

Disruptive IT in South India

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There is a visible shift in perspective in viewing the IT miracle and how it can merge profits with prosperity for the hitherto downtrodden. The new lens of "inclusive capitalism" promises to include the bottom of the economic pyramid in "sharing spoils", thereby making way for innumerable contributions to the forgotten and invisible masses.¹ This obviously points to an emergent, equitable socio-economic system that eludes the Third World for reasons well documented and analysed by concerned scholarship worldwide. Several studies have since appeared to render visible the millions who were not part of earlier traditional markets. This visibility warrants a revolutionary model for the growth and development of these countries and their peoples.

'Disruptive technology', seemingly, is the key word in shifting the debate on low-cost/high-utility technology for the non-consumer. What this technology does is to master current knowledge, turning it around and innovating upon it to produce a revolutionary model suitable for the needy. Disruptive innovation suggests that existing mainstream markets are not starting places for waves of growth, and there is need to "incubate technologies from ground up rather than introduce top down".

Faculty members at IIT Madras of the Telecommunication and Computer Networking (TeNet) group took upon themselves to pursue such R&D and found success and recognition. The group has developed the CorDet and the WLL telecom and Internet systems,² which would cost about a third less than normal. These are decentralised access infrastructure technologies that would not only function in a harsh environment (high temperature and power fluctuation) but would also require significantly low initial investment. N-logue, a company in league with TeNet, has introduced 'disruptive IT', setting up Internet kiosks in Melur, a rural district near Madurai. Doing development in Tamil Nadu for TeNet and N-logue is not a government/NGO supported/subsidised process but linked to doing business with new groups, creating a business environment wherein the local unit can afford buying power and use technology profitably. For them, disruptive technologies will target the poor, drawing them within the market economy such that the transaction is enabling and empowering, and will create active agents in the circulation of capital, cash and material well-being.

My essay will look at a few case studies of what has been happening at the ground level in the Melur area, documenting the uses to which IT is put, and what people instrumental in initiating the process have to say. It is definitely premature to assess and map clearly the social outcome of such interventions and how this may affect emerging social structures and cultural landscapes. But we need to search for clues as to how new technology is received and used, the expectations it provokes and the ways in which social traditions grapple with 'disruption'. Closely linked to 'shaping technologies' is how much/far

social responsibility/caution can be exercised to deploy new technology in societies unawares. In due course, consequences also overtake us unawares, despite careful mapping and surveying of the socio-economic field. It is necessary to remember that technology is not power *per se* with its limited capacity for social engineering. It has to “tread softly for it treads on society”.

How to Network the Rural

Given the fact that rural India contributes significantly to the national GDP, it makes immense business sense to enable rural connectivity, while at the same time the Internet can become an enabling technology. But then we need telecommunications that are cheap, operable and accountable; in short, a ‘disruptive IT’. Disruptive technology is conventionally understood as a new product or service that ‘disrupts’ an industry and eventually wins most of the market share. According to Clayton Christensen, these are “simple, convenient-to-use innovations that initially are used only by the unsophisticated customers at the low end of markets”.³ He suggests that fatal threats to markets may begin as low quality, low margin products that customers don’t want and can’t use – yet. Ignore these disruptive technologies and they just may grow in capability to meet mainstream needs and develop into a competitive threat, dramatically transforming the marketplace. The personal computer is a good example, changing the map of computer usage, freeing computers from the confines of labs, making it affordable to the common man – in the process killing its predecessor, the micro-computer. It definitely disrupted the path of computer usage, taking it to personal spaces and changing lifestyles at several levels.⁴ ‘Disruptive’, though at the outset not of society – scientists at TeNet endorse the view that societies have always been transformed in due course, for better or for worse, with technological interventions.

