



# **Affordable Technologies for Sustainable Development**

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# PLANETFINANCE

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The Microfinance Platform

**Affordable Technologies  
for Sustainable Development**

## **IT @ WORK IN MICROFINANCE IN ASIA**

### **Reference Documents**

prepared for the Brussels conference: February 9-10, 2004

following the

Delhi conference: December 22-23, 2003

Beijing conference: January 12, 2004

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## ACKNOWLEDGEMENT

This reference document has been produced as a basis for the discussions for the Brussels Conference, on February 9-10, 2004.

The excerpts that are provided aim at providing various opinion to engage the debates, first during the conference, but as well in the discussion forum we have opened on our chinese and indian microfinance regional webportals: <http://www.microfinancesouthasia.net> and <http://www.microfinancechina.net>.

The views expressed in this document are entirely those of those who selected various excerpts from international resources, and should not be attributed neither to the European Commission nor to its affiliated organizations, nor as the position of PlaNet Finance on these subjects.

The documents have been gathered and compiled by PlaNet Finance Asia and Communication Departments, with the precious help of Alexandra Blaringhem, Karima Ouadia, Loïc Sadoulet (ULB) and Alain Ejzyn (ICHEC). Many thanks to all of them and to all those, whom we can single out on this page.

Following the conference, this References Document will be reviewed and further improved with all the inputs, comments and suggestions of the participants. We invite all of those who want to go further on the issues, and would like to contribute to the development on an action plan "ITC & Microfinance" and the launch of a series of new initiatives for the 2005 International Year of the Microfinance and the December 2005 second round of the World Summit of Information Society in Tunis, to join us in the forum or to send their comment directly to **Amandine Monteil**, [amonteil@planetfinance.org](mailto:amonteil@planetfinance.org).

## TABLE OF CONTENT

<b>Last Minute China News.....</b>	<b>6</b>
<b>Last Minute China News.....</b>	<b>7</b>
<b>Last Minute India News... ..</b>	<b>9</b>
<b>I. The IT Sector in India &amp; China.....</b>	<b>11</b>
<b>A. Quick Overview : Facts &amp; Numbers .....</b>	<b>11</b>
Deloitte Reports Highlight 10 Trends For Revenue Opportunities In Wireline And Wireless Technologies.....	11
ITU Digital Access Index: World's First Global ICT Ranking.....	11
India ranks 87th in UN's e-readiness index.....	12
Emergence of the I&C sectors in India .....	13
Chinese Internet Surfers Hit 80 million .....	14
The Dragon's Revenge: Tough Times for Telecom Vendors in China .....	15
<b>B. Policies &amp; Recommendations for ICT sector development .....</b>	<b>16</b>
India Information and Communications Technologies Blueprint.....	16
China Business Summit Report.....	17
Ensuring IT remains in Indian territory .....	19
Summary of the Tenth Five-Year Plan (2001-2005) [Excerpts].....	26
Statement by H.E. Wang Xudong Minister of Information Industry at the World Summit on the Information Society [excerpts] December 10, 2003.....	29
First World IP Regimes Slow China's Modernization.....	29
Strategies for Developing China's Software Industry [Abstract & Excerpts] .....	30
China and India: Leveraging Strengths for Partnership .....	31
<b>III. ICT contribution to social and economic development.....</b>	<b>33</b>
<b>A. Opportunities &amp; Challenges .....</b>	<b>33</b>
Regional Human Development Report.....	33
Promoting ICT for Human Development in Asia 2004: Realising the Millennium Development Goals.....	33
The Secretary-General Address to the World Summit on the Information Society .....	35
Fighting Rural Poverty : the Role of ICT .....	36
ICT-Capacity Building for Rural Development and Poverty Alleviation in China.....	37
Transforming Rural India.....	39
<b>B. Case Studies .....</b>	<b>39</b>
Setting up Multipurpose Information Technology Centres in Rural and Tribal Areas of India - The Aisect Experience.....	39

**IV. Microfinance & ICT** ..... 41

**A. What is Microfinance ?** ..... 41

**B. ICT & Microfinance** ..... 42

        Increasing Access to Microfinance Using ICTs [excerpts] ..... 42

        Expanding Microfinance With Digital Technologies ..... 43

        Lessons from the Field: ICTs in Microfinance ..... 44

        Providing Rural Phone Service Profitably in Poor Countries ..... 46

        Microfinance to Get the IT Edge ..... 47

        What can the Internet Offer to Microcredit Loan Officers in Rural China? .... 49

**V. Public-Private Partnerships** ..... 49

        Asian Forum on ICT Policies and e-Strategies

        Public-Private Partnerships and Financing ICT Developments ..... 49

        HP’s Microdevelopment Finance Team ..... 60

        USAID, FINCA International and Visa Announce Microfinance Partnership ... 61

**References** ..... 62

**A few Websites** ..... 62

**Reports, Studies & Statements** ..... 63

The future of the IT industry lies not so much in the developed world, where markets are saturated, as in reaching the billions of people in the developing world who remain untouched by the information revolution. E-health, e-school and other applications can offer the new dynamic of growth for which the industry has been looking.

- Kofi Annan, *World Summit on the Information Society, Geneva 2003*

China is buying more than 10 million PCs a year, while India is buying about 2.5 million a year. To reach the next billion users in homes and SMEs in the world's emerging markets, the computer industry needs to innovate. The target market is large – consisting of 4 billion people, and according to a Financial Times report, 600,000 mid-sized businesses and 76 million small businesses globally. Just the SME market is worth about USD 140 billion in technology spending.

- *Emeric, weblog on emerging technologies, Sept 2003*

"All the experts tell me that business needs very smart and affordable technology, and that the 'killer app' continues to be Return On Investment"

- *Stephen J. Cole, Main Presenter, BBC (World Economic Forum, January 2004)*

"We have moved now to a need, and the actual possibility, to bring technology to the disadvantaged and disabled. A Personal Digital Assistant (PDA) with phone and camera, for example, will be capable of reading signs in other languages and interpreting them for those who cannot read or see, and remembering them for those who can't"

- *James R. Fruchterman, President and Chief Executive Officer, The Benetech Initiative, USA (World Economic Forum, January 2004)*

"There are more than 500 million Internet users worldwide, but 80 % of them are in the developed world. In the developing world, only one in every 50 people have Internet access compared with two out of every five in the developed world. But the digital divide as a whole is narrowing : In 2001, for the first time, there were more new mobile users added in the developing world than the developed one. There were four times as many fixed-line users."

- *Yoshio Utsumi, Secretary-General International Telecommunication Union (Asia-Pacific Regional Preparatory Meeting on WSIS, Tokyo, 13-15 January, 2003)*

"Technology should help advance society. Needs will drive us, not technology, especially for the developing countries."

- *Ahmed Mahmoud Nazif, Minister of Communication and Information Technology, Egypt (World Economic Forum, January 2004)*

Technology and infrastructure data profile in years 1997 and 2001								
Indicators	World		East Asia and Pacific		South Asia		Europe and Central Asia	
	1997	2001	1997	2001	1997	2001	1997	2001
Total population	5.8 billion	6.1 billion	1.7 billion	1.8 billion	1.3 billion	1.4 billion	473.5 million	474.6 million
Fixed lines & mobile telephones (per 1,000 people)	175	328.7 (87.82%)	61.7	207.4 (236.14%)	17.6	38.1 (116.47%)	202.0	375.0 (85.64%)
Personal computers (per 1,000 people)	53.8	86.2 (60.22%)	7.5	19.1 (154.66%)	2.1	5.3 (152.38%)	28.1	52.1 (85.4%)
Internet users (million)	95.8	501.5 (423.48%)	1.9	50.9 (2578.94%)	0.774	8 (933.59%)	3.1	18.8 (506.45%)

Plan Source: *World Development Indicators Database, April 2003.*  
Note: Figures in parenthesis indicate percentage changes as compared to 1997.

## LAST MINUTE CHINA NEWS...

### **Linux Rising in China**

*By Robyn Weisman, [www.EcommerceTimes.com](http://www.EcommerceTimes.com), Part of the ECT News Network, Jan. 30, 2004*

The Open Source Development Labs has announced its first Chinese member organization, which plans to work on the Linux kernel and promote Chinese adoption of Linux on the desktop.

Thanks to the Chinese government's support for open source, adoption could happen more rapidly than in countries like the U.S. One why Chinese companies tend to favor Linux and other open-source products is that the Chinese government wants more software to be developed in China, thereby creating jobs and improving the software import-export ratio. PC penetration is still very low in China. Over the next 10 years, many Chinese people will be getting the first PC in their life, and the Chinese government has a vested interest in having these PCs loaded with software developed in China.

### **US Firms Reap \$2 Billion China Telecom Windfall**

*By Keith Regan, [www.EcommerceTimes.com](http://www.EcommerceTimes.com), Part of the ECT News Network, Jan. 14, 2004*

Motorola emerged as the biggest winner, signing a \$556 million deal with China United Telecommunication, known as China Unicom, and a \$510 million contract with China Mobile Communications. The same two Chinese firms ordered some \$350 million worth of equipment, including packet switches, from Lucent and agreed to buy equipment and services from Cisco Systems, UTStarcom and Canada-based Nortel Networks. Meanwhile, Alameda, California-based UTStarcom won a \$200 million contract to provide its Personal Access System infrastructure to China.

"Given the amount of consolidation in the mobile industry, the big equipment providers need to open up new markets" said Yankee Group analyst Shiv Putcha. The Yankee Group has predicted that the overall Asian market for mobile users will grow far faster than the market in the rest of the world, averaging at least 12 % growth per year for the next four years.

### **Oracle Sharpens Asia Strategy with China Dev Center**

*By Keith Regan, [www.EcommerceTimes.com](http://www.EcommerceTimes.com), part of the ECT News Network – Oct. 30, 2003*

Oracle has opened a 2d business development center in China and has unveiled a program to help Japanese companies tackle this emerging marketplace. This center will offer China-based companies an opportunity to accelerate their emergence into the worldwide marketplace. The center also will allow Oracle and its customers and partners to work more closely with those emerging firms. The lab will focus on several key areas, including wireless technology, e-government solutions and location-based services, such as Geographic Information Systems.

Oracle is just one of many firms that have struck up relationships with the Chinese government in order to put a flag in the ground in what is widely believed to be the economic marketplace of the future. Intel recently announced it plans to invest at least \$375 million to build an assembly plant on the mainland, while AMD and eBay also have made recent investments in China.

### **The Mushrooming Chinese Internet Market**

*By Elizabeth Millard, [www.EcommerceTimes.com](http://www.EcommerceTimes.com), Part of the ECT News Network – Jul. 19, 2003*

When it comes to the Internet, China is no longer undiscovered country. Three Chinese portals are trouncing their U.S. rivals in the region, and investors are taking notice. However, although Sina Corp., Sohu.com and NetEase.com are beating U.S. rivals Yahoo, AOL Time Warner and Microsoft now, they were not always on top. The companies must contend with difficulties that go beyond a narrow revenue model: "Government

regulations, disregard for intellectual properties and increased competition are all barriers," Sina's Lin said. "Only the largest players will have the wherewithal to meet these challenges."

*Note: In Jan. 2004, Yahoo announced it will form a partnership with Sina.com to create an Internet auction site for the Chinese market.*



**LAST MINUTE INDIA NEWS...**

**Gartner estimate rates India as the fourth largest IT spender**  
*The Economic Times - July 13, 2003 (source: <http://www.infochangeindia.org/>)*

According to a Gartner estimate, India spent \$1.008 billion on IT in 2002, making it the 4th largest vertical spender on IT after the telecom, manufacturing and banking and finance industries. This compares favourably with other countries in the Asia-Pacific region, where the total spending on IT was \$15.2 billion. The government accounted for 9% of the total IT spend in India for 2002. This figure is expected to increase to 15% in five years. That establishes India as a serious force within the Asia Pacific region, whose combined spend was \$15.2 billion.

Though e-governance is only five years old in India, a dozen states already have an IT policy in place. The 10<sup>th</sup> Five-Year Plan, which highlights the role of IT as an interface between the government and the public, has given IT a fillip. Where less expensive solutions, based on the Linux operating system are available, these have been adopted in states such as Maharashtra, Goa and Madhya Pradesh.

But, while a beginning has been made, there's still a long way to go. For any IT project to succeed, infrastructure such as power, bandwidth and connectivity is crucial. Literacy levels too need to be enhanced if a lot of people are to benefit.

The best indication of whether e-governance is more than just talk comes from the willingness of IT companies to invest in the sector. IBM has set up an IBM e-governance centre in Gurgaon, near New Delhi, and Microsoft has been signing MoUs with state governments and working on solutions. The IT industry sees e-governance as the big growth area.

**A regional Indian mobile phone company drives up business and helps the poor at the same time**  
*<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/3256516.stm>, December 2, 2003*

Shyam Telecom has opted to take its phones to the people rather than wait for them to come to it. The company, Shyam Telelink, has installed phones offering its cellular services in 200 cycle-rickshaws in Jaipur, the state's capital. The rickshaw drivers pedal their rickshaws around the city and the surrounding countryside where phone services are few and far between, offering locals mobile telephony under a service the company has called 'Chalta-Firta (mobile) PCO'. The rickshaws are also equipped with a battery, a billing machine and a printer. A two-minute call costs Rs 1.20.

Most of the rickshaws are operated by women and disabled persons. Of the women drivers Vohra says: "We want them to be self-sufficient, we want them to take pride in themselves and we want them to revel in the glory of being financially independent." While the drivers are not paid a fixed wage, they get a 20% commission on every call made from their rickshaws. Many earn a significant Rs 6,000 to Rs 9,000 per month. The telecom company does not charge for the initial set-up, the cost of which is around Rs 75,000 for the tricycle and equipment. The drivers are free to cycle anywhere in Rajasthan where there is business. They can fix their

**WHERE CHINA IS WAY AHEAD...**

**GROWTH** GDP has risen an average of 8% for the past decade, compared with India's 6%.

**INFRASTRUCTURE** Highways, ports, power sector, and industrial parks are far superior.

**FOREIGN INVESTMENT** China lures \$50 billion-plus a year. India gets \$4 billion.

**EXPORTS** \$266 billion reported in 2002 was more than four times India's total.

**...WHERE INDIA HAS THE EDGE**

**LANGUAGE** English gives India a big edge in IT services and back-office work.

**CAPITAL MARKETS** Private firms have readier access to funding. China favors state sector.

**LEGAL SYSTEM** Contract law and copyright protection are more developed than in China.

**DEMOGRAPHICS** Some 53% of India's population is under age 25, vs. 45% in China.

Source : <http://www.businessweek.com>



own routine and working hours, though the average shift is around eight hours a day.

“The operator gets traffic on (his) network, the driver gets a commission and the consumers get access to affordable calling,” says Jane Zweig, an international telecom analyst.

In a country where teledensity is a mere 5%, this approach to mobility is definitely on the button.

## I. THE IT SECTOR IN INDIA & CHINA

### A. QUICK OVERVIEW: FACTS & NUMBERS

#### Deloitte Reports Highlight 10 Trends For Revenue Opportunities In Wireline And Wireless Technologies

<http://www.tmcnet.com/usubmit/2004/Jan/1023240.htm>, Jan. 27, 2004

Ten mobile and wireless predictions in 2004 outlined by the Deloitte report:

1. Voice will continue to dominate cellular mobile's revenues and profits.
2. Cellular mobile data growth will slow, dragged by stagnant consumer text messaging growth.
3. Cellular mobile penetration rates will continue rising.
4. More 3G, but not yet for the masses.
5. Mobilizing the enterprise will spread but remain niche.
6. Push applications will be far more effective than pull applications for cellular mobile.
7. The mobile Internet, as a major revenue stream, remains an aspiration.
8. WiFi hot spots will remain more froth than substance.
9. Wireless LAN will have most impact in non-office enterprise environments and homes.
10. Color and polyphony will enhance the mobile phone's personality and drive revenues.

#### ITU Digital Access Index: World's First Global ICT Ranking

*Education and Affordability Key to Boosting New Technology Adoption, Nov. 2003*

According to the first global index to rank Information and Communication Technology (ICT) released by the International Telecommunication Union in November 2003 and covering 178 economies, the top nine are exclusively Asian and European. The DAI combines eight variables, covering five areas, to provide an overall country score. The areas are availability of infrastructure, affordability of access, educational level, quality of ICT services, and Internet usage.

Most of those in the upper category have used ICTs as a development enabler and government policies have helped them reach an impressive level of ICT access. The four Asian Tigers have made the greatest progress in ICTs over the last four years. The results suggest that English is no longer a decisive factor in quick technology adoption, especially as more content is made available in other languages.

ITU Ranking		
1	Sweden	0,85
2	Denmark	0,83
6	Netherlands	0,79
7	Hong Kong	0,79
8	Finland	0,79
9	Taiwan	0,79
16	Luxembourg	0,75
17	Austria	0,74
18	Germany	0,74
20	Belgium	0,74
22	Italy	0,72
23	France	0,72
31	Macao (China)	0,64
76	China	0,43
111	India	0,32

The results of the International Telecommunication Union's new Digital Access Index suggest that it is time to redefine ICT access potential. "Until now, limited infrastructure has often been regarded as the main barrier to

Digital Divide in Internet use in 1998 & 2000		
	Internet users (% of population)	
	1998	2000
East Asia & the Pacific	0.5	2.3
South Asia	0.04	0.4
US	26.3	54.3
Eastern Europe & the CIS	0.8	3.9
High income OECD (excl. US)	6.9	28.2
World	2.4	6.7

*Source: HDR, 2001*

bridging the Digital Divide," says Michael Minges of the Market, Economics and Finance Unit at ITU. "Our research, however, suggests that affordability and education are equally important factors." To measure the overall ability of individuals to access and use ICTs, the ITU study has gone beyond the organization's traditional focus on telecommunication infrastructure, such as mobile phones and fixed telephone lines.

Research has also shown that Internet use is closely linked to education. In China over half of all Internet users are university educated. To acknowledge such findings, the Index includes a number of new criteria, such as school enrolment and Internet tariffs as a percentage of income.

ITU's efforts to identify indicators for measuring ICT access reflects a growing trend by the international community towards the use of transparent and concrete measurements for monitoring country performance. The United Nations has adopted a set of development targets, the Millennium Development Goals (MDG) and associated indicators to monitor progress towards the reduction of poverty, hunger and other areas. Access to ICTs is included in the MDGs and laid out in Target 18: "In cooperation with the private sector make available the benefits of new technologies, specifically information and communication."

### India ranks 87th in UN' s e-readiness index

*www.un.org, Nov. 4, 2003 ; Deccan Herald, Nov. 5, 2003*

India ranks 87 out of 171 countries, and is far from wholly implementing e-governance, according to the UN World Public Sector Report 2003: E-Government at the Crossroads, released on November 4, 2003. This is largely due to the Indian government's failure to pay sufficient attention to information and communications technologies (ICT) in the past, it claims.

While the report acknowledges that several states have embarked on various e-governance initiatives, the large digital divide among India's population is hampering its progress in providing public services via the Internet.

India ranks 32nd in the Web measure index which measures the attitude of governments towards using e-governance as a means to inform, interact, transact and network with the public. Security and privacy issues can discourage potential users. Disadvantaged groups like the poor and, in some cases, women lack access to computers. Even among those with Internet access, only one in five, or fewer, engages in online communication with a government, the report says.

INDIA	
Key Indicators	
population 2002 (million)	1042
main telephone lines in operation 1999 (million)	41,42
growth (1999-2002)	56%
cellular mobile telephone subscribers 2002 (million)	12,69
growth (1999-2002)	573%
personal computers 2001 (million)	6
growth (1999-2001)	82%
internet users 2002 (million)	16,58
growth (1999-2002)	492%

## Emergence of the I&C sectors in India

By Aditya Dev Sood, <http://www.infochangeindia.org/>, Sept. 2003

As is well-known by now, India's IT sector took-off in the early-1980s with the establishment of off-shore development centres. Relatively cheap English-speaking engineering and technical talent were employed at centres in Bangalore and Chennai, then Hyderabad, and now in the suburbs of New Delhi (NOIDA). Since the liberalisation 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 next year, much of it to the United States.

As of 2001, 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 been applied towards the development of 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 costs 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, inhibit such ventures.

Despite the on-going deregulation of India's telecommunications sector, its national teledensity (telephones/100 persons) has improved very slowly, from 0.06 in 1990, to almost 3 today (compare with China at almost 10). Voice over Internet Protocol (VoIP), and Wireless-in-Local-Loop (WiLL or WLL) technologies, however, now appear set to offer a cheaper and lighter form of telecom infrastructure, that should improve rural access exponentially. With some important exceptions, the export-oriented software industry has yet to take full advantage of the opportunities presented by the newly networking home market. The still-unexplored synergies between the infotech and telecom sectors represent the best opportunity for an ICT-driven social and economic revolution in rural communities across India.

