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Reconstruing the digital divide from the perspective of a large, poor, developing country

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Abstract
The global digital divide is usually measured in terms of differences between rich and poor countries in the extent to which they use ICTs in general and the Internet in particular. Such a view of the problem, however, ignores the fact that there are all kinds of ways in which poor, illiterate persons in developing countries benefit from the Internet without any use of computers and Internet connectivity. Most of these benefits occur as a result of intermediaries who, in one way or another, transfer relevant parts of the knowledge available from the technology to recipients in a form that is relevant to their specific needs. Using India as an illustration of this argument, we find that usage understates actual beneficiaries by at least 30 percent. On the basis of this finding, we suggest that a reconstrued notion of the digital divide be based on usage as well as other more indirect forms of benefit from the Internet in developing countries. To this end, much more needs to be known about these other forms of benefit in a large sample of countries in addition to India.
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Introduction

Given the prominence of the issue in current debates on the future of developing countries, it is not surprising that numerous attempts have been made to quantify the so-called global digital divide. With usually minor methodological differences, these studies invariably conclude that the usage of ICTs in developing countries does indeed lag far behind what occurs in the industrialized world. This is problematic, so the argument usually runs, in as much that the usage gap reflects differences in the degree to which countries are able to benefit from the new technologies in question (and that within countries, it may be the poorer rather than the better off households thus bypassed in the process).

In what follows, however, we seek to criticize the inevitability of this assumed link between usage and welfare and in so doing, hope to initiate a reconceptualization of the notion of a global digital divide. Our argument focuses on India, a country in which the gap between Internet usage and welfare derived indirectly from that technology, is arguably the most pronounced than anywhere else in the Third World. Central to our explanation of this discrepancy, is the idea that among the poorer, rural segments of the Indian population, usage is *only rarely the way in which the benefits of the Internet are actually derived*. By describing a variety of cases that illustrate this contention and by estimating the numbers of beneficiaries involved in each case,we are ultimately able to deduce (albeit only approximately) the size of the discrepancy between the number of Internet users and the group of persons that derive benefits in ways other than usage of the technology itself.

Let us first, however, use one well-known measure of the global digital divide, to gain some sense of where India stands in the ranking of both rich and poor countries, according, among other variables, to Internet usage. The purpose of this exercise is to indicate just how much of an anomaly can arise when usage-based measures are applied in the case of a country such as India.

Recent measures of the digital divide

Several of the most recent measures of the digital divide include not only the usual indicators such as Internet users, personal computers, telephone lines and so on, but also a set of variables that purport to capture the ability of a country to use these new technologies. A study by Orbicon (2003), for example, includes literacy and educational attainments, while a more recent study by the ITU (2003) is also designed to go beyond the standard indicators, as explained below. This second study is the one we have chosen to work with, not because it is thought to be superior to the former, but rather because it more clearly illustrates the main theses that we wish to develop.

As shown in Figure 1, the ITU index embraces eight indicators, one of which is the number of Internet users (represented by the inner circle of the diagram).

On the basis of a weighted combination of these indicators, the 178 countries included in the study are divided into four 'access' categories, namely, high, upper, middle and low. The last-mentioned category is made up overwhelmingly of countries from Sub-Saharan Africa, which 'are the poorest in the world … [and] have a minimal level of access to the information society' (ITU, 2003: 17). Just slightly above these extreme cases of disassociation from the world of the Internet falls India, a country that, in the eyes of many observers, is far better characterized as having the most extensive and innovative forms of rural engagement with the Internet, in the entire Third World.[1] Many of the schemes that, for such persons, sharply distinguish India from Sub-Saharan Africa, moreover, have won awards for excellence and some have even been rewarded with the prestigious Stockholm Award (a prize that goes to projects that are of 'such innovative and pioneering structure' that they can serve as a model for future endeavours). These descriptions of India clearly do not square with the country's abjectly low ranking on the ITU scale and the resolution of this anomaly, we feel, requires a distinction to be drawn between usage of and benefits derived from the Internet (and for that matter certain other ICTs as well).

