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## Editorial

Welcome to the third and the last issue of 2007. I must commend the work of our new editorial team of Nupur and Anuradha who have been very successful in getting several professionals to contribute articles for the newsletter. They have also changed the look and feel of the web pages carrying the news letter. This issue carries a mix of practical lessons on making e-government work; a conceptual piece on ICT enabled social transformations; potential of exploiting alternate ICTs; and interesting cases on ICT use by communities from Nepal and the UK.

There are many areas where technology is beginning to create a social impact, at least for the urban populations in developing countries. The richness of the content on many informational and e-commerce web sites suggests that customers are taking to the web for seeking information and transacting business. Although Internet penetration is still limited in developing countries, absolute numbers of Internet users are large enough in many countries to entice an increasing number of content providers. Developing countries have yet to exploit the potential of m-commerce and m-government even though the growth of mobile telephony has been explosive in large countries in South and East Asia.

Reform in the way Governments transact business in developing countries is still in a nascent stage. Even with hundreds of conferences evangelizing the role of e-government, the action on the ground is woefully slow in countries like India, which has launched a large national program of eGovernance.

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# Making E-Government Projects in Developing Countries More Successful and Sustainable

## Lessons from Two Case Studies from India

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### Abstract

Evidence from e-government projects in developing countries suggests that most of these projects either fail completely or succeed only partially in meeting their objectives. How can these projects be made more successful and sustainable over relatively longer periods of time? In this paper, I examine this issue in the context of lessons drawn from two ICT based government to citizen (G2C) and citizen to government (C2G) projects in India. The projects that I examine are: Gyandoot, a G2C and C2G project aimed at delivering a host of government services to the people in Madhya Pradesh, and the e-government component of the Sustainable Access in Rural India (SARI) project, a G2C and C2G project in Tamil Nadu aimed at delivering government services to the public. I examine the sustainability of these projects and argue that in addition to analyzing the critical factors responsible for success or failure of a project using a cross-sectional analytic framework, it is also important to examine the sustainability using a longitudinal framework along five dimensions: financial, cultural/social, technological, political/institutional, and environmental. I conclude that ensuring a project's sustainability along all these longitudinal dimensions is critical to its long-term success in meeting its objectives. I also draw some general lessons from these cases that are critical to the long term success of such projects. I conclude that successful e-government projects require full back-end computerization to improve service delivery, effective disintermediation, and locally relevant content in the local language. Creating suitable ICT infrastructure and coordination among supporting institutions for service delivery are also very important.

Keywords: e-government, projects, developing countries, India, sustainability, success, failure

### Introduction

E-Government, in its essence, is the use of information and communication technologies (ICTs) in the public sector to improve its internal and external functions and operations. When used for internal functions, it can improve an organization's processes and make

them more efficient and transparent. Externally, it can improve the delivery of services to the citizens, empower them, and bring accountability to the public sector's operations. Due to these factors, it is increasingly being seen as the answer to a plethora of problems that the governments or public agencies in general face in serving their constituencies effectively. This is especially so in developing countries, where generally the public agencies face resource constraints in improving their operations and delivering services to the citizens. In such cases, e-government has been touted as a means to save costs while at the same time improving quality, response times, and access to services (ADB, 2003)

Though researchers have focused considerable attention on how e-government can help the government or public agencies in improving their services, there has been considerably less focus on examining the long-term sustainability and effectiveness of these projects (Aichholzer, 2004; Heeks, 2002; Heeks, 2003a). Researchers have noted that e-government projects in developing countries often fail either totally or partially in achieving their objectives despite initial success (Heeks, 2003a). Heeks (2002) classifies these projects into three categories: total failure in which a new system never gets implemented or is implemented but is abandoned immediately; partial failure in which the major goals are unattained or in which goals are attained for some stakeholders but not all; and success in which all major goals are attained for all stakeholders. The sustainability failure of projects can be classified into partial failure where the project attains its objectives for some length of time but is then abandoned (Heeks, 2002). The proportion of projects in developing countries failing totally and partially may range from 20-25% to 33-60% respectively (Heeks, 2002). Only around 15-20% of the projects can be classified as successful.

Researchers have proposed a number of theoretical frameworks to understand the reasons for the failure of such a huge proportion of e-Government projects. The models proposed include critical success factors (CSF) and critical failure factors (CFF) model (Heeks & Bhatnagar, 1999a), 'design-actuality' (R. Heeks, 2002) or 'design-reality' gaps (Heeks, 2003a), scenario analysis for long-term sustainability problems (Aichholzer, 2004), economic sustainability of rural ICT projects (Best & Maclay, 2002) or political and institutional factors due to lack of commitment on the part of political leadership and public managers (Bhatnagar, 2000).

Though the models presented above are helpful in explaining why a project succeeds or fails in meeting its objectives, they focus on analyzing a project cross-sectionally, i.e., at one point in time. As they are

basically synchronic models, they do not help us in analyzing the project longitudinally. For example, it is possible that a project is successful for some length of time in meeting its objectives, but then suffers a sustainability failure.

Kumar and Best (2006) present a sustainability failure model that explicitly considers the sustainability of the project longitudinally. This model consists of five principal modes of sustainability failure: financial/economic sustainability failure; cultural/social sustainability failure; technological sustainability failure; political/institutional sustainability failure; and environmental sustainability failure.

The failure of a vast majority of e-government projects in developing countries raises important and serious questions about the justifiability of the huge investments in financial and human resources made in these projects. How can these projects be made more successful and sustainable over relatively longer periods of time? In this paper, I examine these issues in the context of lessons drawn from two ICT based government to citizen (G2C) and citizen to government (C2G) projects in India. The projects that I examine are Gyandoot, a G2C and C2G project aimed at delivering a host of government services and receiving grievances from the people in Madhya Pradesh, and Sustainable Access in Rural India (SARI), a private and NGO managed G2C and C2G project in Tamil Nadu aimed at delivering a host of government services and receiving grievance petitions from the public. Both these projects are examples of sustainability failure where the projects achieved considerable success in the beginning but then failed to achieve most of their objectives over the long term.

The rest of the paper is organized as follows. First, I briefly describe the two projects mentioned above and how they managed to achieve considerable success in the beginning; next I discuss the research methods employed in this study; then I examine the reasons for sustainability failure or success of these projects using the appropriate theoretical frameworks discussed above; and, finally I examine the general lessons that can be drawn from the implementation of these projects and how they are relevant to other such projects in developing countries.

### **Brief Description of the Projects**

I take up two widely known and acclaimed e-Government projects in India for detailed analysis of their sustainability in meeting their objectives over a relatively long period of time. The first project, Gyandoot, was implemented in Madhya Pradesh state in India while the other project, SARI, was implemented in the state of Tamil Nadu in India. I

discuss below the main features of these projects and how they were implemented.

#### *Gyandoot*

This project was started in 2000. The project established intranet based kiosks in villages with the goal of delivering information related to agricultural practices, crop prices, etc., delivering government services such as copies of land records, on-line applications for caste, income, domicile certificates, and providing an online system for Redressal of public grievances (Bhatnagar & Vyas, 2001). The project was considered path breaking at its time and won several awards at national and international levels. However, subsequent evaluations of the project show that the project has failed to meet its objectives and the usage is quite low (Cecchini & Raina, 2003; Centre for Electronic Governance, 2002). The main reasons for the failure of the project are lack of computerization of the back-end processes, lack of supporting ICT infrastructure in the villages, lack of supporting initiatives for better service delivery, lack of financial sustainability of the kiosks, and lack of relevant content for the poor (Cecchini & Raina, 2003; Centre for Electronic Governance, 2002). The implementation of the project also suffered tremendously as no efforts had been made for institutionalizing the project after the initial champions left (Cecchini & Raina, 2003).

#### *Sustainable Access in Rural India (SARI)*

The e-government component of the SARI project is a G2C and C2G project in Tamil Nadu aimed at delivering a host of government services and receiving grievance petitions from the public. The project was started in 2001 as a private initiative through the collaboration of several organizations in India and abroad. It uses a Wireless-in-Local Loop (WLL) technology to provide internet connectivity to rural villages. The internet connectivity is offered to the local community at kiosks, which are run as a self-sustained business with cost recovery through service charges. A majority of the kiosks are locally owned and operated by self-employed entrepreneurs, while some are operated by self-help groups of a local non-governmental organization. Though the kiosks also offer a number of other services, e-Government was an important component of the project during the first year of its operation.

The e-Government services provided through the kiosks consisted of sending applications electronically to the Taluk office for birth, death, income, and community certificates, old age pensions, and general grievance petitions to the higher government officials. The Taluk office would process these applications and send the certificates through the kiosk operators who in turn would hand them over to the applicants in the

village itself. This had led to substantial savings in cost and time for the applicants and had also reduced corruption in delivery of these services (Kumar & Best 2006). The kiosks were reasonably successful in providing these services during the first year of their operation.

However, this component of the project failed to sustain itself after one year due to a number of reasons. Primary among these were lack of adequate training of government office personnel, lack of sustained leadership and institutionalization of the processes in the government office, lack of consistent evaluation and monitoring, and opposition from government personnel in the lower hierarchy due to reduction in opportunities for rent-seeking (Kumar & Best 2006).

## **Research Methods**

I mainly use qualitative research techniques for this study. In particular, I employ the comparative case study method for analyzing these projects and to draw general lessons from them that may be useful for planning and implementation of similar projects elsewhere. While I use secondary data for analyzing the Gyandoot project, I use primary data for analyzing the SARI project. The secondary data for analyzing the Gyandoot project comes from published studies and reports on this project. The primary data on the SARI project was collected by me during field research during summer of 2003 and 2004. This data came from detailed interviews with the government officials involved in the project, the SARI project officials, the kiosk operators, and the users of the e-government services. I interviewed eight government officials, who included the state level government secretary of the information technology department and every official involved in the project at the district and taluk levels, and four SARI project officials including the project manager stationed at state headquarters in Chennai and 3 local officials stationed at Melur. I also interviewed 12 kiosk operators to understand the entire process behind delivery of e-government services and the reasons for their subsequent failure. In addition, I also conducted interviews with 10 users of these services in 4 kiosk villages to understand the reasons for their choosing the kiosks for obtaining these services instead of submitting a paper application as before. I conducted all interviews using structured questionnaires, designed separately for the village users, kiosk operators, and the government and project officials. Each of these interviews took around one hour to complete.

## **Sustainability of e-Government Projects**

As discussed earlier, researchers have proposed a number of theoretical frameworks for understanding the reasons for sustainability failure of a majority of e-

government projects in developing countries. I use two of these models to analyze the sustainability of the two e-government projects discussed in this paper. These models are the critical success factors (CSF) and critical failure factors (CFF) model by Heeks and Bhatnagar (1999b) and sustainability failure model proposed by Kumar and Best (2006). I first briefly discuss these two models and then explain how they can be used to explain the sustainability of the two cases discussed here.

### *Critical Success and Critical Failure Factor Model*

As per this model, success or failure of an ICT project can be understood in terms of several critical success and critical failure factors (Heeks & Bhatnagar, 1999b). These critical factors can be organized into ten broad categories as follows: (i) information factors relating to provision of content; (ii) technical factors such as availability of hardware and software, compatibility of different hardware and software platforms, etc.; (iii) people factors such as availability of skilled personnel, appropriate training in use of hardware and software, etc.; (iv) management factors, such as appropriate management and organizational practices for bringing the desired changes through ICT projects; (v) process factors, such as modifying existing or designing new processes for making the project successful in achieving its objectives; (vi) cultural factors, such as reforming organizational culture for successful implementation of new projects; (vii) structural factors, such as structural rigidities in traditional organizational structures that may be a cause for failure of ICT projects that aim at reforms; (viii) strategic factors, such as decisions that cover a wide range of services or cut across a number of departments or affect the project's performance over a relatively long term; (ix) political factors, such as political support and support from the stakeholders; (x) environmental factors, such as changes in the overall external environment of the project.

Heeks and Bhatnagar (1999b) then go on to synthesize the above ten categories into seven critical dimensions: Information; Technology; Processes; Objectives and values; Staffing and skills; Management and structures; and Other resources. This framework requires assessing the gaps that exist in the design of the project and the reality along these seven dimensions. Heeks (2002) further refines this framework using a contingency model of organizational change into a design-actuality gap model. This model is more useful for assessing the likelihood of failure of a project based on the gaps that exist along each of the seven dimensions rather than analyzing the reasons for its actual success or failure.

