Empowering Marginal Communities with Information Networking

Hakikur Rahman

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Hakikur Rahman
Sustainable Development Networking Program, Bangladesh

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

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Preface

Role of ICT in Empowerment

Empowerment was originally defined as a process through which powerless and disadvantaged groups could attain power and self-determination. Empowerment is something that marginal people need to manage on their own and gain control over themselves throughout their lives (Larsen, 2004). Empowerment is no longer only something that marginal and underprivileged people are fighting to attain, but also something that others are trying to achieve (Baistow, 1995). Information and communications technology (ICT) for development is widely regarded as one of the best approaches to empower marginal communities (Slater & Tacchi, 2004; Samaranayake, 2004; Mathison, 2003).

History shows that technology has been a powerful tool for human capacity development and poverty reduction. The dawn of the 21st century marked outstanding progress and revolutionary achievements in technological advancement. In almost every field, technological innovations have analogous expansion. Most observable advancements are in medicine, information, and agriculture (Hidellage, 2003).

In the past few years, important progress has been made in providing access to ICTs for a larger portion of people in developing countries. However, it has been observed that, in spite of this progress, most developing countries are facing significant challenges associated with ICTs. The first challenge is the domestic digital divide. A large proportion of the population in most developing countries remain without access to ICTs and are deprived of the opportunities brought by ICTs. The second challenge is the effective use of ICTs. Access to ICTs is only a beginning. Essential skills and knowledge are required to make effective use of ICTs for development purposes (Fillip, 2002). Along this perspective, human capacity development is an essential element to bridge both the global and domestic digital divide. Therefore, this human capacity development must address multiple levels of information skills and knowledge networking.

Bridging the Gap

In any society or country, there are groups of individuals that are distinctly "at a disadvantage." What does that really mean? *Disadvantaged groups* or *marginal communities* are unable to take advantage of opportunities that may be available to others in a society, or a country. There may be many reasons for their inability to take advantage of such opportunities. Perhaps they are poor and cannot afford it. Some may be physically or mentally disabled. Some may find themselves facing special challenges simply because they are women, or part of a minority group (Fillip, 2002). Children and elders in particular often find themselves facing many challenges in accessing information due to lack of education, lack of skill, and even due to economic and social problems.

If the digital divide (i.e., the gap between information haves and have-nots) is likely to exacerbate existing inequalities within countries, it is essential to address the divide with special attention, so that the groups that are most likely to be on the wrong side of the divide and are already in a disadvantaged position can be given equal opportunities in the development processes (Fillip, 2002).

It is a critical fact that, despite dramatic technological advances, approximately one-third of humanity are deprived of basic technologies. The poor and the vulnerable are the principal victims of the impact of technology divide. The technological advancement should offer the poor people real technology choice with affordable, appropriate, and accessible options (Coventry, 2003). The focus of the technology debate should not be restricted to new technologies, but also include all technologies of use to marginal communities. Thereby, the technologies, through scientific development, can be promoted and utilized to uplift their livelihood and empower them (Pant, 2003).

In many countries, the current ICT deployments have contributed positively to their GDPs at an accelerating rate. The challenge is to create and maintain a competitive edge in the global market, inflicting major investments in education and information technology for innovation. Their capacity can be increased further through need-based education, increased communications, by applying scientific knowledge for their benefit, promoting sustainable income-generating activities, and removing social and cultural barriers for knowledge development.

Knowledge Networking for Empowerment

ICTs facilitate the flow of information and the creation of knowledge. Knowledge gives them skill and ICT empowers them. Knowledge is a social and cul-

tural resource, but knowledge networking is about creating new alliances of intelligent entities and the civic society (European Commission, 1994). At the global level, it is about a symbiotic relationship between the local and the global. Hereby, improved access to information can result in improved community knowledge for managing sustainable development.

However, knowledge networking reflects a belief in the need for much wider diffusion of knowledge and experience in a society. So, knowledge networking is not about increasing the quantity of information, the speed of its transmission, and "user-friendly" interaction, it is rather about the quality, appropriateness, and situatedness of information, and the processes of conversation of information into knowledge (European Commission, 1994, p. 1).

Information Networking for Empowerment

ICTs are glamorized in terms of hyper-definitions such as "information society," "information economy," "information technology paradigm," "information is power," "information-poor and information-rich societies," and so forth (CEC, 1991). But, the application of knowledge to "productivity" and "innovation" creates new social groups in the knowledge society: "knowledge workers," "knowledge professionals," and "knowledge executives." Knowledge workers own tools of knowledge. Therefore, the new economic challenge through information networking is about productivity of knowledge work and of knowledge worker (Drucker, 1993, p. 7).

It is evident that the background of knowledge development inhabits information. Information is the result of processing, manipulating, and organizing data in a way that adds to the knowledge of a person receiving it. Information is a form of communication or representation of knowledge such as facts, data, or opinions, in any medium or format, including textual, numerical, graphic, cartographic, narrative, or audiovisual. In broader sense, it is the knowledge about the attributes and performance of a community, based on their assessments, documentation, and data sources used in the assessment and evaluation processes, whereas information networking allows rapid transfer of knowledge and technology across all frontiers of society.

Thereby, the paradox of information networking is that it promotes borderless communication and media technologies in the name of common communication space, while at the same time defending national and regional boundaries in the name of diversity (European Commission, 1994). Hence, information networking at the marginal level can be seen as a network of local knowledge bases for learning, empowering, and technological innovation at the local level. At the

global level it is more or less a network of networks of knowledge bases, which enable and support the access, transfer, and sharing of knowledge and models of experiences across national, regional, and global boundaries.

It is, therefore, important to ensure easy access to demand-driven, value-added, time- and location-specific information to empower a local community through knowledge-based information networking. At the same time, knowledge transfer is essential among rural communities, scientists, educators, administrators, health care providers, and technology enablers for the benefit of the poor and marginal community. Furthermore, there is a need to promote principles of social inclusion, gender equity, reaching remote territories, and remedying regional imbalances. Finally, ICT can provide an excellent means of reaching these goals quickly, and it even serves as a tool for empowering the marginal (MSSRF, 2004a).

Where the Book Stands

ICT is one of the driving forces of globalization in the context of sharing new knowledge and information. In many nations, especially among the poorest, access to the new knowledge dynamics is denied by the absence of scientific research and technological capacity. Separated by the digital divide, found within and across the communities, they suffer as their access to new knowledge gradually constricts, their income-generating skills become incompatible, and their ability to compete in a globalized world diminishes.

ICTs for reaching the un-reached need to focus on developing sustainable operational models for the underprivileged groups by providing easy access to knowledge resources. The book covers chapters supporting development of national information and communication policies, and promotion of information and communication policy leading to a knowledge society. It includes comprehensive guidelines on the policy development process for human resource development, including development of interactive self-learning to increase the skills of local participants (trainers as well) by increasing access to knowledge-based information. The book also assists in generating ideas and implementation techniques in development of local content, in collaboration with other partners, and further identifies and promotes technologies to provide tools to digitize local content and share content development experiences through the different knowledge hubs across the globe.

In this aspect, bridging the digital divide has become a social, technical, educational, and moral challenge, particularly bringing affordable ICT access and content to the un-reached and ensuring that they have the capacity and skills to participate equally (UNESCO, 2002). Associated with these is uneven access of the marginal communities (remote and *unconnected*/*barely connected* rural com-

munity) to the benefits of innovations in education, health, communications, research, technology, and governance.

The main focus of the book is to provide ICT policies and strategies for improved access, and quality learning for the marginal groups, including education orientation to the needs of the society. It can play an essential role in academia by focusing ICT methodologies as a means of solving local problems at local levels and learning from traditional knowledge. The knowledge and experience of different countries within the global community should be seen as a valuable resource to be tapped. Special attention has been given to the needs of the adult learners and community empowerment through innovative approaches like establishment of community learning centers (CLCs).

The book can act as a knowledge bank, learning tool, and guideline providing greater utilization of ICT in the form of repository, providing analysis, repackaging target-based solutions, and disseminating information for the uplifting of the majority of the global village. These may include utilities, methods, techniques, and technologies deployed in the development, implementation, and dissemination of affordable content (education, health, environment, poverty, gender, communications, research, technology, and governance) to the target communities.

The book also includes success stories, drawbacks, and facts and figures in the social transformation processes of globalization to seek and maintain the meaning of the lives of the disadvantaged communities according to their local perspectives and expectations. These include existing, successful experimentations, deserving pilots, and futuristic approaches in developing information network, SME deployments, and other innovative methodologies adapted at the grassroots.

Capacity development of nations by spawning knowledge through scientific research and partnership programs, transmitting by means of formal, non-formal, traditional, or continuing education, and sharing through the media and information systems varies considerably among and within countries. The disparities combined with the developmental gap may more likely produce new forms of exclusion and marginalization. It is in the rural and geographically dispersed areas that the digital divide makes itself felt most acutely. Therefore, the book has focused on these critical issues for providing strategic solutions and policy initiations for marginal communities to be the beneficiaries by utilizing ICT as a development tool.

This book has selected a few projects that are using ICTs to address the needs of disadvantaged groups, children, youths, elders, and communities that are on the wrong side of the domestic digital divide. These are communities in need of support to access ICTs and to acquire the necessary skills to use ICTs most effectively to address their own demands (Fillip, 2002). Beyond these, the book provides valuable insights into the successes and challenges faced by such efforts in several countries in terms of methodological approaches, technological constraints, human and institutional capacity development, and sustainability issues.

The book chapters incorporate research works; community initiatives; regional networks; and knowledge-based information networks from Africa, America, Asia, Australia, and Europe varying from ICT initiatives for empowerment through ICT to grassroots implementation of ICT-based projects, accommodating social enactment, online learning, capacity development, knowledge building, and information networking for marginal communities.

Organization of the Book

The book contains 13 chapters including a case study. A brief description of each of the chapters follows.

Chapter I outlines some of the reasons for online learning becoming a popular vehicle of pursuing educational goals for minority learners. The chapter argues on challenges that must be overcome in order to serve a diverse online learning community. It also urges educational leadership to begin a dialogue on online learning and communication styles, cultural competence in curriculum, academic preparedness, language barriers, and access to technology for success of online learning.

Chapter II discusses effective utilization of information technology tools to promote information-driven learning systems and analyze different capacity development processes for marginal communities. The chapter has squealed information-based learning methods with indicative objectives and outcomes. Several approaches have been analyzed, and a few case studies have been illustrated focusing on ICT policies to develop knowledge networking.

Chapter III draws on the example of an online learning project to show how participatory theories, tools, and processes can be applied to ICT initiatives that fundamentally address power and empowerment issues related to marginal communities. The project methodology is described with research findings to show how the human *communication* dimension of ICTs can make applied technology more sustainable and appropriate for poor communities.

Chapter IV showcases social processes that can prepare marginal individuals to take best advantage of a well-conceived ICT project and empower them. This chapter will be extremely helpful to grassroots organizers in developing a key set of skills for choosing community development agendas, and a practical step-by-step guide for mobilizing diverse stakeholders to achieve desired outcomes.

Chapter V focuses on the importance of social structures in enabling equitable access opportunities and useful applications of ICTs. It argues on the importance of community involvement and organizational learning in designing ICT policy and projects with access and development-related objectives. The chapter presents an example of a program in Uganda and a short project in Ghana,

which both used organizational partnerships and created strong community links to facilitate ICT-enabled development.

