Role of ICT in Social Development: A Critique

By

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Abstract:

The usage of information and communication technology (ICT) is increasingly being seen as a major tool for development. In a huge country like India, this has deeper significances as the ICT enabled services can be used as an alternative to the government services where the latter cannot reach directly to the citizens. However, taking ICT as a solution for various challenges in context to development has its own set of problematics. While India is increasingly appreciated globally for its magnificent growth in the IT sector, a striking majority of people are grossly under privileged without even basic access to modern technologies. Researches show we are a nation fraught with worst kind of digital divide. In such a scenario, it is imperative to weigh the feasibility of using ICT as a tool for sustainable development. This paper looks into these problems, seeking to present a critique of the ongoing projects and suggests an alternative.

Methodology:

The ideas are chiefly drawn from various secondary sources e.g. books, websites; and research papers available online.

Around the world there is a movement of spreading ICT to the remotest corner of humanity. The objective is to connect with the unconnected. India as a major emerging global power is also a part of this movement. The idea is need based application of ICT will empower rural people and make them consciously take part in the huge development process the nation is currently undergoing.

Upgrading sectors like health, education, agriculture and governance in rural India has become the focus of this development process with the initiation of various ICT based developments that started in late 90s. The central and the state governments, local, national, international NGOs and private agencies have come forward to give shape to various ICT projects to make the rural population a part of the developments. However, the success of such projects has been far from being achieved. While India is famous for its human IT resources, it faces one of the acutest digital divide in the world. Millions of rural people have never seen a computer in their lives. A big chunk of population is still illiterate and is evidently on the wrong side of the development.

But before we get into the details of the problems, let us understand what digital divide is. In brief, this means the gap between those who can effectively make use of digital technology and those who cannot. It broadly refers to the *haves* and the *have nots* in context to digital information[i]. The phrase *digital divide* was unknown until it was noted in 1996, in the United States of America[ii]. It was 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 soon the term became widely known. By 1999 the problem was so seriously felt that Kofi Annan specifically mentioned digital divide as a source of growing inequality in the world, in the Human Development Report (1999). He also dedicated the United Nations to bridging this divide.

We usually think that digital divide is a problem that can be simply catagorised through geography and economic conditions. Many are of the opinion that the Western and the rest of the world are digitally divided. Likewise, the rich and the poor, the urban and the rural population share a digital rift. While such theories are valid to an extent, they provide a "poor road map" [iii]to understand the problem. To begin with, there is no such bipolar division, as we discussed. Various degrees of access can be seen in the developed nations. There are various places in UK and America where people do not even understand the relevance of using a computer [iv]because they cannot find information important to them. Likewise, various degrees of access and usage in regard with ICT can be seen even in the same city. So, it's basically, a gradation based on different degrees of access to Information Technology and its successful usage. And over simplification of the problem in terms of geographical location, or socio-economic factors will not provide the full

picture. Also, there is a risk involved in making such bipolar division. Many would see it as undue marginalization of people. For example, we often think that ICT cannot be exploited by the common villagers. Such "stereotyping of disconnected minority could even serve to further social stratification" [v] by discouraging the employers or the content writers to reaching out to those people.

We attribute too much importance to the factor of physical access. Big IT companies have usually used this as a means of expanding their market. Their way of publicizing the entire scenario in the light of physical access to computers has contributed to forming a mass misconception that the problem of digital divide revolves around the area of physical access to computers. This takes the attention away from the complex socio economic aspects that are deeply implicated in this issue. The problem with this notion is this tends to see computers as a larger than life solution. ICT does not exist as an external solution that can be injected from the outside to bring about certain results. Rather, it is woven in a complex manner into social system and process. It may also imply that there is no other reliable source for gaining information and knowledge as this concept classifies the information *haves* and the *have nots* on the basis of ICT. It would minimize our scope of drawing knowledge from other resources. Our flaw in understanding the actual problem associated with these divide leads us to take initiatives that don't work; and do projects that have very limited impact in serving the rural and the underprivileged people, the target clientele in question here.

