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Confederation of Indian Industry

Making the Connection: India's digital future

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Foreword

I am happy to present the report on "Making the Connection: India's digital future" – a forward-looking study based on new primary research conducted by Accenture with the support of the Confederation of Indian Industry (CII). This is a continuing initiative of the CII, to create awareness on the current state of the ICT industry and the associated business opportunities in "Enabling India's Broadband Economy".

As is well known, access to low-cost communication services translates directly into economic growth and new business opportunities. It is evident that the catalytic impact of ICT and the extent of its adoption is a prime factor in the rapid development of the Indian economy in the recent past.

This research will be useful to organisations that are developing and practising ICT strategy as a part of their management approach. The study provides rich insights into key trends and indicates that ICT is expected to deliver spillover and multiplier effects which will bring new growth opportunities across all industries. The Telecommunications, Agribusiness, Education and Financial Services sectors are expected to play key roles in this growth. It highlights that the key to this is developing human capital, both in terms of building a wider ICT-enabled workforce and in terms of improving basic education across India as a whole.

I thank all respondents to this survey for their input which will help to shape and guide the efforts of business, government and civil society in creating India's digital future.

Our warm thanks to Accenture, our partner for this Report, for their detailed work and for sharing their knowledge in making this report a success.

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S S Mehta Director General, CII

Survey of business leaders

The findings in this study are based largely on an extensive survey of over 200 senior executives in India, carried out for Accenture and the Confederation of Indian Industry by IMRB International during August and September 2006. These surveys were then supplemented by more in-depth qualitative interviews with select business leaders and policymakers in India by Accenture, as well as wideranging secondary research. The industry groupings used in this study follow Accenture's consulting focus areas, namely:

Communications and High Technology

(Communications, Electronics and High Technology, Media and Entertainment)

Financial Services (Banking, Capital Markets, Insurance)

Products

(Automotive, Consumer Goods and Services, Health and Life Sciences, Industrial Equipment, Retail, Transportation)

Resources

(Chemicals, Energy, Forest Products, Metals, Mining, Utilities)

Executive Summary

This study, produced by Accenture in collaboration with the Confederation of Indian Industry (CII), examines the future opportunities that Information and Communications Technology (ICT) will deliver for India. It is based on a unique and wide-ranging survey of over 200 Indian business leaders across all major industries and identifies the important trends that will shape and advance the efforts of business, government and civil society to achieve wider ICT access and usage across the economy.

The survey reveals widespread recognition that ICT will play a crucial role in delivering social advances and economic growth to India. Our research suggests that 87 percent of Indian businesses believe that socio-economic disparities between rich and poor communities represent the most significant obstacle to the sustainable growth of the Indian economy. And 88 percent believe that the increased usage of ICT will be a major determinant in overcoming these disparities and thereby advancing growth in the next five years. Many businesses are already running ICT-driven operations in low-income markets in India; the central government and several states have instigated a number of ICT programmes; and non-governmental organisations are conducting numerous ICT-based initiatives. This activity is driven by the belief that ICT can have a disproportionately positive impact on society, the economy and business.

Global ICT supply bases are shifting towards emerging economies and growing consumer markets in these economies are demanding more ICT products and services. India is pivotal in this relocation. Our research indicates that 94 percent of businesses believe the usage of ICT has been a major reason for India's recent economic growth. The country has built a reputation as a fast-learning, ICT-savvy trailblazer among emerging economies. Companies continue to move operations to India to benefit ICT workforce. More of the country is becoming "connected" and rapid innovation and fierce competition are

driving down technology prices. Yet paradoxically India's story continues to be marred by poverty and inequality. Access to quality education, health and employment are still far out of reach for many millions in India. Moreover, the country's increasing population, especially in deprived regions, creates ever greater pressure for rapid improvements in basic living standards and employment opportunities. ICT is one of the few tools that will allow India to address these critical issues across its vast and diverse population and geography. The country clearly has much to offer and much to gain from the ICT revolution.

Indian businesspeople believe that the next phase of ICT-led growth will come from three main sources:

- 1. Supply-side opportunities: As access to ICT in low-income markets improves, emphasis is likely to shift from well-known demandside benefits towards supply-side benefits such as more efficient supply chains, better communication, improved productivity and lower input costs.
- 2.Catalytic impact of ICT: ICT delivers spill-over and multiplier
- effects which will bring new growth opportunities across all industries. The telecommunications, agribusiness, education and financial services sectors are expected to be significant beneficiaries.
- **3.Improving access to education:** ICT is expected to play a central role in the provision of, and access to, quality education across India.

A statistical annex to the study sets out some of the wider survey findings beyond this specific scope.

Both Accenture and the CII believe that building a strong understanding of the role of ICT will improve India's prospects for greater and more equitable growth. The creation of digital opportunities has been an important strategic focus for Accenture over the past decade and is embedded in its thinking and approach towards Corporate Citizenship. CII's theme of "Competitiveness for Sustainable and Inclusive Growth" reflects the Confederation's commitment to balanced development that encompasses all sectors of the economy and all sections of society. Both organisations believe that there are real opportunities for business to collaborate with government and civil society and for all sides to make great progress. This study is our contribution to that debate.

The study concludes with four imperatives to help the Indian economy to capitalise on ICT-enabled growth:

- 1. Invest in human capital: both by building a wider ICT-enabled workforce and by improving basic education across India.
- 2. Create coherent infrastructure: The ICT industry itself needs to build a strong view of the appropriate infrastructures, standards and systems of interoperability that are critical in the delivery of ubiquitous access to ICT.
- 3. Build partnerships between the ICT industry and government: cooperation at all levels is essential to ensure that the development of India's ICT environment is responsive to local requirements and is implemented efficiently.
- 4. Ensure affordability and relevance of content: devices, their ongoing usage and access to content and applications must all be affordable. Content must be relevant and delivered appropriately for each community.

Why India must act now

A powerful combination of factors means that there has never been a better time for India to pursue ICT-based opportunities for growth.

