# Epitaph of Digital Distribution : A Restorative Conundrum

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**Abstract**

*Advancement in the information and communication technology (ICT) has taken us in to the 'information age' and has given rise to 'digital economy' and form a part of the infrastructure sector of the digital economy. The two most important tools of ICT responsible for these unprecedented changes are 'computers' and 'internet'. We can very well imagine the magnitude of development and success if these are made available to common people. But making these tools available to common people is a Herculean task and this has given rise to the issue of 'digital–divide', i.e. "disparities/differences based on economic status, geographic location, between those who 'have' or 'do not have' access to information, internet and other information and communication technological services and those who 'have' or 'do not have' the skills, knowledge and abilities to use information, internet and other information and communication technologies". Hence this study/research is an another step ahead to find out real nature and the extent of digital divide existing in India and to suggest ways and means to bridge the gap between those who 'have' and 'have not' access to information and communication tools and services.*

**Keywords:** Digital divide, ICT, PC Penetration, Digitally literate, Digitally illiterate.

## 1. Introduction

The advent of digital intelligence was largely contrived as a tool of social emancipation before a decade. It was considered a harbinger of equity in sharing the fruits of the new revolution which was unfolding. But its evolution was plagued with the age-old entropy, which was loaded in favor of developed world with lopsided distribution within the developing world. Measurement of human developmental index, UN, World Bank, UNESCO etc were concern with its impact and ramifications as the die was cost in favor of developed world. The matter was visualized as an utmost earnestness and it was evident that the process if left uncorrected would create more uneven distribution of wealth between the digitally literate and digitally deprived societies.

 

A new jargon of vocabulary was introduced viz. digitally illiterate and oriental education may have the diminishing role with societal ramifications. Information was considered the most invigorating mantra for wealth generation and at the same time focus shifted to intellectual property right. The poorer countries would lag farther behind and would lack to reap the benefits of internet and E-commerce. Many developing Nations are now swelling ahead with double digit economic growth although it has some cultural ramification including spillage of cross cultural conglomerate. All over the globe, the pinprick light of the networked society is glowing brighter and growing at a ferocious pace. In a special TIME report entitled "Welcome to the Wired World", Joshua Cooper Ramo stated that at the start of the 1990s there were around one million people connected-or more often trying to connect across copper cables – to computer networks choked with e-mail and scientific – interchange. However, with advancing technology it has become much easier to join the Internet resulting in a spectral and quantum jump in the population of network users as well as in the value derived by them. It has taken the shape of a tornado and poised to whirl around with unprecedented speed in productivity with quality and wealth generation.

## 2. Digital Divide- A Bird's Eye View

There are some fundamental perspectives to illustrate on what the digital divide is and how to solve and inculcate it, which focus on various elements of ICTs and its usage with fruitful outcome.

(a) Digital impoverishment is born of a vicious circle of denial of PC-hardware, computer education, inadequacy in training, inaccessibility of mechanical net-connectivity and an anemic approach to updated.

What may be most engaging is its acceptance, as a very essential need, perception, tool and its overall ramification. It may be compared with the industrial renunciations, which began in 16$^{th}$-17$^{th}$ century and saw its dominance over more than 400-500 years.

(b) The evolutionary process may herald in a self correcting mechanism by utilizing the "VOLUME" if the initiation of the process of IT spread is well planned. What

is most crucial is sprouting, it's self-harmonizing growth patter and its vast potential based on speed and merit to engulf the larger volume. It may become a tornado sucking more and more to engulf wider horizons.

(c) The governmental planning process with bewildering in budgetary constraint and degenerative data approach in arranging the basic infrastructure. The Proactive approach with lusciousness will do a lot good in its smooth social absorption.

(d) Even digital distribution is an opportunity for wider social and national ramifications. It has the potential to grown in geometric proportion and harness wealth accordingly. The governmental role is to harness the positivity of the technology with global reach and flow of information is nothing but flow of wealth. Thus an unhindered enabling of every facet is the basis of its. All the basic modalities thus be made available.

It should not be contrived that once missed, missed for ever yet it would require continued striving to catch –up.

(e) The heterogeneity in the IT literacy is directly linked with poverty, lack of basic infrastructure; developmental index hence is the part of the vicious circle which is a common denominator in developing world. It enabling process may have savoir-faire to satiate the wider needs. More so it has to be perceived as solution provider by the society at large hence transformation at conceptual or embryonic level of education may have to be pushed into.

