#### TRANSFORMING LIVES: THE INTERNET WAY

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### **Summary**

For centuries, man has migrated from far-flung villages to towns, to centres of business and trade, centres of governance, education, and employment. This has led to two undesirable consequences:

- the non-development of villages, and
- the straining of infrastructure and resources in the urban centres.

This paper makes the following arguments to reverse this migration:

- 1. The Internet and other enabling technologies are available today and have shown superlative results in communities where they have been utilized.
- 2. This can be a viable economic model and not just used as a tool for social development.
- 3. Rolling out these initiatives on a larger scale can transform the lives of populations immeasurably, stem migration, and develop local economies.

These new technologies can influence the way of life only if :

- They are self-perpetuating and entrepreneurial
- Technology is an aid to day-to-day life, whether for earning a livelihood or for amusement
- People are empowered to develop their own applications through access to technology, and knowledge

It shall be explained, with numerous examples, how the Information economy can be implemented to bring about change in the non-metropolitan/non-urban areas. It is a cost-effective method to jump from the 19<sup>th</sup> century to  $21^{st}$  century without necessarily traversing the path of Agriculture  $\rightarrow$  Industrial $\rightarrow$ Service  $\rightarrow$ Information economies. Diverse social and infrastructural needs can thus be developed simultaneously to ensure the growth of a nation.

## <u>Context</u>

Migration is as old as man himself. It is an essential process for the progress of mankind. Only through migration have we colonized other parts of the globe, and hopefully will colonize space one-day, to accommodate the needs of a teeming population.

Man has migrated for various reasons, but the most compelling and widespread motive has been economic. Several million men leave their families behind in villages, hamlets, and towns in search of better economic prospects in cities/other countries. Only a fraction of them ever manages to move their families with them. The sense of loss for most people is very keen and does not offset the economic benefits. The quality of life deteriorates with no support system and community being part of their life.

### Reason for Backwardness - INFORMATION POVERTY

2.1 The single biggest cause of poverty globally is 'Information Poverty'. This could be a direct result of lack of information on market prices, weather forecasts, health news, employment opportunities, government information. Accurate news is needed to combat misinformation. The government is a prime example - the amount of information passed on by them to the citizens is enormous, but there is usually only a one-way access to it. Clarifying some feature of the rules or putting your point across is amazingly tough in most

nations. Usually the rich strata of society has access to government officials, favors and handouts and are more effective at using these for their own needs.

2.2 Lack of accurate information on the status of projects or on any part of functioning of local governments is never assessable completely by state/central governments as there rarely is two-way communication.(Fear of reprisals or sheer inaccessibility could be two major reasons). This itself could lead to inappropriate plans for the community.

2.3 Superstitions can be perpetuated due to lack of information. The global world is fed stories by media of far-flung places without any direct contact from them. Paucity of communication lines is a major cause of skewed world views and resulting chaos from that.

2.4 Yet the idea of "Internet/Information" as an enabling technology for the larger non-industrial world community seems irrelevant, inappropriate, and even downright insensitive. The Information/tertiary economy seems almost the exclusive preserve of the developed world.

#### **TECHNOLOGY FOR LIFE**

3.1 William D. Ruckelhaus, Chairman of World Resources Institute says, "We have the tools that could empower people - Tools that could raise productivity income and human welfare". Today's technology (especially digital), allows people to be in closer touch with their families through connectivity (telephone, email, webcams and other communicating devices), thus enriching their lives significantly.

3.2 Proliferation of and acceptance of computers can only happen when people are directly empowered to deal with it. In several examples, it was found that the byproduct of technology, at times, outweighed the primary benefits for which it was set up. We can take the best/ emerging proven technologies to the end-users but if we do not let the users dictate the choice, it will be tough to sustain the benefits that arise from the rechnology.

3.3 This can be improved by explaining the use of these information resources, specifically the Internet, as applicable to the end-user, in assisting in:

- the time factor not becoming a major barrier to work/learning
- getting rid of the distance factor
- disintermediation

3.4 The benefits can outweigh the inaccessibility of areas, inadequate infrastructure, and learning. The Internet can have a dramatic impact on the life of a town/county just as mechanization of agriculture had on them centuries ago. Ithiel Poole once called the I T sector "Technology of Freedom". It provides "access to opportunity" for which many young people were traditionally forced to leave their roots and move to a lower quality of life. Information Technology is a great leveler. It allows even remote villages to reach out to the world and enjoy a good quality of life in terms of health education and community. Once the barriers to accessing information are removed it is just a matter of utilising IT to full advantage.

