

117. Turning Digital Divide into Digital Opportunity-A Critical Analysis

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Introduction

India is the second most populous nation in the Asian region behind China. The country has achieved impressive progress in the field of science and technology and is emerging as one of the strongest economies in the developing world. Information and communication technologies have brought significant changes in development of the Indian society.

The digital divide is defined as the gap between those individuals and communities that have, and do not have, access to the information technologies that are transforming our lives.

Information technology is transforming various aspects of our life all around the world. No other technology is as profound as information technology (IT) in human history has had a great influence on the economy and lives of people around the globe. In India the benefits of IT are beginning to be seen and the impact of these benefits are creating great change. But a large section of population, mostly in developing and under-developed world, is not getting the benefits. This segment is characterized as people on the other side of the digital divide. It is not literacy, but IT-literacy that divides society into digital haves and have-nots. The unequal access to information and communication technologies has led to a massive divide digitally.

The paper discusses initiatives made in India towards digital access to information and the role of several programs in bridging the digital divide.

Today in India, except a few elite Indian Institutes of Technology and some other public and private engineering and management universities, most higher-education facilities do not have functioning computers, except for maybe a few in their libraries. While college officials have computers in their offices, many don't know how to use them; they have their assistants check and print out emails for them. Although most students are computer savvy thanks to numerous internet kiosks in big cities, and even in small towns, many colleges don't use computers and technology as teaching or research aids.

Although India has been one of the emerging super powers in IT, the benefits have been remarkably slow, particularly in rural and remote areas. Besides socio-economic factors, geographic, educational and attitudinal factors have been some of the challenges for the government when introducing IT-oriented programs.

The World Wide Web or the Internet has conked out all boundaries and has tried to integrate itself into one large depository of information, and a system for universal message exchange. Accessibility to Internet, with an email address has become the minimum basic certificate for an IT-literate. Having an email address helps one to get universally connected to all IT-literates, but it is the accessibility to Internet (and the benefits that come along with it) that converts the IT-literate group into the community of digital haves.

The paper highlights the hurdles and barriers to digitization and the need for strong determination, good policy-making and political support in bridging the digital divide in the country.

Scope of the Paper

The scope of this paper is to critically evaluate the efforts made in India in bridging the so called digital-divide. The scope of this paper is to highlight the reflections rather than to sharply draw any conclusions.

The fast developments that have taken place due to technological changes have also propelled a great divide of the information haves and have-nots in the country. The unequal access to information has posed challenges to the government to take appropriate steps to bridge the gap. Some of the efforts made by the government and the non-governmental organizations to bridge the digital divide in the country.

The discussion is based on information collected from various reports, documentary sources, facts and figures and e-resources available to assess the efforts made towards bridging the gap between the “haves” and “have-nots” in remote and rural areas. The discussion is based considering the parameters:

- (a) The growth and development of the information society.
- (b) The Initiatives, opportunities and prospects made towards bridging the digital divide.
- (c) Barriers to bridging the digital divide.

Growth and Development of the Information Society

Information and communication technology has given rise to many benefits in our society. Tools like television, radio and the much talked about Internet have always given direction to change. The application of IT in various fields and Internet technology has been able to influence larger sections of society since its development.

Technological change is the major contributor to the growth and development of the information society; e-learning, e-libraries, e-health, e-governance, etc. have become pillars of the information society. Raising these concerns, a world summit was organised by the United Nations in 2003 in Geneva, under its General Secretary, Kofi Annan. The goal of the summit was to develop a common vision and understanding of the information society and to draw up a strategic plan of action for concerted development towards realizing this vision. Access to information in society is not uniform and globally there has always been a gap between those people and communities who can make effective use of IT and those who cannot, leading to a kind of digital divide.

The government of India has declared IT as one of the thrust areas for the country's development and has recognized it as an “essential service. In India the use of IT and computers began way back in 1978. In 1985 the government decided to increase the pace of information technology at the district level.

The National Information Centre (NIC), a central government organization, that was chosen to implement a national programme called “DISNIC,” Information System of NIC, to computerise all district offices. Commissioning nearly 500 computer centres to a country-wide network, and connecting these computers, was a major breakthrough in this field that led to remarkable social changes. Earlier, people were reluctant to this change thinking that it would take away people's jobs. But today a remarkable change in mindset is apparent. Many state governments like Andhra Pradesh in Hyderabad, Maharashtra in Pune, Delhi and Noida have Cyber Parks, Karnataka in Bangalore, etc. have developed cyber-cities.

Challenges and Barriers to Bridging the Digital Divide

Although the country has increased its literacy rate to an encouraging 65.38 percent according to the 2001 census, much more efforts are required. The government has made steps to improve the lives of common people through several projects. But we need to look closely at Indian society.

The nature of Indian Society

India is a developing nation which is geographically vast and varied. India is a multicultural, multi-language and multi-religion country with complex socio-economic conditions. The growing population, insufficient funds, and delays in implementation of government policies and programs have been some of the challenges that have led to unequal development in the society.

