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Editorial

Welcome to the November issue of the newsletter. The season for conferences is upon us. Schools in the US will soon be completing the first semester. The long Christmas break offers a window to travel. The weather in India and many other parts of the tropical countries is at its best in the coming months. I find myself committed to speak in 6 conferences in the coming 3 months. The recent upsurges in Middle East have provided us with a new flavor of the month and everyone is out to discuss the impact of social media. In India the program to issue Unique Identity to 1.2 billion Indians has created enough controversies, and is therefore a hot topic of debate. The topic of eGovernance is the old war horse, ready to be flogged at the upcoming conferences. ICT4D community will not be so pleased that "digital divide" is now passé. Let me comment briefly on the emerging menu for the intellectuals at the forthcoming conferences.

A hundred million Indian residents have already enrolled in India's Unique Identity(UID) program by providing finger prints , iris scans to the authority in return for a 12 digit number that will uniquely identify each of them. They don't know why they have enrolled and what awaits them. At the enrollment centers they have by default agreed to share their personal information without explicitly being asked to make a choice. I recently enrolled and did not carefully check the screen that displayed my data and a tick in a box that said that I had agreed to share the information.

*(**Editorial** continued on the last page)*

In this Issue…

ICT – a Tool, not a Cause of Protest

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I once attended a lecture delivered by a Professor of Communication.[1] She narrated a story about Janaagraha, a well-known citizen activism NGO in Bangalore. Janaagraha[2] had convinced the municipal government to put a portion of its financial records online, taking advantage of a government project to digitize such records (OneWorld India Foundation 2010). With this new level of transparency, Janaagraha was able to identify instances when the government used its funds in what might be diplomatically called a suboptimal fashion. The NGO protested and pressed for changes based on the records it found online, taking some cases to the public. The professor offered the story as proof of the incredible power of information technology, and its importance to a vibrant democracy.

Having heard many such stories before, most of which ended less happily, I asked a single question: "What happened to that computer system?"

The professor replied, "Well, after a few months, when the government realized that the online system opened them up to unwanted grievances, they shut it down."
With that one response, the story ended with a new lesson, completely the opposite of the one initially proposed: It's not that information technology has special power to improve democracy – it's that information technology remains, like everything else, a tool whose "ON" switch is under human control. Information technology amplifies human intent and capacity (Agre 2002 ; Toyama 2010). If the intent is negative, the tool can be used for nefarious purposes (undoubtedly, much corruption in government is aided and facilitated by mobile phones). It's only if the intent is already positive, and if the capacity to wield it is significant, that the tool results in measurable positive impact.

Alas, the media loves to shine its spotlight on technology, often to the exclusion of the critical human efforts that underlie it. And, if the media does this, you can be sure it's because we, the readers and the viewers, like to hear it that way.
For example, much of the news of the early Arab Spring focused on how protests were organized on Facebook and Twitter. Evgeny Morozov, author of '*The Net Delusion*,' documents this in detail for the Iranian protests of 2010 (Morozov 2011): Andrew Sullivan, a prominent American blogger, wrote that Twitter was "the critical tool for organizing the resistance in Iran" (Sullivan 2009). National Public Radio followed up: "In Iran, tyranny has run afoul of technology in the form of the Internet, turning a protest into a movement" (Schorr 2009). Noted technology pundit Clay Shirky claimed, "…This is it. The big one. This is the first revolution that has been catapulted onto a global stage and transformed by social media" (Anderson 2009). The self-congratulatory excitement among technology cheerleaders was palpable.

And as Morozov traces, the hype impacted U.S. foreign policy. The State Department reportedly asked Twitter to hold off on a scheduled disruption to service; for fear that it would disrupt protests in Iran. Secretary of State Hilary Clinton declared "Internet freedom" a focal point for American international activity.

Ironically, all of the power of the Internet turned out to be insufficient in Iran. The Iranian protests were quashed by a government willing to flex its physical might.

You might think pundits would have learned their lesson, but then came Tunisia and Egypt, and once again, there was talk of Facebook revolutions. Roger Cohen wrote for *The International Herald Tribune* that the "Facebook-armed youth of Tunisia and Egypt rise to demonstrate the liberating power of social media" (Cohen 2011).

Luckily (though not for anyone under fire), next came Libya and Syria, where the media has been curiously quiet about the Internet's role in those rebellions. No wonder – governments in both countries shut down their respective connections to the Internet, *but the protests have continued unabated*. How could that be, if the Internet were so critical to rebellion? With the conflict continuing into months, these countries are showing that ultimately what matters are the competing intents and capacities of those in power and those in protest. (If any technology is the deciding factor, it is the physical, not the virtual, kind.)
Meanwhile, though there were some flirtations with a Jasmine revolution in China, nothing like a sustained protest has materialized. And this in a country reported to have 485 million Internet users (Reuters 2011) and 930 million mobile phone accounts (Xinhuanet 2011). If the Internet were anything like a natural instigator of democracy, the Chinese government would have a lot more to worry about. It doesn't, though, because for the moment, the vast majority of the country is reasonably content with its leadership. Any political oppression affects very few people on a daily basis;

[1] This is a field which studies how society interacts with Communication Technologies.
[2] For more on Janaagraha, see www.janaagraha.org.

and with so many households becoming richer each year, who would want to shake the boat? (Of course, Chinese ministries themselves wield the Internet to their advantage through misinformation, censorship, and arrests when necessary – again, the technology magnifies intent and capacity.)

Let's go back to the latter half of the 18th century when the world saw the birth of modern democracy. From then through the mid-20th century, country after country experienced, through revolution or otherwise, transitions to democracy. In fact, most of the countries that have working democracies today have had them for decades, if not centuries – often in starting an age before electronic communication of any kind. Where people have the will, they will find a way to communicate, whether it be by messengers or lanterns.[1] Considered in this light, it's hard to understand why anyone would suggest that the Internet, social media, or the mobile phone is the critical part, or the vital cause, of democracy. Yet variations of the claim that "the Internet makes governments transparent" or "social media causes citizens to oppose oppression" are frequently heard.

Returning to the story of Janaagraha, it turned out that the story did not end with the shutting down of the online site. If anything, the setback only caused the organization to aim for larger goals. They pushed for policy changes at the national level (OneWorld Asia Foundation 2011). Janaagraha, together with its partners, successfully lobbied for a law in the Jawaharlal Nehru National Urban Renewal Mission that made it mandatory for municipal bodies to disclose their financial records. In addition, a set of benchmarks were designed, which allowed urban public service to be evaluated. Those benchmarks then became one of the measures by which states would be judged according to the Thirteenth Finance Commission.

A report on Janaagraha's multi-year effort illustrates the relative importance of the social versus the technological (OneWorld Asia Foundation 2011). Between 2002 when Janaagraha launched the effort and 2009 when federal policies were implemented, it participated in a coalition of like-minded NGOs; it ran campaigns to bring the case to the public at large; it found moral support from influential leaders; it lobbied the federal government; it worked with the Bangalore government to allay its fears; it trained groups of concerned citizens to interpret municipal data; it developed standardized benchmarks for urban services; etc. In contrast, among the ten achievements listed in the report, not a single one highlights technological achievements.

Of course, Janaagraha used technology as a tool throughout. Some of its public campaigns were run on radio programs and newspapers. Coordination between partners was undoubtedly handled via e-mail and mobile phone. And, when financial records are made public, governments do so by putting computerized data on the Internet.

But it would be a great mistake, and a drastic underestimation of Janaagraha and its partners, to imagine that it was the tools that accomplished transparency. Transparency came exactly because of Janaagraha and the concerned citizens who lobbied for the right policy. The political will came from people, not from machines.

People who look to technology as the solution have two things in common: First, they are looking for shortcuts to complex social challenges. Second, they benefit either materially or morally from sticking to their story. It is far easier to write a Facebook app than it is to convince citizens to put their lives at stake in protest; it is much quicker to purchase a hundred thousand PCs than to provide a real education for a hundred thousand children; it is simpler to put up a website for grievances than it is to root out entrenched corruption.

It's encouraging that in the recent protests, from Anna Hazare's hunger strike against corruption, to the twenty-something's occupying Wall Street; more attention is being paid to the people protesting and the specifics of their demands, than to the tools they use to organize (Kulish 2011). These groups certainly use social media – real-time communication and government websites can aid protesters, assuming certain things already exist: the will to march, the capacity to organize, and some critical mass of support. But the tool is not the cause, any more than it was Gandhi's wheel that spun the thread.

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[1] From the American Revolution, Paul Revere's midnight ride and the signal by lantern, "one if by land, two if by sea," are mainstays of American history books.

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Learning Language Through Satellite Communication
A pilot project for tribal schools of Gujarat

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Rationale

The findings of a study carried out by the Tribal Development Department, Gujarat concluded that the academic gap between students in tribal and non-tribal areas has been found to increase by the time they reach the secondary level despite insignificant differences in their intelligence levels. A significant factor that contributes to this situation is the quality of teaching inputs that children in majority of the scheduled areas receive. In the long run such limited levels of achievement, especially in English, due largely to inadequate exposure and support curtail the students' livelihood opportunities.

With regard to the quality of education, the non-availability of trained and motivated teachers is an important factor. The teachers that are recruited receive very limited support in the form of in-service training. This is a serious disadvantage, especially in the context of teaching English language. Students have very little or no exposure to English in their environment and the school curriculum has to deal with this. Teachers tend to blame the students' limited language achievement on the lack of support from the home rather than question the efficacy of the curriculum. The schools also vary in creating a supportive environment for the students. These factors curtail the potential for students' language improvement drastically.

The absence of exposure and support for English learning in their backgrounds has to be accepted as a fact and given condition. However, the curricular process is based on assumptions and judgments and can be modified. The SATCOM Program for English Language for students in scheduled areas of Gujarat, being implemented by UNNATI Organization for Development Education, Ahmedabad with the support of the Tribal Development Department, Government of Gujarat, takes this flexibility as its point of entry. It is an effort to explore small ways of utilizing the potential of SATCOM based instruction to enhance the quality of the English curriculum, importantly by providing teachers with a practical model of an enriched pedagogy. It is founded on the hope that what is learned at the school level and the system level from this experiment can impact subsequent processes. At the school level it can demonstrate effective practices of classroom teaching and at the system level it can suggest meaningful improvements in the design of the language curriculum and of programs for teacher training and support.

