

# De-hyping ICTs

The Hype Cycle depicts the progression of technologies from inception and over enthusiasm, through a period of disillusionment to an eventual phase of maturity. It highlights patterns of overreactions, typically originated by unrealistic expectations and reinforced by media effects.



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Following the G7 Conference on the Information Society hosted by the EU in Brussels in 1995 and the Midrand Conference held in 1996 in Midrand, South Africa, building a global information society, and setting the priorities for its advent have become a major agenda of many national governments and international agencies. International Telecommunications Union (ITU), WTO, OECD, UNESCO, WHO, Economic Commission for Africa, New African Initiative, The World Economic Forum, UN General Assembly, and the World Bank are some of the forums in which the idea has been deeply deliberated (CEC, 2001). Nevertheless, it was soon realized that uneven access to information defeats the hopes of building a global information society. Further, given the fact that the budgets of many developing countries are limited they cannot find resources for building the necessary infrastructure for increasing access to information. A global information society, without the participation of the world majority cannot be truly global. Focused attention by donor agencies and national governments on seeking means to meet this challenge has given rise to a range of innovative projects and processes that attempt to use Information and Communication Technologies (ICTs) for development.

Private, public and the third sectors are independently and in partnerships involved in these projects in areas such as transport, planning and implementation, sustainable livelihood, governance, promotion of equitable access to social services, supporting macro economic policies and environment management. They are varying intended to enable users to reduce costs, increase efficiency and competitiveness, empower local communities, facilitate social and economic initiatives, create employment opportunities, adapt and disseminate knowledge that enhances pro-

ductivity or reduce corruption and red-tapism in administration. As such these projects encompass a wide area of developmental activities in developing countries.

The major role of ICT expansion in the developing countries pertains to finding solutions to the problems of unemployment and poverty reduction. Massive investments in the public and private sectors and funding by donor agencies are justified by the immense scope of ICTs in mitigating developmental maladies and aiding development administration. ICTs, such as the World Wide Web, e-mail, telephones, cellular phones and satellites can transform drastically the way in which communities interact, conduct their businesses, compete in markets and shape their development priorities. ICTs have enabled a section of the rural communities to access, adapt and apply greater amounts of information often creating opportunities for enhancing productivity and efficiency. It has also to certain extent strengthened democracy, increased social participation and defined new models of sustainable practices. While the opportunities for the use of ICTs in development appear to be enormous, a systematic appraisal of the major restrictive factors that contribute to inefficiencies and instabilities in the outcomes of ICT use has not been undertaken. The absence of a proper framework for assessing the strategies, policies and regulatory approaches as they emerge in the context of ICT expansion in India have greatly affected the rectification processes and attempts to reformulate appropriate and coherent strategies for using ICTs for poverty reduction and employment generation. This is more glaring in the case of initiatives undertaken by Civil Society Organisations (CSOs) with both Governmental and non-governmental financial support. Surprisingly, organizational and technological innova-

tions by CSOs, a crucial component of ICT supported developmental initiatives have not received the deserving attention.

## Innovation and CSOs in Rural ICT interventions

Evolutionary theory in economic thinking has been a major source of stimulating debates in the literature on technical change and innovation (Witt, 1991; Hodgson, 1993; Dosi, et al. (Eds.), 1988; Metcalfe, 1997). One of the major insights of this approach has been the notion that innovation and diffusion are inseparable processes and that technical change and economic change are concomitant (Metcalfe, 1997). Technological changes and economic development is often problematized underscoring the importance of prominent institutions that contribute to innovation processes in a country or province. Understood as national or regional innovation systems, these approaches emphasize the role of interaction of major institutions such as the industry the State and research institutions (Lundvall, 1997; Freeman, 2000; Edquist, 2001; Johnson, 1997; Elam, 1997). Commonly known as the triple Helix model, a new variant of the innovation systems approach has brought in the role of the academia as central to this modeling and provide immense insights into the complex network of scientific practices leading to innovations with systemic features (Etzkowitz and Leydesdorff, 1997; Etzkowitz and Leydesdorff, 2000; Castro, Rodrigues, Esteves and Pires, 2000; Leydesdorff, 2000; Benner and Sandstrom, 2000). Nevertheless, social process that shape feedback mechanisms underlying the complex interconnections are not often given their due in this type of literature (Khan, 1998).