*"India is adding 1.3 million subscribers to mobile telephony every month and has already laid out 500,000 kilometers of fiber optic network"*

- A. Shourie, WSIS, Dec. 2003

## Chinese Internet Surfers Hit 80 million

China Daily January 16, 2004

China's Internet community has multiplied 128 times in a little more than six years, new statistics show. There are now about 80 million netizens in the country, a drastic jump from the 620,000 users recorded in 1997, the China Internet Network Information Center's latest report (CNNIC) shows. The number grew to 79.5 million by the end of December 2003. About 11.5 million new users were recorded in the second half of last year, a

growth higher than the 8.9 million recorded in the first six months of 2003. China's Internet population surpassed Japan by the end of 2002, jumping to the second in the world following the United States. Although large in size, the current number is only 6.2 percent of the country's total population.

The figures were released by the government-funded CNNIC in its 13th semiannual report, the most authoritative data on the Chinese Internet industry.

The report shows that 30.9 million computers are connected to the Internet, up 20.1 percent from half a year ago. There are almost 60 million websites, up 25.7 percent. The domain names with a suffix ".cn," which indicates their Chinese nationality, has grown 35.7 percent to above 34 million. "This trend shows organizations and Internet users in China have recognized the advantage and value of the domain name," the report says.

Although young people still account for the majority of Internet users, the makeup of the age groups has been changing. In 1998, 91 % of all netizens were between the ages of 18 and 30. By the end of last year, that number had dropped to 51.3. At the same time,

the percentage of netizens younger than 18 has grown to 18.8. Some 14.2 million adults aged older than 35 have joined the army of Internet surfers in the past six months, expanding the group's share to 17.8 %. This group includes some 3 million senior citizens aged 50 and above. Students and technicians still make up the main body of the Internet community, respectively accounting for 29.2 and 13.7 %. The proportion of male and female Internet users remained at about 3:2 during the past two years. If the number of people with Internet connections rose, so did the amount of time they spend online. The average time people spend connected rose to 13.4 hours a week. Most, 66.1 %, surf the Internet at home.

But what are all these people doing online? Surveys conducted by CNNIC show most people are using the Web to obtain information, including news, e-books and daily life information. It is interesting that using the Internet for leisure ranks second among users, more than study, getting to know friends, research or sending or receiving e-mails. Shopping online or doing other e-businesses accounted for only 0.4 percent of Internet usage.

CHINA	
Total Population 2002	1,3MM
Urban Population	36,70%
Adult illiteracy rate	14,20%
Literacy in English	12,70%
Consumers among the population	15%
Population living on less the \$1 a day	106 M
GDP 2002	9%
Telecom Growth 2002	14%
Fixed Line Suscribers 2003	260M
Mobile Suscribers 2004	270M
Beijing Mobile Penetration 2003	75%
Central/Western Provinces Mobile Penetration	15%
Netizens 2003	80M
Net Penetration	6,20%
Web-connected PCs 2003	31M
Home-connected PCs 2003	66%
18-30 years' old netizens	51%
number of Chinese websites	60M
websites in chinese	92%
websites in english	7,60%
Students and technicians netizens	43%
Farmers netizens	1%

EUROPE'S 15 COUNTRIES (2002)	
POPULATION	379M
NETIZENS	126M
NET PENETRATION	33%
RURAL ZONES NETIZENS	48%
URBANIZED NETIZENS	52%
MOBILE SUBSCRIBERS	284M
PENETRATION RATE	75%
<i>Source Journal du Net</i>	

Despite the growth, analysts fear the development of information technology and its application is disproportioned across the country.

About one third of the population in Beijing and Shanghai are netizens, but in poorer areas such as Henan, Guizhou and Inner Mongolia, only 3 or 4 % are online. The gap between the rich and poor is also reflected in the figures. Farmers, for example, account for less than 0.8 % of the country's netizen community.

## **The Dragon's Revenge: Tough Times for Telecom Vendors in China**

*BCG Publications – Communications&Technologies Expertise, Oct 2002*

In 2001, Motorola's revenues in China totaled \$5.6 billion-equal to the company's sales in all of Europe and nearly three times its sales in Japan. Nokia had sales of about \$3 billion and sold more in China than in any other country except the United States.

The opportunities are changing quickly, however. Several factors-including slower revenue growth, industry restructuring, postponements of capital spending, and delays in the issuance of new licenses-are making the country's domestic market more challenging for established equipment vendors. China's market is becoming tougher on a number of fronts. First, in both the fixed-line and mobile businesses, there has been a noticeable slowdown in both revenue growth and near-term capital spending, there have been shifts in investment priorities-away from traditional network deployment and improvement and toward the creation of new services and improved customer-service capabilities.

The delay in the issuing of new licenses to mobile operators, disappointing adoption rates for CDMA mobile service further reduce the likelihood that major new infrastructure investments will be made in the near term. Finally, there is the general impact of competition among China's telecom operators and pressures from the investment community. We are also witnessing the rapid rise of China-based telecom-equipment vendors. Some of these companies are already major players in their home markets and have begun to pursue global ambitions.

The recent developments in China's telecom market and the new competitiveness of Chinese vendors have dramatic implications for established equipment vendors. For companies looking to succeed in this new environment, there are several critical steps that must be taken:

- Realign your product portfolios to target new areas of growth Among the most interesting areas are PHS equipment and handsets, metropolitan area networks, selected elements of next-generation networks, and billing and customer care systems.
- Take advantage of the new regulatory environment to improve efficiencies. Most established telecom-equipment vendors set up their China operations based on regulations that existed a decade ago. Most players are now putting new investment into wholly owned companies rather than joint ventures.
- Restructure your local operations in response to the changed economic environment. Successful companies will need to find ways to cut costs significantly. They will also have to bolster their capabilities in marketing and in sales of new products, and improve their relationship-management skills
- Prepare for intensified global competition from China's emerging equipment vendors. On the one hand, the companies are effective at licensing technologies and cooperating with competitors; on the other, they have shown that they can attack overseas markets on their own.

The conditions for doing business will become increasingly difficult as local equipment suppliers gain market experience and jockey for position. Advantage will go to players that recognize the new realities and act upon them quickly and effectively.

**B. POLICIES & RECOMMENDATIONS FOR ICT SECTOR DEVELOPMENT**

**India Information and Communications Technologies Blueprint**

*Prepared for the For the India Summit of the World Economic Forum New Delhi, Nov. 2003*  
 - <http://www.weforum.org/pdf/India/it.pdf>

Despite the many successes of the past decade or two, significant challenges remain for the Indian ICT sector:

1. The sector is very dependent upon one market – the USA. In 2001-02, the USA represented around 66% of total Indian software exports. The UK came in second with a 14% share of Indian software exports<sup>5</sup>. Large parts of the world remain under-exploited by Indian firms. For example, France (0.58%), Germany (2.58%), Japan (2.5%) and China (0.05%) all represent important markets where much more can be done.

*[As a benchmark, in 2001 the USA represented about 45% (about US\$ 170 billion) of the global IT services market (with an expected growth rate of 12-13% in the medium term), Europe and Asia accounted for approximately 30% and 16% respectively of the global IT services market (with growth rates of around 11% for each).]*

2. The focus of Indian ICT firms has been on exports – with the domestic IT services market constituting only around US\$ 1 billion in 2001-02 compared to the US\$ 7.8 billion exports market. Due to multiple reasons, including a high level of regulation in many sectors, government apathy to computerization initiatives and high tariff rates for hardware, domestic investment in ICT has been stunted. India currently spends a small fraction of its GDP on IT – about 1.1% – when compared to the US which spends 5% of its GDP on IT or France which spends 2.7% of its GDP on IT. NASSCOM estimates that in 2002-03, the growth in the Indian domestic software market will actually decline to around 13% from about 18% the previous year.

3. The level of hardware penetration in Indian businesses is low. The spending on non-PC based servers in India in 2001-02 was only US\$ 643 million. At an aggregate level, the entire segment of hardware, peripherals and networking comprises around 22% of the total IT market in India and is inadequate for supporting both software and services exports (60%) and domestic software and services (15%). As a benchmark, hardware constitutes about 85% of China’s IT market and is expected to support dramatic IT services growth in excess of 50% over the next years. The average computer (CPU) utilization in the Western world is around 1%, whereas the utilization figure in India is closer to 80%. Consequently India has many small servers being used for big projects.

4. For society in general, the penetration of PCs (9 per 1000) and the Internet (about 16.5 million subscribers) is very low in India, even when compared to other developing nations such as China (34 per 1000 and about 68 million respectively). This is partially due to high hardware costs. India has one of the highest tariff rates for PCs, forcing about 63% of the total PC market size of 2 million units to be operating in the grey market. While it would take about 12 days of per capita income to buy a PC in the USA, it would take about 4 months in China and about 2 years worth of per capita income to buy a similar PC in India. The low level of PC and Internet penetration in Indian society combined with low investments in ICT by domestic companies has retarded the growth of electronic commerce in India.

ICT in India
- ICT market share of GDP in 2003 : 3,15 % (1,22% in 1997) <i>[Source: NASSCOM Strategic Review 2003]</i>
- Size of the IT market in 2003: US\$ 16,4 billion (US\$ 5 billion in 1997)
- Software exports: 20% of India's total export in 2003 (5% in 1997)

**The rapid rise of China is an important influence on India’s future ICT strategy.**

Though India has had a head-start in ICT, China has the capabilities for rapidly expanding its ICT sector – a large pool of trained technology graduates, high(er) levels of PC and Internet penetration, a well developed domestic ICT sector, good infrastructure and favourable government policies. Industry experts estimate that by 2007, China will pull in US\$ 27 billion for IT services, including call centres and back-office work, matching India. While China will eventually compete with India in certain segments of ICT services, China also



represents an important opportunity for Indian software firms. For example, multinationals expanding in China need reliable software support. China is also a good hub to serve Japanese and Korean multinationals. Analysts predict that Indian firms may eventually control about 40% of China's IT services exports.

The best-case scenario for the Indian ICT sector would be that India develops a global excellence in selected domains of technology and/or process management and maintains a lead in these domains over both developed countries and alternate offshoring locations such as China. That the Indian ICT sector continues to aggressively move forward on its path of technology leadership. That building on its successes of the past decade, Indian firms stake out leading positions in new domains of software technology. That disruptions in technology such as Web services lead to fundamental changes in computing architectures. That firms in developed nations have little choice but to depend upon their trusted ICT partners in India to develop the software for the new class of application services. That Indian ICT firms successfully leverage China's enormous opportunities and that software centres in China not only allow firms to serve China's domestic market but also to use the country to serve as a springboard to serve Japan, Korea and other countries in the Far East.

**This "high scenario" requires that:**

-Customer demand: Disruptive technology creates new challenges for customers. For example, Web services transform software from a product to a service. This calls for a rethinking of the core software applications of organizations. The complexity of the task is enormous and it involves solving associated issues such as security management and the creation of support systems (such as billing, etc.). Customers need help to both design the systems as services and to also rethink how these services will now interact with their customers. In parallel, the need for flexible and high quality process management – including process hosting and re-engineering skills – intensifies among global corporations. They seek both value-adding domain specific competence and software execution capabilities from their trusted partners.

-Collective leadership: The Indian ICT sector can see the writing on the wall. If the status quo is maintained, India will be overtaken by China in less than a decade. The realization emerges that margins will continue to decrease in BPO and rapid growth in that sector alone cannot save the day. Top management becomes aware that the Indian ICT sector's best hope for the future lies in developing and exploiting unique technological competence that cannot be matched easily. A collective leadership among key business and government stakeholders emerges to take the ICT sector to the next level of technological excellence.

Other major prerequisite are:

-Indian ICT firms need to make innovation and global leadership their core strategic focus. In particular they will have to invest in research and development to be at the leading edge of technology and business practice.

-Strong partnerships need to be nurtured across Indian ICT firms and leading Indian universities and institutes of technology. Centres of innovation have to be created to both create new knowledge and educate students in the frontiers of technology practice.

- China has to be viewed more as an opportunity and less as a threat. Indian ICT firms have to aggressively enter the Chinese ICT market to diversify domestic operational risks, to serve the domestic Chinese market and also to benefit from the unique advantages of the Chinese ICT market (such as lower cost labour).

## **China Business Summit Report**

*World Economic Forum, 2002*

### **Developing Technology for China's Competitiveness**

A particularly critical area for China's economic development is the economy's readiness for the networked world. As Bruno Lanvin, infoDev's Programme Manager, emphasized in the workshop, fighting the digital divide provides an important avenue by which to reduce the broader, more complex, and deeper development

divides. But how broad is China's digital divide? What are the key factors responsible for it? And how can the digital divide be bridged?

The Forum's new Global Information Technology Report ranks China 64th on a global networked readiness scale that includes 75 countries. However, as the workshop discussed in greater detail, this summary indicator masks the fact that in some areas considerable progress has already been achieved, while in others key challenges remain. A deeper analysis reveals, for example, that PC connectivity in China continues to be relatively low, few software products seem to fit local needs, the regulatory burden is perceived to be high and software piracy represents an important problem.

On the positive side, a point which was reemphasized by Gao Shiji, Director of the Institute for Economic System and Management (SCORES), the Chinese Government has recognized ICT as a major driver of China's global competitiveness. As Gao stressed, this commitment was demonstrated by China's heavy investment in telecommunications infrastructure, especially fibre-optic cables, and significant growth in teledensity. Along with this, the government has actively supported the growth of the mobile telephony market, a policy whose importance was echoed by Luis Enriquez, Associate Partner, McKinsey & Company, United Kingdom, who provided a comprehensive analysis of telecommunications deregulation from a global perspective.

Notwithstanding these achievements, however, there was general agreement that probably the authorities' most important challenge continues to lie in ensuring equitable distribution of access to ICT in a country that remains characterized by islands of prosperity amidst great poverty. Clearly, the fact that ICTs are an overall priority for the government has to be seen as a very positive sign. But as participants stressed in concluding the workshop, making this strategy work will require embedding it in an overall market-oriented reform process.

### **The Future of the Internet and E-businesses in China**

Despite the recent bursting of the technology bubble and the demise of countless e-businesses in China and around the world, the general consensus was one of optimism for the future of the Internet in China.

E-business is seen as having potential not only in its own right, but also as an enabler of development in other industry sectors. In his opening comments Daniel Miklovic, Vice-President and Research Director, Gartner, USA, said that "nothing can change an economy, any economy, more than the Internet", and invited the panellists to explain how they see new-economy technologies impacting on China.

Edward Zeng, Chief Executive Officer, Sparkice, People's Republic of China, emphasized the extraordinary growth rate of telecoms and the Internet in China to date. By the year 2000 China had the largest number of fixed-line telephones in the world; in 2001 it overtook the United States to become the number one mobile market; this year it is expected to take the lead in broadband users, and by 2005 Zeng predicts it will be the global leader in terms of both online population and ecommerce. However, an increase in users is not the only key to the growth of e-business. Zeng explained that businesses must also make efficient use of China's traditional strengths, for example in its unparalleled manufacturing base, to further the expansion of the economy.

Professor Zeng Ming, INSEAD, Singapore, outlined what he sees as the major challenges facing Chinese e-businesses. Many require not only IT infrastructures, but also basic organizational company structures. Developing the two simultaneously can be a considerable hurdle. They also need to improve their managerial effectiveness – low manufacturing costs are no longer sufficient – a task that can be facilitated by the Internet. Finally, these companies need to develop new business models to make best use of the two most potent forces for change in China today: IT and the WTO. "They have to find how to use these new tools to compete in a changing world," he concluded, "and to find a Chinese way to manage this new technology".

### **Telecommunications: Managing the World's Largest Mobile Market**

Despite the fact that China's telecommunications market is the largest in the world, many challenges present themselves for making the industry sustainable and profitable. H. Brian Thompson, Chairman, President and Chief Executive Officer of the US-based Universal Telecommunications, introduced this topic and others in his opening comments. He elaborated that China faces a series of unique challenges and opportunities, not only in the development of the mobile telephone market, but also in the development of applications and hardware that drive the market. He asked the panellists to explore the topic of technological developments relevant to China.

Shi Jixing, Chairman of the Board for Eastern Communications Co., People's Republic of China, gave an overview of the potential for 3G technology in the Chinese marketplace. Although 3G is still in its infancy, Shi believes that the potential for development in China is immense. While many entrepreneurs question the wisdom of introducing the technology into the Chinese marketplace, citing sluggish performance in the US and Europe, Shi felt that this is precisely what gives China a unique edge in 3G development. If a percentage of the 4 to 5 million people who become new telecom consumers in China each month can be persuaded to use 3G technology, China can become the world's leader in the 3G marketplace. He concluded, "Opening of the 3G marketplace [in China] will provide strong impetus to the global telecommunications industry."

hardware that drive the market. He asked the panellists to explore the topic of technological developments relevant to China. Ronald J. Spithill, President of the PRC-based Alcatel Asia Pacific, reported that his company is also involved in bringing 3G technology to China, and predicted that the challenge, not only with that technology but with the telecommunications industry as a whole, lies in "creating profitable, sustainable business models". He expanded on Chen's proposition that telecom platforms will become integrated by venturing that IT companies themselves will become integrated. Successful companies, he said, will combine technical and business skills, integrating infrastructure, content generation and delivery, and service. To that end, his company has established "3G Reality Centres" throughout the region that provide region-specific content to its customers.

Edward S. Tian, President and Chief Executive Officer of China Netcom Corporation, expanded on the theme of profitable business models by speculating that, in the future, customers will pay for telecom services in a different way than has previously been seen. Traditionally, customers have paid on a rate based on distance and time of use. With the advent of free or extremely low-cost e-mail and other Internet communications options that render these considerations irrelevant, telecommunications companies must look to a different revenue-generating paradigm. This paradigm, he said, is first predicated on the expansion of broadband infrastructure. After that, customers will pay for quality, class of service and the kind of content provided. He drew parallels between the PC industry of 20 years ago and today's telecommunications industry – with the exception that now, after more than 20 years of reform, China is at the forefront of this revolution. "Can we live up to the challenge of producing international-standard service in terms of manufacturing and carriers?" he asked. "This is both an opportunity and a challenge" for the Chinese telecommunications industry.

### **Ensuring IT remains in Indian territory**

*A. Shourie, Minister for ICT and Privatization, Government of India  
January 2004, Indian Express, <http://www.indianexpress.com> [excerpts]*

Just 600,000 persons working in our information technology sector today create \$ 16 billion worth of wealth every year. IT exports are liable to touch \$ 13 billion this year - that is, in spite of recessionary conditions in their principal markets, our IT professionals and firms will earn about Rs 60,000 crore for the country in foreign exchange. Those earnings will account for over one-fifth of our total exports. Such figures represent phenomenal, spectacular growth: 15 years ago the activity was hardly known; just five/six years ago the figure was not \$ 16 billion, it was \$ 5 billion.

- India and Indians have contributed significantly to the growth of this field - one-third of the start-ups in Silicon Valley were by Indians.
- We are today one of the principal knowledge-generators in this field - over 100 of the Fortune 500 companies have set up R&D centres in India. Among these are some of the world's cutting-edge IT firms - Intel, IBM, Microsoft, Motorola, Hewlett Packard, SAP, Sony, Samsung, Texas Instruments. Each of them relies on and seeks to avail of India's strengths in IT.
- We export IT and IT-enabled services to over 133 countries. Our firms are training people in IT in 55 countries. A single Indian firm - NIIT - today runs 100 training centres in, of all places, China. The government itself is setting up training centres for people in other countries.
- Our IT firms have become standards of excellence: today three-fourths of the world's CMM Quality level V companies are in India.

**Indian infotech needs to partner east Europe, target China**

First and foremost we have to remember that in today's world no one can afford to rest even for a moment. Especially not in a sector in which technological and other forms of change are as swift as they are in information technology. Recall what happened in Silicon Valley — in a moment so many stars shot off the sky. Recall that the other day Ireland was one of our main competitors in software; it still is today, but it is also a country firms like Wipro now view as a potential market.

Next, the one way to counter the backlash that is welling up is to provide services of such quality, at such cost that the firms in US, Europe etc, that use them become lobbyists for us. They should be telling their contacts in those governments and legislatures that they will be rendered uncompetitive if they are prevented from accessing India.

That is what happened in manufacturing vis a vis China: American firms that had invested in China, American firms that were importing from and exporting to China are the ones that worked overtime to ensure sanctions were not imposed on that country in the wake of Tiananmen, with the severity many were urging.