The 173 participating schools and 8000 + students covered by the program are spread across 15 districts of Gujarat. This geographical and numerical span could not be reached through face to face language teaching inputs by a small group of specialized teachers. The other option of training master trainers and percolating the training was also not very feasible as the number of teachers in these areas with a background and expertise in teaching English as a second language is extremely limited. Hence, the SATCOM medium was considered as a viable option for connecting to such a wide and spread out audience. The availability and functioning of the SATCOM network in Gujarat also made this option workable. This medium was selected and used to build a learning community where students would receive good quality exposure to English language within their own learning environments.

Design

The SATCOM program was conceived in 2009 and developed as a special pilot project for teaching English to students of class VIII in scheduled areas of Gujarat. At the outset, the program was conceived to provide good quality tutorials to the students to help them score high marks in Board examinations; to help improve their pronunciation by allowing them to listen to grammatically and phonetically "correct" English

[1] This article has been written by the SATCOM team: Anna Sacha, Anurima Chatterjee, Geeta Sharma, Prof. Jacob Tharu and Dr. Ranganayaki Srinivas (in alphabetical order)

and to create language related capabilities among them. It was felt that this can be done by identifying good quality tutors who can be invited to give inputs to students via satellite communication. The program was not meant to replace the teachers in these schools, but provide them support.

Pre-project visits to the target schools and interactions with teachers and students helped determine the current learning levels and pedagogy in use. Students had negligible exposure or opportunities to use the language. Teachers reinforced the need for supportive learning aids as they have little exposure and limited in-service training. They voiced the additional challenge of being required to teach English from scratch when students enter class VIII; this despite the fact that English is introduced in the curriculum in class V. In most elementary schools, there is no dedicated English teacher and many teachers engage in multi-subject teaching, resulting in little support to students for language acquisition. They suggested the need for a balanced focus on English communication as well as remedial support for coping with the demands of the regular syllabus and examinations.
The design of the program had to be based on these realities. It was important therefore to:

a. develop a learning package that would address the needs of both the students as well as teachers,

b. make the program interesting enough to not only hold the attention of students but also engage them in the process, as language acquisition cannot happen through a one-way instruction,

c. engage with the English teachers in the schools since the program was visualized as a supportive mechanism rather than a standalone.

These considerations required the use of a different approach and methodology than what was originally conceived. It was decided that the program would be developed in two parts. The first part of the program would focus on helping students' revise some of the language functions covered in classes V-VII through a Bridge course. The second part would focus on language functions and grammar focus covered in the class VIII textbook. The program would use methods that demonstrate pedagogical nuances and classroom practices that can enhance language development among students. Interactions with and support to teachers was visualized as an integral part of the program. The program would be a vehicle for creating a community of learners, where students would not only practice the LSRW skills[1] in their own school environment but also be able to utilize a platform for connecting to the other schools and learners.

A learning package comprising of 74 audio-visual classes, each of an approximate duration of 40-45 minutes was developed. 6 workbooks, to follow up and extend the learning initiated through the audio-visual classes, were introduced to reinforce learning as well as sustain an environment in which interaction among children and peer learning is encouraged. Stories and songs as well as information related to daily routines, hobbies, interests, hopes and fears shared by students and teachers of tribal schools were used to start the program with familiar stories and contexts. This allowed the students to use knowledge that they already had, helping them to become more confident with the use of the language.

Learning package	Nos.
Production of AV classes 	74
Production of audio rhyme CDs 	3
Production of workbooks 	6

The SATCOM program was named as WELCOME English (WE). The letters in the word 'WELCOME' represent the guiding tenets governing the programme.

Watch – **E**xplore – **L**earn – **CO**mmunicate – **M**aster – **E**njoy

Watch the SATCOM programme, **explore** the language and get familiar with the way it works, **learn** the language, use it for **communication**, **master** the language and **enjoy** the whole learning experience.

[1] LSRW skills is Listening, Speaking, Reading , Writing (language skills)

Objectives

WELCOME English program seeks to reach out to students who, because of their location in remote tribal areas, would otherwise not have received any meaningful exposure to English in their natural environment outside the classroom. It is aimed that through this exposure, they will learn to use English in their daily lives and thus overcome the obstacles they might face while competing with urban youth professionally. Additionally, it strives to introduce and propagate effective teaching practices to improve the learning of English as a second language, especially, those that the rigidities of the system keep out of the regular syllabus and textbook. The exposure of this community of teachers to a live demonstration of the communicative methodology in form of the WELCOME English program could very well negate their own pessimism, towards successful learning in their students.

Engaging with WELCOME English….

would enable students to:

1. listen to instructions, conversations, stories, understand what they listen to and reveal their understanding through meaningful actions.
2. express their feelings, ideas, wishes and dreams to friends, teachers, visitors of the village and participate in natural conversation with them.
3. read and enjoy simple sentences, paragraphs, stories and informative passages.
4. write simple words, sentences and paragraphs to communicate their ideas.

would enable teachers to:

1. use the SATCOM classes to reinforce the concepts taught through the curriculum
2. use interactive methods for English language teaching to engage the students more meaningfully
3. use the SATCOM space for sharing of ideas and concerns related to English teaching

spoken, subtitles etc.] to avoid constant dependence on literal Gujarati translation. Methods like dramas, role-plays, puppet shows, films and rhymes were used to add more interest and scaffolding that would not have been possible only through the print medium.

Although this medium provided several opportunities to evince interest among students in language learning and in reduction of fear, it also posed several challenges. Meeting the needs of students with varying levels of English language competency, across schools with different resource availability through a single pre-designed program, with little scope of need based modifications required a great deal of investment at the design stage. Orienting teachers, including the SATCOM teacher team and students to the new methodology and the medium for this specific purpose was another area that required concerted effort. The choice of this medium also required grappling with the field realities of technical glitches, power failures and inability to gauge on-the-spot viewership levels. Within limited resource, time, budgets and human resource, we were committed to provide a form of "edutainment" where the pedagogical rigor of teaching was complemented by the visual appeal of the AV medium.

Program Outreach

The WELCOME English program reached out to 173 schools across 15 districts. This included 4 different types of schools in scheduled areas viz. Eklavya Model Residential schools, Girls Residential schools, Uttarbuniyadi Ashramshalas and Adarsh Nivasi shalas. The overall responsibility of management of these schools falls under the Tribal Development Department. These schools vary in terms of the financial, human and infrastructure resources, management and admission process.

Program Transmission

At the outset, all the participating schools were equipped with the required infrastructure (a TV and dish antennae) for viewing the program. The WELCOME English program, approximately of 40-45 minute duration was transmitted through Bhaskaracharya Institute of Space Applications and Geoinformatics (BISAG), Gandhinagar thrice a week on Mondays, Wednesdays and Fridays from 3-4 pm. Subsequently, a repeat telecast of all programs was arranged for on the consecutive days of the week, to deal with the problem of power cuts on the day of the relay.

The Bridge Course was telecast during January-March 2010, followed by a relay of the complete program during August 2010-March 2011.
The current arrangement through BISAG affords the possibility of a one-way video and 2 way audio interaction. At the end of the relay on the three main days of telecast, a phone-in time slot was utilized to

connect and communicate with students and teachers. Students got a chance to interact with the TV teachers, speak in English through pre-designed formats as well as spontaneously and this process helped increase their confidence remarkably. On an average there were 6-7 calls during the phone-in time.

The involvement of the school English teachers as partners in this innovation was one of the biggest challenges that needed to be addressed by the team. Various techniques were employed, one of which, using the potential of the SATCOM medium, was the Teacher Interactive session. These sessions allowed teachers to call up the SATCOM teacher team and give their feedback, share their questions/doubts and learn from each other's experiences. The SATCOM team attempted to respond to these issues and promote cross learning.

Teacher Orientation

As part of our efforts for capacity building for the target community of teachers, orientations were held to introduce the WELCOME English class, its techniques and possibilities.
During 2009-10, through 2 three-day residential workshops, teachers of the participating schools were oriented to the approach and pedagogy of the program. This provided them space to experience the joy of learning through interesting pedagogy; equipped them to support the students during the program and engaged them in the development of teaching-learning materials and lesson plans using different methods; some of these ideas were later used to develop the curriculum based audio-visual classes.

During 2010-11, 5 district level orientations were held for English teachers and principals as well as the Project Administrators and Consultants of TDD. The orientations helped in arriving at role clarity of all stakeholders who could contribute to the effective implementation of the program and in receiving their support for monitoring and providing feedback to the SATCOM team.

Program Monitoring

Monitoring the program was a complex process that entailed balancing the academic, technical as well as administrative dimensions. As a result, a combination of techniques was adopted.
To understand the impact of the academic content of the program, visits were made by the SATCOM team to the schools. Interactions with students and teachers and observations helped the team to understand the factors in the program design that had facilitated comprehension and language learning or served as barriers. During the monitoring visits (in 2010 – 2011) it was observed that in 76% of schools the English teacher was present during the class relay. In more than 50% of observed cases teachers made efforts at facilitating the WELCOME English classes. In about 75% of schools the attendance of students was seen to be greater than 50% and in about 45% of schools the students' participation ranged between average to high. Presence of teachers and their facilitation of the class was observed to positively impact the students engagement with the program and learning.

29 visits were made by the team in April 2010 to selected schools after the first phase of program relay to interact closely with the children and teachers and understand how they perceived and received the program. The stories, rhymes, language activities and games in the WELCOME English program were perceived as having helped children to listen attentively, speak without hesitation and also enjoy reading and writing. It was felt that it had led to an increase in their vocabulary, enhanced their participation in class and has helped in an improved comprehension of their textbook curriculum. Teachers reported an enhancement in their own repertoire of teaching techniques which can be adapted and used by them.

Support for teachers and students by way of training, learning aids and libraries emerged as areas requiring intervention. Efforts to augment this process made so far include obtaining permission from UNICEF to distribute and use the CDs of the popular Meena Stories in the schools. Potential publishing houses have been approached to identify and prepare a list of books and teaching aids that can be used to set up libraries in the schools.

Phone calls made to schools after the relay of the class helped gauge whether the schools had watched the class and whether they faced technical problems. 205 phone calls were made (December 2010 to March 2011) across all the 173 participating schools in 15 districts of Gujarat. It was found that 79% of the schools had working infrastructure while about 15% faced hardware issues and 4% complained of connectivity problems. Where the infrastructure was working on the day of the phone call, 16% of schools reported that they did not watch the relayed class. Various reasons were cited including the absence of the English teacher, absence of students during festival periods, exposure visits for the students etc.