However, Apart from this generic problem of understanding the divide, there are some very crucial socio- economic and political issues at work. Problem in the bureaucratic level, problem related to successful implementation of the plans often create huge road blocks. Various socio- cultural and political issues play a huge role in deciding upon the success or failure of a project. Most of these projects are the "brainchild" of individuals. Hence, more than often the success of the project depends to a great extent over the enthusiasm and vision of the "leader". Here the leader could be an officer in the bureaucracy or a project leader in an NGO. Most of the times, the other workers do not take active interest and are not trained to carry out the project with all its vitality in the absence of the leader[vi]. Thus, many projects suffer when the officer is transferred or the project captain goes elsewhere to handle newer responsibilities.

Many projects suffer because the stakeholders fail to define the areas of responsibilities among themselves. Importantly, several projects run through joint partnerships or multiple stake holding. Since there is no set structure of who would take how much responsibility the project invariably suffers. And when the project fails to provide adequate support to the operators or users the parties involved blame each other. The Warana Village Project in Maharashtra, for example, suffered due to the stakeholders' collective failure in providing the village

operators adequate support in relation to training and providing proper hardware and software infrastructure. As a result, after the initial phase the project suffered to a great extent. The local people blamed the external stakeholders such as the National Informatics Center which provided 50 percent initial financing, computer and communication equipment, software, training, support; and the Directorate of Information Technology, Govt of Maharastra (GoM)— who provided 40 percent initial financing, equipment for village booths, software, administrative and logistical support. The villagers felt these stakeholders should have ensured technical and infrastructural support before their "exit"[vii].

Many researches including Professor Kenneth Kensinton of Massachusetts Institute of Technology opine that in the bureaucratic level too many discourses taken place about how to digitally connect the villages with the mainstream development but very few of these promises actually matirialise.

One of the biggest problems is lack of proper dissemination about the full range of services provided in the village information centers. Many villagers don't really know what facilities they can avail of. This lack of information leads to misconception. And this is what exactly has been witnessed in various projects. For example, in the state of Andhra Pradesh many users concluded that computer was meant exclusively for bill paying (APOnline) or accounting (Bellandur Gram Panchayat Computer System, in Bellandur, Karnataka). In some of the n-Logue Chiraag Kiosk sites (Tamilnadu, Maharashtra, Gujarat, Madhya Pradesh) the users thought the machines were toys. Similarly in Gyandoot Samiti project, in Dhar district, Madhya Pradesh, many were unaware of the e-governance services. At the same time the target group of users was not allowed to use the computers. Thus, it potentially distanced the users by denying them the scopes to experiment and acquire knowledge[viii].

The center operator needs to be selected with utmost care as they are the prime agents for revenue generation. They must have basic idea of navigating the internet and make maximum use of the available tools and services. Very importantly, they should be well versed in the services the center provides to the users. It is imperative that they have good communication and marketing skills. Because, they are the ones who are directly contacted by the grass root people for various ICT based dealings. It was seen in some of the n- Logue Chiraag Kiosks project sites and one Kuppam Community Information Center (CIC) that the sites with a non proactive operator always suffered while the others have been successful in making sizable positive impact[ix].

Several projects discriminate among the local population, in general unintentionally. Projects that aim at serving the farmers preclude the women and the people without land. The eChoupal and Warana initiatives portray this

limitation, for example. The e-chaupals are located in the private households. It was observed that in several e-chaupal centers in Madhya Pradesh low caste people were not allowed to enter the households[x]. In addition to this problem, the lack of woman kiosk or computer operators discourages women to use the applications. Such issues make the projects exclusive, further intensifying the socio- economical, cultural and digital divide. Though it is difficult to serve an entire population of a village, projects carried out by MS Swaminathan Research Foundation (MSSRF) have tried to bridge the divide in the best possible ways. Instead of targeting a particular section of villagers they aim at delivering a rounded up package; consisting of employment, enhancement to the existing rural trades like providing adequate information for farming, fishing etc; healthcare, education, gender empowerment [xi]and overall awareness about government and the world outside.

e- Governance is one of the most successful initiatives that have been taken so far by various advocacy groups and the state governments. The objective of the e-governance in rural areas is to make various economic, social, and fiscal services available to the disconnected villagers. Various documents like marriage certificates, birth and death certificates, paper work for pension plans, caste certificates etc and the tax payment, bill payment are some of the primary features of e – governance. In addition to this, it can work as a potent tool to implement the Right to Information act by providing people access to various governmental issues. However, this initiative faces various internal problems barring a few exceptions. In most of the cases though the government takes initiative, the programmes fail to perform as usually the local governments do not invest great deal of money into these projects. However, if it's a question of reputation or money as it happened with AP Online the government makes sure that the project runs and lives up to the expectations[xii].

