

Bridging digital divide in India: Way forward & challenges

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Abstract

Present era is the era of globalization due to which the distances between the people has been reduced by turning the whole world into the global village. In the present globalised world technology is one the major force and most potent instrument of social change and social progress. Technology plays an important role in producing new ideas and removing barriers between the people. In the recent decade, the notion of 'digital divide' has been comprehensively and widely researched and has attracted large spectrum of public speculation for its economic, social and political consequences. Studies have revealed that the gap existing between those who have access to ICTs and those who do not have access creates exclusion, threatening social integration and hamper economic growth. This article discusses initiatives taken by government of India towards the access to digital information and the critical role played by numerous nationwide programs in bridging the digital divide. The article also focuses on some of the key impediments and barriers to digitization and the need for strong determination, good policy-making and political support in bridging the digital divide in the country.

Keywords: digital divide, access, internet, ICTs, infrastructure

Introduction

Around 40% of the world population has an internet connection today. In 1995, it was less than 1%. The number of internet users has increased tenfold from 1999 to 2013. The first billion was reached in 2005, the second billion in 2010, The third billion in 2014, but large proportion of the world population especially in the third world developing countries lack the basic access to internet which has created the digital divide. Digital divide has created a situation of Haves and Have nots. Those who have access to internet and digital sources are considered far more superior than those who don't have the access to the digital sources. Indian is one of the countries where digital divide is very evident. Despite being ranked third in the world internet users after U.S.A and China, India still is suffering from the problem of Digital Divide. Of the total population of 1 billion only 243,198,922 have access to internet which is about 19.19% and 8.33% of world population. The term Digital Divide encompasses inadequate funding, a lack of necessary computer and Internet skills, and a lack of English-language proficiency that hinder expansion and use of digital information resources. Technology is a major force for change. It is a dynamic subject, continuously producing new ideas and development. The economic necessity for a working population skilled and confident in their use of information and communication technologies (ICT) has been widely accepted. Equally, technology has become a key factor in society as a whole, with an ever-increasing use of online communication to undertake daily tasks, such as checking train timetables, shopping for food, completing tax returns and taxing your car. It has occupied each and every part of our daily life.

In a society where knowledge-intensive activities are an increasingly important component of the economy, the distribution of knowledge across the population is increasingly linked to stratification. The mass diffusion of the

Internet across the population has led many to speculate about the potential effects of the new medium on society at large. Enthusiast have heralded the potential benefits of the technology suggesting that it will reduce inequality by lowering the barriers to information allowing people of all backgrounds to improve their human capital, expand their social networks, search for and find jobs, have better access to health information and otherwise improve their opportunities and enhance their life chances. In contrast, others caution that the differential spread of the Internet across the population will lead to increasing inequalities improving the prospects of those who are already in privileged positions while denying opportunities for advancement to the underprivileged.

Broadly there are four digital divides which are emerging in this new IT world. These four digital divide are inter related with each other. The first is internal, between the digitally empowered rich and the poor. This gap exists in both the North as well as the South, although the baselines differ. The second linguistic cultural gap is largely between English and other languages, or more generally, between Anglo-Saxon culture and other world cultures. The third is the gap exacerbated by disparities in access to information technology between rich and poor nations. Finally, there is the emergent intra national phenomenon of the 'digerati', an affluent elite characterized by skills appropriate to information based industries and technologies, by growing affluence and influence unrelated to the traditional sources of elite status, and by obsessive focus, especially among young people, on cutting edge technologies, disregard for convention and authority, and indifference to the values of traditional hierarchies. There are many relevant features, which are crucial in shaping the access to ICT. The most determinant features are income, education, age, and an urban and rural location. Greater access is most associated with greater income and education. It is also 177 positively

associated with urban residence. Even today the access to internet is mainly an urban phenomenon, which needs major improvisation to make it more useful to the developing countries like India where over half of its population still lives in villages, predominantly characterized by poverty and illiteracy. There is a fear that, internet is widening the existing inequalities in India.

