

# 2002 GUIDE

to

*ICTs for Development*

The *Guide* is one of the best thought out pieces on this subject that I have seen. Sood brings an excellent perspective, underlying which is the observation that ICTs are very appropriate as an enabling structure for developing communities, as they can help overcome some of the other deficiencies of such environments.

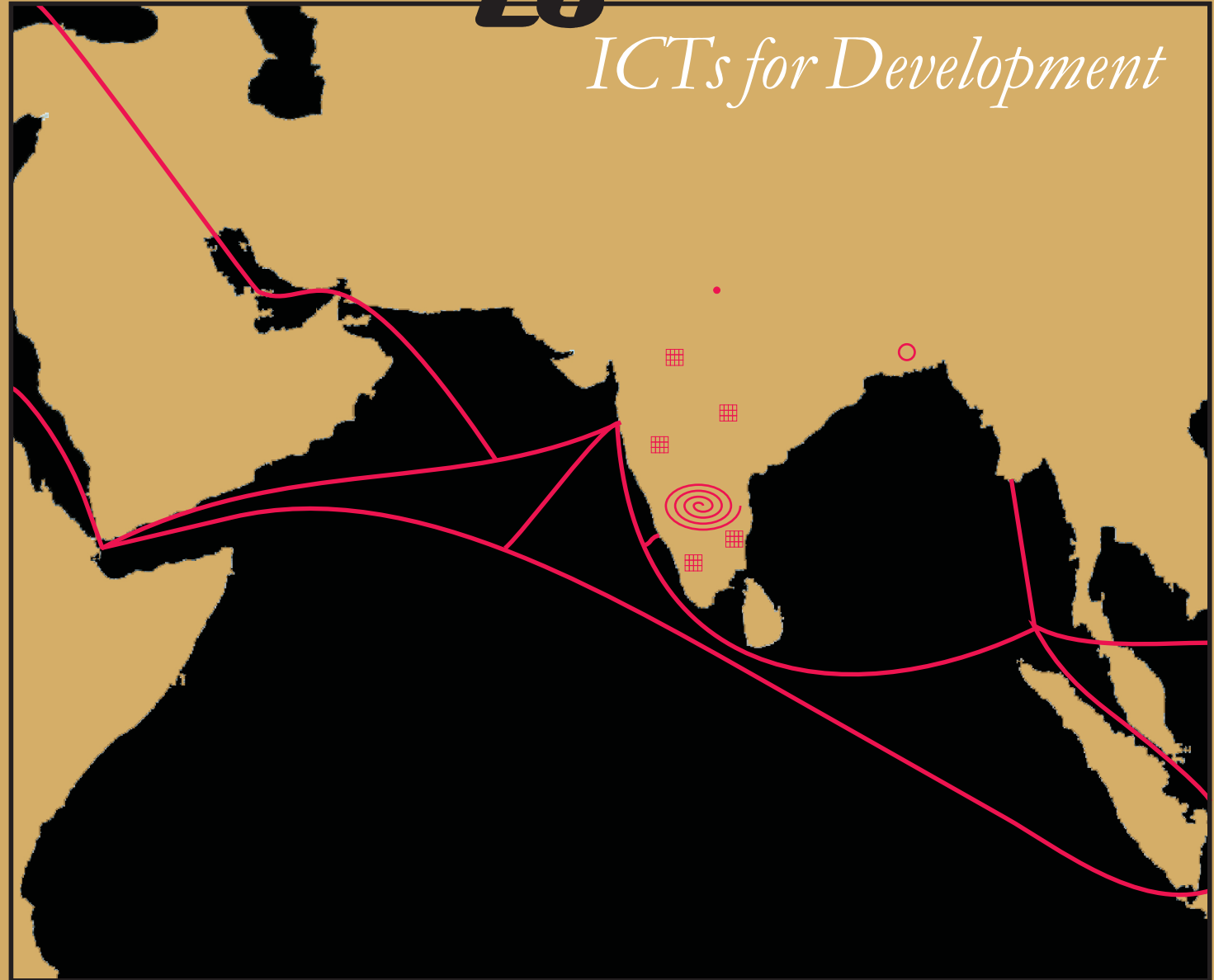
Warren Greving  
HP Labs India

Sood's work is precise and informative. We find it a very useful compass to various on-going efforts at the field level.