### *Sustainability Failure Model*

Kumar and Best (2006) present a sustainability failure model that explicitly considers the sustainability of a project longitudinally. The model consists of five principal modes of sustainability failure, which are as follows:

- (i) Financial/economic sustainability failure: For example, a donor supported program loses its funding after some time.
- (ii) Cultural/social sustainability failure: For example, some stakeholders gain from the project but some others are hurt. This tension over time leads to sustainability failure.
- (iii) Technological sustainability failure: For example, the field hardware and software become obsolete and are no longer compatible with the equipment within the central offices. This also examines the relevance of the content provided.
- (iv) Political/institutional sustainability failure: For example, the local champions leave and without larger institutional structures in place the project fails.
- (v) Environmental sustainability failure: For example, a project that does not have plans for disposing of or reusing equipment when they become obsolete or lose their usefulness.

As noted before, the CSF and the CFF model is a synchronic model that analyzes the reasons for success or failure of a project at one point in time. However, it is very useful in explaining the factors responsible for a project's success or failure. When used in conjunction, the two models discussed above can provide a more accurate picture of the longitudinal success or failure of a project. I discuss below how we can employ these two models to analyze the longitudinal success or failure of the two projects discussed here.

### *Gyandoot*

As explained before, this project has failed to meet its objectives due to lack of computerization of the back-end processes, lack of supporting ICT infrastructure in the villages, lack of supporting initiatives for better service delivery, lack of financial sustainability of the kiosks, and lack of relevant content for the poor. The implementation of the project had suffered tremendously as no efforts had been made at institutionalizing the project after the initial champions left.

As per the CSF and CFF model, clearly the main factors responsible for failure of the project are information (lack of appropriate content for the poor),

technical (lack of back-end computerization and ICT infrastructure), management (lack of appropriate management and organizational processes for bringing the desired changes), process (lack of redesigned processes for delivery of services), and political (lack of institutionalization) factors.

As per the sustainability failure model, we can see that the project suffered a sustainability failure along four of the five dimensions: financial (lack of financial viability of the kiosks), social (stakeholders did not benefit), technological (lack of back-end computerization and ICT infrastructure), and political and institutional as the local champions left the project.

Combining the two models, we can say that the project suffered a sustainability failure due to lack of financial, social, technological, and political and institutional sustainability due to information, technical, management, process, and political factors.

### *Sustainable Access in Rural India (SARI)*

As noted before, the primary reasons for the failure of the e-government component of this project were lack of adequate training of government office personnel, lack of sustained leadership and institutionalization of the processes in the government office, lack of consistent evaluation and monitoring, and opposition from government personnel in the lower hierarchy due to reduction in the opportunities for rent-seeking.

As per the CSF and the CFF model, we can see that the critical failure factors were: people (lack of training for the government staff), management, cultural, and structural (lack of sustained leadership and institutionalization, power shift), and process (lack of evaluation and monitoring).

As per the sustainability failure model, we can see that the project failed due to political and institutional sustainability failures. Combining the two models, we can say that the project suffered a political and institutional sustainability failure due to people, management, process, cultural, and structural factors.

### *Conclusion*

As we can see from the analysis presented in the preceding sections, the two models when used in conjunction provide a more accurate picture of the sustainability failure or success of a project. While the CSF and the CFF model helps identify the factors responsible for success or failure, the sustainability failure model helps us in longitudinal analysis of the sustainability of a project.

### **Making e-Government projects more sustainable:**

## what lessons can be drawn?

Analysis of the sustainability of the two e-government projects discussed before offers a number of general lessons for making these projects more successful and sustainable in meeting their objectives. I discuss these in brief below.

### *Mere Supply of ICT is not Sufficient: Successful e-Government Projects Require Complete Backend Computerization*

The analysis of the two projects here shows that backend computerization is essential for cutting-edge online service delivery to citizens. As noted before, this was one of the major reasons for the failure of Gyandoot. This aspect points to the need for focusing on the transformation required for achieving the goals of the project and not just merely on supplying more ICTs.

### *Disintermediation is Important for Successful Service Delivery*

The experience of these two projects also shows that disintermediation is a must for cutting-edge delivery of services online. Lack of disintermediation was an important reason for the failure of Gyandoot, where people still had to go to the concerned government office even after they had applied through the kiosk (Cecchini & Raina, 2003).

### *Localized and Relevant Content is Critical*

The experience of Gyandoot shows that locally relevant content is critical. Though the kiosks offered a number of services, only very few were actually being used. Content in the local language is also extremely important for increasing usage and delivering the benefits to more people. Customized content for women is also important for increasing usage among them and addressing gender specific digital divide (Cecchini & Raina, 2003).

### *Need for Coordination among Supporting Institutions*

Another important lesson from the analysis of the above projects is the need for ensuring proper coordination among supporting departments for real time updation of data and better online service delivery. These projects depended on coordination among various departments for delivery of services. As noted before, while both projects enjoyed considerable success in the beginning, they failed in sustaining their success due to lack of coordination and support from the supporting departments. This shows the presence of strong complementarities in ICT projects and the need to ensure good coordination among various agencies involved.

## *ICT Infrastructure, Project Implementation, and Sustained Leadership are Extremely Important*

Lack of adequate supporting infrastructure for ICT (electricity, telephone, etc.) was an important reason for the failure of Gyandoot. Lack of financial sustainability of the kiosks due to very low usage was another important factor. Though it may be difficult to ensure financial sustainability through user charges in some e-Government projects in very poor communities, in the case of Gyandoot, the problem was due to drastic reduction in usage over time (Cecchini & Raina, 2003). Implementation of the project and coordination with different government departments also suffered after the initial champions of the project at the district level left. These factors are extremely important in any e-Government or ICT for development project. Several authors have noted their critical importance in ensuring the success of such projects (Bagga et al., 2005; Keniston, 2002; Kumar, 2004).

## **Conclusion**

This study clearly shows the importance of analyzing and understanding the sustainability of e-government projects along its multiple dimensions. Employing two different analytical frameworks, it shows the importance of identifying the critical factors responsible for a project's failure or success and understanding the sustainability of a project along financial/economic, social/cultural, technological, political/institutional, and environmental dimensions. The case studies of two widely known e-government projects in different parts of India clearly show the importance of ensuring sustainability of such projects so that the objectives of the project are met for all the stakeholders over the entire duration of the project and merely in the beginning. The general lessons drawn from them show that successful e-government projects require full back-end computerization to improve service delivery, effective disintermediation, and locally relevant content in the local language. Creating suitable ICT infrastructure, coordination among supporting institutions for service delivery, and sustained leadership are also very important.

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## Defying the Odds: A Success Story from the Mountains of Nepal

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### Introduction

In this article we present an example of a successful IT-facilitated development project from one of the most challenging locations in the world - Nangi village in Nepal - and suggest that there are five lessons from this small case that can be useful to the entire E-Government community. While the literature, websites and blogs are filled with positive stories of IT deployment in a developmental context, we must sadly note that there is an equally large, but perhaps less heralded body of information about significant failures in E-Government deployment. Richard Heeks recently called attention to the [disastrous consequences of health care system implementation in the UK](#). Gauld and Goldfinch<sup>3</sup> cite similarly unsuccessful findings in the same kind of system in New Zealand. The New Zealand project was described this way: "The story is one of lost opportunity, political negligence, shifting ideas about health policy and the shape of the health system, and the development of the Byzantine ICT topography."

Robert Schware of the World Bank, speaking frankly about IT developmental deployment problems, estimated a few years ago that [only about 15 percent of E Government projects meet their goals and over a third of them are complete failures](#). The project we describe is one that fits in that rare 15 percent of success stories mentioned by Mr. Schware, yet it is situated in an area that would seem least likely for

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<sup>1</sup> <http://www.icasit.org/>

<sup>2</sup> <http://www.himanchal.org/>

<sup>3</sup> Gauld, R. & Goldfinch, S. (2006). *Dangerous Enthusiasms: E-government, Computer Failure and Information System Development*. New Zealand: Otago University Press.

high achievement, the mountains of Nepal. The Nangi village experience seems to be a metaphor for what is possible when the five fundamentals of development are met:

1. A comprehensive, agreed-upon plan
2. Enthusiastic participants and favorable publicity
3. Appropriate IT interventions
4. Sustained follow-on projects
5. Skilled leadership by home-grown talent.

Adequate funding could also be mentioned but the accomplishments at Nangi were attained with modest investment, mostly funds from Himachal Education Foundation in Nebraska, International Center for Applied Studies in Information Technology (ICASIT) in Virginia, the Donald A. Strauss Scholarship Foundation, Poverty Alleviation Fund Nepal and many other donors and volunteers. Recently, International Telecommunication Union has also provided equipment to expand the existing network to ten more villages. Moreover, the project is currently working on replicating the network in three different parts of the country. It is significant that the project leader, Mahabir Pun, was recently selected as the [2007 winner of the Ramon Magsaysay Award for Community Leadership](#) and honored in a ceremony August 31, 2007 in Manila for his work at Nangi and the surrounding region.

### **The Plan for IT Deployment: Gradual, Focused Development**

Nangi<sup>1</sup> is a mountain village of 800 inhabitants in the mid-hills of western Nepal at 7300 feet elevation, near the Annapurna and Dhaulagiri ranges of the Himalayas. The hike into Nangi takes six to nine hours from the nearest large town, Beni, and includes an ascent through several mountain villages and forests. Nangi has no factories. All of its people are farmers whose tools are wooden plows, iron spades; axes, sickles, chisels and hammers. No machinery or automated tools are available. Ox and yak power, not tractor power, is used to plow the fields. The people are accustomed to carrying large loads on their backs, as they have been doing for centuries. Life in Nangi is very difficult. Yet now Nangi has computers, a robust wireless Internet to nearby villages and the worldwide Internet community and has been the subject of dozens or reports by news services like BBC, ABC News, PC Magazines, and The Sydney Morning Herald and many more<sup>2</sup>.

### **First requirement: A comprehensive, agreed-upon**

<sup>1</sup> Source: <http://www.himanchal.org/village-economy.html>

<sup>2</sup> Visit <http://www.nepalwireless.net/newsarticles.php>, <http://news.bbc.co.uk/2/hi/technology/3744075.stm> and <http://www.smh.com.au/news/World/Himalayan-village-joins-wireless-world/2004/12/26/1103996439623.html> for more news, stories and articles about the Nangi Project.

### **plan**

Almost a decade ago a plan was developed at the village level to take advantage of the Internet through establishing a connection that could assist in improving health care, agriculture, education, thereby improving the economy of the region. The project has required several steps: first, getting electricity, then setting up a high school computer lab and, a few years later, developing a robust Wi-Fi network<sup>3</sup> connecting four other villages and the Internet hub in Pokhara, a large city about 22 miles away from the nearest relay station. Mahabir Pun and a small team consisting of undergraduates from UCLA and teachers from local Nepali communities were able to set up the network in about three weeks in September 2003. A dozen access points were connected to the dial-up ISP in Pokhara using equipment supplied at cost price by manufacturers. High capacity antennas (Pacific Wireless PMANT24 24-dB-gain directional for 2.4 GHz systems) were required and electricity was supplied by solar panels, wind and water generators. Positioning all the equipment - access points, antennas, power generating equipment, etc.- required traversing vertical distances of over a mile for each installation, since the villages were all at 7000 feet above sea level or higher.

Over the past eleven years, Pun and the villagers have constructed a secondary school (with a library), a plant nursery, a health clinic and its associated telemedicine video link to Pokhara, a carpentry facility, paper-making and sewing machine workshops, a camping ground for trekkers (which includes e-mail capability), a fish farm and a yak farm. The computer lab, shown in the pictures below, was a hodgepodge of equipment donated from many sources. There were several old Windows machines, all with RAM of 64 MB or less, two iMacs running OS X, and one Linux machine. When online processing was instituted some of the software used was freeware, saving on expense and complexity. Currently, Mahabir Pun is working with [Open Learning Exchange](#) (an NGO) to develop interactive educational contents using open source based on the government's curriculum for the school students.



*Computer training in Shikha<sup>4</sup>*



*Villagers reading online newspaper in Khibang<sup>1</sup>*

<sup>3</sup> For a collection of pictures of the wireless network, visit <http://www.nepalwireless.net/photos.php>.