Methodology and Scope of the Paper

Keeping in view of the availability of the resources and feasibility of the present research paper, the author conducted his research studies on the basis of secondary sources of data. Secondary data has been collected from various books, Journals, research articles etc. The methodology of the study also includes the thoughts and writings of various authors in the stream of academic, research & corporate industry. Thus, the author utilized all resources available and carried out exhaustive studies for the present research paper.

The scope of this paper is to evaluate the efforts made India in bridging the digital divide. It discusses several ongoing projects and programmes initiated by the government, non-government organizations and private business houses, and describe some of the challenges faced by the country in overcoming these barriers. The scope of this paper is to highlight the reflections rather than to sharply draw any conclusions.

Discussion

The discussion is based on information collected from various documentary sources, reports, and e-resources available to highlight the efforts made by the country towards bridging the gap between the "haves" and "have-nots" in remote and rural areas of the country. The discussion is based on the following relevant parameters:

1. Growth and development of the information society.
2. Initiatives, opportunities and prospects made towards bridging the digital divide.
3. The role of community information centres, government programmes, libraries and institutions.
4. Challenges and barriers to bridging the digital divide.

Review of Related Literature

Many scholarly publications had been written by using framework "the haves" and "the have not". These literatures discussing the digital divide phenomenon as a global issue and produce global digital divide terminology. These papers explain the differences of ICT's access between the countries within the region, for example, Latin America (de Munster, 2005) [7], Southeast Asia (Tipton, 2001), Europe (Hubregtse, 2005; Lengsfeld, 2011) [11, 15], Asia Pacific (Samarajiva & Gamage, 2007) [19], Sub Saharan Africa (Mutula, 2008) [17]. Other papers explain digital divide between countries in the different regions, for example, Latin America and Europe (Bagchi, 2005) [3], the United States and Europe (Cullen, 2001) [6], or all countries in the world as sample study (Chinn & Fairlie, 2004) [5]. There are also scholars who describe digital divide focused on one country, for example, China (Harwit, 2004) [9], India (James, 2004; Mistry, 2005) [13, 16], Egypt (Warschauer, 2003) [32], Thailand (Srinuan & Bohlin, 2011) [23], Nigeria (Ani, Uchendu, and Atseye, 2007) [2], Malaysia (Zawawi, 2011) [33], Philippines (Alampai, 2006) [1]. Unit of analysis could be using a few schools in one city in

one country, for example, Valades & Duran (2007) [29] who describe the digital divide in the education at California, USA, or some households in the village, for example, Huh (2001) [12] when discussing digital divide in Hwengdun village, Kangwon-do Province, North Korea. Even though they are using dichotomous framework (have and have not), the way of thinking of Fink & Kenny (2003) [8] is slightly different from many scholars on the above. According to Fink & Kenny (2003) [8], the digital divide is not just a difference in ICTs access, but also the differences on ability, real usage, and its impact on individuals and social groups in their social life. It is similar to Valades and Richard (2007) [29] work, who using physical access, actual use, the availability of support for ICTs usage, and social consequences of ICTs usage as variable of their research. Zhao and Elesh (2007) [34] using more different framework. According to them, the digital divide does not have two categories, but four categories. This inequality is a reflection of social injustice in real life (offline world).

Stevenson (2009) [24] has stated that the digital divide is not merely technical and administrative issues, but also the class struggle issues. While Warschauer (2003) [32] starts from Egypt case, trying to expose weaknesses of "haves" and "have not" framework embraced in some literature. According to Warschauer (2003) [32], there is several misunderstanding within this framework, that is: first, the term implies dichotomous division between "haves" and "have not", "connected" versus "disconnected". In fact, connectivity is a continuum, not dichotomous. Second, digital divide reflects inequality phenomenon. In fact, inequality is not only life in the digital world, but also being within the real social life. It means that social, economic, political, and cultural factors will sharpen the meaning of internet in individual social life significantly. Third, the digital divide framework reflects determination of technology in logic of thinking. It implies that the presence and absence of technology will affect the behavior and social life. Some scholars had attempted to explain digital divide phenomenon without being imprisoned in dichotomous framework (have and have not). It is true that internet based ICTs led to digital divide phenomenon. However, ICTs can build digital equality where every person has access to communication technology and Internet-based information without looking at their social, economic, political, and cultural background. Technology can be bridging "haves" and "have not" group (Laouris and Laouris, 2008; Venkat, 2001; Tipton, 2001; Samarajiva & Gamage, 2007) [14, 30, 19]. Hilbert (2011) [10] also proposed new framework to understanding digital divide. According to him, digital divide is not about the dichotomy of "haves" and "have not" matters. It is about who (e.g., individuals, countries, etc.), which kind of characteristics (e.g., age, income, residence), connect how (limited access or effectively adopt), and to what (e.g., mobile phones, internet, digital TV, etc.).