Frederick Noronha  
BytesForAll

The *Guide* is superb! It has great snapshots of the various efforts going on across India. I really wish I'd had this when I first came to work in the ICT for Development sector.

Sandhya Subramanyam  
Ernst & Young and TeNet Labs



INR 100/-  
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Aditya Dev Sood

*The Center for Knowledge Societies*

**GUIDE TO ICTs FOR DEVELOPMENT**

*Aditya Dev Sood*

**2002**

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### THE CENTER FOR KNOWLEDGE SOCIETIES

*Guide to ICTs for Development*

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## PREFACE

Here we are concerned with the relations between *development* and *technology* – Information and Communications Technologies (ICTs) in particular. Development is often understood in terms of advocacy, social work, voluntarism, selfless charity and other *palliative* social services. But perhaps the term is better used to signify the transformation and expansion of a society's *infrastructure*.

Commercial projects become viable when consumers are willing to pay for a product or service at a sustainable cost. In some cases, however, the very existence of this product or service is a precondition to many other kinds of social or economic activities. In such cases, the project not only meets the minimum criteria for financial success, but also *provides some additional benefit to its community*. It is with regard to this second set of potentialities that arise from the existence of a product or service, that we begin to recognize it as a resource, as *infrastructure*. We recognize Information and Communications Technologies as a new and yet essential form of *infrastructure* necessary to the process of development.

ICTs represent an unprecedented opportunity to make new knowledge, services, and opportunities available in underserved areas. Both urban and rural citizen consumers may benefit from ICTs by receiving: (i) enhanced access to information and communication across large distances, (ii) improved access to governmental and quasi-governmental resources and services, (iii) new credit and financial services available through palmtops and information kiosks, (iv) new opportunities to design, manufacture and market their products

through internet or intranet systems, (v) more and better education through computers or about computers or both, and (vi) superior medical advice, diagnosis or knowledge in their own locality. In the long term, rural ICT projects could prove to be the most effective means of driving change in rural areas: *socially*, by ensuring equal access for disprivileged groups, *economically*: by creating new kinds of work and financial transactions, and *politically*: by improving the quality, speed, and sensitivity of the state apparatus to the needs of local citizen-consumers.

Many important challenges to the viability of rural ICT projects remain, given the limitations of electricity, telephony, net-connectivity, and other kinds of basic infrastructure. Furthermore, it is very likely that in these initial stages, ICTs will asymmetrically benefit landowning elites, relatively disprivileging landless artisanal groups in many rural areas. For this reason, rural ICT projects must be constantly monitored, evaluated, and redesigned, so that they are inclusive in their operation, and progressive in their effects. Social research, economic analysis and demographic surveys are all central to the process of conceptualizing and designing new applications, services, and business models for the rural sector.

This book addresses many of the problems and possibilities of using networked technologies for developmental objectives. We lay out our views on how best to create digitally-enabled infrastructure in chapters 1 and 2. In chapter 3 we describe the social and economic impact of networked technologies on rural societies and various kinds of organizations, based on our own experiences. Chapter 4 discusses statistics and recent trends within the sector, that are based on an analysis of our extensive database on this sector. Sections 5, 6, and 7 of this document describe actually existing technologies, projects and resources in South Asia that use or facilitate the use of ICTs for various developmental objectives. This listing is by no means encyclopedic, and is intended only as a guide to the unfolding landscape. Investors and entrepreneurs are invited to think of these resources as an incomplete toolkit, or kit-of-parts, that may be assembled together for new and innovative applications, experiments, and projects. Although the majority of cases discussed here are from India, they may serve as resources for the rest of South Asia, as well as other parts of the developing world.