1. Exploiting the 'demographic dividend'

India's economy faces structural deficiencies that exclude many parts of the population from the country's recent growth and that threaten India's longer-term growth prospects. ICT offers a means to address many of these challenges, and turn them into unparalleled opportunities. Eighty eight percent of Indian senior executives whom we recently surveyed believe that the increased usage of ICT will be a major determinant in advancing economic growth in India over the next five years. ICT-based solutions have the potential to:

 Provide quality education and health across India to ensure that the country benefits from the muchpublicised "Demographic Dividend", rather than suffering under the burden of a booming population without the skills or health to work productively. Our respondents strongly believe that improved access to education is the most important benefit that ICT will bring to India's low-income communities.

- Bring employment opportunities to the vast numbers who have been excluded from India's growth so far. Eighty percent of our respondents believe that ICT will improve employment and hence income prospects for India's poor.
- Increase the productivity of Indian companies, allowing them to stay competitive amid increasing competition from both low-cost emerging economies and experienced players from developed economies. Over 90 percent of business leaders surveyed believe that the usage of ICT will improve the productivity of India's workforce.
- Provide access to products, services and opportunities that will raise the living standards of India's large population living below the poverty line.

2. The convergence of stakeholder interests

Until recently, there were fears that ICT solutions would cause unemployment, but over the last few years there has been a growing consensus that ICT has a crucial role in enabling social and economic growth. There is increasing recognition at all levels of government that ICT is a legitimate tool to deliver administrative and development outcomes effectively and efficiently. Well-publicised successful ICT-based initiatives like ITC's e-Chopal have captured the imagination of policymakers and the Indian government is now implementing its own national e-Government strategies and a variety of initiatives (see Annex 2).

Increasing numbers of Non-Governmental Organisations (NGOs) have also taken up the ICT cause, often in collaboration with the private sector and often with government. There is a diverse range of initiatives around the country that enable disadvantaged communities to access products, services and employment opportunities cheaply and easily using ICT.

Now is an opportune time to capitalise on this convergence of stakeholder interests to press forward with the next phase of India's ICT-led growth.



3. Business investment is real

The new-found optimism is not wishful thinking. Advances in ICT are already leading businesses to step up their investment plans for lowincome markets. Indian firms see ICT as the major driver of the country's current and future economic growth. Nearly 90 percent of business leaders we guestioned recognised the level of ICT as a key consideration when investing in low-income markets. This is significant because these businesses also signalled their determination to increase investments in these markets over the coming five years. Over 90 percent acknowledged the growth potential of India's low-income urban communities and 72 percent saw that same opportunity in rural communities. Based on these responses, we expect the proportion of medium and large businesses operating in India's lowincome urban and rural communities to increase by about 20 percent across all industries in the coming five years. Rapid advancements in the reach and quality of ICT are required to allow these business investments to prosper.

4. The new digital landscape

Innovations in technologies are dramatically expanding the possibilities of ICT-enabled growth in India.

Access to affordable solutions

- Devices are cheaper thanks to mass production in low-cost economies.
 For example, Indians now have access to US\$30 mobile phones, as well as enjoying the lowest call costs in the world.
- Innovations in access technologies like Wimax (microwave), iBurst and 3G make connectivity a real prospect to previously excluded communities, particularly by connecting the "last mile" from India's existing fibre networks to remote end-users.
- Open and multi-platform solutions allow the flexibility to adapt and deploy solutions to reach a greater number of people, at a low cost. This will be particularly useful for health and education programmes which need to be rolled out across the population, as well as supporting the spread of best-practice standards and formats in business, such as accounting practices.

 Inventive business models such as shared-usage allow communities to benefit from ICT-based solutions that are beyond the reach of individuals.

Multiple channels

The variety of means to access information is expanding, offering a greater selection of options to India's diverse user groups. For example, progress in the creation of voice-based ICT solutions promises to overcome issues like language variations within India as well as the pervasive problem of illiteracy. The prospect of convergence (the ability for different technologies to share resources and interact with one another) will only increase the scope of such opportunities.

User-generated content

The evolution of ICT solutions increasingly involves the participation of users. This was first seen in the popularity of cheap and flexible open-source solutions in developing markets and has accelerated through new phenomena like blogging. This trend is particularly important in lowincome communities where user-driven solutions are crucial to technology uptake. Our research also shows that



users in rural communities often view information posted by other users to be more trustworthy than information dictated to them "from above."

Power to the producer

The most visible impact of ICT on the Indian population has come through the use of mobile technology, particularly in providing isolated communities with access to information. This also increases the efficiency of the entire supply chain by cutting out expensive middlemen. The efficiency gains for producers, particularly in the agriculture industry, have yet to see their full impact, but progress in this field is imminent for India. More broadly, ICT solutions will provide Indian producers at all levels with greater access to best practices, market information and national and international markets.

Connected workforces

ICT promises to deliver more efficient labour markets and opportunities for employment as businesses are able to find people with the appropriate skills in lower-cost locations and work with them across vast distances. Looking forward, innovative models of collaboratively sourcing knowledge have emerged in developed markets which have clear potential in low-income markets. For example, the popularity of "crowdsourcing" (the organised invitation for knowledge from people outside your own company), has proven to be very helpful to many businesses in the West. This kind of model puts a value on the knowledge possessed by people in low-income communities who can contribute to these collaborative networks, nationally and internationally. This would be particularly useful in sharing relevant content, best practices and replicating successful models among low-income communities.

Power to the consumer

ICT brings new choices to consumers, increases competition and lowers prices. Recent trends reveal new opportunities for community purchasing, where buyers can organise themselves through ICT channels to increase their buying power, forcing down prices even further. Access to information also brings with it more informed choices for consumers as well as a greater awareness of consumer rights.

E-Governance efficiencies

Our research highlights the need to improve the efficiency of implementing government policies targeting lowincome communities because currently too much of the finance dedicated to these groups is lost or wasted before reaching them. ICT brings the imminent prospect of e-governance solutions that improve transparency, reduce corruption, speed up processes and decrease costs.

