LIBRARY HERALD
Vol 46 No 2
June 2008

Tackling Digital Divide in Kerala and the Possible Role of Libraries

LAILA T ABRAHAM*
N NIKESH**

Describes the phenomenon of digital divide, challenges and initiatives in bridging the digital divide by giving special emphasis to Kerala state. Various efforts taken in Kerala as part of different national projects and at the state government level are discussed in detail. The article also examines the status of rural libraries in Kerala and their possible role in working as Community Information Centres for the bridging of digital divide among the rural community.

Key words: *Digital device, Kerala, E-governance, Rural libraries.*

1 INTRODUCTION

The phenomenon of digital discrimination prevailing among various social, political and working groups has led to the emergence of digital information rich and digital information poor groups within societies and perhaps in the global environment. The Phrase "digital divide" seems to have its origin in the United States of America. Many believe that Andy Grove coined the term. Few others give the credit for this to Larry Irvin. According to Benton Foundation, former President Bill Clinton first used the term during the discussions of the National Information Infrastructure in 1993. Pippa Norris[1] describes digital divide as a multidimensional phenomenon encompassing three distinct aspects. The global divide refers to the divergence of internet access between industrialized and developing societies. The social divide concerns the gap between information rich and poor in each nation. And finally within the online community, the democratic divide signifies the difference between those who do, and do not, use the panoply of digital resources to engage, mobilize, and participate

* Assistant Librarian, Mahatma Gandhi University Library, Priyadarshini Hills, Kottayam, Kerala.
** Reference Assistant, Mahatma Gandhi University Library, Priyadarshini Hills, Kottayam, Kerala.

in public life. It is difficult to sort out the gap despite the burgeoning literature on various aspects of the internet ranging from web design, software development and e-commerce to the sociology of the network society, group identities and virtual culture.

Kerala, being the most literate state in India is working hard for tying up the bridge between haves and have-nots among various groups to a closer level. The State has framed Information Technology policies and e-governance programmes to reach the impact of Information Technology to the grass-root level. It is a proven fact that libraries have played an important role in our "Literacy Movement". Hence they can be considered as the focal point for Information Literacy Mission and providing e-education in a better way.

1.1 WHY BRIDGING THE DIGITAL DIVIDE IS IMPORTANT

Technology evolution offers great possibilities in all fields of life. But despite rapid technological development, information resource management and dissemination is still underdeveloped. A large mass of people is evaded from this system. This directly affects the digital information parity among the common community. Hence, the significance of bridging the e-information gap among people in different walks of life became essential.

Before analysing the bridging parameters of digital divide and the possible role of libraries, it is essential to understand the basic, socio-economic and technical factors that are leading to the divide. Some of them are:

- Lack of proper Information Communication Technology (ICT) infrastructure
- Lack of coordinated Government initiatives
- Political instability
- Low literacy and education
- Psychological barrier

Outcome of these factors results in the following challenges in the effort to bridge digital divide.

2 CHALLENGES OF BRIDGING DIGITAL DIVIDE

In internet language, digital divide is referred as cyber lag. The

disparities in technological, economic and educational distributions of digital technology have an important role in the implication of digital divide. For bridging the digital gap, challenges can be identified among both professional and social groups.

21 PROFESSIONAL DIVIDE

211 *Infrastructural and cost challenges*

In Kerala, we experience slow bandwidth, where the internet access cost is high and the time required to download web based information is more. In most of the libraries, dial up mechanism is used for accessing and the user is bound to pay a huge amount to his Internet Service Provider (ISP). Government is hence bound to undertake such programs for the development of efficient and sustainable communication infrastructures and services by inducing faster progress in the use of ICTs.

212 *Technological challenges*

India has been struggling hard with the technologies that have been in use for the past decades. But the introduction of high bandwidth Wide Area Network, unrestricted access to information, wide range of data services delivered on CD-ROM and the availability of Network stations which helps direct access through local network, the earlier technological situation in India, especially in Kerala, has changed for good. But the challenges still prevail in many areas due to the cost barrier. Efforts need to be focused in this direction for the process of information dissemination to be successful.

213 *Service-oriented challenges*

The challenges ahead in the professional service-oriented area are due to the imbalance in providing proper training, lack of proper skills unawareness, ignorance and financial set up of the institutions at state level.