3.5 One would be surprised at the diversity of applications that technology has been put to, viz. virtual community centres, marriage bureaus, connectivity/ communication booths, government information centres, public libraries... In Mozambique, the net is used to communicate information on 'position of land mines shifting' due to recent floods. These networks do not, and will not, necessarily use information in the same manner as we do. We need to respect their values, sensibility and tradition. An example - the residents of the tiny village of El Limon( Dominican Republic) built their own hydroelectric system, using cement and wooden poles, to generate electricity. They then hooked up a donated computer to the internet using digital radio and an antenna relay system that connects to the nearest phone line 10 miles away. Now their school (with no library and the village with no telephones and indoor plumbing) has a connection to the World Wide Web. They are learning digital video editing and are in the process of making a documentary.

3.6 Appendix I gives an indicative list of technologies used in various parts of the world to facilitate us to have a more complete life through access to information. Appendix II suggests a list of possible application areas using these technologies.

3.7 The basic components of life, 'food, shelter, clothing' and the next level of development, 'educational, social, cultural' can all be aided through the net. However, the most far-reaching influence will be the business or economy aspect of it.

#### **INFORMATION SHARING- CHANGING LIVES**

4.1 James D. Wolfenson, President of World Bank said, "People don't need charity. They want a CHANCE'. Dignity, for most human beings is of paramount importance. Not many people like to live off charity for the rest of their lives. Therefore, it is important to let people guide their own destiny. The most effective way of doing that is to introduce them to technology, its uses, and its applications to their way of life and to their future.

4.2 Once we share the experiences of what technology has done for us, they will find innovative solutions to suit their needs. Information sharing will create a distributed set of people working to sustain a more richer, healthier and educated society. Some potential areas to transform lives include:

•Education- Ensuring that millions of children worldwide are not denied education because of lack of teachers / schools / infrastructure. These students could learn and introduce practical uses of these technologies to their groups.

•Health- Tele-health could provide health workers and even doctors with the ability to perform basic diagnosis and gather primary health information. It could also be used by citizens to confirm or get additional information about their ailments and medication.

•Business- Virtual institutions such as banks, trading bodies, health centres, government information centres, public telephones, educational institutes could be accessed at a fraction of the cost of corresponding 'real' institutions. It could support this sector with more efficient flow of knowledge and ensure cheaper transactions.

Catastrophe control- Technology could help locate potentially devastating catastrophes such as land- mines contaminated water, foul weather, and assist in relief efforts, reuniting families in situations of earthquakes etc.

#### **BUSINESS AND INTERNET**

5.1 This fundamental area has a huge trickle down effect on the local economy. It not only allows the locals to strengthen their means of livelihood but also their lives and families. This can be a very significant and important tool in ensuring the proliferation and rapidity of use of any kind of technology. More informed entrepreneurs can make better economic decisions. Only business can ensure the sustainability and replicability of the system. Banks are willing to loan money to entrepreneurs (instead of social ventures) as these are seen to be viable business propositions.

5.2 Creating larger markets:

U.K. Village: A consortium of village led artisans have created this web site to enable a group of entrepreneurs, to expand their trade and to market special handcrafted goods to the larger world. Cheap imports from third world were affecting their business. This has helped them initially to survive.

Christmas trees: (Greenviewfarmtree.com) In rural Wisconsin, USA, Paul, & Danni Garrison achieved reverse migration. They were residents of Chicago area and moved to Wisconsin to start a farm for Christmas trees. They have used their skills to create a nation wide distribution with no overheads and a reduction in cost. The net was chosen as a vehicle of distribution. The business not only expanded but increased.

Toehold.com: Kolhapur, India is renowned for its hand crafted leather footwear. Exquisite, hardy, leather slippers fit for a king are churned out by thousands daily. However, many imitations were being sold in other parts of the country. Now the website (toehold.com) allows people to buy the original goods, through the web.