Challenges & barriers to bridging digital divide

The basic requirement for reducing the digital divide is to give priority to the development of communication infrastructure and provide universal and affordable access to information to the people in all geographical divisions of the country. There are a number of barriers to bridging the digital divide. Although socially and economically deprived

communities in India are gaining access to information technology and the use of internet but their benefits are limited because of the following reasons.

Infrastructural Barriers

Despite the tremendous growth of the Information technology since the early 1990's, India still lacks a robust telecommunication infrastructure. The necessary infrastructure is not at par with that of other nations; hence despite the rapid spread of the Internet, the digital divide is becoming wider as the technological standards grow even higher. Due to the lack of proper funding India is not able to develop the desired infrastructure for training of professionals. India is yet to have robust and fully equipped Libraries and information centres, with their primary objective of promoting access to information and promotion of life-long learning. Public libraries which can provide access to the Internet do not have computers and Internet access. Although India has witnessed a tremendous and progressive growth of cyber-cafes but financially poor people cannot afford to have access due to their financial constraint.

Literacy and skill barriers

Education and information literacy plays a major part in keeping society from fragmenting into haves and have-nots. Literacy in the form of Information technology (IT) is very important to allow access to digital information. In the third world developing countries like India, Education in information literacy will play a significant role in keeping the society intact and prevent it from getting fragmented into a population of information haves and have-nots.

Economic barriers

Due to economic constraint or the lack of proper funding, the people of low socio-economic status do not have discretionary money to spend on private cyber-cafes or to have internet connectivity on their own to have the access digital information.

Content barriers

Access to information technology plays a key role in the dissemination of information freely between the people globally. Since no entity controls the Internet, any person with access internet has the potential to share his ideas and information. Therefore, if the problem of digital divide is to be solved, there is need of time bound and progressive effort on the part government to ensure that all citizens are able to receive the information content relevant to their lives as well as be able to produce their own ideas or content for their communities and for the Internet at large.

Language barriers

Language is a key vehicle which connects the people and is a source of sharing information between different groups. India is a multicultural and multilingual country. At present we are witnessing the information revolution in the world where large amount of information on the Internet is in English, which acts as a constraint or a barrier for the people of those countries where primary language of the people is not English.

Bridging the digital divide, Initiatives, Opportunities and Prospects

The basic requirement for reducing the digital divide for countries is to give priority to the development of their telecommunication and IT infrastructure in order to provide universal and affordable access to information to the people of every corner of the country. At the time of independence there were only 80,000 telephone subscribers mostly in government sector. However, after the formulation of the National Telecom Policy in 1994 and the subsequent improvements made in the policy in 1999 led to a significant and progressive growth in the telecom sector, with corporatisation of telecom services in 2000. The cellular mobile sector has also grown exponentially from 1.2 million to the base 1 billion users which is only one step behind china, as per data released recently by the country's telecom regulator. But experts see the milestone as the beginning of some dramatic action rather than as a climax. "A big chunk of these billion mobile subscribers will become smartphone users in the next couple of years that is the thrilling next wave. In India from here on, it will be about exploding growth in data usage and internet access through the mobile, which will get millions of Indians conducting business, getting social and participating in governance through their phones. India has a mere 125 million smartphone users currently, the world's third-largest base after China and the United States. However, the growth opportunity is huge. The country is slated to overtake the United States in 2016 and become the world's second-largest market for smartphones, exceeding 200 million smartphone users says research firm e-Marketer. China, in contrast, already has over 500 million smartphone users.

