

cheaper and quicker than copper wire connectivity." When it comes to a comparison with laying down for land lines, the problem is that the cost of laying down a land line is borne by the Department of Telecommunications, whereas with WLL, it is passed on to the subscriber.

An important aspect related to the network is replication and scalability. Other districts of the state have not been able to replicate the success attained by Gyandoot. It would have been very helpful if the book had covered in greater detail the factors that could lead to successful replication of the network in other districts. Indeed, it would be wonderful if the next version of the book covers the changes and learning the project has undergone since the first printed edition.

Overall, the book has largely achieved the objective of documenting the challenges involved in implementation of community networks like Gyandoot and is highly recommended reading for academicians as well as practitioners interested in working toward bridging the digital divide.

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Bridging the Digital Divide: Gyandoot—The Model for Community Networks.
By Rajesh Rajora. New Delhi: Tata McGraw-Hill. 2002. Pp. 319. US\$15.95 (paper).

Well-planned community networking can play a key role in bringing the benefits of information technology (IT) to rural societies, and the Gyandoot initiative in rural Madhya Pradesh, central India, is perhaps one of the best such exemplars.

Rajesh Rajora is an officer of the Indian Administrative Service in Dhar district, where as a civil servant with responsibilities in socioeconomic development he helped in conceptualizing, installing, managing, and assessing the Gyandoot community centers (*gyandoot* literally means purveyor of knowledge in Hindi). Leveraging access via the intranet and Internet, it represents a sustainable, self-supported model of interactive information services tailored to the local rural communities.

The Gyandoot government-to-citizen network (www.gyandoot.nic.in/) won the Stockholm Challenge Award in 2000 as well as the Computer Society of India's National Award.

The book is must reading for the development community, policy makers, social scientists, educators, activists, IT specialists, rural entrepreneurs, and all IT professionals with a sense of social responsibility. The material is divided into 12 chapters, covering theoretical models of community access, networking infrastructure, information needs assessment, user behavior, research findings, and recommendations for other similar projects.

The unfolding of events is presented in a step-by-step manner that will be very useful for social activists; the described journey is also fortified with a wealth of data in the form of charts, tables, and statistics capturing patterns of information access, demographic profiles, user attitudes, and diffusion of skill sets. The material is well written, full of anecdotes, and has touches of humor, quotes, and cartoons thrown in as well, thus making for an informative and enjoyable read.

An eight-page bibliography cites useful works such as *Reinventing Technology, Rediscovering Community* (Agre and Scheuler), *Democratizing Communication* (Bailie and Winseck), *Ties That Bind* (Cisler), *Developing Community Teleservice Centres* (Graham), and *Growing Sustainable Communities* (Holley). Numerous online resources are also listed, such as www.col.org/telecentres, www.bytesforall.org, www.ctcnet.org, www.cks-b.org, www.govtech.net, www.grameen.org, www.tc.ca.

The book begins by focusing on the digital divide in India, a country with a strong IT sector but low levels of overall telecommunication and computer diffusion as well as inadequate focus on domestic applications.

Late in 1999, a group of administrative officials, headed by Rajora, decided to launch a rural community network initiative whose success could be guaranteed via public-private partnerships, assessment of appropriate information services in the local language, appropriate tariff structures to make it affordable yet self-sustaining, and suitable marketing messages.

Discussions, meetings, and focus groups were held in a number of villages with the help of voluntary organizations to find out what the village community would really seek from an interactive information resource service. The information needs varied across the constituent groups: rural elite, large and small farmers, nonfarming workers, below-poverty-line families, and backward castes.

Information needs assessed by these surveys included agricultural commodity prices in nearby markets, land records, property registration, microcredit financing, employment listings, grievance redressal, application forms, matrimonial services, weather forecasts, local news, ration shop information, village council records, distance learning, voter lists, marketing services for dairy and handicraft products, emergency services, and access to expert advice (health, agriculture, cattle, law).

Based on lessons learned from the funding models and technology infrastructure of existing community networks in India (such as the Warna Wired Village Project for sugarcane farmers in Maharashtra and the Information Village Research Project in Pondicherry, which used expensive technology and needed strong government or donor funding), it was decided that fee-based services and basic dial-up would be used for most of the community centers, especially using wireless access links.