## 5.3 Training

In the above example, (toehold.com), an enterprise is also working to implement CAD (Computer Aided design) systems in those areas. There is a massive market for skills in the computer field, including data entry and programming. The net can provide youth of villages with these skills and they can thus upgrade their skills and job opportunities. A few people have turned their skills into a profitable enterprise by teaching the other youth.

## 5.4 Disintermediation

The following examples are classic cases of getting rid of the middlemen and garnering a larger profit for your goods.

Gyandoot (ambassador of information): Soochanalayas (information kiosks) have been set up in local villages in Madhya Pradesh (in central India) with investment by the local governments. One can access information against payment on a per-hour basis. A garlic seller found out that the price that she received was much lower than those in other far away markets. So, she contacted a dealer from there and received a greater remuneration for her garlic.

Virtual Souks: This site helps underprivileged artisans in the Middle East/North Africa to enable them to sell their wares worldwide.

Saree weavers: In the Indian textile world, Kanjeevaram sarees are known for their intricate designs and are well sought after. They command high prices in towns and cities. Recently a weaver in Kanjeevaram (India) sold a saree directly through the net for US\$1,100. (Normally she would not have earned more than 10% of this amount as it would go through 2-3 levels of dealers).

### 5.5 Specialized skills

An individual can earn a living through marketing on the net. It need not be only handicrafts/artisan led products, but knowledge too. Artisans such as the above have tremendous opportunity to funnel the economic worth of their goods directly to themselves and thus in turn improving the economics of the community. In a village in the Dominican Republic, there were individuals with knowledge of over 360 different plant life/herbs and their medicinal applications. Such knowledge is rare, not documented and worth a lot of money to the pharmaceutical companies around the world. Facts of flora fauna unique to a region are clearly known to most communities and could be very useful in botany, zoology, and study of such plant life. Just sharing the information with scientists across the globe can assist their scientific explorations further.

Greenstar (a for-profit organization) is exploiting an incredible opportunity. It has started recording the music/art of local communities and is selling it worldwide online. They are focussing on authentic art, music, legends, literature, and history of the region. The latest venture is in Paravthapur, India after successful attempts in Jeddah and Palestine. They are digitally recording local music and art with the help of a team of teachers and artists from the villages. The revenues that accrue from sales will fund the basic needs (as decided by them) of each village for its future.

## 5.6 Trading

Successful examples of trading using the net (such as Greenviewfarmtree.com) have been seen in all parts of the world.

E-bay: This is a great opportunity for any individual to market, trade, barter goods, and services. A lady in rural USA has chosen not to change her "quality of life" and run to a big city. She has a big house with no neighbor for a few miles, surrounded by farmland; she enjoys the rural life and earns an income using her trading skills, through the net. She has found her niche in antiques, and there are several to be sourced in her area and neighboring areas. She earns a good income from this venture. Investments were limited to a computer and an Internet connection. She has a balanced family life, her children are never in day-care, and she does not have the pressures of office life.

Ideas.com: This is another great service. Its like a meeting ground for persons with ideas and companies who could benefit from it. Companies picking up an idea would pay a sum of money to the originator of it. Now, idea generation is definitely not a preserve of the elite, urban, or first world individuals. This is another opportunity for people to earn using their own resources.

## 5.7 Jobs created due to the Internet

A feature that has not been touched upon is technology itself becoming a tool for freeing individuals. An example is – computer education. Numerous, for-profit, training institutions have sprung up in and around small towns across various countries. These organizations have educated the youth in systems development and software programming opening a whole new world for them and their families. As these skills are required by many large businesses, these individuals have experienced the opening up of their lives through work opportunities, even while remaining in their provinces (offshore development).

It has also become a tool for creating jobs. In the Gyandoot project (ref. point 5.4 above), local unemployed youth were trained in the use of a computer and Internet and with the help of loans from local banks have set up the kiosks. Not only has it created a new skill base for the local economy, it has stopped these youth from having to migrate to cities.

In the case of Grameen (village) Phone project, in Bangladesh, – which envisages putting cellphones in 45,000 villages - banks, are lending money to women to operate communication centres that provide the use of telephones to public for a fee. In some cases the operators have already paid off their loans and are earning a good profit. In another case, in Kuppam village (Andhra Pradesh, India-population 20,000) it was found that young kiosk entrepreneurs have started making Rs. 3,000 (approximately US\$70) profit per month, which is a sizable amount of money in the local context.

