Towards bridging the digital divide in India: Challenges and Opportunities from a national perspective.

Abdul Jaleel Tharayil[*]
Executive-Library
IBM Global Services India Pvt Ltd.,
Airport Road
Bangalore 560017, India
tabdul@in.ibm.com

Rajeev K R
Executive-Information services
Sasken Communication Technologies Limited
No.139/25,Ring Road, Domlur P.O.
Bangalore 560 071, India
krr@sasken.com

In a developing country like India, advances in ICTs have brought a lot of opportunities and perhaps a whole lot of challenges as well. One of the main challenges is the frightening gap between the information have-s and information have-nots -what we call the digital divide. The paper highlights the concept of digital divide in general and the Indian scenario in particular. Major challenges in the path towards digital opportunity such as poverty, illiteracy, political instability, and poor ICT infrastructure are highlighted. Key initiatives in bridging the digital divide in India are explored in detail. The more significant role of rural libraries in bridging the digital divide in India is proposed.

Digital divide: Some thoughts

Digital divide, arguably the most intriguing phrase of the present day seems to have its origin in the United States of America. Many considered Andy Grove one of the creators of digital divide network coined the term. Few others say the credit goes to Larry Irvin. According to Benton Foundation, former President Bill Clinton first used the term in the discussions of the National Information Infrastructure in 1993. Though there are controversies existing as to who coined the term, there is a wider acceptance on the increasing gap between information have-s and Information have-nots -what we call the digital divide. Recent report of UN appeared in New York times lamented the growing digital divide in developing countries. In reality half the people in developing countries have never even made a telephone call, leave alone browsing the web. No exception, the Indian subcontinent is struggling to stay alive with the growing digital divide, leaving the poor illiterates poorer and the rich babus richer. "The great Indian digital divide by Dipankar Das (2000)" mentioned India's latent capabilities in bridging the digital divide paradigm. Government at the centre is doing a good job indeed, taskforce on IT and software has been set up, IT policy has been formulated along with the announcement of telecom reforms in 1999 attracting greater participation from private sector, etc. In spite of these achievements, the country faces several challenges. There is a widespread undernourishment, the infant mortality rate has been deteriorating. Approximately 40% of the people live without electricity, safe drinking water and sanitary facilities. Gender inequality and increasing unemployment are other issues of concern. Only a mere 3.63% have access to

---

[*] For correspondence

telephone and even lesser ie well below 1% of the population have access to a PC. We need more sustainable efforts on employment generation that requires the economy to grow not less than 10-12% to create new jobs for the increasingly unemployed youth. Above all a grass-root level initiative and a collective effort in the attitude towards bringing change in the way we operate. What not - an exhaustive list of things to be done!

Digital Divide in India: state of the art.

India is a snake with its head in the 21st Century and it's tail in the 17th century" grab greater attention today. Loaded with 16% of the world's population, 30% people in India live below the poverty line (people (family of five members) who live with less than INR 50/day). This means that these people have no proper electricity, no proper drinking water supply, no proper sanitary facilities and well over 40% are illiterates. More than 65% live in the alienated rural area and 60% earn their livelihood from agriculture. Only a meagre 3.63% of the of the 1 billion have access to telephone and less than 1% of population have a PC and this constitute even the business houses as well. What more is required to present the dismal state of our country? True, that many who live below the poverty line can get away without knowing the real-time *Nasdaq* and *Dowjones* index, this is not the worry, providing access to timely information on agriculture, weather, social, health care, employment, fishing, etc which deeply affect the poor is what matters. We need to provide timely access to the right information at the right time at the right place to the right people. Obviously we need to connect the rural population and hence it is classified as the most challenging assignment of the nation today. The next few sections will delineate the major issues and problems of digital alienation in India, major successful attempts, and the major challenges ahead along with possible solutions. The role of rural libraries in bridging the digital divide in India is highlighted.

Barriers to digital opportunity in India

There are many factors challenging the movement of digital divide to digital opportunity. Considering the present scenario in perspective, an attempt has been made to analyse the more fundamental problems and issues involved in the path towards digital opportunity in India.

Lack of proper Information communication Technology Infrastructure

The telecom reforms took off with the establishment of Telecommunications Regulatory Authority of India (TRAI), along with privatisation of mobile and fixed line services in the year 1992 and 1994 respectively. By the end of 1999, the long distance call services were also open for private participation. Coming to network infrastructure, India does have a good network infrastructure in place, the railway reservation systems, the stock exchange transaction systems, NICNET connecting the centre and the state Government, etc. are highly reliable networks. In total, India spends about 28% for ICT only. In spite of these initiatives the Tele-density has reached only a meagre 3.63%. Only 1.1 million out of the 1 billion have access to a PC. With the introduction of Public Call Offices, access to telephone in the rural villages has improved enormously. But 40% of the villages are devoid of even a single telephone.