## 3. Some Evidence About Digital Divide

There is no single, simple explanation for different digital divides. In trying to analyze the causes, some of it may be illustrated in the realm of followings.

The divide seems to be all pervasive and the very first visible separation exists within every sphere.

The wealthy societies are more connected through the net, computer and online access to information. Even the disparity in income and education exits in most developed country viz US. It is very visible in at the social segmentations and is dramatically different between those who own computers and those who do not, as between those who can access the Internet and those who cannot. This may be very abstract conclusion and there may be several supplementary factors to it yet the fact is the availability and utility that has a bearing on the well being. The Tele-density and internet access in USA was found to have direct linkage with income. The top 10% segment of the society (house hold income above $75000) has 20 times more reach than the poorer. The PC

ownership in economically sustainable household is several fold larger (9-10 fold) which proves the direct connectedness with economic vibrancy. The higher echelon of the US society with university education have stratification in PC and net access (computer ownership are 69% in higher educated group versus 8% in less educated and the Internet access percentages had similar trends ie. 49% versus 3% in ) . This trend all pervasive in the developed world viz, western Europe and Australia. Thus the empowerment and availability of ICTs have the credible and multiplier role and direct linkage with economic prosperity.

A second digital divide, less often noted, is linguistic and cultural. In many nations this divide separates those who speak English or another West European language from those who do not. But even in the United States, where English is common dialect (above 95%), the IT access has inhomogeneous distribution in various ethnic and cultural groups. well, A survey conducted during the fledging state of IT in the year 1998 of amalgamations of PC and net in US revealed that 55% Asian America had access to it where as 52% White American and 25% of Hispanic group only had the access to PC. The accessibility and usage of NET was more heterogeneously distributed in different groups. It was obvious that the variance in access is an outcome of income disparity. It was also visible by the survey that white American and Black American have differences in the ownership of PC and access to Net. Thus, cultural barrier continue to hold a sway yet it has sublimed in many other areas of human development. Besides the economic and cultural, educational effect, the most profound effect on the spread of NET worthiness of the nation as whole is based on governmental approach. The UN has expressed its concern of the lack and widening gap of It application in Southern hemisphere and hence the less developed HDI. The third digital divide follows inevitably from the first two — it is the growing digital gap between the rich and the poor nations. The United Nations Report on Human Development devotes much of its concern to the widening gap between the information-rich nations of the North and the information-poor nations of the South. At one end of the pole lies the United States and the 'Nordic' countries like Sweden, Germany, Great Britain, Finland, and Iceland, with over 90% of household telephone connectivity, 50% computer saturation level and 50% (average) home based internet connectivity. At the other end of the pole lies most of Africa, most of South America, South Asia, China, Indonesia, and so on — the 80% of the world

where telephone connectivity is a tiny fraction of the above 3% or less (less than 30 million/1 billion in India), home computer ownership is scanty 1 - 2% and Internet connectivity less than half of that. The reason why the digital divide between nations is increasing seems very clear. ICTs are the enabler of wealth and prosperity for the developed Nations. This is creating a more wide distinction between the Rich and the poorer. (Extracted from http://www.mit.edu/people/kken/papers/intro_sage.htm.)

In India and America besides the above three-paradigm shift we can add a fourth dimension of growth in the selected segment viz. those who have high degree of IT knowledge and application. This is true both for India and America. In America a similar pattern is noticeable in Silicon Valley, Austin TX, North Carolina, and other zones devoted in "high-tech" areas. It was noticed that in the era of high evolution and NET off take about 64 millionaires were produced each day from nowhere. It is a revealing fact that the front line computer personnel and those engaged in state of the art development have very high quality life and affluence. This group is the richest and has a distinction and is the leading lights of new US over the older elite class. A similar culture may be budding with a idiosyncratic Indian flavor in cities like Bangalore, Chennai, Hyderabad, NOIDA, etc. A host of factors and developmental orientations based on speed will favor the cyber savvy to accumulate wealth, knowledge and global reach.