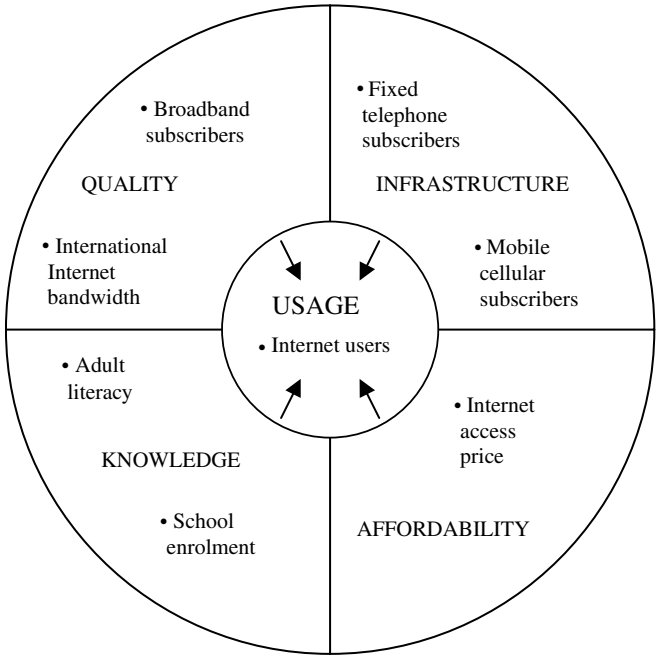

Figure 1 Factors affecting ICT access. Source: ITU (2003).

In particular, our contention is that for the bottom 60 per cent or so of the (mostly rural) population, direct *access* to this technology is *not* the means by which its benefits are conferred. What occurs, rather, is that intermediaries of one kind or another, drive a wedge between access to and benefits from the Internet.[2] In terms of Figure 1, what intermediation means, is that many of the access/usage variables shown there, become totally irrelevant to the question of whether and to what extent, benefits from the Internet are conferred on the society. Consider, for example, the case of technological intermediation in community radio programming (as practised mainly in Sri Lanka and Nepal).[3] In particular, it is perhaps most useful to consider the so-called 'Radio Browsing' format adopted by the Kothmale Internet Project in Sri Lanka. What this entails, is a

> daily two-hour radio programme in which broadcasters take the Internet to the community by surfing the web in search of answers to listener queries. Sifting through the Internet's terabytes of data *Radio Browsing* finds information that is useful to the communities and then interprets it – making *useful* information *meaningful*. It plays a role that is part search-engine, part librarian, part journalist and part translator (English is the language of the Internet, but not of most Sri Lankers. (Girard, 2003: 11)

What is important about this example, for our purposes, is that the community can benefit from the Internet even though its members make no use of computers; even though they may be illiterate and non-English speaking and unable on their own to adapt Internet information to their own problems and circumstances. Nor, finally, do they need to be in possession of fixed telephone or mobile cellular subscriptions (see Figure 1). Although this particular form of intermediation has been hindered in India by essentially political factors,[4] many other forms are being practised in that country, as we now seek to show.

Role of intermediaries in bringing the Internet to rural areas in India

The essential point to be made in this, the major part of the paper, is that when the access index is applied to India, it excludes millions of people (drawn mainly from rural areas), who are engaged with the Internet by virtue of the activities of intermediaries, rather than any direct form of access to the technology itself. Our specific task will be to describe the main projects where such intermediation occurs and to estimate the number of beneficiaries in each case. In the aggregate, these estimates can then be compared with the actual numbers of Internet users in India, so as to obtain some idea of the discrepancy between beneficiaries and users.

Such a discrepancy, we should emphasize, would be a distinct rarity in developed countries, where almost all of those who benefit from the Internet, have direct access to it. Generally, this is the result of individual ownership of what

is needed (computers, Internet subscriptions, etc.) for such a purpose.[5] In other cases, direct access is achieved through rental facilities such as cybercafes[6], which obviate the need for some of the factors mentioned in Figure 1 (such as telephone subscriptions) but not others (such as adult literacy and school enrolment). More generally, the point is that the usage access measure is based (often implicitly) on the circumstances prevailing in the developed countries, which, as we now attempt to show, correspond rather poorly to the ways in which many of the benefits of the Internet accrue to the rural majority in India.