The IT infrastructure, particularly the penetration of information technology, has improved but a lot still needs to be done particularly in rural and remote areas. The rapid advancement in the IT industry and its impact on society has brought significant social changes. Earlier, people were reluctant to plunge into IT communication. Now all states have had a sudden change in their thinking and are pressing for use of ICTs which is vital decisions to boost their IT sector. The government of India has declared IT as an essential service and one of the thrust and core areas for the country's progressive growth and development. Several state governments have started investing in an IT infrastructure for e-governance projects.

Programmes Launched By Government of India For E-Governance

Despite significant **Teledensity of 81.82% (November 2015)**, there still exists a divide between rural and urban areas that needs to be bridged. One of the prime concerns of the governments in developed and developing worlds has always been to ensure the accessibility and availability of information and public services without much hassle. State governments in the country have been actively involved with several IT-oriented projects in an effort to bridge the digital divide, some of which are discussed as follows.

1. CARD Project: The Computer Aided Administration of Registration Department (CARD) project initiated by the government of Andhra Pradesh. This system was designed to smoothen the citizen - Government interface

by transforming services of property registration across the counters leveraging the benefits of IT with pre-defined service levels. The various features of the system are electronic preservation of documents and automation of back-office functions, Counter-based/web-based services on issue of Certified copies, Market Value assessment, Encumbrances, Transparent valuation of the properties. The project has a tremendous impact and as such has led to the increased the productivity of employees and has led to an increase in the number of registrations and thus increased revenue to the department. Under this project, land registration offices throughout Andhra Pradesh are now provided with computerized counters. Citizens can now complete registration formalities without much hassle.

2. **Sourkaryan and E-Seva:** yet another project of the government of Andhra Pradesh which has been quite popular among the people is Sourkaryan. Sourkaryan, which is now operational in the port city of Visakhapatnam, provides the facility for a citizen to pay property taxes online and also view details of plans and projects of the government and local bodies. Similarly the E-Seva Kendras in the Hyderabad state city is an innovative experiment towards eliminating personal contact between citizen and the bureaucracy. Here a citizen can pay sales taxes, insurance premiums, property taxes, land taxes, etc. Additionally, the government of Andhra Pradesh has formulated a prolonged strategy to further the prospect of e-governance in the state.
3. **MeeSeva** (translates as 'At your service') is a good governance initiative that incorporates the vision of National e-Gov Plan "Public Services Closer to Home" and facilitates single entry portal for entire range of G2C (Government to Citizens) and G2B (Government to Business) services. MeeSeva was launched in Chittoor district in Andhra Pradesh, India on 04-11-2011 with offering 10 services to the citizens. Today, MeeSeva offers citizens a bouquet of 348 high volume services from across 34 departments through 7000+ MeeSeva kiosk centers across the states of Andhra Pradesh and Telangana. After the AP State re-organisation Act 2014, MeeSeva contains two different portals for the states of Andhra Pradesh and Telangana. The objective of MeeSeva is to provide smart, citizen centric, ethical, efficient and effective governance facilitated by technology. The initiative involves universal and non-discriminatory delivery of all government services to citizens & Businessmen of all strata and improved efficiency, transparency and accountability for the government. The initiative features transformed government-citizen interface at all levels of administration along with a shared governance model.
4. **The Bhoomi Project:** Bhoomi (meaning land) is the project of on-line delivery and management of land records in Karnataka. It provides transparency in land records management with better citizen services and takes discretion away from civil servants at operating levels. The Revenue Department in Karnataka, with the technical assistance from National Informatics Centre (NIC), Bangalore, has built and operationalised the BHOOMI system throughout the state. The BHOOMI has computerized 20 million records of land ownership of 6.7

million farmers in the state. The project has earned the goodwill of many people and also international funding agencies. This project has reduced the delays involved in interacting with the bureaucratic hierarchy of the state revenue department. Bhoomi centres are located all over the state. Any land record can be reviewed through a touch screen at these kiosks; the project can also be used as a data bank for various projects of public and private sector organizations. UNDP and the World Bank have lauded Bhoomi for bold vision and implementation. With the success of the Bhoomi project other states of India, viz. Tamil Nadu, Maharashtra and Madhya Pradesh have started evolving models based on Bhoomi in their respective states.