214 *Challenges in manpower development*

The environment of digital information has become a part of our day-to-day activities now. So the aptitude and skill of professionals should be developed according to the system needs.

215 *Access and domestic divide challenges*

Providing training to staff alone would not serve to promote uniform digital expertise within an institution. Unless they are provided with

opportunities to make use of the expertise they acquire, they are prone to face with situations of digital have nots. Hence, in spite of the training given, they are psychologically and job-wise denied of the opportunities to handle such service situations. Here is where the effort for digital expertise succumbs. Only when staff expertise is uniformly distributed, a library can ascend to heights of digital development.

22 SOCIAL DIVIDE

The challenges faced among various social groups are mainly based on literacy, poverty, unemployment and psychological inhibition.

221 *Literacy, Poverty and Unemployment*

Even though Kerala is the most literature state in the country with more than 90% literacy, most of them are E-illiterate. Illiteracy in digital information includes lack of knowledge in computer and information skills necessary to survive in this modern job market. Internet is certainly democratizing information. The poor and unemployed people strive to hold their livelihood rather than go for quenching their thirst for e-information. Hence, if we design information technology in an appropriate way, we will be able to bring it to the door steps of even the poor.

222 *Psychological Barrier*

Socially backward classes have a psychological inhibition to learn the computer operations as they think that socially high people are the right persons to monopolize that area. Caste, creed, illiteracy, poverty and unemployment are some of the reasons that keep them away from the premises of digital world.

3 INITIATIVES TO BRIDGE THE DIGITAL DIVIDE IN KERALA

Various efforts are being taken as part of national programs and by the Government of Kerala towards bridging the digital widening among various groups in the society.

31 STATE-LED INITIATIVES IN KERALA

Apart from definite policies designed at promoting the ICT industry within the state, the Information Technology (IT) Policy of Government of Kerala adopted in 1998 and 2001 laid emphasis on using ICT in all walks of life to improve living standards. The Task Force on IT implementation in

government also recommended that the state adopts a strategy of administrative reform-based computerization simultaneously with highly visible and immediately implementable citizen interface projects. The move towards citizen interface was based on the assumption that all direct Government-Citizen interactions (G2C) can be ICT enabled and can be categorised as: (*a*) making payments, (*b*) getting entitlements, and (*c*) getting/providing information and grievance redressal. The main efforts in various sectors are:

311 *E-governance and Information Literacy*

E-governance is a concept which helps the citizen of a country to reach the government and vice versa on-line. It is the latest application of IT in government action and procedures through which citizen use the same in their interaction with the government. In Kerala it is officially claimed that "As a part of the Government's e-governance initiatives 34 Government Departments with high Citizen-Government interactions (C2G) interface have been identified. Nodal officers from each Department were chosen to supervise the computerization activities. They have been provided training on implementation of the project. In areas of hardware procurement, software development and training, Total Solution Providers have been identified for each Department and specific guidelines have been issued by the Department of IT to all Departments/PSUs". Government has taken the following strategic decision to implement the e-governance programme.[2]

- ICT Access points will be established by the Name 'Aksshaya e-kendra' for every 1000 families, one for every two or three wards.
- Centres will have 5 computers and other infrastructure at a cost of Rs 3-4 lakhs per centre, and the centres will be in 2-3 kilometer distance to every house hold.
- Social Entrepreneurs Model, entrepreneurs from the locality with service orientation shall be selected for running the centres.
- E-literacy component. At least one person from every family to be given training for 10-days – Local bodies to fund e-literacy. Rs 140 will be the tuition fee for 15 hour training programme, (Rs 80 from Gram Panchayat, Rs 20 from Block, Rs 20 from District Panchayat, Rs 20 as beneficiary fee).
- Strategies for community involvement, Civil Society organisations,

youth and welfare organisations, local bodies etc for implementation.

- Positioning Social Animators for linking Akshaya Centres, Citizens local bodies, and Government.
- Strategies for establishing Connectivity, creation of locally relevant content etc.