The emerging context of information technology expansion in developing countries provides an interesting backdrop for empirical and theoretical reflections on innovation processes and economic development. The ways in which the discussion becomes significant in terms of ethical and political economy questions of development has been discussed by us elsewhere (Sreekumar, 2001). We have to recognize that there are several dimensions to the problem of ICT expansion that requires closer attention. Many countries of the

developing world, particularly countries of South Asia, are now formulating policies and strategies to generate scientific synergy and economic productivity through the development of information technology. These programs and policies have not received the scholarly attention it deserves. We notice that there are at least four major actors (See Figure 1) actively participating in this process: the State, the industry, the University and Civil Society Organizations (CSOs).

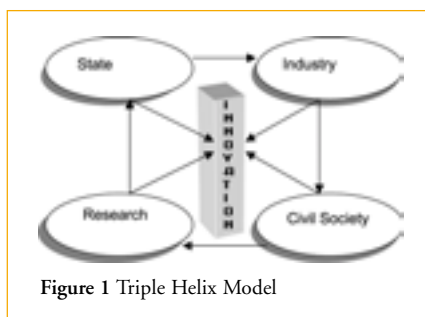


Figure 1 Triple Helix Model

The CSOs have also come to play an important role in facilitating ICT expansion in developing countries. Their relationship with the basic actors of the triple helix is particularly important. CSOs have become major vehicles in the implementation of government programmes for governance and poverty alleviation. With the expansion of ICTs, there are at least two major developments in this front that deserves attention. One is that many CSOs have started using ICTs on a large scale creating a new pattern of demand for them. Secondly, many CSOs have emerged which use ICTs directly for developmental activities that they undertake. These ICT CSOs focus their attention on the dissemination and use of ICTs in the rural sector.

There are several ways in which this becomes crucial in looking at innovation processes in developing countries. The ICT based CSOs have created a milieu of innovation where cost effective ICTs for developmental activities are being generated for catering to the rural demand for these products. The case of Simputer developed in India is a typical example. There are also a host of packages and services that are created with the specific intention of making rural developmental activities more effective. The dynamism produced as a result of these activities could signal

back demand impulses for more of such technology. A positive feedback mechanism can come to operate reinforcing this tendency.

Further, the activities of CSOs in the area of ICTs have another major catalytic role in shaping government policies in this sector. In the triple helix model, innovation is essentially viewed as a technocratic phenomenon. It does not attempt to capture the grassroots level dynamics of technology diffusion and the feedbacks it can generate ultimately influencing the pattern and direction of innovation processes. The ICT expansion, given the nature of infrastructure problems in developing countries were destined to remain an urban phenomena in the absence of effective agency that can mediate and negotiate technology diffusion. With the massive proliferation of CSOs in the area of rural ICT expansion, rural connectivity has been brought into the governmental agenda with the urgency it deserves.

The State also requires CSOs active participation and involvement in implementing ICT related projects such as e-governance. The state cannot on its own undertake the massive task of familiarizing the illiterate and semi literate populace of developing countries with the use of ICTs. Collaboration between State and CSOs on the one hand and CSOs and universities on the other become centrally important in this process. Industry also has an important role to play in this context. The new demand for specialized packages and services created as result of grassroots level understanding of the real needs of rural areas can be attended to only by involving the industry. But how the dynamics work out depends on the degree and scale of integration of CSOs into the traditional structure of the triple helix model. We have discussed the conflicting nature of State-CSO relations elsewhere (Sreekumar, 2002a, 2002b and 2003).