## INTRODUCING THE CENTER FOR KNOWLEDGE SOCIETIES

CKS Consulting (Center for Knowledge Societies) affords insight into the use of Information and Communications Technologies (ICTs) among new user groups in emerging economy contexts. We bring social and economic analysis, as well as linguistic and cultural insight to bear on the design and deployment of emerging technologies, particularly for rural and non-elite communities, and other non-traditional target populations. With offices in Bangalore and New Delhi, CKS has executed projects for technology houses, international development agencies, and grassroots organizations.

CKS has also been building partnerships with research organizations in key emerging economy countries around the world including China, Indonesia, Malaysia, Brazil, Mexico, Kenya and South Africa. CKS plans the entire research program and designs all research tools; specific data collection activities are outsourced to partner agencies in other countries. These results are then sent back to CKS for analysis and design synthesis.

All CKS work begins in the field in the attempt to capture and represent user preferences, needs, practices and behavior. We lay emphasis on understanding the nature of the initial research question thoroughly, and supplement this with statistical and bibliographic research as well as other classic market research techniques. Our greatest value to our clients however, is our ability to stimulate user creativity and harness their insights, modifications and innovations for the ongoing development of innovative new products and services.

Besides our corporate work in the area of ICT design and usability, we are deeply involved in ecology building, where the intersections between technology, design and art, and their effects on culture and society are explored in various ways. These take the form of non-contractual public domain projects, which happen within the ambit of *Center for Knowledge Societies* programs. The *CKS Commons* engages in work that is contributed to other organizations and events. The *CKS Gallery* has CKS flagship projects displayed as permanent exhibits, and also collects and curates interesting projects by individuals and organizations from all over the world.

CKS personnel are drawn from premier departments and programs around the world in a variety of disciplines including design, architecture, media, communications, social science, philosophy, management, human factors and engineering. CKS has also initiated internship programs with leading design, technology and management institutions in India.

For more information on CKS, please visit [www.ict4d.info](http://www.ict4d.info) or email us at [cks-info@ict4d.info](mailto:cks-info@ict4d.info).

# 1

## HOW TO BUILD KNOWLEDGE SOCIETIES

Beginning in the middle of the twentieth century, development assistance or aid to newly postcolonial nations from more industrialized economies assumed a tripartite public sphere, consisting of the private sector, the state and its agencies, and non-profit and non-governmental organizations (NPOs and NGOs). This 'third sector' served to disseminate funds and aid to the most disprivileged sections of developing societies, correcting for the excesses of the market and supplementing state-sponsored developmental efforts. Of late, however, it appears that the market is expanding to encompass activities and services that were supposed to be within the purview of either the state or the third sector. In South Asia, in particular, through the liberalization of the Indian economy in the 1990s, the government relinquished control over many social services, including health-care and education, selling or closing significant Public Sector Undertakings (PSUs), and forming new collaborations with corporate leaders. Having received little additional funding from the state or from local industry, developmental NGOs in some regions of South Asia also face new governmental restrictions on their eligibility for and use of international funding. In general, the non-profit sector has had difficulty keeping pace with the new demands of their growing economies.

Despite the fact that private capital has always played a critical role in the creation of social and economic infrastructure, popular perceptions distinguished between businesses which were ‘free’ to disregard the wider social, cultural, environmental and sometimes political effects of their profit-making enterprises, and the public philanthropy of the company or its founding family, which sought to correct or even atone for the damage wrought through the rapaciousness of these activities. This schizophrenic perspective has increasingly been replaced with a new understanding of development, which recognizes the central role of private capital in growing sustainable – and even profitable – forms of increasingly sophisticated infrastructure that then make a host of other secondary and tertiary social and economic activities possible. ‘Development,’ in this view, is hardly the exclusive purview of the third sector, but requires new and dynamic kinds of partnerships across all three sectors, as well as the involvement of academia, including centers of technological training, research and design.

