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## **Grassroots ICT Projects in India: Some Preliminary Hypotheses**

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*Grassroots ICT can be a significant and cost-effective way of responding to the needs of large disadvantaged sections of the Indian population. Unfortunately, such hopes are built almost entirely on an empirical vacuum. Almost nothing is known about factors that make for effectiveness or ineffectiveness of grassroots ICT projects in developing nations. The preliminary hypotheses emerge out of site visits, observations, discussions and on descriptions of projects. These hypotheses are being currently tested.*

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In August 2002, I entered two phrases in the Internet search engine *Google*. The first was *digital multiply*. It produced 33 hits, all of them having to do with various formulae for multiplying two integers. The second was *digital divide*. This phrase gave me 360,000 hits. I read only the first two or three hundred. All these dealt with the perceived gap between the digitally empowered and the digitally deprived, between the information rich and the information poor, between developing and developed nations, and most important, with above all the hope that modern information and communication technologies (ICT) could be used to close the gap between the rich and poor nations, between the North and the South, and – within nations – between the privileged and the disadvantaged.

Six years ago, a similar search through *Google* or its earlier incarnations would have produced almost no similar results. The phrase *digital divide* was unknown until it was noted in 1996, in the United States, that there was a gap in the United States between those who had telephones, computers and internet connections and those who did not. The phrase *digital divide* was invented to characterize this gap, and the term soon gained widespread currency. For example, in the Human Development Report (1999), Kofi Annan specifically mentioned *digital divide* as a source of growing inequality in the world, and committed the United Nations to bridging this divide.

Few concepts in history have spread as rapidly as the *digital divide*, and with it, the hope that modern ICT could be used to promote development. From an unknown mathematical phrase, *digital divide* has suddenly leapt to the forefront of the development discourse. It is today the slogan of the season, the mantra of the year. Billions of dollars and crores of rupees are committed to the hope that ICT can enable the poorest of developing nations to *leapfrog* traditional problems of development like poverty, illiteracy, disease, hunger, unemployment, corruption,

and social inequalities so as to move rapidly into the modern *information age*. In India as abroad, the basic hope is that ICT can be used in a double capacity:

- First, to enhance India's international economic position by building further on the success of the Indian software industry.
- Second, to develop programs of *IT for the masses* (in the words of a recent Government of India report) that would play a critical role in solving the as yet unsolved problems of development that beset large sections of the Indian population.

Here, I will deal only with the second set of hopes – ICT for the common man. Grassroots ICT can be a significant and cost-effective way of responding to the needs of large disadvantaged sections of the Indian population. In India, as elsewhere, scarcely a day goes by without another story in a newspaper or journal about a successful IT project that is bringing benefits to ordinary people. No state in the Indian union is without a plan for bringing ICT to the masses; every major NGO has its IT projects.

But unfortunately, the hopes so widely expressed are built almost entirely on an empirical vacuum. We know almost nothing about the factors that make for effectiveness or ineffectiveness of grassroots ICT projects in developing nations. Thus, critics can point out that the cost of creating a working Internet connection in a developing nation like India is the same as that of providing immunization against six fatal childhood diseases to thousands of children. Others have argued that the introduction of ICT into communities otherwise unchanged will merely heighten existing inequalities. But instead of comparative research to counter or address such claims, we have *stories* – to be sure, largely true stories of successes – from which trustworthy generalizations are impossible.

At least fifty grassroots projects are currently using modern ICT for development in India.<sup>1</sup> Surprisingly, these projects have rarely been studied. No comparisons have been made between them. They are seldom in touch with each other. Lessons learned in one project are not transmitted to others. Appropriate technologies are rarely evaluated. Central questions of financial sustainability, scalability and cost recovery are hardly ever addressed. So, opportunities to learn from the diverse, creative Indian experience so far remain almost entirely wasted.

The propositions listed below derive from an ongoing study of grassroots ICT projects in India. These are based on site visits, above all on the observations and comments of Indian colleagues, and on a reading of the descriptions of projects I have not yet visited. These are preliminary hypotheses that I am currently testing, modifying, or changing on the basis of further research. Above all, I hope they will be useful to Indian researchers, who can pursue these issues far with far greater insight than I can:

**A. *More talk than action:*** Plans abound. Ground realities are fewer. International, national, state and local projects and conferences abound. Only a few have substance so far.

**B. *Difficulties abound:*** Nothing is anywhere nearly as simple as it seems. Almost every project is late and runs into unexpected difficulties. One example: the officer involved in computerizing land records in one Indian state recently said more than half of them are legally contested, or in the names of dead people, or illegible, etc. Yet, computerizing land records is on the agenda of almost every Indian state. It will be interesting to know how some states that claim to have done it, have succeeded.