Wireless access was provided by nLogue Communications based on CorDECT WLL technology developed at the Indian Institute of Technology, Chennai. The cost of the wireless "last mile"—usually a formidable barrier in rural telecoms—is much lower than the normal copper wire and ditch-digging alternative, according to Rajora.

A team of officials was used to mobilize 35 village councils to invest in computers, modems, and backup power generators (though there was some opposition to investing in such technologies instead of more basic infrastructure). Twenty-one villages were selected in the midst of this cluster, and local graduate youths were selected for training on network center operation; these operators would act as mediators in providing information services to literate as well as illiterate villagers.

Right from the beginning the working model was based on commercial lines to be self-funding, with launch capital coming from the local community and ongoing support from content service fees.

Different rates were charged for access to agricultural product prices (5 rupees or approximately 10 cents), land records (15 rupees, about 30 cents), online forms (10 rupees, about 20 cents), filing of complaints (10 rupees), e-mail (5 rupees), matrimonial ads (25 rupees), assistance from experts (10 rupees), job listings (50 rupees), weather reports (5 rupees), and poverty classification listings (5 rupees).

"The *soochaks* [operators] adopted innovative ways to satisfy the demands of their customers. The cultivation of enterprise became a milestone for sustainability," says Rajora. Popular "off-line" services at the telecenters included photocopying, faxing, recording of cassettes, desktop publishing, data entry, and computer training. Average income at a kiosk grew to 5,000 rupees per month; as a result, it took Gyandoot less than 18 months to break even, according to Rajora.

A key challenge was marketing the availability and use of these online services, which was eventually done via a creative campaign involving street plays, announcements in marketplaces, cartoons, and appropriate slogans in pamphlets, posters, cards, and stickers.

Several tables in the book document patterns of usage of the various information services broken down by parameters such as gender, income level, age, occupation, and even number of kilometers traveled to the community centers.

"It is critically important, as technology provides us with positive tools, to keep an eye on those who are disadvantaged at the starting point, and to ensure that they have access to these tools so that they do not fall behind," Rajora urges.

"An understanding of computers and their use can be a way out of poverty and into the mainstream of the informed world. Technology can accelerate the rate of progress for the disadvantaged sections of society, if we make sure that they have access to it," according to Rajora.

Some interesting findings in the research include the rapid adoption of IT by students (as a result of which a scholarship program was started for needy students), the ability to use the kiosks to promote competitions for healthy children, and the need for continuous assessment to ensure that interactive services meet the needs of the most marginalized communities.

One superb chapter provides actual anecdotes and case studies of benefits of the community center services—such as women vegetable buyers finding the markets with the best prices, garlic sellers locating the best auction centers, citizens voting on satisfactory or unsatisfactory performance of their elected officials, filing of complaints about malfunctioning water pumps, identifying treatment for cattle ailments, and even enabling the sale of a cow via an online ad!

Challenges arise, of course, at the level of technology infrastructure (power supply), skill sets of network operators, corrupt government officials who refuse to cooperate with online channels (the “will-nots”), obstruction by inefficient administrators, noncooperation by the lower bureaucracy, and hostility by the rural elite.

More information in the book would have been desirable on questions such as the implications of such centers for restructuring of information flows and government department configuration, performance issues such as the amount of crowding and length of queues at these community centers, and the overall content management and coordination system.

Looking further down the road, Rajora advocates the use of user-friendly voice-recognition technologies and touch-screen interfaces for illiterate users, funding approaches based on local microfinance and transactions instead of hefty grants from donor

agencies, cyberlaws protecting online use of land records, more sharing of such community center experiences, and technical assistance programs for capacity building.

“Food, clothes, shelter and bandwidth are becoming the necessities for the villages. The rural, illiterate, and tribal community, through Gyandoot, has shown indubitably that information technology has a substantial role to play in their lives,” Rajora observes.

“Involvement of the community at the planning, execution, and management stage of the network creates faith among the diverse sections of the community; it should be based on value-pull and not tech-push. Human bandwidth is more important than volume bandwidth. Sharing stories about how citizens are benefiting is the best way to help people understand the benefits of the network,” Rajora concludes.

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