Chapter VI investigates the role of ICT in promoting indigenous people's development. The chapter analyzes key factors under which information and knowledge can be instrumental and substantive for the empowerment of marginal groups. The chapter develops an alternative evaluation framework for ICT interventions based on Armartya Sen's capability approach, in contrast to the current discourse around the *digital divide*, which argues that for the human development of the poor, technology is not the center point.

Chapter VII examines the concept of the digital divide with available data, and shows that those with low incomes and those who are older have little access to technology and the use of computers. Low-income seniors are especially limited in their opportunities to own a computer, and they seldom have the skills needed to use one for e-mail, searching the Internet, and so forth. Various approaches being used to help seniors learn how to use computers are described in this chapter and then focuses on two projects (SeniorNet and SeniorComp) that have proved to be successful.

Chapter VIII provides an overview of the problems of persons with mental illness, and shows how ICT access and usage can be approached in order to empower such a marginal population in both developed and developing countries. It argues that, since isolation is their main problem, networking those people with reliable sources of medical information, providers of distance training and learning, and online self-help communities can have a profound impact on lifting their marginalization.

Chapter IX characterizes the use of ICTs to share information with people at grassroots as *connecting the first mile*. It examines the literature about connecting the first mile and identifies the key debates: whether solutions should be participatory or top-down, technological or social, whether they should focus on global or local information, and the overall potential of ICTs for development. The chapter synthesizes the lessons from a range of practical studies to identify the factors that contribute to the success of an ICT-based knowledge sharing project.

Chapter X investigates the ability of the Internet as a fundraising tool for marginal communities in South Africa, and discusses the challenges facing social justice organizations working in the South African non-profit sector in their attempts to harness new technologies to promote their causes as well as their sustainability. The chapter uses online fundraising as a medium and elaborates on the difficulties that social justice organizations face engaging with the online audience.

Chapter XI looks into the actionable context of knowledge networking, from the perspective of sustainable development, which should accommodate the building of communities in cyberspace of today's Internet and World Wide Web. This

investigation provides a basis for thinking about the possibilities of a virtual community and the dynamics of its construction across a variety of computer-based contexts. The chapter concludes by reiterating the challenge of expositing what it means to create an appropriate context of knowledge networking through which purposeful actions can be supported with the elaboration of suitable information technologies.

In Chapter XII accessibility is defined as providing barrier-free Internet applications for those with physical and other disabilities. In some nations, accessibility to government Web sites and Web-based applications is the law. In the private sector, providing accessible Web sites makes good business. Although there are cost and time challenges for Web designers, who incorporate accessibility, these may be overcome through careful planning and a thorough understanding of accessible design principles.

Chapter XIII is a case study. This chapter focuses on a few capacity development initiatives for marginal communities to achieve the Millennium Development Goals (MDGs) in developing countries. It looks at issues and concerns related to empowerment of marginal communities, problems, and apprehensions in human and social capacity development through effective utilization of ICT. The chapter takes several cases in different countries and later on elaborates on three implementations in South Asia.

Conclusion

Local scientific resources are always poorly developed, nourished, and disseminated in many countries. Small states are particularly disadvantaged by the absence of employment opportunities for local scientists and researchers, and remained heavily dependent on outside assistance. Serious attention must be paid for their capacity building in scientific education, building relations between science and communities, and targeting limited scientific resources through effective policy and governance. This book can serve as a knowledge provider for the researchers and academics, including policy initiators at all levels for the benefit of common masses.

Throughout the book, contemporary technology issues have been portrayed with lessons learned from different projects that complement and applied for economic, technical, and social benefit, and content of this will become an added asset to the traditional knowledge systems in the developing countries.

This may encourage all stakeholders of similar nature to undertake participatory reviews of their social sciences curriculum in schools and tertiary institutions to ensure that the content, pedagogy, and goals of basic education parallel citizenship requirements. The outcome should focus on making changes in both con-

tent and pedagogy to strengthen learning techniques towards strengthening of civic consciousness and the revitalization of social resources. This is a long-term but ultimately effective approach to empower marginal communities.

Empowering the community through hierarchical information infrastructure goes a long way in enabling the concept of *information empowerment* to strengthen the grassroots institutions (MSSRF, 2004b). The phrase *information society*, coined by Daniel Bell in 1973, is significant to ICT for emergent service-dominated economies in post-industrial societies and being at the beginning of the new technological revolution of ICT whose consequences are difficult to evaluate. In this context, *leapfrogging* for developing countries must be considered as something more substantial than simply technological advancement. Until the technological leapfrog "changes the way people work together and the way they live together," there is no leap towards developed countries of the present and the information society of future. There is enormous quantity of writings by many scholars about the role of ICT transforming the human society. Opinions regarding this transformation vary from one extreme to the other. The direct consequences of ICT revolution is the increased quantity of information flow, while the social impact happens when information flows bring new content to change the society (Walsh, 1996; Frasheri, 2002).

In this context, a few organizations are taking a leading role in empowering the marginal communities. APC, with its mission statement — "to empower and support organizations, social movements, and individuals in and through use of information and communication technologies to build strategic communities and initiatives for the purpose of making meaningful contributions to equitable human development, social justice, particularly political processes and environmental sustainability" (APC, 2003, p. 12) — is providing valuable directives to many organizations that are working in this field.

Similarly, Bellanet promotes an increased awareness among its partners of the importance and relevance of knowledge sharing practices in support of learning, and works to develop the capacity of organizations to utilize knowledge sharing approaches through workshops, presentations, and dialogue. Bellanet is also aimed at fostering an open and collaborative approach to software production, information sharing, and content development and dissemination (Bellanet, 2004).

However, communication and media infrastructures cannot in themselves be either determinants or mediators of common economic, social, and cultural dimensions; they are just one of many social and technological determinants which vary from society to society and culture to culture. The infrastructure may be global, but its applications and impacts can only be determined by the local human conditions. Hence, future research studies and implementation strategy should include enhancement of impact assessment and implementation support; improvement of knowledge management; promotion of partnerships with insti-

tutions with similar aims; and improvement of policy dialogue (European Commission, 1994) for grassroots empowerment.

Observations suggest that making this information revolution accessible to the poor can significantly enhance their living standards. Instances cited in the book demonstrate how leaders and residents of poor neighborhoods have used computer-based information creatively in their own improvement initiative. However, "the effective use of information needs to become an integral part of all the functions of community development" (Kinsley, 1998, p. 23).

This book has also framed the empirical results within broader theoretical, conceptual, and practical contexts related to the policy discourse on marginal empowerment. Emphasis has been given to an increasingly important issue like social integration for the most marginal and vulnerable community. Specific policy approach has been adopted towards those who do not, cannot, or are unwilling to fit within a universal or normalizing social policy approach. However, if this recognition is not complemented by willingness at the national level to provide the necessary scope and resources to accommodate and provide for these people (Larsen, 2002), the ultimate outcome will be restrained.

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Hakikur Rahman, PhD
SDNP, Bangladesh
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Acknowledgments

Section I:
Education and Learning

Chapter I

Diversity Challenges in Online Learning

Cecilia Stanton
Capella University, USA

Abstract

Delivering online quality education and equal access requires a commitment to diverse learner populations. This chapter outlines some of the reasons why online learning has become a popular vehicle for pursuing educational goals for minority learners. The author also indicates challenges that must be overcome in order to serve a diverse online student body. She also urges educational leadership to begin a dialogue on on-learning and communication styles, cultural competence in curriculum, academic preparedness, language barriers, and access to technology as they relate to success in the online learning environment.

Introduction

In July of 2004 this author entered the world of online learning after a career of more than 10 years in a traditional brick-and-mortar institution. This author has focused on diversity and ways to incorporate the value of difference throughout educational institutions. The perceptions that college students brought with them made this task difficult, that is, perceptions that *their way* was the *only way* and

that everyone else was an aberration from the norm. These classes were mostly made up of college seniors, young people ready to take on the world. Yet they were barely prepared to take on the challenge of working in a diverse environment. Each week classroom lessons focused on issues of difference, like class and poverty issues, race prejudice, and language barriers. It was surprising to see how little they knew and how much time it took to convince them of the social structures in place that prevented a true level playing field. One of the greatest difficulties was getting each student to recognize their own biases and pre-conditioned prejudices that allowed them to pass negative judgments on those who were not like them.

This author has always believed that most people are genuinely good hearted and want to treat others well; however, it is the differences that tend to get in the way we perceive one another. People's values and beliefs often act as a filter that *colors* the way they see the world. Thus, when someone see a person behaving in a certain way, that someone's filter helps to label that behavior as either good, bad, or indifferent. That labeling is called stereotyping.

In many cases stereotyping can be a good thing, because it helps people function efficiently in the world. For example, when someone sees an object with a round top and four legs, immediately he or she recognizes, it as a table. When a loud, high-pitched, whirring sound is heard, it is immediately recognized as a fire engine. When a scent of sweetness is smelled, it is recognized immediately as a freshly baked cake. In each of these cases, stereotyping is at work. With only a few simple cues, peoples' mind can, in the blink of an eye, determine the name of an object, its use, and its value. While this wonderful brain capacity is invaluable for interpreting objects, it can be detrimental when the same power is turned against people. Just as quickly as someone can distinguish a chair or a table, he or she can just as quickly label someone's race, gender, or socio-economic status along with the accompanying values and beliefs that may hold for each.

Renowned author William Gladwell (2005) states that when a person meets someone, within milliseconds he or she begins to pass judgment on that person, which is one reason why it is said that first impressions are the most long lasting. However, stereotyping continues even if that person knows someone for a time — someone may be known in one's family as a slacker or that family may have a friend who everyone believes is an overachiever. Once a person is stereotyped in this way, he or she is expected to behave accordingly in every situation. Whenever that "slacker" brother says that he has a plan to become successful, everybody doubts his abilities to carry it through. If the "overachiever" friend says that she is nervous about her upcoming test, everybody brushes it off because after all, she always does well. The longer a person gets to know someone, the easier it is to reinforce the beliefs about him or her.

Teaching students about stereotyping does not necessarily change their personal beliefs, no one leaves unchanged. Each person exits the class with a little more

than what he or she came in with. Most importantly, each leaves with the knowledge that it is his or her responsibility to find ways to address the problems of inequality in this world. It is a responsibility that everyone should take seriously. It was this author's commitment to this ideal that led to a position as a diversity administrator at an online university. One of the reasons students found it difficult to understand and appreciate diversity was that many of them were born and raised in environments where everyone around them looked the same. In fact, the United States is as segregated today as it was prior to mandated desegregation of the public schools. The result is that the poor interact with the poor, the rich with the rich. Whites attend white churches, and Blacks attend Black churches. While some schools offer courses for English as a second language, learners in most American schools are taught in English. Thus people are rarely ever pushed outside of their comfort zone. People are limited to non-existent interactions with those who are different, forced to create distorted images of those who are different. The media, schools, churches, and second-hand stories recounted by parents and peers shape these images. It is then easy to meet a person who speaks broken English and make the assumption that they are uneducated. If someone lives in a society that promotes diversity and provides opportunities for maturing the senses of diversity, the society could encounter the same person and appreciate that they know more than one language through that person.