We shall find it analytically useful to separate these various mechanisms, all of which are based on intermediation of one kind or another, into two groups. The first and by far the most important category in terms of impact, refers to cases where intermediaries operate via the sale of Internet services in rural kiosks (where the sale may entail, for example, assistance provided by the kiosk operator with respect to filling in forms downloaded from the Internet; translation or adaptation of information to local circumstances; answering queries and so on). The second group, on the other hand, contains cases where the intermediary intervenes in ways other than through face-to-face transactions in rural kiosks (as is the case, for instance, with intermediation at a distance, rather than at the close quarters inherent in rural Internet kiosks).

Table 1 contains a summary of some of the major modes of intermediation that occur in India's rural Internet kiosks. In each case, an estimate is provided of the numbers of persons who may, thus far, have made use of the specific opportunities afforded by the project at hand.

As is clear from some of the notes to Table 1, one cannot be at all sure about the actual numbers of kiosk users when the available information provides only the numbers served by an Internet connection. Or, when one knows the number of users per month, but not whether these are the same or a different group of individuals. Thus, certain assumptions need to be made. In the latter case, we make the most conservative assumption that the composition of users remains the same each month. In the former examples, we count only half the maximum possible number of users. On this admittedly crude basis, our finding is that around five million kiosk users, mostly in rural areas, have derived some form of benefit from the Internet, without having been in any direct personal contact with computers or the World Wide Web. Since the ITU (2002) estimates that there were some 16.5 million Internet users in India in 2002, more than double the figure of seven million in 2001, we suggest accordingly, that there is a rather sizeable discrepancy between users and beneficiaries of this technology (a discrepancy, we should note, that would be entirely missed by the variables contained in Figure 1). The cases in the second category mentioned above, do not yet add greatly to this discrepancy, but they are very likely to do so in the near future.

Internet intermediation without rural kiosks

We begin this section with an initiative that clearly has vast potential for improving the conditions of India's farmers via long-distance Internet intermediation. In particular, this initiative is an attempt by the Ministry of Agriculture to bring high technology to bear on agricultural extension services, using the exceptional degree of access to public payphones found in Indian villages.[7] (extension services practised in a top-down manner, one should note, have long been criticized as ineffective in India, as elsewhere in the Third World). Inaugurated in early 2004, this initiative is based on so-called 'Kisan Call Centers' which are designed to provide information on specific problems raised by individual farmers, a process that can thus better be described as 'bottom-up' rather than 'top-down'. Farmers are able to dial a toll-free number in order to pose a question that is directed to the nearest call-centre and answered, in the first instance, by a graduate student of agriculture in the local language. In certain untypical cases, where the question cannot be answered at this stage, it is transferred via the computer system to a known expert at a university or government research centre. That person will then be able to reply directly to the caller.

In order to appreciate the potential of this model for farmers, one needs to reiterate the fact that India is one of the few developing countries with a public payphone in the vast majority of its villages.[8] This fact, in turn, implies that the call-centres are within reach of almost the entire farming community in India, which, for its part, is sorely lacking in the information its members so urgently require. It is hardly surprising, therefore, that the Kisan call centres are already being declared 'a hit with farmers all over the country' (*Hindustan Times*, 23 January 2004). Indeed, within the first day of their opening, the centres had received almost 1,500 queries. And at a subsequent average daily rate of 2,000 calls, an annual total might be in the vicinity of 600,000–700,000 (which, again, measures the intensity of demand, rather than, more usefully for our purposes, the number of beneficiaries).

The second project with potentially major gains for India as a whole, is an initiative of the Department of Posts known as 'e-post'. Begun in 2001 on a trial basis in five states, the project was scaled up to the national level in early 2004. What 'e-post' has in common with all the other cases described above, is that it enables those living in isolated rural areas to benefit from the Internet, regardless of whether the process has any connection at all with the variables in Figure 1. Essentially, this is achieved in two stages that define the 'e-post' idea. The first is that customers hand in to a *postal worker a* message intended for an ordinary 'snail mail' address. In the second stage the message is typed and e-mailed to the post office nearest the recipient, where it is printed out, placed in an envelope and delivered in the ordinary way. Thus 'e-mail can now be sent and received … even without the sender or the addressee having access to the computers or Internet' (*The Hindu Business Line*, 31 January 2004). If there were relatively few post offices in rural India, 'e-post' would be unlikely to attract more than a small proportion of the rural population. In fact, however,