Lack of coordinated Government initiatives.

India has inherited a bureaucratic administrative system, which has convincingly proved its inefficiency to interact with 1 billion people. The famous "red-thread" reveals the incredibly slow, inefficient, highly complex and inaccessible system of operation. Therefore reforms shouldn't stop just by establishing a centre for e-governance, it should rather get started here. However there are challenges ahead, major ones are: bringing in a positive attitude towards moving to e-governance, educating the bureaucratic *babus* about the need for change and imparting training to use the technology effectively. Creating a viable coordination between the state and centre regardless of political reservations by eliminating the state monopoly is also essential. Massive campaign involving the rural people to bring awareness about the advantages of e-governance to the society is required

Political Instability

One of the major problems we face today in India is the mere absence of a stable and an effective Government at the centre. Recent report of World Bank (2002) on the "political stability index' has shown a scanty -0.05%". It is the case with the government "effectiveness index" also, which recorded at 0.17%". Further, India stood at 75th position in the "corruption perception index", where China is in 58th position. These calls for a corrupt-free politics and the dare need

of a stable Govt at the centre. These statistics also demand a change in the way we function today. We also need to encourage the learned and educated community into politics who can provide leadership and lead the country in these times of uprising.

Low literacy and education

Despite having goal set to increase the educational investment to 6% of the GDP, India spent only half of it, ie. 3.8% of its GNP on education, when the world average on education spending is 4.9%. India has 46% of its population aged 15 years and above as illiterates. On the contrary China spends only 2.6% of its GNP and has only 22% of its population aged 15 years and above as illiterates. Education and literacy rate in India varies hugely from one part of the country to the other. As per the 2001 census, the over all literacy rate in India stood at 65%. Kerala recorded one of the highest literacy rate in India, so is the case with many of the North-Eastern states. Let's take the case of Kerala. It is believed that social reformist-leftist government, the Christian missionaries and a number of demanding people have progressed the state to receive better educational facilities and therefore improve the literacy and education. Major efforts of social development in Kerala could be considered in the following points.

- Land reforms movement and Christian missionary efforts
- Authorisation of private managed schools by the Government
- Free mid-day meal in schools
- Participatory nature of communities who complain about problems and demand solutions.
- Free education to the tribal groups by the leftist Government
- Very active social reform organisations like people's science movement (KSSP).

These are some of the bullet points that helped Kerala grow up into the present educational realm. Perhaps, this would also help as model for other states to introduce similar efforts to bring them to the forefront of education and literacy.

Linguistic diversity

India has a large population with great linguistic diversity. Creating and maintaining locally relevant content for a country with over 400 languages is a challenge. At the same time, local language content is slowly making ICT more relevant and accessible to a broader cross-section of the population. For example, India's Center for Development of Advanced Computing has recently launched a scheme called iLEAP-ISP to create a free multilingual word processor to be made available to all Internet subscribers. Meanwhile, some states such as Tamil Nadu have launched their own initiatives to support the standardisation of local language software through interface programs that can be adapted to word processors, dictionaries, and commercial keyboards for use in schools, colleges, government offices and homes.

Economic factors

Simple lesson from Cable TV Industry would give us vivid picture of affordability leads to greater usage. A Cable TV connection in India cost as low as Rs 100-150 per month has grown from zero in the year 1992 to over 40 million today. It is the mere economics that brought such a huge success. Considering this, if the ICT access costs were brought down a vast majority would be able to connect to the ICT. Therefore we need to develop and encourage the R&D community to innovate better and affordable ICTs considering local requirements in perspective. A research & development- industry collaboration would certainly help, as it has been happening in the case of Simputer and the low cost access devices experiments at IIT-Madras (Tenet group), we need to encourage more of similar efforts.

From divide to Opportunity

Admitting we have a problem is obviously the first step in the right direction. India seems to have recognised and understood the problem in its core. Noted earlier, lack of proper ICT infrastructure, education and literacy are the daunting issues we are facing today. However we can't just stop by identifying the problem, we need to offer solutions to curtail these crucial issues and move towards the future. Naturally the question paused is how to bring technology to the masses? How can we get the 60% rural population hooked onto the network? How effectively can we convince the rural population about the critical aspects of not having access? Are there any examples of similar efforts being carried out in India or any other developing countries? Are there other viable alternatives available or any initiatives in place?