Due to these characteristics it has its own compelling challenges. For a country with such large population and scarce resources, computer technology comes as a great tool of social transformation. It has already revolutionised the field of communication and in convergence with mobile and internet technology is changing the way Indians communicate.

Facilities like supercomputers are quite at disposal of few urban elite intellectuals like scientists, engineers and policy makers and makes indirect impact on the population in general. While some people are rich and have many resources, others do not.

Few years ago, a low-cost handheld dubbed the Simputer was touted as a way to give villagers in poorer countries access to computing power. That dream remains elusive. Very few Indian villagers have even seen one, and the government agencies and nonprofits that were target buyers have barely bitten.

The educational system of India also has been slow to achieve the set target framed by various commissions and committees and schemes launched from time to time.

Indian society in general has slowly awakened to this computer revolution and technological advances are also being made taking into consideration the requirement of different segments of the Indian society.

A fundamental requirement for reducing the digital divide in countries is to give priority to the development of their communication infrastructure and provide universal and affordable access to information to individuals in all geographical areas of the country. There are a number of barriers to bridging the digital divide. Although underserved communities in India are gaining access to computers and the Internet their benefits are limited because of the following factors.

Infrastructural barriers

Despite the incredible growth of the Internet since the early 1990's, India still lacks a robust telecommunication infrastructure with sufficient reliable bandwidth for Internet connection. Due to high costs the necessary upgrading of hardware and software is cumbersome; hence, despite the rapid spread of the Internet the gap is growing wider as the technological standard grows even higher. Faster networks, higher level machines, more complex software and more capable professionals are required, but in many nations including India the funding is not available to support these developments.

Libraries and information centres, with their commitment to freedom of access to information and promotion of life-long learning in India, are yet to have a robust infrastructure.

Literacy and skill barriers

Education and information literacy will play an important role in keeping society from fragmenting into information haves and have-nots. In the perspective of the digital divide, IT literacy is very important to allow access to digital information. In a country like India where roughly 50 percent of people do not have reading and writing skills for functioning in everyday life, IT literacy is out of the question. Generally, online content and information have been designed for an audience that reads at an average or advanced literacy level and those who have discretionary money to spend.

Education in information literacy will play an important role in keeping the society from fragmenting into a population of information haves and have-nots. The lack of skill in using computer and communication technology also prevents people from accessing digital information.

Economic barriers

Poor access to computer and communication technology also causes a digital divide. In India the ability to purchase or rent the tool for access to digital information is very less among the masses.

Public libraries which can provide access to the Internet do not have computers and Internet access. Although cyber-cafes have been increasing at every nick and corner, poor people cannot afford to have access due to high costs.

The lower income group does not have money at their discretion to spend on cyber-cafes or to get Internet connectivity on their own to access digital information.

Content barriers

The Internet allows ideas and information to be shared freely from citizen to citizen globally. In many ways the strength of the Internet is a function of the number of people and organizations creating quality content. Since no entity controls the Internet, anyone with Internet access has the potential to contribute information. Therefore, to solve the digital divide, steps should be taken by the government to ensure that all citizens are able to receive diverse content relevant to their lives as well as to produce their own content for their communities and for the Internet at large.

Language barriers

India is a country having a multicultural and multilingual population. India is divided into states on the basis of language. Even though the Indian government works officially in English and Hindi, the language of administration differs from state to state. The Eighth Schedule to the Indian Constitution contains a list of 22 scheduled languages.

Due to British rule, English is understood in all the states and is therefore works as a common thread of communication between all the states. Hence when computer was introduced in India, English became the language of communication with computer as well. But general public's inability to understand English became the biggest block in reaching out to masses.

When we look at the statistics of Internet pages, 84% are in Latin based scripts (i.e., English, French and other European languages), 13% in CJK scripts (Chinese, Japanese, and Korean based scripts), and all other languages of

the world combine to make up for the remaining 3%.

There is no precise statistics available for Internet pages in Indian languages, and it is estimated to be at most around 0.3%! India is a multilingual country having 18 recognized languages written in 12 different scripts including Arabic and Latin (English).

The remaining ten scripts are Devnagari, Bangala, Gurumukhi, Gujarati, Oriya, Tamil, Telugu, Kannada, Manipuri and Malayalam. These have evolved from the ancient Brahmi script and they are together referred as Indic scripts. If we include the People of Indian Origin (PIOs) staying in other countries, it is estimated that around 22% of the world population speak languages that are written in Indic scripts. Then why there is only 0.3% Internet pages in Indian languages?

Unicode

The Indian Government had realised in 1980s itself the need to make computer accessible in all Indian languages. It focused on two key issues: script encoding (the way an Indian script should be stored in computer memory or disks) and keyboard standard for all Indian scripts. For script encoding, it proposed ISCII standard (for

8 bit encoding), and in 1998, UNICODE standard (for 16 bit encoding). Unicode is becoming far more attractive as this scheme treats all scripts of the world uniformly, and the most of the Internet browsers (since the year 2000 like Internet Explorer, Mozilla, etc.) are giving an in-built facility to view any Unicode encoded Internet page written in any script, or any mixture of scripts. Furthermore, the most famous and powerful search engines like Google has started accepting search words and phrases in Indian scripts, and its search coverage encompasses all those sites whose pages are encoded in Unicode.