5. **The Gyandoot Project:** On January 1, 2000, Dhar district began the new millennium with a mass-based information revolution. Computers in 21 major centres in five Blocks of the district were connected through an Intranet network. These computers have been established in Gram Panchayats. They have been called Soochanalayas. From the Soochanalaya, user-charge based services are given to the masses and at the same time the information technology related developmental needs of government departments and Panchayats are met free of cost. This Intranet has been named Gyandoot. Gyandoot, which literally means "Knowledge Messenger," is the first ever project in India for a rural information network in the Dhar district of Madhya Pradesh which has the highest percentage of tribes and dense forest. Every village has a computer centre or "soochnalayas" at prominent market places or major roads. Soochanalaya caters to approximately 15 Gram Panchayats and about 25 to 30 villages. The benefits cover wide-ranging information needs of all villagers, not merely those belonging to co-operatives. Thus, the Gyandoot network benefits over half a million villagers living in 311 Gram Panchayats and over 600 villages. People can easily log in and complain or request information on crops, forest fields, water resources, etc. of the district. The government of Madhya Pradesh is attempting to make Gyandoot Project a great success by extending it to other districts. The state is in the process of starting 7,800 IT kiosks with the help of the private sector. To train common people to be computer literate, 7,500 "Jan Shiksha" public instruction centres have also been identified, and policy is being formulated to bring IT to the common people's need and benefit. It is expected that the Gyandoot Project will play an important role in bridging the digital divide between the urban and the rural people. The village people by virtue of their remoteness will no longer be technologically behind. The Project will be of great help to the farmers to get better crop yield by providing timely information to them.
6. **Friends Project:** The Fast, Reliable, Instant Efficient Network for Disbursement of Services (FRIENDS) is a single window 'no queue' integrated remittance centre, where the citizens have the opportunity to pay all taxes and other dues to the Government, under one roof at no extra cost. An ongoing project of KSITM (Kerala State IT Mission), FRIENDS is now operational in all 14 districts of Kerala. FRIENDS accept payments of the Kerala University, MG University, Calicut University, Local Bodies, Kerala State Electricity Board, Kerala Water

Authority, Revenue, Civil Supplies, Motor Vehicles, Electrical Inspectorate and BSNL. Railway reservations can also be made in the three centres at Wayanad, Pathanamthitta and Malappuram. The computerized counters work from 8.00 am to 7.00 pm, including all Sundays. The basic philosophy of FRIENDS is to treat citizens as valued customers. Similarly in Tamil Nadu state, a Chennai-based N-Logue Communications Pvt. Ltd. the Internet access provider to the rural areas plans to set up 40,000 Internet kiosks across the country in the next 12 to 15 months. The company will have 'Chiraag', as its brand name for all its Internet kiosks. offering low cost tele-solutions has worked wonders in Madurai districts by using the local loop technology and making available fibre optic lines running across the district, by helping private entrepreneurs run services including that of e-governance.

7. **Lokamitra/Smart Project:** For providing easy access to the general masses of Himachal Pradesh (HP), gov. initiated the Lokamitra project and facilities of e-governance to the door steps of the people. Government of H.P has so far set up "Sochnalaya Kendras" (information centres) in 25 Panchayat areas which are run by unemployed youth. The Web-enabled Government-Citizen Interface, named LokMitra is one such step of the Himachal Pradesh State Government in that direction, in order to make people aware of government policies and programmes, and also providing an interface to interact with various government functionaries and solicit their active and direct contribution in the process of governance. The National Informatics Centre, Himachal Pradesh State Unit, also identified as the E-Governance Wing by the State Government in its Information Technology Policy-2001, is designing & developing necessary software and implementing the project. The government of HP has also developed IT Vision 2010 in collaboration with NASSCOM (National Association of Software Companies) to convert the hill state into an IT destination and also make Simple-Moral-Accessible-Responsive and Transparent (SMART) Government. The project aims at better dissemination of government information at the remotest corner, resulting in better awareness among rural masses about various Govt. Schemes and bringing in transparency.