**C. *Financial sustainability:*** The goal of financial sustainability is rarely achieved. Granting that initial start up costs have to be borne by someone, very few projects even plan for long-term sustainability, and even fewer achieve it.<sup>2</sup>

**D. *Scope of IT:*** IT should not be simply identified with computers and Internet. Some of the most inventive uses of IT involve radio, television, and embedded chips, potentially useful satellite inventories, etc. The classic example is the use of automated butterfat assessment equipment in Gujarat, which has radically simplified the process of evaluating milk and paying dairy farmers.

**E. *Grassroots consultation:*** Starting by consulting at the grassroots is essential. Top-down projects simply do not work. These end up by providing information that people do not really need or use – at an incomprehensible level of technical detail and terminology, or in a literary language that local people do not understand.

**F. *Information uses:*** The information people initially say they need, may not always be what they end up using. In the M.S. Swaminathan Pondicherry Project, for example, male farmers originally said they needed information about agriculture. In fact, their largest single usage of village info-kiosks was to get information about government programs.

**G. *Standardization of codes:*** Local language content is a prerequisite for any successful project. Much has been spoken and written about the problems of the standardization of codes and fonts for major Indian languages. The bottom line is that, despite many brilliant efforts, and despite widespread awareness of this problem on the part of the Government of India and of many state governments, every major Indian language suffers from multiple schemes of coding and fonts. Hence, the absence of inter-operability between programs involving distinct codes.<sup>3</sup>

**H. *Development of locally relevant content:*** Is essential, and the nature of that content varies from region to region. Without accessible, local content that

addresses the real problems of local people in their own language, and in terms which they can understand, *ICT for the common man* projects are bound to fail. There is some evidence that radio programs, especially designed to appeal to ordinary people, may be more effective than computers in reaching people about topics like best agricultural practices, family planning services, etc. Almost 100% of the Indian population has access to radio; perhaps 30% has access to television occasionally, and well under 1% has access to the Internet and the web. Whatever the mode of communication, the need to present locally relevant information intelligibly both in terms of language and in terms of the level of explanation is imperative.

***I. e-governance:*** Is one of the most promising uses of ICT. In practice, it involves two distinguishable activities:

- First is the computerization of government functions itself, as discussed especially by Andhra Pradesh. This proposes connecting the state government headquarters to district officials, computerizes registrations, legal proceedings, land records, state offices, etc. for the benefit of the administrators of the state. This type of e-governance also exists at the level of the central government; some years back, nearly all districts were connected via e-mail to Delhi.<sup>4</sup>
- Second, e-governance may mean government-to-people and people-to-government connections whereby citizens obtain direct access to records, rules, and information about entitlements that they need or want in their daily lives.<sup>5</sup>

Both forms of e-governance are difficult and costly to implement. These also run into strong resistance, since such methods eliminate middlemen and others whose jobs and incomes depend upon the relative inaccessibility of government documents.

***J. e-commerce:*** In the sense of customer-to-business on-line buying within India, is probably many years away for a majority of Indians. But the operational, internal computerization of small and medium businesses has already begun in the larger cities, with notable gains in efficiency. At the national level, the computerization of the railroad reservation system and the banking system are notable examples of Indian successes. If small business software packages were available in local languages, some observers believe small and medium size merchants in cities, towns and villages, adoption would be quicker.

***K. Commercial funding:*** Commercially funded ICT networks have considerable promise. For example the Warana Project, though heavily funded initially by the state of Maharashtra and by Delhi, is currently maintained by the sugarcane cooperative in the area, and offers tangible benefits to sugar producers and to sugarcane growers. The E.I.D. Parry project in Nellikuppam, Tamil Nadu expects advantages in terms of improved information to their producers about best agricultural practices. ITC-IBD has set up a large number of IT Chaupals for soybean, shrimp and coffee farmers with the goal of reducing the costs of

production that currently go to middlemen. In such cases, commercial interests may justify the expense of establishing rural info-kiosks, which could in theory also provide much general information in addition to specific product information.

**L. *The limits of ICT:*** The market for *indigenous crafts* is a niche market in a few rich countries. Therefore, e-commerce from countries like India to Europe, the United States, or Japan has enormous logistic problems. It is not a realistic solution to use IT for total poverty alleviation but a tiny fraction of Indians. For example, the recent claim of one state government that millions of local women are to be involved in the export of local crafts turns out to be a promissory note that is likely never to come due. Furthermore, if it does turn out that there is a big market in wealthy countries for an *indigenous* product, local craftsmen are almost always beaten out by industrial producers.

**M. *ICT gains:*** A successful commercial ICT sector does not necessarily *trickle down* to ordinary Indians. Proposals by state governments to develop *IT for the masses* often place primary emphasis on developing software technology parks, improving education at higher levels of information technology, etc. These are laudable and necessary goals if India is to continue its astonishing growth rate in the ICT field. But there is little evidence that the growth of the software industry is reflected in improved living conditions, more schools, greater justice, better health, more jobs, or other benefits for ordinary Indians.<sup>6</sup>

**N. *Impact of technical decisions:*** Apparently *technical decisions* concerning IT regulation, bandwidth allocation, pricing mechanisms, transmission standards, etc., can have profound effects on whether or not information technologies benefit ordinary Indians.<sup>7</sup> One case is the requirement that Internet service providers guarantee to *cover* an entire state. This effectively precluded local entrepreneurs from providing Internet connectivity in small and medium towns, unlike local initiatives that have helped spread satellite television rapidly in rural India. Analysis of the impact of technological decisions on *IT for the common man* is largely absent.