While the SATCOM team made efforts through the above methods at reaching out to the schools, it also recognized its limitations. Participatory efforts of the stakeholders were seen as a strategic step in the overall monitoring plan where the English teachers shared the responsibility of monitoring the implementation and impact of the program. During the district orientations, teachers were assisted to develop a set of criteria for

self- monitoring. These aimed to gauge the level of involvement of the students and teachers in viewing the classes, completing worksheets, preparing teaching learning materials, participating in class activities, providing the SATCOM team with feedback and consistently engaging with the program. Each criterion had Gold, Silver and Bronze categories corresponding to varying levels of interest and achievement. In the foregoing year, more than 50 % of the schools reported that they watched more than 75% of the classes relayed and the students had completed the workbooks in a timely manner. Out of these 17 schools were awarded with certificates of appreciation for their participative efforts in monitoring of this program.

The program was also evaluated by an external agency. In the context of the history of educational television in India, wherein there is no conclusive evidence of the effectiveness of education through TV, this program was considered as:

> *"a bold step and renewed attempt in the use of television for improving English language in terms of reading, writing and speaking of the tribal students of Gujarat." (Taleem Report, 2011:4)*

Results of the study indicate that…

> *"improvement and total net gain in the knowledge of the students of experimental schools…was on the higher side especially in case of writing in English, special features of animals, celebration of 'Holi', parts of speech, active passive voice, pronunciation, verbal fluency in speaking and writing…As far as knowledge of grammar is concerned there was significant improvement in knowledge of students of experimental school as compared to those of control school." (Taleem Report, 2011:17)*

The Way Ahead

An Advisory Committee Meeting was held in May 2011 to review the implementation of the pilot phase of the SATCOM program, examine it critically for gaps and discuss the way ahead for the Roll-out phase. The program team acknowledged and identified the need to intensify the process of teacher support and monitoring in the Roll-out phase.

The plan for monitoring, developed for 2011-12 includes importantly, field visits by the SATCOM program team, during the relay of the program as well as on non relay days, to a sample of schools covering all districts to study the impact of the AV classes and observe other aspects of the school's program and resource availability. English proficiency tests focusing on those aspects (sub skills) that the WE classes are promoting will be tested through administration of Special Worksheets by the teachers themselves during regular class sessions. Differing in pattern and scope from the formal unit tests and final examination, these will emphasize a child friendly and stress reducing manner of administration. The results of these Special Worksheets will be uploaded on the Vanbandhu Kalyan Yojana website. In addition, an attempt will be made to include a small and unobtrusive monitoring dimension in the ongoing phone-in and interactive sessions. While the data obtained through these channels is necessarily qualitative and not representative of the total field, it will have the advantage of being current and timely.

Field based monitors will be appointed at a cluster level to directly monitor and support each of the participating schools during the program implementation. Field visits will be made by this team along with the Department's own inspectorate personnel to monitor the availability of resources and administrative support at the school level, which are pre-requisites for the effective utilization of the academic inputs provided.

Based on the inputs of teachers and the observations of the SATCOM team, the WELCOME English learning package has been reviewed and revised to a 50 class package with 3 workbooks for relay in the Roll-out phase (2011-12). A learning package will also be developed for class IX students.

With the introduction of Right to Education Act, 2009, class VIII is in the process of being shifted to upper primary schools. This process has also been initiated in the tribal schools. Hence, the Roll-out phase will also include some of the upper primary schools where class VIII has been included. The shift will affect the composition of the participating schools in the subsequent years.

On A Reflective Note

The use of the SATCOM medium for education in itself has been an innovation and to use it for teaching of English as a second language has been even more of a challenge that has required constant reflection, revision, innovation and monitoring. The SATCOM program has, thus, been more of the *learning by doing* experience considering the presence of no precedents to base its assumptions and processes on. With the commencement of the Roll out phase, the same processes have become less fluid considering the experience that has been built up in these two years. Only an approach of constant innovation, research, review and revision from all stakeholders involved will ensure maximum efficacy of this endeavor.

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Relationship between ICT penetration rate and socio-economic variables in the Asian countries: a dynamic panel data approach

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Abstract

Despite the slow socio-economic development (namely health and education), the ICT sectors have grown remarkably in Asian region thanks to a massive penetration rate of ICT devices (particularly cellular and internet) in the last couple of decades. This phenomenon raises the question on how much have ICT development contributed to the society. Addressing this issue, the study aims at relating two variables of socio-economic indicators included in the calculation of the Human Development Index (HDI): educational attainment and health, whereas the variables of the Internet subscriber and telephony are representing the development of ICT sectors. The study covers roughly 35 selected Asian countries that represent all the sub-regions in Asia based on the World Bank and International Telecommunication Union (ITU)'s database, and the figures range in time from 1983 to 2005. The study first identifies the unit root test and then builds cointegration between the non-stationer series. As there are many gaps in the data, the Maddala-Wu (1999) estimation is implemented while the Westerlund (2007) cointegration test is applied to further examine the long run trend. The results are quite surprising in that ICT sectors represented by internet and telephony have no statistical evidence of cointegration with socio-economic variables.

Keywords:Socio-economics variable, panel cointegration

Introduction

Previous studies have successfully explained how investment in telecommunication sector has led to a better economic performance in terms of growth rate and a greater degree of total factor productivity at macro level (Madden & Savage, 1998; Chakraborty & Nandi, 2003; Shiu & Lam, 2008). Madden, Savage and Ng (2003) identified that the Asia Pacific Region experienced rapid growth from the 1980s to the 1990s in network expansion and traffic flows. The average annual growth of main lines from 1984 to 1994 of 7.8% is higher than the 3.3% per annum in developed OECD countries. Low-income countries like Indonesia and Thailand have achieved substantial development in their telecommunication infrastructure, maintaining a growth rate of 15% during the periods. In addition, between 1992 and 1994, international telephone circuits increase by 64% in China, 69% in Thailand and 52% in Singapore. Outgoing Australia-Asia telephone traffic increased from 131.6 million minutes in 1987 to 274.4 million minutes in 1992, which is an increase of 16% per year. As a result of the rapid development in the sector, the study shows that the development of the telecommunication sector is also followed by a rapid increase in Total Factor Productivity (TFP). The TFP growth rate in Asia is about 1.65% per annum. Furthermore, a recent analysis by Kanamori (2004) suggested that the impact of ICT on economic growth was quantified in Asia, focusing on the role of communications equipment. The result also reveals that communications equipment made a positive impact in all the Asian economies during the 1990's, and the size of the impact was similar in most Asian economies. In other words, the results scrutinize the evidence that rapid investment in communications equipment in these economies means that the role of communications equipment industry are becoming increasingly important.

Yet, little attention has been paid to the impact of the ICT sectors on developing socio-economic variables, for instance, health and education. In a view of conceptual framework, the importance of ICT sectors, particularly telecommunication, and socio-economic variables can be explained in the following Figure 1 discussed by Dutta (2001).

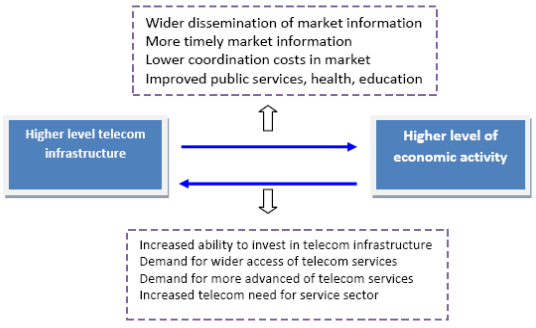

Figure 1 Relationship between ICT investment and economic growth

From Figure 1, it can be ascertained that there are two-ways direction between higher telecom infrastructure and economic activity. A higher economic activity leads to a higher telecom infrastructure through increasing demand of new services and the derived demand from other sectors which is also showing a network externality. In opposite, a higher telecom infrastructure leads to market efficiency thanks to faster information dissemination. Nevertheless, whereas the impact of higher telecom infrastructure to economic activities and market efficiencies has been the focus of investigation (Brynjolfsson & Hitt, 1997; Chacko& Mitchell, 1998; Bresnahan, Brynjolfsson & Hitt, 2000), the impact to public service, health and education, is still somewhat missing in the literature. Therefore, this study aims at scrutinizing the relationship of ICT sectors to socio-economic variables. This aim is achieved by looking at the cointegration analysis which is hypothesizing that cointegrated series are entitled to long-term relationship.

3. Telecommunications in Asia

Telecommunication sector in Asia has been growing remarkably in the last couple of years. Based on the 2007 South-East Asian Telecom statistics, the tremendous achievement of telecommunication sector in the countries in ASEAN region, for instance, can be summarized as follows:

Table 1: Development of the telecommunication sector in South-East Asia

No	Country	Development
1.	Brunei	As a small and wealthy country, Brunei has reached quite a decent standard of telecommunication infrastructure while most of the ASEAN countries are still progressing, for instance, 100% digitisation was achieved way back in 1995. The country has also been identified as a strong consumer of telecommunication services thanks to the support from government. Improved regulation, especially in relation to the increase in liberalization in the local market, may be needed to increase development in this sector.
2.	Cambodia	Cambodia is still increasing its efforts to direct the building of a telecommunication infrastructure. Unlike most Asian countries, which have reached a substantial penetration rate in the cellular market, Cambodia's penetration rate is relatively lower having 57.65%, with even lower performance for fixed lines (only 40,000 subscribers or 2.54% penetration rate) by 2010.
3.	Indonesia	As a country that has 220 million people, Indonesia is a huge market to develop further. Nevertheless, given the varied geographical area, it is difficult for Indonesia to increase the level of telecommunication infrastructure, especially for fixed lines. The fixed line penetration rate is around 15.83%% as of 2010. In contrast, the cellular market recorded a dramatic boost having the growth rate 91.72%, and hence the number of subscribers reached around 220 million by 2010.
4.	Laos	Lao's economy is still seeking a better performance in general. The low rate of fixed line teledensity, which is only 2 per 100 inhabitants, initiated the plan from the government to seek additional foreign investment. The cellular market achieved penetration rate of 64.56% by the end of 2010.
5.	Malaysia	Telecommunications are battling against a more competitive environment in the industry, when the past decade has shown positive growth in the sector. The mobile penetration rate has surpassed 100% by the end of 2010 (120%). In the meantime, the government has issued a number of Wimax licences as a catalyst to further growth. Fixed-line services, however, were still at a penetration rate of 16.1% by the end of 2010
7.	The Philippines	The country still faces difficulties in developing the telecommunication sector, especially fixed lines. The fixed teledensity stood at less than 7.27% up to 2010, showing difficulties in lifting the network connection. Nevertheless, as is becoming the phenomenon in most Asian countries, the cellular industry recorded massive development that had reached 85.67% by 2010.
8.	Singapore	Singapore has built a very competitive telecommunication industry and at the same time has a high-quality, progressively

		regulated telecommunication environment. Over 98% of homes have fixed-line telephone connections with a fully digital telephone network. Even though the incumbent Singapore Telecommunication (SingTel) continues to dominate in absorbing the market, new operators are also entering the market. The penetration rate of fixed line and cellular are among the highest in ASEAN region having 39% and 143% respectively by the end of 2010.
9.	Thailand	The telecommunication sector has become a rapid economic growth sector especially in relation to the role of cellular telecommunications. By 2010, the mobile penetration rate was about100.81% and 10.14% for cellular. In late 2004, the role of the national telecommunication regulator undoubtedly played an important role in accelerating the development of the sector.