Unfortunately, it seems that people are headed down the same path, expecting different results. People continue to live, educate, and worship in a segregated society while at the same time talking about diversity as if it really mattered. What is most frustrating is that they have set up a society in which some are privileged while others go lacking. It is astounding that educational institution remain segregated and unequal (Cashin, 2004). Most curriculum that is taught is one sided and built on a foundation of a Eurocentric culture, further excluding the many cultures that have contributed to the global world. At the same time those who do not assimilate to majority culture are often excluded from the best institutions. It is for this reason that this author left the traditional brick-and-mortar institutions in search of different modes of education and to study ways to increase equal access. Certainly online learning had broken at least one barrier that elite traditional brick-and-mortar institutions were still struggling with, that being the challenge of maintaining a diverse student and faculty population.

Background

In the past few years, there has been growing numbers of faculty and students attracted to online learning. Online learning provides the opportunity for collabo-

rative learning and connections to diverse people that the learner may not ever encounter in a traditional learning environment (Bonk & King, 1998). The lack of time and peer pressure inherent in face-to-face interactions allows for non-dominant group members and second language learners to respond in discussions with ease (Kim & Bonk, 2002). Those who tend to be attracted to online learning are a very diverse group. For some it is the flexibility and ease with which they can gain access to the courseroom that is attractive. For a busy professional or mothers who cannot get away to take courses on a full-time basis, online courses open the doors to an education they could not otherwise receive. For others it is the allure of technology that makes it attractive. Technology enthusiasts are those who love to be involved in the fast-growing opportunities that the Internet offers. For others it is the opportunity to connect with diverse groups of people that is attractive. If a person lives in a small rural homogenous community, the Internet allows the opportunity to attend class with people from all over the world. Still others are excited about learning online because it removes the barrier of prejudice.

In fact, many attest to the Internet as a way to level the playing field (Kim & Bonk, 2002). In a traditional courseroom setting, the lone minority may face the barriers of prejudice or may feel uncomfortable. Their views will go unheard, and eventually many leave the traditional college setting feeling angry and dejected. In an online courseroom some say that the ability to become whoever they want helps to remove the barriers that are placed on them in real-world situations. Women are not intimidated or made to feel like their contributions are less, racial minorities are no longer visible. On the Internet some believe people are not judged according to their appearance, their social standing, or their educational background.

While the Internet is a godsend to some, it is also fair to say that some cultures find the ease of technology as having a negative impact on continued face-to-face interactions. Wheeler (2003), in her study of Internet use in Kuwait youth, found that elders within the community believed the Internet took young people away from quality time usually spent with family members. In a culture where family and community are revered, the Internet is a major clash with the values that are so strong within this society. For example, in the evenings it is not uncommon for the girls to spend time with the older women. They would talk and learn to sew and cook. It is a time of bonding and relationship building. For boys the evenings are spent in the club with the elder men of the community. They also spend the time talking and learning what it means to be a man in the Kuwait society. For this culture the evening is the time when each member of society is strengthening their community. Unfortunately, the evenings have become the time when youth are participating in online chat discussions. The author found that Kuwait students agreed that the Internet did have negative consequences; however, they also recognized the positive benefits. For example, Wheeler recounts that many Kuwait women stated "that they enjoyed talking with members of the opposite sex because they did not generally have first-hand knowledge of how men think.

Men were a mystery, outside of their interactions with family members, and the opportunity to interact with strangers of the opposite sex in a safe and anonymous place was irresistible" (p. 4). While the experiences of Kuwait youth may diverge from experiences of American students, it does broaden the knowledge of how the Internet influences and is influenced by the society and culture.

Furthering the knowledge around diversity issues as they relate to online learning is critical, considering the diversity that is present within the unconfined walls of the virtual learning environment. Students bring a rich element of diversity to online education; the same can be said for the growing number of faculty who have become a part of online academia. Many faculty members seek out teaching online for the same reasons students find it attractive. While traditional colleges and universities yield as little as 3 to 12% minority faculty, many online universities are far exceeding those percentages. There are several reasons why. For starters, online faculty are usually active scholars and practitioners. While traditional colleges and universities seek out primarily those who have research and teaching backgrounds, online universities provide those who are in the corporate arena to also provide leadership in the courseroom. The benefit is that online colleges and universities offer their students courses taught by faculty who have real-world experience and practical knowledge. Another benefit is that faculty are not restricted by location. A faculty member living in New Zealand can teach an online course as easily as one who resides in Chicago, Illinois. These limitless boundaries provide online universities with the chance to seek talented individuals from across the globe.

The type of faculty who find online learning an attractive opportunity are those that are interested in helping adult learners succeed and want to be on the cutting edge of technology. They also represent a wide range of subject matter expertise, ranging from nuclear engineering, teaching strategies, K-12 education, feminism, peace studies, and leadership models — just to name a few.

Many faculty who identify as American Indian, Asian/Pacific Islander, African-American, or Hispanic/Latino find teaching online attractive because they also do not have to deal with the prejudice that is sometimes inherent in traditional college and university settings. Many prefer to, instead, teach in an environment where political disputes are kept to a minimum and where there is no stress of *publish or perish*. Minority faculty are also attracted to the rich diversity of thought, background, and experiences that online courserooms offer. Such a community also provides the industry of online learning with an opportunity to meet a challenge that institutions across the country are struggling with: the opportunity to provide quality education and equal access. For example, Capella University, one of the fastest growing online universities, has proven itself a front runner in this arena in that it ranks second in the nation for conferring minority doctorates in business, management, and marketing.

Despite the growing diversity of learners seeking higher education, Black and Hispanic learners are still more likely to be on academic probation, and minority students as a whole withdraw from college at higher rates. While the reasons for these results are not clear and will need further exploration, it offers us a glimpse into issues that need to be addressed.

While online institutions have a promising trend for diversity among both faculty and students, clearly there are tremendous opportunities for increased diversity in both groups. In order to move in this direction, there needs to be a deeper understanding of what is needed to increase diversity and create a learning community that will sustain that growth. For an institution to be successful in this endeavor, there needs to be a personal commitment by key faculty and students, as well as a commitment from the institution that acknowledges and honors diversity.

Quality education and equal access for marginal communities is very much needed; what will make it a reality is a willingness to acknowledge limitations and the courage to raise awareness around issues that will move our educational institutions out of their comfort zone. Indeed each of the community people is personally responsible for influencing the environment around the community. The business case for providing equal access to marginal communities recognizes that alongside grassroots-level change, there needs to exist institutional support from governing structures of the organization. This institutional support should be driven by the fact that there is tremendous opportunity in maximizing the potential in a diverse learning community. Online institutions can also look to learn from organizations that have shown excellence in maximizing their potential through diversity. For example, NASA summed it up best when they wrote:

Diversity is not about correcting imbalances, being a good corporate citizen, or even about the law. Diversity is about constructively using those things that make us different and unique, that reach far beyond generalized group descriptors. Diversity is about leveraging all aspects of human potential. (p. 3)

Online learning presents the opportunity to level the playing field in an otherwise stratified arena. At first glance one would expect that the virtual community automatically levels the playing field. In the courseroom a participant is no longer a specific race or gender. One cannot detect accents or socio-economic background. Can anyone? It is not that simple. In fact, once engaged in truly critical dialogue around issues from education to leadership styles, it becomes nearly impossible not to expose who the other person is. More importantly, true critical dialogue must acknowledge the diversity which each of the participants brings

to the courseroom. The question then becomes: How do people allow for the acknowledgment of the diverse group memberships while at the same time respecting and honoring those differences among them?

Main Focus of the Chapter

One answer lies in understanding privilege in the society and finding ways to empower marginal communities to overcome barriers through online learning. Social privilege can be defined as a right, advantage, or immunity granted to or enjoyed by persons beyond the common advantage of all others — an exemption in many particular cases from certain burdens or liabilities. While privilege may not be apparent, it continues to exist in the way educators structure the curriculum and the strategies they use to teach. Historically privilege has been granted to White males, while civil rights laws, protests, mandates, and sensitivity programs have had a huge impact on increasing the rights for all people; the fact remains that there are still remnants of privilege that pervades the society. In the realm of higher education, women and minorities still lag behind in their access to quality programs, and even when these historically under-represented groups are given the opportunity to be educated alongside their white male counterparts, there still remains disparity. One possibility is that there are cultural differences in the way under-represented groups learn and communicate.

A second explanation is that being a member of a minority can affect a student's performance. This has been termed stereotype threat (Steele & Aronson, 1995). In online learning the latter becomes less of an issue, but the former can become even more important. Most online courses are writing intensive, which requires the student to express themselves through posts, essays, and papers. If students are still judged based on the traditional methods used in brick-and-mortar college settings, online colleges and universities risk the possibility of creating barriers for the very population that is seeking out online education. For this reason, it is imperative that the development of online education begins with a focused study of culture and the ways that it influences learning styles for diverse students.

Culture mediates a learner's cognitive development, and although individuals are not necessarily conscious of their cultural influences, it was argued that there were different modes by which knowledge is acquired. In 2000, Marcus and Gould set out to try and understand how culture and learning orientations manifest themselves in online Web environments. Using Hofstede's (1997, p. 399) cultural theory, the authors used the following indices to understand cultural differences: "*Power-distance* refers to the extent to which less powerful members expect and accept unequal power distribution within a culture.

Collectivism vs. individualism refers to the degree to which an individual values their contribution to society at large or values personal achievement and status." According to Singh and Baack (2004, p. 5), "People within collectivistic cultures need forums, places, or clubs where they can share concerns, views, and emotions. [Multimedia features that can be considered collectivistic include] community relations, clubs, chat rooms, newsletters, family theme, pictures, and symbols of national identity and loyalty programs." *Feminine cultures* tend to allow cross-gender behaviors and value good relations with others, a congenial home and work environment, and job security; *masculine cultures* are more likely to maintain defined gender roles and value wealth, challenge, promotion, and recognition. *Uncertainty avoidance* refers to the extent of a culture's tolerance of ambiguity. And *time orientation* refers to a culture's emphasis on either the long or the short term.

While these indices can seem abstract, when studied in terms of online learning, there are many interesting implications. For example, according to Marcus and Gould (2000), online courses that rely on working alone and competing against others will inherently appeal to individualistic learners, but when technology is used to communicate and collaborate, it may appeal to the more collectivistic learner (Kim & Bonk, 2002). For learners that come from a high power-distance culture, emphasis is placed on acceptance of centralized authority. In an online learning environment, this may manifest itself as discomfort in challenging the ideas of others and misunderstanding the instructor's use of the Socratic method as confrontational.

The need for culturally responsive teaching was explored further by McLoughlin (1999). In her study *Culturally Responsive Technology Use: Developing an Online Community of Learners*, she set out to understand the cultural implications for the development of an online learning community for Australian Aborigines. At the early stages of development, it was understood that culture played a major role in the success of such a program. The population consisted of people who were not only under-represented in the country, but also in higher education. The need to understand the specific needs of this group played an integral role in the model that was developed. By viewing technology as a *cognitive tool*, McLoughlin and colleagues set out to transform learning by pairing technology with subject matter expertise. McLoughlin identified seven areas that could be interpreted differently depending on culture. They include: (1) e-mail, chat, and peer dialogue; (2) lectures and information presentation; (3) hypermedia organization; (4) collaborative projects; (5) resource sharing and prescribed content; (6) internal vs. external learner control; and (7) social networks and relationships.