Role of libraries and information centres:

Libraries are vital for dissemination of information and play a central role to bridging the digital divide. Today the professional librarians are being better recognised as information disseminators or communicators rather than custodians of information. Although digitization is progressing at a slow pace in India but, several projects like the National Science Digital Library (NSDL), Vidya Vahini Project, and Digital Mobile Library have been the time bound interventions taken by the government to bridge the digital divide.

1. **National Science Digital Library (NSDL):** National Science Digital Library (NSDL) aims at providing comprehensive S&T information to students of science, engineering and technology in the country. Begun as a Tenth Five Year Plan Network Project of Council of Scientific and Industrial Research (CSIR), NSDL is the

only one of its kind that provides curriculum based content to address the information needs of the undergraduate students of science. The content creation and development for NSDL has gone through rigorous procedures to make available quality content for the students. A task force was constituted in April 2002 by a planning commission and the project was approved in 2004

2. **Vidya Vahini Project:** The Prime Minister, Atal Behari Vajpayee launched "Vidya Vahini", an ambitious school computerisation programme aimed at connecting 60,000 Government and aided schools through internet and intranet. A pilot project had already been undertaken in 140 schools in seven districts. The programme envisages selecting 20 Government and aided schools in each State in consultation with State Governments. In each school, a computer lab consisting of hardware worth Rs. 10 lakhs will be set up.
3. **Digital Mobile Library:** In order to bridge the digital divide in a larger way the government of India, in collaboration with the Centre for Advanced Computing (C-DAC) based in Pune, aims to bring about one million digital books to the doorsteps of common citizens. Digital Library of India, part of the online services of the Indian Institute of Science, Bangalore and partner in the Million Book Project, provides free access to many books in English and Indian languages. The scanning of Indian language books has created an opportunity for developing Indian language optical character recognition (OCR) software. The publications are mainly in PDF or QuickTime format. Because of copyright laws, the texts are all out of copyright and therefore not sources for current information, but rather useful for history and background. As of 2006 (November 10), DLI had scanned 84,895 titles. The poorest and underprivileged students will no longer be deprived of the latest reading material by virtue of their remoteness or affordability.
4. **Library Networks:** Library networks are playing an important role in bridging the information needs of the people. Realising this need, the planning commission in 1984 recommended that the government modernise library services and information in the seventh five-year plan by means of library networks. Consequently the biggest library network, the INFLIBNET (Information and Library Network), was initiated in 1991 by the university grants commission with headquarters located in Ahmedabad. The programme is directed towards modernisation of libraries and information centres and the establishment of a mechanism for information transfer and access to academicians and researchers in India. Several city networks, such as CALIBNET, the Kolkatta Library Network; DELNET, the developing library network, Delhi; Bombay Library Network (BONET); Madras Library Network MALIBNET; Pune Library Network (PUNET); and, Ahmedabad Library Network (all sponsored by NISSAT Department of Scientific and Industrial Research) are promoting resource sharing and disseminating information by creating centralised union catalogues of their holdings.
5. **Public Libraries:** Public libraries in India need to be equipped with the latest technologies and IT infrastructure. Ministry of Information Technology has

set several community information centres have to help people use e-mail and Internet for gaining access to information. Most of the states like West Bengal have encouraged the establishment of community library and information centres (CLICs) in rural areas. Around 1,500 CLICs will be set up in places where no public libraries were set up in India.

Role of academic and research institutions

Academic institutes, particularly the Indian Institutes of Technology (IIT), have been making continuing efforts for helping the people of rural areas to have access to the Internet. IIT Kanpur initiated a project and developed a battery-powered facility, the "Infothela" (Information Box), which includes spreading information about education, weather agriculture, and employment. To ensure active participation educated and unemployed, village youth have been empowered to operate the project. Another project has been started by IIT Karagpur to "bridge the communication gap between the sightless and the sighted." The project has enabled the blind to surf the Internet, read text in Indian languages and even take up normal office work. A software IIT Webel has been developed to translate Braille into plain English. Similarly the National Association of Blind, with the help of Microsoft, initiated two projects: a cyber-cafe for the blind in Mumbai and a Braille printing unit in Bangalore. These projects have made encouraging efforts to empower the blind people by bridging the digital divide. Technology for the benefit of the common man is also introducing telemedicine in a big way in India. The Indian Space Research Organisation (ISRO) started a pilot project in 2002 with a "technology demonstration" and has been established in nearly 100 hospitals, with twenty of these at super-speciality hospitals and 80 of them in remote districts and trust hospitals. The result of the use of this technology is extremely encouraging. It is noted that 15,000 patients have obtained consultation services from super-speciality hospitals without travelling to big cities. Lives have been saved in remote places through instructions obtained from experts with the help of this facility. During the recent tsunami disaster which struck the coast of India and the Islands of Andaman and Nicobar, the SATCOM-based telemedicine and GRAMSAT Islands Network provided by ISRO was pressed immediately into service.