Perhaps the term ‘development’ is most appropriately used to describe the creation of *infrastructure*, whether it is of a concrete, institutional, technological, social, or human sort. But where does infrastructure begin or end? It is not just roads, railways, ports and bridges, but also postal and telephone networks, schools to educate a population, hospitals, and market systems for distributing, storing and selling produce. Increasingly, the term also encompasses all layers of information and communications technologies, from sheer connectivity through wireless or optical fiber networks, to installed hardware and software, to the content and services made available at these nodes, and even the cadre of computer trained operators that mediate between citizen-consumers and all of this infrastructure.

There is considerable energy and excitement in South Asia and in other parts of the world at the new possibilities entailed by this multisectoral view of development. Where state-sponsored and non-governmental technology initiatives have had great difficulty in achieving wide usage, or in gaining currency as technology standards for generic products and services, the private sector might be more successful in creating and using emerging technologies for the mass population.

Whereas the creation of such new *infrastructure* might rapidly transform and enrich an impoverished society, direct intervention, in the form of philan-

thropic charity, schooling, care, or advocacy, can only be *palliative* in nature. We must recognize that neither approach is likely to be successful except if it works in concert with the other. While many of the infrastructure-building functions of non-profit agencies could be effectively shifted to the private sector, its palliative social services are not easily compatible with profit-driven organizations, no matter how enlightened, networked, or socially committed. These include, for example, primary education, basic health care, HIV / AIDS intervention and advocacy, areas from which state-sponsored and philanthropically-funded agencies can neither withdraw, nor expect much competition from private capital.

In order to develop new infrastructure through a commercial model, it is essential to seek replicable as well as scalable financial models. This becomes possible when (i) the target population is willing to pay for the new services provided, (ii) it is able to do so at a cost that will make the whole enterprise viable, and (iii) the availability of these services has a beneficial secondary effect on its socioeconomic context, such that it drives growth, and thereby *spurs its own demand*. A commercial model of infrastructure development, therefore, holds out the possibility that profits generated from socially and economically successful projects could be reinvested in *scaling* these initiatives up, or in *replicating* them in other regions. This is where information and communications technologies can prove most useful, for projects that use these technologies have an inbuilt advantage, in being able to expand their coverage areas and populations-served more quickly and efficiently.

## 1.2 Information and Communications Sectors in India

As is well known by now, India’s IT sector took off in the early 1980s with the establishment of off-shore development centers. Relatively cheap English-speaking engineering and technical talent were employed at centers in Bangalore and Chennai, then Hyderabad, and now in the suburbs of New Delhi (NOIDA and Gurgaon). Since the liberalization of the Indian economy in the early 1990s, the Indian government has relentlessly promoted the IT sector as the harbinger of the nation’s economic aspirations. Even though the country possesses only 3.7 million Personal Computers (PCs; Pentium I or superior), it houses the largest number of software professionals outside California, whose efforts might result in the export of software worth 8 billion dollars next year, much of it to the United States.

The checks and balances of electoral politics in India's largely rural society mean that economically liberal and technologically sophisticated leaders cannot afford to leave themselves open to the charge of promoting IT at the expense of rural development, and this is a fine line to walk. Andhra Pradesh's Chief Minister Chandrababu Naidu, nevertheless, crafted an aggressive state policy to attract IT-oriented investments, simultaneously claiming that this sector served the larger public interest. Beginning in 1996, he was the first Indian politician to advocate E-governance for making the state machinery more responsive and sensitive to citizen needs at the district and *panchayat* level. By 1998, these policies were echoed at the national level through an 'IT for the Masses' policy statement, as well as a policy statement on E-governance. Karnataka is one among many other states of India to have issued an IT policy statement directed towards the 'common man.' But Tamil Nadu has perhaps done the most to actually implement network connectivity in its rural districts, several of which will be connected in the current year.