Source: South-East Asian Telecom Statistics, 2007 and ITU (2011)

In summary, the ASEAN telecommunication sectors have developed in a progressive way amid the problems of a relatively low penetration rate of fixed-line services due to lower development in infrastructure activities.

The phenomenon is also reflected in the case of Central Asia, which comprises 3.98 million square km and a population of up to 56 million (Uzbekistan, Kyrgyzstan, Tajikistan and Kazakhstan). From the ITU database, it can be seen that in many countries the cellular penetration rate has increased significantly. In Uzbekistan, the penetration rate grew from just 10.4% in 2006 to 76.34% in 2010. In Kyrgyzstan, the number of subscribers reached 4.9 million in 2010 from unrecorded data in 2006. Tajikistan also shows better cellular performance by obtaining 5.94 million in 2010 compared with 2.13 million in 2007.

In South Asia, the ITU (2002) explains that as the region has a combined total of 1.3 billion people, South Asia has developed the telecommunication sector dramatically starting in the late 1990s with a total of 43.7 million fixed lines in operation and 8.5 million subscriber at the time. South Asia has accounted for 4% of the world's fixed lines and 1% of its cellular subscribers. The compound annual growth rates for fixed lines and cellular phones are 20% and 78% respectively while, at the same time, the growth rate for these two devices was just 7% and 48%. Nevertheless, the growth rate of fixed lines is still considered very low, with a long waiting list for fixed lines that stood at 2.6 million at the end of 2001. In the past decade, there has also been a phenomenal increase in the number of public telephone facilitates within the region. The penetration is about 2.7% of the total number of mainlines, equivalent to more than 1 million marks compared with only 100,000 in the 1990s. The recent statistics on penetration rate of cellular shows the remarkable development of the sector. By the end of 2010, the penetration rate of cellular is recorded 61.42% in India or equals to 750 million subscribers. While in Bangladesh, Sri Lanka and Pakistan, the ITU statistics reported 46.17%, 83.22%, and 59.21% respectively.

4. Socio-Economic Problem

Having explored the promising sign of ICT in general and the telecommunication sector in particular, there is an opposite pole phenomenon in which most Asian countries are still struggling with the low levels of the socio-economic variables, namely education and health. Puri (2005) explains some challenges currently faced by most Asian countries:

- **Economic growth rate**: The Asia Pacific Region is growing at twice the rate of, for example, the European countries, but the baseline is very low (mainly in China and India). There is therefore a huge challenge to increase the growth rate and to spread it in the region.
- **Food security**: Access to reasonably good quality food is still a major challenge in relation to lower productivity in the agricultural sector and the development process in the rural area.
- **Employment**: An extra effort is needed to match the number on the labour market, which has reached 1 billion workers, by providing such fulfilment on the demand side.

In addition, Chatterjee, Prakash and Tabor (2004) found that when using the poverty line of 1USD/day there were still 700 million poor people in the entire Asian continent in the year 2000; a fall from the previous figure of 800 million. Surprisingly, India and China contributed most to the number of poverty heads. Omitting these two countries, the number of poor people in Asia was about 100 million in 1999 and 2000. Oxaal (1997) found that despite the developments in education, the proportion of female-male enrolment is still not equal in Asia, particularly not in tertiary sector education. Whereas the proportion of males to females is almost equal in primary and secondary education, females only recorded 70% of the total for males in tertiary

education. Regarding the health sector, Friel and Baker (2009) discovered that the life expectancy rate for all the Asia Pacific countries increase significantly during 1990-2008. The distribution between the countries is not uniform though. Japan, Taiwan and Korea have an average life expectancy rate of 82 years while Lao, Myanmar and even Cambodia have a rate of only about 60 years. This phenomenon is undoubtedly closely related to health-sector development in each country. They also found that by grouping the population based on quintiles, the richest quartile in India is vulnerable to the risk of the under-five mortality rate of about 40%, which is equal to the rich of that poorest quartile in Vietnam. Moreover, Bloom (2001) mentioned that South and South East Asia are also very vulnerable to the AIDS epidemic, having found that 5.8 million people were infected with the virus, which resulted in 470,000 deaths in 2000.

To conclude, there is a big question of how ICT sector is actually related to the socio economic development, primarily education and health sectors. Having found many studies indicate the positive relationship to income, this study emphasizes on the relationship to health and education answering whether the contribution by the ICT sectors do not only exist for the macro-economic variable in general but also from a socio-economic aspect.

5. Methodology

This article is written employing a panel data cointegration analysis as the main methodology. The term "panel data" means that the econometric analysis is employed on the data which has two dimensions (cross-section and time series). Therefore, the data employed in this paper consists of 35 Asia-Pacific countries during the period of 1983-2005. In addition, the terminology of cointegration means that this article aims at identifying the long run relationship between two series. To put in other words, two variables are said to have a long-run relationship if they are both cointegrated. Therefore, this article scrutinizes whether the long run relationship exists between the ICT development (internet and telephony subscribers) and socio-economic variables, namely health and education.

To operationalize this method, the unit root test analysis is firstly carried out to test the stationerity of the series. Once, it is found that the series are not stationer, the continual step is to test the cointegration analysis between two non-stationer series. This article found that most series in the observation are not stationer thus enables the cointegration technique to be done. Moreover, the cointegration analysis supports the conclusion that socio-economic variables (mainly health and education) are not cointegrated with ICT development (mainly internet penentration rate) thus there is no long run relationship between these two variables.

The first test is related to stationarity analysis within the series. To enable the test, the study implements the following panel unit root test for cross-sectionally independent panels, as explained in the following equation:

$$y_{it} = \alpha + \rho y_{t-1} + c_t + \varepsilon_t$$
$$\Delta y_{it} = \alpha_i + (\rho_i - 1)\, y_{i,t-1} + (\rho_i - 1)\, \gamma_{it} + \varepsilon_{it} \quad (1)$$

where $\gamma = \frac{c}{\rho - 1}$

From equation (1), the unit root test puts the hypothesis that $\rho_i = 1$ means that there is no trend in the data affecting the current value of observation. Given sufficient T, this hypothesis can be tested on N individual time series. This study employs, in particular, the Maddala-Wu unit root test, which gives a possible estimation for the gaps of panel data series. The stationarity test then uses the rule:

$$-2 \sum_{i=1}^{N} (\ln p_i) \sim \chi^2\ (2N)$$

Where p_i is the p value of country i's ADF test and ln denotes the logarithmic transformation. The p value for each country's ADF regression must be obtained by simulation, as the t-statistics in the ADF equation follow a Dickey-Fuller distribution. Further investigation using the cointegration analysis aims to provide a number of test statistics based on the Error Correction Model (ECM) for which the underlying idea is to test for the absence of cointegration by determining whether there is error correction for the individual panel members or panel as a whole. This estimation is conducted after investigating the stationarity process of the previous step. Thus, the cointegration analysis is only implemented between non-stationary series. The process of cointegration between x and y is explained as follows:

$$\Delta y_{it} = c_i + (a_{0i} - b_i x_{i,t-1}) + \sum_{j=1}^{K_{1i}} a1_{ij}\, \Delta y_{i,t-j} + \sum_{j=-K_{2i}}^{K_{3i}} a2_{ij}\, \Delta x_{i,t-j} + u_{it} \quad (2)$$

The first sum on the right-hand side in equation (2) represents the lag differences to account for short-term dynamics while the second sum denotes some part of the short-term dynamics and leads to difference regression. The model is estimated separately between the countries, choosing the appropriate lag length K to ensure that the error term is white noise. The cointegration hypothesizes that:

- If $a1_i$ =0, there is no long-term equilibrium and the co-integration equation is level and y and x are not cointegrated
- If $a1_i$<0, there is an error correction process, hence both series are cointegrated.

6. Data

This study employs data that cover roughly 35 selected Asian countries that represent all the sub-regions in Asia based on the World Bank and International Telecommunication Union's database. The figures range in time from 1983 to 2005. The length of the period is thus 22 years of observation, fulfilling the minimum length of the series (T=20) to be considered as a long T-panel data set (Pedroni (2008) on Eberhardt(2009), p.2).

6.1. Statistic descriptive

The list of variables investigated in this study is presented in Table 2.

Table 2: Variables to be investigated

Variable	Definition	Source
BIRTH	Births attended by skilled health staff (% of total)	WB
LIFE	Life expectancy at birth, total (years)	WB
PRIMARY	Primary completion rate, total (% of relevant age group)	WB
RATIO	Ratio of girls to boys in primary and secondary education (%)	WB
INTERNET100	Estimated Internet users per 100 inhabitants	ITU
F100	Main (fixed) telephone lines per 100 inhabitants	ITU
COMP100	Number of personal computers per 100 inhabitants	ITU
TV100	Number of TV sets per 100 inhabitants	ITU
COMHOUSE	Proportion of households with a computer	ITU
FIXEDHOUSE	Proportion of households with a fixed-line telephone	ITU
RADIOHOUSE	Proportion of households with a radio	ITU
TVHOUSE	Proportion of households with a TV	ITU

The summary of descriptive statistics of the variable is presented in Table 3 and Table 4.