Table 1 summarizes the actual position of the initiatives. It can be seen that most of the attempts are still in preparatory stage and have not become fully operational. Nevertheless, in Kerala one finds some attempts to start

Table 1: *E-governance projects in Kerala: Status summary*

Departments	Objectives	Status
Rural development	Automation of Development Blocks	RDNet -All the 152 Blocks in the State have been networked through this project.
Local Self Government	Automation of local bodies	Information Kerala Mission - All the 1157 local bodies have been selected for networking through this project. In some panchayats, testing of software and purchase of hardware are completed.
Kerala Water Authority	Automation and stipulation of citizen services	13 offices of Kerala Water Authority and billing and collection at 9 centres have been computerised. Have plans for Centralised web enabled billing and collection at Trivandrum.
Civil Supplies	Automated delivery of citizen services	Automation of Ration Cards has been completed through this project. Issued Smart Cards in 4 Taluk Supply Offices in Trivandrum.
Motor Vehicles Department	Automation and stipulation of citizen services	MoU for customization of CORE soft-ware for implementation of back-end computerisation have been signed by the Kerala Government and NIC. For the back end computerisation, Regional Transport Office Thiruvananthapuram has been selected. Software for conductIng Learner's License test through online has been installed in a few RTOs on experimental basis.

Table 1: *E-governance Projects in Kerala: Status Summary*

Departments	Objectives	Status
FRIENDS by IT Mission	Automated payment utility bills, taxes and fees relevant to the participating departments	Its office functions in all the 14 District HQs, Sub district level duplication is considered. The State IT Mission has signed a MoU with NIC bringing all the 14 FRIENDS Janasevana Kendras under a network by using the band-width of KSWAN project.
Sevana by IT Department	Information on various government schemes, programmes general information on local bodies, links to important sites and other fact relevant to the rural population are provided.	The first computrized rural information centre at Kallara Gram Panchayat Library in Trivandrum District was launched by State Library Council. Established 14 Rural Information Centers, one in each district of the State under the project.
Treasury	Automation and internet connectivity of District and Sub Treasuries	All District Treasuries and a few Sub-Treasuries are online now.
Registration	Automation of land records and stipulation of citizen services	Computerisation of 54 Sub Registrar Offices (SROs) is under consideration. In 4 offices the pilot project has been completed. PEARL has been installed in 37 out of the remaining 50 SROs. An additional 113 SROs are now under consideration for automation.

projects with a social content. But it remains to be seen whether these experiments in ICT based social initiatives are offering a reasonable solution to problems that e-governance and e-education are supposed to tackle.

312 *Information Kerala Mission*

In Kerala, villages are linked to district headquarters for transparency and accountability governance. Information Kerala Mission has started to cover all 990 Village Committees (Panchayats) of the state. A computer having internet facility is placed in the local library and managed

corporately by the Panchayats and Department of IT of Kerala. Two important projects like Akshaya and Kallara project of Kerala government have significance in this context. Akshaya, launched on 5th May 2004 which was conceived as a two phase e-literacy program was inaugurated by our former President Dr APJ Abdul Kalam. The project aimed for the development of IT infrastructure in the state in order to meet the needs of common people in their daily life and to transform Kerala into foremost knowledge society of the world. The first experimental phase of Akshaya project has been implemented in Chmravttom village of Triprangode Panchayat of Malappuram district in Kerala.[3] Based on the experience, the state has started the project in the remaining 13 districts of Kerala also. The first phase is almost completely implemented.

Chief Minister of Kerala Shri VS Achuthanandan declared Kannur as the first e-literate district among seven districts in the phase II of Akshaya programme on Sept. 22, 2007.[4] Under the programme 3,29,173 families in the district attained computer literacy. In addition to this, 1,14,723 families had achieved computer literacy independently. This was implemented through 1198 Akshaya centres in 81 panchayats and 6 municipalities.

313 *New Measures in e-District Projects*

The Union Ministry for IT identified Pathanamthitta and Kannur districts in Kerala for implementing the people-friendly e-District project in the year (2007).[5] The project is part of the National e-Governance Plan (NeGP) to cover local high-volume services, thus taking the total number of Mission Mode Projects (MMPs) under the Plan to 27. The project is being implemented as an integrated sector project through Kerala government. Each district will get Rs five crore for its implementation. NeGP has been formulated for providing all Government services in an integrated manner at the doorstep of the citizen at an affordable cost. It envisages a three-pillar model for delivery of "web-enabled anytime, anywhere access" to information and services in rural India. Besides saving huge costs to the Government, the NeGP makes the Government dealings more transparent and efficient. Various common service centres will be front-end delivery network for Government services. According to Pathanamthitta Collector Asok Kumar Singh, 10 departments had been identified for the proposed e-District project based on a socio-economic need analysis. The State Government has already obtained the Union Government's approval to establish the Kerala State Wide Area Networking (KSWAN) and 8 Mbps

data link from the Secretariat to the districts. The Plan is to extend the reach of network to block level. District Network Management Stations should be established at the district headquarters, and network operating centres should be established in all the 14 block headquarters in the district to manage and maintain KSWAN.