India potentially has a powerful set of ICT tools at its disposal to achieve its growth objectives. India's success in bringing ubiquitous access to these tools in this decade will be a crucial determinant of the country's growth in the future.

Supply-side opportunities in developing communities

As access to ICT improves, supply-side opportunities will drive investment in India's lower income locations.

Many businesses are already profitably serving consumer markets in lowincome communities. Indian and multinational companies have long understood that 'low-income' is very different from 'no-income', and that markets as large as India's can provide profits from high volume-based business models. ICT allows companies to reach these consumers without the costs normally associated with operating over such vast and scattered markets, particularly given India's infrastructure problems.

But businesses are now also looking beyond these markets to the next phase of ICT-led growth. Our research reveals that Indian companies are excited about the supply-side business opportunities brought by improving ICT access in low-income locations. When asked about the top commercial benefits that will emerge as ICT reaches low-income communities, Indian business leaders cited the following:

- 1. more efficient supply chains
- 2. more efficient communication
- 3. productivity and lower input costs

More efficient supply chains

India's supply chain issues are notorious. Indian companies are beginning to see the benefits that efficient ICTbased supply chain systems can have on their cost structures, but those that can invest in such systems still remain subject to the weak state of the country's infrastructure and a host of external obstacles.

India's poor transport infrastructure and unreliable power supplies are major causes of inefficient supply chains, dragging out timelines and building up unnecessary costs for business. This is a particular issue where products are perishable: very little of India's vast agricultural produce travels further than the local area where it is produced. Another problem is the country's financial services infrastructure, which makes it very difficult for dispersed units of the supply chain to be financed effectively. On the positive side. India's communications infrastructure is gradually improving, particularly thanks to improvements

in ICT infrastructure, with mobile technology playing a critical role in remote locations. There is no shortage of pressures on the Indian government to rapidly improve the infrastructure deficit throughout the country, and the Prime Minister is leading efforts to push through much-needed reforms in this area with high hopes pinned on Public-Private Partnerships (PPP).

Other external factors slowing India's supply chains include reliance on expensive middlemen who can manipulate prices, high levels of loss through theft and the lack of a consistent policy environment to give businesses the confidence to invest in modern systems. The latter point is particularly important because the scattered nature of supply chains often involves the conflicting jurisdiction of multiple states.

The benefits that ICT can bring to supply chains are very tangible. At the level of infrastructure, ICT will improve communication and financing channels as well as reduce costs due to middlemen and supply chain leakages. The accurate recording and

Figure 1: Commercial benefits for business as ICT reaches India's low-income communities



Respondents selected 3 benefits and ranked them - result obtained by collating ranks 1 and 2

storage of data will allow companies to forecast and plan with greater certainty, reducing locked inventory, capturing lost sales and improving responsiveness to local consumer patterns and preferences. Transport and logistics costs will also be saved through improved tracking of supplies. In addition to this, ICT will allow collaborative and coordinated working models that enhance individual and team productivity, including the use of workflow software and tools to aid decision-making. At a more fundamental level, companies will benefit from ICT-based manufacturing and packaging techniques that are both time and cost efficient. Our survey shows that Indian businesses are acutely aware of the opportunity to transform supply chains through ICT, from procurement to delivery, across regional, national and international boundaries.

An essential first step is investment in infrastructure and technologies that will allow supply chains to benefit from ICT. But the diversity of India's geography and population also underlines the importance of ensuring that ICT devices, content and applications are specifically tailored to user requirements (a point highlighted by 91 percent of our respondents). The physical dispersion of supply chain operations could be overcome by flexible platforms and technologies that are cheap to update and customise. Server-centric computing, where the end user's device is extremely lightweight but talks to a more sophisticated remote server, is an example of the innovations that could already allow relatively complex supply chain facilities to be established and connected, in advance of more longterm solutions.

More efficient communication

The swift advances in the efficiency of communication over recent years have benefited developed markets through products like e-mail, instant messenger, computer-to-phone calling and smart phones which have all been taken up quickly and in large numbers. Easy and cheap communication will be all the more valuable as it connects low-income and rural communities to each other, to the rest of India and to the world. Efficient communication translates into immediate bottomline savings in the time and cost of running a business with operations across diverse and distant locations. The success of mobile telephony in low-income markets has illustrated that there is an appetite for ICT solutions and that uptake can be swift as long as there is a clear value proposition. Our analysis suggests that efficiency in communication will be enhanced by four factors:

1. Affordability

Our research indicates that affordability is seen as by far the most important factor in ensuring suitability of technology for low-income communities (see figure 10). The falling cost of ICT solutions will play a key role in incorporating India's low-income communities into the business models of Indian and global companies.

2. Relevant Content

Greater quantities of relevant content will be accessible and shared through more channels with more people. The increase in user-generated information sources, such as blogs, also means that previously detached communities can share knowledge and develop working



teams. The challenge will be to educate users to filter out low-quality content.

3. Voice and language-sensitivity

Innovations in voice-based technologies are making communication especially efficient by allowing flexibility in language and dialect as well as empowering illiterate members of the workforce. Software and news companies are already providing multilanguage services in India. Technologies like Voice over IP and Voice-SMS will have particular currency in a country with 45 percent illiteracy, 15 major and several hundred minor languages.

4. Reach

New wireless technologies like Wimax and 3G have made a big impact in the feasibility of extending access to remote end-users by providing "last mile" connectivity from existing networks. There will continue to be debates as to which technologies are most appropriate for which uses, but the options will be there to choose from.

Productivity and lower input costs

Over 90 percent of the respondents in our study believe that the usage of ICT will improve the productivity of India's workforce.

By connecting companies to workforces outside India's traditional urban business centres, ICT will create opportunities to access lower-cost, productive labour. These "connected workforces" are new sources of labour which will hold further advantages such as the ability to tap local knowledge across diverse and distant locations and the possibility of developing more efficient collaborative working methods like crowdsourcing.