When considering instructional design paradigms McLoughlin identified four approaches to the design of the curriculum. The first seeks to insert culturally sensitive material without challenging or changing the dominant culture, the second seeks to design parts of the curriculum that speak to the minority experience

without providing validating exercises, and the third is to completely ignore any cultural differences. The fourth approach, or multiple cultural model, seeks to create an eclectic curriculum that incorporates multiple ways of teaching and learning. This choice is best suited for use with diverse populations. Using the multiple cultural model, a message board was created for learner and teacher interactions that included a variety of components. An e-mail component allowed for direct communications; a Yarning place (an informal chat board) enabled dialogue around community topics related to the chapter of study. A news component gave students access to information outside their community, as well as direct links to tutors and mentors, who served to guide students throughout their learning process. These links also included pictures of the teachers; while McLoughlin does not give further information on the importance of photos, this author believes that visual representations aid students in connecting and feeling a sense of engagement with teachers and students that they may never see. Students also tend to seek out faculty who share a common background or ethnic identity in hopes that they can make a connection with someone who understands their experiences. Many minority faculty have reported that when they post their picture within the profile pages, they receive many requests from minority students who want to be mentored by them.

Diversity within learning orientations is just one piece of the bigger puzzle. Communication styles and language can be quite challenging when facilitating online discussion, especially around controversial topics. Even in face-to-face interactions, there are some topics that can create an intense atmosphere. A teacher must be adept at facilitating dialogue so that students can learn from one another and challenge each other, and yet not feel attacked. In an online learning environment, the lack of effect and intonation in the written word can be particularly problematic (Curtis & Lawson, 2001). Equally challenging is the teacher's ability to keep students engaged in dialogue. In a face-to-face class setting, a student may still learn from being a passive observer. In an online forum a student can simply choose not to read postings that stir their emotions or challenge their beliefs.

In 2003 Stromer-Galley set out to try to more fully understand how the computer-mediated communication contributes to the diversity of discussions online. While some researchers hold the belief that the Internet attracts like-minded people to come together to reinforce their own values, Stromer-Galley found that many who participate in online communications seek out and enjoy debating with people who hold different beliefs and have different backgrounds and experiences. The participants in her study spoke about both positive and negative consequences of participating in dialogue with diverse people.

People felt that they learned from those with whom they talked. They learned about political topics of which they knew little before, or they gained richer, deeper insight about an issue on which they were already well-versed. They

learned what other people were thinking and what others' opinions were on issues. They learned about themselves. They discovered how they felt on political subjects, and sometimes they even changed their opinions on an issue. There also were some negative consequences. The most prominent consequence was that they were exposed to opinions and views that were highly problematic to them, views that they labeled as racist, backwards, or simply wrong (p. 10).

In an online courseroom setting, differences of opinion can make for exciting debate. However, it is extremely important that the faculty member set guidelines that will provide a safe environment for students to challenge each other without disrespect. Trust can be easily gained in an online environment, but it is also very fragile and temporal (Jarvenpaa & Leidner, 1998). The instructor should also retain the right to remove a posting that can be seen as offensive. While some faculty may prefer to stay away from controversial topics in order to avoid conflict, it must also be understood that the online environment is one of the best places to begin to break down barriers that are too difficult to approach in face-to-face settings. For example, during a discussion about sexual orientation, the educator may have one student whose religious beliefs do not allow for any room in understanding and accepting gays and lesbians. In that same courseroom the educator may have a gay or lesbian or someone who has a close friend or family member who is gay or lesbian. The safest choice would be to avoid the topic all together. The wisest choice would be to create space that can allow for a dialogue around differences. In these moments the Internet can assist the society in bridging the gaps divided by these differences (Bakardjieva, 2003; Gammack, 2002). For a faculty member who wants to facilitate dialogue around differences, it is important that they create opportunities for students to debate on topics that will not cause people to attack each other. For example, instead of asking the question of whether homosexuality is right or wrong, the question can be posed as a scenario such as: there are two roommates who have been paired to live together on their college campus, one is a conservative Christian and the other is an out lesbian; what are some of the issues that could arise, what are some ways the roommates can learn to live together harmoniously? In this way, the educators are challenging students to think about real-world issues, and instead of focusing on the right and wrong of a person's values and beliefs, the educator should begin to move students toward thinking proactively about how to communicate successfully across differences.

Online discussions can also be influenced by other diversity classifications. For example, Crowston and Kammerer (1998) attempt to shed some light on gender differences in computer-mediated communications. Through survey data, they attempted to understand how gender effects participation in online discussions. As one would guess they found that males and females tend to join discussion based on interests, and those interests differ depending on gender. These results have important implication for future study of the extent to which genders

participate. For example, the number of responses made in a particular thread may not be due solely to gender differences in communication style, but also due to general interest in the subject matter. The authors attempted to further understand two communication styles, the adversarial and supported/attenuated. According to Herring, "men and women use both styles, but men tend towards adversarial and women towards supportive/attenuated[,] and the extremes of each are used "almost exclusively by one gender and not the other" (p. 187). Crowston and Kammerer found that both males and females were less likely to join discussions where adversarial was the dominant.

In line with understanding how conversational styles influence learner participation, Kramarae (2000) reviewed studies that supported the idea of gender and ethnic differences. The six areas studies were verbosity, politeness or rudeness, abruptness, flaming, topic control, and silence. The author found that men tended to post more than women and that women posted less if they had not received responses to their posts. Women were also more likely to post in response to other learners, and to acknowledge others and to be polite in their responses, but less likely to continue posting to prove their own point when others disagreed. One interesting finding is that in mixed-gender Internet discussions, women are less likely to control the topic of conversation and overall receive less responses than males.

Further exploration of this topic reveals that females of all cultures do not always communicate similarly to what has been found in the United States. For example, Panyametheekul (2003) found that women who participated in Thai chat rooms were more aggressive in their ability to take control of a conversation and that men had to work hard in order to dominate conversations. In a study conducted by Michele de Oliveira (2003), it was found that contrary to the findings of Crowston and Kammerer (1998), Portuguese men tended to be more polite in their postings.

While it is apparent that gender plays a part in communicating in online settings (Rodino, 1997), academic background also plays a part in the differing levels of understanding a learner may have on the subject matter. A student's access to technology and skill level also plays a huge role in whether the educators are providing quality education to the diverse student population (Hoffman, Novak & Schlosser, 2000). A successful online course should be supported by tutorials or stand-alone modules that can assist students in continuing to build the skills necessary to be successful. In line with this thinking, many have started to become aware of the need to understand how language mediates success in the online environment.

Future Trends

In further understanding the ways to create culturally sensitive modes within technology-mediated online learning, a subject for future discussion includes the use of language. According to Global Reach (2004): "There are approximately 172 million English speakers and 163 million non-English speakers online…50.4% of Web Users speak a native language other than English and over 100 million people access the Internet in a language other than English." Sloan Consortium (2002) also indicated that in 2003, 1.9 million students may have taken at least one online course. Future developers of online education will have to understand how to reach non-English speakers in order to continue to close the digital divide.

According to CyberAtlas (Danet & Herring, 2003), since the Internet began expanding globally in the 1990s, "the number of non-English-speaking users has grown to 470 million, or roughly two-thirds of all Internet users. To date, however, the research literature in English on computer mediated communication has focused almost exclusively on emergent practices in English, neglecting developments within populations communicating online in other languages" (p. 1).

The development of the Internet has developed much in the same way as educational curriculum in the United States. The focus has been on serving the needs of one type of consumer. The Eurocentric approach has created a keyboard with a letter and numbering system compatible with the English language. For some it is believed that the use of English will result in a dominant language that all people can share in order to communicate. Others believe that this imperialist approach will only serve to exclude many while fostering the extinction of many languages. Regardless of the stance one takes, the fact remains that as the Internet becomes more widely accessible, researchers must begin to turn their attention to understanding how language mediates communication and how the Internet can be used as a vehicle to communicate across differences.

Conclusion

In the *real* world there is the benefit of communicating face to face and building relationships on concrete interactions. The qualities of the relationships that are built are also inhibited by the perceptions of those around the community. Each person is shaped and molded according to his or her environment, and until recently their environment has been limited to where they live, work, and travel. With the introduction of the Internet to the global world, people are now in a place of infinite possibilities. Now there is the opportunity to learn from people all around the world. There is also the chance to teach people that one may never

see and to empower communities that otherwise would never have access to educational opportunities. In *real* time and place, interactions are governed by stereotypes, which over time can become so ingrained that they become prejudices. These biases veer people away from exposing themselves to those who may challenge values and beliefs. The Internet has the potential to change that. When entering a chat room or an e-learning courseroom, participants are forced to interact with others without the benefit of preconceived notions. The Internet also serves as a way to break down the achievement gaps by offering educational opportunities for those who may not be able to pursue education through traditional means.

Understanding the diversity of people who use the Internet as a form of communication and learning does not mean throwing away all values and traditions that have been handed down from past generations, but it does mean that everyone has the opportunity to take what has been given, and develop it and make it better for the next generation.

The topics that have been written about here are a part of the virtual diversity challenge. Each area reveals inherently different ways of looking at the world, thus influencing learning. There are many questions to be answered, learning models to be developed, curriculum to be created, and each and every person committed to empowering marginal communities plays an important role in making these things happen.

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Terms and Definitions

Cultural competence: The capacity of a person to communicate effectively and convey information in a manner that is easily understood by diverse audiences including persons of limited English proficiency, those who have low literacy skills or are not literate, and individuals with disabilities. Cultural competence is a developmental process that evolves over an extended period. Individuals are at various levels of awareness, knowledge, and skills along the cultural competence continuum.

Courseroom: In an online courseroom, all of the instructional material, the homework, and the tests are presented to the learner through the computer. The student never enters a physical classroom.

Diversity: *Otherness*; those human qualities that are different from our own and outside the groups to which we belong, yet are present in other individuals and groups. It is important to distinguish between the primary and secondary dimensions of diversity. Primary dimensions are the following: age, ethnicity, gender, physical abilities/qualities, race, and sexual orientation. Secondary dimensions of diversity are those that can be changed, and include, but are not limited to: educational background, geographic location, income, marital status, military experience, parental status, religious beliefs, and work experiences.

Learner: One who is enrolled or attends classes at an online school, college, or university.

Virtual learning environment: A set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process.

Chapter II

Empowerment of Marginal Communities Through Information-Driven Learning

Hakikur Rahman
Sustainable Development Networking Program, Bangladesh

Abstract

Effective use of information technology can play an important role in learning processes among constricted-bandwidth-inflicted countries with bare minimum information infrastructure. The Internet can act as the learning tool for providing appropriate content with easier access at lesser effort. When communities interact through any effective means of communication to gain access to relevant information, raise their knowledge, develop their capacities, mobilize resources, establish knowledge network, and empower themselves, penetration of the Internet must be ensured at acceptable state. However, the information-driven learning system requires more than these, so that information becomes truly a value-added product for the marginal community.

Introduction

When groups of users interact intensively through some medium, they progressively constitute a community. However, community feeling does not automatically emerge just because groups use electronic communication. It takes a lot of time and a lot of interaction. It requires sharing goals and sharing experiences (Dillenbourg, 2000). Information sharing can help groups develop community, and information-driven learning can empower those communities as they emerge.

Effective use of electronic communication technology and Web-based techniques can play an important role in the learning process, especially in the absence of a dependable information infrastructure. The free flow of information, and easy access to it, are primary ingredients of information-driven learning.