3131 *FRIENDS Janasevana Kendras and KSWAN Project*

The Kerala State IT Mission has signed a MoU with NIC to network the 14 FRIENDS Janasevana Kendras in the State by using the bandwidth of KSW AN project.[6] The work is proposed to be completed in a period of one year. By the completion of the networking, people from any district can pay their bills and taxes in any of the centres of FRIENDS across the state. At present, people can make the above payment at the respective centres in their own district. FRIENDS centres are also likely to enter into a tie up with Life Insurance Corporation (LIC) for the collection of insurance policy premiums through FRIENDS. The FRIENDS centre in Thiruvananthapuram received ISO 9001-2000-standardisation award last year. Kudumbasree units will continue to assist the centres. A gradual increase in income from FRIENDS centres can be witnessed. While the income generated in 2005-06 was Rs 60 lakh, it increased to Rs 80 lakh in the year 2007.

3132 *Knowledge Centres and Rural Life*

Ten village knowledge centres have been set up in state by the Confederation of NGOs of Rural India (CNRI), the national apex body of NGOs of rural India functioning under the Union government, as part of its initiative to set up 1,000 centres in the country.[7] The centres are set up in Mulanthuruthy, Kanhangad, Attingal, Kallara, Aryanad, Kanyarkulangara, Kundara, Thevannoor, Ambalathara and Uduma. Computer literacy, environmental protection, disaster management, rural entrepreneurship are the programmes under the initiative. The centre set up at Mulanthuruthy Higher Secondary School has conducted training programmes on book binding, making paper carry bags, two and three-wheeler repair and bouquet arrangement. Coaching on fundamentals of computer and training in computerised accounting are also included. The centre has already acquired 5 computers. The programmes so far conducted at various centres in Kerala include medical camps, skill development in cost-effective building techniques, fruit processing, honey processing, soap making and mushroom cultivation. A MoU has been signed between CNRI and Indira

Gandhi National Open University for ensuring distance education facilities, vocational training and multi-media education. These centres have been set up in co-ordination with P N Panicker Vigyan Vikas Kendra and are instituted in government schools with the support of headmaster/ headmistresses and the parent-teacher associations. A monitoring committee under the chairmanship of the local panchayat president evaluates the programme. CNRI has plans to establish IT clubs, community Ham Radio stations, e-banking centres, e-commerce centres and national open school centres.

4 NATIONAL LEVEL EFFORTS AND EFFECT IN KERALA

41 INFORMATION LITERACY MISSION

India Millennium 2020" the information literacy mission[8] by our former President Dr APJ Abdul Kalam can transform India to a developed country by 2020.

42 EFFORTS BY NATIONAL INFORMATION CENTRE

In India, there are many information networks. National Informatics Centre (NIC) is an important information centre for community data, NIC had been set up in 1975 at Delhi with regional centres at Pune, Bhubaneswar and Hyderabad. NIC has set up extensive database up to all districts level with the assistance of Planning Commission at the beginning and later with Ministry of IT. To support this, a DISNIC program was launched by NIC in 1987 to develop Statistical Information System and database at district level. All kinds of information is made available to all districts, panchayats and villages with the help of DISNIC. All the districts of Kerala have a NIC centre now.

43 EFFORTS BY EDUCATIONAL NETWORKS

ERNET

ERNET (Education and Research Network) India, the scientific society under the Ministry of Communications and Information Technology was initiated in 1986 by the Department of Electronics (DOE) with financial support from Government of India and United Nations Development Programme (UNDP).

ERNET is providing the state-of-the-art communication frastructure and services to academic and research institutions, Government

organizations, Non-government organisations, Private sector, R & D Organisations and various other commercial organisations for bridging the digital divide. It has a major role in promoting Research and Development, generating manpower at different levels through training and consultancy and content development. Its contributions also includes insights into issues life ATM networks, networked multi-media and information infrastructure.[9] ERNET is the ISP for many academic institutions in Kerala. Eg. www.mgu.ernet.in (MG University library web site).