A more liberal and generous usage views disruptive technology as mastery over manufacturing processes, and innovation upon them. More often than not, disruptive technology can be reduced to simple economics. The instance of the proliferation of cable TV in India from nothing in 1992 to fifty million now was achieved by the indigenous use of simple technology and the provision of cheap and accountable services. More importantly, the nature of the organisation that provided services was by less trained people using a complex technology, rather than better trained technicians handling relatively simple technology, and incurring more costs; an example here is of telephone wiring. In the case of cable TV, the small-scale entrepreneur incurs manpower cost several times lower than in the organised sector and these costs are passed to subscribers, making cable TV affordable.⁵

Telecommunications conventionally require large initial investments (of the order of several tens of millions of rupees) to start providing connections. Development of research has led to reduced equipment and reduced investment to provide telecom connectivity and operation costs, as well as the possibility of coming up with small access systems that can be connected to a backbone telecom network. A small entrepreneur can then serve a neighbourhood (either a few streets in an urban area or a few blocks in a rural area) and provide accountable, low-cost services.

In order to “think and act rural”, the company n-logue was incubated with the sole aim of providing telephone and Internet connectivity in villages and “by charter... not operate in

urban areas". This business model is based on two of the biggest entrepreneurship successes in India today – that of the PCO-STD booths and cable TV operators. n-logue uses a similar kind of business unit, called the local service provider, for services in Internet kiosks in a service area.⁶ Their project of connecting one thousand rural villages in Madurai aims to empower rather than place more connections in urban areas. The growth of users would help "support financial viability, aggregate demand and develop a community integrated by a common route of communication". This in turn would harness the demand for more such connectivity and the accompanying benefits to society at large. The SARI project, Sustainable Access in Rural India,⁷ is the sponsor working with similar objectives in the district of Melur, where each and every village would have Internet connectivity through kiosks. The project envisions sustainable development strategies, seeking viable markets for information and communication services aided by "innovative and enabling technologies and business models".

Case Studies⁸

In Melur, a paddy growing district with 42% literacy and one-third of its population living abroad, the need for communication services is high. The area has huge dependency on the government for all the services, big and small, that it provides. With the setting up of 64 village Internet centres in Melur and Madurai North *taluks*, some in areas with no public telephone facilities, a new mode of communication has opened up. Apart from six connections in schools, 19 operated by a local NGO and three by *taluk* offices, the rest are operated by individual kiosk owners with technical and hardware support from n-logue. Villagers now use this facility with support from the district collectorate, and services available include income, community and nativity certificates, online application for encumbrance certificates and welfare schemes, tie-ups with an eye hospital for online appointments, with agricultural and veterinary colleges for online consultancy and even a web-based travel agent booking bus and train tickets online. I will turn to data from case studies in three villages highlighting the social profiles and the entrepreneurial skills of operators, and how the sociocultural landscapes in these villages can slowly change with these tele-services.

Padinettankudi, 35 kilometres from Madurai, became home to the first Internet kiosk in rural Tamil Nadu. The owner built a room behind his tea shop and, with loans for the PC, connection and with basic computer training, started his e-business. Since the village is small and poor, with no public phone, "Yahoo Messenger seemed to be the only means of communication other than physical travel". The operator, Rosy, a feisty woman of twenty-one with a diploma in computer applications from Melur, has a marketing success story to her credit. From speaking to people who frequented the tea shops to door-to-door campaigns in both low and upper-caste colonies, she sold the concept of telecommunication to Melur residents. The promise of tuitions for children in computers, astrology from the web, and film shows further aided the steady growth of user population in the village.

In contrast to Padinettankudi, Keelavalavu is a prosperous village, and Abdul Razzak, the kiosk owner, holds a diploma in engineering, has studied computers and has teaching experience in an Aptech centre. In order to sell his services, Razzak created free e-mail IDs for the villagers, tuning them into sending and receiving mail, and also conducted free eye-

screening camps, besides launching e-government, travel and VOIP-chat services. The economic profile of the village has shaped a certain demand for such services. Quarrying is the main source of livelihood, and a small percentage is engaged in farming. The village is located on a main highway and equipped with basic health and banking services. Razzak has now bought a second computer for teaching and has about 1,500 students using computer education and games. The fee he charges is almost ten times less than his urban counterparts, and the students save on travel costs. Despite aggressive and continuous marketing, he feels that this prosperous village is still not giving enough dividends. But what motivates Razzak is the knowledge that rural India will soon be a component of the digital revolution; he likes playing a role in developing the next computer generation in his village and believes that children and the educated in the village can be influenced even if little mark has been made on the consciousness of the older generation.