According to researchers in the field, digitizing the governance would demand new technical training for the government officials. Once the governance is digitalized, many government officials and middlemen will have to make do without the bribes they get from the commoners[xiii]. Moreover, lots of inter and intra departmental political disagreements occur when a project is in its operational stage– all these are enough reasons to sabotage a project.

Often, what is committed by the government officials is not met with during the course of the project. Projects like n-Logue and Kuppam faced big troubles as the support they were promised they would get from the government offices was not delivered. [xiv]High ranked government officials said that they would digitized all the necessary contents needed to process papers like birth and death certificates, caste certificates, income certificates, and land records. But at the time of delivery

none of these promises were fulfilled.[xv] There were no electronic content available. So, both of these projects had to stop the e-governance facilities.

Apart from these implementation related problem there are some instances, when there is a question of the practicality of trying to have things done digitally. For example, if someone in the village has a complaint that needs to be paid attention; there is no reason to think having the process done digitally (ex: through email) would actually serve better to solve the problem than meeting the concerned person face to face[xvi]. Moreover, most of the times, the concerned person is often a representative from the village. Naturally, to a villager, it would look more practical to meet him/her in person and explaining things prior to the submission of the complaint in pen and paper.

The cost of deployment is not commensurate with the amount of revenue generated. The money spent on building the technology infrastructure is not redeemed by the incoming money. Despite claims of site managers, even the highly successful projects are not able to retrieve the primary cost of deployment. The extent of usage among the customers is simply not enough to make profit. The lack of a practical and financially viable model is a big problem the projects are faced with[xvii].

In most of the sites power shortage is a big problem. Often the power doesn't even stay for more than four hours a day. Back up systems such as solar power or inverter cannot be accounted for the supply of power required for an entire day. This problem is particularly acute in the eChaupal and Gyandoot projects in Madhya Pradesh. It was seen that in most cases the UPS systems were broken or last only for ten minutes[xviii], making the smooth operation impossible. Hardware failure is another major infrastructural problem the projects are confronted with. Specifically the projects in which second hand computers are used the hardware failure is one of the most prevalent problem. For example, the MSSRF operates through the donated second hand computers. The repair charge incurred is an additional cost that unnecessarily burdens the projects.

The objective of all these projects is to make the rural people directly involved in the process of development. For this, the rural people themselves will have to take part in the ICT run initiatives. But in most of the cases, the handing over of responsibilities has not taken place. Various reasons like flaw in the planning of a project or the inability of the villagers to pick up the responsibilities have barred the projects' envisioned advancement. As a result the aimed empowerment of the rural people has not taken place.

Table 2: Stages of Growth in Rural Capability Enhancement

	Urban-based provider's role	Shared roles	Transferred to rural provider	Rural provider's additional roles	Projects
Stage 1	Content, finance, input sourcing, technology, shop-front design and quality control	None	Shop-front capacity and sales	None	HP iCommunity eChoupal
Stage 2	Technology, input sourcing	Content, finance, and quality control	Shop-front design	None	APOnline Gyandoot MSSRF n-Logue Warana
Stage 3	Technology, hardware sourcing	Software sourcing, finance, quality control	Content	Add content from other rural providers	Boodikote
Stage 4	Backbone technology	Finance, quality control	All sourcing, access technology	Add content from other urban providers	
Stage 5	Competitor	None	Backbone technology, finance, quality control	Subcontract to rural providers in other locations	Bellandur

[*As mentioned in Rafiq Dossani & Roma Jhaveri, Enabling ICT for Rural India, Asia-Pacific Research Center Stanford University, Stanford, November 2005*]

So, there is still not enough proof that spending money on ICT infrastructure is more justified than spending money over providing basic needs such as water, food, medicine and education. None of these projects present any model that has become sustainable and self supportive[xix]. Though, this may be too early to conclude so, as any large scale initiative in a huge country like India is difficult to deliver to its fullest potential[xx]. Especially when it is targeted to the rural population the challenges are more than just infrastructural and socio political. Cultural barriers such low level of education, negative perception of machine, sometimes even fear towards it, play a big negative role. Many people are reluctant to use and experiment with computers as they feel the machine may crash down.