## 4. Some Latest Trends

A survey in 2004 revealed that in the G8 countries one in every two individual have the access (Canada, France, Germany, Italy, Japan, Russia, the UK and the US) and they have the maximum functions based on internet applications. The figure for African countries is very disturbing ( 3 in 100 ) IT IS ALSO THOUGHT PROVOKING THAT the users in G8 are much more than the remaining users world ( 429 million Internet users in G8, 444 million Internet users in non-G8).It is estimated that top 20 countries in terms of Internet bandwidth are home to roughly 80% of all Internet users worldwide. Discrepancies in international Internet bandwidth - the critical infrastructure that dictates the speed at which websites in other countries can be accessed - are nothing short of astounding. Tiny Denmark has more than twice the international Internet bandwidth that the whole of Latin American and the Caribbean combined. The cost of international bandwidth is very high which is a major constraint for developing nations as they have

to pay full cost of a link to a developed nation for a hub. (extracted from http:// www.itu.int/wsis/tunis/newsroom/stats).

**Table 1: World Internet Usage And Population Statistics**

| World Regions | Population (2006 Est.) | Populati on | Internet Usage, | % Populatio | Usag e | Usage Growt |
|---|---|---|---|---|---|---|
| Africa | 915,210,928 | 14.1 % | 32,765,700 | 3.6 % | 3.0 % | 625.8 % |
| Asia | 3,667,774,0 66 | 56.4 % | 394,872,213 | 10.8 % | 36.4 % | 245.5 % |
| Europe | 807,289,020 | 12.4 % | 308,712,903 | 38.2 % | 28.4 % | 193.7 % |
| Middle East | 190,084,161 | 2.9 % | 19,028,400 | 10.0 % | 1.8 % | 479.3 % |
| North America | 331,473,276 | 5.1 % | 229,138,706 | 69.1 % | 21.1 % | 112.0 % |
| Latin America | 553,908,632 | 8.5 % | 83,368,209 | 15.1 % | 7.7 % | 361.4 % |
| Oceania / | 33,956,977 | 0.5 % | 18,364,772 | 54.1 % | 1.7 % | 141.0 % |
| **World Total** | 6,499,697,0 60 | 100.0 % | 1,086,250,9 03 | 16.7 % | 100.0 % | 200.9 % |

**Table 2: Telecenter Project in India**

| Name | #Kiosks | Agency | Years | Activity |
|---|---|---|---|---|
| Bhoomi | 30 | GOK | 2 | Land Title |
| e- Chaupal | 3500 (5) | ITC | 2 | Procurement |
| Warna | 72 (54) | NIC | 3 | Cane Factory |
| Akshaya | 617 | Kerala | 1 | e-Literacy |
| Melur,Nellikup pam,Baramati | 200 | n-Logue | 1 | Internet kiosks |
| TaraHaat | 18 | Dev. Alt. | 1 | e-training market info |
| Drishtee | 90-5 states | Digital Partners | 1 | Mandi prices Land Titles |
| Milk Coops | 5000 | NDDB | 5 | Milk Collection |
| CIC (NE) | 30 | NIC, MIT | 1-2 | Internet access |

## 5. Learning from Projects

1) Pilot studies by NGO's, Governmental bodies, private sector, and individual approach have to be pooled.

2) More than 10000 rural pockets and village have been provided with PC and have the potential for its multiple applications.

3) The evaluation has been many but fructification is very little.

4) The pilot project may not be true representative as they are designed with misplaced priorities. The initiation, continuance and sustainment should be the benchmark.

5) Willingness in rural population to buy it as an enrichment tool.

6) The need of the hour is to encompass the wider ramification for its acceptability viz. a system to meet all the need under one window which could conceive, tailor-made, and make it function requires.

## 6. From divide to Opportunity

The digital gap does exist and causative factors may be multi factorial and contributory to one another like a vicious circle are the daunting issues we are facing today. Its vibrancy could not be attained without penetration to under privileged and rural population. To the need however we can not just stop by identifying the problem, we need to offer solutions. Naturally, the question posed is how to take the technology to the door step of the masses?

It became thus, imperative to deduce the complexity of the issue and its exact nature, quantum and types of digital divide so that solution could emerge in a comprehensive mould. We decided to adopt a more practical and efficient way so as to come up with the most accurate and appropriate reason and solution of the same. Hence a survey was carried out to evaluate the penetration of ICT in the various sectors of the society. The survey proved to be the backbone of the entire work. It was designed to serve as the main tool for the study of the Digital divide among the society particularly in densely populated and backward region of Eastern UP, India with perpetual resource crunch. It figured out the level of penetration of ICT, awareness and information level in the society.

## The Evaluations made

### Objective

a) To assess the level of awareness and information in the society especially in the rural population.

b) To assess the level of penetration of ICT and its tools in the society especially the aware and the in formed class comprising of students and teachers.