Efforts made by private business houses

Some of the private businesses, like the Tata Council of Community Initiatives, are playing an important role in promoting adult education in the country. The council has extended several innovative computer-based literacy programs to improve India's adult education by preparing multimedia presentations. Similarly the Azim Premji Foundation has been involved with universalization of elementary education by creating effective and scaleable models to improve the quality of learning in school. Some of the corporate giants like "Hindustan Liver" have embarked upon a project called i-shakti, an IT-based rural information service to provide information to meet rural needs.

The project envisages setting up of 1,500 kiosks for delivering information services to over 10 million rural people across 7,500 villages in Andhra Pradesh. The Oglivy and Mather Company project "Param" is initiating rural

connectivity in the country. This electronic connectivity network has been conceived to reach the remotest corner where no land line or media-based communication is available. The motto of the project is to "connect the last mile first." The "Param" Computer interacts with the operator in the local language in both spoken and written form.

A well known corporate dairy giant, the "Amul India" based in Anand in the state of Gujrat, has developed a network of Dairy Information System kiosks (DISK). Currently 2,500 village-level kiosks have been connected and when the project is completed it will cover 70,000 villages milk societies. The kiosks offer milk account, market intelligence and telephony.

Suggestions and conclusions

- The unequal access to information and communication technologies has led to the digital divide not only in developing countries but also in developed countries as well. India has made number of efforts to bridge the gap by initiating a number of projects and programmes for rural and remote locations, a lot more needs to be done to bring the people into the information society. All that is required is strong determination among people, good policy-makers and political support to bridge the digital divide. Libraries and information centres have a special 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. The country needs to improve the infrastructure of public libraries and link them with community information centres.
- There is a need of the hour is to promote technologies which are best suited to the requirements of the rural India. For example to bridge the gap of digital divide in its real sense there is need to increase PC penetration. The reason is very simple; mobile cannot do everything a PC can. But, mobile are cheaper, more portable and their extended battery life is suited to regions where access to electricity is lacking or non-existent. The infrastructure needed to connect wireless devices to the Internet is easier and less expensive to build. There are also no learning curve, no literacy barrier and no technical-support challenges to overcome. There are no costly and burdensome applications to load, maintain and update. Thus, mobile is best suited for the rural people. Therefore, not only government but also private players should encourage mobile penetration in India.
- The main barrier in Indian rural society is the fact that peoples under estimate the significance of communication technologies as a result they behave very passively towards the ICTs. If these 'passive people' are to be made active participant of national progressive then the broader understanding of the 'ICTs for everyone has to be Promoted. There is need to develop innovative and time bound strategies to address the issues, the world's women face in their access to and use of ICTs. The information content used by them must be useful and purposeful so that women are to be able to make use of the Internet for income generation and education.
- Promotion of telecommunication infrastructure in the rural India is the most important condition for bridging the rural-urban digital divide and government can play a vital role in creating the IT infrastructure in the rural

India. A special expenditure should be marked for bridging the digital divide among the regions.

- In India, there is a need of solving linguistic issues arising as a result of the diverse sections of population speaking diverse languages. English language is used nowadays in every field of life. There is a need to promote cultural diversity and the avoidance of social exclusion among non-English speaking population of India.
- Due to lack of funds from governments, ICT projects have been on the decline due to budget constraints and global economic slowdown. This requires the greater need for resources and investment by the private sector. With the effective deployment of ICT in the core areas of education, healthcare, and connectivity for redressing the grievances of the people in the countryside, the digital divide can be narrowed as wireless and satellite links have made them economical and affordable.

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