In such a scenario, making ICT a tool for development seems to be unrealistically ambitious. So, how viable this option actually is?

The beauty of ICT lies in its capability to provide unending supplies of information. Increased information gives people access to increased amount of resources and hence, empowering large number of people, who don't have access to both information and resources, otherwise. It can weave millions of physically unconnected people in a string by virtually connecting them. Hence, it has the potential to take a very fruitful role in making education, healthcare and governance available to the unconnected. So far, many initiatives have been taken and these have changed the lives of thousands of people. Let us discuss the successes achieved by the various projects where ICT has been used as a tool for development:

According to a report of World Bank[xxi], the computerized milk collection centers in Gujarat, is making the pro poor market development through ICT based calculation process. Previously the milkmen, of this locality would collect milk from faraway places, and wait for hours, in the dairy cooperatives, where they sold milk. All the calculations were done manually and they would be paid every ten days. The farmers complained that such long processes was non conducive for their business time and often result in malfeasance of calculation. But with the emergence of computerized calculation the process has become faster and fairer. The whole process has become transparent.

ICT can increase access to government services**.** Since January 2000 Gyandoot – a government–owned computer network – has been making availing of government services easy and less time consuming to the villagers of the under privileged drought – prone Dhar district of Madhya Pradesh[xxii]. They provide various government papers and local important information to the local people. Papers like Domicile Certificate (*mool niwasi*), Caste Certificate, Landholder's passbook of land rights and loans (*Bhoo adhikar evam rin pustika*), Rural Hindi e-mail, Public Grierana Redressal (Shikayat Nivaran), Forms of Various Government Schemes, Below Poverty Line Family List, Employment news, Rural matrimonial (Vivah Sambandh), Rural Market (Gaon ka Bazaar), Rural News Paper (Gram Samachar), Advisory module (Salahkar), E-education General Provident Fund; and Khasra Nakal Avedan[xxiii]. Apart from providing easy access to various types of documentations, it has revolutionized the attitude of the people concerned – that is enabling the villagers to avoid the common practice of bribing the officials[xxiv].

The kiosks in various projects like ITC e-chaupal, n-Logue etc has enabled thousands of small farmers to track the crop prices. As a result they are no longer gullible enough to be duped by the middlemen, or the big traders in the business centres or *mundis*. They can now negotiate crop prices in the wholesale market

more confidently. Thus, ICT is resulting in better trades for the grass root traders. Similar helping bodies have been formed in the other states. Organizations like STAR: (Simplified and Transparent Administration of Registration) Chennai SETU - Integrated Citizen Facilitation Centres of Maharashtra serve the same purpose.

Other organisations like FRIENDS (Fast, Reliable, Instant, Efficient Network for Disbursement of services)[xxv] in Kerala; and LOKMITRA - Govt. of Himachal Pradesh's e-Governance Initiative[xxvi] are readily providing services from government to the citizen and connectivity between the citizen and the government. Such initiatives are generally up grading the lives of the villagers. e-BillPost and e-Post Services of the Department of Posts are helping people both in rural urban and suburban areas[xxvii]. A great deal of effort is being directed in upgrading general standard of life both in rural, urban and semi urban areas. The fundamental aims are better connectivity, saving time, providing relevant information related to health, education, market economy etc. In short, these organizations are working as extensions of the government that cannot physically reach everyone for the vastness of the country. It is synonymous to expanding the country's democracy.

ICT can be used as an effective tool to expand microfinance [xxviii].
Swayam Krishi sangam[xxix], a microfinance institution in the Medak district of Andhra Pradesh has shown impressive result of usage of information technology in their transactions with the farmers of the villages. all these transaction happen through Smart cards. This organization is inspired by the group lending model developed by Bangladesh's Grameen Bank. Initially, the high cost of delivering services to its target clientele, was a major problem facing this organization. All cash transactios would occur at the village meeting where each case would be discussed and finally the decision will be taken. Once the decision was taken a great deal of time was spent on documentation, discussing loan terms and conditions, and counting money. But with the introduction of Smart card n this entire process things have become faster and more precise. Each smart card holds history of clients' credit. Thus, it lowers the cost of delivering services by reducing the errors and fraud, eliminating unnecessary paper work, and finally speeding up the procedures. Once SKS is in a position to implement the usage of Smart cards fully, its operational costs could be cut by nearly one fifth[xxx].