	<b>Increase in ICT expenditures</b>			
	Total ICT expenditure (million USD)		ICT expenditure as % of GDP	
	1995	2001	1995	2001
China	20	66 612	2.9	5.7
	401	(226.51%)		
India	7	19 662	2.1	3.9
	250	(171.2%)		

*Source: Development Data Group, World Bank*

Third, we must go on diversifying our markets. The figure we encountered earlier — that the US accounts for 60 % of our IT exports — is not something that should by itself discourage us: perhaps the US accounts for some similar proportion of the use of IT as a whole. But it should caution us. Germany and Japan are the obvious markets we should target: Germany's IT market is worth \$ 66 to 70 billion; our IT exports to Germany are only \$ 250 million — that is, if you accept our figures; they are just \$ 50-55 million if you go by German figures. And as countries like Cyprus, Bulgaria and others join the European Union, forming strategic alliances with their companies, even setting up subsidiaries there can help us vault over such tariff or non-tariff barriers that may be set up in the coming years. They have strengths — for instance, in mathematics.

We have strengths from which they can gain — for instance, entrepreneurial skills as well as good knowledge of the markets that have to be targeted. “And frankly,” says an Indian IT executive who has long worked in Europe and knows it well, “there is racialism. Mounting a campaign, ‘Our jobs are being taken away by Indians’ is easy. Mounting a campaign, ‘East Europeans are stealing our jobs’ will be difficult. Others within Europe will muffle those voices.” So, alliances with those who will be joining the EU. And there is no time to lose — some of them join from the coming May.

One other potential market is the host of western firms that have set up operations in China. Many of our major software generators supply various kinds of software services and products to their principals outside China: given the fact that they already know the acumen of our firms and professionals, their subsidiaries in China will feel quite comfortable in assigning work to our firms. Fourth, we can be certain other countries will learn to provide several of the types of services that we have been supplying. And each of them will have advantages of its own. For instance, that we know English has been one of our advantages. Little Mauritius, as its professionals pick up IT, will have an advantage in accessing the French market: Mauritians speak French as

their mother tongue. The Chinese will soon overcome English: and they will do so with the focused pursuit that has become their hallmark — a report said the other day that they had imported 20,000 teachers of English, and that many of them had been deployed in the IT industry; another report said they had decreed that every taxi driver — that should actually read “even every taxi driver” — in Beijing would have to be fluent in English by the time the city hosts the Olympics four years from now.

The lesson is obvious: formidable as our achievements are, as others will start doing what we have been doing, we must continually aim to provide ever more complex IT services and products. And we can do so. After all, we are among the half a dozen countries that put satellites into space; we are among the few that have manufactured guided missiles; we are among the three or four that have put supercomputers together on their own; we are among the few that have developed nuclear weapons; our scientists have done excellent work in imaging from space.

Each of these tasks has required software of high complexity. Far from sharing the requisite technologies, software etc, other countries have done everything they could to deny them to us. All of the required software and hardware have been devised by our own professionals. So, our scientists and IT companies can. Indeed, apart from moving to more complex IT products, we should move to integrating the software services we provide with providing complete business solutions. Recall what Indian professionals were able to do to turn the Shinsei Bank around in Japan. There is much that our IT firms can learn from the sort of mutation a firm like IBM is going through. We think of IBM as a company manufacturing computers. The fact is its computers are not “manufactured” at any one site now. What it does by way of hardware is better described as “assembly” — of components produced in many countries. Even more significant, providing hardware is itself becoming an activity that describes the past of IBM.

The Economist reports, “Big Blue (IBM) expects profits to migrate to software and services, and is managing its product portfolio accordingly. For example, it has sold its hardware drive business and acquired the consulting arm of Pricewaterhouse Coopers, an accountancy firm. Slowly but surely, IBM is morphing from a technology vendor with a strong IT-services arm into a business consulting firm that also sells software and hardware.” (The Economist, May 10, 2003).

We have much to gain by vastly extending the range of non-IT services that are provided via IT. Lawyers and chartered accountants are ever so expensive in the US and Europe. You just have to get our young graduates of the National Law School to bone up on American or German law, or our accountants to learn the particulars of accounting practices in those countries, and they will provide the high-flying legal and accounting firms there the kind of research and back-up assistance they can’t dream of.

And thanks to the advances in IT and telecom infrastructure, that assistance can be provided in realtime, online. The same goes for medical diagnosis and counselling. And for a host of other specialisations.

But there is a prerequisite. A country cannot go on doing increasingly complex things in thin air. Unless institutions of higher learning maintain standards of excellence, and unless they produce persons of requisite quality in large numbers, the country will not be able to maintain such lead as it has acquired. F.C. Kohli, one of the pioneers of the IT industry in India, began a presentation the other day with a telling figure. “A few institutes like IITs together produce about 2,500-3,000 top class first degree engineers. About 2,000 migrate abroad, another 500 opt for business management.” You can infer how many will be left at the end of the stream for scholarly work in their disciplines. The numbers signing up for basic sciences — mathematics, physics, chemistry — has been falling at an alarming rate. Such trends have to be reversed. Many proposals for doing so have been advanced. Among them is the elementary one — of multiplying the sheer number of persons in such disciplines that we turn out: Kohli and his associates conducted a most imaginative analysis of the gap that exists between one of the best institutions in Mumbai and the regional engineering colleges in Maharashtra. And he has devised a concrete —and inexpensive — plan to upgrade the latter so that the number of engineering graduates can be multiplied ten-fold.

Similarly, the smallest changes in governmental regulations will cause a flood of private investment to come into institutes of higher learning. Why should we have just five IITs? Why should we have only half a dozen IIMs? Why not 50 of each — and each of the standard of the present ones? Reforms in this sphere will repay the government’s efforts a hundred-fold in no time. And unless they are brought about swiftly, India will not attain the leadership we talk about in fields like biotechnology, indeed it will lose the lead it has established in IT also.

Several kinds of steps are being taken to counter the backlash:

- NASSCOM as well as our embassies are working with companies that are locating operations in India, and with their associations. Together they are documenting — to senators, to governors, to their staff — the advantages that have accrued to the US economy, for instance, as a result of the services that Indian IT companies have provided. A recent study by the McKinsey Global Institute estimates that every dollar's worth of labour cost outsourced by US firms creates \$ 1.45 to \$ 1.47 worth of wealth worldwide. A full \$ 1.12 to \$ 1.14 — that is, 75 to 80 % — of this comes back to the US: not just in reduced costs — McKinsey estimates that costs get reduced by 45-55 per cent of initial costs of the operation, by 65-70 % once the business processes too are re-engineered; not only in increased revenue — because of the huge reduction in costs, American firms can now go after unpaid amounts that were earlier too small to pursue; on top of all this, the off-shoring provides orders for US firms — a call centre is set up in India, telecom equipment for it comes from

...

- We have to redouble coordination with countries that have as much interest in accessing western markets as us — including many that are competing with us for this space: China, Mexico, Brazil, South Africa. As happened at Cancun, together we have to convince the developed countries that we will not open our markets for goods if protectionist walls are put up to block services.

There are other things to which we must pay special attention lest we give a handle to those who are campaigning against outsourcing. An American expert well versed in IT trends in the US, and one sympathetic to India, illustrated this by what he told me the other day. "You are just one privacy incident away from disaster," he said, pointing to the urgent need for our firms to ensure that the data they receive, the processed data they send back is completely secure.

He pointed to a chilling instance: a firm used to get medical data transcribed by qualified persons in prisons: one of the persons handling the data threatened to use it in an unauthorised way, and that was the end of the arrangement.

### **What should governments be doing to help the IT industry grow even faster?**

The phenomenal success in IT is the result primarily of the enterprise and innovativeness of our entrepreneurs and young professionals, and of private firms that have spread computer literacy to millions. Government initiatives and incentives have also played a major role. By count there are almost three dozen fiscal incentives the Government has given to the software industry — the very ones the industry itself has urged would help it the most. Similarly, the Government has set up 39 software parks. In these, IT firms get all the infrastructure and services they require at one go. About 3,500 firms operating from these parks export Rs 37,000 crore worth of IT products and services — that is, about 80 % of IT exports.

In a word, the sector is a model of government-private partnership. Some of the things the Government has to do in the coming months are implicit in the foregoing — for instance, our embassies and chanceries in the US and Europe must continue to work together with NASSCOM and other organisations to staunch the backlash.

The Government has to continue to, and is continuing to, improve the infrastructure the industry requires. Work along other coordinates is also proceeding apace. Attitudes too have changed: government personnel do realise their task is to enable entrepreneurs and technicians to do even better. But every other week I come across some facet that reminds me this is one area in which the governmental structure can be more forthcoming:

- IT professionals do not make much distinction between night and day: in part because they are young, in part because they get seized by the problem on which they are working, in part because when at night they are home it is day for their client in, say, the US.
- Clients from Europe are loath to spend extra hours, sometimes a day changing flights in Mumbai, to get to Bangalore; they require daily direct flights to Bangalore.
- Firms that operate from multiple locations have complained of problems with local customs officials about soft-bonding of components.

- For persons in this industry, as for many others, a laptop is as much of an accessory as a pen, as a mobile phone. But our regulations require that, each time we go abroad, we have particulars of our laptop stamped on our travel documents.

Such examples can be multiplied. Many of them are minor. Governments must attend to them nevertheless — in part because they are irritants; even more so, to convince those who are doing so much for the country that the governmental structure is sensitive to their needs — I would hope, to an extent even to their whims.

One of the reasons the IT and cable industry have grown so rapidly in India is that governments were, in a sense, not looking — or that the growth and mutation were so rapid that governmental structures were not able to decide what to regulate and restrict. But now that these sectors are so conspicuous, many see features in them that should be regulated! In the IT industry, when tasks are secured, professionals are brought together, and they disperse when the job is done. The industry is also very prone to cycles. This is all the more so in the case of small firms. Even a modest-sized job for them requires a major enlargement of their personnel. Asking the firms to keep this staff on after the job has been done will be the surest way to kill them.

Does the basic rationale of laws such as the Contract Labour Act hold at all for industries like IT? The rationale has always been that workers engaged on contracts — like construction workers — are lowly paid, and therefore there is a need to protect them through legislation. But professionals in the IT industry are among the highest paid in the country.

So, the first rule for governmental intervention should be self-denial. But there also are things governments should be doing.

The largest 20 companies — they constitute 0.6 % of the number of companies in the industry — account for almost 60 per cent of the industry's revenues. The per cent contribution of small- and medium-sized companies has been falling in the past five-six years. This draws attention to the sheer size of the target at which we have to aim. We are told our IT exports have to reach around \$50 billion by 2008. If the large Indian firms keep growing even by 20 % a year, such targets will not be realised unless the small and medium firms in this sector grow by 40-50 % a year. At present they are growing at just 10-15 %.

Innovation often comes from inconspicuous, small units, often from isolated, eccentric individuals. Our structures — for instance, our banks and financial institutions — are not attuned to nurturing and supporting such firms and individuals. The collapse of so many tiny IT units three/four years ago has made bankers all the more wary of extending help to such firms and individuals. But the consequence is even the more robust units are now fighting for survival.

A host of small things can be done to help them along. For instance, certifications by recognised authorities are vital: potential customers require assurance of excellence, and most often do not have the time to evaluate on their own the worth of a group of professionals. Governmental help takes the form of assisting SMEs to ramp up their facilities and standards to, say, CMM Quality level V. The Government could set up a body for these firms to parallel R.A. Mashelkar's National Innovation Foundation. It could set up an incubation-cum-innovation fund. It could prod banks and financial institutions to be more forthcoming in assisting SMEs in this sector. It could initiate some pooling of risks by them as insurance firms do in regard to extraordinary events.

There is another area that deserves attention of our governments. Indeed, it concerns what governments are themselves doing in this sector. Several departments of central and state governments are installing software for a variety of operations. And there have been notable improvements as a result: 80 % of the forms of the Directorate General of Foreign Trade, accounting for 90 per cent of total value, for instance, are now filed online; as a result, the processing time of these, which used to be 45 days, has come down to six hours.

In the US, in the UK, in Germany, governments are having to spend billions to make their systems inter-operable. In a sense, we have the advantage — such systems are just being installed. Ensuring inter-operability at this stage will be much less expensive than vaulting over the silos will be five to 10 years from now. Therefore, ensuring inter-operability — at least of the critical systems — should be one of the priorities in the coming year.

We have done exceedingly well in software. Incentives given by the government have helped. The 39 Software Technology Parks that it created, and in which information technology firms could get worldclass facilities under one roof, have been decisive: 80 % of IT exports originate from units operating out of these 39 parks. The task is to now replicate this kind of success in the hardware sector. For that we have to go many miles farther than we would have had to a decade ago — when some of the companies came to set up their production facilities here, and we turned our noses up. For by now they have already established their factories in China, Malaysia etc. Why should they not expand those operations, why should they not set up their next factory in those countries rather than pick up their bags and come to India? They will do so only if what we have to offer them is decidedly better than what they actually have in their present locations.

That is a lesson we still have not learnt. The other day the lead story running across the front page of Business Line was “Trade unions setting their sights on IT sector”. The familiar litany: “anarchy”; “the conditions are worse than the exploitation seen in villages”; labour laws are being violated; “feelings of insecurity, humiliation” ... Should the unionists succeed, all that will happen is that firms in Europe and the US that are outsourcing to India, firms that are setting up R&D centres here, will conclude that locations in India cannot be relied upon for uninterrupted work.

The general reputation is thus all-important. But it is not enough. The individuals who are going to make the crucial decisions have to be convinced — “one by one, little by little, again and again”. And this is best done by entrepreneurs and not by ministers and civil servants. This is exactly the sort of team we are organising in the Ministry of Information Technology.

### **Creating domestic demand for IT**

85% of India's IT industry, as we saw, is for exports. Observers often contrast this with China: there the position is the exact opposite — 85 % of its turnover is for the domestic market. This is doubly undesirable, they say — on the one hand, we are not availing of advantages that would accrue were we to introduce IT in our lives and operations in a big way; and, on the other, our IT industry remains at the mercy of fluctuations in economies abroad. I am with them up to this point, but not with the inference they draw from these figures, namely that, “The main demand has to come from government.” There already is an instruction to ministries that they must earmark 3 % of their budget for modernising their operations by inducting information technology. I am not much for such earmarking.

One should avoid putting a sector on artificial respirators. One should especially avoid habituating a sector that has shown such inventiveness and resilience as our IT industry to respirators. The way to develop a large domestic IT market is for the industry to come up with solutions and products that meet real needs. Therefore, “Fewer but better” — another phrase much favoured by Lenin! That is the strategy the government has adopted for the coming year after a presentation to the prime minister. For the same reason, outside government also, we should address specific, and urgent needs of our people:

- One can think up many fancy applications for e-governance, for instance. A few hundred applications have been developed and adopted in different parts of the country. Some of them are scarcely used after being developed and installed. Others have already made a perceptible difference. The Bhoomi project in Karnataka, under which all land records have been digitised is an example — the farmer can secure the title documents etc. he needs for selling or buying property, for raising a loan without having to wait upon the patwari.

- We cannot hope to provide in the foreseeable future continuous Internet connectivity to persons in remote settlements. Our ministry has therefore provided a grant to IIT Delhi to develop technology for an innovative solution: a kiosk in that remote village can be set up to provide a series of services — birth and death certificates, title documents etc.; e-mail messages too can be keyed in from the kiosk; an antenna is affixed to a bus and a processing unit is installed in it; when the bus passes near that area, it electronically delivers the documents that have been sought, the e-mails that have arrived and it collects the e-mails and requests that have been fed in at the kiosk.

- Similarly, by installing tele-medicine infrastructure and software, the Apollo Hospital chain has enabled patients in distant, isolated communities — in Nagaland — to receive the best medical diagnosis and advice from any of its 27 hospitals. At those hospitals, the best specialists take turns to be available for providing advice.



- 18 languages are recognised as official languages under the Constitution. To enable people to access these new technologies, software has been developed by C-DAC that transforms text — and will soon convert speech — automatically from one language to another. This software is now being developed for mobile phones — so that you can send your e-mail in English; your friend, who would rather receive it in Hindi, will receive it in that language.

- The script of Indian languages is phonetic. That of English is not. Therefore, software — Shakti — has been developed by an IIT Chennai based group by which, while I type on a standard English keyboard, the computer transcribes and prints the text in the script of the Indian language. Incidentally, Shakti illustrates the potential in other ways too. Its office suite does all the things that the office suite of the dominant company does. It does more — by a mere click you can have the toolbars etc. turn from English to Indian languages. The suite of that foreign major costs Rs 25,000 a piece. Shakti provides the equivalent for Rs 1,800!

- Many of us cannot read print — either because we are visually impaired or because we are illiterate. WEBEL in Kolkata has developed software that scans a page, transforms it into electronic text, and prints it out in Braille. C-DAC in Pune has gone one step further. It has developed software that transforms text into speech. This has already been done for anything available in electronic form — for instance, a person who is blind can by just a click or two get to his favourite newspaper on the Internet, or someone can reach that for him, and the computer reads out the paper to him.

- Similarly, one of the doyens of the IT industry in India, F.C. Kohli, has developed methods for making people literate using IT. The methods are bound to spell a revolution. Even the illiterate adult knows language; he has picked it up as he has grown. What many of them do not know is how to recognise in print the word they know. The conventional method of instruction has been to teach such a person to read by first getting him to learn the alphabet. But the method that has been used extensively for handicapped children is different: it exposes her or him to the word as a whole, almost as an icon; simultaneously, the person hears the sound and sees a depiction of what the word connotes. Instead of learning “umbrella” by learning “u”, then “m” etc. the person is shown the entire word. Simultaneously, the computer pronounces the word. And shows him a picture of what an umbrella does. Through this “total immersion”, and capitalising on the fact that a vocabulary of just 500 to 700 words is sufficient for reading the average, daily newspaper, almost 40,000 persons who were totally but totally illiterate have, in Kohli’s experiment, been brought to a level that they can now read newspapers on their own. This has been done through instruction of just an hour to an hour and a half a day for just 10 weeks.

The advantages of the approach are obvious. The shortage of teachers has been overcome. The person is able to choose the time at which she can come to the place for learning. “Literacy” in this experiment means not our conventional definition — someone who can sign his name; but one who can read a newspaper unaided.

Kohli estimates that 300 to 400 people can be made literate with one computer in a year. If only we are allowed to import a million second-hand computers, he says, we can wipe out illiteracy from the country in little time. And he is the sort of person who can actually get the IBMs and others to donate those million computers free!

One final point. In many of our research organisations research is going on — and on. We should take up a few projects in what the president calls “mission mode” and bring them to a swift conclusion. The four that occur to me are:

- Use ICT to abolish illiteracy;
- Develop the Universal Networking Language — so that a person can put his data or message onto the Net in any of our 18 languages, the machine should translate it into the Universal Networking Language, and his friend in another state should be able to receive it in his own language;
- Bring text-to-voice and voice-to-text software to perfection so that worlds from which they are today shut out are opened to the print disabled;
- Today one of the severest impediments to enabling people to avail the benefits of the new technologies is the expense of laying the infrastructure to their doorstep; we should complete research that would enable wireless signals to go to a multiple of the 50/60 km they traverse at present.

Each of these is a do-able task. Each of these will spell untold benefit to millions. Together, they are worthy of India, they will make India a beacon for the world — in this field, of course, but also in compassion for the handicapped and the distant.

## **Summary of the Tenth Five-Year Plan (2001-2005) [Excerpts]**

*Information Industry Ministry of Information Industry, People Republic of China*

The Fifth Plenary Session of the 15<sup>th</sup> Central Committee of the Communist Party of China clearly pointed out that informatization is the key in promoting industrial advancement, industrialization and modernization. Therefore, national economic and social informatization should be the first priority. Putting effort into promoting national economic and social informatization is a strategic action in the fulfillment of the whole modernization construction plan. It aims at using informatization to promote industrialization and actualize the expeditious development in productivity. It is the very first time for the Central Committee of the Communist Party of China to put informatization in such a high strategic position.

### **Information industry as a pillar industry in the national economy**

- The Information industry is a new area of growth in the national economy. During the tenth five-year period, the Information industry will continue to grow at a rate of three times the rate of growth of the national economy. In 2005, the value added will account for more than 7% of the GDP of which telecommunications will account for 4.7%, and electronic products will account for 2.5%. The direct contribution of the Information industry will increase continuously, whereas the indirect contribution will increase steadily.
- In 2005, the electronics and IT products will account for 30% of the total volume of exports. Its leading position in the national export sector will be further strengthened.
- In 2005, the Information industry will become the leading industry among all other industries in the economy, and emerge as the largest industry in China.

### **Information industry as a core industry underlying informatization and the changes in the directions of growth in the national economy**

- The telecommunication network and information technology equipment are the main force and the basic resource for national informatization.
- The popularity of information technology and extensive use of information products will transform social production and lifestyle.
- The development in the Information industry will speed up the progress of informatization in other industries, and therefore enhance their efficiency, largely reduce the consumption of resources and transaction costs. This can stimulate and enhance economic growth towards economizing resources, protecting the environment and the continuous development of content-intensive industries, raising living standards and modifying the working methods.