Table 3: Descriptive statistics of socio-economic variables

Vari-able	No. of obser-vation	Mean	Std. deviat ion	Min	Max.
Prima -ry	271	89.62	22.02	15.86	150.36
Ratio	259	95.66	12.64	0	122.49
Birth attend -ed	160	70.63	31.86	7.4	100
Life expect -ancy	1754	61.99	10.65	31.13	82.59

Source: the World Bank database

The socio-economic variables in Asia Pacific diverge greatly in all aspects. For instance, there is a country within the duration of observation in the panel data with a 0 ratio of girls to boys for the respective years of education, though some countries are even more dominated by girls. Birth attended by skilled health staff varies from only 7.4% per total number of births to 100%. The life-expectancy rate varies between 31 years and 82 years. The disparity of the data can be seen in the wide range of standard deviation for all series, which show huge gaps. Given the limitation of the data and gaps of the observation the socio-economic variables investigated in this study are on education (primary education and ratio of male-female) and health (life expectancy rate) whereas the investigation birth attended by skilled health staff is not sufficient for the kind investigation.

Table 4: Descriptive statistics of ICT-related variables

Variable	Obs	Mean	Std.Dev	Min	Max
Mobile coverage	211	72.75	32.81	0	100
Internet penetration	645	9.99	18.17	0	76.50
Fixed line penetration	1354	11.71	15.43	0	59.37
Computer penetration	477	9.15	15.43	0.006	76.04
Household with computer	259	25.26	27.43	0	85.9
Household with fixed phone	31	44.96	36.28	1.6	93.9
Household with mobile phone	32	54.69	37.82	5.5	93.9

Household with TV	37	67.04	29.5	13.1	99.4

Source: ITU database

Likewise, the descriptive statistics for ICT-related variables also carry the same message. There is a country with 100% mobile coverage, but there is such a condition in a country at a particular time that coverage is 0.The ownership of ICT devices (computers, mobile telephony, fixed lines and Internet) thus also varies between countries. Similar to the reason due to the limitation of the data and gaps of observation, internet and fixed line are chosen to represent the ICT variables[1].

7. Results

The results section of this study is divided into two analyses: the unit root test investigating the stationarity of the series and the cointegration test, observing the existence of long-term relationships between variables. This study adopts Maddala and Wu (1999) that does not require a balance panel data whereas the Cointegration test in later section does require a balance data set. Therefore, the series of the unit root test covers all countries (35 countries) over the period 1980 to 2008, while the cointegration test omits some countries with missing values during the period 1983-2006. In addition, some interpolations are also appended to the countries that have long series but with gaps between them. The test combines the p values from N independent unit root tests, as developed by Maddala and Wu (1999). The Ho of the test is that the series have a unit root and hence it is not stationer. The p value of the test is then compared to prob>chi2

Table 5: The unit root test on the social-economics variables

Lags	Primary	Ratio	Birth	Life
Level	203.1848 (0.0000)	144.1304 (0.0000)	0.3585 (1.0000)	931.5847 (0.0000)
1	20.6803 (0.9951)	56.0979 (0.3239)	1.1149 (0.5727)	232.7523 (0.0000)
2	7.6232 (1.0000)	25.5948 (0.4995	0.0000 (1.0000)	435.964 (0.0000)
3	3.9355 (1.0000)	125.0514 (0.0000)	0.0000 (1.0000)	111.0499 (0.0035)
4	0.0000 (1.0000)	0.0000 (1.0000)	0.0000 (1.0000)	115.688 (0.0014)

Source: Author's calculation

It can be interfered from Table 5 that in most cases, the series of socio-economic variables is not stationer in all simulation lags, except for the life expectancy rate. It can be inferred from the p-value in the parenthesis that most cases are higher than the critical value (α=5%). In the other words, where p-values > critical value, then the series are non-stationer. Having said that these are non-stationer series, most of the series are trended so to speak.

Table 6: Unit root test on ICT-related variables

Lags	Fixed line	Internet
Level	54.594 (0.9497)	32.597 (1.0000)
1	97.2917 (0.1523)	40.441 (0.9999)
2	273.4879 (0.0000)	83.8381 (0.3053)
3	164.4661 (0.0000)	21.767 (1.0000)
4	116.4641 (0.0110)	75.769 (0.5504)

Source: Author's calculation

Table 6 also carries the same inference, that the Internet penetration rate falls in the non-stationer in all numbers of lags, while the fixed line penetration rate is stationer only on the number of lag=2 or above. The results suggest that having obtained the non-stationer series, it is then feasible to investigate whether they have long run relationship with the socio-economic variables discussed earlier.

The underlying idea is to test the absence of cointegration, by determining whether there is an error correction for individual panel members or for the panel as a whole. As discussed, Westerlund (2007) will be used in this investigation. The method constructs four test statistics to determine the cointegration analysis. Nevertheless, this study only adopts a `group mean' indicator (Gp) which measures t-statistics for N estimates for $a_1$in equation (2).

Table 7: Cointegrationanlaysis

No.	ICT variables	Socio-economic variables		
		Health	Education	
		Life	Primary	Ratio

[1]The more reliable investigation in this study should be conducted by looking at the long run cointegration between cellular penetration rate and socio economics variable. Nevertheless, given the fact that cellular penetration rate just evolved during the early 1990's thus the analysis using cointegration is not possible to be conducted due to data limitation.

		Expectancy rate	education	male-female
1.	Internet penetration rate	1.491 (9.186)	-0,688 (1.073)	0.367 (5.001)
2.	Fixed line penetration rate	3.044 (0.667)	-0.640 (1.250)	0.507 (5.523)

Source: Author's calculation

Table 7 shows the long term relationship in terms of cointegration tests between ICT variables and socio economic variables in the study. The table shows that none of the p-value is in the area of the rejection of Ho. It means that the entire null hypothesis that the series are not cointegrated is accepted.

8. Conclusion and Policy

The ICT sector in general and the telecommunication sector in Asia have clearly shown significant development of many indicators: better competition environment, rapid infrastructure development and a dramatic increase in the penetration rate, especially the cellular rate. However, the socio-economic variables in Asia still show that little has changed in the last couple of decades, in terms of the low quality of education, health and poverty rates. It is therefore important to achieve a better socio-economic variable by obtaining a greater role of the ICT sectors.

The investigation into Asia Pacific countries covered 35 countries during the observation, which was conducted in 1980-2005. The first analysis on the unit root tests shows that in most cases, the series of socio-economic variables and the penetration rates are not stationer in all simulation lags, except for the life expectancy rate. The later investigation applied using cointegration analysis, scrutinizes no evidence of the long-term relationship between ICT development and education and health.

The finding of this study -though it seems a surprise- is similar to those in Latin America. Balboni (2010) in the study shows that ICT diffusion is concentrated in narrowly defined segments of income and education groups in each country. Consequently, income, education and geographical areas are key determinants of ICT diffusion. In other words, ICT will largely impact the society with the higher existing human capital, i.e., higher literacy level, in addition to other pre-requisite conditions, for instance law enforcement (Jorgenson, 2001; Oxley and Yeung, 2001; Gregorio, et al, 2005). The similar results can also be found in African countries (Ifinedo, 2008) which indicated the importance of human capital to spreads the benefit of ICT development apart from law enforcement factors.

The phenomenon pops up a further question on what should be the role of government and other stakeholders involved in accelerating the stronger linkages of the success story of the development of ICT, especially between telecommunication sector and socio-economic variables. The existing policy in developing countries, for instance Pakistan, has actually adopted the role of government to promote ICT sectors in a more systematic way (Hameed, 2005). The national ICT strategy has conceived the ICT sector for having the functionality as the means for enhancing capacity building and focusing on export market while at the same time focusing on development goals. Thus, the policy aims at maximizing the benefits of economic growth in the short term without trading off the sustainability in the longer term. Moreover, international promotion of ICT development has also been implemented for, instance with the more advanced countries like Korea. The Korean Agency for Digital Opportunity and Promotion (KADO) and other institutions have participated in the development assistance program cooperating with the Pakistan government, for instance in training activities, voluntary services and expertise sharing, and aid in kind. In conclusion, while Pakistan ICT policy has stressed that the development of both ICT vision and strategy with the greater degree of involvement of the people, the national ICT strategies in fact is still putting the burden on the government shoulder to design the initiatives.

These are some policies derived from this study:

Firstly, by promoting local economic development mediated by ICT sectors/devices especially for agriculture sector where the majority of poverty cases are found. The agricultural sector which is supported by the role of ICT in India can be seen as a progressing example. India traditionally is an agrarian economy, where 40% of the country's GDP is derived from agriculture and agriculture products. The crafting institutions by government and private sectors (industry) enable the increased acceptability of the latest innovations and tools by the farmer (Bowonder and Yadav, 2005). The second policy is related to education which is concluded by previous studies as the pre requisite enhancing factor to acquire a larger impact of ICT. Television program can be seen as a strategic mean for disseminating the knowledge and education especially for the people in the remote area through the distance learning program (Demiryurek, 2010). Television seems to be a more suitable and still important medium for distance education for rural people in developing countries. It is more accessible and reaches more people usually in a cost effective way. In addition, it is still popular due to its entertainment characteristics and audio-visual capacity when the availability of the more advanced internet based distance learning cannot be fulfilled due to limited budget for providing the infrastructure.

Given the limitation on the series of data in this study, future research will emphasize on the more advanced ICT development particularly the impact of cellular and broadband in Asian countries. Country-to country case studies are perceived for picturing the clearer investigation in this regard.

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Experiences of using Satellite Supported Networks for strengthening quality of School Education

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Abstract:

Indira Gandhi National Open University (IGNOU) has been working with ISRO for the past two decades to effectively utilize the Satellite Based Connectivity to deliver its academic programs through distance mode of education, and has now acquired a great deal of experience and expertise in this area. The success of such endeavors has opened up new possibilities for using this, Satellite Based Networks for making meaningful interventions in the area of School Education also. It is in this context that a Major Collaborative Venture using Satellite Supported Networks for School Education was conceived. Rajiv Gandhi Project for EduSat Supported Elementary Education (RGPEEE) which is on the national beam of EduSat in Ku band is a major venture of Ministry of Human Resource Development (MHRD), Indian Space Research Organization (ISRO), IGNOU and governments of Hindi speaking states in India. The project launched by the Government in December 2005 aims to add value to elementary education thereby making it interesting for target groups, reduce cost of operations, train teachers and above all, enhance the reach to the remotest corner of the country. This Project has its presence in seven Hindi Speaking States of India and is coordinated from its national hub at Jabalpur.