ICT can take a major role in improving health care delivery. Though, the implementation of ICT based tools and services in delivering healthcare have not been experimented on a wide scale, few initiatives have so far shown encouraging results. The midwives in Andhra Pradesh, now use the handheld computers which is giving them more time to serve the patients in the villages. They used to take care of about 5,000 people – typically across multiple villages and hamlets and

had to do a great deal of data entry and paperwork. The computers provided under InfoDev (a development body of the World Bank) - sponsored India Healthcare Delivery Project, is freeing them to devote more time to the patients. According to a report by word Bank[xxxi], it has saved them 40% of their service time. Likewise, in Sisu Samrakshak, a joint initiative by the government of Andhra Pradesh and UNICEF that is based both in Andhra Pradesh and Karnataka, a pilot project is running to make use of ICT for integrated information for Early Childhood Development. Sisu Samrakshak has been able to make positive changes by providing access to rapid, precise and up-to-date information on issues of child health, maternal care, HIV/AIDS, water supply and sanitation. Moreover, they provide information and vocational training support intermediaries such as Anganwadis, Auxiliary Nursing Maids (ANMs), teachers and other workers in health care.

Broadly speaking, ICT can address gender disparity by "challenging existing social norms, shifts in power relations, an increase in perceived opportunity, and increase in 'confidence levels'"[xxxii] of the women members as a result of integration of ICTs with their professional goals. Significant changes have been observed in a small village called Baduria in West Bengal, since an NGO called Change Initiatives began empowering the women here through various ICT enabled services conceived in the Nabanna Information Network project. The fundamental concept was to make the local women confident by giving them scope to indulge in creative and interactive activities and helping them learn basic computing skills. They were made to take part in brush painting, learning to use Microsoft word, writing in Bengali by using I-Leap etc. But, above all, such activities gave them a chance to interact with other rural women in a "non partisan way"[xxxiii]. This may not be a big change. But for the marginalized women this exchange of ideas, scope of unleashing their creativity can make a difference and help creating a mass awareness about the world outside and the possibilities within. Organisations like Sewa in Gujarat; Foundation of Occupational Development in the predominantly Muslim ghetto in Seelampur-Zaffrabad located in the fringes of North-East Delhi is helping under privileged women gain economic self sufficiency.

Information technology can play a big role in spreading mass awareness about AIDS and sex education. Modern age youths embrace the use of ICT for entertainment, learning and communication. Even the rural boys and girls can be benefited by it if given access and proper orientation to the computers and internet. The advantage of this media is, this is highly personalized and interactive; qualities which enable people to gain knowledge without hesitation. In recent times, several reports have provided highlights on the use of ICT to combat HIV/AIDS. In November 2001, a consultant for the International Development

Research Council[xxxiv] produced a comprehensive report showcasing several pilot project activities in this area.

Looking at these initiatives, it is clear that ICT does make a difference in people's lives. However, achieving this development or change is not easy. There are matters that need to be addressed before we can even think of using ICT as a tool for development for the mass. So far, we have seen both what is working and what is not. Keeping in mind the negative aspects, there is a need that we focus on how best these challenges could be handled. Providing computers alone would not solve the problem.

Primarily we need to have a clear understanding of digital divide, so far, the major road block in harnessing ICT for sustainable grass root development. This is not a problem that emerged suddenly. The seed of the divide was embedded in our complex socio economic structure. Since lack of education, different socio cultural orientation, gender disparity are one of the major reasons behind this divide, the process of bridging the divide has to go hand in hand with providing the basic developmental services like education, employment, and the initiatives to include more people in the development. The goal of using ICT with marginalized community is not to overcome a technical divide but rather to further a process of social inclusion[xxxv]. And to achieve this, it is important to "focus on the transformation, not the technology" (Jarobe).

Sharp focus has to be given to factors like content, language, intention of the policy makers, education, literacy and community or social resources.