### **Review of Information Industry in the Ninth Five-Year Period**

With the development of reform and open-door policy, especially after the Ninth Five-Year period, the position and role of the Information industry has become more and more important, and it has emerged as the dominant industry in our national economy. The telecommunication Industry has built up a network that is close to the international standard. The scale of the fixed telephone and cellular networks is the second largest in the world. The postal service has a service network that basically covers all cities and provinces, and connects with the whole world. Both our network scale and coverage occupy a high ranking in the world. We have comprehensive telecommunication services that can basically satisfy our society's multiple needs. Network construction has established a solid premise for the construction of the national telecommunication infrastructure. A fair and systematic market environment has been preliminarily established. During the Ninth Five-Year period, software, electronic and IT manufacturing industries grew more than 30% per year. The productivity and sales volume of the main telecom products increased rapidly, structural adjustment began,

and there was breakthrough in some core technology. The industry as a whole has achieved a leading position in the world. We have become the world's main manufacturing country of colour TV, LCD, colour tubes, program controlled switchboards, cellular phones, display devices and monitors. The pace of national economic growth and informatization of social services has increased.

### **Existing issues**

- Use of information resources is still lagging behind the development in communication network infrastructure
- Delayed construction of a legal and regulating system, existing rules and regulations are inadequate in facilitating the development of the industry
- Structure and the organization of the industry need to be improved
- Gap exists in productivity and operation efficiency between local organizations and other global organizations
- Insufficient channels in financing the industry and there is a lack of research and development funds
- A lack of innovation, mechanisms for research and development in enterprises and a shortage of human resources
- Software, integrated circuit and components industries are the bottleneck that curbed the development of the IT manufacturing industries.

### **Guiding principles of the tenth five-year plan**

- 1) Striking a balance between speed and efficiency, market-economy and government regulation, universal services and effective competition, open market and security and achieving a coordinated development between manufacturing and services industries.
- 2) Deepen the reform, reduce monopolies, make comprehensive laws and regulations, better manage the industry and push the strategic reorganization of state-owned enterprises and establish modern enterprising policies. Incubate competitive enterprises to enable them to operate across different areas, industries and become multinational corporations.
- 3) Strengthen the development of basic infrastructure, integrate the use of different resources and use them efficiently. Coordinate planning to avoid replications in the building of infrastructure
- 4) Following through the plan to develop the Western region, develop resources that have comparative advantages, open up local and overseas markets, speed up the structural reorganization of the information industry in this region
- 5) Increase the competitiveness and strengthen the capabilities to innovate, grasp the core technologies in IC and software development, raise the proportion of products with intellectual property rights. Support commercialization of research outputs that are profitable, put more effort into the development of new technological applications and new business services, conduct more research in standards development, actively participate in the development of international technology standards, place a high value upon information and network security
- 6) Adjust the structure of the industry, remove the bottlenecks that hinder the development of the industry
- 7) Using IT to reform and upgrade traditional industries, the information industry will be capable of providing system equipment and services to other sectors, pushing the growth of the national economy and informatization of the society
- 8) Strengthen international cooperation, increase international competitiveness, gradually open the local communications market and enter the international market. Using foreign investment effectively, stress the importance and increase the scale of IT exports

### **Targets of development**

#### Economic targets :

- The rate of growth in the communications industry will continue to outstrip the overall economic growth rate. Revenue from the communications industry will amount to 1 trillion yuan (based on an average yearly growth rate of 23.38%), of which telecommunications will account for 920 billion yuan, three times that of year 2000.
- The value of IT products manufactured will reach 2500 billion yuan (20% yearly growth rate), industrial value-added will increase to 320 billion yuan, sales revenue will reach 1500 billion yuan and exports volume will increase to US\$100 billion, an average growth rate of 15% per annum

Communications capacity :

- Optical cable: 2.5 million km in length (over 500,000 km for long distance cabling).
- Fixed telephone capacity: 300 million
- Total wireless network capacity: 360 million subscribers
- PC on-line: 40 million
- Internet subscribers: 200 million
- 5000 ISP/ICPs

Service penetration :

- Over 500 million telephone subscribers, achieving a penetration rate of over 40%. Strive to provide telephone connection in 95% of the administrative villages
- Fixed telephone subscribers will reach 240-280 million, account for 20% of the world total. Main line penetration will increase from 11% in 2000 to 18%, exceeding the world average of 17.65%
- Number of mobile subscribers will reach 260-290 million, accounting for ¼ of the world total. The penetration rate will increase from 6.7% to 21%, exceeding the world average of 15%
- Data, multi-media and Internet subscribers will reach 0.2 billion (15% penetration rate)
- Countrywide coverage by radio broadcasting and TV networks, cable TV subscribers will reach 150 million

Investment and returns on investment :

- Investment will reach 1700 billion yuan during the tenth five-year period of which the telecommunication sector and IT manufacturing sector will account for 1250 billion and 400 billion respectively.
- The investment output ratio for the telecommunications industry will increase from 1:1.5 in year 2000 to 1:3.3 in 2005
- Fixed capital to output value is expected to increase to 60-70 yuan.
- The fixed capital input output ratio for the IT manufacturing industry will reach 1:4

Informatization of the society :

- Information industry will provide the systems, equipment and services to meet the demand from finance, taxation, education, macro economic adjustment and national security. IT will be widely applied in different areas of the national economy, progress in the development of B2B and B2C e-commerce will be prominent and the scale of the information services industry will expand
- With the government online project, government departments can produce, send and receive documents on line. The public can access information from government departments through the Internet.
- Promote computer education in secondary and primary schools
- Promote B2B and B2C e-commerce and develop electronic payment systems

A focus will be put on developing the Western regions:

- Systematically plan and coordinate the development of the Western region. Aim to accelerate the development of communications, strengthening economic development. Launch a large scale communications infrastructure to improve the basic infrastructure, further open up the IT manufacturing industries and the software industry in the Western region, reform the business structure and accelerate the pace of improvement
- Develop technologically advanced industries that enjoy comparative advantage. To utilize national debt and low-interest loan from the country or from overseas to develop the basic telecommunications infrastructure and the IT manufacturing industry
- Encourage investors from overseas or local enterprises in other provinces or cities to invest in the communications industry in the Western region

## **Statement by H.E. Wang Xudong Minister of Information Industry at the World Summit on the Information Society [excerpts]**

*December 10, 2003*

The developing countries should, through their own efforts, explore development modes of the information society that suit their own national conditions, and China will work unremittingly toward this end. We call on the developed countries to fulfil their obligations to render active and effective help in providing capital, technologies and human resources to enable the developing countries to keep up with the pace of development of the global information and network.

Governments, related international organizations, private sectors and civil societies should be encouraged to strengthen cooperation in building the information society and bridging the "digital divide".

We appeal for more participation and coordination by inter-governmental organizations in such issues as internet-related public policies to create a favourable international environment for the development of the Internet.

### **First World IP Regimes Slow China's Modernization**

*By Jeff Smith, <http://www.world-information.org/wio/wsis/texts/1071758472>, Nov. 2003*

China does not have access to the knowledge it needs in fields that are critical to development. It cannot afford the hundreds of thousands of Western books, journals, databases and other materials - in agriculture, economics, engineering, law, medicine, and other critical fields - wanted by its universities and research centers.

The price of a basic text in Western medicine equals the monthly salary of a professor, and digital books are equally expensive when they exist. The price of a core collection in Medicine and Health --1,054 books and 220 journals recommended by the U.S. Medical Library Association -- is US\$150,000 which is beyond the means of nearly all universities. The price of 144 such collections, for all of China's medical schools, is \$20 million which is beyond the means of the Ministry of Public Health.

Enthusiasts predicted that the Internet would make knowledge accessible to everyone, and that it might replace paper libraries with digital media. However, books have persevered, paper libraries, costly as they are, are the most effective means of transferring formal knowledge to the greatest number of people, and access to knowledge has remained limited to a relative few.

It is not a fault of the technology, but of regressive intellectual property regimes.

Bridge to Asia (BTA) was founded in 1987 to supply Chinese universities with donated books, a second-best strategy for providing a knowledge base. In the past five years, BTA gave more than half of all foreign language books acquired by Chinese universities overall.

Until knowledge is treated as a public good rather than a commodity, and until access to core contents is affordable, developing countries will continue to struggle and may never close the knowledge gap, at a cost of human suffering and loss worldwide.

The global community should press the industry to release contents that are critical to the modernization, release them for free or at cost, as the pharmaceutical industry has done (under global pressure) with AIDS drugs. Unless these and other aggressive solutions are tried, developing countries may never bridge the knowledge gap, and they and the world at large will pay terrible costs.

## **Strategies for Developing China's Software Industry** [Abstract & Excerpts]

*Mingzhi Li, Ming Gao, School of Economics and Management, Tsinghua University, Beijing, China*  
(2003) Full report on: <http://mitpress.mit.edu>

The software industry is deemed an ideal target for a developing country to integrate into the world ICT market. On the one hand the industry is labor intensive, and the developing countries have a large labor surplus; on the other hand, it is a worldwide trend for developed countries to outsource a vast amount of low-end, software-related tasks to the low-cost countries and regions, which fits into some developing countries' caliber nicely. India has often been cited as the role model for a developing country to tap into the world software market for its continuous success in the software export sector. In comparison, China's software industry is still negligible in the world despite its sustained high economic growth rate since the economic reform took off in the late 1970s.

This paper aims at examining strategies for developing China's software industry. We use India as a reference because of the similarities of the two countries' stages of economic development and the clear divergence in their ICT structures and development paths. Although the language barrier has often been singled out as the major obstacle for China's software exports, we believe the major reasons for its underdevelopment can be ascribed to the following factors. On the national level, the government attention has been skewed toward the hardware sector in the ICT industry, and there is no clear national vision for the strategic direction for the software industry.

On the industry and firm level, software development has been regarded as the art of individual creativity rather than an engineering process. As a result, the importance of quality and standards, the two important critical factors in software development, have been largely neglected. Perhaps an even more fundamental factor lies in the deeply rooted notion that software is an attachment to the hardware and should be a free product. The lack of intellectual property rights protection on the government side also contributes to the low spending on software, which further hinders software firms' incentives to innovate.

Extending Heeks's model of strategic positioning for developing country software enterprises, we conclude that rather than following in the footsteps of India to promote export, China should focus on its domestic software services market in the near term and pursue a more balanced development strategy in the long run. Rather than asking the question of whether China can become a major competitor like India in the world software market, we propose that there are rich opportunities for collaboration between China and world software superpowers, including India.

Alliances between Chinese and foreign software firms will help both sides gain benefit from becoming cocompetitors in niche markets of mutual benefit. Cooperation with these international firms will also naturally open up foreign markets for the Chinese software firms.

...

Analysis based on the framework of Heeks (1999) indicates China should focus on its domestic market as a starting point and with an eye toward a more balanced strategy in the long term. One problem in Heeks's framework is that it does not take into consideration the interaction between domestic and foreign software firms. In the era of globalization, cooperation and collaboration are becoming central themes, especially in the

ICT industry. Although most people keep asking the question whether China will become a major competitor of India, we believe there are abundant opportunities for the Chinese software industry and firms to build alliances with Indian firms as well as with other software superpowers. They will both benefit from becoming cocompetitors in the world software markets. The huge market potential of China will undoubtedly become the central battlefield for the world software firms. The exploding growth of China's domestic market and its increasing share of ICT products and services are indicators of its growing importance. "This growth is being supported by the favorable regulations and government policies in the country that enable it to attract a large share of FDI owing into Asia, other trends contributing to China's success include its emerging strength in hardware related technologies like embedded software and the growing trend among Japanese companies for setting up offshore facilities in China," as commented by Arun Kumar, vice chairman of NASSCOM.

On the Indian side, to sustain their performance, the leading Indian firms are making strong efforts to move up the value chain by acquiring better software project management capabilities and deeper knowledge of business domains, and by reducing costs and improving quality through the development of superior methodologies and tools (Arora and Athreye 2002). These practices will bring good models to the Chinese firms that are struggling with problems of quality improvement and standardization of software development processes. The experience gained in the international market by the Indian software firms will also become an inspiration to the edging Chinese software firms. Most Chinese software companies do not have the domain expertise or project management skills that Indian companies have acquired. Building on their strengths such as deep expertise in the area of call centers, the world's best software engineers, CMM level 5 software quality, software project management skills, and its huge presence in Silicon Valley, the Indian software industry will have good opportunities to tap these opportunities in the Chinese market. There are big opportunities for enterprise applications and solutions such as enterprise resource planning (ERP) and supply chain management (SCM).

Most of the companies in China are using legacy mainframe-based systems, that are being transformed into or replaced by new systems and the trend of global companies setting up manufacturing bases in China will accelerate the demand of ERP and SCM applications. Banking and telecom were other potential areas for software products and services. According to statistics from the Research Center of Computer and Microelectronic Industrial Development, of the Ministry of Information Industry, China's market of ERP, which helps businesses manage the whole process of their operations, nearly doubled its growth rate from 570 million RMB yuan (about US\$69 million) in 2000 to 870 million RMB yuan (about US\$105 million) in 2001. There is also the distinct possibility of both India and China working jointly on some projects. Some Indian software firms including Infosys, TCS, Satyam, WIPRO, ZenStar, and Pentasoft have already set up bases in China. Similarly, a large Chinese telecommunications firm, Huawei Technologies, has set up a research and development center in Bangalore where 180 Chinese programmers work alongside locals. Rather than a zero-sum game, China and other nations may be able to participate in the international division of software labor through collaboration.

## **China and India: Leveraging Strengths for Partnership**

*China Business Summit 2003, 07.11.2003*

"The 21st century belongs to China and India," said N. R. Narayana Murthy, Chairman of the Board and Chief Mentor, Infosys Technologies, India, to open the discussion. India and China are the world's two most populous countries, together comprising one-third of the globe's people, and the economies of both countries have been expanding at tremendous rates in recent years. Murthy commented that while the US\$ 5 billion in trade between the two massive neighbours is a relatively "puny" amount, it is forecasted that this will double by 2005. Murthy asked the panellists to discuss what India and China can learn from each other now that their economic relationship is surging ahead.

Narayanan Srinivasan, Professor and Dean, Business School, Murdoch University, Australia, began with a

brief history lesson in Sino-Indian relations, joking that the transmission of Buddhism from India to China two millennia ago was the first instance of “trade” between the two neighbours. Despite tensions over unresolved border disputes which linger to this day, Srinivasan was confident that the burgeoning trade partnership now eclipses the thornier side of Sino-Indian affairs. China is ahead of India according to almost every economic indicator, and Srinivasan suggested India has a great deal to learn from its neighbour, particularly in developing infrastructure and attracting foreign direct investment (FDI). Elements of the Indian example which he believed China may want to emulate are the subcontinent’s higher standards of corporate governance and its better teaching of the English language. Since border disputes are dragging on, Srinivasan argued that the productive economic relationship must be kept separate from the messier political sphere.

The theme of cooperation between these two Asian powers was the focus of Shen Jiru, Professor, Institute of World Economics and Politics, Chinese Academy of Social Sciences, People’s Republic of China. Indians and Chinese may have different skin colours, but scientists have found that they are close genetic relatives, said Shen; though they have sometimes found themselves as enemies, friendship is the more natural state of their relationship. Shen hearkened back to the words of Deng Xiaoping, who maintained that without the prosperity of both China and India, prosperity for the greater Asian region is an impossibility. China and India must put historical enmity behind them for the benefit of their people, as Western European countries were so successful in doing in the latter half of the 20th century, according to Shen. He expressed his hope that with the growing mutual trust between China and India, the two will work together to shape a new multi-polar peaceful global order.

Ajay Kumar, Director, Global Manufacturing Solutions, Rockwell Automation, Hong Kong SAR, whose company has operations in both China and India, said that the advantages of China are clear to multinational corporations: low labour costs, a disciplined workforce, a large domestic market and a good FDI environment. India, on the other hand, has used its strong university sector to model itself as a knowledge-based economy, rich in intellectual capital, producing world-class professionals. Kumar’s vision of the future of Sino-Indian business, particularly in the sector of information technology, would see the two countries playing to their comparative advantages, with India taking charge of research and development, while China acts as the manufacturing engine driving production.

India and China clearly share strong economic prospects, but participants raised vexing questions about the cost of bureaucratic inefficiency in India and the demographic problems of both countries – an exploding population in India and an ageing one in China. Shen stated that it is not a matter of judging which country’s political system is superior, but rather of working out the practical solutions to the very real problems both countries face; if the two can learn from each other’s experiences, they must try to do just that. Murthy concurred, invoking the famous Deng Xiaoping saying, “It doesn’t matter if the cat is white or black, so long as it catches mice.”



### III. ICT CONTRIBUTION TO SOCIAL AND ECONOMIC DEVELOPMENT

#### A. OPPORTUNITIES & CHALLENGES

#### Regional Human Development Report

#### Promoting ICT for Human Development in Asia 2004: Realising the Millennium Development Goals

*UNDP, 2004 [Excerpts]*

ICT breaks barriers to human development:

- **Access to information and education are indispensable in building human capabilities.** The internet and other ICTs are increasingly becoming their key delivery mechanisms to sections of the population which did not have access to educational infrastructure and content. Moreover, these new delivery mechanisms provide access to global and diversified sources of information and educational content, thereby enhancing dramatically the quality of educational inputs that are available to even the most remote and deprived populations. ICTs are also being actively used in promoting life-long learning and continued education as well as reintegrating unemployed people into the workforce through re-education and retooling of skills. Women and other excluded groups stand to benefit particularly from this.
- **The world has witnessed innovative uses of the internet and other ICTs in enhancing political participation as well as in bringing about greater transparency and accountability.** In many parts of Asia, where the mass media have been and continue to be strictly controlled by governments, the internet has offered a new medium of political mobilisation and participation. Internet and ICT based news and information groups have contributed to the creation of a more vibrant public sphere. They increase social, political, economic and cultural participation which enhances networking and social mobilisation and can drive governments to become accountable and transparent.
- Since the ICT sector requires less initial investment than the more traditional sectors of industrial activity, it **lowers the barriers to entry into the economy for people who could never break into the industrial sector.** ICT provides new and unprecedented opportunities to people who have proficiency in handling ICT tools and have an idea or service to sell. ICT has also created new outsourcing opportunities whereby services are provided in one country and delivered to another country. The global outsourcing market is worth more than US\$ 100 million and provides an array of opportunities to Asian countries with their high-skill ICT proficiencies and relatively cheap labour. In addition, ICT, through the creation of call and transcription centres, has led to new economic opportunities for large sections of the Asian population. These new avenues of employment have particularly benefited the underprivileged sections; for example, in India, women constitute a large section of the workforce in call and transcription centres.

Specifically, ICT can play a critical role in:

#### **Eradication of extreme poverty and hunger**

The direct contribution of ICT to poverty reduction, can come either through employment generated by the diffusion of technologies into poor rural and urban areas, or through ICT-enhanced returns from economic activities of poorer households. Indirect contribution can come through facilitating delivery of ICT services and reducing their costs. Increased service delivery either promotes wage and self-employment, or helps overcome structural constraints on poverty alleviation projects. In a situation where the world is becoming a global village, ICT can help the poor acquire literacy, marketable skills and other knowledge to alleviate poverty.

Due to its communications dimension, ICT can provide timely information to trigger rapid responses by the state to combat hunger. This is especially important in case of food crisis when starvation can result in widespread malnutrition and even deaths. ICT can serve as a critical tool for monitoring and managing the procurement, storage and distribution of essential food grains.

Malnutrition is aggravated through inappropriate dietary practices arising out of ignorance and misinformation. Here, the dissemination of correct information through ICT can contribute to improvement.

### **Increasing employment and other economic opportunities for the poor**

Using electronic job marketplaces, employers and employees can match labour skills and availability to satisfy their demands. TARAhaat, an Indian portal designed to serve villages in rural India, provides job opportunity information on local websites in local dialects. Another country to have harnessed ICT for improved labour market facilitation and direct payment is Mongolia where it is widely utilised for job search, employment and education.

The telecentre movement is gaining momentum in the developing world, as ICT becomes more affordable. Individual telecentres foster profound developmental outcomes within the communities they serve. As telecentres provide shared access to the communications infrastructure, it becomes possible for many to share the cost of a single connection.

Access to credit is crucial for micro-enterprises. Microfinance is a substitute for formal sector credit which tends to bypass the poor and women. In countries like India, Sri Lanka, Bangladesh, Pakistan and Indonesia, microfinance institutions have been particularly successful in providing the credit to rural women. But microfinance, even when successful in reaching credit to the poor and ensuring high recovery rates, is characterised by high transaction costs which influence interest rates. India's Swayam Krishi Sangam (SKS) smart cards project is an example of using ICT to reduce transaction costs and minimise the cost of credit provided by self-help groups.

Agriculture is also being transformed by ICT. ICT can empower farmers, rationalise supply chains, improve productivity, facilitate research and development, and promote information sharing on agricultural farm extension technologies, market prices, weather information, etc, all of which can enhance food security. India's network of internet-connected kiosks, known as e- Choupals, serves the soybean, cotton, tobacco, and shrimp farmers in its procurement network enabling farmers to get up-to-date weather reports, local and international produce prices and also to buy agricultural inputs and consumer goods for daily use. China's Beijing FarmKnow reaches over 100,000 farmers through its website where they can access information on crop planting, disease control, pest identification and control, seed prices, and market prices, as well as consult agricultural specialists by email.