Concerns over labour productivity have long been a priority in developed markets like Europe and the United States, but this key indicator will take on increasing importance in India as the country seeks to improve its global competitive position. India's predicament lies in the fact that it is being squeezed from two different directions: it faces increasing competition both from developing economies looking to replicate its lowcost business models as well as highly productive, innovative economies such as the United States in high-end products and services. The situation is aggravated by rising salaries and costs in India's main cities. This leaves fewer levers to remain competitive going forward.

India's less developed cities and rural areas are more comparable to emerging economies like Vietnam and Indonesia than to the advanced cities of Bangalore and Mumbai. If India is to maintain its overall competitive advantage over lower cost emerging nations, it is essential to boost productivity by utilising ICT and the workforces in its own lower-income locations.

Supply-Side Opportunities – The way forward

The expansion of ICT brings promising supply-side opportunities for Indian business. An important implication of this trend is that it will bring increased employment to India's low-income communities. Eighty percent of the Indian businesses we surveyed believe that ICT will improve employment and hence income prospects for India's low-income communities.

But skills deficiencies remain an important barrier. It is therefore imperative to ensure that the work being done by businesses, governments and NGOs to build the required ICT infrastructure, networks and technologies is complemented by appropriate skill-building programmes to deliver an ICT-enabled workforce. Over 80 percent of our respondents underlined the importance of ICT skills and, more fundamentally, 81 percent identified basic literacy as the most important skill required by India's lowincome communities to benefit from ICT-enabled growth. With 35 percent of children aged 7-14 unable to pass a simple reading test and 60 percent unable to read a simple story, there is substantial room for improvement and an urgency to take action¹. The topic of education is addressed in more detail later in this study.

ICT as a catalyst for cross-industry growth

ICT will deliver spill-over and multiplier effects bringing new growth opportunities across all industries.

ICT is not an end in itself. Rather, it is a powerful tool that enables the attainment of wider objectives. As Lt. Gen. (Retd) Mehta, Director General of the Confederation of Indian Industry, argues: "the fact is that ICT is not a sector-specific technology. It is a strategic force that affects everything. ICT is like fresh air; everybody is required to breathe it."2 The ICT sector is an important industry in its own right, but the elegance of ICT lies in its ability to improve the way businesses across all industries carry out every aspect of their operations. When asked about which industries would benefit most from ICT-enabled growth, our respondents identified the following sectors:

- 1. Telecommunications
- 2. Basic farming
- 3. Processed farm products
- 4. Education / Training
- 5. Banking and Finance





Respondents selected 5 verticals and ranked them - result obtained by collating ranks 1 and 2



Telecommunications

The telecommunications industry is perceived as having by far the greatest opportunities to benefit from ICTenabled growth (ranked first by nearly a quarter of our respondents).

This result is consistent with the respondents' expectation that efficient communication will be one of the most significant commercial benefits of improved access to ICT. It is also in line with growth predictions for the industry. The Investment Commission of the Government of India expects India's telecommunications market to be among the fastest growing in the world, with projected growth of 30-40 percent a year, reaching 250 million subscribers by 2009-10.³

Bringing telecommunications to India's low-income and rural communities is one of the simplest and most effective ways of introducing people to the benefits of ICT to improve their everyday lives. Mobile telephony has been leading the way by embodying many of the characteristics required for this environment: India's mobile usage is very cheap, and even a low-end mobile phone meets basic communication and information needs, doesn't require literacy and is not reliant on continuous power supplies. The case study below is an example of the initiatives that are introducing new opportunities to India's lowincome communities - initiatives that will improve their ability to find employment and become part of India's connected workforce.

Case Study: Making More of Mobiles

Accenture Development Partnerships^a and the GSM Association^b are working together on a number of projects across Africa and Asia to bring social and economic development to disadvantaged communities through mobile technology. The GSMA Development Fund focuses on "shared access" initiatives, health surveillance via mobiles and the use of alternative energy (biofuels, solar and wind) for powering base stations in remote areas. In addition, the Development Fund is looking into new ways in which GSM technology can act as a tool for social development, including industry skills development for the unemployed, use of GSM technology for the environment and remittance payments.

In India, the Development Fund has engaged with Bharti Airtel, IDEA Cellular and Hutch to support "shared access" initiatives since October 2005. The Shared Access to Voice solution aims to connect the unconnected through the creation of an entrepreneur who makes a living or earns supplementary income working as a Mobile Phone Public Call Operator (PCO). The entrepreneur purchases a "business-in-a-box" which comprises a US\$30 Motorola emerging markets handset, and a 128k SIM card with an embedded Shared Phone SIM application that allows the mobile handset to operate like a payphone.

Unlike fixed PCOs, entrepreneurs can go to customers instead of the other way around. The target market for the "business-in-a-box" are unemployed and underemployed individuals (in need of supplemental income to improve living standards) as well as village women, influential 'gram pradhas', taxi and autorickshaw drivers (during lull times), street vendors, construction workers at makeshift slum sites and disabled individuals.

There are many benefits to the shared access model – shared access provides low-entry to business, hassle free activation, ease in expansion, a spinoff phone rental business as well as low capital and operating costs. The entrepreneur also gains from personal use of the phone and increased status and trust in the community.

The development of a distribution channel strategy with potential organisations like SEWA (Self-Employed Women's Association) and Drishtee (a for-profit rural organisation) also enables the telecoms companies to penetrate new remote markets which they would typically be excluded from.

The Shared Access to Voice model has been rolled out in Uttar Pradesh (West)

and Uttaranchal by Bharti Airtel, and in Maharashtra by IDEA Cellular. Work is underway to implement a similar pilot in Haryana for Hutch and to go nationwide with IDEA Cellular.

Beyond Shared Access to Voice, the Development Fund is also looking at ways to enable "Shared Data" applications on handsets. These applications include value-added services and mobile commerce content suited for rural communities, such as commodity 'mandi' prices, access to Krishi portals for farming advice and matrimony predictions.