### Methodology

**1)** The survey conducted was a probability sample.

**2)** The survey is designed primarily to produce national and state estimates of existing digital divide characteristics of the urban and the rural population of the section of society which is literate, informed, aware and the (misinformed illiterate class) less privileged illiterate class.

**3)** On Demographic level the sample class consists of independent samples in various districts, blocks and small villages. In other words, each sample space is specifically tailored to the awareness, connectivity and availability of ICT that prevail in that sample unit.

**4)** To make the sample true representative of the section chosen the Eastern UP has been further subdivided into blocks and villages to carry out a focused and detailed study of the prevailing conditions of ICT, its application and its usage there.

**5)** In urban areas the survey covered that section of the society which is aware of the existing digital divide and who use ICT as a medium to improve their QOL (Quality of Life). This consists of the student community, professors, head of institutions and others.

**6)** In rural areas the survey covered that section of the population who are poorly informed and poorly equipped with ICT and its instruments that do not use ICT to improve upon their QOL, sometimes due to ignorance, poverty and sometimes due to poor infrastructure and poor connectivity. This includes the section of society which is primitive in leaving and is actually unaware of the gizmo.

**7)** An extremely important component of the survey has been the Questionnaire, the survey instrument. Although the concepts and definitions of both ICT penetration

and awareness collected in the survey have, with a few exceptions, remained relatively constant in cities and among the so called aware class, the survey instrument was radically redesigned for the rural areas. This was done to meet the standards and level of information and availability of ICT in rural areas. The question designed was in tune, conformity and consonance of the assessment of rural needs.

Though separate Questionnaire has been used for Under Graduates, Post graduates, engineering students, HOD's and Head of institutions. Overall they represent the "aware and informed class". Thus it was tailor made to suit the needs and scope of each class.

The Questionnaire was designed in 5 different sets so as to target 5 different types of sample units. These sample units were:

**1)** Students (Graduates of different streams)

**2)** Students (Post graduates of different stream: engineering, science, arts etc.)

**3)** Professors, Faculty members of Degree / Post-Graduate Colleges / Universities /Engineering Institutions.

**4)** Head of Institutions / Head of departments / Principals / Directors / Vice-Chancellors.

**5)** Rural population (All of them being residents of villages of Eastern UP).

**Findings**

**Data For Faculty Members:**

Following is the data obtained for the category of faculty member, which contains the information about the faculty members of institutions or an educational organization located in the rural areas.

**Table : 3**

| No. | Category | Percent |
|---|---|---|
| 1 | 0-15 | 00.00 |
| 2 | 16-30 | 00.00 |
| 3 | 31-45 | 30.00 |
| 4 | 46-60 | 35.00 |
| 5 | 61-75 | 35.00 |

The SPSS table as shown above has two fields' category and percent. While category gives the marks range, percent gives the percent of heads falling in that category out of the total surveyed in FACULTY type.

Following could be concluded from the data tabulated above.

**1)** No member falls in the lower categories (0-15) and (16-30) indicating that some basic awareness of ICT and its penetration in the faculty members.

**2)** Distribution of similar equi- percent in the rest categories indicates that equal numbers of heads are present in each category. i.e. some are average, some are good while others are excellent.

**Data For Under-Graduate Student**

Following is the data assimilated for the undergraduate students from the survey sheets from educational institutes located in rural areas.

**Table : 4**

| No. | Category | Percent |
|---|---|---|
| 1 | 31-40 | 4.28 |
| 2 | 41-55 | 28.57 |
| 3 | 56-65 | 35.71 |
| 4 | 66-75 | 31.43 |

In the case of Undergraduates following could be inferred:

**1)** Very few students in the lowest category.

**2)** Almost similar number in the (41-55) and (66-75) categories.

**3)** The highest number in the good category i.e. (>55-65) category.

This indicates a poor response from a community which is known for its dynamism and learning power as the majority of them don't fall in the highest mark category. This is

the group which is supposed to rekindle to aspiration of new generation and penetration would be largely through them.

**Data For Post-Graduate Student**

The data tabulated below is about the postgraduate students from rural areas.

**Table : 5**

| No. | Category | Percent |
|---|---|---|
| 1 | 39-52 | 14.03 |
| 2 | 53-66 | 38.59 |
| 3 | 67-71 | 19.29 |
| 4 | 72-95 | 28.07 |

In the case of Postgraduates following conclusion could be drawn:

**1)** The data is widely scattered and very distributed in a random fashion.

**2)** The data indicates that the majority of them fall in the category which is in fact considered as an average category. As the study was of post graduate students such statistics only indicate the poor penetration of ICT and connectivity.