<sup>4</sup> Source: <http://www.himanchal.org/school-mahabir>

## Telemedicine

The availability of links to outside sources has made it possible for Nangi to have its own telemedicine system. The early cases, in mid 2006, involved serious diarrhea, pre-natal problems and serious injuries. Two local health workers receive guidance from doctors in Pokhara through the telecommunications system and are able to deal with the situation satisfactorily. Mahabir Pun has also been organizing occasional training programs for village health workers with the help of visiting medical professionals and using audiovisual equipment made available through ICASIT<sup>2</sup>.



*Lila checking a patient*



*Rupa consulting with a doctor using laptop*

## Agriculture - better yield from yaks

Farmers are also helped by the Wi-Fi linkage. One of the early benefits was the ability to communicate frequently with the yak herders of the nearest yak farm, a grueling two-day journey by treacherous foot paths from Nangi, about the need of supplies, and the need of medicine for the yaks. Farmers were also able to use the Internet to check on spot prices of crops, new agricultural techniques, seeds and other important information through this system. Moreover, village farmers are being able to advertise their farm products for sale in the local market through local e-commerce site created by the project.

## Enthusiastic, committed participants and favorable publicity

The local villagers in Nangi were the biggest supporters of this project, and also its greatest beneficiaries. The support network stretches around the world - from Nepal to the various equipment manufacturers in the United States that supplied the required network gear, to the foundations and individual donors who gave sufficient funds to keep the projects going, to the many volunteers, including doctors from Pennsylvania State University and University of Nebraska, and other sources like George Mason University, Himanchal Education Foundation, and UCLA.

## Appropriate IT interventions

Many developmental projects, even in very poor countries, try to use the very newest and most complex equipment, reasoning that it will help the local project to “leapfrog” ahead. In Nangi the model was very different. Nangi did not have any funding available when it started the wireless project in 2002. Therefore the emphasis was on using the simplest, cheapest, and used equipment and leveraging it to the maximum. When it came time to set up a WiFi connection, the emphasis was on strong, high-capacity, easily maintained equipment, but the deployment strategy included liberal use of very simple approaches, like employing as many existing natural objects for antenna placement as possible, including trees and rocky crags.

## Skilled leadership by home-grown talent

Nangi and the other villages had several skilled teachers, and Mahabir Pun was able to coordinate their efforts effectively, thereby guaranteeing that there would be a continuous transmission of expertise, new ideas, and an increase in qualified people. Every project needs a Mahabir Pun, a person who understands the region but also has the wider vision to integrate technology, political savvy, and a carefully coordinated plan for a successful implementation. All the volunteers from the United States and around the world - doctors, dentists, nurses, college students etc. - were particularly careful not to try to “take over”. Instead, they were able to stimulate the village experts to be more independent in their use of the training and to spread the knowledge extensively.

## Sustained follow-on projects

One of the most interesting aspects of this project was that once the villagers started communicating about livestock, crops, health care and other useful subjects, they found that there was a niche that would generate other economic gains, and give some of a villagers a new way to use their skills. A paper-manufacturing business has come to Nangi<sup>3</sup>. One of the villagers was sent to Kathmandu for training and returned to train a cadre of others. The result is a new way to leverage both the technology and the inherent craftsmanship of these villagers for creating highly saleable paper products for upscale customers in larger cities in Asia. Recently the villagers also started jam making program from plums and juice making program from rhododendron flowers hoping to sell the products in the market. We feel that one of the indices of success for development objects is not simply meeting the goals, as difficult as that can be, but also establishing a sense of progress that opens up many more opportunities. That is what has happened in Nangi.

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<sup>1</sup> pun.html

Source: <http://www.himanchal.org/school-mahabir-pun.html>

<sup>2</sup> Pun describes his plans for telemedicine at [http://icasit.org/Nepal\\_Telemedicine.htm](http://icasit.org/Nepal_Telemedicine.htm).

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<sup>3</sup> For pictures and more details on the paper-making project, visit [http://icasit.org/Nepal\\_Telemedicine.htm](http://icasit.org/Nepal_Telemedicine.htm).

## Conclusion

We have suggested that there are five characteristics of the Nangi experience that have made it a regional success and a model for other implementations. Unfortunately, literature indicates that most development projects fail, even if extensive funding is lavished on them. This one succeeded because it was able to concentrate on the crucial elements of good development practice. The carefully crafted plan assured that the aims and means were well aligned. Enthusiastic participants were frequently consulted and their feedback and additional ideas have kept the project on course for almost a decade. Also there was considerable publicity in several major national and international news outlets during the life of the project, assuring broader dissemination of lessons learned. The technology interventions, although taking advantage of the very best available equipment, were aimed at solid, maintainable systems, instead of fancy, state-of-the-art experimental gear. The follow-on projects, including the paper business and others described above, seemed to be a natural outgrowth of good developmental planning. When people are enthusiastic and initial plans are successful, new opportunities do not seem impossible.

Finally, we acknowledge the importance of home-grown leadership and particularly the contributions of Mahabir Pun. We urge the practitioners as well as students of e-government to take careful note of the Nangi case. We feel it can be extended far more broadly, and the lessons learned are certainly applicable anywhere in the world.

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## Broadband and Governance: Empowerment or Illusion?<sup>1</sup>

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Proponents of Information and Communication Technology for Development (ICT4D), roaming the corridors of power restlessly, find reasoned arguments for the support of the rapid dissemination of broadband connectivity in India which seem to bounce endlessly off the walls. In the meantime, the doors of decision makers seem ever more open to the blandishments of commercial technology providers, whose bulging balance sheets reflect their seductive views on where the demand really lies: in the ready pockets of the *arrivistes*.

Do alternate technologies exist in reality, and can they

really provide meaningful leverage for development? This article takes a quick look at the choices for India.

Smart connectivity, a sea change from the analogue technologies ubiquitously deployed in the developed economies of the 20th century, appears to be a powerful argument for the spread of equitable governance. Proponents of these technologies argue persuasively that a "knowledge society" is one armed with more information (and by corollary, better information): better information enables better choices.

Paradoxically, despite the apparently liberalized economy now prevailing, the overwhelming thrusts of technology deployments in fact continue to be 'dumb' solutions. Some admittedly wear a digital guise: GSM and CDMA and the newer, digitally enhanced, landline switched circuit technologies of the last decade. However, like wolves in sheep's clothing, these solutions conceal their capacity to take more than they give: the illusion of information transformation, when the reality is barely more than a mere conveyance of ephemeral data.

All data transfers take place through centralised 'switches', currently powerful microprocessor controlled devices demanding enormous infrastructure in terms of building and electricity to perform. Any interruption in the ability of these switches to function, results in total breakdown of service.

This data exchange therefore comes at a huge, yet mostly hidden, cost. The picture of the Indian ship of state racing through the ocean of economic development, with the skyline stippled by the awesome beauty of icebergs, comes irresistibly to mind. The dependence of ordinary people on faceless and occasionally unresponsive commercial entities for basic telecommunications, representing a paradigm shift from an earlier, exceedingly inadequate but state-supported, system is clear. It was necessitated by an unfortunate belief that communication was a luxury: this fallacy is completely discredited today, with telecommunications the very backbone of grassroots-driven development.

Traditional telecommunication solutions, both landline (wired or fiber, the concept is the same) and mobile, use the principle of circuit switching. In this model, an exclusive circuit is reserved for each conversation, or exchange of data. In effect, a portion of the entire connectivity infrastructure is devoted entirely to this particular dialogue. Digital enhancements to this model enable such sophisticated features as the sharing of multiple conversations in the same space, in the form of conference calls, but each additional participant actually occupies an additional circuit.

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<sup>1</sup> © Vickram Crishna, Radiophony, Mumbai

At this point, I think it is important to note that the apparent exclusivity of the circuit by no means assures personal privacy: the nature of the solution in fact leaves immense scope for the subtle content transfer of such exchanges to third parties, with or without the knowledge or consent of the conversationalists. This is equally true of both GSM and CDMA as well, although being digital, these technologies are inherently capable of powerful encryption. There is little doubt that both protocols are compromised by design, provided with backdoor approaches to decryption.

Quite apart from these characteristics, this kind of communication network also features the need to reserve a complete end-to-end circuit for each call. GSM and CDMA technology networks also 'poll' devices and switches frequently, using reserved frequencies in order to achieve this activity. These frequencies are also used for 'handshaking', the mutual exchange of identification needed to correctly place the call, prior to allocating the dedicated network resource needed to maintain it until conclusion.

To summarise, circuit-switched telecommunications have a history of over a century of existence, and have progressed from electromechanical, completely analogue servo-mechanized switchgear, to electronic, largely digitally operated solid-state mechanisms. They are characterized by dependence on intermediate expensive and resource-hungry devices for proper functioning of the system. The logistics of delivering call fulfillment also demands enormous resource allocation from the network, with complete end-to end circuits locked up exclusively for the entire duration of the call, and additional spectrum reserved for 'handshaking' and 'polling'.

Interestingly, the lengthy history of this exclusively dedicated resource paradigm makes it difficult for many users in India to even conceive of alternates. However, they do exist, and have come about from the diametrically opposite direction of digital computer technology development.

While microprocessors are heavily used in modern switched circuit telecommunications, they are mainly used to control the switching function, and play little role in subsequent activity. Microprocessors have, on the other hand, been central to the development of low-cost, so-called 'personal' computing, systems built on relatively inexpensive general purpose computers that enable a variety of applications from games to heavy-duty scientific calculations.

At the very early stages of the development process of microcomputers, it became an obvious advantage to be able to link them together in digital networks, harnessing the power of both devices and human users

to work together collaboratively. Until 1995, such networks were largely connected physically, using various sophisticated cabling techniques to enhance the quality and throughput of data interchange.

However, that year, IEEE, the Institute of Electrical and Electronics Engineers, the standards body for electronics, issued the 802.11 standard for wireless data networking. It had been under discussion for several years, and finally all the participating manufacturers agreed to settle on a specification that all could meet. Almost immediately, the new standard became known as Wi-Fi, a play on the acoustic home audio quality standards known colloquially as Hi-Fi.

The new standard allowed suitably enhanced computers to exchange data, using tiny RF transceivers built on circuit boards with the necessary computer serial communication interfaces. Current interfaces include fast USB; this opens innovative possibilities that are the subject of enthusiastic research and development, about which more follows.

A fundamental difference between 'mobile' telephony (actually, 'cellular' telephony is a more accurate description) and the 802.11x standards is the fact that the latter operate on the exchange of self-addressed 'packets' of data, rather than the exclusive switching of entire end-to-end circuits. Essentially, any slice of spectrum in any physical geographical segment of the network is only used for the time it takes to transfer a single packet from one node to the next.

The specifications were designed to enable wireless connectivity at relatively close range, mimicking LAN standards that use UTP cable, and using industry standard Internet Protocol (IP). For this reason, such wireless networks are nicknamed WLAN (wireless local area network), and offer data throughput rates that parallel those available in wired/cabled networks.

Very quickly, do-it-yourself enthusiasts found that by tweaking the hardware with improved antennae, it was very easy (and with home-built antennae, very cheap) to extend the distance between wireless points, from the original 100 meters to hundreds, then thousands of meters. While effective communications need line of sight between points (nodes), this can (and has been shown to) extend till hundreds of kilometers. Recent advances such as the USB Wi-Fi dongle have been adapted to build even more sophisticated and reliable high-gain antennae, almost literally in kitchens, using cheap and convenient kitchen gear.

Commercial hardware manufacturers also began producing devices and antennae that exploited this feature, thus adding public credibility to the development. Since the devices are commonly sold for domestic use by a multiplicity of vendors, they exploit

competitive market forces, especially with regard to costs: for example, the street price of a USB 802.11 b/g mini-device (external) has dropped in price from about Rs 1,000 a year back to Rs 200 currently.

An important factor is that spectrum regulators across the world (including in India) have allowed unlicensed outdoor use of the frequency band for this purpose. Actually, the original spectrum (nominally 2.4 GHz) was unlicensed to begin with, under international agreement, as 'junk', or unreserved, spectrum available for domestic use in microwave ovens, cordless phones and so on, but it is important to specifically allow its unrestricted outdoor use.

Modern variations of the standard (labeled 'a', 'b', 'g' and the latest 'n', released in September 2007) use other frequencies, but the unlicensed use of such frequencies is not universal (in India, one such band, nominally called 5.1 GHz, is restricted for indoor and campus use only).