Figure 3: Growth of mobile subscribers in India



Source: Telecom Regulatory Authority of India (TRAI)

Accenture Development Partnerships is a not-for-profit group that provides business and technology consulting at reduced rates to the international development sector and charitable organisations. For more information visit www.accenture.com/adp

^b The GSM Association is a global trade association representing more than 700 mobile phone operators in 215 countries. For more information visit http://www.gsmworld.com/developmentfund/index.shtml





Agribusiness

The enormous growth prospects of agribusiness (farming and food processing) lie in eliminating the inefficiencies in India's existing food supply chain, from farmers to retail. Despite having the second largest arable land area in the world, only two percent of India's fruit and vegetables are processed, compared with up to 80 percent in many developing countries³, and most produce never travels beyond its neighbouring villages.

With retail markets growing at over 20 percent a year, there is particular urgency in modernising and improving these supply chains. The private sector is already beginning to exploit this opportunity. Bharti Enterprises has recently invested large sums into agribusiness in a joint venture called Field Fresh Foods with EL Rothschild Group, looking to export Indian produce to markets in Europe and the United States. Reliance is also investing significant sums into contract farming, mainly to supply their vast plans for the retail business in India, but also to export. Foreign business can also play a role by bringing their modern ICT-based processes and techniques to India, in return for the potential profits to be made

from India's US\$200 billion annual food consumption. Food processing is expected to increase as incomes grow, lifestyles change, more women enter the workforce and prices fall. In fact, the Ministry of Food Processing expects the market to grow three-fold by 2015, to reach US\$310 billion.³

The government has also recognised the potential of this industry and has coordinated its thinking from a variety of ministries to create an "Integrated Food Bill". The Indian Ministry of Food Processing Industries forecasts that India will increase its share of world trade in food and agricultural products from 1.7 percent (US\$7.5 billion) to 3 percent (US\$20 billion) by 2015.³

Underlying all these expectations is an assumption that these industries will be using efficient, modern techniques that allow them to grow beyond their current small scale. The growth of agribusiness requires private sector expertise and a strong information and communications system that is reliable over great distances and consistent over time. The recent investments from the private sector are a welcome signal that the prospect of developing this technology backbone is realistic. Figure 4: Indian food processing market growth



Source: Indian Ministry of Food Processing – Draft Vision Document



Education and Training

Unlike telecommunications and agribusiness, the education and training industry has yet to attract serious attention, making it a particularly attractive opportunity for visionary first-movers. Our research highlights the pressures that are forcing private and public sectors to prioritise education.

India is justly proud of its higher education institutions, which have played a central role in the country's recent economic growth. Indian businesses realise that knowledgebased growth will be an essential part of being competitive in the global economy. Business strategists and industry associations are preoccupied with the question of how they will find sufficiently skilled workforces to compete in tomorrow's "knowledge economy" and there is already a fierce war for talent in all high-value industries. Costs (including salaries) are rising fast in India's traditional business centres and companies have already been pushed out to more remote operating locations, with the pool of

educated workforce acting as the prime factor in location decisions. The need to build high-value skills in these new locations is clear.

The necessary improvements in education go beyond the higher-value skills. Basic education is required to ensure that there is a suitable workforce for India's manufacturing sector, the growth of which is essential to bringing mass employment to India. Most urgently, India's primary education system requires significant improvement to provide realistic employment prospects to India's growing population.

India's educational challenges are complex. The education industry has the potential to undergo a fundamental transformation, and ICT is destined to play an important role in this. It is conceivable that certain sections of the industry will eventually be industrialised to create modular low-cost solutions that can be delivered on a mass scale. Other parts of the industry are already thriving, providing lucrative business models based on targeted training. The private sector and civil society are also involved in numerous ICT-based education projects around the country, such as Aptech Education, a leading IT education and training company based in Mumbai which offers longterm career courses in education and high-end short-term courses in IT, multimedia and soft skills training.

Our survey highlights that there is an opportunity for companies to design appropriate business models that will enhance India's education system and at the same time generate profits.

Banking and finance

Over 80 percent of the business leaders in the Indian financial services sector involved in our survey (mainly from banks) plan to operate in low-income urban communities in five years' time, a figure considerably higher than that of other industry groups. This may partly be due to government policies aimed at ensuring that basic financial services are provided to disadvantaged communities. Nonetheless, this sector also seems to be the most confident overall in investing in low-income communities, with nearly 40 percent of respondents prepared to invest even in

Figure 5: Respondents involved in business process sourcing in low-income communities



the absence of evidence of economic viability, again higher than other industry groups.

The success of the microfinance industry may well be a key reason for this confidence. The Reserve Bank of India (RBI) estimates that about 25 million Indian families are covered by microfinance schemes. India's commercial banks are seizing the opportunity, with ICICI Bank having captured an estimated 40 percent of the microfinance market share.4 At the same time, foreign banks are increasingly interested in microfinance, and with the RBI strongly encouraging them to enter India's low-income communities, this sector could become increasingly competitive.

ICT will help financial services companies improve the efficiency of their operations. The financial services companies in our survey were particularly determined to use India's low-income markets as sources for basic business processes. In fact, when it comes to sourcing business processes, interest from this sector is between two and three times that of other industry groups, for both low-income urban and rural markets. Moreover, this large disparity is expected to continue throughout the five-year period. The plans for growth in rural markets are especially impressive, with 33 percent of financial services respondents planning to have business processing operations in place in five years, compared with 24 percent now. In India, the financial services industry appears to be in the vanguard of this new phase of business process sourcing.









Where will we be in five years?

Businesses across all industries expect to increase their operations in lowincome markets (see figure 6) over the next five years. Based on this sample, we can expect the proportion of medium and large businesses operating in low-income urban and rural communities to increase by about 20 percent over the coming five years. Respondents were not asked whether their forecasts included any assumptions about the rate of progress in connectivity and technology in these locations. It therefore seems fair to assume that improvements in the ICTenvironment would give a further boost to these predictions.