The Internet is supposed to be a deductive tool to promote awareness, provide content, raise skills, and act as the catalytic agent of empowerment. However, the actual picture reveals that, although the non-English-speaking population comprises almost 90% of the world population, only 8.4% have Internet access, and only 4% access the Internet in Asian languages. Of the entire world population, only 12% has Internet access. About 35.2% of the Internet Web sites are in English (Global Reach, 2004).

During August to September 2004, Isoph (2004) carried out an online survey on non-profit associations providing Internet-based learning, or e-learning. Out of 697 respondents, more than 54% claimed that either they are using e-learning technology or plan to use it within the next 12 months. However, this number would be very different in the context of developing countries.

Thus, to raise the knowledge system platform for use by marginal communities, penetration of the Internet to the third or fourth tier of the communication channel (Figure 1) has to be made mandatory. Whether communication initiates through networking within organizations (1st tier) or through huge national networks (5th tier), penetration of communication among cities and networking among regional communication channels (in 3rd tier) are essential to create information-based communities in a country.

Along this channel many countries have adopted the top-down approach, but it has been found that the bottom-up approach is more pertinent for designing the information infrastructure in developing countries. Establishing networking within an organization without sufficient knowledge about its outer peripheries, interface capability with the next higher tier, and routing possibility to the next higher level of communication channel often creates complexities in extending the network, incurs higher cost, and restricts their smooth operation. Hence, the communication channel should be extended down to earth by establishing national networks in modular form at first, and then they can reach the next lower level by interconnecting lower level networks through necessary piggybacking.

Figure 1. Communication channel within a country for effective information flow

Ultimate destination of a network	

Within organization

1st tier

Inter-organization

2nd tier

Inter-locality

3rd tier

Inter-city

4th tier

Inter-region (state/division)

5th tier

Saturation point of a network

Intra-country
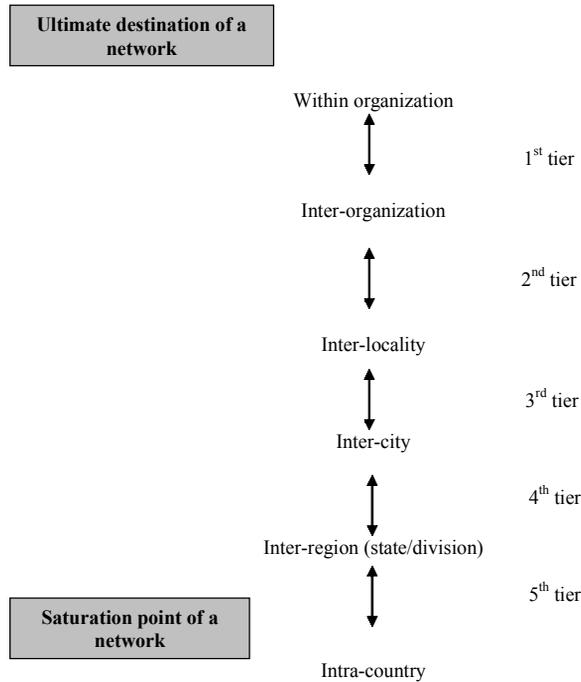
However, the end users at the community level need to be fed with content and information driven by their own needs (demand-driven information). At the same time, the communication channel needs to be refurbished with dynamic refreshments focusing basic human necessities.

When community information centers are supposed to act as crucial tools for knowledge development, community users are urged to cultivate and adopt a critical attitude towards the real use of information. Justifying the sources of information, they choose to evaluate and analyze the information to develop knowledge in their own perspectives, such as on economic, political, or social conditions. This process of justification of the content, source of content, and adoption of content forms the basis for changing and transforming the community.

Rapid human capacity development programs depend on the formation of a healthy civil society. Community members should develop their capacity by integrating information and knowledge into various development activities. Such capacity

Table 1. Potential sectors of society and possible responses for community empowerment

Sectors	Possible interdisciplinary responses
Education	Develops essential skills and uses ICT for improving educational access and quality
Science	Makes use of ICT for capacity building through virtual universities
Social Sciences and Humanities	Uses ICT for information dissemination on social issues
Culture	Facilitates access to ICT for use in cultural resource management
Communication and Information	Promotes development of national ICT policies

empowers the common people to solve intelligently the problems that exist within their community and eventually transforms them into valuable assets of society (Rahman, 2004; Tuomi, 2004).

Among contemporary global challenges, ICT (information and communication technology) development remains an important component. Table 1 shows the effects of ICT in different sectors of society (UNESCO, 2002).

Table 1 indicates that mass information dissemination plays an important role for community empowerment across different sectors of society. Since the humanities and social science are the core sector, they need special attention. Necessary skill development should evolve within the education and science sectors. ICT skills should promote development of information-driven initiatives at the national level.

It is evident from these perspectives that learning systems are becoming largely dependent on ICT-based dissemination processes. Some familiar and commonly used techniques in this arena are:

- *E-groups:* The simplest one-way mass dissemination technique (e-mail, mailing lists, etc.);

- *Bulletin board service (BBS):* The oldest platform of common consequences (chat rooms, MSN/Yahoo messenger, etc.);

- *Moderated e-discussions:* Recently adopted popular means to seek generic consensus, to generate research reports, and to create research documents; and

- *Virtual seminars:* Similar to moderated e-discussions, but made more interactive through the use of new developments in Web-driven, graphic-simulated utilities *(*concept maps, social network diagrams, etc.).

Most importantly, increased networking among education institutes, research organizations, and eventually government and non-government agencies are needed to establish interactive information exchange platforms to empower marginal communities. Sharing knowledge and expertise are also essential at the at grassroots level to formulate effective governance, and for knowledge networking and mass information dissemination for enhancement of development processes (Rahman, 2003a, 2003b).

Background

Empowerment means to give each element of society the ability to take more control of its own development processes and make informed decisions. Empowerment makes it possible to upgrade the livelihood of these elements through greater delegation of authority to act (Google.com Definition Search, 2005). Thus, empowering a group of people living in a particular local area with bare minimum standard of living (a marginal community) through the cognitive process of acquiring skill or knowledge demands rigorous implementation of pragmatic delegation policies.

"Information is a process by which, from the set of accessible data, the subset of relevance for the subject being informed is extracted and elaborated" (Infovis.com Electronic References, 2005). Information is the knowledge acquired through learning and understanding. Hence, information can be widely adapted to improve the organizing capacity of a marginal community. Furthermore, it can be utilized as a medium of learning.

Information-driven learning develops solutions and products, aiming at making relevant information available at the right time and the right place. The system relies on knowledge-based products capable of evaluating documents or information regardless of their particular structure and to relate them to the various jobs, requirements, and interests within the community (Online document, 2000). Through this learning system, information becomes a value-added product for the community.

It is vital in a learning system that learners should be able to deal with real-world tasks that require problem-solving skills, integrate knowledge incorporating their own experiences, and produce new insights for their career. Learners and their

educators should be able to handle a number of challenges before actual learning starts. They should make themselves resourceful by utilizing their own strengths, skills, and demands by maintaining self-esteem and by defining what has been learned, how it is useful to society, and how the content would be effectively utilized for the community in knowledge building.

There are several critical issues that concern the effectiveness of a design methodology and of the actual implementation plan for a learning system. Issues concerning the development of learners' skills by exploiting technology and becoming active members of an online learning community need to be addressed (Willis, 1993; Souder, 1993; Ackerman, 1996; Crovela, 1999).

Furthermore, learners should be able to:

- Adopt a constructive approach in the learning process;
- Participate in joint activities;
- Amplify their abilities to cope with different kinds of information;
- Organize themselves through knowledge development;
- Share knowledge with others more effectively; and
- Satisfy their demands and objectives by participating in well-organized and coherent programs (Johnston, 1994; Rahman, 2001).

In distributed learning systems every learner must have easy access to network infrastructure and the Internet. The network should be robust during high-traffic and diversified data flow. Interactive multimedia-based courseware typically demands extended bandwidth — a demand which is often difficult to satisfy in the context of developing countries where high-speed data transmission is not yet available to most of the end users. To address this problem, off-line interactive multimedia CDs are becoming increasingly popular (Rahman, 2003c). Therefore, in developing countries emphasis should be given to collaborative learning processes. By actively sharing information, ideas, and problem-solving methods among a team of learners, and jointly assessing the outcomes, community learning (or collaborative learning) can be established.

Furthermore, research on the development of collaborative learning systems (representation of the knowledge domain, architecture of the system, and user interface) needs to be built around the analysis on how the system supports the educator in the process of "scaffolding" the learner's progress (Cornet, 2001). It enhances the process of structuring and frameworks the learning sequences.

The goal is to define a methodology of conception allowing the learning model to build around the following three topics: (1) to build knowledge by ensuring an

operative computational dialogue, (2) to be able to synthesize the learner's actions and their productivity, and (3) to represent these products into analytical format (Cornet, 2001).

Learning at a distance has become successful through the use of tools like audio-videoconferencing and shared curriculum (Web-based materials, e-mails, and Internet), and shared display and multi-tasking architectures (graphics, networks, and servers) (LeFebvre & Craig, 1999; Serim & Koch, 1996; Bates, 2001; Colle & Roman, 2003; infoDev, 2003). The Internet provides a distributed infrastructure for sharing information globally with minimum technology features (Surman, 1999; Aldrich, 2003; Raush, 2004; Hauschen, 2003). Particularly, it is easy to develop collaborative applications linking the growing number of diverse clients with enriched Web content (Chichlinksky, 1998; Barabasi, 2002; Richardson & Domings, 2004). Available technologies can be integrated to form low-cost information providers. Utilizing distance education techniques, educators and learners can be brought together in common collaborative platforms to make the system cheaper and easily available to marginal community users (Badshah et al., 2003; Best & Maclay, 2002). Particularly, Web-based e-learning solutions are adopting collaboration environments that enhance accessibility to a full range of educational resources supporting rich interaction with participating parties in a synchronous or asynchronous fashion (Qiu & Jooloor, 2004).

Two characteristics of an online education tool are shown in Figure 2; the x-axis shows how synchronized it is and the y-axis shows how interactive it is (Nakabayashi, 2002). E-mail is more asynchronous than broadcasting methods, and it is more synchronous than video on demand (VOD). It is more interactive than broadcasting methods, and it is as interactive as electronic meetings, as shown in Figure 2 (Hino et al., 2002). Therefore, electronic meetings and e-mail interactions seem to be the most effective means of communication among marginal communities. They can be utilized to disseminate learning in constricted bandwidth situations (Bush, 2001; Rahman, 2003d).

Several experimentally verified learning models are shown in Figure 3. This figure shows that ICT-based learning methods are mostly related to distant modes of learning through both traditional and virtual models. This form of learning system is also expanding with much faster development, and day by day becoming more acceptable to the marginal users (Rahman, 2004).

Online mobilization and activism have all of the diversity of their off-line counterparts (Surman & Reily, 2003). Designing appropriate online learning tools with support from their off-line counterparts, the learning sequences can assist the knowledge development processes more rapidly. Figure 4 illustrates the shifting of knowledge domains from a distributed to a centralized repository approach. The diagram also suggests that research networks and information pooling contribute to both distributed and centralized contexts, but tend toward a centralized context.