INFLIBNET

INFLIBNET is a prestigious project launched by the UGC in 1998 for networking academic and research libraries in India. INFLIBNET has contributed for bridging the digital divide by giving assistance to universities and college libraries for building the Information Network infrastructure and providing e-joumal consortia (UGC-INFONET). UGC along with ERNET's partnership and infrastructure has set up the UGC-INFONET Programme with the active involvement of INFLIBNET.[10] The Programme which is a boon to higher education systems provides assured quality of service with optimal utilization of bandwidth resources. The Project is funded by UGC with 100% capital investment and up to 90% of recurring costs.

The centre serves as a computer-communication Network for linking libraries and information centres in universities and colleges, UGC Information Centres and R & D institutions in India. The centre helps in manpower development by organizing staff training programs. Now, all the Universities in Kerala are members of INFLIBNET.

DELNET

Developing Library Network is operational since January 1988 with the initial sponsorship of NISSAT & Department of Scientific and Industrial Research, Government of India and later by NIC, Department of IT Ministry of Communications & India International Centre, New Delhi. It was registered as a society in 1997. Its prime objective is promoting resource sharing among the libraries in India through the development of a library network by developing computer based softwares suitable for linking libraries of many institutions allover India using the emerging ICT technologies. It collects, stores and disseminates information besides providing computerised services to users, co-ordinates efforts for collection development and avoids duplication where ever possible.

For the past ten years DELNET has been promoting MARC. It has developed DELDOS for the creation of database, which was used in National Bibliographic Database for creating MARC Records. For the purpose of library management two softwares namely DELMARC and DELPLUS were launched and are made available to the member libraries at a lower cost. Their services include giving access to more than million catalogue records and other resources, Interlibrary Loan services and Document Delivery services. A project called "Electronic libraries in rural India" was submitted to the Planning Commission and the Department of Culture, Government of India, and has organized a national seminar on establishing Electronic libraries in Rural India as initiatives towards bridging the digital divide.[11]

The National Convention on Library and Information Networking (NACLIN) conducted each year helps to promote the exchanging of ideas on the latest technologies and their adoption, as far as possible. Now, all the Universities in Kerala and many colleges and research institutions are the members of DELNET.

EDUSAT

EDUSAT (Education Satellite) was launched by the Indian Space Research Organisation (ISRO) on 20th September 2005. EDUSAT facilitates as the first exclusive satellite for serving the educational sector. It is mainly meant for providing connectivity to school, college and higher levels of education and also to support non-formal education including developmental communication.[12] The program is to be launched in its first phase in Jammu and Kashmir, Kerala, Rajasthan, Haryana, Punjab, Madhya Pradesh, Tamil Nadu, West Bengal and Uttarakhand. Kerala government has iniatiated steps to materialize the program in all the schools of the state since July 2006. Now many schools in Kerala are part of this programme.

AMRITA LEARNING PROJECT

In co-ordination with BSNL (Bharat Sanchar Nigam Limited), Amrita University in Kerala has started an international level educational e-learning project called AMRITA LEARNING meant for CBSE students up to Eighth class. The facility can also be used by students in the SSA syllabus from the internet portal http;//bsnl.amritalearning.com. More details about the project can be sought using the id:info@amritalearning.com.[13]

5 THE ROLE OF RURAL LIBRARIES IN BRIDGING DIGITAL DIVIDE IN KERALA: POSSIBILITIES

In this age of information, it is recognized that information is the core of all developmental activities where libraries have the key role in collecting, storing and disseminating the universal information. But libraries are not getting adequate attention and care while chalking out action plans for digital divide.

51 DIGITAL DIVIDE AMONG LIBRARIES AND LIBRARY PROFESSIONALS

In Kerala state, among the three main categories of libraries, viz. Academic Libraries, Public libaries and special libraries, librarians of academic and special libraries are well qualified to handle information management activities. Different organizations in this field are conducting training programmes for librarians to equip them with modern technological and digital environment. Many institutions are now conducting in-house training programmes for their library professionals. Efforts of educational networks and special library networks have an appreciable role in this matter. But Rural libraries are nowhere in the scene. They are facing with technological, manpower and financial crunch and functioning merely as reading rooms. Most of them do not have even professionally qualified librarians. Some of their basic constraints are:

- Crisis in getting sufficient funds
- Crisis in manpower development
- Crisis in conducting staff training programs to improve working quality
- Crisis in getting qualitative house keeping software
- Lack of Feed back from users regarding technological problems
- Non-availability of resources in digital form leading to lack of proper information services.