## CSOs and the Triple Helix Model

The major pillar of argument that supported the innovation system approach was its characterization of innovation as a non-linear process based on analytical advances in economic reasoning contributed by the evolutionary theorists. Its point of de-



### *ICTs enhancing learning opportunities for girl children*

parture from various theoretical schools of thought such as classical political economy of Smith and Ricardo, Marxian economics, neo-classical economics and Schumpeterian development economics was the primacy it attributed to the degree of interrelationships and linkages between state and the private sector in determining the growth direction and patterns of innovation in a national or regional economy. The major actors in the national system of innovation were the State and the industry with historically specified roles and intermediation delivering a collective system of projects and processes leading to scientific knowledge production as well as innovations. The national innovation system approach comprised of two different types of conceptualizations one strand hinging on an understanding of the innovation process where the lead role among the actors was attributed to the State by while the other ascribed it to the industry.

An implied concept of double helix, the analytic of a co-evolution between two dynamics of State and industry in the national innovation systems approach, has been found unsatisfactory in the context of diminishing role of the State and industry's increasing dependence on the academia for powerful innovative interventions leading to the emergence of what is commonly termed as triple helix configuration of innovation. The new model reconfigures the national system of innovation approach to integrate the role of universities in shaping production, dissemination and use of new ideas and concepts. The three ways interaction envisaged in the triple helix model adds to the description of institutional arrangements and

policy dynamics where the universities encompass a third mission of economic development in addition to the State and the industry.

The new phase of globalization is marked by changes in technological fix in the case of information technology, biological technology and materials technology had indirectly influenced a more encompassing theorization of the innovation process in national and regional contexts. The industrial era was characterized by techniques of data storing in the analogue form using electricity and electronics. The new technology manipulates data in digital form with the aid of microelectronics, optronics and associated software. Biological technologies have been revolutionized. In the industrial era, industrial fermentation using enzymes and microorganisms formed the core of its technical package while emerging technologies in this field apply microbiological techniques to microscopic engineering of living organisms. Industrial transformation of materials was the leading technology for the industrial era in the case of materials technology. The frontier know-how in the field concentrates on the microscopic control of structure of materials (Miles, 1997:30). These new generic technologies are conceived as priorities for national development, "with almost monotonous regularity" (Ibid: 25).

The triple helix model captures this moment of assent of new generic technologies with their excessive dependence on universities in the creation of innovative and entrepreneurial talent. The political economy of changes in the conditions of knowledge production necessitated a reconfiguration of State-industry relations and State-university relations where, State's withdrawal from investment in projects for innovations compelled both the industry and university to come closer looking more meaningful associations. The major actors seemed to have adapted to the new regime of innovation protocols defined by the emergence of a triple helix of State-indus-

try-university interaction with universities taking a central place in the overall configuration. The model has not only given a new dimension to the innovations system approach, it successfully incorporates several institutional and structural aspects of the process of technological change which a co-evolutionary model of State-industry relation was unable to comprehend. A striking example of this analytical advance is reflected in the new focus on the internal changes in these institutions interactions cross linkages and the cumulative and recursive effects of these changes.

Nevertheless, the extension of triple helix model to the problems of innovation in developing countries is fraught with a welter of institutional and structural problems. In the context of well-developed innovation systems the specific inter-linkages as well as the benefit stream that might accrue from it are far more clear and tangible. On the other hand, the usefulness of the model is capturing the holistic dimensions of innovation processes in developing countries ostensibly look less apparent. The dependent relations of the industry with the international order, State's financial limitations, quality of education in universities etc are only aspects that appear at the surface. If one digs deeper, one will be perplexed by the complexities of institutional and organizational rigidities that envelope the processes of scientific research and innovation in developing countries.

The state's role remains fundamental having close interaction with all the other participants. Obviously the triple helix of innovation has a significant role to play in the development of ICTs in developing countries. There is a widespread belief that international technology spillovers are becoming increasingly transparent and smoother with the new phase of globalization and liberalization of domestic economies in the developing countries. But in reality, the 'digital divide' as the gap between developed in countries in ICTs is some times referred to, is widening. This could be due to a re-enforcement of the patterns of global economic processes, which historically and politically hindered the development of low-income countries; or the result of more deep-rooted struc-

tural problems of domestic economies in interaction with the rapid changes in the international technology market. The strategic significance of these aspects is underscored by the differential progress made by low-income countries in reaping the benefits of global information economy expansion. Consequently a development oriented interventionist State remains an important element of the innovation systems in developing countries modulating and facilitating the activities of other agents of change besides directly involving in capacity generation and knowledge dissemination.