Figure 2. Various online learning systems
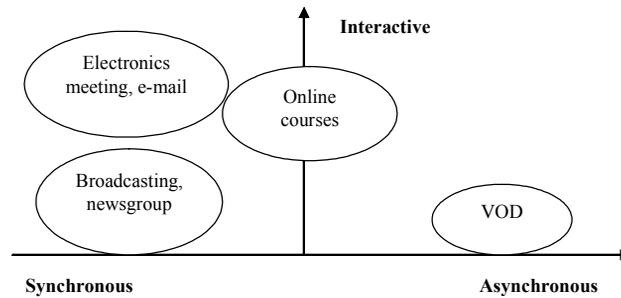
Figure 3. Different learning models
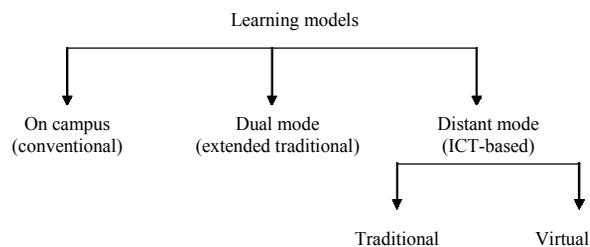
This form of information-driven learning system will radically change the knowledge development processes in the very near future.

Learning models should be built to help learners achieve five required competencies identified by a number of researchers. Each of the following skills is needed to prepare individuals with basic concepts of knowledge (Secretary's Commission on Achieving Necessary Skills [SCANS] Report, United States Labor Department, 1991). Individuals should:

- Have the ability to allocate resources (time, money, materials);
- Possess interpersonal skills for effective teamwork and leadership;
- Have the ability to acquire, analyze, and use and access information;
- Understand the social, organizational, and technological systems of working; and
- Have the ability to use appropriate technology.

Figure 4. Different online activities of the knowledge domain

Formal

Distributed data
collection

Information
pooling

Collaborative
research

Data
mining

Distributed   **Centralized**

Research
network

Open source
intelligence

Network
monitoring

Informal
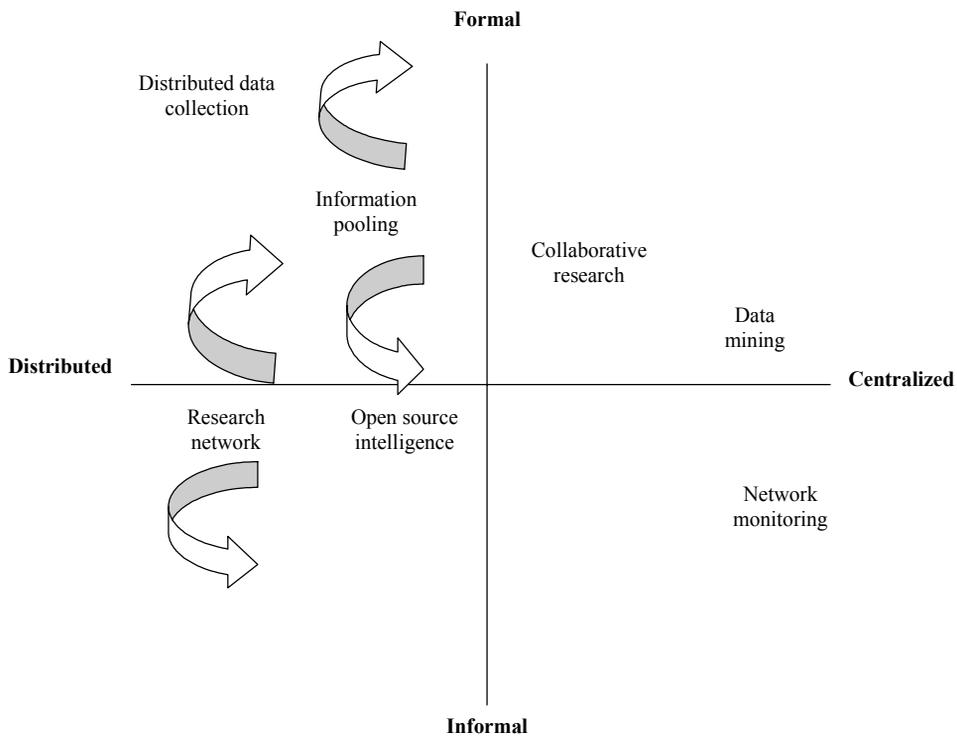
Furthermore, the syllabi and curricula of basic education systems need to upgrade fundamental skills for marginal communities to provide that all individuals are:

- Able to read;
- Able to write;
- Able to listen and understand; and
- Able to speak and make themselves understandable;

and that they:

- Know basic mathematics and arithmetic;
- Have thinking skills (creative thinking, reasoning, decision making); and
- Possess positive personal qualities (responsibility, self-esteem, integrity).

Similarly, access to tertiary education by marginal communities can be viewed as an opportunity of enrolment in the mainstream education system and can be treated as sustained involvement in the development processes of society through appropriate education programs. Accesses include features of openness to heterogeneous environments, support to diverse clientele, and relevance in diversified offerings. Success in tertiary education is also a multi-faceted term, which measures the extent of achievement in national educational goals. It is also indicative to the improvement of efficiency and quality of the learning system by lessening session jams, reducing illiteracy rate, improving socio-economic condition, and enhancing knowledge networking.

Finally, when developing electronics-supported learning services and resources for the empowerment of marginal communities, the following key objectives to drive outcomes of accessibility, flexibility, peer support, and independent learning should be taken care of. They should be able to:

- Provide participants with a comprehensive range of services and resources, preferably within a Web-based environment;
- Integrate the Web environment with the existing networking facilities for knowledge networking and peer support;
- Address the peer support needs of remote and possibly global participants;
- Provide links to other agencies and external sites acting as a one-stop shop of resources, links, and support for remote participants;
- Ensure accessibility of all content (including Web sites) for all users;
- Provide specialist resources, support, and information for participants with any disability;
- Develop self-learning materials and resources on basic skills, education, and health, and put them in an online repository; and
- Introduce and mobilize the learners/participants to the development activities and make them self-expertise.

Approaches

The striving forces behind the so-called information revolution are the sharp decline in the prices of information processing, the convergence in communication and computing technologies, and the rapid growth in network computing. Communication networks and interactive multimedia applications are providing the

foundation for the transformation of existing social and economic relations into an *information society* (OECD, 1997). It is, indeed, widely believed that modern information technology will change the world, but how can such a change be measured and its impacts assessed (Pohjola, 1998)? This section has tried to address this question.

It is customary to argue that the emergence of the so-called new economy has presented developing countries with new opportunities for success, but at the same time increased the risk of their marginalization (Kapur, 2002). UNDP (2001) estimated that in 2000, 79% of the Internet users lived in high-income OECD countries that contain only 14% of the global population.

From the development perspective there may be several possible approaches to empower remote and information flow constrained communities. Most ICT strategies give high priority to an enabling policy environment at the national level to facilitate development of this sector. However, the education sector makes extensive use of ICT, and distance learning programs at all levels are increasingly important elements of the development strategy of a country for empowerment of marginal communities.

The social and human sciences sector also recognizes the importance of information dissemination and continues to support activities in this area, including use of ICT. Similarly, there is great potential for the culture sector to apply ICT in mobilizing grassroots support for heritage conservation, cataloguing cultural resources, promoting cultural industries, sharing information on culture through an Internet database, using distance education techniques for training cultural resource managers, and developing public cultural education programs through Web sites (UNESCO, 2001a).

Thus, an effective and efficient learning system can be established through necessary policy reforms at the national level, sufficient logistic support at the marginal level, and necessary capacity development of the stakeholders. Globally it has been recognized that the achievement of a country's educational aims mostly relies upon the development of effective policies and strategies with improved planning, analysis, and research. Particularly, attention should be given to the overpopulated developing countries for improvement of their learning system.

In this context, the South Asia and sub-continental countries have been found to be socio-culturally diverse, which necessitates policies based on multi-culture and multi-social principles. However, recent trends in ICT initiatives have resulted in formation of a uniform platform in many fields and aspects. This perspective has fostered a single-minded focus to act uniformly within the development agenda. However, there are many approaches available to enhance capacity development and knowledge networking through e-learning. By e-learning, here it is meant not only the electronics form of learning, but it also may include any form of information-driven education.

Conventional University as Added Catalyst

Many highly reputed international universities, such as Adelaide University, Athabasca University, Carnegie Mellon University, Deakin University, Keio University, Harvard University, McGill University, the University of Wisconsin, and so forth, have adopted learning processes in open and distant modes.

Organizations such as the Commonwealth of Learning (CoL), the International Centre for Distance Learning (iCDL), and the International Council for Open and Distance Education (ICDE) are furnishing a common platform for meeting specific needs for open learning communities. However, a repository of content, especially in regional form, is still non-existent.

Traditional education systems such as the Asian Institute of Technology and the Asian Institute of Management are making excellent contributions to society. But, similar approaches are missing for an open learning system. A regional institute can provide logical support to transform a traditional information warehouse into a regional open learning repository.

Open University Approach

Computer-mediated communications make the teaching and learning process independent of time and space. The commonly used distance learning tools are: printed materials, electronics materials, teleconference, videoconferencing, radio, television, facsimiles, e-mail, newsgroups, the Internet, online chats, specialized software, and so forth (Murshed, Karmakar, Rahman, & Rahman, 1999).

A few distance educators have been the leaders in providing distance education for many years. The Open University of the United Kingdom, Open University of Hong Kong, Indira Gandhi National Open University of India, Sukuthai Thamathirat Open University of Thailand, Bangladesh Open University of Bangladesh, Allama Iqbal Open University of Pakistan, and Open University of Sri Lanka are a just a few initiators in establishing distance education platforms for open learning systems.

Community Telecenter Approach

Multipurpose community telecenter (MCT) may seem to be a new concept and sound complicated for many communities in developing countries (Short, 2003). While harnessing technologies for the ultimate purpose of community development and being advocated worldwide, communities need to be brought under the sunshine at this stage. An MCT can act as the technology hub, allowing a

community to establish many programs and services by providing social, economic, and information technology support, in addition to acting as a learning dissemination juncture.

Telecenters can do much more than providing people just *demand of the market* access to the Internet. In fact, the use of networking technologies is the ultimate stage in the process of informal learning and technological diffusion. Once someone has mastered the skills and developed the determination to utilize the Internet, they are at the edge of a learning process that provides them with skills and utilities to be largely self-directed in their use of ICT.

Telecenters are the focal point for the diffusion of skills and access to tools associated with formation of the Knowledge Society (Badshah et al., 2003). Simple access to the Internet assures only that using the computing and telecommunications devices and knowing the value of information will act as an additional resource. Telecenters assist in bringing many more people to this point of personal capacity development in information-driven learning.

To improve local access to the Internet, telecenters can help to organize community participants. In extended form they may comprise business community, development agencies, students, health care workers, and civil societies (Colle & Roman, 2001). This can:

- Create partnership development and partners in learning,
- Act as a knowledge resource center, and
- Assist in community-based formal and non-formal education programs.

By improving the availability of information and use of ICT services in rural and remote communities, plus fostering the associated skills and consequential opportunities, telecenters can expand the scope for employment and endeavour, and enhance the competence and confidence of the broader community (ILO, 2004). Through the utilization of information and the delivery of services (including education and capacity development programs) identified by the community as relevant to their particular needs, telecenters may empower them.