Major Initiatives

The rural India has started to realise that access to information is not a luxury, instead it helps them compete in the market place and survive in the digital age. For example, two years ago, fisher men in Kerala started carrying mobile phones in their tiny boat thinking that it will be useful during emergencies. Now they call up the coastline to verify which village provides a better deal for their fish-catch. Similarly, a Kisan in the Dhar district of Madhya Pradesh went to the Gyandoot cyber-Kiosk and sold his buffalo on-line at the cost of Rs.10. In brief, there are several projects attempting to provide the crucial information services to the village population in India. Some of the major projects have been explored.

The Village Knowledge Centre project -By Swaminathan Foundation

One of the early experiment in electronic knowledge delivery to the poor. The project connects ten villages near Pondicherry by a hybrid wired and wireless network - consisting of PCs, telephones, VHF duplex radio devices and email connectivity through dial-up telephone lines - that facilitates both voice and data transfer. The entire project draws its sustenance from the holistic philosophy of Swaminathan, which emphasises integrated pro-poor, pro-women, pro-nature orientation to development and community ownership of technological tools against personal or family ownership, and encourages collective action for spread of technology. The project draws attention by using Solar powered network power station. The local volunteers gather information and feed it into an Intranet and provide access through nodes in different villages. The project is supported by International Development Research Centre (IDRC), Canada and Canadian International Development Agency (CIDA), Canada with a Partial support by Ford foundation, Government of Pondichery.

Gyandoot
This project is an outcome of the agreement between Drishtee and the district administration of Dhar. This would perhaps be the most outstanding initiative by government to launch a e-governance paltform. Gyandoot is more of community-owned, technologically innovative and sustainable information-kiosk. The project covers 20 village information kiosks in five Blocks of the district. The entire network of 31 kiosks covers 311 *Panchayats* (village committees), over 600 villages, nearly 50% of the entire district. Users' fee is charged at the kiosks for the services provided. Local rural youth act as entrepreneurs, running these information kiosks along commercial lines. Thus it has become a commercially viable project with the potential to replicate to other parts of India.

The Simputer project
Scientists from IISc and the Encore software brought this idea into practice. This project grew out of the dare need for an affordable access device for the rural population in the country. The Simputer is a low cost portable alternative to PCs, by which the benefits of IT can reach the common man. It uses simple and natural user interfaces based on sight, touch and audio eliminating the need for IT literacy. The in built Smart Card feature enables the Simputer to be shared by a community. Approximate cost has been fixed to half that of the normal PC.

Taarahat
Is a project conceived by the Delhi based Development Alternatives group. The project provides a bunch of services like employment, mandi-market, e-mail, weather, matrimonial, etc. to the village community. The highly picturised interface makes it easier for a lay- man to use.

e-Choupal
Conceived by ITC in June 2000, e-Choupal has already become the largest initiative among all Internet-based interventions in rural India. 'e-Choupal' services today reach out to more than half a million farmers growing a range of crops - soyabean, coffee, wheat, rice, pulses-, - in some 4,500 villages through 770 kiosks across four states (Madhya Pradesh, Karnataka, Andhra Pradesh and Uttar Pradesh). Sanchalaks - as they call it can access information in their local language on weather & market prices, disseminate knowledge on scientific farm practices & risk management, facilitate the sale of farm inputs (now with embedded knowledge) and purchase farm produce from the farmers' doorsteps. The company plans to extend the services other 14 states also, the net business of over 1billion has been transacted so far.

Though the projects discussed are in their early stage of development they do reveal some of the primitive facts about, how and what make these projects tick. Take the case of Gyandoot and e-Choupal both the projects have a commercially viable mechanism to generate finance and therefore they appear to be successful. On the

other hand the village knowledge centre project of Swaminathan Foundation has survived one of most important challenge of electric supply by establishing a self-reliant solar powered network connectivity. Nevertheless, it is yet to build a commercially viable alternative for its sustenance. Further more, the Warana wired village project in Maharatshra, is yet to grow beyond a well connected delivery mechanism for the sugarcane bundles. All these suggest that sufficient need analysis and social research has to go into these projects before they are launched. Initiatives should be responsive to its surroundings and limitations, especially to the local economic set up. For instance, the Simputer initiative has several local language interfaces and it is quite affordable. Similarly, the TeNet Group in India brought more adaptable and affordable access technology.

The role of rural libraries in bridging digital divide in India

When we talk about digital divide it is not the 0's and 1's that we have missed access to, instead it is the information- the nucleus of all developmental activities. Libraries that have been in existence for the primary cause of acquiring, organising and disseminating information seem to have thrown out of the very network of bridging the digital divide paradigm especially when they are to be playing one of the most significant role.