The most amazing outcome of just providing telecommunication, in Bangladesh, was that the operators have started a side business as INFOMEDIARIES. They collect market prices for local produce (poultry, agriculture etc.) and sell the information to the residents of their community. The social/fiscal lives of these individuals have far transcended their aspirations and expectations.

There are other kiosks/telecentres (called Infocentros in El Salvador, providing email, telephone, fax, and photocopying services.) wherein again private enterprise is involved. The corporation setting these up expected a 27-month breakeven period, as it was felt that information requirements would not be high. However, once the centres were up and running, break even has been achieved in 6 months. Such successes spur other entrepreneurs who are then motivated to replicate it. In northern India, Information 'thelas' or carts are being promulgated to satisfy a variety of information needs.

In places where demand is not so great, the inventiveness of the local entrepreneur comes in to play. He can customize the information requirements to the needs of people and thus generate a steady stream of income.

5.8 It has been found that despite low per capita income, aggregating the buying power of an entire village can support the infrastructure required. Even in places where the richer classes have sought to fund these enterprises, an indirect benefit is that they would need an educated and skilled set of individuals to operate these centres. Thus, they would need to invest in training for their own business needs.

## 5.9 Best Practices

Web sites such as Pakissan in Pakistan and Farmnet in Uganda, help farmers communicate, not only their problems with each other, but also share best practices. It is a virtual community of people from similar trade (farming or fisheries). They have come together and increased their selling power with the distributors by aggregating their combined produce. Subsistence farmers in Africa and South America improve their crop yield with information provided by Ohio State University.

## WOMEN AND THE NET

6.1 A woman in Timbuktu once wrote, "Information is the access to all doors". Studies and empirical evidence has shown that women are more interested in keeping the community alive and prosperous. Women have far more to gain from keeping their spouses going away for long periods outside the village to make a living. With access to information, they have a better command over their future and of their communities.

6.2 Although two-thirds of all people who cannot read are women, the Internet could empower them. Using icons and voice technology access to the global world and opportunities is feasible even for the semi-literate.

6.3 Many websites dedicated to women have been set up, such as Mahila web in Nepal, which shares information about women. IT can pick up the expertise of those women who have mastered skills necessary for sustaining families through war, disease, floods and famines. Others include more active wesites such as Tortas, which is an ecommerce portal for homemade cakes made by Peruvian women, and Village leap in Cambodia, which helps women sell scarves through the net.

6.4 The possibilities for women empowerment are endless. This may be done keeping in mind the local sensibilities and traditions with respect to women. For example, women in "purdah" need not be denied equal rights in education, health, and opportunities. These women can study ,trade and learn about all kinds of entertainment and leisure options without leaving the portals of their house or confined area.

#### **GOVERNMENT AND THE NET**

7.1 Governments are increasingly realizing the power that information economy can have on their countries. The investments required are far less than what would normally be needed in more traditional areas to leapfrog their nations into the 21<sup>st</sup> century. So all kinds of projects are being pursued to utilise the power of technology. The 'Amazon Boat Project' is trying to bring IT tools via boats to the Amazonian Community. The Indian government's proposal of "IT for the Masses", which targets 100 Mn Internet connections in the next 5 years in an effort to get the country net-centred. This through kiosks/PCO's/Post offices/Railway stations/colleges public and private enterprises. They have proposed a rural studio initiative for developing reusable software component and services for the rural sector.

7.2 In rural areas giving access to the Internet, it has been found that the largest percentage of queries from users were government related. (either directly or indirectly through lodging complaints about whether a school teacher is absent or services of a vet or land holding related queries.) Fewer trips have to be made to the government offices, in the city as information can be accessed from their residential villages. They are even willing to pay for this convenience.

7.3 Other areas of governance are computerising land records, judiciary, exams, and employment exchanges. The most effective way for governments to sit up and take notice will be when citizens start voting on their performance. It has been done in some parts of the world through the Internet. No fear of reprisals will hold back true responses. The Indian policy on IT hopes that people do not have to visit government offices for day-to-day work (by 2005). They are planning to dismantle licensing controls in low density telecom areas to further growth.