So, Government and local bodies should give proper attention to these areas. An action plan should be framed for the development of rural libraries. Formerly printed information was the major one and all types of libraries viz. public, academic and special libraries were in a position to serve their population moderate level. Earlier public Libraries were

providing government information leaflets and other documents. But when the emphasis shifted from print to digital information, libraries especially public libraries are facing many barriers to change their environment appropriately by digital information storage, retrieval and dissemination. With Government and institutional support, some academic libraries especially university libraries and special libraries have managed to cope up with this situation but public libraries still remain neglected identity. This has created a digital divide among libraries and library professionals working in different organizational set ups, as the public libraries are having the closest links with the community, this digital lag ultimately affects the rural community.

52 RURAL LIBRARIES AS COMMUNITY INFORMATION CENTRE

Rural Libraries are the grass root nets of public library system and nearest link with the rural community. But Government and other agencies working for bridging digital divide do not give proper importance to Rural Libraries even though one rural library from every panchayat is selected for implementing Information Kerala Mission to act as community centre. It will not be effective if rural librarians are not trained in the management of digital information access and preservation, especially in exploring the possibilities of Internet and give IT enabled services for rural community. Community Information Centres (CIC) are centres, which assist individuals and groups with daily problem solving and participation in the democratic process. CIC may cover a very wide field of our day to day needs, e.g. information on housing loans, rural banks, prices, agricultural inputs, local markets, panchayats, cooperatives hospitals, etc. These are basically information centres established to create awareness among rural people about rural development programs. By giving proper training in digital information collection, storage, retrieval and dissemination to rural library care takers, they can be converted as good managers of CIC and help in the building of contents. The CIC can be taken as extension of services by libraries in order to fill gap between information rich and information poor. With the help of rural library CIC, all sorts of information may be made available under one roof with the cooperation of various agencies. Thus expenses on running parallel agencies may be minimized with the maximum utilization of resources "The library in a particular locality may become a clearing house for currrent information on community organizations, services, etc. It should respond to the community problems.

It may provide specialized services both inside and outside the library building, such as job information for a community with high unemployment. The library may create local directories, maintain files of service agencies. Local organizations help individuals to become self-sufficient. Users will have a non stop centre to get information about local issues, organizations and services and keep abreast of local issues.[12] Also if the villagers are given access to their crucial Information requirements through rural libraries, It will help them save a lot of time as well as money. Simultaneously the governing bodies can function smoothly and corruption free. Besides, the villagers will not have fear in approaching their library and get the information.

6 CONCLUSION

The initiatives in reducing the digital gap among various social groups show some progress in many areas but moderately week result in rural areas. This has happened not only due to the lack of financial resources but also due to lack of innovativeness. Only when the initiatives gain acceptance at the grass root levels like panchayats and blocks, with the support of local community, success can be attained. As discussed above, by enhancing the status of rural libraries to CICs, the increased participation of common people to digital information can be ensured. Thus the potency of library community in the management of e-information can be properly utilised in the process of bridging the digital divide.

REFERENCES

1 NORRIS, Pippa. Digital Divide: civic engagement, information poverty and the Internet world wide. New York: Cambridge University Press. 2001. P 3-4.

2 http://www.keralagov.com

3 http://www.iimahd.ernet. in/egov/ijip/april2004/article.204.htm

4 STAFF Reporter. Kannur to be declared e-literate tomorrow. The Hindu newspaper, September21, 2007.

5 KUTTOOR (Radhakrishnan). E-District project for two districts. The Hindu newspaper, April 17, 2007.

6 EXPRESS NEWS SERVICE. Friends to transcend district boundaries. The New Sunday Express, August 12, 2007.

7 RAMABHADRAN (Pillai R). Energising rural life. *The Hindu* newspaper, September 23,2007

8 http://www.ijla.og/iv/ifla70/papers/I45e-kumar.pdf

9 http://www.eis.ernet.in/aboutus.htm

10 http://www.injlibnet.ac.in

11 http://www.delnet.nic.in

12 http://www.isro.org/pressreleaseljuly23_2004.htm

13 AMRITA LEARNING internet educational project in co-ordination with BSNL. Veekshanam(Malayalam daily), August27, 2007