**3)** The 2nd major group falls in the category (72-95) yet this may not be considered satisfactory as rest 71.93 (14.03+38.59+19.29) could not make it to top category. This is not a good sign from the post graduate students and may be the tripping point requiring radical solution.

**Data for HoDs and Head of Institution**

The study here focused the role of institutions in spreading ICT awareness and the infrastructure that they offer towards penetration of ICT in the society.

**Table: 6**

| No. | Category | Percent |
|---|---|---|
| 1 | 25-40 | 14.28 |
| 2 | 41-55 | 28.57 |
| 3 | 56-70 | 28.57 |
| 4 | 71-85 | 28.57 |

This data enable the following conclusions:

**1)** Very few institutions have high quality infrastructure and gadgets towards ICT education and awareness. This can be attributed to the inability of medium self funded private institutes to procure computers and other related infrastructures.

**2)** Though institutions are not offering high quality facilities yet they are providing some basic infrastructure, which may not be satisfactory. The poor performers have a good percent i.e. 28.57+28.57+14.28= 71.42

### Data For Rural Areas

The data collected is for all those who are illiterates and are put in this category.

**Table 7**

| No. | Category | Percent |
|---|---|---|
| 1 | 15-26 | 9.52 |
| 2 | 27-38 | 16.19 |
| 3 | 39-50 | 18.09 |
| 4 | 51-62 | 28.57 |
| 5 | 62-75 | 27.61 |

The following conclusions were drawn on the basis of the above:

Though the performance was satisfactory yet a close look at the questions and scores revealed that the awareness may not be strictly said to be in terms of ICT and IT. The good performance slowly revolves around the awareness in terms of news and entertainment. Thus ICT awareness suffers in this category too. Also the sections (15-26) and (27-38) are really poor in every aspect.

### Conclusion

This study propounds that IT has not only inculcated conceptual changes in every sphere of human endeavor in less than one decade but has produced a paradigm shift in every facet of our activity with unprecedented speed. The IT invasion in the last one

decade has been phenomenal and has touched the thought process and living pattern both in urban and remote rural settings. The intensity of penetration has qualitative impact on the productivity, wealth generation, trickle of accurate information, and harmonization in approach and synergy in developmental approach with integrated modules, which were unthinkable before couple of years back. The embryonic phase may be over yet that it continued to be in fledging stage in rural setting, as a close glancing of the data would reveal. The platform for wider societal ramifications is ready for launch, which would result into total annihilation and redundancy of the old age practices of education, governance, administration and research approaches.

The present day distinction in terms of the rich and the poor is likely to be replaced by the new distinctions such as velocity with acceleration in IT, or movement with inertia in IT. This would also challenge the practices of definition of growing and static; connected and unconnected; accurate & reliable and erroneous & unreliable as the evolution in IT would be four dimensional and segment would acquire the cognitive ability to invigorate a development which would usher in an era of space and time demanding new definitions.

The IT revolution has provided enormous opportunities for India to carve out a special space in the 21st Century on the strength of moderate IT savvy work force as indicated in the survey. Our success story would have been entirely different in terms of GDP and per capita income had there

been mechanism to realize its multiplier effect by tapping the vast potential at the massive scale which could be assimilated by reaching the wider segment of population. The data collected in the study is a pointer towards the need to pool all the resources at the level of government, enterprises, individual, NGO and by all other means to make a revolution at the crack of dawn so that we do not fall victim to the old edges of " once missed, missed for ever". The scope of activity would subject each and every one of us to a massive pressure to effect changes that are an inevitable outcome of the challenges of competition posed by multiple factors such as regional, global, rural vs. urban, economical and infrastructure. Our economy continued to be based on agricultural in reality, however, the support and proportion of input from the industrial and the high-tech information arena is ever growing. These impediments need to address quickly with IT intervention.

Information and communication technology, it is an enabler to earn for poor but not the mother goddess to feed. The basic economics star tilting in the favour of those who has

approached this road and the offer are more jobs, better jobs, highly paid jobs, with spiraling effect. It could be of immense help in health, transport, banking and all other social sectors. It is a tool which makes the obscure governmental functions transparent and within the reach of a common man which was considers a taboo heather too.

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