As pointed out above, the development of this 'industry' was shared between the corporate sector and do-it-yourself enthusiasts, with much of the fruits of research being available in the public domain. This allowed the growth of public 'free' networks (ie, free of proprietary access): importantly from the point of view of this article, such networks have been very crucial to the provision and sustenance of rural networks.

Perhaps the most impressive of these 'community' networks is in Djursland, a rural district of Denmark. As of date, some 20,000 rural homes are connected across several hundred square kilometers. This area was a dying rural farming community, where modern societal services such as telecom, health and transport were being discontinued. This situation prevailed until 2003, when the network was initiated. Some 35 commercial telecom providers had either outright refused service or proposed nonviable pricing plans at that point. The Djursland network, in contrast, is maintained and physically grown by its own community members.

In India, several scientific and technological institutions have demonstrated the practical utility of such networks, including IIT Kanpur. However, the only very large network in existence locally is the 2,000 plus nodes of the AirJaldi network run by the Tibetan Technology Center in and around Dharamsala, in Himachal. There are many other smaller networks, run by NGOs and local communities, scattered across the country.

Following the development of WLAN, commercial companies have been researching other 'business models' using wireless. The emerging standard, called WiMax promises to deliver broadband across medium

distances using a cellular distribution. It is currently under commercial testing in several regions, including India.

While this protocol also involves packet-switched data exchanges, all packets must be transacted through central servers rather than being self addressed. Obviously, it is possible to rationalize some amount of packet size between the address and information components, and this account for the increased data throughput capability. However, an increase in capacity in the new 802.11 'n' standard makes some of this advantage moot. Cost (total cost of installation) comparisons between Wi-Fi and WiMax indicate a twenty-fold increase in the case of the latter.

To summarise, it is economically and technologically possible for communities to set up and run their own very wide area data networks, primarily using industry-standard devices sold for domestic use and thereby taking advantage of economies of scale in their manufacture and marketing. It is also possible that new commercial wireless distribution of broadband data services will become commonplace in the future.

Since the exchange of data packets is entirely digital, digitally processed functions such as audio, video and multimedia simply represent resource allocations in the total data packet interchange, and given sufficient bandwidth can be served effortlessly within and through the network. Network applications such as VoIP, videoconferencing and so on are ubiquitous, with innovative variations possible in education, healthcare and other useful socially desirable possibilities are daily transforming service deliveries in these sectors.

Importantly, the technology inherently allows users to merge relatively seamlessly between data (common) and dedicated content streams such as telephony and television. This means that it is possible, in theory, to substitute traditional content access technologies with wireless data networks. Of course, in the interest of efficiency and minimizing gross network utilisation, some applications, such as access to archives, are better run from servers that are deliberately kept as local as possible.

As it happens, such access is interestingly different, conceptually, from their parallels in the historical telecommunication paradigm. Continuous audio and video, for instance, arise from 'streaming' content delivered from storage servers, just as audio and television is delivered from storage media. The fundamental difference lies in the way that the storage can be accessed, which is by deliberate selecting the preferred choice. This can be as particular as a single 'track', or file.

In traditional media, radio and television, this is done by 'tuning' the receiver to a particular station, and further 'drill-down' is not possible. Interactive multimedia isn't even possible. And telephony is a completely different arena from the push media. Naturally, this dynamic has significant (and not unexpectedly, a positive) influence and impact on the efficiency of network resource allocation and utilisation.

It is not the intention here, given limited space, to exhaustively explain these philosophical differences that arise primarily from the technological underpinnings. The interest here is to understand the 'business models' that dictate how such technologies are actually deployed.

Since the traditional media are conceptually end-to-end, the infrastructure for delivery must necessarily be created in detail, from the point of content creation to the 'last mile' delivery to the end-user. This is not required in the case of IP based digital data transactional systems, where individual 'lakes' of information resources are 'pooled' together through interconnection.

Extraordinarily, the 'lakes' are actually created by the users themselves, thus transforming the 'last mile' into the 'first mile'. From the developmental viewpoint (and of course, a society that is not developing is stagnating), the difference is staggering.

Do the interconnects (regional, national, international) still remain as part of the infrastructure resources that society needs to externally (i.e., through complexes of public, private or joint sector services) provide? Until the development of IP-based wireless, this was entirely true, but is no longer so. To a large extent, IP based (cable) networks grew out of shared infrastructure, although there has been a stream of propaganda that a single US armed forces research program was responsible for the growth of the Internet. As the popular expression goes, such statements are rather economical with the truth.

While not pretending to argue that this kind of community exercise can be repeated at the global level, at the fine-grained - and even national-level, the situation is different. Many metropolitan areas around the world are choosing to set up their own, public, networks today. The ability to attract the sort of intelligent and hardworking people who typically need access to interconnected networks far outweighs the cost of setting up and maintaining free to access wireless interconnectivity. Urban conglomerations need high value, high revenue generating citizenry, in order to offset their costs and remain good places to work and live.

Rural areas are no different, although nearly everywhere in the world, the population density needed for society to exist is far lower, and the revenue generating potential even more so. This low economic density actually discourages providers of commercial services from investing in the level of switched network resources that assure high-quality connectivity. Poor connectivity, in turn, discourages high-value citizenry from staying rural. The problem of people immigrating from rural to urban centers is huge: both areas suffer almost insoluble difficulties as a result.

As far as rural telecom goes in India, the performance of the corporate sector is almost as dismal as that of the public sector, that once held the Indian telecom service as a monopoly. Recent astounding growth levels in total telecom density, almost entirely due solely to the mobile sector, and in fact quite possibly, more than offsetting the dropout rate of the landline segment (figures on true telecom penetration are unfortunately skewed badly for reasons well known to many, although not germane to this article) are sadly confined to the urban sector.

The digital enhancements of the traditional (if that is the right word) interpersonal telecommunication media - text messaging, caller identification, etc - have opened up new possibilities for increasing their relevance to economically poor areas. These are characterised by extraordinarily low teledensity (even by Indian standards - overall density is in the low double digits, but rural density is still in single digits).

There has therefore been a frisson of recent interest in maximizing the usage of such media.

Unfortunately, it is difficult to imagine that this is nothing more than a chimera. While it is entirely true that modern smart phones, the end user device of choice, are quite open to the development of specialised software applications, there are issues.

For instance, the operating systems used for these devices are supposed to hew to a standard. In reality, the implementations of individual manufacturers are sufficiently different that each application needs to be individually tweaked. Thus a user organisation (such as a micro-bank) is forced to buy exactly the same telephone to actualize a synergising technology deployment. Compared to parallel devices emerging from the computer sector, this is a major limitation.

The problem of connectivity is far more serious. At this point in time, only the public sector company (BSNL) has a presence in most rural areas, and it has a policy of refusing service (roaming) to other service providers. The company is subject to external ministerial supervision, and has been in the public eye

for its 2 year delay in the purchase of new switchgear compatible to enhanced data services (so-called 3G equipment). The decision was finally made in September 2007 - and it was for a money-saving investment in more 2G equipment, thus effectively blocking several categories of data services for the foreseeable future.

Frankly, this would be a good decision, had the government actually followed a practice of technology neutral decision making. This turns out not to be the case. Whether it is spectrum availability, or hardware, or governance, decisions are nearly always skewed towards favouring particular technologies or vendors. In the case of telecommunications, the two are often synonymous, because commercial vendors overwhelmingly bank on technology differentiation in a complex and competitive global market.

To some extent, the situation in the personal computing sector is quite different. There are only three major varieties of operating systems, and only two vendor-specific hardware platforms on which they are deployed. Application compilation for each system is also largely a done deal.

It is true that device development in the handheld segment is not quite as far along as in the telephone segment. The proprietary environment surrounding telephony is largely responsible for this situation. Handhelds acquired acceptability simultaneously with cellular deployment. However, wireless 'desktops', devices that mimic the look and feel of older landline telephones, also exist, and are deployed in India within the designated Fixed Wireless Local Loop telephony license.

This year, the introduction of the Apple (a major US IT company) iPhone signals the first serious salvo in the Cold War for the handheld telecommunications device space. It also uses the proprietary Mac OS X operating system developed for personal desktop computers, but since this is built on the Mach kernel (derived from Unix, a minicomputer OS, whose functioning and enhanced features draw heavily from the Open Source and Free Software movements), it is fairly easy to program special applications.

The device is intended to break existing paradigms in the telecommunications space, and has already sold over 1 million pieces since its introduction in June. The company has also dropped its introductory price between \$100 to \$200, a staggering 40% reduction, making it exceedingly competitive with comparable devices from the telecommunication sector.

Since it is primarily a computer cum media device, with GSM telephony as a special feature, it inherently uses Wi-Fi (and Blue tooth, a very short distance

wireless protocol) for connectivity.

Alternates from other vendors in the computer sector include minilaptops, devices with screen sizes of under 15 cm (diagonally measured, the usual nomenclature) and keyboards with largish buttons. These are much lighter than typical laptops, and offer much longer battery operation, the critical factor for handheld devices. The standard laptop-sized 'notepad' could also become a significant device in this space, being a thin, touch-screen format, with no inconvenient bulky keyboard. However, it has not found major market acceptance so far.

To summarise, therefore, in the Indian context, rural telecommunication choices are at a cusp. Intriguingly, perhaps for the first time in the nation's history, the choice is not between particular technologies, but rather between particular technologies and a completely hands-off, technology-neutral approach.

On the one hand, the government can continue to support individual telecom players, at least three of whom are already financial behemoths, having benefited enormously from the present licensing regime. On the other, the telecommunications sector can be opened up to community-led, grassroots driven growth, with the connectivity paradigm shifting from the view that spectrum is a scarce resource, to one where radio frequency spectrum is regarded, as a true public resource, a commons, with no special reservations or, allocations to vendors of either technology or devices.

The government needs to take hard realistic look at the development paradigm. Technology choices may continue to be driven from the top, but decisions that take years of deliberation (necessary partly because of their long-term implications, inherent because of the overweening responsibility, but where accountability is not a hallmark, at least not in our recent history) tend to fall short of the need.

The alternate is to trust citizens to make the best choices for themselves. Given the oft-expressed desire to create a Knowledge Society, this might be a good place to start.

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## Community Informatics, Past, Present & Future: Tapping community resources through ICT?



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It was ten years ago in 1997 that I first got involved in what I now know as Community Informatics or the use of Information Communications Technology to support community development. I was running a small high technology business in a tiny village on the outskirts of the town of Market Harborough in Leicestershire, located in the heart of England amongst quaint rural hamlets and rolling countryside. My business had been delivering professional business presentation services to blue chip companies across the UK and providing an advanced digital imaging service through a network of retail outlets who would take PowerPoint presentations on disk from clients visiting their print/copy shops and send them electronically for my company to turn them into high quality 35mm slides and OHPs with a 24hr turnaround. Life, running this small business from a converted barn in the courtyard of my home, was comfortable but I knew that I had to diversify to survive as clients were increasingly able to design their own presentations and use a data projector to make their business presentation.

This article chronicles the role of social enterprise and emerging technologies - how they can and will shape the social and economic health of our communities.

In 1997, the UK Dept of Trade and Industry (DTI) ran an awards competition called the "Multimedia Demonstrator Program" (MMDP) as an initiative to encourage small businesses to adopt emerging technologies such as multimedia and the internet. It was regarded as a vital part of a strategy to make the UK's nation of small & medium enterprises competitive in global economy.

This competition was an opportunity to diversify my business and generate income for future growth. Like many small, local businesses across the world, I had experienced the frustration of doing business with blue chip companies across the UK, yet finding the companies who were on my doorstep turning to big city firms in London, Birmingham or Manchester to get their presentation services. I became determined to explore how technology could be used to help small communities tap into local skills and talents more easily and thereby support sustainable social and economic development. My story begins here.

I entered the MMDP awards competition with a project called ComKnet (Community Commerce and Knowledge Network) and put together a consortium of local partners including a local newspaper, an internet service provider and a university. I was fortunate enough to win £150k of funding for the 2 year project, to be matched in kind by all the project partners. So, late in 1998, I set out on a journey that would take me all over the world to meet wonderful, passionate people all committed to building a sustainable future in the Global Information Society.