Authors of this paper have been involved in the Content Development, Project Implementation and Management of RGPEEE, right from its inception. This article presents the experiences of this major technology intervention in the rural schools of India and is organized in three parts. The First Part describes the strategic framework of the project. This part also throws light on the overall background in which it was felt necessary to use the Satellite Supported Networks for the cause of education, which has been deliberated and the genesis of this project has been described. In the second part, critical analysis of the strategies, issues faced and its impact since its establishment has been discussed. Lastly, the third part talks of the future prospects and scope for further expansion.

Background

What ails Indian School Education?

Indian School Education System faces huge challenges of Access, Retention and Quality, primarily due to inaccessibility of most of primary/elementary schools, weak and inadequate system of teachers training, poor communication & infrastructural facilities, variations in standards, social backwardness and absence of a single language as a mean of communication all over the country. Government is now gearing up its systems to meet the constitutional obligations; the 86th amendment to Constitution of India making free and compulsory Education to the Children of 6-14 years age group, a Fundamental Right. However the pockets

where immediate interventions needed are those areas where it has turned out to be most difficult to access.

Target groups are sparsely distributed, mostly live in geographically isolated settings and are socio economically most disadvantaged. This huge clientele consisting of nearly 192 million children in 1.1 million habitations badly in need of a change and any expansion through conventional means is economically not viable. Weak and inadequate system of teachers' education further aggravates the problem. There is a strong realization among policy makers that country desperately needs "Only, Out of the Box Solutions" can help fulfill its constitutional obligation, to reach out to such target groups and evolve training capabilities for untrained teachers (nearly 1.5-2.0 million) living in such areas and most important of all , to do it at an affordable cost. It is in this context that Distance Education is being visualized as a cost effective and viable method to reach out to large numbers in a short span of time.

Ministry of Human Resource Development (MHRD) Government of India has focused its efforts on Distance-Education Programmes as a Mission Mode Intervention under its flagship Programme of Sarva Shiksha Abhiyan (SSA)[1]. This major mission mode project of Government has been using ICT in a big way to realize the objectives of SSA.

ICTs: A ray of hope for the planners

It seems a good idea that if teachers cannot be physically present in remote areas, their expertise can be brought

there through effective use of Information and Communication Technologies. Advances in ICT have helped the planners to address crucial issues like adding value to elementary education and making it interesting for target groups; reduce cost of operations, train teachers and above all, enhance the reach to the remotest corner of the country. The **"Sarva Shiksha Abhiyan" (SSA)** has now come to a stage when we cannot get away from ICT applications. Satellite supported networks have been viewed by the planners as one of the most promising tools to fulfill this huge constitutional obligation in such challenging settings. Satellite systems are capable of linking the islands of excellence in the country to those locations where teachers are unwilling to go and train them without displacing them from their locations and make teaching interesting for the target groups. Surprisingly, all this can be achieved at an affordable cost. This has motivated the Department of Space, Government of India to make huge investments for the launch of EduSat[2], a dedicated satellite, solely, available for education and development. This capability to link to the remote areas has facilitated one national level network and five regional/state level networks in the country in Ku band.

Genesis of RGPEEE: Initial motivations

In the year 2004-2005, there was a major collaboration between School Education Department of Government of Karnataka and ISRO under which, 885 primary schools were networked through EduSat supported network with the purpose of adding value in school education through teleducation. The project was launched for teaching and learning transactions in Kannada medium and was observed to have an encouraging response. Inspired by the visible success of this experiment in a meeting attended by senior officials of ISRO, MHRD and IGNOU it was decided that a similar network need to be set up in Sidhi District, Madhya Pradesh with 700 ROTs(Receive only terminals) and 9 Satellite Interactive Terminals (SITs) It was also decided that IGNOU would be developing a proposal for implementation in consultation with Department of EE&L,MHRD and State Government of Madhya Pradesh will act as a nodal agency for the implementation of the project. The project proposal developed by IGNOU was finally approved by the ministry on 29th June 2005 and IGNOU was assigned the responsibility of content generation, project implementation and management. As decided, IGNOU would implement the project in collaboration with participating states, MHRD and ISRO. An apex core group was formed with the members from the senior secretary levels from participating states, IGNOU and MHRD[3] for planning, implementation and monitoring the project.

RGPEEE primarily aimed at adding value to the elementary education by incorporating an element of ICT component in it. Under the project, an up linking station was established at Jabalpur (MP) with the facility to develop video programs and establish a network of Receive Only Terminals in remote villages. Project has created a network of 1082 ROTs with its hub at Prantiya Shiksha Mahavidyalaya Jabalpur since December 2005. These Receive Only Terminals

[1] Details of Sarva Shiksha Abhiyan (SSA) are available at http://education.nic.in/ssa/ssa_1.asp and for a quick review of the ICT applications under SSA ,interested readers can visit http://www.digitallearning.in/sept06/SSA.asp

[2] For details of the EduSat project please see http://www.isro.org/publications/pdf/EdusatBrochure.pdf

[3] Interested readers can go through an extensive review of the project written by Prof S C Garg and Prof S V S Choudhary published in Educational Research and Reviews Vol. 5(4), pp. 155-165, April 2010 and another article written by authors which will be published in the next issue of Vikasvani Journal of XIDAS Jabalpur (MP) .

(ROTs) are meant for receiving regular broadcast from the RGPEEE Hub at Jabalpur. The network started with a modest beginning in December and has now expanded to seven (07) Hindi speaking states of the country comprising of Bihar, Chhattisgarh, Haryana, Jharkhand, Madhya Pradesh, Uttaranchal and Uttar Pradesh. Facilities have been recently augmented with a network of 33 Satellite Interactive Terminals (SITs) which can facilitate two- way video interactivity. SITs are those interactive terminals which are upgraded versions of ROTs with facilities for interaction from receiving ends. These facilities have been made available at present only in those locations where institutions are able to provide sufficient physical infrastructure for EduSat activities. The core idea was to identify the hard spots in the school curriculum and prepare innovative lessons to be telecasted from this location. It was envisaged that project will make the education interesting for the target groups, empower the teachers as they will be able to explain hard spots of curriculum through innovative means, support literacy as well as adult education initiatives and ultimately strengthen the teachers training programs.

The main objectives of the project were:

1. Ensuring availability of quality content online through a variety of other access devices in elementary schools and DIETs[1].
2. Enriching existing curriculum and pedagogy at different levels by employing available technologies, including virtual classrooms and video on demand through EduSat.
3. Promoting a shift from passive instructions to active learning.
4. In-service and recurrent training of elementary school teachers for their professional development and breaking isolation.
5. Training teachers and master trainers in multi-skills for handling IT-supported and ICT-enabled education through EduSat.
6. Supporting total literacy/ adult education and compulsory education for children in the age group 6 – 14 years.

PART –II

Project Planning and Implementation

Identification of Schools and Creation of Network

MHRD had set the target for inauguration of the project as December 2005. Hence, it required meticulous planning at different levels, coordination with various agencies and would need fast decision making so that pilot phase could start off by the given deadline. Identification of schools and installation of ROTs was an important work to be undertaken before the starting of the project. The exercise was undertaken at different levels, right from district administration, to IGNOU and ultimately up to the Ministry of HRD. Only those villages were identified which were not electrified and where the student teacher ratio was very unfavorable. A team of Engineers from ISRO, administrative staff of IGNOU Regional Centre and Bharat Electronics ltd. (BEL) (Vendor of ISRO) visited some of these sites to assess the physical infrastructure at these locations. The team visited the places and interacted with teachers to judge their responses. Team also interacted with the district administration, at length to uncover, the likely issues to prop up during the installation of ROTs. A detailed report was submitted to IGNOU, MHRD and ISRO based on the findings of the visit; an action plan was worked out by ISRO for speedy installation of the ROTs. To begin with, 700 Schools from Sidhi , Madhya Pradesh and 50 schools from each of the adjoining states were identified and the installation work began by October, 2005.

Orientation of teachers and removing their biases:

Satellite technology was alien to most of these communities and technology had not entered classrooms. Most of the teachers had the conventional teacher, mindset which was largely confined to 'Chalk and Talk'. Blending the skills of these teachers with technology aided systems; initiating them into new systems of teaching and learning; and at the same time making the teachers realize the potential of the ICTs was a huge challenge for the project officials.
Therefore, it became necessary to sensitize the end users and give them an orientation of the project and its objectives and seek their cooperation for successful and effective implementation. With this objective in mind, a series of 10 training programs were organized by IGNOU's DEPSSA[2] Cell along with the help of resource persons from IGNOU HQs, IGNOU's Regional Centre Jabalpur, ISRO and Bharat Electronics Limited(BEL) between September 2005 to March 2006.From every location at least one teacher was selected to participate in these workshops. These workshops started much earlier than the task of installing ROT. Through these initial training programs, 868 teachers and functionaries associated with the project were oriented at different places/ levels.

[1] For the details of the activities of the project through DIETs please visit http://dietsidhi.nic.in/ict.htm

[2] For details regarding DEP-SSA a collaborative project of IGNOU and MHRD please visit its web site at http://webserver.ignou.ac.in/dep-ssa/index.htm

Preparing teachers for content generation: A major area of concern

The training programs were also utilized to identify exceptionally motivated teachers and to take their feedback which was immensely useful for future implementation of the project. Identifying suitable content generation experts was again a major challenge for the project officials. A group of 130 potential teachers were identified during these orientation programs by the team of experts/ resource persons. These groups of teachers were further shortlisted and a group of 50 highly motivated teachers were identified based on the mastery of their subject and their communication skills.

The Orientation Programs were also used to identify few motivated teachers who were specially inclined to be involved as content generation experts .They further underwent intensive training in IGNOU's Electronic Media Production Centre for both, content generation and electronic production. The teachers were specially oriented, to communicate the important concepts through electronic media, plan a script, use the electronic media to its full potential and empower themselves. Like mentioned earlier, removing the psychological barrier of technology and making them understand the technicalities involved in facing the camera was indeed a major area of concern as most of the teachers had never been exposed to this mode of communication.