The industry has also a key role to perform. The increasing visibility of the information economy and the proliferation of techno-polis the world over are beginning to receive academic attention and consequently a large corpus of analytical studies has been generated. Majority of the new techno-poles is situated in the United States, England, continental Europe, and newly industrialized countries in Southeast and Japan. Castells and Hall (1994) argue that techno-poles exemplify the reality that cities and regions are increasingly being modified in their structure. They are also conditioned in their growth dynamics by the interaction of major global historical processes. These include a technological revolution based on information technologies (including genetic engineering), the formation of a global economy that works as a unit in a world wide space built for capital, management, labor, technology, information or markets and the emergence of new forms of economic production and management where horizontal networks substitute vertical bureaucracies and flexible specializations replaces standardized mass production (ibid.). However, the strong drive of many regions to become the “next Silicon Valley” has failed. They argue that the magic formula often worked out by opportunistic consultants: a small dose of venture capital, a university or Technology Institute, fiscal and institutional incentives to attract high technology firms etc, wrapped in a glossed brochure and futur-

istic name need not help build a new techno-polis. According to them “the world is now littered with the ruins of all too many such dreams that have failed or have yielded meager results at far too high costs” (ibid: 8).

The triple helix model, in a sense, responds to this issue by bringing the central role of educational institutions in creating a social space conducive for technical change and innovation. There are two types of interaction involved in the process. On the one hand the historical relationship between the State and the university is under siege. But, nevertheless, it is still important in many developing countries. On the other hand, the industry-university relations had not been particularly strong and visible in developing countries. But this scenario is gradually changing leading to much greater integration between these two actors, for reasons we discussed earlier. See Figure 2

### Field of Innovation for CSOs

It is against this backdrop that the role of CSOs has become important. The issues of economic development and technical change in developing countries have to be addressed without ignoring the impact of human agency in effecting these transformations. In the case of ICTs we observe that a huge number of CSOs have become major mediators of rural transformation leading to demand generation for ICTs and thereby acting as positive feed back loops in influencing innovation processes. While the importance of the triple helix configuration is well recognized, the activities of CSOs in the area of ICT related activities demonstrates the grassroots level impacts of new technology and the feedback mechanisms it generates to influence policy priorities of The State, industry and the university. The manner in which a field of innovation becomes operative in the case of a rural ICT intervention is captured in Figure 2. It shows that

process of innovation and diffusion is not based on a simple linear model as is sometimes assumed.

### Diversity of Experiments and Some Assumptions

A rich variety of ICT interventions have emerged in developing countries initiated by CSOs. The Grameen Telecom in Bangladesh is a widely discussed example. Interventions, which are similar to this, can be found in many villages and regions in India. With the expansion of ICTs, there are at least two major developments in this front that deserves attention. One relates to the fact that CSOs have started using ICTs on a large scale creating a new pattern of demand for them. Secondly, many CSOs have emerged which attempt to use diverse tools of ICTs directly for developmental activities that they undertake. These ICT-CSOs focus their attention on the dissemination and use of ICTs in the rural sector. Development Alternatives, a CSO in Bundelkhand have come up with TARAhaat.com, a portal designed specially for rural communities and TARAkendas, multi-purpose kiosks with a thrust on e-education. It tries to provide a blue print for inducing new dynamism into the village economies by helping them to leapfrog into the digital age. It attempts to use ICTs for creating jobs, promoting sustainable livelihoods and alter rural marketing systems transforming the complexion of the rural economy. It believes in social engineering. Its partners include James Martin &Co., an international management consultancy, HUGHES escorts Communications, KLG Systel and Excel-sior Ventures Management LLC. Hindustan Liver, a monopoly industrial house, is backing the portal. World Bank has entered the scene with a research grant under the Global Development Gateway project. Angel Investors in NEW York are considering collaboration with the CSO. The village Knowledge Centres run by the