> India Post's network is one of the best and quickest ways to take technology and its benefits to the rural population in India. Across India 154,000 post offices reach the people in an intense and intimate network of knowledge and service. No Indian is more than roughly a mile or so from the nearest post office and 137,000 of them are in

Table 1 Internet intermediation in rural (and some urban) kiosks; selected cases from India

Project name	*Year begun*	*Project description (summary)*	*Numbers of users thus far*
eSeva	Late 2001	Beginning first in the city of Hyderabad and extended subsequently to rural areas of Andra Pradesh, eSeva allows clerks at computer terminals to help clients with a wide variety of transactions with the government. In the rural version, some of the most important services on offer include online filing of complaints and grievances, issuance of certificates, information about market rates, and online beneficiary application registration	800,000 per month[a)]
Drishtee	2000	'Drishtee is an organizational platform for developing IT enabled services to rural and semi-urban populations …. . The services it enables include access to government programs and benefits, market related information, and private information exchanges and transactions …. Drishtee's business model is driven by a village entrepreneur who is suitably trained to handle user-friendly software. The unit revenue earned by this kiosk owner is a few cents per transaction, but the volume of the operations and an intrinsic demand enable viability very early in the operation. This individual, educated to 10th grade or above becomes a role model and a messenger of valuable information for the villagers'. (executive summary, www.drishtee.com)	0.2 million[b]
e-choupals	2000	As one of India's leading private firms, ITC, has started a network of e-choupals (roughly defined as a high-tech version of a traditional meeting place), throughout India. Each e-choupal is managed by a local farmer who is trained for this purpose and in whose house a computer with Internet access is installed. 'The farmers can use the computer to access daily closing prices on local mandis [markets], as well as to track global price trends or find information about new farming techniques – either directly, *or, because many farmers are illiterate, via the sanchalak*. They also use the e-choupal to order seed, fertilizer, and other products … from ITC or its partners, at prices lower than those available from village traders' (*Digital Dividend*, 2003, executive summary, emphasis added)	Up to 1.8[c]million farmers
Bhoomi	1991	Bhoomi was launched by the Karnataka state government in order to computerise land records on a massive scale, and to make them available to farmers for a small fee. No fewer than 20 million records have been computerised and in the form of computerised kiosks, can be securely called up. Such records are crucial to farmers because they are used for other purposes, such as loan requests. Formerly, land title records could only be obtained from village officials, a process that was often time-consuming, unreliable and expensive (as a result, partly, of the payments that such officials often demanded)	1.25 million farmers[d]
n-Logue	2002	n-Logue is a spin-off of work carried out at the Indian Institute of Technology, Chennai, which is specifically concerned to find low-cost solutions to the problem of bringing information technology to rural and certain relatively backward urban areas. Central to the n-Logue model is corDECT WLL technology, an innovation that emerged from IIT, which is substantially cheaper than standard WLL technology. CorDECT enables n-Logue to sell low-priced village kiosks to local entrepreneurs, who are well-placed to deliver services that meet the needs of the local community. Beyond the usual requirements for e-governance, price information and so on, these needs may also include local entertainment requirements (such as information from the 'astrology' page of a popular Tamil portal. On the basis of a number supplied by the client, a forecast appears on the screen and is then typed at the going fee of the kiosk owner). See www.n-logue.com.	A maximum of 3,500,000 persons. Actual use unknown[e]

[a]One cannot, of course, say how many users in a given month are the same as in a subsequent month.
[b]Estimate provided by Mr Satyan Mishra of Drishtee in correspondence, dated 6 April, 2004.
[c]*Times of India*, 13 April, 2004. The figure here refers to the numbers of farmers 'served' by the project (i.e., the potential number of users) rather than the actual number of users.
[d]From Stockholm Award, contest website, 2002.
[e]Estimate provided by Mr Varadarajan of IIT, Chennai. Here too, the figure is a maximum number of users as opposed to the actual total.

rural areas. Beyond that, the last mile is traversed by the postman on the cycle (World Bank, 2002)

As noted above, however 'e-post' service at the national level has barely begun and it would obviously be unreasonable to expect anything like the full capacity of the scheme to have reached within so short a period. That said, the number of future users across the country as a whole, could easily run into the hundreds of thousands.