Developing telecast schedules: Issues

The ICT inputs through the project was just an added component in the educational delivery at schools .This input was just to supplement what already existed and then to monitor how useful the teachers and students find it.
Therefore the telecast schedules had to be developed in a way that ensured effective synchronization with ongoing classroom lectures without any clashes. It was a tough operation as the project officials had to deal with syllabus and classroom schedules in four different states i.e. Madhya Pradesh, Bihar, Chhattisgarh, and Uttar Pradesh. Telecast schedules were therefore planned in close coordination with concerned departments of these different states. Schedules were planned meticulously and were then communicated to the schools well in time.

Maintenance and Security of Equipments

Maintenance and security of the project was found to be another big issue in RGPEEE. It cropped up primarily because most of the schools identified were situated in remote areas and so were not easily accessible and the consequent poor communication between the receiving sites and the Project officials. The vendors responsible for the maintenance also found it difficult, to respond to the problems because they did not get the intimation in advance and also because their representatives were not available in every district. The Maintenance and Security turned out to be a weak area of the project and got aggravated in course of time. Receiving sites were under varying political and administrative set ups and received different degrees of support for its implementation from different states.

Monitoring the Network

The project was closely monitored by the people at the helm of affairs in IGNOU, MHRD and ISRO on a daily basis. The meetings at Block Resource Centers (BRC) were also held periodically to find out the barriers in smooth implementation of the project. Printed inland letters were distributed among teachers to ensure their regular feedback which was used for continuous improvement in learning materials produced at the project site and their delivery.

Impediments in Project Implementations:

1. Utilization of the facilities: What did not work?

The facilities created at the receiving sites had a mixed response. Though in some of the places the teachers showed overwhelming and enthusiastic response, it also stimulated worries for security of the equipments. The key reasons which discouraged the effective utilization at some of the places are as follows:

a) Schools in remote distant areas lacked security arrangements for their premises and had apprehensions that the principal might be held responsible in the event of a theft .This feeling was further aggravated as the equipments started getting stolen from the very beginning in some of the places.

b) The technology oriented educational delivery was alien to the culture of these societies which was predominantly tribal population. There was a massive psychological barrier with technology which prevented the people to get started and take initiatives for effective use of the equipments.

c) The already overburdened teachers did not have any incentives to make use of the equipments against all the odds. Most of the schools were having huge shortage of teachers and they felt that addition of the ROTs equipments have only added to their problems as they had to keep them in safe places which occupied the already shrinking space of the schools

d) The teacher's felt less accountable to project officials who were not part of their mainstream system in the schools. The monitoring of its usage was not part of the administrative systems of the government and it was not difficult for the school teachers to shirk responsibility and ignore questions raised by project officials of IGNOU who did not have any administrative control over them. The continued persuasions through workshops and orientation programs served a limited purpose as IGNOU was generally perceived as the only agency having anything at stake in the project. Therefore a lack of sense of belonging was obviously visible in the teachers at receiving sites. They found it as an additional burden on already existing work load and accountability for security of those equipments. So despite the fact that they realized the importance of ICT, they did not feel motivated to use it primarily due to the constraints in which they work. It did not help them to resolve the basic problems which they face.

e) Solar panels were used to run the equipments at receiving sites located in remote villages as electricity was unavailable at such locations. In the course of time the battery which was used for the Solar Panel completed its normal life of two years. The replacement of the battery could not be done timely as a result of which systems remained unused in several schools for a long period of time.

Huge Cases of theft and its impact on project implementation

The theft of the ROTs came up as a big issue in the project right from the very beginning.

As on April 2011, 719 ROTs (out of total 1082) reported cases of theft .The maximum cases of theft were reported from Madhya Pradesh where 588 ROTs (out of total 751) were stolen. As a result, by April 2011, only 360 ROTs have been found functional though a network of 1082 had been put in their places. The sites where the ROTs were established had poor physical infrastructure and school did not have any provision for security of the equipments. Governments were not ready to create any separate provision for security just for IGNOU's equipments. The cases of theft were recorded from the very beginning i.e. within 6 months a number of such cases were noticed. It attracted the attention of the University authorities and the process of insurance of these equipments was undertaken. However most of the insurance agencies were apprehensive for ensuring the equipments due to many reasons. It took around a year's time for the University to finally get it done. Despite the huge cases of theft; reimbursement by the insurance company was made in only a few cases primarily due to the procedural requirements which are expected to be fulfilled for taking a claim from insurance agency. It turned out to be a major setback for the project. It de-motivated the teachers who were interested to utilize the facility.

Synchronization of schedules with classroom lecturing

The synchronization of the schedules with classroom lecturing became a still larger issue of concern as the project expanded to entire Hindi Speaking belt. At present it is spread over 7 Hindi speaking states which have different syllabus and schedules of class room lecturing. Scheduling is therefore becoming a big problem and a challenge. It has also been a reason for poor utilization of the project facilities at the receiving sites.

Frequent transfers of teachers: Issues of coordination

Frequent transfers of the teachers added to the problems of the Project officials. When a trained teacher was transferred then it usually was not possible to immediately train another teacher in that school. This lowers the utilization of the ROTs at receiving sites. Project officials have been unable to find a lasting solution to this problem as the Project gradually expanded to different states. The response from the administrative machinery of the states has a drastic variation. Though from some of the states the response was exceedingly proactive, it was also observed that from quite a few places it left much to be desired. It thus affected project performance. The project made a lot of difference in those locations where the local leadership was proactive whereas in other places it did not realize its full potential.

What could be achieved through RGPEEE?

Despite some of the inconsistencies, RGPEEE has established the usefulness of satellite based delivery of educational content at systemic level. In those locations where the facilities were utilized the results have been encouraging and achieved results, as expected.

The students and teachers have well received the intervention in their classrooms. The fact that schools are located in remote and alien cultural environment this is an encouraging development. It establishes the fact that design of the project is in consistency with the sensibilities of the people and lives up to their requirements.

In those locations where the facilities were utilized have stimulated a great deal of enthusiasm among the students with significant percentage of them saying that it helped them understand the content. The parents of the students also confirmed that students have found the televised lessons interesting. Such visible

enthusiasm among the students substantiate that the delivery of the content through televised lessons have filled the gaps in the hitherto prevalent teaching and learning practices. In such locations students have found the delivery of content useful primarily due to the fact that the hitherto prevalent practices of teaching and learning have been boring for them .The television is a new tool for educational delivery. It excites them as they had never seen a teacher addressing them through such a medium. The project had also been able to sensitize teachers about various tools which televised lessons offer. There has been a sharp and visible difference in the attitude of the teachers about utility of ICTs and has inculcated a sense of empowerment in them.

During content generation process high level of enthusiasm was noticed among the teachers to try out new ways of presentations to make the content clearer to students. The greater degree of sensitization has created an atmosphere conducive for ICT interventions in future. The community at the receiving sites was observed to have a greater degree of receptivity for ICT. They have started realizing that ICTs can change their life. The students who have undergone such teaching and learning practices have changed their parent's outlook and also of the community as a whole.

PART III

Lessons learnt and Road ahead

The experiences of the project implementation have shown that RGPEEE has had encouraging results in places where the facility was utilized properly. The problems of security, maintenance and theft put a serious setback in those areas where the communication links were poor. Future projects of this kind need to bring about community's involvement to a great extent. Community through its elected bodies like local governing body of the schools, village Panchayat, parent teachers association etc should be sensitized to enhance the community's involvement in the security of the equipments. One of the important areas in which the project needs to focus is repeated orientation and feedback system from remote locations. The project officials should develop a direct rapport between the teachers and give them better incentives in association with state governments. The experiences of the project has shown that Project officials have so far done reasonably good, to keep the wheel moving at the teaching end but a lot still needs to be done for the receiving end. Till April 2011, project officials had identified about 2500 Hard Spots on the curriculum (difficult topics faced by the students) through mutual consultations and workshops and so far have developed 818 videos which were telecast from Jabalpur based Hub of the Project. About 40 workshops/training programs have been conducted by the project which has been fruitfully utilized for project planning and identification of topics for producing videos.

The lessons produced by the Project Site have been appreciated all over the states; however, the utilization needs to be strengthened. The e- content designed and developed has been found to be in accordance with the mood, tastes and psychological status of the local community. The focus now should be on the usage of network during long term vacations of the students. Facility can be fruitfully utilized during these vacations for teachers training programs, awareness on health related issues, women empowerment and a range of other socially relevant issues. Network can also be utilized by Agriculture University's extension education department through KrishiVigyanKendras (KVKs). It will also be useful for the scientists to impart agricultural skills and educate them at the grassroots.

Conclusion

Despite inconsistencies of some of the issues the Project has turned out to be major success and the programs have been well received. The project design has a potential to realize its objectives but the monitoring mechanisms need to be strengthened further. It is also believed that continuous refinement of these lessons over a period of time in view of the feedback at the grassroots needs to be the focus of future endeavors. Project officials also need to concentrate their efforts and develop teachers training programmes by using Satellite Interactive Terminals (SITs) network of the project. However, the most important of all, there is a need for a strong plan for maintenance & security of equipments, and impact assessment at the receiving ends in which district administration should play a very pro active role. These exercises will create a bigger impact.

Importance of 'I' in Information and Communication Management (ICM) for Agriculture

Compiled by Gerard Sylvester[1]

[1] Compiled by : Gerard Sylvester, Knowledge and Information Management Officer, Food and Agriculture Organization of the United Nation (FAO), Regional Office for Asia and the Pacific (RAP) with inputs from the CIARD movement, Dr Ajit Maru, Global Forum on Agricultural Research (GFAR) and Dr Stephen Rudgard, FAO HQ.

Innovations in information and communication technologies (ICT) have transformed the process through which information is generated, stored and shared. These transformations provide enormous opportunities for agricultural research for development (ARD) related activities.
Further spurred by the colossal increase in the amount of data and information accessible through the World Wide Web over the last decade has initiated more effective ways of managing data to facilitate efficient data retrieval. The emerging Semantic Web (http://www.w3.org/2001/sw/) showing potential to change the way humans and computers interact in the near future.

Figure 1 highlights some of the key building blocks for smart and effective information/knowledge dissemination in many organizations. One of the key requirements to building information services is the availability of information in an "accessible" format. Many projects and initiatives which try to address the issue of providing the right information to the right person at the right time fail due to the lack of "open" reliable information. e! Science News[1] a science news harvester does not have a human editor behind it – it works on harvesting news from reliable sources that are tagged appropriately. Such kind of smart mashups can only be built if there is a critical mass of tagged and reliable information.