Figure 2 Field of Innovation

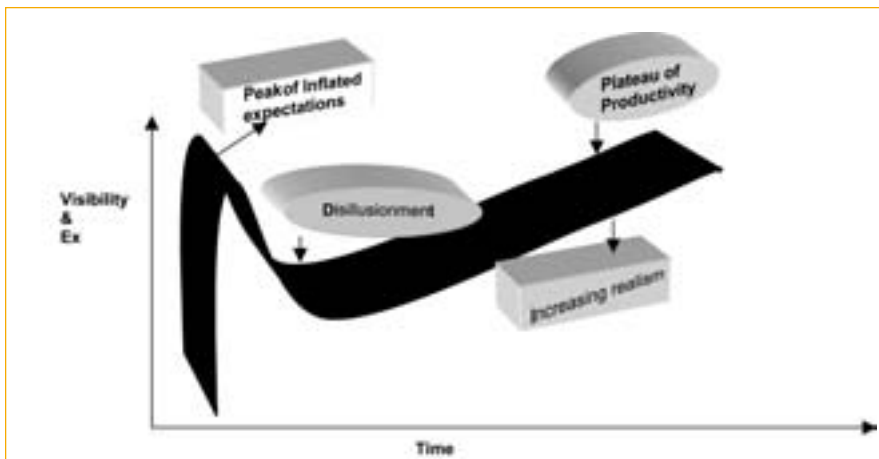


Figure 3 Hype Cycle Model

Source: Adapted from Linden & Finn (2002)

MSSRF in Pondichery undertakes activities aimed at enskilling the rural farmers and fisher folk in using ICTs and also provide information. The project uses CB radios for data analogue voice transmissions between a nodal center and its satellites. In Pondichery, the Foundation has selected a cluster of 12 villages to provide information and knowledge to the rural needy. It provides, for example, thermal wave maps to fishermen to help them to snare bigger catches. This is a clear case of attempts to increase in productivity through the successful use of ICTs. Drishtee, a fast growing initiative, similar to GyanDoot, launches franchised kiosks to rural youth and supports them by providing a wide range of services and information. It has more than 200 centers across Haryana, Rajasthan, Karnataka, Bihar, UP and Himachal Pradesh. One of the strengths of Drishtee is that it tries to enroll government agencies into its operational logic, which greatly helps to fulfill its E-governance promises. Telecommunication and Network Group a CSO in Tamilnadu engages in a project to connect 1000 villages. Its collaborators are MIT's Media Labs and Harvard Center for International Development. It envisages to tap the existence of a sustainable market for information-based services and products in rural areas generated as result of expansion of connectivity and knowledge skills. These and dozens of other similar ventures in various parts of the country have created a new set of initiatives for catering to their requirements. The concept of the 'iStation' and Simputers are telling examples of inno-

vative initiatives that sprang in response to CSOs involvement in using ICTs for development. 'iStation' offers email connectivity at the plug of a phone line through appropriate software and a linked email service. This is priced around US\$ 150 enabling many rural users and NGOs to acquire it. Simputers are available for US\$ 200. This is a pocket device that can read a sim card simultaneously possessing advanced audio and text processing capacity in several Indian languages. The Center for the Development of Advanced Computing (C-DAC) develops Indian language fonts and software, which cater basically to the CSOs in enskilling rural people to use ICTs. The Anusaraka Project in Hyderabad has launched a machine language translation project that supports cross translation of Indian languages.