Conclusions

The global digital divide is usually conceptualized and measured in terms of a country's usage of, or ability to use, ICTs such as the Internet (a tendency, we should note, that is well exemplified by a recent 'global digital access index', prepared by the ITU). This is described as 'the first global index to rank ICT access' (ITU, 2003, 6).

Viewing the important case of India from this perspective, however, gives rise to a serious anomaly, one, we feel, that forces us to reconsider usage as a proxy for the true benefits of ICT to a country. In particular, we find that the egregiously low ranking of India on the 'global access index' (only fractionally higher than the least industrialized countries in sub-Sahara), is due largely to the fact that there are a very wide variety of initiatives that confer the benefits of the Internet on disadvantaged Indians, *other than through usage*. What is common to almost all such initiatives is that there is an intermediary involved, someone who essentially converts the information on the Internet into something valuable, even for illiterate, poorly educated and geographically isolated inhabitants of developing countries. On the basis of data that were, on occasion, admittedly rather crude, we were able to estimate that such indirect benefits make up at least an extra 30 per cent of the direct benefits derived from Internet usage in India. (In terms of Figure 1, that is to say, the estimates of literacy, education, Internet subscriptions and other variables, become irrelevant since the notion of usage itself is implicitly misconstrued as a measure of the total benefits derived from a technology such as the Internet.)

As I noted earlier, the misconceived obsession with the usage of the Internet is almost certainly most evident in India. As such, it can fairly be said that our choice of country best suits the case we have sought to make. On the other hand, however, one should bear in mind that this country comprises a large part of the Third World as a whole and thus that a misconceived idea is more serious in India than in a much smaller developing country. Nor is it the case that the problem to which we have alluded occurs only in India. In Nepal, for instance, there are five community radio stations, which confer indirect benefits of the Internet on the population. In combination, these stations are likely to cover a fairly wide swathe of the rural population. Or again, it is well worth emphasizing the fact that, as evidence mounts against donor-funded telecentres, whose benefits are expected to accrue to the rural population on the basis of actual usage, more and more countries are likely to emulate the type of initiatives that are so prevalent in India.

How, finally, does the critique we have offered in this paper bear, normatively, on the way we should conceive of and measure the global digital divide? Perhaps the most obvious need is to generalize the Indian case and to re-measure the digital divide between rich and poor countries, where usage in the latter group has to be corrected in the aggregate, by the weighted inclusion of gains from the Internet that accrue by other less direct means. Weighting means that given corrections in a large country such as India or Pakistan would have more impact on reducing the extent of the overall digital divide (as now measured), than corrections in relatively small countries. In any event, though, one would expect corrections along these lines in developing countries as a whole, to lead to an overall lessening of the digital divide, as compared to the way in which it is currently conceptualized and measured (in relation to the Internet at least). For, it is in poor, rather than rich countries that modes of Internet delivery other than usage, tend to be systematically more prevalent.

An essential element of this particular way of looking at and re-measuring the digital divide is the need to conduct country studies that seek, in as much detail as possible, to estimate the number of actual gainers from the Internet (as opposed merely to users), in much the same way as we have tried to do (albeit somewhat crudely) in the Indian case. For, the more countries that undergo such a measurement correction, the more accurate will tend to be our estimate of the difference between the 'real' digital divide and the estimates that are currently in use. The country studies we have in mind will need to be undertaken by researchers with a deep understanding of the various mechanisms (formal and informal) through which the benefits of the Internet ultimately accrue to non-users of computers with Internet connectivity (not least because mechanisms that are dominant in one country will be of much less relevance in another).

Notes

1 See, for example, Keniston (2003).
2 This point is elaborated in James (2004).
3 As described in Girard (ed.), 2003.
4 These are well-described by among numerous others, Page and Crawley (2001).
5 Most typically, that is to say, in developed countries.
6 Even in developed countries, there are those who cannot afford computers with Internet connectivity.
7 Minges and Simkhada (2002) estimate that almost 80 per cent of Indian villages have access to a telephone.
8 As noted above.

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