### **Health**

ICT can improve the formal healthcare system and the effectiveness of health promotion and disease-prevention programmes as well as health-service delivery. ICT is increasingly being used to facilitate two-way information exchange in healthcare between rural and urban areas, providing isolated communities with access to the latest health information and treatment and informing officials of rural public health issues.

ICT has made health administration processes more efficient, cost effective and reliable by automating the administrative, financial and clinical aspects of care, for example scheduling systems, ordering of medical supplies and access to lab test results. ICT has enabled proper data storage and retrieval, thus reducing the time and effort spent on healthcare administration and management.

ICT increases access of rural care givers to specialist support and remote diagnosis, and reduces the need to transfer patients to a site of medical expertise. Telemedicine is an active and expanding field of ICT in healthcare, have carried out research on ICT for health applications. Medical consultations include tele-radiology, tele-pathology and tele-cardiology among others. In Asia, governments, public institutions and the private sector have been promoting ICT for national health systems. In Western China, the Angel Programme uses ICT to establish a telemedicine network, connecting hospitals at national level. In Yunnan, China, village doctors in mountainous areas use mobile telephones to consult directly with experts at provincial capital hospitals, several hundred miles away. Mobile phones help village doctors to improve the quality of their diagnoses and provide prompt treatment. In India, Apollo Telemedicine specialises in providing consultations

and second opinions to remote areas where access to quality healthcare for children is difficult. Its rural telemedicine centre caters to about 50,000 rural population. The Indian Space Research Organisation (ISRO) has demonstrated how satellite communications have been harnessed to extend super speciality medical consultations in remote and inaccessible locations.

ICT can enhance access by local healthcare workers to suitable and relevant international information and adapting the information to local circumstances as necessary. It increases mapping, tracking and information sharing to enhance support in the most crisis-vulnerable and affected countries. ICTs can document local health problems in local languages, propagating locally-suitable approaches through local channels and in local languages.

## The Secretary-General Address to the World Summit on the Information Society

*Kofi Annan - Geneva, 10 December 2003*

“We are all familiar with the extraordinary power of information and communications technologies. From trade to telemedicine, from education to environmental protection, we have in our hands, on our desktops and in the skies above, the ability to improve standards of living for millions upon millions of people.

We have tools that can propel us toward the Millennium Development Goals; instruments with which to advance the cause of freedom and democracy; vehicles with which to propagate knowledge and mutual understanding.”

“The so-called digital divide is actually several gaps in one. There is a technological divide – great gaps in infrastructure. There is a content divide. A lot of web-based information is simply not relevant to the real needs of people. And nearly 70 percent of the world’s web sites are in English, at times crowding out local voices and views. There is a gender divide, with women and girls enjoying less access to information technology than men and boys. This can be true of rich and poor countries alike: some developing countries are among those offering the most digital opportunities for women, while some developed countries have done considerably less well. There is a commercial divide. E-commerce is linking some countries and companies ever more closely together. But others run the risk of further marginalization. Some experts describe the digital divide as one of the biggest non-tariff barriers to world trade. And there are obvious social, economic and other disparities and obstacles that affect a country’s ability to take advantage of digital opportunities.”

“The future of the IT industry lies not so much in the developed world, where markets are saturated, as in reaching the billions of people in the developing world who remain untouched by the information revolution. E-health, e-school and other applications can offer the new dynamic of growth for which the industry has been looking.”

“Information and communication technologies are not a panacea or magic formula. But they can improve the lives of everyone on this planet. Yet even as we talk about the power of technology, let us remember who is in charge. While technology shapes the future, it is people who shape technology, and decide what it can and should be used for.

The Millenium Goals
1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

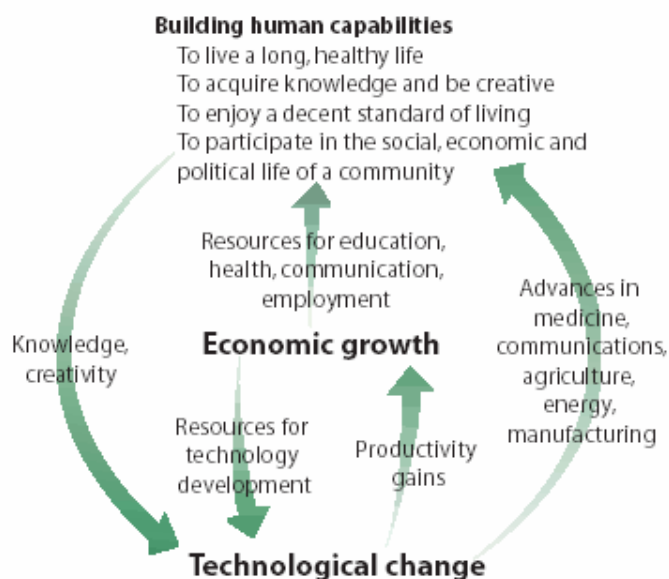
## Fighting Rural Poverty : the Role of ICT

*UN International Fund for Agricultural Development*

More and better information and knowledge made possible by ICTs could:

- Increase price realization of farmers and other rural producers at the village level.
- Increase the productivity of those who own productive resources by spreading innovations beyond local confines and even to illiterates.
- Increase the income and social standing of ICT operators.
- Improve extension and education.
- Enable community-based organizations to promote tourism and other income-generating activities.
- Be useful in demanding access to government programmes and transparency of government expenditures.
- Assist but not substitute for the process of mobilization of the landless, including women, for land and other productive resources.

### Links between technology and human development



Source: Global HDR, 2001.

More important, however, the successful spread of ICTs to the poor, particularly in South Asia, will itself depend:

- on public funding to increase rural connectivity,
- on success in the twin areas of land reform and literacy.

The digital divide is being superimposed on other, earlier divides. The dichotomies between hills and plains, landed and landless, men and women, are all historical divides that need to be addressed if ICTs are to be really accessible to the rural poor. It should come as no surprise that the overall penetration of ICTs, whether by personal computers, internet connections or mobile phones, is far less in India than in China. Indeed, lower levels of poverty and higher levels of literacy combine to create a higher user base for ICTs in China, which is at least five times more than in India. The global development of India's information technology industry, though only in software and not in manufacturing, is largely based on external markets. The low penetration of ICTs in India is itself a reflection of the digital divide. Overcoming the latter will

inevitably involve confrontation with low educational levels (let alone illiteracy) which are in turn linked to landlessness. A beginning can be made by including ICTs in IFAD-initiated projects, not only in areas such as Northeast India where literacy levels are already fairly high, but also in areas where literacy levels are low. This would take advantage of the fact that there are always some literates among the poor, particularly among the youth. At the village level, women's SHGs could be equipped with 'knowledge centres' and linked with sources both of market information and extension materials. Such expansion of rural connectivity – beyond the limits currently seen as 'profitable' – is important not only for its immediate and likely effects on production, but also for the enhancement of encounters that could spark off further creativity.

Making ICTs available to the rural poor through community-based intermediaries could have unforeseen and even substantial ripple effects. The poor and the women could become new power centres within the village, breaking up older, more conservative power structures. The number of users could spread to include students and other youth. Overall, just the availability of more knowledge from the outside could have beneficial effects on creativity and innovation. But it must be re-emphasized that land reform and advances in the spread of education are both necessary pre-conditions for the widespread application of ICTs in the rural context.

## **ICT-Capacity Building for Rural Development and Poverty Alleviation in China**

*Excerpts from infoDev ICT Proposal (2002)*

The Center for Development Research at the University of Bonn (Germany) released a study recently (2001) that suggests “that ICT presents a historic opportunity for the development of rural China, specifically for the enhancement of the Chinese farm household” which comprises half of the Chinese population.

That a significant ICT potential exists in China is suggested by recent research data and informed opinion. One expert claims that the Internet has become the fastest growing means of information transmission in China.

Growth of ICTs in the country has been remarkable since September 20, 1987, when Professor Qian Tianbai of Hsing Hua University sent China's first e-mail titled "Crossing the Great Wall to Join the World" – marking the beginning of the use of the Internet by Chinese. Since then, the Chinese Internet population has seen an extraordinary increase in absolute terms, although its size relative to total population is still quite small. According to the *Washington Post* (April 22, 2002), almost 57 million people have home Internet access in China. Internet subscription rates are growing at the rate of 6 per cent a month. A recent report of the China Internet Network Information Center (CNNIC), reports that the number of Internet users in China increased by more than 35% during the first six months of 2002.

Furthermore, there are approximately 130,000 web sites registered under the “.cn” domain. In mid-2002, the *People's Daily* boasted a www “visit rate” of 500,000. CNNIC reports from its survey data that on June 30, 2002, there were almost 300,000 world-wide web (www) sites in China.

Some experts predict a scenario whereby China will have 257 million people on line by 2005, representing about 25% Internet penetration. It is a scenario that persons promoting social and behavioral change among the population need to contemplate now. It calls for the building of ICT capacity that especially focuses on development and poverty alleviation.

However, it is important to note that there is an uneven geographical distribution of Internet access – a “digital divide” that separates Chinese society. According to CNNIC data, fewer than 5% of the 1.3 billion population are Internet users. Almost 70% of all Internet users in China live in big cities such as Beijing, Shanghai, and Guangzhou and in the eastern coastal region. The 13 provinces in western China have less than 1% of the country's Internet users, and vast parts of the country's western areas were not connected to the Internet in 2002. This imbalance reflects regional disparity in general economic development and level of education.

CNNIC indicates that “obtaining information is the primary purpose of getting on line.”

The China situation reflects situations existing widely in developing countries. These include the potential for using ICTs in rural development and poverty alleviation.

In June 2002 the United Nations General Assembly held a 2-day meeting in New York climaxing a series of major international forums during the past five years focussing on the need to make information and communication technologies (ICTs) available for all nations, especially for development and alleviation of poverty. Secretary General Kofi Annan remarked:

A wide consensus has emerged on the potential of information and communications technologies to promote economic growth, combat poverty, and facilitate the integration of developing countries into the global economy. Seizing the opportunities of the digital revolution is one of the most pressing challenges we face.

The enthusiasm for ICT initiatives is based on the twin assumptions that *quality* information made available widely and inexpensively contributes to development, and ICTs expand the reach and impact of that information.

Among the many challenges to turning these assumptions into reality is providing communities with convenient access to ICTs and insuring that the information and communication services are relevant, localized, understandable, affordable, and *demand-driven*. In many countries the answer has been partly provided through a variety of public ICT facilities. Among them are multi-purpose telecenters, cybercafés, and information access points – all of which make the access possible because of the more affordable cost associated with *sharing* as compared to individual home ownership of ICTs and individual network use fees.

The modern telecenter movement began in the middle of the 1990s, driven principally by the emergence of the Internet and the World Wide Web (www). The significance of the Internet in this development is illustrated by a village chief in Cambodia who was quoted in the *International Herald Tribune* (May 14, 2001) as saying: “I don’t really know what the Internet is or how it works, but it is changing our lives.” In his village – called Rovieng – several young women have revived the village’s traditional silk-weaving industry by selling scarves through its web site ([www.villageleap.com](http://www.villageleap.com)) and investing the profits in a pig farm, which in turn has generated new employment opportunities for the village. Anecdotally, it illustrates the link between ICTs and reducing poverty.

Everyone is aware of the enormous amount of content available through the “web.” The United Nations Development Program (UNDP) estimates that about two million new web pages are made available each day. But critical questions are being raised about the information these pages provide. A recent multi-nation study by the International Institute for Communication and Development in The Hague suggests that “easier access to globalised knowledge is fast turning us into ‘consumers’ of distant and potentially irrelevant information.” Furthermore: “More worrying perhaps, developing countries are being ‘invaded’ by foreign ideas and values that may undermine or overwhelm local cultural heritage and economic livelihoods.” The report puts special emphasis on the need for local content.

If we are serious about the use of ICTs as an empowerment tool – so poor people can shape decisions that affect their lives, so they can grasp economic and social opportunities, and so they can deal with misfortunes and disasters, then this foreign content must be matched by the expression and communication of local knowledge that is relevant to local situations. To a large extent, this means that ICTs need to be conveyors of locally relevant messages and information.

Local content, the report says, faces intense competition because big content initiatives tend to push their external content onto local communities. Content, says IICD, needs owners or originators with the motivation to create, adapt or exchange it.

## Transforming Rural India

*Rajesh Jain, Netcore Solutions Pvt. Ltd. (Aug. 2003)*

*[www.emergic.org](http://www.emergic.org) , [www.i4donline.net](http://www.i4donline.net),*

I am heavily biased towards technology and computers. I believe that by empowering people with access to computing and the Internet, we can create a bottom-up revolution across India. These connected computers themselves will not work wonders, but they will open the minds of people, especially the young, to new ideas and new worlds. Computers will enable them to learn new skills, which could be harnessed in many different areas.

For example, farmers could use the connected computers to get commodity prices faster, or get information on new agricultural techniques. The youth would get details on job opportunities across the state. The district administration could get details of problems in near real-time. The eligible could search for matrimonial matches across adjacent villages. The voters would communicate their concerns to the politicians and bureaucrats electronically, with a trail of the communication.

What is missing is the ability to think of solutions which can be replicated across India between two elections rather than two generations. The village officials could share governance best practices faster among their counterparts elsewhere. Many of these and other activities could doubtless be performed without computers. But there is a pain in those processes. That is where technology can make a difference. Computers have been the disruptive innovation of the past two decades. And yet, they have barely made a difference to the lives of people in most of the developing markets of the world.

I believe that the time has now come to take computers and allied technologies to every village of India and the world. Only through such a mass-scale deployment we can create a platform on which other programmes can be layered, whose power now can be amplified dramatically. From primary education to adult literacy, from providing a two-way flow of information to enabling transactions, from increasing governance transparency to reducing corruption, from jobs to marriages, computers can indeed be the manna for the world's villages.

By themselves, computers will do little. They need applications to make a difference. They need change in government's processes. But by making computing available to every citizen, they will force a seismic change through the lines of governance. They will become platforms on which an entire range of different services can be built.

Computing as a utility in every village is at the heart of my vision of transforming Rural India. As we shall see, a combination of innovative ideas can make this a reality in a commercially viable business model – one where the government is not a funder, but an enabler.

## B. CASE STUDIES

### Setting up Multipurpose Information Technology Centres in Rural and Tribal Areas of India - The Aisect Experience

*Presented By Santosh Choubey, Director General All India Society for Electronics and Computer Technology E-8/54, Bharat Nagar(Shahpura) Bhopal. ([www.aisect.org](http://www.aisect.org) )*

The All India Society for Electronics and Computer Technology (AISECT) has been operating an All India Co-ordinated Programme (AICP) to set up Multipurpose Information Technology centres in rural, tribal and underprivileged areas of India since 1996. The programme has been implemented in ten states and registered significant results. Over 600 training, servicing and information centres were set up during the project period, a large variety of training and servicing modules were prepared in Indian languages and methodology for rural I.T. intervention was defined. Apart from the nodal centres, which were funded by Govt. of India departments, a large number of self funded, entrepreneurship based centres also came up which were networked with the programme at block, district and regional levels. Interesting new possibilities related to village information centres, village communication centres, panchayat level planning, education and maintenance emerged from the project. In fact a comprehensive model for rural I.T. intervention was prepared by AISECT, which found its place in the World Bank Institute's report on successful I.T. strategies in India and in the compendium of Rural Technology models published by CAPART (GoI). The DOE (Now MCIT), in its final review of the programme found the strategy extremely useful, recommended its expansion all over the country and proposed setting up of a National Resource Centre to support and propel the programme further.

A National workshop was conducted in Bhopal in the year 2000 to share the strategy with over 50 NGOs, state and central govt. departments. A PLAN 5000 was devised and adopted in this workshop to set up over 5000 multipurpose I.T. centres in next five years. Over 4300 centres have been set up by AISECT till now, under this plan. The last two years have seen new advances both at technological and at policy levels. There is a growing realisation in the country that dissemination of technology within the country is as important as setting up targets for exports. The national Task Force on Information Technology, constituted by Govt. of India recommended widest possible dissemination of I.T. learning and applications in Indian Languages. It called for making I.T. a mass movement.

At technological level intranet and internet based network models have emerged linking up panchayats to blocks and blocks to the districts. Community access to information has assumed greater importance and knowledge based enterprises are increasingly seen as a tool to reduce unemployment. It is in this revised and vibrant scenario that AISECT designed Suchna Mitra Software for linking up district and blocks with Panchayats. Intranet networks based on this software are operational in Panna, Guna and Narsinghpur districts of M.P. Over 1300 centres have been set up in the schools of predominantly tribal state of Chhattisgarh, which, in addition to providing computer education to girls in the school, are also providing citizen services like provision of land records, provision of information relating to employment and educational opportunities and that relating to various Govt. schemes.

We believe that the problem is not merely technological but there is a sociological angle to it, and if we do not consider that, the technological intervention is likely to fail.



## IV. MICROFINANCE & ICT

The Microcredit Summit Campaign's goal is reaching, by 2005 (declared by the UN, "Year of Microcredit"), 100 million of the world's poorest families, especially the women of those families, with credit for self-employment and other financial and business services.

As of December 31 2002, over 68 million microfinance borrowers were reported. Of the poorest one, 79 % were women, and over 80% were in Asia.

### A. WHAT IS MICROFINANCE ?

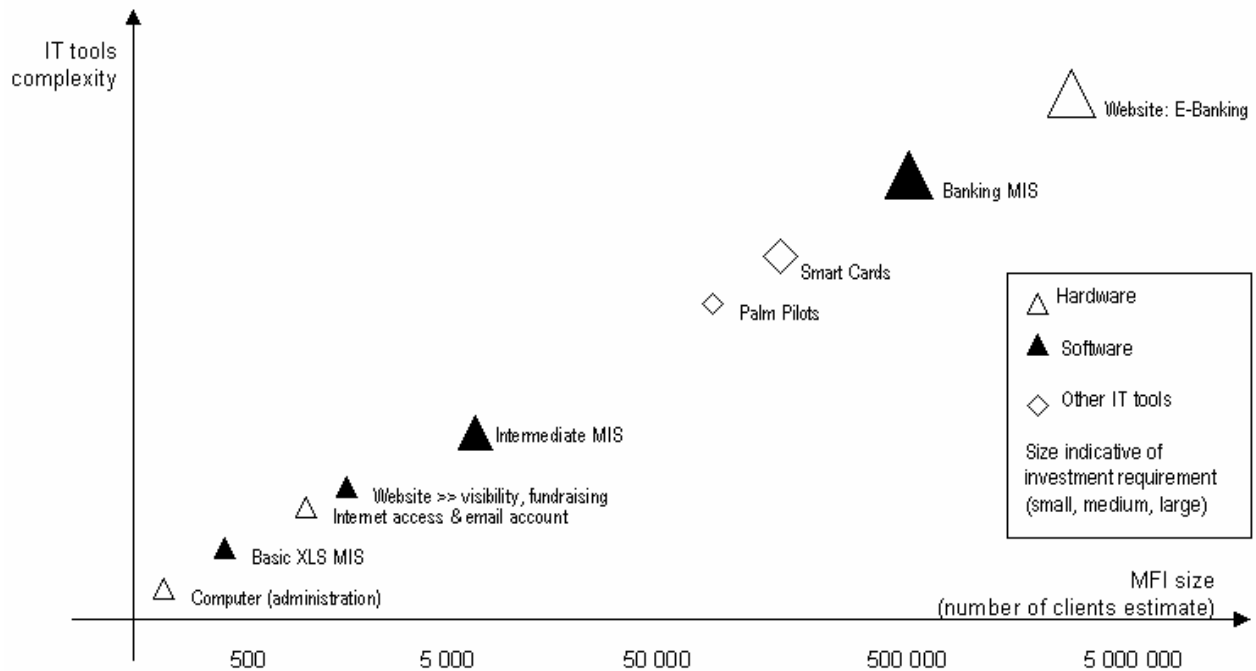
*By Muhammad Yunus*

Three years back we surveyed the educational status of Grameen borrowers' children and we were pleasantly surprised. Not only were all of them in schools, many of them had graduated from high schools, which was beyond our expectation. We all expected they would at best finish primary schools. But many of them graduated from high schools, many were in colleges, and we even found some of them in medical schools, engineering schools, and universities. We were so excited by this outcome that we immediately introduced another loan package to meet all educational expenses for higher education. All expenses are financed by Grameen Bank, no questions asked. All they have to do is sign an undertaking that when they go into professional life, they'll pay back the loan. Such has been the impact of one of the "Sixteen Decisions."