I began by searching the internet to discover local technology champions with whom I could collaborate to build a growing network of knowledge sharers. It was here, within a few days of my project starting that I discovered an awful truth - someone had got there before me and had already established a community website with the functionality to deliver many of the things I had planned to do. I was very nervous because the webmaster of this site had the design skills to be a strong competitor, not only to the ComKnet project, but also to the web design part of my own business.

Imagine my surprise when I invited the webmaster to visit my offices to explore how we could collaborate only to discover that he was already known to me as my milkman!! This man (Frank Bingley - see <http://www.bigfern.btinternet.co.uk/index.htm>) with no technology background, had taught himself how to design web pages using the most basic of tools and had done all this on a computer he had built himself. My initial reaction was that he was "from a different planet" and was a unique phenomenon. I have since discovered that there are thousands of people like him all across the globe - ordinary people doing extraordinary things without fuss or any awareness of the magnitude of their work.

*"Lesson 1 - every community has ordinary people capable of extraordinary ideas for the use of technology to benefit local people - our challenge is to identify these community champions (technology warriors) and harness their talents."*

As the ComKnet project developed, I began to understand the depth of local talent and the extraordinary ingenuity of ordinary people without any technology background, yet capable of finding exciting innovative ways of using technology to solve local problems. I then developed links with other community technology projects, and became involved in a London scheme to set up a community learning centre in an old laundrette at South Kilburn. Working with the resident consultant on the project, we decided to organise a global web cast on community technology networks.

I needed to find someone who could help us make a

video about both projects so that we could broadcast this over the web and stimulate discussion about the challenges of globalisation and technology in both rural and urban communities. An advert in the local paper attracted two volunteers, and once again I was staggered to discover that I had a former senior BBC cameraman living in my village, and a special effects expert working on the Harry Potter films. They helped me to arrange a series of interviews with local people describing how they saw technology affecting their communities in the new millennium.

To deliver the web cast, we worked with a corporate partner who wanted to launch their new webcast technology called e-video and we negotiated a deal in which they provided the studio and the network free of charge and we brought over 300 people to log onto the event from around the world. It was the world's first community networks live video webcast in April 2000. In the event, there were so many people connected that the streaming technology failed and most people who were logged on were only able to view the presentation slides and chat via text.

Although the web cast technology was not up to the task in the year 2000, the event connected many people with common interests in community informatics and it acted as a catalyst to build new relationship which fostered some great initiatives and brought to light at an international level some of the extraordinary talented and committed around the world.

*“Lesson 2 - the internet can bridge the local and the global and help us to realise how much we all have in common, and even when technology fails, good things can happen.”*

One of the people logged on that day in April 2000 was John Hibbs in San Diego. He runs the [Benjamin Franklin Institute for Distance Learning](#) and has been organising an annual international webcast called “Global Learn Day”. John is passionate about using simple and affordable technology to make education accessible to everyone. Every year, with little or no funds but energy, passion and skill, he organises a global learning voyage which reaches people by telephone, radio and internet. Amongst the VIPs John has recruited for this amazing 24-hour journey around the globe is Kofi Annan, the former UN Ambassador.

*“Lesson 3 - the most vital ingredients in community informatics are passion, energy, determination and stamina.”*

Whilst working on the ComKnet project, I encountered some wonderful projects and people. Mino Eusebio-Castro was a leader in the Ashaninka tribe in Peru. In a jungle without electricity, he set up a

computer powered by a generator in a tribal hut as a way of bringing the benefit of communications and knowledge to his community - see [http://www.idrc.ca/en/ev-5375-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-5375-201-1-DO_TOPIC.html). He, like many others around the globe has used enterprise and innovation to make a real difference to local lives.

*“Lesson 4 - enterprise and innovation in the use of technology can attract inward investment to your community.”*

As word spread about our project in Market Harborough, I found myself involved in many international conferences. Through these conferences and connections, I discovered the potential of community radio through projects like [Kothmale Radio](#) where a community radio station with internet access provides an information service through radio chat shows where listeners can send in questions which studio experts research through the web. I ran a similar project called “The Radio with Pictures Show” in Market Harborough - using a combination of local radio, teleconferencing and a virtual classroom I connected local and global experts to discuss common issues from Melbourne to Moscow and Market Harborough to Mumbai.

I subsequently had the pleasure of visiting Bangalore for a conference in 2001, and another on regional community informatics in Korea in 2002. Both conferences taught me that grass roots organisations can deliver great ideas. In India, a project called [Daknet](#) uses a wireless computer or laptop on vehicles to deliver email as it passes through villages in remote areas, and in Korea, communities have been using the internet to create a new national resurgence.

*“Lesson 5 - technology need not be expensive or complex to reach communities and change lives – radio broadcasting and telephones can be very effective.”*

Time is too short to catalogue all the exciting projects that have emerged alongside the technologies that are rapidly now converging. Many of these developments have been driven by “leisure media applications” such as electronic games. The popularity of computer games consoles has helped to improve the computer graphics on our desktop computers and mobile phones as well as fuelling the drive for faster and better broadband and wireless connections.

It is almost impossible to predict where technology will take our global society over the next few years, but I believe that there are some key lessons to be learnt from the many informatics projects around the world :-

- Social entrepreneurs and community champions are vital catalysts for enterprise, innovation and attracting inward investment.
- It is important to think global whilst acting local.
- Successful projects balance grass-roots initiatives with top-down support and the right level of resources (financial and human). It is like a 3-legged stool and if one leg is missing or deficient, the stool collapses.
- Use technologies that are appropriate to local circumstances and engage local people.
- Local culture and heritage is a powerful force for building a shared vision for the future.

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## Social Innovation and the Partner State as Emerging Models for the Developing World

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[The author was an internet pioneer and serial entrepreneur in his home country of Belgium, where he created an intranet/extranet company (E-Com, sold to Alcatel), and a cyber-marketing agency (KyberCo, sold to Virtuology). He was also editor-in-chief of the digital magazine *Wave*, knowledge manager for British Petroleum, and eBusiness Strategy director for the country's largest telecommunications company (Belgacom). He has co-produced a 3-hour TV documentary, *TechnoCalyps*, on the metaphysics of technology. In 2002, he moved to the mountains of Northern Thailand, and created a global cyber-collective, the Foundation for Peer to Peer Alternatives, to study and promote the new forms of peer production, governance, and property. He blogs about such social change dynamics at <http://blog.p2pfoundation.net>.]

The internet has an under appreciated quality, which is that it enables the global coordination of small teams<sup>1</sup>, which means that the peer to peer logic of small teams can operate on a global scale. The amount of capital needed to start an internet company has gone down dramatically, and many networked micro agencies<sup>2</sup> are arising, operating with a minimal amount of capital. Since knowledge workers operate with their own means of production, i.e. their brains and their computers, they are in a different structural position from factory workers needing to sell their labour to capital owners. For knowledge workers, capital becomes not an a priori condition for innovation, but rather an a posteriori necessity in case of rapid viral adoption of their innovations. [Google](#), [Bittorrent](#), [YouTube](#) did not need large amounts of capital for their invention, but only for their deployment after

massive adoption. And even this necessity is predicated on their choice for centralized networks of servers, and could be largely bypassed through a strategy of user-capitalized distributed networks. As Cory Doctorow summarizes: “**Computers are machines for copying data. A good computer is one that copies well, quickly and cheaply. The internet is a machine for moving copies of data around. When the internet works well, it copies data quickly and cheaply.**”<sup>3</sup>

In a world increasingly dominated by this universal machine, it makes less and less sense to use a proprietary intellectual logic. Far from promoting innovation, increasingly restrictive IP goes against the grain of the logic of non-rival goods: not only do you not lose its enjoyment by sharing, but it actually increases in value through network effects. Knowledge that is available in a commons can be endlessly improved without permission. In such a context, IP, and the artificial scarcities it creates, becomes the key obstacle to a further growth of social cooperation and an explosion in innovation.

This means that innovation is therefore becoming social, an emergent property of the network of already always-connected knowledge workers, and not just a property of internal R&D departments or individual entrepreneurs. Organizational edge competencies<sup>4</sup>, namely the ability to insert one self in participatory networks, start to trump core competencies. The monopoly of capital in terms of access to centralized production machinery, and in terms of organizational skills, is eroding. This is not only happening in the sphere of immaterial production, but also in the sphere of material production where the combined developments around desktop manufacturing<sup>5</sup>, rapid tooling and manufacturing<sup>6</sup>, personal fabricators<sup>7</sup> and multi-purpose machinery<sup>8</sup> are replicating in the physical world, what has already happened with the computer - a dramatic lowering of the threshold of investment that leads to a transformation from centralized and decentralized logics to distributed logics. This has to be coupled with the increasing ecological crisis (global warming) and the depletion of

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<sup>3</sup> Cory Doctorow, The Guardian, <http://www.guardian.co.uk/technology/2007/jul/31/comment.drm>

<sup>4</sup> Edge Competencies, [http://p2pfoundation.net/Edge\\_Competencies](http://p2pfoundation.net/Edge_Competencies)

<sup>5</sup> Desktop Manufacturing, [http://p2pfoundation.net/Desktop\\_Manufacturing](http://p2pfoundation.net/Desktop_Manufacturing)

<sup>6</sup> Rapid Manufacturing, [http://p2pfoundation.net/Rapid\\_Manufacturing](http://p2pfoundation.net/Rapid_Manufacturing); Rapid Tooling, [http://p2pfoundation.net/Rapid\\_Tooling](http://p2pfoundation.net/Rapid_Tooling)

<sup>7</sup> Personal Fabricators, [http://p2pfoundation.net/Personal\\_Fabricators](http://p2pfoundation.net/Personal_Fabricators)

<sup>8</sup> Multi-purpose Production Technology, [http://p2pfoundation.net/Multiple-Purpose\\_Production\\_Technology](http://p2pfoundation.net/Multiple-Purpose_Production_Technology)

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<sup>1</sup> Global Microstructures, at [http://p2pfoundation.net/Global\\_Microstructures](http://p2pfoundation.net/Global_Microstructures)

<sup>2</sup> Networked Micro Agencies, at [http://p2pfoundation.net/Networked\\_Micro\\_Agencies](http://p2pfoundation.net/Networked_Micro_Agencies)

natural resources which will eventually mean an end to the era of cheap energy, and to the profoundly anti-natural tendency to operate with an infinite growth machine in a finite material environment. To put it rather bluntly, the continued operation of an infinite growth machine in a limited environment is both a physical and logical impossibility. In a few decades time, we will therefore need to dramatically reverse the current ill-logic, i.e. a mistaken belief in material infinity with artificial scarcities in the immaterial world, into its opposite - a 'natural capitalism'<sup>1</sup> that respects limits, coupled with a universe of free sharing in the immaterial world.

As this logic has started to emerge, we have seen the emergence of a new mode of production based on non-proprietary open designs<sup>2</sup>, such as the open source software world, budding open design communities in the sphere of hardware, and new business models. One is the sphere of individual and collective sharing of cultural expression - the Web 2.0 model whereby it is the participants that create the (use) value, but are supported by proprietary platforms that enable that sharing to take place, in exchange for the selling of the aggregated attention to the advertising market. Think [Google](#), [YouTube](#) and [eBay](#) as companies that are capturing the value created by communities of sharing and exchange.

The other model is the commons-oriented peer production<sup>3</sup>, as in [Linux](#) and [Wikipedia](#), where the community is self-organized under peer governance models<sup>4</sup>, creates non-profit foundations to manage the collaborative infrastructure, and finally gives rise to an ecology of businesses that create scarcities around the commons (for instance, Red Hat and IBM around Linux) which in turn support the commons<sup>5</sup> from which they create their wealth. Finally, in the crowd sourcing<sup>6</sup> model, it is the companies themselves which mobilize participation under their own frameworks and control, but nevertheless have to compose with the logic of connected communities.

Any company which adopts co-creation<sup>7</sup> and can link up with participatory processes, using open<sup>8</sup> and free

raw material as input, and a commons-oriented licence as output<sup>9</sup>, will have competitive advantages as compared to companies that remain closed to outside participation. And companies that use proprietary strategies, and hence cannot access communities that ameliorate their products, will tend to lose out from the for-benefit structures that can draw on such community-enhanced development. Think [Britannica](#) vs. [Wikipedia](#) to see how such competition plays out, and how the latter has completely eclipsed the former.