Applications developed by or in collaboration with local staff are more likely to suit local conditions and to be sustainable. Out side control and top – down approaches, by contrast, often waste resources. Rajasthan's state – sponsored e-governance program has failed even though the software was easy to use and delivered in Hindi – because centralized planning did not take account of local conditions[xxxvi]. In addition, content provided through information and communications technology should not be limited to knowledge from outside sources, but extended to draw on knowledge held by underprivileged people. The InfoDev – sponsored Honey Bee Network, based in Gujarat, provides a database of solutions to local agricultural problems- an excellent example of gathering and disseminating poor people's knowledge.

Applications must be available in local languages to be relevant for poor people. The contents should be visually oriented and use voice interfaces to the possible extent. Illiteracy and knowledge of only the native languages are big hinderances to people's use of information and communications technology[xxxvii]. For example, the handheld computers used in the India Healthcare Delivery Project use software

designed keeping in mind the literacy levels of health care workers. Image enabled content is required for the less educated or illiterate people.

Since e-governance is the most successful ICT enabled initiative to include the under privileged into the process of development some significant alternatives may be suggested to make such projects successful. To begin with, the projects may be run by the localized officials. It has been seen; the projects run better if the local government officials, the panchayats, and the local people are involved. The reason is the operators are more accountable, as the villagers know them personally and can reach them. On the contrary, the government officers operating from their state or divisional headquarters are naturally distant from the villagers and may have gaps in the interaction with the people served[xxxviii].

e-governance should be spread in the block and the district level as well[xxxix]. All the government departments work in an interconnected way for various services. The villages need required support in terms of system, content, software etc. from the district and the block levels. Hence, initiating e-governance only in the village level will not be of much help and thrust should be given to begin e-governance also in the village and district levels.

There should be a clear and well defined role for the government and the private partners who hold stake in the project. It should be understood by both parties; who looks after what. For example, tasks that are routine and standardized and require no decision making, on the part of a government official can be outsourced to the private partners[xl]. Request for the birth certificates will fall into this category. However, digitization of such contents is one primary requirement.

There is another type of documentation that needs discretionary decision making by government officials. Old age pension claims fall into this category[xli]. Many steps like digitizing content, system maintenance, analyzing the claim against benchmarks, recommending the claim for approval or rejection to the appropriate district official and so on, need to be taken prior to zeroing in on a decision. Private sectors can always take part in this primary information gathering process, but the ultimate decision is made by a government official. And both the parties involved need to be aware of their scope of operation.

However, implementation of such ideas is easier said than done. Most of the time, allocation of responsibilities remains a policy challenge to the parties involved.

Training is another important aspect of successful information and communications technology projects. As learning is more effective through practice; innovative and interactive training is more successful. India's Self - Employed Women's Association, an Ahmedabad based NGO trains poor women

to use video cameras and audio – visual equipments to make educational documentaries[xlii]. These women now form a team who produce videos as a tool for learning, education, development, and policy action[xliii]. It is a rounded up educational process. The women learn in an innovative way, they make videos that can further educate more people, in the process of making the videos they add up to their knowledge. Training can also reduce the fear of machines a lot of users face while using machines. Proper training will also include making people aware of what is useful to them and what is not. Without proper orientation, people may actually spend all their time and money over services (such as various entertainment websites); they cannot be benefited with. While the importance of entertainment cannot be looked down upon, it has to be noted that the primary objective of all the ICT enabled projects are to empower people financially, socially and culturally- to make them consciously take part in development.

It is also important to raise awareness about the use of information and communications technology. That ICT can actually play a relevant role even in the life of a farmer, a fisherman; a small trader is a big step towards social inclusion of the unconnected people. That is why taking the so called elitist garb off the ICT is so important. This can be done by providing the target users with proper content and useful information. Weather report, news, various educational entertainment programmes can serve this purpose well. According to a report by Marwah, in Pigato, 2001, contents which are not directly linked with the development goals– such as news, matrimonial ads, and entertainment information – can increase the use of internet kiosks. So, whatever, ICT enabled services are provided the basic focus needs to be directed to usability.