Catalysts for change

Many of the industries that are expected to grow as a result of ICT are also catalytic in their own right, generating a powerful multiplier effect across the wider economy.

Telecommunications is a classic example of an ICT tool that can be used by every person and business to improve the way they work and live. An efficient food processing industry requires a series of ancillary products and services. Education and training provide skills that can be transferred across the economy and transmitted to more people, multiplying the impact of each individual. Financial services are required to finance every part of a business, and increasingly also individuals through microfinance.



Cross-Industry Growth - The way forward

The multiplier and spill-over effects are important for India's economic growth. From a technology perspective, the ability to achieve the multiplier effect across different industries and across the country will demand interaction between systems and a level of interoperability. Platforms, networks and technologies must be able to interact with one another, while remaining flexible enough to be customised for specific industries and local needs. Trends like technology convergence will also bring new opportunities to share information and capabilities efficiently. A combination of interoperable systems, increasing convergence and innovative business models like ICT infrastructuresharing by competitors can open new

possibilities to deliver greater access to more people, more rapidly and at a lower cost.

In order to realise these benefits, it is imperative for the ICT industry to collaborate and form strong views on the appropriate infrastructures, standards and systems of interoperability required to deliver ubiquitous access to ICT. Private sector expertise will be critical to support government decisions on such a major task. A strategic, collaborative approach has the potential to make the step-change from the excellent pilot initiatives around the country to a scaled ICT-driven economy.

Education – fuel of the knowledge economy

Globalisation and rapid technological change have made knowledge a critical determinant of competitiveness in the world economy. But, as we have argued, India's sustainable growth relies on its ability to ensure that the right skills are being built at each level of the economy, not just the high-value end. How can ICT help to deliver these changes?

sanitation

healthcare

Others

Education and skill levels consistently emerge as being central to India's sustainable growth prospects. Improved access to education is identified in our survey as the social and business service that would make the biggest positive impact on India's low-income communities. Over three quarters of the business executives interviewed ranked the lack of quality education as the single biggest root cause of India's socio-economic disparities.

Furthermore, improved access to education is also singled out as the greatest benefit that ICT will bring to India's low-income communities. 40 percent of respondents placed education in first place, more than double the closest alternative. This recognition of ICT's role in achieving improved education is important, given the scale of the challenge.

Our additional findings around the investment opportunity represented by the education industry and the catalytic nature of education as a growth driver, discussed previously, further underline the role of ICT in addressing India's education issues.

Figure 7: Main reasons behind the socio-economic disparities between rich and poor



Figure 8: Social and business services that would have greatest positive impact on India's low-income communities

Access to education

Access to health

Access to information on health, laws, rights, opportunities, support structures

Access to e-Government processes

Access to market information

Access to new sources of finance

Access to business and technical advice

Access to business tools



Figure 9: Main benefits that ICT can bring to India's low-income communities

Improved access to education

Improved access to information

Improved employment and business opportunities

Greater accountability of government and local bodies

Improved access to healthcare

Improved opportunities for entrepreneurship

Improved access to media and entertainment

Improved access to commercial products and services Others





ICT and Education - The way forward

ICT offers a unique chance to address India's education challenges by creating replicable, scalable, low-cost solutions that provide consistency in quality and can be designed to respond to a variety of social and geographic conditions. A number of ICT-based educational initiatives are already under way using techniques like distance-learning and the design of e-curricula. There are countless examples of innovative projects being carried out around India by NGOs, often in collaboration with the private sector or government. The focus of such initiatives varies in terms of issues like urban or rural communities, gender disparity, special needs, teacher training and models to improve evaluation, monitoring and quality. All of these factors are important. It is therefore essential to take a broader view that captures and shares best practices from all these efforts. It is critical to bring a sense of coordination and direction to make the most of the work that is being carried out.

At a federal level, the Planning Commission of the Government of India has highlighted "Connectivity to All Education Institutions" as a main thrust of policy, and over recent years, the government has increased investment in education and has developed relevant initiatives on ICT (See Annex 2). With the government, private sector and civil society all involved in ICT-based education projects around the country, the ingredients seem to be in place to move from the current mixture of pilot projects and ambitions to a scaled implementation plan that capitalises on the joint powers of ICT and education.

Strategies on ICT and education must take into account the important work that is being carried out on developing the appropriate infrastructure to deliver these solutions. Strategies must also be flexible enough to meet India's enormous diversity and deliver solutions that are appropriate and relevant to local needs. This highlights the importance of private sector expertise in ICT and local government endorsement and support.

Preparing for the Future

Much has been made of India's "Demographic Dividend" – the prospect that India's population is the only one in the world that is expected to continue growing up to the year 2050. Attaining the benefits of this dividend requires India's young population cohorts to be skilled, healthy and productively employed. ICT is one of the few tools that may be able to deliver these skills, health benefits and employment quickly and efficiently to India's vast population. Our research highlights four specific imperatives for accelerating ICT-led growth in India.

1. Invest in human capital

There is a clear human capital imperative, both in terms of building a wider ICT-enabled workforce and in terms of improving basic education across India as a whole.

Improved education and training levels offer India enviable prospects in terms of employment and productivity, as well as a promising outlook for sustainable growth. However, if current issues around quality and access are not resolved, India's weak basic education levels have the potential to hinder the country's future competitiveness and compound existing socio-economic disparities.

ICT offers a unique opportunity to address India's education challenges, but will require commitment from business, civil society and policymakers at all levels in India. The urgent case for integrating ICT into education plans must be developed in a way that offers a clear value proposition to communities all around India. A multitude of initiatives are successfully in operation across the country, but, these have unfortunately remained on a small scale. There is an urgent need to gather and share best practice sustainable models that can be replicated and scaled. Numerous associations, initiatives and committees have been set up to look at the important characteristics required to build such models — all of them involve collaboration between business, government and society and important common themes include:

- Infrastructure: it is important to set up the requisite physical ICT infrastructure and to also create an enabling policy environment that allows the appropriate infrastructure to be built and accessed.
- Quality: many assessments of India's education system often focus on quantity rather than quality. It is essential to ensure basic quality standards both for teachers and for the curricula and content. This implies effective evaluation and monitoring processes.
- Engagement: policymakers, the community, teachers and students must all be engaged in the proposed ICT solutions. ICT is often an easier sale to students, so it is therefore

important to ensure commitment from these other stakeholders to implement the changes required.