All the above - the emergence of peer production, governance and property as a third mode of producing value, which is not only post-capitalist in its logic of sharing and the creation of commons, but is also embedded in the market - is happening on a worldwide scale. This is particularly so in the Western countries who combine a greater relative social weight of knowledge workers, together with a sophisticated understanding of the benefits of participation by the new "netarchical"<sup>10</sup> capitalist platform owners.

Historically, though new modes of production and social organization have always started in the dominant countries, it is the countries at the margin which could gain more, and therefore effect the revolutions by making the new modes dominant<sup>11</sup>. Developing countries have both - relatively less knowledge workers, but also huge reserves of unemployed knowledge workers - who may be frustrated, and often engaged in destructive activities such as computer cracking. What if the policy makers understood that they could empower and enable the direct social production of value and that such individuals could engage in socially constructive projects, for which they would be recognized, and which may lead to the self-creation of new business niches? In other words, the analogy of the state as parent will have to be transformed to a vision of the Partner State, and public authorities would create the infrastructure necessary for more social innovation to occur. This could not only motivate new layers of people for social collaboration, but would in its wake create an ecology of businesses that can draw on such knowledge commons and open designs. It is my contention that developing countries will make much more relative gains from adopting such practices, than the already privileged western countries.

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<sup>1</sup> Natural Capitalism, [http://p2pfoundation.net/Natural\\_Capitalism](http://p2pfoundation.net/Natural_Capitalism); Natural Enterprise, [http://p2pfoundation.net/Natural\\_Enterprise](http://p2pfoundation.net/Natural_Enterprise)

<sup>2</sup> Open Design (movement), [http://p2pfoundation.net/Open\\_Design](http://p2pfoundation.net/Open_Design); Open design initiatives are indexed at <http://p2pfoundation.net/Category:Design>

<sup>3</sup> Peer Production, [http://p2pfoundation.net/Peer\\_Production](http://p2pfoundation.net/Peer_Production)

<sup>4</sup> Peer Governance, <http://p2pfoundation.net/Category:Governance>

<sup>5</sup> Commons, <http://p2pfoundation.net/Commons>

<sup>6</sup> Crowd sourcing, <http://p2pfoundation.net/Crowdsourcing>

<sup>7</sup> Co-creation, <http://p2pfoundation.net/Co-Creation>

<sup>8</sup> Openness, <http://p2pfoundation.net/Openness>

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<sup>9</sup> It is the combined operation of open and free raw material as input, of participatory processes, and commons-oriented outputs, which guarantees the social reproduction of peer production. It has been called the Circulation of the Common by Nick Dyer-Whiteford,

[http://p2pfoundation.net/Circulation\\_of\\_the\\_Common](http://p2pfoundation.net/Circulation_of_the_Common)

<sup>10</sup> Netarchical Capitalism, [http://p2pfoundation.net/Netarchical\\_Capitalism](http://p2pfoundation.net/Netarchical_Capitalism)

<sup>11</sup> This process is brilliantly explained in Larry Taub's book, *The Spiritual Imperative*, see <http://www.spiritualimperative.com/> for details

In a world which will soon face a dramatic series of serious ecological crises, with dwindling natural resources, what we can envisage as a new model is the co-existence of global-local open design communities operating through the internet, combined with local production capacities, a 'built-only' capitalism that respects natural limits<sup>1</sup>. Such a model would combine the advantages of an open cultural sphere of cooperation, based on a relaxation of restrictive IP legislations and a large abandonment of the technological undermining of internet technologies through DRM<sup>2</sup>, with a peer-informed but market-based system to manage scarce natural resources.

Countries like India and China are now living the capitalist dream (of course some others would call it a nightmare), oblivious to the fact that we are already consuming two planets, and that parity with the Western lifestyle would demand four planets. Preparing for these coming limits, they would do well to develop policies that can draw from the new forms of social innovation, which are creating dramatic gains and positive externalizations from social cooperation, and can also contribute to thriving market ecologies.

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## West Bengal Women Log In To ICT-Based Enterprises

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[The author is director of Nabanna, an information and communication technology (ICT) project being undertaken by [Change Initiatives](#), a Kolkata-based NGO. This news article has been especially written for the Newsletter by her in her efforts to bring forth the work being done by Change Initiatives in the area of ICTs in development in West Bengal, India. Change Initiatives, which was initiated in

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<sup>1</sup> Co-incidentally, this process of transition to a new form of globalism combined with relocalized production, has an uncanny resemblance with the transition from the slave-based Roman Empire, to feudalism. The former could not switch to intensive development as it could not give autonomy to slaves, and therefore the re-orientation of the economy and society had to occur through the switch to a new social logic; similarly, the present system is meeting its limits of extensive development, but the intensive development of the immaterial sphere, is only marginally operating as a for-profit economy, and follows the logic of an ethical economy. See Peer to Peer and the Feudal Transition, by Michel Bauwens, <http://blog.p2pfoundation.net/peer-to-peer-and-the-feudal-transition/2007/09/10>; and Adam Arvidsson, The Crisis of Value and the Ethical Economy, at [http://p2pfoundation.net/Crisis\\_of\\_Value\\_and\\_the\\_Ethical\\_Economy](http://p2pfoundation.net/Crisis_of_Value_and_the_Ethical_Economy)

<sup>2</sup> Digital rights management (DRM), [http://en.wikipedia.org/wiki/Digital\\_rights\\_management](http://en.wikipedia.org/wiki/Digital_rights_management)

collaboration with University of Manchester with funding from DFID, has been promoting ICT-based enterprises in West Bengal for almost two years. Activities include localizing and translating a handbook in Bengali, organizing workshops and helping women to set up enterprises. See <http://www.change-initiatives-india.ibfx.nl/ictbasedenterprise.htm> and <http://community.telecentre.org/en-tc/blog/597> for information about projects being undertaken by this organization.]

Buoyed by the falling cost of technology and a growing demand, women of West Bengal are breaking the digital divide through ICT-based enterprises. The women, keen to explore new opportunities to break away from the confines of their daily lives, have sensed great opportunities in desk-top processing (DTP), training, word processing, photo-copying and phone facilities. Meet Kakoli, Sarama, Pranati, Manasi and Madhusree from Rasapunja in the South 24 Parganas district of West Bengal. The five, coming from less privileged backgrounds, have set up Digital Graphics which is into its sixth month of operation. Digital Graphics offers DTP and digital photography services. Within the short span of its existence, the outfit has notched up revenues of around ten thousand rupees.

*"This is a small plant now. We want to see it as a big tree. And we are doing everything we need to do to make our dream happen."*

Manasi and others are part of a facilitation process being undertaken by Change Initiatives to promote ICT-based enterprises in West Bengal. They were emboldened to set up the enterprise after attending a workshop conducted by Change Initiatives. These women, whose educational attainment ranges from matriculation to post graduation, were short-listed from among ten candidates to set up this enterprise. They are associated with the Jeevika Development Society, which is Change Initiatives' partner in the setting up of Digital Graphics. Training in enterprise development, personality development along with DTP and digital photography followed. After this on the basis of a consensus, the five were chosen to set up the enterprise. They received equipment support in the form of two computers, one inkjet printer, one laser printer, one scanner and a digital camera. The laser printer, scanner and digital camera were provided by Anudip, which also imparted computer skills to the women. A room was rented by the five entrepreneurs. They painted the room and organized the office equipment for their activities. The inauguration was done in May 2007 and from then it was a story of orders for passport photographs, typing in English and Bengal, designing of visiting cards and many more.

Meanwhile, another group of women belonging to the Howrah Municipal Corporation, also in West Bengal,

are gearing up to set their ICT-based enterprise. Change Initiatives had organized a workshop at the municipality, from where four women have decided to set up an enterprise to provide DTP and phone facilities. The municipality has already allotted a room, and a public telephone booth is on its way. Change Initiatives would provide equipment and entrepreneurial development support to the DTP centre. In another initiative, Soumyadyuti Koyal is expanding her small computer training business with the help of Change Initiatives. After attending a workshop, she was given a used computer and printer for her training centre and financial support for publicity. She then proceeded to give training at various workshops, including some government training programmes. She has a total of thirty-five students and an average income of rupees six thousand per month.

- e) Ignorance about applicable schemes
- f) Illiteracy of beneficiaries
- g) Lack of accountability
- h) Non-sustainable nature of the schemes

There is a need for a model which ensures that the five essential elements of a good and viable developmental project are undertaken:

1. Transparency which clearly records who are the beneficiaries, the quantum of benefit provided, and when and where did they get benefited. This information can be hosted on a portal to give a chronological account of the details of beneficiaries and benefits provided to them.
2. Accountability
3. Sustainability
4. Integration
5. Ownership

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## Integrated & Sustainable Rural Developmental Model for India

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India got her Independence sixty years back and though there are pockets of development happening in urban areas, the rural scenario is far from satisfactory. Many of the rural development schemes of the government have been ineffective and even NGOs, with a few exceptions, have failed. The proposed model, if put into practice together with the fervent and wholehearted support of the government and potential contributors, could achieve the desired results for the rural sector. It aims to develop community centers in order to reach remote areas and to showcase their development globally.

It may however be observed that several well-intended developmental schemes of the government like the one in Kuppam failed<sup>1</sup> mainly due to

- a) Lack of monitoring at the grass root level which requires a strong community involvement, local participation and ownership; and clear metrics and process definition for continuous and accurate monitoring
- b) Corruption
- c) Poor management
- d) Lack of ownership and responsibility

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<sup>1</sup> For related stories and papers, visit:  
<http://www.apdip.net/projects/2003/in/>,  
<http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN007048.pdf>,  
<http://www.hindu.com/2007/07/05/stories/2007070557850300.htm>.

### Recommended Model

India spans an area of around 3.3 million sq kms and has six hundred thousand villages. The idea is to have 100,000 community centers (CCs), each covering an area of 33 sq kms or serving an average of six villages that are reachable by bullock cart or cycle. The government would provide two acres of land, free of cost, to set up each CC. The implementation of the CCs would follow a uniform model as given below:

- a) To be initially funded and managed by an NRI<sup>2</sup> (Non-Resident Indian) who is willing to make a contribution of the US\$ 5 million needed to set up one CC<sup>3</sup>. There are an estimated 20 million NRIs in the world and only 0.1 million of these ready to invest the required amount is sufficient for implementing this self-sustainable model.
- b) To construct a self-sufficient community center, which would form the nerve center of development for the villages it is meant to serve. The sponsor of the center would be provided with information like population in the six villages, number of BPL (Below the Poverty Line)<sup>4</sup> families

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<sup>2</sup> A non-resident Indian (NRI) is an Indian citizen who has migrated to another country, a person of Indian origin who is born outside India, or a person of Indian origin who resides outside India. Source: [http://en.wikipedia.org/wiki/Non-resident\\_Indian\\_and\\_Person\\_of\\_Indian\\_Origin](http://en.wikipedia.org/wiki/Non-resident_Indian_and_Person_of_Indian_Origin)

<sup>3</sup> For related links and efforts by a few NRIs, see <http://timesofindia.indiatimes.com/articleshow/43397440.cms>, <http://www.nri-home-coming.com/>, [http://www.nriinternet.com/NRIschool/India/2007/6\\_NRI\\_village\\_school.htm](http://www.nriinternet.com/NRIschool/India/2007/6_NRI_village_school.htm), <http://www.nri-worldwide.com/cgi-local/pages.pl>.

<sup>4</sup> India has the world's largest number of poor people. Of its nearly 1 billion inhabitants, an estimated 260.3 million are below the poverty line, of which 193.2 million are in rural areas and 67.1 million are in urban areas.

among them, potential goods / services that can be provided by these people and literacy level.

- c) The community center would be built and managed by the sponsor's representative or the local panchayat representative (optionally) and local volunteers and would be helped in the initial setup by professionals in consultation with the sponsor.
- d) The CC will have adequate solar/wind-powered energy sources besides a UPS with adequate backup to run the computer equipment, lights etc.
- e) VSAT connection from this center to the Internet will enable the CC and in turn, the people of the six villages, to get connected to the mainstream.
- f) The CC will have a web-based portal which will capture details of all the people covered by the CC, and especially of those who belong to BPL households. This will then enable the sponsor / government agency / non-government organization to remotely monitor the improvements on a time scale.
- g) The CC will have a VSAT terminal for communicating with other CCs or with the sponsor.
- h) In co-ordination with government-sponsored schemes, the CC will be responsible for facilitating:
  - Communication through the Internet and community radio, which could be broadcast through VSAT-based Internet radio or FM radio
  - Agriculture-related advice and information on seeds, fertilisers, pesticides, crop rotation, irrigation techniques, crop loans through the PACS (Poorest Areas Civil Society) Programme<sup>1</sup>, fair prices, food processing techniques
  - Development of infrastructure through rural involvement in construction of roads, toilets and even houses and by utilizing cheap techniques
  - Availability of clean drinking water: The process would start with installation of a solar-submersible pump with solar panels at a proper location that has an assured supply of ground water. The local people would be employed to build a large water storage facility into which water would be continuously filled using the solar pump. This

water storage facility would then be used for irrigating crops and for other purposes. Good water filtering and purification facilities are to be used to provide adequate potable water to the villagers.