Rural Knowledge Center Approach

A more pragmatic way to empower marginal communities with information and learning content is the knowledge center approach. A knowledge center is used to convert generic information into demand-driven content to raise the skills of local community members (MSSRF, 2004; Nair & Kuppusamy, 2004). It is an

enhanced form of telecenter approach, more specifically focused to create a knowledge vortex at the outset. Integrating the application of communication technologies such as the Internet, cable TV, community radio, and other available media, the Rural Knowledge Center can become an effective tool for harnessing the power of partnership among professionals, academics, the common people, and rural families. Low-cost e-learning methods can be conveniently channelled through these centers, and these programs easily can be made effective and useful to the communities.

Case Studies

During recent years, many governments, development agencies, and knowledge networking partners have evolved successfully around the globe (Coglianese, 2003; WSSD, 2002; Tipson & Frittelli, 2003). A few successful cases are described in this section to illustrate the utilization of Internet and related utilities to empower marginal communities. Quotes from a few developing countries that have adopted pragmatic ICT policies to develop knowledge networking and IT literacy are also included, as they clearly indicate the importance of national policies. It is believed that without initiation at the national level, proper development of a learning system for the common mass will not be easily achievable.

Jamaica adopted an important focus in its national ICT policy:

The Ministry of Education, Youth and Culture will develop a type of "Marshall Plan" to educate all sectors in the society, retrain the ICT workforce to use modern programming languages, and broaden the ICT curriculum offered by the universities, colleges, and technical and vocational schools. (Jamaica IT Plan, 2002)

Similarly the Bangladesh Government has recognized that the information infrastructure needs to be upgraded to form a national data bank that supports development initiatives. Its ICT policy states:

3.2.25 A central depository for collection and dissemination of ICT information and research findings will be developed. This will be done under a network, connecting all university libraries and research organization[s] to this central depository, which in turn will be connected to the Internet. (Bangladesh ICT Policy, 2002)

The National Information Technology Plan (NITP) 2000 of the Philippines has adapted two major issues in its education component to improve IT literacy and IT manpower development. IT literacy focuses on the educational system and IT solutions (hardware, software, and consulting). IT manpower development focuses on training through strategic alliances between academia and industry.

As a global representative, UNESCO adopted ICT initiations in this policy:

1.2.1.3 Developing information and communications technology (ICT): One of the driving forces of globalization is the privileged gathering, commercial exploitation, and sharing of new knowledge and information through information and communications technologies. However, for many people and nations, especially the poorest in the region, access to the new knowledge dynamic is denied by the absence of scientific and technological capacity. Separated by a digital divide, found both within and across countries of the region, those without ICT will suffer as their access to new knowledge declines, their income-generating skills become outmoded, and their ability to compete in a globalizing environment diminishes.

1.2.1.4 Bridging the digital divide is a social, technical, educational and cultural challenge, in particular bringing affordable ICT access and content to the unreached (e.g., the remote and "unconnected" rural poor) and ensuring that they have the skills to participate. (UNESCO, 2002)

A few cases from different global leaders in the field of information-based learning are described next to illustrate how the Internet and related utilities can be utilized to develop partnerships and educational platforms, and to empower marginalized communities.

Case 1: A Virtual Schooling Service (VSS) Pilot Project was established by Education Queensland in 2000. The project sought to test the feasibility of flexible delivery of senior secondary school curriculum to students using online audiographics technology via the statewide telecommunications infrastructure, namely the EDNet.

Case 2: Deakin University, Australia, a leading provider of distance education, is committed to the development of leading-edge technologies to facilitate its online teaching and learning facilities and environments.

Case 3: The United Nations Online Network of regional Institutions for capacity Building in Public Administration and Finance (UNPAN) is a virtual electronic network promoting exchange of expertise and sharing of experiences and lessons learned in public administrative and finance.

Case 4: The International Virtual Education Network (IVEN) is a joint project of the IDB, Brazil, Argentina, Colombia, and Venezuela, to develop multimedia mathematics and science teaching materials for upper secondary schools.

Case 5: One such government ICT initiative in Malaysia is SJ 2005, which is entrusted with pilot testing an e-community model in Subang Jaya to be eventually replicated nationwide. This pilot project is based on a tri-sector partnership between public, private, and community sectors. This partnership involves NITC, the Ministry of Housing and Local Government, MPSJ (City Council of Subang Jaya), and the SJ residents (Badarudin, 2001).

Case 6: Indira Gandhi National Open University (IGNOU) works towards popularizing IT literacy in rural parts of India. In partnership with UNDP, IGNOU has initiated training programs to train village IT volunteers to run the village IT kiosks.

Case 7: Universiti Tun Abdul Razak (UNITAR) is Malaysia's first e-learning, MSC-status, and ISO 9001:2000-certified private university. UNITAR offers the best combination in its teaching and e-learning methods by combining traditional face-to-face classes with the effective use of CD-based courseware and online tutorials.

Case 8: The Government of Pakistan has declared the Virtual University (VU) as one of the highest priority projects in its *IT Action Plan* for the country. Aimed at meeting the critical need for IT education in Pakistan, the VU is also seen as the first step for a "smart, learning nation" approach to socio-economic development in Pakistan (Intralearnasia, 2004).

Case 9: Bangladesh has established a distance education university with a view to serve marginal communities with the following objective: "To expand all levels of education, knowledge, and science by a diversity of means, including the use of any communication technology to improve the quality of education and to provide opportunities for education to the general public through mass-orientation of education and to create efficient manpower by improving the quality of education in general" (BOU Act, 1992).

Futuristic Approaches

Learning has always been a personalized dynamic issue, which is noted as a pedagogical process in professional education research. The performance of a learning process can be affected by many variables, such as the content presentation format (i.e., text, image, video, audio), the content delivery format (i.e., in-class lecture, distance learning on TV or on PC), the interaction between educators and learners, prior knowledge before learning, psychological preparation for learning (i.e., motivations, enthusiasm), and many other issues. People can naturally expect an ideal e-learning solution to have the advantages of both traditional in-class learning and distance learning (Huang, 2004).

Systematic, analytic, and pragmatic approaches need to be taken to improvise distance education techniques for improvement of learning systems in marginal communities. It is imperative that implementation may vary on a case-by-case basis. By taking into account the unique conditions at the local level, implementation phases should be carried out in modular form. Adaptation may also be needed to utilize support of available outreach networks to acclimate those unfamiliar users to a technology-driven learning environment.

Learning programs should address the strategic use of the world's greatest resource — information. Stakeholders should be able to target the use of information for decision support and as an innovation catalyst. One of the key outcomes of using information-driven learning concepts is that the mind becomes far more global, open, and enquiring as to what is possible, one of the key pathways to innovation (NIS, 2001).

An effective system for managing instruction is essential to learning. The system should incorporate coherent and focused curriculum, coordinated and integrated effort, and decisions should be information driven. Learning differences should be accommodated with necessary support to keep the learner on track, to be time sensitive, and to provide in-depth learning. These goals require consistency of philosophy, beliefs, expectations, and commitment among educators (SIP, 2001).

Learning technique should focus on the following objectives in designing a content-based distance education system:

- Develop interactive and integrated communication media,
- Build on knowledge management,
- Provide interdependence on interconnected repositories, and
- Emphasize virtual interactive learning.

Finally, the learning system should:

- Equip the learner with lifelong knowledge, skills, and attitudes in facing the challenges of a dynamic and information-driven learning community; and
- Inculcate the values of productivity, creativity, and respect and tolerance for social values in contributing collaboratively towards the common welfare of the learning community (Huenda, 2001).

Challenges

While computer-based technology for education and access to the Internet are expanding rapidly in developed countries, they remain a far-off possibility for many developing countries. Poor communications infrastructure, unreliable electricity and telephone networks, and high telecommunications costs present formidable obstacles to connectivity in these countries. For the vast majority of the world's population, access to computer-based learning remains impossible, and the best opportunity for gaining access to an affordable education is through traditional distance learning methods involving print, radio, or television (ILO, 2001).

In the context of developing countries, to compete in the newly evolved knowledge dynamics, they must be able to provide their learners easy access to updated information, regardless of the subject and situation. Contrary to common perception, mere access to computers and electronic networks is not enough to ensure that developing countries will actively participate in the knowledge society. Sustainable and systematic training, capacity-building curricula — especially for the education providers for the next generation — are crucial to institutionalize knowledge networking. This form of virtual learning allows efficient transfer of knowledge anywhere and any time, regardless of the space, media, subject, and platform.

Modern technologies, especially the Internet and the World Wide Web, have contributed a great deal to the information explosion phenomenon. It is true that learners can search and find practically any information on the Internet and the Web. However, the cognitive resources that educators and learners expend in order to find appropriate and useful information, and to evaluate the worthiness and value of such information, can be better utilized by learning appropriate content (Thirunarayanan, 2002). The resources that educators and learners employ to learn how to use new technologies and to solve the problems associated with and presented by such technologies limit the availability of these same resources needed to educate and learn new content.

The emergence of enormous discrete repositories of learning materials will necessitate new capabilities for storing, caching, searching, filtering, retrieving, and managing digital information among geographically distributed servers. The system should be able to expertly cope with creation of content, storage and management, search, query and filtering techniques, wide distribution and easy access, and management of content rights.

Conclusion

Community members must able to identify and discuss their development problems on their own so that they become capable of demanding further information by themselves. Linking information needs with community development activities allows the community to collectively process and add value to the information, content, and knowledge accumulated from different sources. These learning systems deserve sound financial planning and management to ensure sustainability. In many cases, developing countries find that funds are not available to continue a distance education program after donor funds are terminated, so it is important that initial investment be accompanied by adequate funding for recurrent expenditures.

Initiating and sustaining an institution-wide redesign of education will require strong executive leadership and a viable process model, because it entails fundamental rethinking of instructional strategies (Diana & Mark, 1994). Designing a revitalized learning experience needs hard thinking, understanding core values of thoughts, and effective changes in long-established instructional patterns. The amalgamation of three existing information networks in the region — ASTINFO, RINSCA, and RINSEAP — into the Asian and Pacific Information Network (APIN) can assist in forming a common knowledge platform in that region.

To be a successful knowledge network, it deserves:

- Sound management by a highly committed committee,
- All out support from the community,
- Mass awareness of the community, and
- Opportunities to serve the local demand.

The most common factors for a successful telecenter, are:

- The capabilities of the coordinator, the management committee, and the community people;
- The entrepreneurship, and flexibility in the management and operation;
- Business creation and service delivery covering a much wider range than would be possible in the locality or region; and
- The ability to be responsive and adaptable to local conditions.

This form of learning system can only build on a set of basic computer literacy skills and serve as a facilitator in motivating digitally illiterate individuals to pursue computer literacy education, while serving as a vehicle for deepening advanced computer literacy skills.

Due to the lack of an appropriate paradigm, there is no definitive networking approach yet to be designed to operate under a sound virtual collaborative learning method. However, approaches to bring new expectations and changes in the attitudes and remuneration structures for both learners and knowledge providers with different pedagogic and learning methods, including technical and training supports, are needed for proper implementation. This will effectively build a versatile social structure through knowledge development, by encouraging a potent learning system and developing critical thinking skills within the marginal community.