#### **EDUCATION AND THE NET**

8.1 Through a USAID project, children in Wyoming, USA, and Ghana, Africa are studying together through distance education. Education has the potential to create a big wave in a community. Though business will be primarily the driver of ensuring the entry and sustenance of IT and Internet, only through education can long term viability be an option.

8.2 Education through the Internet can cater not only to the underprivileged but also to the privileged that do not have access to education of their choice. If one wishes to pursue a scientific course of study, but the only kind available in your village is religious; you can make choices to pursue your options with relative ease through distance learning over the Internet.

8.3 Education has always been one of the big causes of migration. If high quality, excellent education is available at your doorstep, another reason for migration is removed.

8.4 Educ.ar Argentina: The aim of this project is to provide internationally competitive education by connecting all students to the Internet. They are training all the teachers under the program and expect to put the national curriculum online. This project anticipates connecting 40,000 schools and 11 Mn students.

8.5 Cybercare Malaysia: This project is set up to provide Internet access for educational resources covering 26 networked orphanages.

8.6 In Bangalore, India, there are computerised rural schools funded by the government, which provide free schooling for children during the day. This institution runs adult computer-education classes in the evenings and weekends to generate income, thus guaranteeing resource utilisation and a networked adult society too. 8.7 In El Salvador, students improve their English language pronunciation using software. They chat with friends worldwide and are connected to global youth.

8.8 Everything from basic elementary education to higher learning is possible through the Internet. Women in South Africa receive basic literacy training using course materials downloaded from the Internet.

## <u>COMMUNITY</u>

9.1 As for local communities, digital technology greatly reinforces their own unique way of living. The number of groups that encourage community reinforcement is too numerous to list here. However, the range in diversity is significant. Across borders from Palestinian Refugee camps to street-children slum centres in Ecuador. Multi-purpose community centres - farming and fishing communities, one even for mountainous regions in over 100 countries. E-Bario for the Kelabit ethnic community in Sarawak. The Warana Sugar Co-operative in India which has networked 72 villages. In Madurai district(south India), 1000 villages are to be connected to the net through the 'Sustainable Access in Rural India project''. Finalizing marriages or trading tractors, threshers, old TV sets, cattle and motorcycles is all possible through online advertisements.

9.2 Digitalization (Greenstar) is another excellent way of preserving local culture roots and diversity. Local language, art, and music, can be reinvigorated, instead of getting lost in the 'anglicizing of the net'.

# HEALTH AND THE NET

10.1 Telemedicine and tele-healthcare are becoming increasingly popular not only in urban areas but all around the world, where people may not have access to a doctor too. In Ethiopia, health workers can access latest health information and advances through the Internet. Computer based and online expert diagnostic systems enhance the quality of healthcare and diagnosis available to far flung communities. Another benefit would be the collection of health data from primary levels for aggregation and planning. Even in places where connectivity is a problem, just providing a CD-ROM of information, which can be accessed by the locals, can be enormously helpful.

10.2 MEDLINE, the online database of the US National Library of Medicine is used by local health practitioners for advanced professional training and for consultations with specialists and researchers worldwide. The EDPS (Early Detection and Prevention System) can provide a preliminary on-line analysis of disease symptomology even in the absence of a doctor.

10.3 Having such resources can stem the migration of doctors outside the community. It can also allow the community group to seek out medical help in cities as a last case, and get high level care at their place.

### **BUT HOW DO WE DO IT?**

Innovative solutions

11.1 The information-hungry world has created inventive solutions to keep in touch. An Internet project is underway in Sri Lanka (Kothmale Community Radio), where the talk show hosts introduced "radio web browsing" for listeners to call in with queries about the Internet, which were then answered by surfing on the radio's station internet connection. Questions such as online recipes for local bakers, research into new craft techniques for bamboo artisans, environmental networking, were some of the areas researched and questions answered. 11.2 Another pioneering initiative is happening in South India. A hub-andspoke model of data-cum-voice communication was set up four years ago in a group of six villages. Each morning, information on weather (CNN.com) and wave/tide conditions from an unused US spy satellite was made available to the villagers. This tells them whether it is safe to go out to sea and informs fishermen of the areas of best catch. Market prices, job opportunities, and news were downloaded from the hub and forwarded by fax/intranet to each of the villages. They in turn either broadcast the news on microphones or through written notices outside the centre. The villages donated the building and manpower. Lack of infrastructure leads to novel and hybrid technology. They have used wired with wireless for communication, solar power with mains for power supply. Only the hub has Internet access, they collect queries from the spokes and transmit the results back to them.