 Inclusiveness: solutions should be flexible to allow for targeting user groups such as those who have recently dropped out of high-school, girls and other disadvantaged groups.

2. Create coherent infrastructure

The ICT industry itself needs to build a strong view of the appropriate infrastructures, standards and systems of interoperability required to deliver ubiquitous access to ICT.

Investment in infrastructure, networks and technologies is necessary to build the fundamental systems that will offer people throughout the country cost-efficient access to ICT. Furthermore, there needs to be a level of coordination to ensure that appropriate standards and systems are in place to maximise the number of people who will be connected to one another and profit from the multiplicative benefits of ICT. Clearly, this requires collaboration with government to establish appropriate policies in areas like spectrum allocation and standards, but the industry should have a strong consensus view to bring to the table. This is an area where organisations like CII play an important role.

The ICT industry itself should make a concerted effort to evaluate the most appropriate tools to generate the best opportunities for ICT-led growth in India. The development of India's ICT infrastructure and toolkit needs to be done in an innovative way that makes the most of what is already there and draws on the fast-evolving new technologies from around the world. The views and recommendations of the ICT industry will be essential in developing joint solutions with civil society and all levels of government.

3. Build partnerships between the ICT industry and government

Given the variations in ICT awareness and infrastructure that exist within India, effective partnerships between the ICT industry, civil society, and government at all levels will be critical to enable ICT-led growth. Over 70 percent of Indian business leaders agree that public-private partnerships should take primary responsibility for reducing socio-economic disparities. About 40 percent believe that an increased emphasis on public-private partnerships would best support further ICT-enabled growth, and one third see public-private partnerships as the best way to deliver skills to low-income communities.

Key principles of success for such partnerships will be:

- Responsiveness to local requirements: when initiatives are primarily private-sector-led, an overwhelming majority of business leaders we surveyed (94 percent) believed such schemes should be funded and operated in partnership with local communities.
- A mixture of funding and provision models: where initiatives are commercially feasible it is likely that they will be funded and provided primarily by the private sector. However, even when public funding is necessary for non-commercial initiatives, there are still opportunities for private sector involvement. Over 80 percent of Indian business leaders are of the view that publicly-funded initiatives are best contracted out to private provision.
- Efficient implementation: each stakeholder should capitalise on its comparative strengths to maximise the overall efficiency of implementation.

4. Ensure affordability and relevance of content

Our research shows that affordability of devices is by far the most important factor in ensuring suitability of technology for low-income communities. This puts a premium on innovative business models such as shared usage which allow affordable access to ICT solutions.

India's huge variations in language and skill levels place particular importance on models that allow for local customisation. Innovations like crowdsourcing can then spread best practices and information while maintaining relevance to users.

The size and diversity of India's economy in terms of income, culture and geography are immense. ICT awareness and infrastructure have still to reach many of the rural parts of the country where the poorest live. ICT has the potential to be the tool that finally delivers the education, healthcare and employment opportunities that these communities have been excluded from for so long.

Figure 10: Priorities for ensuring that ICT content and applications are suitable for user requirements in India's low-income communities



Annexes

Annex 1: Selected Survey Results

Socio-economic disparities between rich and poor communities represent a significant obstacle to the sustainable growth of the Indian economy Usage of ICT has been a major reason for the recent economic growth of India





Increased usage of ICT will be a major determinant in advancing the economic growth of India in the next 5 years



Access to a basic level of ICT will be an important consideration when investing in low-income market operations Perceived growth potential of India's low-income urban communities

Perceived growth potential of India's low-income semi-urban and rural communities







Usage of ICT will improve employment and therefore income prospects for India's poor Usage of ICT will improve the productivity of India's workforce

ICT devices, content and applications need to be specifically tailored to user requirements to make the most of ICT-based opportunities for India's low-income communities



92% 92% Agree Disagree



The policy environment is very important in making the most of ICT-based opportunities for India's low-income communities



Strong ICT infrastructure is very important in maximising ICT-based opportunities for India's low-income communities



The usage of ICT will play a key role in enabling local entrepreneurship



ICT skills are very important in making the most of ICT-based opportunities



Factors that triggered or would trigger business investment in low-income urban markets



Factors that triggered or would trigger business investment in low-income semi-urban and rural markets

Suitable physical infrastructure for operating in low-income markets

Evidence that the government is supporting investment in low-income markets

We can invest without any external evidence that it is economically viable

Availability of skilled resources in these markets

Evidence that competitors are making profits in low-income markets

Evidence that other companies (in other sectors) are making profits in low-income markets

Others



Device expected to make the most impact in bringing social and economic growth to India's low-income communities



Respondents selected 3 devices and ranked them – result obtained by collating ranks 1 and 2

Access technology or networks for voice, data and multimedia which will make the most impact in bringing social and economic growth to India's low-income communities



Communication services expected to make the greatest positive impact on India's low-income communities



Respondents selected 5 services and ranked them – result obtained by collating ranks 1 and 2



Most important skill required by India's low-income communities to benefit from ICT-enabled growth

Best way to deliver skills to India's low-income communities



Stakeholders expected to take primary responsibility for reducing India's socio-economic disparities



If private sector takes primary responsibility, how?