Vellalur is a rich agricultural village with ground water, schools, PHC's, banks and other amenities. An engineer in the PWD, Madurai, started the kiosk in Vellalur, his native village. The Internet business has done very badly here, more so in comparison with its poorer cousin Padinettankudi. One may argue that good business is a combination of aggressive, purposeful marketing, public relations and personal attention, coupled with a good hold over new knowledge and how to sell it. A shy uncommunicative operator coupled with an absentee owner made for bad business in this kiosk.

Speaking to members of n-logue's team, one realised the challenges of the not-so-simple process of selling telecommunication to people, some of them unexposed even to telephones. Aimed to bridge the 'information gap', Melur became the 'incubator' for e-business with self-sustenance, progress and endurance. Doing business was intimately linked to impact the overall nurturance of a community in terms of computer literacy, starting up a computer culture in day-to-day dealings and replacing earlier (ineffectual) modes of communication. We ask traditional sociological questions like: which strata of society is being most affected by this intervention, how is it going to change social compositions/profiles, will new leadership/entrepreneurs emerge out of the process dislocating the entrenched, are social hierarchies clogging the spread of this communications culture? The team felt that these differences are not showing up, as yet, as business interests are overriding others. It was usually an influential person who set up the kiosk, but caste has not intervened in recruiting employees/operators in daily business operations. (The case of Rosy was interesting, and there was a view that her being Christian helped in taking kiosk culture across caste groups). The difference, as the team perceived it, is in the 'nature of technology', which could neither stall people from using it nor let it be usurped by a few. Hence the issue of affordable technology becomes crucial.

Sometimes reactions in a community are inevitable since one cannot ignore the arrival of a powerful means of communication. The online veterinary and agricultural consultancy tied to research institutes, eye/health care tied to hospitals and e-government services are the beginning of a culture that promise much in terms of introducing a mode of communication accessed by all, leading to more public participation in the village economy.

Dr. Ashok Jhunjhunwalla, who leads the TeNet group in IIT Madras, opines that it is a little early to start speculating about social impact and change. He confessed, in a lighter

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vein, about portents from friends and foes that this 'revolution' may well result in a new set of landlords dotting the social landscape, and a new era of e-feudalism in an age of telecommunications. Self admittedly, the TeNet mantra was to indigenise a complex technology, to make it affordable to rural populations and, more importantly, usher in a democratic digital revolution. All this had to make business sense without creating economic cleavages. One instance of a business model that was cheap, reliable and absolutely essential was the "way milk packets reach the doorstep, for a wee bit of expense which the consumer bears" – telecommunication has to be the same for rural India. Dr. Jhunjhunwala felt that cheaper technology coupled with accountable services would win the day in areas hitherto unavailable to reap benefits. Disruptive IT may ultimately take over and race ahead through the process of heeding rural consumers.

Bhaskar Ramamurthi, senior scientist at TeNet and one of the initiators promoting R&D for wireless technology, had interesting insights to offer. Using the example of telecommunicating in Melur, he is very clear that technological options now available have rendered certain processes transparent and are making systems work. The erstwhile lethargy of e-governance is being challenged as information exchange becomes transparent and online applications and appointments go on record. Similarly, online consultancy for crop diseases, soil and health care has hastened information exchange, resulting in monetary saving and delivering timely advice. However, the interesting quip from Dr Bhaskar was that it is still unclear if computers have enabled anything "new which could not have been possible earlier". Consultancies, government certificates, health check-ups were all possible in earlier times with human intermediaries instead of computers. He adds that with human functionaries, social positions and status played a big role in shaping an imperfect, sometimes non-existent, public governance.⁹ Delays, corruption or simple non-performance point to a system that did not work. Computers are not going to 'create' a complete performance-oriented culture but they can, by ensuring the transparency of information exchange, alter performances for the better. With predictability, time and money are saved. Intended or unintended consequences follow such interventions. For example, the shadow economy of touting and corruption was dented when computerised ticketing, reservations and phone bills came into use. Here, introducing technology for efficiency aided cleaning up petty crime. Computers can definitely not play God in any human endeavour, nor are they empowerment *per se*. While committed to people's participation and empowerment, scientists feel responsible for the extent to which technological interventions, keeping in mind the baggage of the past, are deployed. What may happen, the *longue durée*, remains unforeseen.