Of late, the initial euphoria surrounding India's successful software export industry has given way to a new introspection into the reasons why these intellectual and human resources have not driven concomitant improvements in India's public and private institutions, education systems, and infrastructure. These reasons are not hard to find: (i) the Indian software industry solves small components of larger problems for international clients; (ii) this work is usually protected by confidentiality agreements; (iii) many Indian software professionals and companies compete for the same international contracts; (iv) the opportunity cost of working for Indian versus international clients is very high; and finally (v) low teledensity, computer usage, literacy, the inadequacies of regional language software interfaces, and other obstacles of India's developing infrastructure, coupled with regulatory hurdles have inhibited such ventures.

Nevertheless, the export-oriented software industry has yet to take full advantage of the opportunities presented by the newly networking home market. It is, perhaps, in part due to the InfoTech industry's extraordinary capacity to solve other peoples' problems more efficiently than they could themselves, that they have an atrophied ability to actually define and conceptualize these problems *de novo*. On the other hand, as urban India's telecommunications markets approach saturation, the Telecom industry is beginning to look to new rural markets. In this process, we may look forward to new synergies

between India's Infotech and Telecom sectors, spearheaded not by the most established players in the market, but by new hybrid start-ups.

Due to the on-going deregulation of India's telecommunications sector, its national teledensity (telephones per hundred persons) has improved, albeit slowly, from .06 in 1990, to about 3 today (compare with China at around 10). However, Voice over Internet Protocol (VoIP), and Wireless-in-Local-Loop (WiLL or WLL) technologies have begun to offer cheaper and lighter forms of telephony that may enhance rural access. New software start-ups now target non-English speaking users, and the idea of non-elites using and benefiting from ICTs no longer elicits scandalous disbelief.

### 1.3 What is a Knowledge Society?

The term 'knowledge society' might be uncomfortably *courant*, representing a transient *zeitgeist* whose promise is either already broken, or eternally deferred. But the main referent of this elusive term may be a release from the epistemic constraints of figuring ourselves an eternally *developing nation* with an export-oriented *client* economy, to one which invests its intellectual and technological capital towards its own future growth. Our operative definition for a knowledge society, then, is the effective use of its gamut of *superstructural* resources for the improvement and transformation of its own *infrastructure*. Should any part of South Asia become successful in achieving such an empirical and epistemic shift, it might eventually serve as a model for other emerging economies around the world.

While the telos of industrial development has always already been determined by the most powerful Euro-American economies, the 'new economy' is still in flux. Terms have yet to be set for most sectors of emerging technologies, including Information and Communications Technologies, Spatial Data Systems, and Biotechnology – and in all of these areas South Asia already has an unlikely but real stake.

The developmental ICT sector is a critical component of many possible South Asian knowledge societies. This sector demands creativity at all levels, from designing partnerships with non-profits, to drafting eccentric business models, to transcending limitations of infrastructure and policy, to inventing new kinds of applications and services, to marketing these technologies to non-

traditional markets of variegated language, culture, and economic assumption. Organizations and individuals who rise to these challenges, who compete and succeed under these adverse conditions, can legitimately expect enormous returns from servicing huge new markets, albeit at asymptotically small margins. Even now, unparalleled technological and business expertise is being generated in this sector, whose 'back-channel' applications for traditional markets can only be guessed at.

To build new knowledge societies, we seek a new pattern of interaction between the different estates of our society, so as to maximally utilize their respective expertise and abilities. We will need: (i) well funded centers of research into technology, media and the social sciences, where new ideas and new models of development, governance, policy and business can be generated, (ii) venture capital funds and new hybrid public-private corporate entities directed towards the development of social and human infrastructure, (iii) authoritative and responsible civil society organizations that work with, rather than either against or in parallel with the state and private sectors, and (iv) governments and bureaucracies that work in transparent dialogue with these other estates.