The barriers to electricity and connectivity and training can be overcome.

11.3 Technological barriers, big or small, can be accosted with ease if the mindset is positive. Lack of electricity has led to solar panels, pedal power, bull power; dynamos and hand cranked springs. The key lies in solutions that facilitate local electricity generation rather than depending on a centralised system. Options such as micro hydel or wind power are feasible options.

Lack of investment for several computers has led to time sharing by different villages. Cell phones and wireless- in-loop networks have been used instead of setting up expensive land lines and telecom infrastructure. Old unused railway cables, CB radios in Africa have also been put to innovative use.

11.5 Experiments have shown that people, with limited competency in the English language, can access and use 'Graphical User Interface' very quickly. The Gyandoot project (in India) and other profitable telecentres have shown that rural consumers are willing to pay for services that they think will change their lives in any useful way.

11.6 With advances being made in security systems, and in feel- touchsmell software products, online trading products will be much easier and feasible.

11.7 Many institutions worldwide are training young professionals to acquire skills in small business management, determining information content needed by their markets and getting information to them in a timely and inexpensive manner. IT sensitization by governments is also on the rise, which would positively affect nations. The Indian and Argentinean governments plan to train all schoolteachers in the use of Internet.

11.8 The cost of funding such digital connectivity is reducing drastically. The infrastruc ture costs could be shared by the community being serviced and could be as low as \$.50 to \$5 per individual.

## **FUTURE SCENARIOS**

12.1 What are the possibilities and realities for this technology to take off? 12.2 At an academic level, it seems feasible. The real life examples have the added advantage of making us feel more comfortable about its practicality. What remains to be done is a large-scale rollout that will make a significant difference.

Opportunities

12.3 <u>Bespoke/Handcrafted</u> items whether pottery, crafts, or home-cooked meals are in big demand these days across the globe. Designers in cities can send design specifications to artisans who can create the designs as required by the market and obtain high wages for the same. 12.4 <u>Devolving governance</u> at county level. Government tasks are highly information intensive. We can visualise a society in which each county takes over a part of the governance. For example: Sales tax, - the entire government machinery pertaining to that can be maintained at the local or district level. All across the state, this group of workers will handle work relating to it. Another district will handle all land registration and so on and so forth. The main advantages are that you will stem the migration of a large number of clerical workers to the bureaucratic centres in the city. A secondary benefit would be that the elected representative of that district gets to do a lot of local development.

12.5 Another by-product of this will be de-crowding of the cities too. In turn the massive strain put on the city infrastructure for housing, and handling commuter traffic will be eased to some extent. Cities will not then automatically become magnets to attract people.

12.6 The opportunities are diverse, possibilities infinite. Though the cost of using Information and communication technology is high, the cost of not using them is much greater, in loss of opportunity, economic growth and social improvement.

# Appendix I

# **LIST OF TECHNOLOGIES**

- Internet, e-mail
- On-line databases, discussion groups
- Set-top box on TV for internet access
- Voice over Internet protocol(VoIP)
- Wireless-in-local-loop(WLL) technology-enables simultaneous data and voice

## across long distances

- Packet switching Sending short bursts of data at specified times of the day
- V-Sats
- 'Simputer' small handheld device which can read a SIM card and has advanced

audio/text processing capabilities in local languages

- Istation an e-mail only device
- Simple cell phones
- CB radios-hand cranked spring(A similar technology for computers is being

explored by GE)

- CorDECT
- 802.11b standard communication technology

Appendix II

# POSSIBLE APPLICATIONS OF THE NET

- Weather forecast
- Market rates
- Availability of agricultural inputs
- Information sharing (quality of seeds, feed, farming techniques, crop yields)
- On-line markets
- Entertainment
- Design database for handicrafts/artisans
- Distance learning
- Adult learning
- Medical information
- Government entitlements/information
- Opportunity to bank online
- Design, manufacture, market product
- Truckers load matching service

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