It is clear that implementation of ICT to bring about possible change is gaining stronger ground. But even if we put aside the ambitious dreams in regard with the usage of ICT for sustainable development, it can be safely postulated that implementation of ICT will give us a potent network to carry out any long term activity in a more systematic manner, than now. That is why ICT is the tool for the future. Negating it would be turning our backs to the reality. However, it should be kept in mind that this is a tool; not the author. The chief responsibility of how a project works has to be shouldered by the ones who make decisions. So, factors like how we use it and for what objective - are very important. The stake holders need to be careful as there is immense scope of experimentation and research. Rigorous monitoring and evaluation are customary to be sure if the gains out of the ICT projects are worth the projects' costs – especially when they are aimed at social inclusion of the underprivileged citizens.

[i] http://www.edutopia.org/php/article.php?id=Art_420&key=188 as on 20.2.07

[ii] KENNETH KENISTON, Grassroots ICT Projects in India: Some Preliminary Hypotheses, ASCI JOURNAL OF MANAGEMENT 31(1&2), 2002

[iii] Mark Warschauer,*Technology and Social Inclusion: Rethinking the Digital Divide*, MIT Press, January 1903

[iv] James W. McConnaughey, Senior Economist, Office of Policy Analysis and Development (OPAD). Wendy Lader, Senior Policy Advisor Office of the Assistant Secretary. "Falling through the Net ii: New Data on the Digital Divide", National Telecommunications and Information Administration, US. Taken from *http://www.ntia.doc.gov/ntiahome/net2/falling.html* as on *14.2.08.*

The report gives some precise census of the digital divide. An excerpt of the report has been included here:

"Although PC ownership has grown by 10-13 percentage points in all areas since 1994, central cities again lag behind the national average for PC ownership and on-line access (32.8%, 17.3%), as do rural areas (34.9%, 14.8%) (Charts 10). Urban areas are slightly higher than the average (37.2%, 19.9%). The West's urban areas (43.9%, 23.14%) rank highest in PC and on-line access, while the Northeast's central cities have the lowest penetration rates (24.7%, 12.6%) (Charts 19, 24). After accounting for income, there is not a significant difference between rural, urban, and central city areas for computer penetration (Chart 11), although rural areas still have a significantly lower rate for on-line access (Chart 20)".

"UK digital divide to deepen? One- third of public has never been online…" , *http://management.silicon.com/itdirector/0,39024673,39166402,00.htm*, By Gemma Simpson, Published: Monday 19 March 2007 as on 14. 2. 08.

Also John Fisher, Chief Executive, Citizens Online - a UK based digital inclusion charity told silicon.com: "One-third - 16 million - of individuals in the UK have not been online and they don't understand how to do it.", cited in

However according to a reaserch by Ofcom http://www.ofcom.org.uk/media/news/2007/05/nr_20070524 this divide is diminishing. "Digital divide across the UK is narrowing"24|05|07 as on 14.2.08

[v] ibid

[vi] Rafiq Dossani & Roma Jhaveri, Enabling ICT for Rural India, Asia-Pacific Research Center Stanford University, Stanford, November 2005

[vii] ibid

[viii] ibid

[ix] ibid

[x] Ibid.

[xi] http://www.mssrf.org/index.htm as on 12.2.08

[xii] Op.cit. , Rafiq Dossani & Roma Jhaveri, Enabling ICT for Rural India, Asia-Pacific Research Center Stanford University, Stanford, November 2005

[xiii] KENNETH KENISTON, Grassroots ICT Projects in India: Some Preliminary Hypotheses, ASCI JOURNAL OF MANAGEMENT 31(1&2), 2002

[xiv] Op.cit. , Rafiq Dossani & Roma Jhaveri, Enabling ICT for Rural India, Asia-Pacific Research Center Stanford University, Stanford, November 2005
[xv] Ibid.
[xvi] Ibid.
[xvii] Ibid. Kenneth Kensinton, Grassroots ICT Projects in India: Some Preliminary Hypotheses, ASCI JOURNAL OF MANAGEMENT 31(1&2), 2002. Jeremy Grace, Charles Kenny, Christine Zhen-Wei Qiang, with Jia Liu, Taylor Reynolds, Information and Communication Technologies and Broad-Based Development, A Partial Review of the Evidence, The International Bank for Reconstruction and Development, World Bank Working paper no. 12, Washington, D.C. 20433, U.S.A., December 2003

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[xix] Ibid.
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