Rural Libraries – a forgotten identity

Rural Libraries are part of the public library system in the country. We have state central libraries, district central libraries and then the Taluk and Panchayat Libraries (referred to as rural libraries here). Like many other public-sector undertakings and perhaps even more, the rural libraries are suffering from the financial crunch. Therefore most of the rural libraries do not have a proper person to handle the library effectively, let alone having a professional librarian. And hence these libraries function more like reading rooms. Although IT was introduced in rural development in the year 1986, rural libraries largely remained as a forgotten asset in the dissemination of information to the rural population. Secondly the IT Policy formulated in the year 2000 shown little interest in the development of rural libraries. This may be because the policy makers were not very keen to explore the tremendous

potential of rural libraries in bridging the divide in India or the library professionals were not enthusiastic enough to convince the policy makers about it. The scenario need to change, we the information professionals need to come forward and study the present system of operation and find a better solution to transform these reading rooms into an information centre where people find value. Many a time it is possible to run the library with a private-government-community collaboration. We need to explore these possibilities. We need to make rural population responsible for their library improvements.

Importance of rural libraries in bridging the divide

It is universally accepted that information is the core of all the developmental activities. Therefore providing vital information to the rural population plays a significant role. Considering 60% of the population live in rural areas, the information requirements of rural population relates to their day to day like agriculture, fishing, education, health-care, weather, loan facilities, land registration, fees related to various government services, etc. In order to get these services, it becomes necessary for the villagers to travel 25-30 Miles and in some cases bribe the officers. If the villagers are given access to their critical information requirements through rural libraries, it will help them save a lot of time as well as money. Simultaneously the governing body can function smoothly and corrupt free. Besides, the villagers will not have fear in approaching their library and get the information.

Role of State Government and the Kallara Project

In India, the States are formed on the basis of language and culture. Often the language of communication in a State differs from one region to other. However the laws and regulations are same through out the State. So the State government should take necessary initiative to digitise the content and provide the necessary interface that support rural people's requirements. To this effect, the State government should create a web-site and provide access to the rural community. The state should continuously update the information on the net as per the information seeking behaviour of the people. In addition to this, CDs containing government services and information has to be

made available in rural libraries-which is not of real time value. The information should be available in local language and in multimedia format so that it is easier for the people to learn and understand the content. CDs will help the rural libraries from paying heavy telephone and Internet charges. State government should make sure that each rural library gets one computer, telephone and Internet connection. However this requires huge sum of money and hence can be implemented in phases, perhaps state can look for assistance from various societies and international organisations. Also, state government in association with the state library association should encourage the Panchayats to train at least two rural library personnel from each rural library in using the Internet and the CD. The trained members in turn educate other members as well as the villagers in finding out the information.

In Kerala, the Department of IT in association with the State Library Council has launched the first computerized rural information centre at Kallara Gram Panchayat Library in Trivandrum District. There are 14 Rural Information Centres, one in each district of the State, have also been established. These centres enable the rural citizen to have free access to the Internet. A package named 'Sevana' provides information on various government schemes, programs, general information on local bodies, links to important sites and other facts relevant to the rural population. Though the project is in its infancy, learning from the Kallara experience, we must look for similar efforts to replicate to other rural libraries across India. Perhaps the project should be less dependent on the government funding and more dependent on commercially viable alternatives than initiating a project only to see it dying.

Challenges

The challenge of libraries with respect to digital divide is to pro-actively participate in bridging the digital divide paradigm and justify the role of libraries in the information society. In reality, the challenge of digital divide specifically intersects the vision and the very existence of libraries ie. to provide information for all. More over libraries have already been organised and structured to address many of the digital divide problems and issues. Secondly, when policy decisions are drafted relating to information, library professionals should also be part of the committee to reflect the opinions of the library community. However the present committee consists of technocrats do not properly see the value of libraries and therefore missing the mark. In these circumstances the library professionals should quickly position themselves to provide the needed inputs to the policy makers. At the least they should be positioned in such way that they can convince the policy makers.