Grameen also plays a role in the political life of its borrowers. We make sure 100 percent of the Grameen family members vote in every national election. It's a social value we are trying to encourage among them, because if you vote, then politicians pay attention to what you say. In the 1996 elections, voter turnout in the whole country was way above the past records. Seventy-three percent of the population turned out to vote. More women voted in that election than men. This had never happened in the history of Bangladesh. The number of women voting in any election had always been about half the number of men voting. This time, women outnumbered men. The following year, 1997 was the year of local elections at the village level. This time Grameen women not only voted, they became candidates. More than 2,000 Grameen members, many of them women, were elected in the local bodies. I was surprised because the idea of women running for political office had never occurred to me. The reality was that the women had thought ahead of me.

I am frequently asked why so many Grameen borrowers are women. When I began I had two serious allegations against conventional banks: one, as I have already written, is that conventional banks reject poor people. My second allegation is that conventional banks are biased against women. All my banker friends got very upset about this allegation. The first allegation they understood, but they couldn't do anything about it. Regarding the second charge, they said, "This is not true! We give loans to women". I asked them to look at the gender composition of their borrowers: not even one percent of them were women. We noticed that money that goes to families through women brings many more benefits to the family. You can see this in every case. When a man is the borrower, there are some positive changes, but not as many. When women borrow, children become immediate beneficiaries. Women have longer vision. They want to bring changes to their lives step by step. They use their money very cautiously. Women are excellent managers of scarce resources. A woman in a poor family learns to stretch every resource to its maximum. She must manage everything with whatever little she has. When she gets a loan, she brings her excellent managerial skills to it. She always gets much more mileage out of it. Noticing this, we changed our policy. Instead of making 50/50 our goal, we decided to prioritize women. As a result, today 95 % of our borrowers are women. I think many of the good things that have happened at Grameen are a result of our decision to focus on women.

## B. ICT & MICROFINANCE



This graph, designed by PlaNet Finance Asia Team, describes the general client-base required to justify the investments in the relevant ITC tools. It is for indicative purposes only, as specific factors may alter the required size of investment and benefit according to specificities in the operating environment.

### Increasing Access to Microfinance Using ICTs [excerpts]

*Peter Siu, Chemonics International, <http://www.microfinancegateway.org/>*

According to a recent UNDP press release, “despite the growth of microfinance initiatives, only 3% to 6% of the estimated global potential of 500 million poor households have been reached. Microfinance loans tend to have quite high interest rates in order to recover the high costs of loan administration. ICT can allow MFIs to lower the cost of loan administration, and thus, offer more affordable and flexible loan products to clients. In addition, ICT can also help MFIs to expand their service coverage by providing logistical, strategic and analytical support:

1. Through well-defined **MIS**, MFIs are able to access/analyze information more efficiently for better decision-making, operations management, and product development. Several potential features include:
  - Access control and security (i.e. passwords, audit trails)
  - Loan functionality (processing different types of loans with changing repayment schedules and interest rates)
  - Deposits functionality (including access for the user to interest rates, fees, and penalty charges)
  - Report generation and database query/analysis capacity (i.e. loans profile by gender and risk, credit scoring)

2. **Smart Cards** are plastic cards, similar in appearance to debit/credit cards, in which microchips are embedded. The microchip allows for data storage—and allows MFI clients to carry all their related loan and

purchase information on a microchip. As a result, smart cards can act as a debit card, an account passbook and even a credit card.

The smart card allows for withdrawals, deposits, currency exchanges, money orders and other services. As a security precaution, fingerprint images are stored on the microchip and are compared with those taken by biometric scanners at the time of transaction. Since Smart Cards hold their information on the cards (in the microchip), transactions do not require a transfer of information from a central source; transactions can be entirely off-line, rendering telephone lines and fibre-optic cable unnecessary. In addition, since smart card transactions can reduce some of the paperwork, transaction times are much shorter, enabling loan officers to service more clients. Information reconciliation/consolidation from the vendor/loan officers to head office can occur through information transfers at regular intervals.

One large advantage Smart Cards have over traditional ATM and credit cards (which are also being used by MFIs) is their ability to store and track purchasing and transactional histories.

3. **PDA**s are small portable handheld computers that can allow loan officers access to his/her institution's MIS from the field. Depending on location, information can be updated by the loan officer to the head office instantaneously or every day (which decreases the need for data entry clerks).

Palm Pilots can also be able to generate reports when connected to a printer, process complex calculations and track employee time allocation for productivity analysis (by tracking machine usage statistics). As with Smart Cards, the Palm Pilots greatly reduce the amount of time needed for transactions between the loan officer and clients.

Since ICT in microfinance is a relatively new phenomenon, many unknowns still exist. However, what has been learned—and applicable towards ICT in any developmental setting—include: designing approaches tailored to the users' needs (not the other way around), being realistic about what technology can do, ensuring a holistic and flexible implementation scheme, and being wary of unintended consequences.

## Expanding Microfinance With Digital Technologies

*<http://www.businessweek.com/adsections/digital/microfinance.htm>*

Micro-loans in their modern form were pioneered by the Grameen Bank to provide a source of credit for poor people in Bangladesh. Today more than 1,000 microfinance institutions offer micro-loans of between \$150 and \$500 to five million clients in poor rural communities or urban slums spread across Africa, Asia, and Latin America. Most such loans go to women to enable them to expand small businesses. A track record of remarkable repayment rates and success in helping recipients climb out of poverty have made micro-loans a favorite of development agencies.

Yet relatively few poor people have access to micro-loans -- about five percent of an estimated 500 million potential borrowers worldwide. Major reasons are inefficient practices and the resulting high costs of processing loans and keeping records. Few if any microfinance institutions are profitable, so they cannot tap banks or capital.

What may change this picture is the advent of digital tools to automate transactions and increase efficiencies. Imagine a loan officer travelling from village to village, equipped with a mobile data entry device similar to that used by FedEx delivery personnel and transmitting loan data over wireless links to a central computer. Microfinance institutions operating in Mexico are now testing the use of Palm Pilots equipped with simple accounting software for their loan officers, and many such groups are introducing computerized accounting systems.

PRIDE AFRICA operates in six East African countries where half the population subsists on less than \$1 a day. PRIDE links its base of 100,000 clients to financial services, information, and markets. It has developed its own banking software to manage micro-loans and small savings accounts and to automate administrative tasks. The group is now experimenting with magnetic cards and information kiosks that allow even illiterate

clients to access their accounts and check loan balances, while cutting costs. PRIDE is developing software that will enable it to bundle together loans from tens of thousands of its clients and resell them to commercial banks, opening up capital markets to finance expansion.

PRIDE Founder Jonathan Campaigne points out that microfinance can benefit from the same emerging Internet-based technologies that are forcing retail bankers everywhere to rethink their business models. These include tools like data mining, customer service and support software, and customer relationship management applications. PRIDE, for example, hopes to work with partners to build an Internet-based virtual "back-office" and provide tools that are easier for poor clients to use -- all with the intent of making access to financial services as widespread as the traditional African drum.

## Lessons from the Field: ICTs in Microfinance

*Digital Dividends <http://www.digitaldividend.org/>*

The majority of poor people in rural areas around the world lack access to financial services. In India alone, over 200 million people (36% of the rural population) do not have access to a bank. Although India has more microfinance organizations than any other, these programs only reach a small percentage of needy households. The rest have no alternative to the local moneylenders whose exorbitant interest rates reinforce the indebtedness that contributes to a lifetime of poverty.

Microfinance Institutions (MFIs) play an important role in the economic development of poor communities. Access to credit enables households to accumulate wealth and assets, which allow them to better cope with their economic and social vulnerabilities. MFIs include non-governmental organizations (NGOs), credit unions, non-bank financial intermediaries, and even a few commercial banks. The majority of these microfinance organizations are donor funded, which is an obstacle to their scalability and sustainability. Of the more than 7,000 MFIs worldwide, less than 100 can claim financial self-sufficiency.

To combat this problem, some MFIs are using new information and communication technologies (ICTs) to improve their operations in three main areas: expanding their customer base and extending their reach into underserved areas, establishing secure identities for customers, and lowering transaction costs.

### **Reach**

Larger banks, whose access to capital, scale, reach, and expertise could alleviate many of the problems associated with microfinance, have been reluctant to respond to the unmet demand for microfinance services due to the large costs of building and maintaining physical bank branches, and the high transaction costs and low profit margin on small loans. With this in mind, many initiatives are currently using new information and communication technologies (ICTs), such as smart cards, handhelds, and modified ATMs, to bypass the traditional methods of providing bank services. In doing so, they are lowering their overhead costs and expanding their reach, helping to extend the availability of microfinance.

In Bolivia, one MFI is providing ATM-enabled banking services to Bolivians that do not have access to the traditional banking system. PRODEM FFP was established as an NGO in 1986 by ACCION International. Since 1999, it has been a regulated, privately held financial fund focused on bringing microfinance services to underserved communities, both rural and urban.

In a country where 70% of the general population and 94% of the rural population are classified as poor, PRODEM has designed its own ATM, tailored to meet the needs of its rural customers. The company provides its customers with a smart card, so that the ATMs are able to verify the customer's identity and complete transactions without being electronically connected to the central office, thereby allowing PRODEM to expand its reach into remote areas.

PRODEM finds that the ATMs allow it to serve customers who cannot come to their branches during normal business hours. Moreover, the ATMs are capable of "speaking" to their users in their local language, thus enabling illiterate customers to access their services. Audio instructions are currently available in Spanish, Quechua, or Aymara. Combined with a touch screen interface, customers are able to deposit and withdraw funds without filling out a deposit slip or withdrawal form. Additionally, the ATMs facilitate money transfers, and provide access to government programs that provide work for low-skill workers and make payments to senior citizens.

PRODEM's ATM software was developed by a subsidiary of PRODEM, Innova Empresarial, which specializes in technology and consulting services. Its features include an easy-to-use administrative interface, as well as a number of reporting options, including daily, weekly, and monthly. In addition, Innova is in the process of developing palm technology that would enable PRODEM to take their financial services, via a handheld, into local homes and businesses of their customers. ICTs are also being used by VOXIVA to allow MFIs located in Peru to expand their reach. The company uses a phone-based system with voice prompts to expand microfinance networks into rural areas that have high numbers of illiterate people. The service reduces operating and transaction costs, resulting in savings that can be passed on to the borrower.

#### **Identity**

Rural poor people frequently lack an "identity" that allows them to access credit. Banks are reluctant to provide services to these potential customers, who are often illiterate and have no credit history. By providing secure identification, new ICTs such as smart cards and biometrics are compensating for this, allowing many to access credit from formalized institutions for the first time.

PRODEM, for example, is using ICTs to verify the identity of its customers. It utilizes a combination of smart card technology combined with biometrics to allow fingerprint ID verification at all of its branches and ATMs. The use of fingerprint verification ensures that only the account holder can complete a transaction, making it more secure than traditional ATMs that only require a PIN number. The system is also easier to use for customers not familiar with PINs, passwords, or other identifiers that require memorizing an identification code. The smart cards store all of the customer's personal and financial data. As a result, the ATMs are able to verify the customer's identity and complete transactions without being electronically connected to the central office. As of May 2003, PRODEM had 32,000 smart card account holders. The company plans to extend its network throughout Bolivia, and intends to expand into other countries in the near future.

Secure identity can also protect MFIs from customers who have proven to be bad credit risks "shopping" for loans from one branch or one MFI to the next. Addressing this problem requires sharing customers' credit histories among MFIs operating within a country--a function typically performed by a credit bureau. A new effort to explore such cooperative approaches, and the ICT tools to make them possible, is the Microdevelopment Finance Group (MFG), an initiative convened by technology giant Hewlett-Packard as part of its pro bono initiative under the UNCT Task Force working group on entrepreneurship. The MFG is developing new "end-to-end" technology solutions for microfinance as well as new organizational forms that could increase cooperative efforts such as credit bureaus or pooling loans across many MFIs to access capital markets.

#### **Efficiency**

ICTs also allow microfinance organizations to increase their efficiency, thereby lowering their overhead costs, and helping them to achieve sustainability. The Dhan Foundation, for example, is streamlining its microfinance activities using a combination of handhelds and smart cards. The technology results in time savings for loan officers, while also ensuring more accurate accounting and record keeping. Because all the information is stored on a smart card, field officers can make decisions on the spot, reducing the number of visits required to complete a transaction.

BASIX, India's largest microfinance organization, is experimenting with handhelds and smart card technology to automate the loan process and keep track of repayments, in order to reduce labor and cash handling costs. BASIX's Mobile Portfolio Management System also helps to minimize accounting errors.

Swayamkrushi, a women's lending cooperative in India, has also experienced an increase in efficiency since it computerized its operations. The computers used in the microfinance operations are also being used by members to access the Internet, providing additional benefits to the women.

Pride Africa, a cluster of MFIs currently operating in five sub-Saharan African countries, is using IT for increased efficiency and faster growth. In Kenya, it has launched an experimental portal, DrumNet, which stores information on the buying and business habits of Pride clients, in order to group the purchasing power of thousands of small entrepreneurs.

Various software packages are contributing to the increase in efficiency of many MFIs. HISAAB, for example, is a group-level microfinance software designed for illiterate and uneducated users. The software is used to document transactions, and allows for more macro-level analysis of lending patterns, cash flows, and repayments. Other software features include the ability to record meeting attendance and savings/credit account transactions, and to exchange data with the central bank office. Cooptions Technologies has developed a software package, which will computerize the activities of cooperative lending societies and micro-lending banks. The software features online disbursements, data transfer to managing banks, savings/credit account modules, and financial accounting systems. Another, Microfinancer MATRIX, is designed for large micro-lenders. It links the head office to branch offices, and also has built-in accounting and evaluation capabilities.

Additionally, software enables microfinance organizations to consolidate their loans. Once microloan details are stored in an electronic format, their amounts can be combined into a larger loan that can be bought by a larger bank, or securitized to capital markets, thereby providing a much needed supply of capital to MFIs. The Microdevelopment Finance Group hopes to field test some elements of a system that can potentially provide increased efficiency and other aggregate benefits to MFIs over the coming year.

MFIs often don't know what software they need, or are not culturally ready to adopt it within their organization. To address this deficiency, the Consultative Group to Assist the Poorest (CGAP) will soon begin a consulting program that helps these MFIs to decide what software they need, and then assist them in buying and implementing it.

ICTs will continue to impact microfinance operations worldwide. As prices of relevant technology like ATMs, biometrics, voice recognition, smart-cards, and PDAs continue to fall, more MFIs will be able to take advantage of the benefits they offer. New technologies and applications are constantly being developed aimed at increasing the reach and efficiency of microfinance organizations. Improvements will make operations more secure, increase transparency (and thus scalability), reduce repetitive tasks, and provide data mining capabilities that will allow MFIs to compete effectively and better manage their operations. Together, ICTs are helping MFIs to finally meet the unmet demand for microcredit throughout the developing world.

## **Providing Rural Phone Service Profitably in Poor Countries**

*<http://www.businessweek.com/adsections/digital/microfinance.htm>*

In poor countries, most people -- in all, half the world's population -- still live in rural areas. Village phone service is rare, Internet service non-existent, and poverty widespread. In Bangladesh, for example, 90 percent of the country's 68,000 villages have no phone service of any kind and average annual income is less than

\$200 per person. It might not sound like a promising commercial telecom market, but appearances can be deceiving.

Since 1997, GrameenPhone has provided commercial cellular services in Bangladesh, operating primarily in urban areas. A subsidiary, working with the microfinance organization Grameen Bank, provides service in rural areas via local entrepreneurs, usually women. Each local entrepreneur owns and operates a cellular phone that typically serves an entire village. Villagers pay for phone calls in cash, by the minute. Grameen Bank helps by loaning the entrepreneurs money to buy the phone and collecting payments from them for phone usage on behalf of GrameenPhone.

These shared-access village phones are very profitable, generating revenues that now average \$1,200 per year per phone, more than three times as much as the company's urban phones. Each phone serves an average of nearly 70 customers -- in effect, tapping the buying power of a whole village. Per phone revenues have more than doubled in two years of service, and some phones in larger villages generate revenues in excess of \$12,000 per year, in one of the world's poorest countries. A study by the Canadian International Development Agency shows that the village phones also have a big social impact. For villagers, access to phones often substitutes for a trip to Bangladesh's capital, Dhaka, that could take days and cost many times as much as the call. Villagers also use phones to find out current market prices for their crops, arrange remittances from family members working abroad, and obtain urgent medical help.

If it works in Bangladesh, how about in rural areas elsewhere? If phone and perhaps Internet services can be provided profitably to rural communities through shared access, then opening up such regions to commercial telecom competition may be an effective way of stimulating rural development and providing significant social and economic benefits to impoverished areas. The business opportunity also seems large enough to stimulate private investment: becoming the phone company and the Internet service provider for nearly half of humanity.

## Microfinance to Get the IT Edge

*By Frederick Noronha,*

He's a young researcher still in his twenties of Indian origin. Parikh has been spending time in India even as we start seeing signs of a reverse brain-drain with skills and talent showing up from among expatriates keen not just to understand their roots, and work to improve things here.

Micro-finance, one attempt to get the poor to help themselves by collecting small sums of money and loaning it between themselves, is to get a leg-up from IT if Parikh and his team have their way.

Their new software is getting finalised to make it easy for simple villagers to undertake more complex financial transactions. It's called Hisaab (meaning, 'accounts'). Interestingly, what it does is not just to make the account-keeping process simpler, but also to make sure that people with low-literacy skills can use this new package. "This software has a different kind of user-interface. It has been designed with low-literacy groups in mind," explains Parikh. Instead of names and text, it has more numbers involved. It's obvious, but we often forget that it's easier for the poor to read numbers. "Users could replace someone's name with a code-number. Numbers are also easier to remember," says Parikh. It's easier to type in a number too.

Behind micro-credit, the idea is to ensure that money goes round the village, and that it gets productively used. This simple idea could help the poor, if given that vital IT-edge, feels Parikh. How the software works seems simple enough, at least in theory: Each month, the group of women meets and puts together Rs 50, 70 or 100 or some other predetermined figure.

Over time, this generates into a collection of money that can be used for income generation, tackling sickness, or the loss of a job. Because the group works collectively in saving and loaning out their resources, repayments tend to be high due to peer pressure against defaulting.

"Money is put back, and over time, it grows. This allows larger loans to be taken. The core-goal is to rotate money as much as possible, so it supports productive activity. So, a one rupee (a little over two cents, but not pittance in a rural Indian setting) put in gets used not two or three times in a year, but revolves around 10-11 times if possible," says Parikh.

He says such groups expect to link up with banks, NGOs who are working on micro-finance, and NABARD (the Indian bank for agriculture and rural development) also offers loans to such self-help groups.

"Due to their collective liability, they have shown better repayment rates. Because if one person doesn't pay, everyone would be less likely to get a loan. Peer pressure being high, repayment rates are as high as 90-95% while individual repayments elsewhere could be 40%," argues Parikh. "This is not just theory. It works in practise too. It depends on how strong the groups are, and how well managed. You need to build capacity in accounting, management and discipline," says he.

To make the software user-friendly to the poor, it's being built up textually-light, with a greater number of images and graphics. Currently, it is being built up by teams of the Media Lab Asia and the Human Factors International. HFI is a Fairfield-Iowa headquartered group which says "we make software usable". It has its India office in Andheri in the Indian commercial capital of Mumbai.

Recently, the team putting together this software went and gave a demo to potential users in Tamil Nadu. Feedback was positive. Its demo version has been done in Flash, while actual development would be done in Java -- meaning that the software could be run on either the popular Windows platform, or the stable GNU/Linux operating system. "We want this to be an empowering tool (for the villager and micro-credit groups). By being able to manage their own finances in a more sophisticated way, they will now be able to undertake more complex transactions," says Parikh.

For instance, withdrawals and deposits could be more 'arbitrary' and need-based than would otherwise be possible in a more traditional form of account-keeping. You don't have to save fixed sums of money just because it makes account-keeping easier. "More complex financial transactions are possible without accounting hassles," says Parikh.

"We want it to become part of a very local system: locally managed, locally mobilised and locally distributed. We want to minimise external interventions, and plan to have a lot of partnerships with NGOs," says Parikh.



## What can the Internet Offer to Microcredit Loan Officers in Rural China?

*Kaiser Kuo, October 2003*

With all the attention paid to the tremendous strides China has taken in ICT in recent years, it's easy to forget about those who have been left behind. Tsien's fear is that unless something is done, the ICT gap will translate into increasingly pronounced economic disparity as government and social services as well as financial institutions migrate on line, and as commerce is increasingly conducted over the Internet. "It's people on the wrong side of the divide who stand to benefit the most from even the most rudimentary training in use of information technology," says Tsien.

"Right now, accounting numbers are kept by hand, copied and recopied." With over 2,700 outstanding loans in that county alone, the accounting tasks are daunting. "We have some computers," says Long, "but no one can use spreadsheets." The computers they're trying to run it on are often really old, and the system just couldn't run on a 386 with 32 megs of RAM." Zhou has been pleading with his superiors to upgrade, and to buy basic accounting software—but so far with no success.

