaled up. Majority of these projects attract few users as services are not valued. A substantial number of projects were unviable to begin with or did not sustain after initial success. He stated that the rural population is willing to pay for true value addition but the need is to:

- find organizations with financial resources, leadership and strong project management
- discover services that are valued; and
- develop synergies and partnerships

In last decade, internet penetration has increased radically from 0.1 % to around 4%. The Internet subscribers' base increased from 6.94 million at the end of March 2006 to 7.71 million during the quarter ending June 2006 thus registering a growth of 11.10%. The number of Broadband subscribers (with a download speed of 256 Kbps or more) increased from 1.348 millions at the end of March 2006 to 1.56 millions during the quarter ending June, 2006 registering a growth of 15.72% during the quarter (www.trai.gov.in). While the growth looks pretty good, however, it is much lower than the penetration level in Asia (10.2%). Leaving the developed countries aside, even many developing countries have higher internet penetration than India. Much small countries like Pakistan (7.2%), Maldives (6.3%) and Azerbaizan (5.5%) boast of higher internet penetration (www.internet worldstats.com). This calls for a different route of growth and ICT strategy. There is another crucial aspect / area that must be addressed to ensure the success of our rural connectivity initiative. This deals with the development of locally relevant content and applications in regional languages. This alone will address the issue of digital divide in a meaningful sense. (Maran, 2006)

Economic intelligence Unit, a business information arm of The Economist Group provides annual e-readiness ranking of the world's largest economies, using a model developed together with the IBM Institute for Business Value. A country's "e-readiness" is a measure of its e-business environment, a collection of factors that indicate how amenable a market is to Internet-based opportunities. India stands at poor 53rd position among 65 countries. Many small countries of Asia and other continents are ahead of India.

Conclusion
In the words of former UN Secretary General Kofi Annan (2000) "People lack many things: jobs, shelter, food, health care and drinking water. Today, being cut off from basic telecommunications services is a hardship almost as acute as these other deprivations, and may indeed reduce the chances of finding remedies to them." Governments across the globe have understood the importance of ICT in socio-economic development and bridging the digital divide, and India is no exception.

While the growth of internet and telecommunications in developing world, including India is much higher than their developed counterpart; need of the hour is to further accelerate this growth and later to sustain the momentum. This will require proactive and pragmatic efforts by the government. More rigorous efforts should be made to strengthen the public-private partnership model for this noble cause too.

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