In Conclusion

It is the firm belief of the TeNet group that rural India is ready to reap the benefits of the Internet era. There is visible enthusiasm among users and entrepreneurs about changes poised to take over traditional communication culture. It has also become clear that technology has to be affordable to connect and sustain rural India, and to do so a "business model has to be envisaged in each region that will work locally". This particular experiment has stumbled upon the clear viability of Internet kiosks managed by local entrepreneurs and operators. There is no gainsaying the fact that the evolutionary path of this technology may

lead to unforeseen changes in the socio-cultural fabric of society. It augurs well for researchers and scientists to be alert in such scenarios; to study, document and possibly predict outcomes.

NOTES

1. Hart, Stuart L. and C.K. Prahalad "The Fortune at the Bottom of the Pyramid" (in *Strategy + Business* January 2002) p. 54-67. The authors envisage a capitalism that would include the billions of aspiring poor who join the market economy for the first time.
2. A detailed appraisal of this technology can be found in, Jhunjhunwala, Ashok "Making the Telecom and IT Revolution Work for us" (in *Hypertext* <http://www.tenet.res.in/Papers/techolo.html>) and "Can Telecom and IT be for the Disadvantaged?" (in *Hypertext* <http://www.tenet.res.in/jhun/papers/TelIT/TelecomAndIT.html>).
3. Christensen, Clayton M. *The Innovator's Dilemma: When New Technology Cause Great Firms to Fail* (Harvard Business School Press, 2001, Boston).
4. For case studies of several disruptive technologies at work, Christensen, Clayton M. *op. cit.* and Hart, Stuart L. and C.K. Prahalad *op. cit.*
5. Developing disruptive technologies for developing countries is premised on catering to a large market that is otherwise deprived of the fruits of technological advancement. To provide infrastructure products, access products and backbone networks at very low cost, an efficient marketing of these is imperative. It was obvious that such tasks cannot be successfully undertaken without totally mastering the technologies, turning them upside down and innovating upon them, as well as acquiring an understanding of the directions in technology development and the costs associated with each element. While IIT faculty understood the concepts and theory and had some idea about implementation, the task at hand required significant industrial expertise. After toying with several ideas, the group decided to give a call to their alumni working in industry around the country. These alumni have come together and formed companies working jointly with IIT.
6. The CorDet can connect the fibre-ised *taluka* headquarters to villages around a radius of 25 kilometres and can provide simultaneous telephony and 35 kbps dedicated Internet to each connection. It leverages the fact that fibre reaches over 85% of *taluka* headquarters in India. There is a fibre connected rural exchange for every 150 sq km of rural India. Thus a wireless system with a 10-kilometre range, if installed at existing connected exchanges, would cover 80-85% of villages in India.
7. The Sustainable Access in Rural India project (SARI) seeks to show that viable markets exist for information and communication services in 'rural poor' areas by inventing and deploying innovative technologies, assessments and business models. Through the development and introduction of appropriate and enabling technologies and applications, SARI will foster economic development and improve health and learning. It will do so in a financially sustainable way, even as it reaches into the poorest and most disadvantaged communities. SARI's diverse partnerships with universities, non-profit organisations and the private sector have begun to implement a unique project that will begin by wiring approximately one thousand neighbouring villages in Madurai.
8. Material for this section is derived from my fieldwork and from Kumar, Richa and Ashok Jhunjhunwala *Taking Internet to Village: A Case Study of Project at Madurai Region* (Report submitted to the United Nations Centre for Regional Development, 2002, Chennai).
9. If caste status was a major barrier in creating an open public culture, it is not as if the 'pariah' or the *palla* is about to visit the kiosk. What one hopes for is that sheer affordability and business sense may allow a dilution of social prejudices.