Fund and operate in partnership with local communities

Fund and operate alone



If public sector takes primar	y responsibility, how?	
Fund and contract out operations		81
Fund and operate alone	14	
Others	5	

Policies that would best support further ICT-enabled growth

Increased transparency and accountability in decision making

Better incentives for ICT investment in infrastructure Clearer and more stable

regulatory framework

Increased market liberalisation

Increased emphasis on public private-partnerships Greater strategic focus on the

role of ICT in development

Others





Survey Respondent Profile

Respondents by industry group



- Communications and High Technology
- Financial Services
- ProductsResources
- Resource
- Communications and High Technology (Communications, Electronics and High Technology, Media and Entertainment)
- Financial Services (Banking, Capital Markets, Insurance)
- Products

 (Automotive, Consumer Goods and Services, Health and Life Sciences, Industrial Equipment, Retail, Transportation)
- Resources
 (Chemicals, Energy, Forest Products, Metals, Mining, Utilities)

Legal status of organisation



- Indian private company private limited
- India private company proprietary / partnership
- Indian private company public limited
- Multinational company- joint venture
- Multinational company wholly owned
- Public sector
- Others co-operatives

Respondents currently operating in low-income urban markets

Undisclosed



Respondents currently operating in low-income semi-urban and rural markets





>INR 25000

Number of permanent employees across India



Annex 2: Government of India and Planning Commission Initiatives

E-Governance Initiative

The Government of India approved the National E-Governance Plan for implementation during 2003-2007. The plan seeks to create core infrastructure and policies required for the growth of e-Government services and to implement a number of Mission Mode Projects to bring about a citizen-centric and business-centric environment.

Government of India Infrastructure Initiatives

- State Wide Area Network (SWAN): SWANs are intended to extend data connectivity of two mega bits per second up to the block level in all states in the country. This will be further connected to all villages by wireless technology.
- Common Service Centres (CSCs): The government plans to establish over 100,000 CSCs to provide all government services to citizens in rural areas and provide "government at your doorstep."
- The government is also making efforts to make digitised information available in India's many local languages – a key factor highlighted by our business interviewees.

Software Technology Parks of India (STPI)

STPIs are intended to act as a "single window" to provide services to the software exporters and incubation infrastructure to small and medium enterprises. As of December 2005, 6129 units were operational with 4088 of them exporting. Software exports reached over US\$16 billion in 2004-05 and are estimated to hit US\$21 billion in 2005-06.

Planning Commission initiative on Spatial Data Infrastructure for Multi-Layered Geographic Information System (GIS) Planning

Starting with the village as a unit, multi-layered databases are created and maintained for block and district levels. National and state GIS atlases with 100 map layers and a district GIS atlas with 150 map layers have been prepared. This version uses 11 million data points.

Planning Commission initiative on Computer Aided Digital Mapping Project for six cities (Ahmedabad, Bangalore, Chennai, Hyderabad, Kolkata and Mumbai)

This project aims to provide digital maps for use by all city agencies as well as analysis facilities for utilities including water, sewage, electricity, roads, communication, gas and pipelines.

Government of India Policy Measures

- Over the years, we have seen the liberalisation of foreign trade policies on electronics and IT products, simplification of customs and excise procedures, and the reduction of customs duties on specified capital goods and raw materials for electronics and IT hardware to zero percent.
- Electronics Hardware Technology Parks (EHTP) and Special Economic Zones (SEZ) have been tailored to boost the manufacturing sector of the economy.
- Excise duty on computers is zero percent. Microprocessors, hard disc

drives, floppy disc drives and CD ROM drives are exempt from excise duty. Parts, components and accessories of mobile handsets, including cellular phones, are also exempt from excise duty.

- IT-related SEZs are being set up to enable easier manufacturing for export purposes.
- Export profits of SEZ operations are exempt from income tax for five years, with a 50 percent reduction for the next five years, and smaller proportions from that point.

Annex 3: Gaps in India's Basic Education System

Lack of Facilities and Teachers

8 percent of primary schools in India have no classrooms and 17.5 percent have only one teacher^a. A Central Advisory Board of Education (CABE) committee estimates that 88,562 additional classrooms and over 130,000 additional teachers will be required in 2007-08 to provide education for children eligible for but not attending secondary school.

Teacher Absenteeism

Literacy rate (1999 - 2000)

A recent World Bank report^b estimates that 25 percent of teachers in India are absent at any given time, and of those present, only 50 percent are actually teaching.

Quality Gaps

In a recent study^c, 35 percent of children aged 7 to 14 were not able to pass a simple reading test (a short paragraph at Grade 2 level) and 60 percent could not read a simple story. 50 percent of children aged 6 to 10 (enrolled in Class I to V) in government primary schools and 38 percent in private schools could not solve a two digit subtraction.

High Drop-Out Rates

Drop-out rates sit at 44 percent for children aged 5 to 10 (from Class I to V) and 53 percent for children aged 5 to 13 (from class I to VIII^d). According to CABE estimates, more than 50 million children of school-going age were out of school in 2004–2005.



Teacher absence



^a Report by National Institute for Educational Planning Administration (NIEPA) in 2005

- ^b Teacher absence in India: A snapshot, Journal of the European Economic Association, 2005, vol. 3, issue 2-3
- ^c First Annual Status of Education Report (ASER) by Mumbai-based NGO Pratham, 2005

^d Hundred and fiftieth report on demands for grants of the Department of Elementary Education and Literacy, 2005-06

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The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the growth of industry in India, partnering industry and government alike through advisory and consultative processes.

CII is a non-government, not-for-profit, industry led and industry-managed organisation, playing a proactive role in India's development process. Founded over 111 years ago, it is India's premier business association, with a direct membership of over 6300 organisations from the private as well as public sectors and an indirect membership of over 90,000 companies from around 336 national and regional sectoral associations. A facilitator, CII catalyses change by working closely with government on policy issues, enhancing efficiency, competitiveness and expanding business opportunities for industry through a range of specialised services and global linkages. It also provides a platform for sectoral consensus building and networking. Major emphasis is laid on projecting a positive image of business, assisting industry to identify and execute corporate citizenship programmes.

With 57 offices in India, 7 overseas in Australia, Austria, China, France, Singapore, UK, USA and institutional partnerships with 240 counterpart organisations in 101 countries, CII serves as a reference point for Indian industry and the international business community.

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