Conclusion

Connecting rural population is the challenging task ahead. Accommodating the million strong populace connected to the global economy-what we call the knowledge-economy demand continuous discovery, innovation and attitude towards change. We need to work out a model in partnership with the rural population that would be affordable and self-sustaining. Many of the technologies are developed for the literate class, we need to depart from this and build technologies for the masses. Perhaps, encouraging private participation on a mutually beneficial basis is the quickest way to help the rural India gets connected. We need to develop models of collaboration among researchers, social scientists, librarians, technologists, etc. so that local requirements are met in a technology innovation. We need stable and corrupt free government that can inculcate the much-needed change in the bureaucratic set up. India's policy makers and rural development employees need to review their rusted ideas on rural libraries and recognise the more central role of the rural libraries in bridging the digital divide in India. Meanwhile, library professionals need to come out from their shell to drive the rural library development with a high spirit and enthusiasm. Since India's heart lies in its villages, rural libraries can play a much-needed role not only in bridging the digital divide but also in building a well-informed and literate society. Though we have to go a long way in accomplishing this challenging task, Gyandoot, Simputer, Taarahat and Kallara projects are giving some hope for improvement. Nevertheless no project can sustain without adequate financial support, so there should be a mechanism to sustain these projects with the support of government-industry-community participation. Massive campaign on e-governance involving the rural people will help the government to build a confidence in the rural population to use various 'e-governance' related resources. If thousand strong rural libraries in India are replenished, for sure these will emerge as the bridge between the information have-s and information have-nots.

REFERENCES

Yourdon, Edward. (1992) Decline and fall of the American programmer, New Jersey :Prentice Hall

Paul, Anthony. (2002) Can India catch up. Fortune, 145, 9; 33-40

Jhunjhunwala , Ashok, Making the Telecom and IT revolution work for us. Retrieved June 29, 2002 from (http://www.tenet.res.in/papers/techolo.html

World Bank (1998/99), Knowledge for development, World development report, Washington DC, 1998/99

Kalpana Dasgupta. (2000). Rural Libraries in the changing environment in India: important factors for discussion. Retrieved June 1, 2002 from http://www.ifla.org/VII/dg/srdg/srdg6.pdf

Yasmin Ghahremani.(2001) Heroes of the digital divide, Asia Week, June 29, 2001

Jarboe, Ken. (2001), Five thoughts about the digital divide, Retrieved June 1, 2002 from http://www.darwinmag.com/read/thoughts/column.html?ArticleID=164darwinmag.com

World Bank. (2002). Knowledge assessment report. Retrieved June 7, 2002 from http://www1.worldbank.org/gdln/kam.htm

ITTA. (2001). State of the INTERNET 2001. Washington : ITTA and USIC

UNDP. (2001). Technology achievement Index-Asia Pacific, Human resource Development Report.

Mishra, Satyan (2002), Connecting India village by Village. Retrieved June 17, 2002 from http://www.iicd.org/base/story_read?id=4956

Government of India, Ministry of IT (2000). IT for masses background report-1, New Delhi. Retrieved June, May 31, 2000 http://itformasses.nic.in

Das, Dipanker. (2000) The great Indian digital divide, The Hindustan Times Daily, 6th June 2000.

Benton Foundation http://www.benton.org

Transparency International. (1999). Corruptions perceptions Index. Retrieved July 1, 2002 from http://www.gwdg.de/~uwvw/1999Data.html#Table1

Government of India (1991). Census of India. Retrieved June 11, 2002 from http://www.censusindia.com

Government of India, Ministry of finance. (2002), Economic survey 2001-2002, Retrieved July 12, 2002 from http://indiabudget.nic.in/es2001-02/welcome.html

Government of India. (2001). Census of India- 2001, Population By Residence. Retrieved July 12, 2002 from http://www.censusindia.net/results/state.php?stad=A

Gyandoot Samiti. (2001), Gyandoot Project Retrieved July 1, 2002 from http://Gyandoot.nic.in

Government of India, Ministry of education (2001). Educational Statistics-2001, Retrieved July 12, 2002 from http://www.education.nic.in

Kagan, Alfred, Ed. (1999). The Growing Gap between the Information Rich and the Information Poor, Both Within Countries and Between Countries. IFLA Social Responsibilities Discussion Group Composite policy paper. Recommendations, August 2000). Retrieved July 1, 2002 from http://www.ifla.org/VII/dg/srdg/ srdg7.html

Government of India, Ministry of Rural Development. Retrieved June 1, 2002 from http://rural.nic.in

Government of Kerala, Department of IT, Kerala State Library Council and Kallara Panchayath (2000). Rural Information centre for Kallara Panchayatha. Retrieved June 1, 2002 from http://www.keralagov.com/news/kallaraproject.htm

The Warana Wired Village Project, Maharashtra. http://www.mah.nic.in/warana/

M S Swaminthan research foundation. Information village research project (1999) Retrieved May 21, 2002 from http://www.mssrf.org/informationvillage/informationvillage.html