**O. *The wheel is constantly reinvented:*** One can identify at least four dozen *grassroots* projects in India. The people in these projects are not usually in touch with each other, rarely publish or write anything about what they are doing, and - if they are public officials - are constantly transferred. There is little accumulation of knowledge, not even the most preliminary kinds of on-the-site evaluation.<sup>8</sup> So, there is little possibility of learning from the successes or failures of other projects.

**P. *Credibility:*** You cannot *believe* a lot of what you are told.<sup>9</sup> A number of projects that are publicized turn out, on a site visit, to have closed, or not yet to be in operation, or to have deteriorated from their stated original goals.

**Q. Wiring India:** Until the costs of the last mile of basic IT devices, and of local language software are brought down, the goal of *wiring India* will remain unachieved.<sup>10</sup> Low-cost technological solutions alone are of course not solutions to the problems of development, but they are prerequisites for IT in India.

**P. Wishful thinking:** *The IT for the masses and bridging the digital divide* movement has an inordinate amount of exaggeration and wishful thinking. But there are in fact real cases of ICT projects that actually help poor people in India to meet their basic needs and assert their fundamental rights. We need to define the characteristics of those projects and try to spread the word about what works and what does not.

## Conclusion

I trust it is clear that I am not yet convinced that ICT is invariably, or even usually, the best answer to poverty, injustice, illness, inequality, discrimination, exploitation, hunger, etc.<sup>11</sup> The challenge is to learn if, when, and how information and communication technologies (of all kinds) can be the most cost-effective means to help people, especially poor people, meet their basic needs and assert their fundamental rights.

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## Notes

1. A few of these projects (Dhar-Gyandoot, Pondicherry-Swaminathan, CARD-Hyderabad) have been publicized; the great majority remain unpublicized.
2. But there are exceptions: the Dhar-Gyandoot Project in Madhya Pradesh is close. The Pondicherry Project has received a further grant with the goal of attempting to become self-sufficient. E.I.D. Parry, which provides inputs for agri-business, has set up a series of info-kiosks in villages, partly to provide better information to farmers about agricultural inputs, harvesting of sugarcane, and other matters. And some projects, once the initial public or NGO funding disappears, simply disappear as well. Example: an Apple project for rural health workers in Rajasthan a few years back, which was only recently taken up again by CMC.
3. The governments of states like Tamil Nadu and Karnataka are acutely aware of this problem, but lack the ability to enforce the use of common standard. This technical problem dramatically complicates the development of local software and of local IT use throughout India.
4. But one study suggests that these connections are rarely used.
5. The most successful example of this I know is in the Dhar-Gyandoot Project, where more than a dozen official documents are available, and defined as legally valid if obtained from village cyber-kiosks under the right circumstances. This use serves to

- make public records immediately available and to eliminate lengthy trips, long wait, and frequent bribes necessary to obtain vital documents.
6. The development of the Bangalore region goes hand in hand with the persistence of Karnataka as one of the poorer states in India. Critics of the Chief Minister in Andhra Pradesh claim that his stress on IT has not helped relieve the poverty of the average rural citizen of the state. One project, however, Nilgiri Networks, has created a software center in Ooty with the goal of spreading the benefits of the IT boom to outlying regions.
  7. Prof. Jhunjhunwala of IIT-Madras has written extensively on the subject.
  8. The kind of expensive, detailed evaluation that the Grameen Bank cell phone project in Bangladesh has undergone is unlikely at this point. In any case, the research concludes the project works financially because of the unusual regulatory structure and financing of telecom in Bangladesh. One desperately needs efforts to learn from comparative studies of existing projects what work, what does not work, how local conditions affect outcomes, etc.
  9. At one meeting, for example, the audience was told that satellite water temperature data for the Bay of Bengal is being provided to offshore fisherman. A member of the audience asked why this information had only been available for two out of the last 365 days. The speaker replied, *cloud cover*.
  10. My heroes in this area are Ashok Jhunjhunwala at IIT-Madras, Vijay Chandru and his colleagues at the Indian Institute of Science, and Rajeev Sangal of the IIIT-Hyderabad. They are doing world class work on lowering the cost of the *last mile*, on producing a low cost (\$200) *Simputer*, and on sophisticated machine translation of India's languages. The *India-Linux* movement is also lively and enthusiastic; projects like the Simputer project use Linux because it is simple and free. But they run into obstacles, not least of all with Government of India regulations, with multinationals, and with companies that have a financial interest in having India import European, Japanese, or American technologies.
  11. But at the same time, I think that Bill Gates overstates his point when he says poor people need medicine and not computers.

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