- Local knowledge integration and global propagation of services pertaining to alternative medicine, local tourist attractions, ancient arts / customs, heritage sites, etc.
- Global exposure and marketing of rural produce and handicrafts which could form the basis for a sustainable model
- Monitored development of cottage industry
- Development of skills among the rural people to work as midwives / primary health workers, teachers, computer literate professionals, agriculture experts, rural bankers, rural strategists giving thought leadership
- Educational facilities like teaching of R's<sup>2</sup> - Reading, (w)riting and (a)rithmetic - to everyone, primary schooling through ICTs / CBTs (computer-based training) and other cheap educational implements like engraved granite slates
- Healthcare and family welfare through establishment of a primary health center, provision of first-aid facilities, and family planning and AIDS education to create awareness. The proposed smart card-based national Identity card<sup>3</sup> can also capture health details like blood group and medical history. The same card may be used to capture information on conception pattern of rural women that could enable advance forecast and planning for pre and post-natal care of mother and child, thereby reducing infant and mother mortality. Telemedicine, wellness programs and alternative medicine techniques can also be provided on a cost-effective basis.
- Banking facilities through the Internet or rural branches established at the community center
- Recreational facilities like sports, folk arts and dramas which may be showcased globally
- Implementation of government-sponsored schemes for poverty alleviation, rural development, tribal welfare and employment generation. Panchayats can also be covered by these CCs to escalate their working details and highlight achievements or short comings.

<sup>1</sup> The PACS Programme is a seven-year (2001-2008) effort to empower millions of poor people living in many of India's most backward districts. It seeks to achieve this by strengthening civil society organisations working for the poor. The programme today covers 19,781 villages in 93 districts of 6 states through a network of over 665 CSOs. Source: <http://www.empowerpoor.com/>

<sup>2</sup> Reading, (w)riting and (a)rithmetic are crucial elements in the education of any child. A child's ability to later cope in the adult world, to have a career, to take charge of his financial affairs and to live independently depends to a large extent on his mastery of these skills. Source: [http://audiblox.com/preschool\\_education.htm](http://audiblox.com/preschool_education.htm)

<sup>3</sup> For more information visit: <http://www.indiacard.co.in/products.html> and <http://www.nxp.com/news/identification/articles/otm64/india/>

All of the above and more would be done in co-ordination with government-sponsored schemes by following the simple 'mantra' of Ownership, Integration, Transparency, Accountability, Technology, Globalization and Monitoring for assured and demonstrable progress.

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## Report on the Second eLearning Africa Conference on ICT for Development, Education and Training

[This article is an abstracted version of the report on the eLearning Africa 2007 conference, which was held during May 28-30, 2007 in Nairobi, Kenya. The complete conference report is available on eLearning Africa's website at [http://www.elearning-africa.com/pdf/report/postreport\\_eLA2007.pdf](http://www.elearning-africa.com/pdf/report/postreport_eLA2007.pdf).]

Participants of the second eLearning Africa conference on ICT for Development, Education and Training eLearning included users, newcomers, providers and experts from 88 countries spanning all continents. The conference featured inputs of representatives from major development organisations such as UNESCO-UNEVOC, the [Global Development Learning Network \(GDLN\)](#) and the World Bank; and national and governmental institutions, mainly from Africa but also from Europe, Asia and North America. Bringing together leading experts and practitioners from Africa and beyond, the conference proved an excellent opportunity for networking and sharing experiences in the application of technology throughout the learning cycle - from primary and secondary education to professional development and lifelong learning. Projects and initiatives from all over Africa were presented, and the agenda featured valuable examples of how the latest developments in eLearning are being put to work in the service of learners regardless of their location or level of technology. eLearning at school and in medical and public health education, as well as free and open content and the provision of open education resources for all types of training, featured significantly in this year's agenda.

Events that took place during the conference included a conference track titled 'African Showcase' that highlighted examples of how ICT is being taken up by African institutions, special networking sessions, hands-on workshops and seminars dedicated to building and enhancing existing networks, and summits aimed at bringing together expertise on specific topics. Among others, some of the major themes around which the agenda of the conference was organized were:

- Unleashing the Capabilities of Universities

through Information and Communication Technologies (ICT)

- Empowering Women through ICT with ICT-Based Capacity Building
- Designing and Delivering Online Learning
- eLearning in the School System, Corporations, Governments and the Public Sector
- Policy Issues and Large-scale Take-up of eLearning
- Building ICT Infrastructures to Provide Access and Connectivity in Africa
- Localization, Customization and Content Development
- Open Source, Open Content and eLearning

### HIGHLIGHTS OF THE CONFERENCE

There were numerous Special Focus sessions led by leading organizations in the field of African eLearning. In its presentation, NEPAD<sup>1</sup> offered insight into its 'e-Schools Initiative'. The UNESCO-led convocation discussed its [Teacher Training Initiative for Sub-Saharan Africa](#). The assembly organized by the GDLN featured interviews and a discussion about GDLN as a global network. Special attention was given to Africa GDLN and AADLC<sup>2</sup>.

The challenge of bringing gender balance into eLearning programmes was highlighted in a series of talks that began with case examples from [Makerere University, Uganda](#); [Women's Health and Action Research Centre, Nigeria](#); and [Obafemi Awolowo University, Nigeria](#). The culmination was a discussion highlighting the work of the [Forum for African Women Educationalists](#) and the [Africa Gender and Development Evaluators Network](#), Kenya, amongst others.

Health featured significantly in this year's agenda, with presentations of various examples of online learning opportunities for health professionals, such as the [initiative of the African Medical and Research Foundation](#) to upgrade 22,000 nurses in Kenya supported by Accenture, the [Global Healthcare Information Network](#) and the [Uganda Chartered HealthNet](#) supported by IDRC. Later on, a session devoted exclusively to showing examples of online courseware designed to heighten awareness of AIDS/HIV featured examples from [CompuTainer Pty Ltd., South Africa](#); [HealthFoundation, The Netherlands](#); [University of the Western Cape, South Africa](#); and Waters Biomedical Communications, Canada.

While setting up projects and initiatives in the field of

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<sup>1</sup> New Partnership for Africa's Development, <http://www.nepad.org/>

<sup>2</sup> Association of African Distance Learning Centres, <http://www.aadlc.com/>

eLearning may be relatively straightforward, the challenge for those attending eLearning Africa lies in finding sustainable models, and this topic was the subject of both a presentation and a lively discussion. Sustainability issues were accentuated through examples of efforts that included a project for dispersed communities in rural Canada, another on the Ethiopian Civil Service College eLearning initiative and yet another on the work of [Digital Links International](#). The ensuing discussion brought together several long-term practitioners who - with input from the audience - strove to identify best practice in creating sustainable initiatives.

African Showcases were spread throughout the agenda, offering examples of digital courseware and learning materials developed with a focus on African learners. Free and open content and the provision of Open Education Resources for all types of training featured significantly on the agenda. Stimulating food for thought was tabled at the presentation of the [Teacher Education in Sub-Saharan Africa](#) programme, aimed at supporting teacher training throughout the Continent and UNESCO's Open Learning Platform.

Finding ways to support learners in rural Africa also continues to be a crucial challenge that brings together several concerns, not the least of which is how to operate successful telecentres in areas where access to infrastructure is very problematic. Mobile technology brings new hope to rural learning initiatives, as does re-thinking the value of traditional media like radio. Examples of projects highlighting developments in this field were presented.

Universities continue to lead the way in Africa in the implementation of Information and Communication Technologies, and there were several sessions devoted to exploring how this is being realised. African cases that illustrate challenges in this area included those put forward by some of the participating universities. [UbuntuNet](#) and the efforts being made throughout Africa to link research networks attracted quite some attention to the general topic of connectivity. This discussion was enhanced through examples of experience, such as those made by the African Virtual University and [LinkNet Zambia](#).

Using an innovative format called the [World Cafe](#), a significant number of participants took part in sessions designed to promote network-training practitioners' exploration and discussion of ideas and issues relevant to their work. These meetings exposed attendees to both new and existing networking initiatives, such as those built around the [ItrainOnline Partnership](#) - a network formed around a portal on ICT4D training resources.

The general topic of introducing eLearning into school

systems proved to be very popular, with events devoted to teacher training, effective partnerships for African Schools and successful strategies for implementing ICT in schools. 'Harambees' or networking get-togethers were a new addition this year and the response from participants to set up and lead these informal sessions was overwhelming. 'Harambees' that took place covered some of the following subjects:

- Choosing and setting up an LMS in African schools and universities
- Dialogue on strategies and courses of action that could result in eLearning projects and/or networks for accessibility to educational content
- How not to succeed In ICT projects
- Discussing a PPP to look at the issue of e-content
- ICTs and rural development
- Teacher training initiatives
- Developing Africa's business leaders' use of eLearning
- Online mentoring for Africa
- Using eLearning to support Maths teaching in Africa
- Practical project assessment

Continuing eLearning Africa's policy of highlighting innovative and appropriate technical developments, this year's demonstration sessions were well attended and included demonstrations of low-cost videoconferencing tools; the MEEIT<sup>1</sup> package aimed at nomadic children in India; and the HIV education programme shown by the HealthFoundation, The Netherlands.

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## Book Reviews

### **Dangerous Enthusiasms: E-government, Computer Failure and Information System Development**

Robin Gauld and Shaun Goldfinch  
Otago University Press, 2006, 160 pp.

Review by [Dr. D. C. Misra](#), E-government Consultant, New Delhi, India

Is e-government a dangerous enthusiasm? Yes, conclude Gauld and Goldfinch after analysis of a number of e-government case studies in New Zealand and a survey of wider literature. And it is an interesting judgment in the case of New Zealand, a

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<sup>1</sup> *Marshalling the Environment to Educate through Information Technology (MEEIT)* is a product of the Developmental Informatics Laboratory, Indian Institute of Technology, Bombay, India. This application has been developed with the objective of motivating and encouraging nomadic children to learn from their own living environment.

country with a population of four million only, but with well developed e-government. By mid-1990s, most New Zealand government departments had established a web presence. New Zealand also has clearly set e-government goals. For example, by 2007, ICT will be integral to the delivery of government services; by 2010, the operation of government will be transformed; and by 2020, people's engagement with the government will have been transformed. The [New Zealand government portal](#), primarily meant for government officials, is rich in resources. It also has a one-stop portal, <http://www.govt.nz/>, for citizens. Government ICT spending is estimated at \$3 billion annually.

But none of this impresses the authors of this book - both of whom are lecturers at the University of Otago, New Zealand. Written for a general audience, the book 'takes a critical look at policies, problems and prospects of e-government in a series of case studies' and attempts to answer the question of 'why have ICT failures in the public sector occurred and what lessons do they provide for the future?' The book has 7 chapters, notes, references and index. In Chapter 1, *E-Government and Information System Development*, the authors provide a good review of literature and propose a model containing four 'pathological' enthusiasms:

1. Idolisation (public servants 'idolise' IT and see it as leading to great benefits);
2. Technophilia (more and better technology prevents or fixes problems);
3. Lomanism (feigned or genuine belief of IT suppliers and sale staff in their company's products);
4. Managerial faddism (new management or structures bring benefits and prevent or fix problems) (p. 19).

In Chapter 2, *What is E-Government?*, the authors define e-government, describe e-government expectations (managerial, government co-ordination and transformation, and participation) and developmental phases of e-government (online information, two-way interaction, vertical integration, and horizontal integration) and discuss e-government developments in Australia, Britain, United States and New Zealand.