Yet, there does not seem any accelerated growth in Internet pages written in Indian languages?

To develop a site in Indian languages you need mechanisms to input Indic scripts. The Department of IT

(formerly the Department of Electronics), the Government of India, standardized INSCRIPT keyboard layout for all the ten Indic language scripts as early as 1991. INSCRIPT keyboard standard is a bilingual keyboard, i.e., English with one of the Indic scripts. In contrast, most of the countries in the world are monolingual, and hence a keyboard with a single script is sufficient for their use.

At present, to input any Indic script, we have two mechanisms: (a) use a bilingual keyboard, or (b) display the "Indic keyboard layout on monitor," and choose different letters through the mouse. The latter scheme is usually not used in those applications where user interactivity is very high (e.g., word processing). The bilingual keyboard comes in two styles: (a) Key tops are engraved with Latin script and one Indian script, or (b) the key tops of standard Latin keyboard are pasted with a paper/plastic film which has Latin and one Indic script printed over it. Usually, it is the latter case of usage, as the market of bilingual keyboard has not picked up yet. This latter scheme has a strong limitation, as after sometime either the paper/plastic films on the key tops get torn, or get dirty. This makes the keyboard illegible and unusable. Further, the people who are not familiar with English do not feel at home with either of these two solutions. And this is the main cause of digital divide!

Further, this bilingual keyboard does not permit to mix two or more Indic scripts, e.g., Hindi & Bangala, or Hindi, Tamil and Kannada, etc.

We feel that there should be only one keyboard (call it Brahmi) that can be used for any of the twelve Indian scripts (including Latin and Arabic) simultaneously. The Brahmi keyboard will have key tops with LCD display, and the letters are displayed, not engraved. In addition, there should be a "script selection knob" to switch the keyboard from one script to another at any time, irrespective of its state. With Brahmi keyboard, a user can type any mix of the 12 Indian scripts in his text, and this single keyboard can be used throughout India!

To develop Brahmi keyboard none of the research institutes or CSIR labs would be interested, as there is no research content in it. Neither a venture fund will be interested in putting money as the estimated cost of Brahmi keyboard would be far higher than Rs. 300, the present cost of an English keyboard. The result is the perpetuation of digital divide! But is there any way to get out of this trap?

CDAC developed a GIST technology which has to its credit several innovative products and cutting edge technology which have revolutionized computing and made GIST synonymous with Indian Language Computing. Its areas of Research are impressive and cover the full gamut of computing: Natural Language Processing tools

(such as spell and grammar checkers, natural query), Search plug-in's, Semantic Web, Video Technologies, fonts technology, expert writing systems, image processing (Optical Character and Handwritten character Recognition), Speech Processing, Embedded and Mobile Computing to name only a few.

Today GIST technologies forms an integral part of mission critical activities of various organizations. Mindful of the social function of computing the GIST technologies also powers the National initiatives especially meant for

masses in the areas of e-Governance, education, agriculture, health, banking and communication and so on.

Google's transliteration effort

The latest to contribute to the development of software offering uniform platform to Indian languages is the software giant Google. Transliteration is the method to enable users to enter text in one of the supported languages using a roman keyboard. Users can type a word the way it sounds using Latin characters and transliteration script will convert the word to its native script. Till recently this service was offered online only—means you need an internet connection for transliteration. Now Google has launched the new transliteration software—"Google Transliteration IME" which enables offline transliteration also.

This is available today for 14 different Indian languages—Arabic, Bengali, Farsi (Persian), Greek, Gujarati, Hindi, Kannada, Malayalam, Marathi, Nepali, Punjabi, Tamil, Telugu and Urdu.

Conclusion

The unequal access to information and communication technologies has led to the digital divide not only in developing countries but globally as well. It goes against the well known adage—that the world is a global village as proposed by Marshall Mc Luhan. Although India has made encouraging efforts to bridge the gap by initiating a number of projects and programs for rural and remote areas, much more needs to be done to bring the people into the information society and make them active participants in the process of development. All that is required is strong determination among people, good policy-makers and political support to bridge the digital divide.

Libraries and information centres play an important role in providing information to all in order to reduce the gap between those who have the facilities to access digital information and those who do not.

Although peer-reviewed journals have been available on the Internet for many years, the digital divide has continued to pose as a challenge for the developing world. The digital divide is keeping out the developing world from very useful research information. This Bridging would give researchers free access to high quality research articles. This drastically improves the quality of research input in developing nations. The country needs to improve the infrastructure of public libraries and link them with community information centres. International support can help developing countries to benefit from technological advancements and enhance their productive capacity.

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