Nevertheless, not much attention has been given to the practices and experiences of these organizations in India and elsewhere even though their efforts and achievements are widely publicized nationally as well as internationally. The interest of the public sphere in the working of the CSOs in general and ICT based CSOs in particular has resulted in the creation of a set of impressions about their practices, promises and potential. First and foremost amongst them is the view that they are rooted in the resources of the local economy and even if this is not so in the beginning, they have the prospects of evolving into a structural mould capable of drawing on local community resources for their sustenance. The second impression is related to their ability to contribute to local

economic regeneration and there by contributing significantly to the national economy through creation of jobs, developing local services and markets and providing training for enskilling and entrepreneurship, and building social capital. Poverty alleviation through creation of entitlements and capabilities has, hence, become a sloganeered objective of ICT-CSOs. Thirdly, it is also believed that they form replicable models that would deliver universally, provided similar conditions are reproduced through the involvement of State and non-State agencies both nationally and locally, in a continuum of mutual sharing of resources and experience. Finally, it is also widely held that these ICT based CSOs are harbingers of social transformation and they are often credited with achievements that decades of social and political interventions and struggles have been unable to deliver such as reducing gender inequalities and mitigating caste oppression. These assumptions and presumptions have been found to be grossly exaggerated (Sreekumar, 2002a, 2002, b, 2003). Perhaps an impassioned appraisal of the apocryphal elements in these impressions would help us to understand the art of the possible as regards the promises of these organizations. It is in this context that a hype cycle model appears to be useful in explaining the emerging scenario.

### The hype cycle model and CSO Interventions

The hype cycle provides a snapshot of the position of a set of technologies or innovations in the cycle of hype and disillusionment that characterizes a technology's path to maturity (see figure 3).

According to Gartner group "The Hype Cycle depicts the progression of technologies from inception and over enthusiasm, through a period of disillusionment to an eventual phase of maturity. It highlights patterns of overreactions, typically originated by unrealistic expectations and reinforced by media effects." The original model was developed in the context of the triggering and diffusion of ICTs in industry. We are adapting the model to explain the experience of rural ICT interventions. So how does it work? There is initially a technology or innovative trig-

ger, which creates significant interest in the community as well as media consequent on the emergence of a new possibility of ICT use for rural development. The establishment of the multipurpose kiosks catering to local specific and clientele based packaging and delivery of information is a case in point. This interest crystallizes into over enthusiasm and unrealistic projections such as 1000-10000 kiosks in two years, coverage to all villages in 3 years etc. The projections of usage will also be similarly exaggerated. The ideas about sustainability and financial viability will be overly optimistic. These over-inflated expectations are met with a welter of hurdles and the organizational mechanisms turn defensive and either refuse to accept the failures or change strategies. A better understanding of the rural economic dynamics and grounded reality through the interactions in the field of innovation may result in a more realistic and defensible project that is far less high-sounding than the original. If this organizational and technological innovation ingrained in the model

demonstrates its capacity to produce tangible results, it may survive. Still their survival will be conditional.

## Conclusions

Nonetheless, while de-hyping appears to be the need of the hour, a pessimistic negative hype may turn out to be counter-productive. What is needed is a selective strategy of identifying critical technology for fine-targeted goals that are geographically and economically realistic. Whether the major CSOs involved in ICT based developmental initiatives show this wisdom is the major question. Their rhetoric and the barrage of quotes from visitors to their projects aired around are any clue they are far from taking this down to earth attitude.

The CSO interventions in the arena of ICTs have been instrumental in creating a social hype about their effectiveness in resolving developmental problems such as poverty and unemployment. These interventions on the one hand helped to re-define the map of innovation processes by

emerging as an active agent in the dynamics of innovation along with State, Industry and the University. Thus they provide a case for revising the triple helix model of innovation to include civil society into its structure. The CSOs, however have a unique field of innovation where grounded realities of adaptation, adoption and diffusion are enormously important. They have to consider the complex e-patterns of resource use and allocative rationale in rural economies particularly the use of space, labour and power. They are expected to go through a hype cycle more or less similar to the New Technology Gartner Hype Cycles. In India, most of the initiatives are now struggling to maintain themselves at the peak of expectations, but slipping down the path of disillusionment. In order to survive, their operations have to be scaled down to fit the rural realities in India. If they are able to understand this and shape their responses accordingly, they would pass along the path of maturity and continue to make their marginal contributions to the rural economy.

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