And yet the low IT skills penetration among the microcredit program officers stands in marked contrast to the relatively advanced infrastructure of even this semi-rural county seat. Mobile phones are ubiquitous, 512 kbps ADSL broadband service is available for only US \$10 a month, and there are three well-equipped Internet cafes in town,

"In just about every township across China, there's at least one Internet café. Right now, of course, they're mostly full of kids playing online games. But what if we could kick out all those kids, bring in groups of microcredit loan officers and teach them what the Internet can offer them?" Tsien rhapsodizes on the possibilities: Online credit databases, Web-based tools for loan management, sophisticated mobile Internet tools. "We're taking it step by step. It still requires a little leap of faith."

## V. PUBLIC-PRIVATE PARTNERSHIPS

### Asian Forum on ICT Policies and e-Strategies

#### Public-Private Partnerships and Financing ICT Developments

*Kuala Lumpur, 22-23 octobre 2003, Paul Ulrich, Independent Consultant Hong Kong*

The paper begins with a taxonomy of the different sets of actors involved in public-private partnerships, identifies their respective roles and interests, and discusses the factors that cause partnerships to succeed or fail. It then analyzes how partnerships provide funding for ICT development with particular emphasis on the promotion of innovation, employment, and small business in ICT—through incubators, technology parks, and special zones—and providing access to ICT for the poor—via rural ICT deployments, universal-access funds, and targeted subsidies. The discussion describes how various options for funding, recent advances in technology, and creative program designs can enable governments to achieve their objectives in ICT.

#### 1. Classification of Public-Private Partnerships

Development agencies, civil-society organizations (CSOs), and businesses bandy about the term "public-private partnerships". Fostering global partnerships even figures as a separate U.N. Millennium Development Goal—the last of the eight—with diffusion of the benefits from information and communications technology (ICT) mentioned as the final target. Partnerships and ICTs, however, are not merely an after-thought to be

addressed once communities achieve the other needs of poverty alleviation and sustainable development. Rather, they are integral to the process of reaching those goals. At the same time, while development generates much rhetoric about the need for, and benefits of, public-private partnerships, there is little clarity as to what exactly the term means, its consequences, potential pitfalls, and advantages.

The nebulous nature of the concept partly stems from the myriad actors who can act as partners, on either side of the public-private relationship. The constituents of governments, businesses, civil society organizations (CSOs), academia, and donors come most readily to mind. But how does one classify them and their roles? Upon initial reflection, governments, donors, and academia fall into the public domain, while businesses and CSOs represent the for-profit and non-profit private sector, respectively. Yet, as shown in Figure 1 below, governments may control state-owned enterprises, donors may be private foundations, and academics may belong to private universities or work within corporate-research departments. Some businesses are public-stock companies or non-listed parastatals, with specific government-mandated obligations to fulfill, and civil-society organizations may actually be state-owned or government-organized non-governmental organizations (SONGOs and GONGO, respectively)—a contradiction in terms, but which nonetheless occurs in places like China.

Moreover, the direction in the flow of funds between the various parties can vary. CSOs may be recipients, but in the case of international NGOs, they more often serve as conduits between international donors and local NGOs. Many large companies practice corporate philanthropy and act as donors in their own right. Others are publicly listed and receive much of their capital from the public and, in some cases, debt financing as well. Partnerships may be bilateral, but can frequently be tri-lateral or even multi-lateral with a host of organizations involved. In some Asian countries like China, private CSO interactions with government are less partnership, more uneasy alliance: the state makes registration difficult, requires local government oversight, and permits neither geographic nor sectoral expansion without approval (Young, 2003).

Figure : A Taxonomy of Entities in Public-Private Partnerships

Public	Private
<b>Government</b>	-----> SOEs
Listed Firms	-----< <b>Business</b>
GONGOs	-----< <b>CSOs</b>
<b>Academia</b>	-----> Corporate Research
<b>Donors</b>	-----> Foundations

## 2. Factors Affecting Performance

Partnerships take many forms, are inherently complex, and management intensive. Even between similar ICT businesses, they have a high rate of failure. In the early 1990s, studies by consulting firms McKinsey, Booz Allen Hamilton, and Dataquest found that half of all such partnerships failed in that they destroyed, rather than added, shareholder value or ended in dissolution. Strategic alliances tended to have a higher rate of success, followed by equal joint ventures where each held a fifty-percent stake. Acquisitions and mergers fared worst. After mention of overly optimistic expectations, the second leading cause of failure revolved around poor communication and inadequate sharing of information—a shortcoming that ICTs can address, but only if the organizational environment permits it.

In compensation for the higher risk inherent in partnering with another firm, the studies showed that alliances also provide higher annual returns than going it alone (at an average of 17 percent versus 11 percent), and this explains their popularity, with the frequency of such partnerships growing by as much as 25 percent per year (TA, 1998). By far the highest returns can come from venture-capital investments, but chances of any one

investment's succeeding are slim, thus leading to a portfolio approach of investing in multiple non-related ventures.

Like best pairs with like, but such partnerships of equals are not possible in public-private arrangements of inherently very different entities. Looser alliances and those that are open in dealing with the other party often do well in business ties. That feature can characterize public-private partnerships, as well. Clarity in respective roles is important—for surveyed ICT businesses, this feature, along with communication between partners were the third and fourth most cited attributes to success after selecting the right partner and senior management's commitment to the endeavor (TA, 1998).

Among all sectors, telecom services, software, semiconductors, and biotech tend to place priority on alliances with relatively deep integration and a high number of such partnerships. Telecom equipment vendors and the media tend to have both fewer alliances and less integration than the other three, but still occupy the middle of the range among all sectors.

Strategic alliances fare better than acquisitions, mergers, or joint ventures because the looser arrangements allow partners to more easily isolate and benefit from the other's strengths without also inheriting its weaknesses. Another risk of tighter arrangements, which is especially prevalent in venture-capital investments, is the need for a viable exit strategy should things go wrong or to recoup one's investment. For example, over three quarters of joint ventures end in sale by one of the partners, but once a joint venture has been formed, it is virtually impossible to sell to anyone but the partner, which means the sale, often inevitable after a number of years, occurs at "firesale prices".

In contrast to some of the many failed corporate tie-ups in ICT, privatizations of public telecommunications operators, which reached their heyday in Asia and elsewhere in the late 1990s, have had a stable track record. Perhaps because of the large sunk costs and high transaction expenses involved in the process, very few privatized telecommunication infrastructure projects have been re-nationalized, re-negotiated, cancelled, or transferred to another private operator (Harris, 2003).

In general and for smaller-scale endeavors, the success factors of public-private partnerships in development mirror those in the corporate world and include:

- mutual trust, complementary strengths, reciprocal accountability, joint decision-making and a two-way exchange of information;
- clearly articulated goals, equitable distribution of costs and benefits, performance indicators and mechanisms to measure and monitor performance, clear delineation of responsibilities and a process for adjudicating disputes;
- shared perceptions and a notion of mutuality with give-and-take;
- mutual support and constructive advocacy;
- transparency with regard to financial matters, long-term commitment to working together, recognition of other partnerships (Lister, 1998).

### **3. Motivations for Business Involvement in Public-Private Partnerships**

As in any form of negotiated agreement, public-private partnerships that succeed share a complementarity of interests. The key interests of respective parties need not coincide or even overlap, but they must not fundamentally come in conflict. Ideally, the two or more parties share, or at least profess to have, the same goals—the development of society. Some companies put the notion of corporate social responsibility higher on their agenda than others. Ultimately, however, for-profit businesses intend to make money and will not enter a partnership that does not in some way lead them toward that aim.

From the business's viewpoint, a public-private endeavor may be entirely philanthropic, and most major ICT corporations have departments for this. One well-known example is Hewlett Packard's e-Inclusion program to

bring development through ICT projects to underserved communities. Another is Cisco's global system of networking academies, which train and certify ICT professionals and students in the use of Cisco equipment. Like Cisco, other leading vendors such as Oracle in databases, Microsoft in software, and Intel in microprocessors provide certification courses and often train those in less developed countries for free or at concessional rates.

Many view corporate philanthropy or social responsibility as good for business—directly, in its impact on public relations in the marketplace and indirectly in improving the likelihood that those it helps will become future customers, as well. Winning a new customer can cost as much as ten times that of keeping an existing one, so ICT firms—like most others—will do what it takes to enter or gain dominance in a market. Microsoft, for example, offered to share its secret source code with the Chinese government and tends to turn a blind eye to widespread piracy in Asia—in part as a way of reinforcing the spread of its software as the de-facto standard. Other firms enter money-losing alliances with governments as a way to gain potentially lucrative future public-sector contracts in related areas.

For the same reason, corporations partner with civil-society organizations in developing standards that the businesses feel will ultimately help the sale or development of their products. The standards may benefit the entire industry and society in making technologies simpler and cheaper to deploy, but that is not necessarily the reason for corporate support.

Cisco's networking academies have succeeded because the goals of the company in developing a broader group of technicians able to use its product complements that of the host countries, which need more and better-trained ICT personnel to take advantage of the economic opportunities presented by the sector.

Another success—the Digital Opportunities Initiative, which resulted in one of the better and more widely read analyses of ICT, was a partnership of a donor (the UNDP), a private CSO (the Markle Foundation), and a major ICT consulting company (Accenture). Accenture benefited by strengthening its credentials for ICT strategies in the developing world. However, for whatever reason, the initiative has not continued, and the Markle Foundation, which focuses on media and society, has exited from its involvement.

The success of partnerships often hinge on personal relationships between individuals rather than formal institutional structures. Nevertheless, despite the well-intentioned dialogue about the virtues of partnering for development, truly equal partnership may be impossible due to the asymmetry in power that characterizes most public-private endeavors. The unequal power relationships depend largely on who provides the bulk of the funds and the degree of concentration in that funding. For example, a strategic investor or large minority shareholder in a publicly held firm frequently has more influence on the company's actions than the public at large, which may hold more shares but is not organized to exercise its shareholder rights.

In addition to “hot” money flows of foreign capital, a lack of corporate governance and transparency in public-private partnerships contributed to Asia's financial crisis in 1997 and 1998. An overly cozy relationship between government and the country's major domestic firms led to insufficient oversight over loans that were made on relationships or directed-lending policy rather than strict financial criteria.

Public-private partnerships inevitably involve negotiations, but getting to “yes” can be easier than may at first seem. Even if the two (or more) parties have diametrically opposed views on key points of negotiation, so long as they place differing priorities to the interests in contention, there is a good deal of scope to reach an agreement, combining the top few priorities of each and a blend of those that rank equivalently in importance between them.

#### **4. The Need for Transparency, Accountability, and Vigilance in Partnerships**

Information is the lifeblood of finance and the efficient allocation of capital. Just as public stockholders—to make informed investing decisions—need to know what a company's management is doing, so too a country's

citizens need to be aware of the terms of any deals between its government and firms contracted to work for it. Subsidies and other incentives provided by government to a business represent an aspect of partnership. To avoid public discontent about crony capitalism or unfair tendering processes, governments (and donors) should make their awarding of grants and contracts as transparent as possible. South Korea's OPEN program is notable for its use of ICT in facilitating this process of good governance and public accountability.

Strong personal ties, or "social capital" can help bridge the disparities in status between partners, but not overcome them, which makes such arrangements especially vulnerable to changes in leadership. Some have said that the partner that most completely assimilates the knowledge of the other will benefit most from the relationship; another view states that one party exercises power by shaping the needs of the other so that it not only acts in ways it might not otherwise do, but actively wants to pursue the aims in the former's interests (Lister, 1998). According to the first approach, those who succeed are good learners; according to the second they are good manipulators.

By virtue of their grassroots presence close to communities, many CSOs can act as honest brokers in partnerships between governments and donors on the one hand and private ICT firms on the other. They are able to monitor the results of the endeavor and ensure that those affected have a voice in the decision process and actually benefit as intended. For the more remote communities, ICTs represent an entirely new product or service that may initially seem to be of dubious benefit. Since all new markets tend to follow an S-shaped curve of market demand, characterized by initially slow uptake by a few early adopters, followed by a rapid surge once the items become mainstream, and finally a second leveling off at the market's saturation, CSOs can also help catalyze demand in the early stages by explaining the uses and benefits of the new technologies.

Academic institutions can play a role in helping design and evaluate joint projects that often can involve technically demanding research. They and their corporate research counterparts are active in developing standards that are revolutionizing the spread and use of ICT: from open-source software and the next-generation Internet (IPv6), which will enable pervasive telemetry, to wireless local-area networks (IEEE 802.11b or "Wi-Fi"), the longer reaching standard of 802.16 (or "Wi-Max"), and the proposed 802.20 "Wi-Mobile".

Governments and big businesses that close the deals for a joint endeavor may be far removed from those who experience (and sometimes suffer) its impact. As in any complex undertakings that involve multiple stakeholders, public-private partnerships can also have unintended consequences outside the interests of any one party.

For example, some groups like Digital Partners in the U.K., have hit upon the eminently reasonable notion of donating used (or "pre-owned") corporate ICT equipment to communities in developing countries that can ill afford to buy the products themselves. Indeed, the Organization for Economic Cooperation and Development (OECD) estimates that companies worldwide will decommission 500 million PCs over the next five years. Digital Partners has lined up a number of top-tier corporations who are more than happy to participate. And why not—by the time of disposal, their idle stocks will have a net negative value to the company: the components contain so many hazardous materials that strict environmental policies in their host countries mean that they would have to pay recyclers to dispose of the equipment for them. In fact, it is ten times cheaper to ship what has come to be known as e-waste to Asia than to recycle it in the U.S. (Goodman, 2003), and that is what already happens. Eighty percent of discarded computers and components go to Asia for recycling and most of that to just one country: China. The transfers are illegal, as China has banned the import of hazardous waste, but it is smuggled in and dumped in places not far from Hong Kong (BAN, 2002). Admittedly, the work of recycling provides much needed jobs, but it also generates horrific environmental and health damage in the affected area.

E-waste is the dirty secret of an otherwise model industry. A true public-private endeavor to solve this problem must involve global organizations like the U.N. to pressure the U.S. to prevent its companies from shipping hazardous materials overseas for disposal, or better yet, to design the products from the start to be more easily disassembled and environmentally friendly. To defray the costs of re-designed products, governments might enlist consumers to pay a small tax on all product purchases with proceeds going into a fund for payment to those who re-design their products. Producers of such components—and many of them are in Asia—would be eligible recipients.

## 5. Sources of Funds

One commonly thinks of the private sector, and particularly large, mainly Western firms, as the primary source of funds for public-private ICT partnerships in Asia. During the decade of the 1990s, flows of private portfolio and direct foreign investment to the region swamped in magnitude the degree of aid provided by international financial institutions (IFIs): nearly a quarter trillion dollars of private investment flowed into infrastructure projects and much of this, perhaps a third or more, went into telecommunications. Indeed, for this reason, the World Bank has stopped making loans to many large telecom projects in Asia's emerging markets, which nevertheless may still receive support in social infrastructure like health and education, for which private capital is less forthcoming.

A recent study by the United Nations Commission for Trade and Development (UNCTAD) surveyed the effect of host-country policies in attracting foreign direct investment. The study found that investment incentives ranked lower than access to markets (the top priority), the policy environment, production costs, workforce competence and level of education. This confirms similar findings from the past twenty years that LDCs frequently give away too much in hopes of getting foreign investment. The process leads to a “race to the bottom” as country competes against country as to who can give the biggest or longest tax holiday. The same process repeats itself within countries between different regions or even between different counties vying for the jobs that a new production plant or service center might offer.

China has recently overtaken the U.S. as the world's largest recipient of foreign direct investment (FDI). However, one should read investment data with care—there is a fair amount of “round-tripping” of money that goes from China to Hong Kong (and another tax haven, the British Virgin Islands) before returning to China for registration as “FDI”—a kind of tax dodge to earn rebates from apparent exports. Similarly, by a strict accounting measure, the tiny country of Luxembourg—not the U.S.—ranked in 2002 as both the world's leading source and recipient of FDI. Large corporate mergers and acquisitions involving multinational companies with headquarters based in that country (again for tax reasons) resulted in the accounting anomaly (Sauvant, 2003).

China's dominance in attracting FDI becomes apparent in comparing its levels with those of the Association of Southeast Asian Nations (ASEAN). Ten years ago ASEAN received 75 percent of U.S. FDI in East Asia; today much of that now goes to China, and ASEAN's share in East Asia has dropped to ten percent. China's huge domestic market, disciplined labor force, and low production costs are key inducements. While Indonesia has the largest population and market in the ASEAN region, its periodic flare-ups of instability are not conducive to encouraging foreign investors, who abhor risk and uncertainty.

FDI to fund Asian ICT need not come from the West: it may come from other Asian countries within the region. Throughout Asia-Pacific a number of countries share related historical or cultural similarities. Such ties and mutual understanding facilitate foreign investment. South-South efforts at cooperation might try to pair these, with businesses and governments of economically more advanced countries partnering with their poorer or smaller neighbors—whether Thailand helping Laos; India helping Sri Lanka, Bangladesh, or Pakistan; Central Asian countries cooperating with Mongolia; Singapore with Malaysia; Indonesia with East Timor, and so on. As channels for FDI, Taiwan and Hong Kong have contributed enormously to China's development, particularly in its most dynamic region—the Pearl River Delta, while the Japanese and Koreans are more prominent in northeast China's Bohai rim. China also has a formal program of internal partnerships, pairing each of its most

advanced eastern provinces with a relatively backward western one as a means for spurring development and convergence of living standards.

In addition to job creation and economic growth, countries encourage FDI to transfer knowledge and technology. China presents probably the best case study in successfully attracting FDI and requiring explicit conditions of joint research and training as part of the package. However, smaller countries generally without the enticement of a large internal market lack the leverage to make similar demands.

Forms of private financing for public-private ICT partnerships resemble those of conventional private-sector investment and run the gamut from direct domestic investments, foreign direct investments, as well as domestic and foreign portfolio investment in publicly listed entities. In privatizing major telecom assets, the government can involve the private sector through (1) joint ventures, as in Indonesia; (2) build, then transfer facilities back to the government entity; (3) build, operate for a fixed period, then transfer, as in Macau; (4) build, transfer, and then operate, as in Thailand (where the country's constitution does not allow the private sector to own such strategic assets); or (5) undertake some form of outsourcing arrangement.

Some IFIs such as the International Finance Corporation of the World Bank or a similar facility at the Asian Development Bank can take equity stakes in private ventures. Others cannot: they either provide loans, typically on concessionary terms (and hence containing a grant component), give loan guarantees, or they provide outright grants. A few donors have also tried to use fancier instruments to like subordinated debentures to get around restrictions on taking equity shares. Such debentures are like equity in having a subordinate claim on the investee's assets. Governments may also provide grants directly to a partnership, but more frequently offer grants in other ways: as discounted rates on use of supporting infrastructure, as tax holidays, or as exclusive territorial and service franchises. In return, they make take a share of revenues, royalties, or licensing fees.

Alliances need not involve equity or debt financing but can be contractual in, for example, a marketing alliance. In China, one cell-phone manufacturer partnered with the government postal system to market its handsets at local post offices. No matter how loose the arrangement, however, alliances and partnerships require a standard legal contract defining the terms, spelling out the parties' responsibilities and recourse should any party fail to meet its commitments. Otherwise, informal agreements based on intentions or good will are unlikely to produce meaningful results.

The bursting of the stock market bubble in 2000 and near ruinous over-bidding for 3G wireless licenses among Europe's telecom providers have meant a slow-down in overseas capital for Asia's telecommunications investments. Foreign telcos are strapped for cash and wary of new entanglements, so large domestic players are increasingly filling the void. Several major providers in China and Singapore have even purchased stakes in, or acquired, Western telecom companies. At the same time, funds from IFIs and bilateral donors are unlikely to rise and may decline as the rebuilding of Iraq swallows an ever-larger share of foreign-aid budgets.

While most governments in the region recognize the benefits of liberalized telecom regimes of independent regulators and multiple private competitors, even private monopolies have generally brought better telecommunication services than those run by the state. However, where markets fail—when benefits accruing to society exceed those captured by the private participants—the public sector of governments and donors need to craft public-private solutions to provide appropriate incentives for investment. In the realm of ICT, two such areas are the funding of innovation to spur growth and the extension of services to apparently unprofitable, isolated communities as a way to enhance equity. The need to generate economic growth without compromising societal equity illustrates two potentially competing priorities for policymakers.

## **6. High-Tech Zones, Industrial Parks, and Incubators**

Although some Japanese firms lead in the number of annual high-tech patents they receive, Asia as a whole invests a lower percentage of its gross domestic product in research and development than the U.S. and

Europe. Big companies often have their own internal research departments, but the vast majority of employers and sources of jobs are small businesses, and an increasing number of these are in ICT sectors.