As we are aware, most information/knowledge generated through research stays within that research organizations, sometimes these findings are published as journal articles. Information has varied value to different stakeholders – the challenge is to capture and make available information at regular intervals of the research cycle.

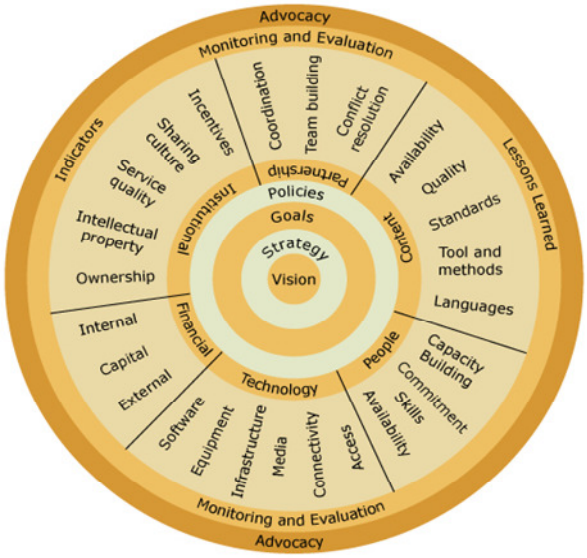

Figure 1 : Building blocks for an effective information/knowledge dissemination in an organization

CIARD

The Coherence in Information for Agricultural Research for Development[2], CIARD movements actively working with agricultural information creators to make agricultural research information publicly available and accessible to all, it also aims to help them disseminate it more efficiently. There are more than 50 national and international partners, behind this initiative, who recognize the importance of ensuring public domain research outputs, in the form of information, data and knowledge form part of a global 'knowledge commons' for agriculture, and these outputs should be created, assembled, handled and disseminated in ways that ensure that they will be Available, Accessible and Applicable as possible.
The CIARD manifesto[3] is "Towards a Knowledge Commons on Agricultural Research for Development" with a vision to make public domain agricultural research information and knowledge truly accessible to all.
CIARD recognizes that

- Agricultural research and innovation are vital mechanisms for rural development and food security driven by farmers, farmer organizations, researchers, policy-makers, governments, and other stakeholders participating in "innovation systems";

- Public science and research systems are based on the principle of openness and the free exchange of ideas, information and knowledge; and public access to research outputs provides greater returns and increases the potential spillover benefits from global investments in agricultural research for development;

- Enhanced access to these outputs by all actors in agricultural research and innovation is essential both to enable effective decision-making and to empower those concerned with agricultural production and food security;

- The lack of institutional, national, and international policies regarding access to information limits the effectiveness of agricultural research and innovation;

- Lack of skills, finance and technology directly restrict access to these outputs, with adverse

[1] e! Science News http://esciencenews.com/

[2] www.ciard.net
[3] CIARD manifesto http://www.ciard.net/ciard-manifesto

impacts on rural development and food security;

- International and national efforts to promote effective broad access to research outputs are often held back by under-investment and a diversity of incompatible approaches to information system architecture;

In order to facilitate enhancing information coherence, CIARD identifies four key thrust areas or Values - Advocating effective instruments, Establishing coherent systems and services, Communicating content and Developing and Strengthening capacities. The CIARD checklist[1] represents a set of items through which organizations, research systems and individuals can progress towards achieving the CIARD manifesto and Values – It is not a set of requirements. The checklists are aimed at developing necessary institutional readiness, as well as approaches to managing digital content, licensing and 'opening up' that content, and then disseminating it. They address the applicability of research outputs to a range of stakeholders, setting out approaches that will ensure that research outcomes are more likely to be sustainable. In addition to the Checklist, a range of targeted CIARD Pathways are provided showing the ways in which the Checklist actions can be achieved.

CIARD CHECKLIST

Developing Institutional Readiness

1. Introduce and gain support for the CIARD Manifesto and Values in your institution.
2. Have your institution recognised as a CIARD participant.
3. Adopt a formal institutional information/communication strategy.
4. Develop the capacities of your institution to achieve the CIARD Checklist.
5. Develop national/local partner networks to share resources and skills.

Increasing the Availability, Accessibility and Applicability of Research Outputs

6. Ensure that your research outputs are available digitally.
7. Develop institutional or thematic repositories of your outputs as open archives.
8. Use international metadata standards, data exchange protocols and agricultural vocabularies and thesauri.
9. Develop a clearly defined licensing policy for your outputs.
10. Optimize the structure and the content of your web sites for search engines.
11. Share your metadata by participating in international information systems.
12. Use 'social networking' media and applications to share your outputs.
13. Build formal and informal networks to repackage your outputs.

The CIARD Pathways[2]

CIARD Pathways are ways in which you as an individual or an organization could achieve Availability, Accessibility and Applicability of research outputs in their work. The organizations that participate in CIARD endorse the Manifesto, evaluate their information management practices against the checklist of good practices and share and follow the pathways towards better accessibility of information.

CIARD Virtual Fair[3]

The CIARD virtual fair is a facility where people and organizations can share and learn about ways to make their information and knowledge open and accessible. There are three ways to explore the CIARD Virtual Fair:

- Via the CIARD Pathways – mapped against the organizations ('Enablers') and services showing ways of achieving each Pathway.
- Via the Services provided – mapped against the relevant Pathways and the Enablers.
- Via the Enablers – or originators of the Services. In some cases the Service and the Enabler are synonymous.

The CIARD Ring[4]

The CIARD Ring (Routemap to Information Nodes and Gateways) is a global registry of accessible web-based services that give access to many kinds of information sources pertaining to agricultural research for development (ARD) – think of this as signpost and yellow pages for information services in agriculture.

Functions of the RING:

- to provide a map of accessible information sources with instructions on how they can be searched effectively;
- to provide examples of services that show good practices on implementing "interoperability";

[1] CIARD checklist http://www.ciard.net/checklist

[2] CIARD Pathways http://www.ciard.net/pathways

[3] CIARD Virtual Fair http://www.ciard.net/ciard-virtual-fair

[4] CIARD Ring http://www.ciard.net/the-ciard-ring

- to clarify the level and mode of interoperability of information services;
- to provide instructions for building enhanced integrated services that repackage information in different ways

The RING is designed mainly for agricultural information professionals and website developers, and secondarily for consumers of agricultural information as a "bookmark" list of agricultural information services. In other words, as a primary service to support development of applications that enable customized information services according to contextual needs to a vast array of agricultural information users at local, national, regional and global levels. The RING is a route map that guides the users in discovering, accessing and exploring the existing information sources.

Visit the CIARD initiative at http://www.ciard.net/ and become a member of the CIARD community and make an effort to make agricultural research information more available, accessible and applicable to all.

Conference Announcements:

International Conference on Informatics for Development 2011

November 26, 2011
Yogyakarta, Indonesia

The International Conference on Informatics for Development (ICID) is to be conducted at Yogyakarta, Indonesia on November 26, 2011. ICID will enable interaction of practitioners and researchers to discuss in particular, a range of applications of ICT in the day to day life of a person; improving his quality of life besides the social implications of technology on society.

The emerging field of Informatics addressing the MDG's for Developing countries is another subject to be taken up for discussion. The emerging field of Informatics addresses and offers solutions to the problems faced by people across the world.

Further details can be accessed on http://icid2011.com/

UP 2011 Second Annual Global Cloud Computing Conference,

December 5-9, 2011,
California, US (on December 5-6, 2011 and virtual on December 7-9, 2011)

This conference organized by Cloudcor Inc® at California is a hybrid event which will have both physical and virtual delivery. UP 2011 intends to promote analysis of the latest developments and challenges in Cloud Computing and ICT.

This conference looks up to fresh objectives besides streamlining the research in cloud and Information Technology from industry analysts, and look forward to share information and possible strategies for the future.

For further details log on to http://up-con.com/

International Conference on ICT and Robotics in Agricultural Applications (ICTRA – 2012)

February 19, 2012,
Singapore

The Conference ICTRA, organized by 'Interscience Institute of Management and Technology, Bhubaneswar,' is being conducted to discuss the current development and possible future growth in ICT and Robotics for Agriculture and its related industries.

ICTRA aims at providing a common ground for discussions of the participants and researchers in the related field to enable build networks and for the Development of Innovative Technologies. This is due to the rise in demand to fulfill the requirement for quality food and to study the impact on environment.

For further Information, visit the site http://www.interscience.ac.in/ICTRA-2012/index.html

Editorial

(continued from page 1)

Although, enrollment in UID is not mandatory, state agencies will de facto make it mandatory for some groups by linking it to delivery of benefits to Below Poverty Line(BPL) families. States are planning to use the UID number as a record identifier in the data bases on residents maintained by different agencies. In fact they plan to link the data bases and analyze the number of different benefits being availed by different BPL residents. This may benefit those who receive fewer benefits. However, access to such linked data bases can also be abused if the whole process of access is opaque. It is known that Governments of the day target

political opponents by mining data on land ownership, income tax payments and such other records surreptitiously to discover misdemeanor. Given the slow judicial processes, residents will have no relief even if a strong legislation exists to prevent misuse.

As is bound to happen with any new initiative, there are pros and cons. If the UID numbers are used as a basis for delivering subsidized food grains, and other forms of subsidies, a lot of wastage of resources can be avoided. Currently many deserving residents do not receive the subsidies and a large number of undeserving residents access the subsidies through corrupt means. This problem can be fixed by strengthening the system to establish eligibility of a subsidy and use the UID for issuing cards for such entitlements.

I must point out that often debates on such initiatives are not balanced. The purpose of the debate at this stage when the program is under implementation should be to correct the flaws and not to jettison the initiative. Unfortunately the decision to implement the program was "top down" without any public debate.

I wonder if other developing countries that have anti-poverty programs are using any kind of citizen identity cards for dispensing benefits. Please share your experience.

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 the support of various agencies such as IDRC and COMNET-IT in the past. Since 1999, 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 has been published on the web for more than a decade.

The next issue of the newsletter will be published in March 2011. For archives, subscription details and guidelines for contributions, please visit the Newsletter website:
http://www.iimahd.ernet.in/egov/ifip/wg.htm