In Chapter 3, *ICT in New Zealand's Health Sector: A story of lost opportunity*, the authors say that 'the story is one of lost opportunity, political negligence, shifting ideas about health policy and the shape of the health system, and the development of the Byzantine ICT topography.' (p. 45); '...progress was variable despite a succession of high-level information management strategies, and problems that were identified at the start of the decade remained unresolved at its end'

(ibid., p. 48). A new strategy was successively applied in 1991, 1996 and 1999 with the patient information system occupying centre stage. Two key lessons emerge from the New Zealand experience. First, central governance is required if interoperability, including architecture and standards, is desired. Secondly, collaboration, and not competition, is required in the health sector.

Chapter 4 reports *A Major Health Care Information System Failure* of the Health Waikato (\$17 million) and Capital Coast Health (\$26 million) projects, both of which were abandoned. It shows the realities of implementation of ICT projects including inability to fix responsibility for failure. Similarly, Chapter 5 on *The INCIS Fiasco in the NZ Police Force* shows how the \$100 million Integrated National Crime Investigation System (INCIS) project (the total budget of the police force is \$800 million) and 10 years of work, was abandoned starving the police department of funds. Chapter 6 on *LandonLine* shows mixed results.

In the concluding chapter on *Lessons from Computer Development in the Public Sector*, the authors dispel the belief that 'project failure could be avoided largely setting in place the right monitoring regime, the right contract design, and using the required risk analysis mechanisms' (p. 121). Similarly, they find accountability at political / bureaucratic level largely intractable. The authors draw the single most important lesson that large projects almost always fail (p. 133). Despite this conclusion, the authors are aware that large scale, ambitious IT projects will continue to be launched. They therefore advise that pessimism, that is the expectation of failure, should be the guiding principle.

However, e-government is not a dangerous enthusiasm, as the alarming title of the book makes it out to be. Enthusiasm is necessary in e-government, as indeed in any walk of life, if we wish to achieve anything worthwhile. All that is required is caution, which should not be thrown away in planning and implementing e-government projects.

Problems are solved only when they are posed and faced and not when they are brushed aside under the carpet, which is often the political / bureaucratic norm in IT project administration. Gauld and Goldfinch deserve to be complimented for writing this valuable book whose strength lies in presentation of well documented case studies of New Zealand public sector, though at times the reader feels that the case of project failure is often overstated. This book should not be missed by any one interested in e-government. Otago University Press too has done a good job in attractively producing it.

## **Public Information Technology and E-Governance: Managing the Virtual State**

G. David Garson

Jones and Bartlett, 2006, 541 pp., ISBN: 0763734683

Review by [Tod Newcombe](#), Editor, Public CIO

Published in Government Technology's [Public CIO](#),

June 2006

In 1985, I worked for a small association of local governments. One of the membership features was that each city and county had a designated contact -- usually the government librarian -- who was given a small keyboard device for communicating with other members. (Think of France's Minitel device, the world's first broad-based online service before the birth of the World Wide Web.)

This forerunner of e-mail allowed members to communicate in real time without a telephone. The device was quirky, definitely a novelty and used by just a handful of people. By the time I left the organization five years later, everybody was using the system to communicate with everybody else.

The use of technology in government has since exploded, and today its complexity, sophistication and universality has spawned not just a huge industry to serve and support the unique needs of public-sector IT, but also has led to everything from a media market to educational courses for CIOs.

Now comes what might be the first textbook for technology and government. *Public Information Technology and E-Governance* provides a comprehensive overview of the political issues raised by information policy in the public sector and administrative issues that managers will likely encounter in governing the virtual state.

Authored by G. David Garson, a professor at North Carolina State University, the book blends theory with practice on everything from e-democracy, access and privacy to information planning, partnerships, project management and implementation issues. Each chapter begins on a theoretical note, then covers the main dimensions of the topic, and is followed by one or two case studies, a glossary and discussion questions.

Garson devotes only two pages to the role of the CIO and limits his overview to the federal sector, while state CIOs are mentioned in a brief paragraph covering the National Association of State Chief Information Officers. Given the book's claim to be a comprehensive tool for "managing the virtual state", it is unfortunate that the author did not allot more discussion on what has become a critical leadership position in the function and management of government IT.

Despite this oversight, Garson is to be credited for writing the first true textbook for public administration schools covering the entire field of public-sector IT policies and management.

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## **Conference Announcements**

### **4th Annual State of the Net Conference**

January 30, 2008, Capitol Hill, Washington

Now in its fourth year, this annual full-day conference brings technology and the Internet to the forefront of debate and has become the premier forum to discuss technology trends and the enormous challenges which lawmakers, industry leaders, and citizens must confront and resolve. This widely attended event is hosted by the Congressional Internet Caucus Advisory Committee (ICAC), a private sector organization comprising of public interest groups, trade associations, non-profits, and industry leaders. The diversity of ICAC membership ensures that all educational events and initiatives are fair and balanced forums for Internet-related discussion.

Largely unregulated, the global, decentralized Internet has matured and today demands a new and imaginative regulatory framework - one that is only beginning to be shaped. The State of the Net Conference offers attendees a chance to track and influence policy trends in this field. Located on Capitol Hill and drawing strong participation from government officials and industry leaders, the Conference is the perfect setting to connect with stakeholders in the Internet's growth and development. The conference will focus on the following issues:

- **Trust, Privacy & Security:** Concerns related to trust, privacy and security are becoming more acute as more and more businesses, consumers, and systems rely upon the global Internet grid.
- **Intellectual Property Protection and Innovation:** As the Internet evolves, technologists and policy makers must continue to struggle with the challenge of ensuring that both intellectual property and creative innovation are appropriately protected.
- **Media Convergence and Internet Architecture:** Convergence is becoming a reality. The Internet has begun to subsume traditional communications technologies. As Congress continues to explore telecom regulation, how will it balance traditional regulatory policies with the Internet's open, decentralized and unregulated nature?

For further details, please visit <http://www.netcaucus.org/conference/2008/>.

## 9th Annual International Conference on Digital Government Research

May 18-21, 2008, Montreal, Canada

The conference is presented by the Digital Government Society of North America (DGSNA), with major support from the US National Science Foundation. DGSNA is an organization of professionals and scholars who share an interest in furthering the development of democratic digital government. The four day conference will feature invited speakers, panels, research presentations, system demonstrations, posters, workshops, and discussion groups.

The conference theme 'Partnerships for Public Innovation' focuses on information-intensive innovations in the public sector that involve linkages among government, universities, NGOs, and businesses. This theme emphasizes the importance of sharing practical issues, policy perspectives, research insights, and expert advice, in order to reach higher levels of performance in diverse public enterprises.

The conference combines presentations of effective partnerships among government professionals, university researchers, relevant businesses, and NGOs, as well as grassroots citizen groups, to advance the practice of digital government; and research on digital government as an interdisciplinary domain that lies at the intersections of computing research, social and behavioral science research, and the problems and missions of government. The Conference Committee encourages submissions on interdisciplinary and crosscutting topics addressing broad government challenges. Topics include, but are not limited, to the following:

- Digital Government Application Domains
- IT-enabled Government Management and Operations
- Information Values and Policies: such as accessibility, digital democracy and governance, digital divide, openness, privacy, public participation in democratic processes, security, transparency, trust, and universal access to information and services.
- Information Technology and Tools to Support Government

For further details, please visit [http://www.dgo2008.org/index.php?option=com\\_content&task=view&id=16&Itemid=35](http://www.dgo2008.org/index.php?option=com_content&task=view&id=16&Itemid=35).

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## eLearning Africa 2008 - 3rd International Conference on ICT for Development, Education and Training

May 28-30, 2008, Accra, Ghana

eLearning Africa has established itself as the largest and most comprehensive capacity-development event for technology-enhanced education and training on the African continent. The sheer magnitude of the event and its innovative conference features provide an unprecedented opportunity for African professionals and stakeholders to benchmark, learn, share and network, thus strengthening the Continent's many and varied educational technology initiatives and projects. The three-day conference will be held under the patronage of the Ghanaian minister for education, science and sports.

Pre-conference workshops, seminars and meetings that will take place on May 28, 2008 will offer participants the opportunity to gain practical knowledge and insight from leading experts in a variety of specialised fields. The workshop is also followed by pre-conference seminars. The emphasis of the conference is on activity and interaction. eLearning Africa will be of professional interest to:

- Deans, directors and researchers from universities and the higher education sector
- Corporate training and development executives
- School principals and administrators, teachers and trainers
- Senior staff from government departments and international development cooperation agencies

Please visit [eLearning Africa 2008](#) for further details.

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## eCollaboration: Overcoming Boundaries through Multi-Channel Interaction

June 15-18, 2008, Bled, Slovenia

The Bled eConference attracts speakers and delegates from business, government, information technology providers and universities and is the major venue for researchers working in all aspects of "e". This conference has since many years concentrated in bringing forward the development and reach of "e" which in turn has contributed a lot. The 21st Bled eConference on eCollaboration will have a variety of keynote speakers from industry, government and academia. The four-day conference has a wide appeal, and offers:

- A fully-refereed research track, devoted to researchers in all aspects of "e";
- A business and government panel track which attracts eminent business and government leaders from Europe, the Americas and Asia-Pacific; and
- Business, government and academic meetings offering unparalleled opportunities to think and share with colleagues from around the world.

For further information and details pertaining to the

conference, please visit  
<http://www.bledconference.org/Home/>.

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### **8th European Conference on e-Government (ECEG 2008)**

July 10-11, 2008, Ecole Polytechnique, Lausanne, Switzerland

The European Conference on e-Government (ECEG) has become, over the years, the premier place for critically discussing the latest research in matters of electronic government and electronic governance more generally. The 8th Annual ECEG Conference at the Swiss Federal Institute of Technology will contribute to furthering knowledge in this rapidly evolving field.

As governments seek to remodel and restyle their services, e-Government continues to arouse interest and attention. New dynamic issues such as e-democracy, e-citizenship, e-Identity and e-voting have become core elements in the development of public sector delivery. Submissions are invited from academics, government departments and practitioners in the public and private sector, on both the theory and advanced practice in respect of the following themes: applications of e-government, challenges to e-government, e-voting, e-democracy, measuring e-government / economics of e-government, trust and governance issues in e-Government, etc. In addition to the main conference, submissions are welcomed on the two mini tracks: e-Tax and e-Revenue; and e-Democracy.

For further details, please visit: <http://www.academic-conferences.org/eceg/eceg2008/eceg08-home.htm>

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### **Editorial**

*(continued from page1)*

Recent impact assessment studies have shown that wherever projects have been implemented successfully there has been some positive impact on cost of access, quality and convenience for the citizens. In a presentation that I made at the World Bank in Washington DC in September, I discussed the impact of e-government on administrative corruption (i.e. proportion of users paying bribes for legitimate services). An [analysis of impact of eight projects from three states in India](#) indicates that out of five agencies where corruption was a problem, bribes were virtually eliminated in one and significantly lowered in two others. On the other hand corruption continued unabated in two other agencies even after computerization. No one argues that e-government is a panacea for many of the complex problems such as corruption. However, it has a role to play in improving the delivery of certain types of government services.

The bottleneck in large scale adoption of e-government is the willingness to reform amongst the politicians and civil servants. For example, the success of e-procurement in Andhra Pradesh has not prompted any other state to implement e-procurement. We hear that in Karnataka, the e-government secretary who was making vigorous attempts to take e-procurement forward was shunted out of his portfolio at the behest of some politicians. I feel that all those who are interested in seeing that the full potential of ICTs is realized have to think about new models of citizen engagement so that politicians can be made accountable. Technology can be an enabler in this process of creating accountability. Legislation on right to information has begun to empower ordinary citizens to question the actions of the Government. Many computerized delivery systems fight shy of putting out information on their own performance vis-à-vis their promised charter on web sites.

#### **The IFIP WG 9.4 Newsletter Website**

*The [Information Technology in Developing Countries](#) Newsletter has been published by Prof. Subhash Bhatnagar (Founding Chairman of IFIP WG 9.4) through support of various agencies such as IDRC and COMNET-IT in the past. In recent years, the Newsletter has been published as a joint publication of IFIP WG 9.4 and the [Centre for E-Governance](#) (CEG), Indian Institute of Management, Ahmedabad (IIMA).*

*A legacy of 10 years of print circulation to its credit, this newsletter is now published on the web.*

*The next issue of the newsletter will be published in April 2008. For archives, subscription details and guidelines for contributions, please visit the Newsletter website:*

*<http://www.iimahd.ernet.in/egov/ifip/wg.htm>*