Software constitutes an ever-growing part of telecommunications devices. Governments such as India early on recognized its importance, and now others like China and Vietnam actively support the industry, consisting mainly of small firms, with tax policies and investment incentives unavailable even to other ICT firms (Chidamber, 2003). However, the recent accession by China and the ongoing effort by Vietnam to join the World Trade Organization (WTO) may mean a phasing out of some concessions, due to the WTO requirement of non-discrimination in treatment of national and foreign companies.

Software firms and Internet start-ups, by virtue of their small size, low capital intensity, and high potential for growth are well suited for business incubators and government research grants. Studies of programs from the U.S. Small Business Innovation Research programs to incubators in OECD countries have shown the efficacy of incubators in generating jobs in surrounding communities and in doubling the survival rates of member firms. Growing in number at an estimated twenty percent per year, incubators in Asia are a relatively recent phenomenon. Nevertheless, South Korea has over three hundred, China well over one hundred, and both Malaysia and India have invested considerably in them, as well. China also has dozens of software parks, many supported by its Ministry of Science and Technology, while its incubators tend to be physically larger in floor space per firm, to have close government support, and to receive more foreign investment than in many other Asian countries (Scaramuzzi, 2002). The country even has special science and technology parks specifically for Chinese students returning from overseas to set up business. Others are targeted to women, particularly those laid off from restructuring state-owned enterprises. Since much of China's ICT services fall in the realm of sensitive or protected sectors, most of the country's venture-capital firms are government-owned.

Surprisingly, most incubators worldwide are non-profit and supported by local governments, while the fewer for-profit business incubators receive help from both private and public sources, including international donors—often, for example, in the form of subsidized use of facilities or help in licensing and marketing new products. In return, the member start-ups sometimes offer an equity stake or a share of royalties from sales. Once they leave the protective environment of the incubator, wealthy private investors or “angels”, venture-capital funds, and large high-tech firms sponsoring their own R&D—either as separate spin-offs or sometimes in the form of internal “intrapreneurs”—are the main sources of capital in addition to that of the business founders themselves.

Incubator models range from those with a strong real-estate component located near universities, in specially designated technology parks, or at high-tech zones with government provision of advanced infrastructure, to “virtual” incubators of companies linked primarily via communication networks but not physically co-located, to international incubators with foreign joint-venture investment. China, Korea, and Malaysia have successful examples of the latter, while mainly non-Asian countries have tried the virtual format. Since much of innovation depends on the informal and serendipitous sharing of ideas fostered by proximity, it is doubtful that virtual connections can achieve the same results as more conventional ones. Incubators tend to have a time limit—typically one to several years—by which point, members must graduate and move out on their own. The dot-com phenomenon in recent years accelerated that period to tenures lasting just a few months, but such a breakneck pace ultimately proved unsustainable.

## **7. Funding Expansion of ICT to Supposedly Unviable Areas**

Unlike other utilities such as water and electricity where revenues cover only a fraction of the costs, telecommunications overall generate surplus revenues. In many Western countries, legislation requires universal service, whereby an incumbent operator or a fund created from general tax revenue or from prorated levies on operator proceeds cross-subsidizes the deployment of phone service to remote households that may be economically unprofitable to serve. Most developing countries cannot afford this and, for the time being, are opting instead for universal access—cross-subsidies to pay for shared rural community facilities like payphones or Internet kiosks within, for instance, a five-kilometer or thirty-minute walk of all inhabitants. In the



poorest countries with weak government budgets and insufficient telecommunications revenue, donors like the World Bank often provide initial seed financing to get the universal-access funds operational as quickly as possible.

In 1995, Chile pioneered an approach to reduce the cost to the government's fund for telecommunications development of providing payphones in rural areas. Over five years, the government set up multiple rounds of reverse auctions whereby pre-qualified private operators bid for the chance to enter new rural markets with help from a government subsidy. Administrators of the fund estimated the maximum subsidy needed to allow an operator to serve a designated area or group of communities and made that amount potentially available to the winner in competitive bidding. Those bids requiring the least subsidy won for each round, and winners, upon fulfilling the mandate to provide coin-operated payphones, could also provide additional revenue-generating telecommunication services to the same communities. The technique reduced the share of Chile's population without access to basic telecommunications from fifteen percent in 1994 to one percent in 2002, and the least-subsidy auctions resulted in huge savings from what the government would otherwise have had to pay, with total subsidies costing just 0.3 percent of overall telecom revenues. In addition to its careful design, the process encouraged efficiency by transferring market risk to the operators themselves—those best able to bear it (Wellenius, 2002).

In Chile, the fund granted the subsidy to a winning bidder only once—as an enticement to cover any capital or expected operating shortfalls and thereby yield an acceptable rate of return on the investment. Future plans may shift from this format to one of extending a line of credit from, for example, an IFI, which might provide greater leverage in ensuring that the operator actually fulfilled its commitments.

The success of the Chilean endeavor prompted other countries to follow suit. As of mid-2002 four additional Latin American countries had least-subsidy auctions underway, and Uganda and Nepal were beginning the process (Dymond, 2002). A year later, it seems that Nepal is still the only Asian country adopting this approach, although Sri Lanka has announced intentions for doing so as a way to encourage the private-sector build out of broadband access to rural areas. Elsewhere in developing Asia, Malaysia and India have created universal-service and universal-access funds, respectively, and the Philippines and China also have plans. Malaysia has not used competitive bidding as in Chile but opted instead to distribute funds based on the applications, development targets, and actual investments in uneconomic areas by a single incumbent, Telekom Malaysia Berhad (Hamid, 2002). This approach, however, may be less transparent, and more prone to error or interference than open bidding (Navas-Sabater, 2002).

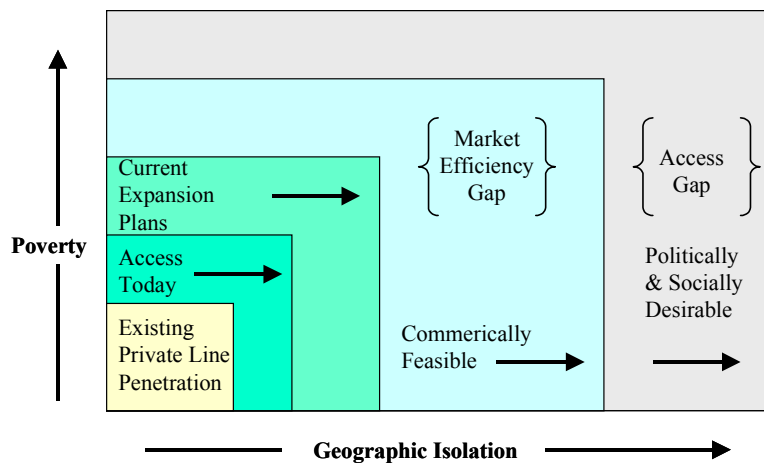
Countries vary in their requirements as to who should contribute to the funds: from fixed operators alone, to fixed and mobile, Internet Service Providers, and even the postal sector. Typically, operators do not receive exclusive licenses, but as the first to enter a remote region, are unlikely to face competition for some time. Initial rounds, as competitors seek footholds in others' territories tend to be the most hotly contested and generate the greatest savings in spread between low winning bids and the amount of funds potentially available as subsidy.

Certain elements have characterized successful auctions: a well-designed process providing contracts worth bidding for, careful research to give baseline data to help bidders make informed bids, and a regulatory regime that lets rural operators charge higher rural tariffs (within limits) and higher access charges on interconnection for calls terminating in the countryside. Appropriate interconnection policies are crucial because they can allow rural operators to profit from what is often significant demand for incoming calls from urban relatives phoning the village. Such a phenomenon has led to the cellular practice of beeping, where a rural cell phone user calls the cell phone of a (typically wealthier) urban one and hangs up just before incurring charges. The recipient then returns the call based on the number left on the handset (Oestmann, 2003). As in the U.S., where long-distance providers pay five times more to connect calls into rural networks than into urban ones (Witte, 2003), several Latin American countries have instituted asymmetric interconnection plans to help rural operators cover their costs.

**8. Public-Private Cooperation in the Countryside**

The lower cost of deploying mobile services versus fixed-line infrastructure in rural areas has expanded the boundaries of commercially feasible territory, illustrated in Figure 3 below. Mobile investments are more amenable to economies of scale with low marginal costs of serving additional customers. Moreover, as the first mover in many rural areas, they attract all pent-up demand for services. For those mobile operators targeting urban users roaming outside the cities, rural users represent additional income. Popular mobile pre-paid phone cards also provide operators with cash upfront, eliminate customer administration, credit checking, billing, collections, or exposure to bad debt—a problem particularly prevalent in poor areas (Dymond, 2002). Such attractions mean that even fixed-line operators like Philippines Long Distance Telephone are starting to use pre-paid cards.

*Figure: The Market for Universal Access*



*Source: Navas-Sabater et al, 2002*

In countries with micro-credit programs, it may make sense to integrate them with the expansion of rural telephony where such programs are viable and not, for example, subject to anti-usury laws that prevent the charging of interest rates sufficient to cover costs. In the Grameen Phone program of Bangladesh, for instance, Grameen bank recruits women entrepreneurs and gives them each a micro-finance loan to buy a mobile-phone handset to operate as public phones in rural areas. The International Finance Corporation of the World Bank Group has invested in Grameen Phone to expand its franchise network to thirty thousand villages. In India, Spice Telecom, a mobile operator, likewise enlists small entrepreneurs to operate mobile phones as payphones. Similarly, Indonesia has several thousand telekiosks and “Xpress Connection” revenue-sharing phone businesses in remote villages based on very-small-aperture-terminal (VSAT) satellite stations, and in Thailand, village heads and storeowners provide public-phone businesses as agents of the Post and Telecommunications operator (Navas-Sabater, 2002).

Even with declining technological barriers and improvements in the competitive and regulatory environments, there will remain areas that require government subsidies for access. Where commercial markets fail to reach, local governments can encourage telecenter start-ups through competitive bidding procedures, following principles that have so far succeeded with least-subsidy auctions for rural-telephony funds.

**9. Conclusion**

Public-private partnerships are fundamental to the development process and to the diffusion of the benefits of ICT. Despite the complexities of interactions among inherently different entities, both sides, and society in general, benefit from the process. Where markets work, the private sector is best suited to capitalize on them in spurring development; where markets are weak or absent—as in financing innovation or in extending ICT to remote areas—the public sector can catalyze participation with public funds. In all circumstances, successful joint programs and projects require due diligence, careful design, monitoring, and clear communication at every stage of the endeavor.

## HP' s Microdevelopment Finance Team

Convened by the Hewlett-Packard Company in August 2003, the Microdevelopment Finance Team (MFT) represents a unique public-private consortium of microfinance leaders, technology specialists and business thinkers. Members include ACCION International, Bizcredit, echange LLC, FINCA International, Freedom from Hunger, the Grameen Foundation USA, HP and PRIDE AFRICA. The U.S. Agency for International Development is providing an additional \$1.2 million in program funding.

An early result of the collaboration has been a realization that many programs face the same issues around reaching rural poor and that technologies to assist with operations are still under-developed.

The MFT's objective is to *"champion a breakthrough in the effectiveness, relevance, and scale of financial services to the world's urban and rural poor."* To accomplish this goal, the MFT decided to focus on four key levers to scale: operational costs, financial costs, capital flow, and industry dynamics. Positively impacting each of these areas will help to create conditions necessary for a breakthrough in scale. Specifically, the MFT aspires to:

- Lower operating cost by reducing transaction costs across core MFI processes
- Lower financial costs by improving performance transparency and standards of reporting
- Increase capital flow by attracting additional commercial sources of funding to the sector
- Improve industry dynamics by creating a framework and means of cooperation among MFIs.

The MFT has focused on developing a technology solution that directly or indirectly addresses these key barriers to scale. To be applicable 'industry-wide,' the technology solution must be affordable, scalable, replicable, and where appropriate, should leverage existing technologies and infrastructure. Such technologies may include handheld field devices, smart cards, biometric identification, rural wireless connections, and reporting standards.

The near term focus of the technology solution will be the development of an Independent Payments Network' that allows for:

- Remote cash disbursement and collections in peri-urban/rural locations (beyond the current service reach of MFI branch networks)
- Standardized means of electronic identification for clients
- Electronic data capture on transactions

The network will be shared by multiple MFI's and used by the combined client base. It will leverage existing peri-urban/rural commercial infrastructure as third party locations for collections/disbursement (e.g. gas stations, post offices) and will facilitate savings and loans transactions.

The main impact of the project will be the creation of a new point of sales device for microfinance transactions. This device will enable remote transactions, including payments, deposits and disbursements, and provide an electronic record of each transaction. We expect that this technology will have a number of benefits. Other outputs will include:

- For microfinance clients: 1) lower travel costs by enabling pay payment and disbursement points in multiple rural locations; 2) increase convenience by allowing clients to complete payments and receive disbursements in a more customized way (e.g. payment at time of their choosing, savings disbursement in amount); 3) broadening the reach of microfinance institutions by lowering the costs of rural expansion, thus opening up microfinance to new clients.
- For microfinance institutions: 1) improve the collaboration between microfinance institutions thus building a model for future collaborative efforts on industry-wide issues; 2) create opportunities to increase scale since those resources can be used to either expand the number of clients served, or to enhance the



quality/breadth of products offered to existing clients; 3) Lower the cost of rural outreach; 4) Provide affordable and scalable technology solution operating in the institution.

## **USAID, FINCA International and Visa Announce Microfinance Partnership**

*DAVOS, Switzerland, January 26 // -- Partnership targets next generation of microfinance*

The US Agency for International Development (USAID), FINCA International (Foundation for International Community Assistance) and Visa International today announced a major public-private partnership that aims to bring new efficiency and security to microfinance clients in the developing world utilising electronic payment products. The initiative builds upon a two-year partnership between FINCA and Visa to improve the delivery of financial services to entrepreneurial women in developing countries.

The partnership plans to pilot how Visa solutions will provide FINCA and its clients both cost- and time-saving processes, allowing FINCA to expand its outreach to more of the world's poor. Specifically, Visas' electronic payment solutions will help:

- Minimise loan transaction times for both clients and microfinance providers
- Lower transaction costs for processing loans
- Provide microfinance clients more secure access to their loan capital
- Reduce the possibility of cash theft
- Expand the variety of financial service products available to FINCA's clients
- Introduce a new market segment to participating commercial banks

## REFERENCES

### A FEW WEBSITES

#### IT for Development & Digital Divide

- UN ICT task force - <http://www.unicttaskforce.org> - to bridge the global digital divide, foster digital opportunity and thus firmly put ICT at the service of development for all.
- International Telecommunication Union - <http://www.itu.int/> - a UN organisation where governments and the private sector coordinate global telecom and network services.
- WebWorld - <http://www.unesco.org/webworld> - An initiative of UNESCO to encourage international debate about the impact of globalisation on access to information and the process of communication.
- World summit on the information society - <http://www.itu.int/wsis/>
- InfoDev - <http://www.infodev.org/> - Promoting ICT for Social & Economic Development
- Digital Dividend Project Clearinghouse - <http://www.digitaldividend.org/>
- Bridges - <http://www.bridges.org/>: an international non-profit organisation with a mission to help people in developing countries use information and communications technology (ICT) to improve their lives.
- Digital Partnership - <http://www.digitalpartnership.org/>
- Digital Opportunity Task Force - <http://www.dotforce.org/>
- Digital Divide Network - <http://www.digitaldividenetwork.org/>
- Digital Opportunity Channel - <http://www.digitalopportunity.org/>
- E-Primers for the Information Economy, Society and Polity - <http://www.eprimers.org/>
- Eldis - <http://www.eldis.org/ict/> - ICT for Development Resource Guide

#### Asian Initiatives

- APDIP - Asia-Pacific Development Information Programme - <http://www.apdip.net/>
- Digital Review of Asia Pacific - <http://www.digital-review.org> - provides a quick overview of how ICTs are being deployed across the region to facilitate socioeconomic development.
- China Internet – <http://www.chinainternetupdate.com/>
- Indian Development Network - <http://www.indev.nic.in/indevnet/default.aspx>
- ASEANconnect - <http://www.aseanconnect.gov.my> - a platform for the exchange of information on critical aspects of the digital divide phenomenon within ASEAN
- Asian IT Ministries Summit - <http://asiaitsummit.nic.in/information.htm>
- CHIPS - <http://chips.nic.in/content/choice.htm>

#### Development & Microfinance Resources

- Global Knowledge Gateway - [www.developmentgateway.org/](http://www.developmentgateway.org/) - a World Bank initiative, is an interactive portal for information and knowledge sharing on sustainable development and poverty reduction
- Millenium Development Goals (UN) - <http://www.un.org/millenniumgoals/index.shtml>
- UNCTAD - <http://measuring-ict.unctad.org/>: an online source of information on indicators, methodologies and statistics related to the information society
- CGAP (Consultative Group to Assist the Poorest) - [http://www.cgap.org/iss\\_site/documents.html#mis](http://www.cgap.org/iss_site/documents.html#mis)
- The Microfinance Gateway - <http://www.developmentgateway.org/node/133831/> and <http://www.microfinancegateway.org/content/article/detail/13639>
- PlaNet Finance China - <http://www.pfchina.org/>
- India Microfinance Portal - <http://www.microfinancesouthasia.net/>

#### A business perspective: IT Sector Websites & Corporate Social Responsibility

- Ethical Corporation - <http://www.ethicalcorp.com/>
- Global Philanthropy Network - <http://www.philanthropyforum.org/network/microcredit.htm>
- Technews - <http://www.technewsworld.com>
- CENT - News.com - <http://news.com.com>
- Emergic - <http://emergic.org> - Weblog on Emerging Technologies, Enterprises and Markets

## REPORTS, STUDIES & STATEMENTS

### ICT for Economic Growth & Development : The Strength of Asia

#### *ICT Sector Analysis & Perspectives in Developing Countries*

- World Economic Forum, India ICT Blueprint, 2003
- MIT, The Internet in China and in India, L. Press, W. Foster, P. Wolcott, W. McHenry, Fall 2003
- OECD, China's Software Industry and its Implications for India, Ted Tschang, Feb. 2003
- McKinsey, Could Mobile Banking go Global, 2001.
- UNCTAD, E-finance and SMEs in developing and transition economies, 2001.
- ICICI, E-finance in a Developing Country like India.

#### *The Information Society & the Digital Divide:*

- Orbicom, Monitoring the Digital Divide and Beyond, 2003.
- World Summit on the Information Society : Action Plan & Statements, 2003.
- E-Asean Task Force UNDP-APDIP, The Information Age, E. Lallana, 2003.
- E-Asean Task Force UNDP-APDIP, Nets, Webs and the Information Infrastructure, 2003.
- Chinese Academy of Social Science, Internet Survey in 12 Chinese Cities, 2003.
- Asian IT Ministers Summit, ICT Enabled Bridge for a Digital Unite in India, 2004

### ICT, Microfinance & Poverty Alleviation

#### *ICT for Human Development:*

- UNDP, Regional HDR: Promoting ICT for Human Development in Asia 2004 – Realising the Millenium Development Goals
- InfoDev, The Wireless Internet Opportunity for the Developing Countries, 2003.
- ADB, ICT and Poverty – The Indisputable Link, 2001.
- A vision for rural India - Transforming rural India, Rajesh Jain.

#### *ICT, Microfinance & Poverty Alleviation*

- ADB Institute, Microfinance and poverty reduction in Asia: what is the evidence?, E. Kurmanalieva , 2003
- CGAP, Management Information Systems for Microfinance Institutions – a Handbook, 1998.
- Digital Dividends, Lessons from the Field - ICTs in Microfinance.
- Chemonics International, Increasing Access to Microfinance Using ICTs, Peter Siu

### Public-Private Partnerships To Achieve Development Goals

#### *Governments' Responsibilities:*

- Asian IT Ministers Summit, Hyperabad Declaration, 2004.
- Kuala Lumpur Declaration on ICT policies and e-strategies in Asia and the Pacific, 2003.
- Markle Foundation, Global Digital Opportunities - National Strategies of 'ICT for Development'.
- E-Asean Task Force UNDP-APDIP, Legal & Regulatory Issues in the Information Economy, 2003.
- OECD, Broadband Driving Growth: Policy Responses, 2003.
- Chinese Government, Summary of the Tenth 5-year plan (2001-2005)
- MIT, Strategies for Developing China's Software Industry, Mingzhi Li, Ming Gao, Fall 2003.
- The creation of a favourable environment for investment in rural China, Han Jun
- Ensuring IT remains in Indian territory, A. Shourie, 2004.

#### *Public-Private Initiatives:*

- UNDP-APDIP, Public-Private Partnerships and Financing ICT Developments, P. Ulrich, 2003.
- Digital Opportunity, Making Rural Development Big Business in India, C. Runyan, 2003.
- HP, Rural Transaction System Architecture, Microfinance Technology Project, 2003.