The International Commission on Education for the Twenty-first Century notes: "It is now generally recognized that, for economic growth to take place, a high proportion of the population has to have received secondary education" (UNESCO, 2001b, p. 39). Regardless of geographical locations, future learning systems cannot be dissociated from information and communication technologies. As technology becomes more and more ubiquitous and affordable, virtual learning carries the greatest potential to educate masses in the rural communities in anything and everything. This system of information-driven learning can and will revolutionize learning systems within the global context, especially among developing nations.

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Terms and Definitions

Asynchronous: Refers to processes that proceed independently of each other. An asynchronous course is one in which the instruction is delivered at one time and the work can be done at a different time. In asynchronous classes, learners and educators use e-mail, listservs, or other technologies that allow them to communicate without having to be in the same place and at the same time.

Civil society: Non-profit, organized groups, clubs, and associations in society that operate independently from government and the state. Examples of groups in civil society include universities, non-governmental organizations, voluntary associations, organizations, movements and networks that live and work in the social space outside the state and the private sector, environmental movements, indigenous peoples' associations, organized local communities, and trade unions. A civil society can be organized at the local, national, and international level.

Collaborative learning: A learning environment in which individual learners support and add to an emerging pool of knowledge of a group; it emphasizes peer relationships as learners work together creating learning communities. It is a form of teaching and learning where students work in teams toward a common goal. It can also be seen as an instructional approach in which students of varying abilities and interests work together in small groups to solve a problem, complete a project, or achieve a common goal. Collaborative learning can refer to any instruction method in which students work together in small groups toward a common goal.

Development process: Development is systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes. Development process is a project-specific process for delivering an application or other products to the end user.

Distributed learning: A type of distance learning that makes use of information technology and is facilitated by an instructor who uses videoconferencing or similar means of technology to unite a class. It is a student-centered approach to learning that incorporates the use of technology in the learning process. This system of learning supports different learning styles by using mixed media, builds on the learner's perspective through interactive educational experiences, builds learning skills and social skills through collaboration among learners and with the community, and integrates the learning into daily life by doing authentic tasks.

Knowledge network: Knowledge is defined as the remembering of previously learned material. It represents the lowest level of learning outcomes in the cognitive domain. Network is an interconnected system of things or people. A knowledge network is a form of network through which information can be evaluated and organized in the human mind so that it can be used for empowerment.

Synchronous: Synchronous communication technologies require the simultaneous participation of the communicating parties. In this system, both the learners and educators interact with each other on the same platform and at the same time.

Tertiary education: The term has been taken to cover both further and higher education. It can be a form of education, usually very specialized in nature, and leading to high-level qualifications at the post-secondary level.

SECTION II:
SCIENCE AND RESEARCH

Chapter III

ICTs, Empowerment, and Development:
Articulating Grassroots Analysis Through Participatory Approaches

Hannah Beardon
ActionAid, UK

Abstract

The digital divide has its roots in the political and power dynamics that underlie all inequality. It follows, therefore, that the response from the development sector should be rooted in learning from the long experience of tackling inequality and unequal power relations in many other fields. This chapter draws on the example of the Reflect ICTs Project to show how participatory theories, tools, and processes can be applied to ensure that ICT initiatives fundamentally address power and empowerment issues rather than ignoring or, worse, exacerbating them. The project methodology is described and some findings shown, in an attempt to show how attention to the human communication dimension of ICTs can make applied technology more sustainable and appropriate for poor communities in their struggle to access their rights.

Introduction

Information and communication technologies (ICTs) can be an empowering force, providing access to rapid communication and timely information. According to a recent study of ICT for Development (ICT4D) projects in Africa, access to communications technologies can improve people's livelihoods, access to services, agricultural practices, participation in government (and government's accountability and transparency), incomes, voice, security, social relationships, and health.

Where people are struggling to access even their most basic needs, such as clean water or school for their children, information and communication technologies may not appear to be a priority. However, within a rights- or empowerment-based approach to development, there are many types and levels of work: whether to enable people to access their rights; to influence policy makers; to enhance communication between actors; or to develop new methodologies, tools, and resources. Information and communication are at the heart of all these. As such ICT4D can be an important part of the empowerment process, if (and only if) explicitly placed within a wider movement to achieve equity and social change through access to and realisation of human rights.

Learning from the Past

The so-called *digital divide* is a term which, although of relatively recent coinage, deals with concepts and problems of long-standing in the development world. For the divide between those who can avail themselves of ICTs for rapid and efficient communication and those who suffer from lack of timely and reliable information has at its root the same dynamic as any other gap between rich and poor, have and have-not, exploiter and exploited. As such, the same theories and practices which have evolved in the development sector in the past 50 years also have great significance for the field of ICTs for development or empowerment.

This chapter draws on the example of the Reflect ICTs Project to show how participatory theories, tools, and processes can be applied to ensure that ICT initiatives fundamentally address such gaps rather than ignoring or, worse, exacerbating them.

The project, which has been running pilots in Burundi, India, and Uganda since 2003, highlights in its methods and findings the importance of recognising politics and power relations at all levels, and of forming transparent and effective partnerships between different actors in the field. Here, some of the methods are shared and their applicability to different contexts discussed, based on a review of some of the perspectives and theories underlying the work.

Background

Participatory theories, such as Participatory Rural Appraisal (PRA) and Participatory Learning in Action (PLA), have evolved over the last two decades to enable and encourage a shift in relationships within the development sector. This means away from a traditional paternalistic donor/beneficiary paradigm towards a situation where the traditional *targets* of development — the poor, women, older people, refugees, and so forth — could become the drivers of change in their own environment. Values such as equality, empowerment, solidarity with the poor and marginalised, and gender-equity are explicitly held at the heart of such approaches.

Participation is the vital ingredient in the PLA process (Ruland, 2003). Participation is understood as a process, not an event, whereby local people undertake their own analysis, reflection, and action. Theories, tools, and methods have been developed to understand and deal with the dynamics of power, confidence, and culture that create elites, amplify some voices, and drown out others. It acknowledges the ways that built pedagogies constrain some learning practices and enable others, and the works to create dimensions that catalyse empowerment through participation (Monahan, 2000). The most famous include visual and oral methods for facilitating appraisal, analysis, and planning. Examples of such tools and reviews are available in a number of literatures (Wilcox, 1994; UNDP, 1997; Belgeonne & Brookes, 1999; Allen & Kilvington, 2001; Allen, Kilvington & Horn, 2002; Bates, Bruce, Doig, & Gitonga, 2002), including Communication and Power (CIRAC, 2003), on which this project is partly based.

The focus on group dynamics and power relations is not simply an objective one, but involves a transformation of our own roles as researchers and practitioners as well. This relationship is transformed from one of doing, directing, or transferring technology, to one of facilitating, sharing, enabling, catalysing, as well as learning and reflecting ourselves.

The early theories and methods have been used, adapted, rejected, and reinvented for innumerable contexts and thematic focuses so we now have what Robert Chambers describes as:

A growing family of approaches, methods, attitudes, and behaviours to enable and empower people to share, analyse, and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate, and reflect. (Chambers, 2004)

ICTs in Participatory Theory

In light of this shifting relationship and empowerment focus, information and communication technologies have an interesting (potential) significance, for information and communication are at the very heart of the appraisal, analysis, and action which make up this approach to development. Good choices are well-informed choices. People can make more appropriate decisions or plans if their local analysis is rooted in an understanding of the larger-scale processes which influence them. Technologies, including video, radio, and the Internet, can be put to use to ensure both that information flows adequately and that voices are heard more fairly. As the Rockefeller Foundation states on its Web site (www.rockfound.org):

Communication can enable poor people to move from being passive recipients of externally generated development interventions to being effective advocates for the enrichment of their own lives and, finally, generators of their own development.

The Reflect ICTs Project was designed as a participatory approach to ICTs for Development. In essence, the aim is to test the assumption that ICTs chosen by communities based on a thorough and participatory analysis of their communication and information needs (and practices) will be more useful, more empowering, more sustainable, and ultimately have more impact. The project builds on the existing work of Reflect practitioners in the pilot locations and around the world.

The Reflect Approach

Reflect is an approach to adult learning (see Figure 1) and social change, which is used by over 350 organisations in 60 countries (CIRAC, 2002). It began as a fusion of the pedagogical theories of Paulo Freire, who argued that education is not a neutral process and therefore must be deliberately designed to liberate (Freire 1968, 1994), with participatory methodologies such as PRA (Chambers, 1994). The result was an approach to adult learning which focuses on power relations and works through systematising and deepening people's existing knowledge to enable them to base their choices and actions on thorough analysis (Archer & Cottingham, 1994; Phnuyal, Archer, & Cottingham, 1998).

Although Reflect originated as an approach to adult literacy, it has in recent years evolved to link empowerment with communication practices more broadly,

Figure 1. Women from Bubel reflect circle, Orissa, India

including access to information and influence over decision makers. People need to articulate their views through any available or appropriate means of communication — oral, written, visual, or audio — to strengthen their participation in decisions that affect their lives.

Some of the principles and methods behind this are collected in the recent Reflect publication *Communication and Power* (CIRAC, 2003). With this, local groups and community organisations are able to own and adapt the resources and techniques of PRA to strengthen their voices and sharpen their struggle for change. In different contexts this means different things, whether communication for peace and reconciliation in Burundi, holding local institutions accountable through budget tracking or school management in El Salvador and Mali, challenging racism in the UK, or accessing land rights in South Africa. More examples are available on the Reflect Web site (www.reflect-action.org).

With this changing focus of Reflect, and the emergence of the digital face of the resource gap, the Reflect ICTs Project was born. The project, funded for three years by the UK Department for International Development (DFID), aims to build on the emerging understanding of the relationship between communication and power, not only to provide a critical analysis of existing ICT for Development work, but also to provide resources and models for applying participatory principles and theories to future ICT projects.

Issues and Perspectives

Though ICT for Development is a relatively new field, it has taken a well-trodden path. A technology which the market has made cheaply and easily available to the more advantaged and wealthy, then becomes considered important or

necessary to those the market does not reach — the poor and marginalised. Various powerful individuals, international and local non-governmental organisations (NGOs), governments, and their departments and agencies develop policies and plans in order to make these technologies and their valuable impact more widely available. Meetings, conferences, and summits are convened; articles, papers, and books published, trying to understand why technology is not being taken up, reaching the poorest, or making a difference.

From a participatory or empowerment perspective, it is possible to see a link between the involvement of people in decisions made for and about their lives, and the sustainability and impact of development interventions. Too many failed or questionable development projects suffer from a surplus of good ideas and intentions from the top and a deficit of real involvement and understanding at the grassroots. So what looks good on paper does not translate directly into reality. Plenty of evidence, anecdotal or otherwise, exists of such failures: of fully equipped telecentres in Argentina remaining unused, or complex computer systems aimed at decentralising land registration in India ending up in the hands of the same corrupt elites who routinely use their power to deny poor people their constitutional rights (Sanjoy, 2003).

Participatory theory has emerged from an understanding that development must not be done on behalf of others, but must be based in locally generated processes. The field of ICT for development or empowerment also needs to follow such logic to avoid such failures and be fair to those in whose name the work is done. The value of a computer or a video lies not in its existence, but in its use. Empowerment is not an easy process, and requires taking sides and making waves. It is a political process, whereby the voices of poor and marginalised people are strengthened and broadcast to *challenge* the status quo that exploits them. Information and communication can transform, if the aim is to expand meaningful participation in decision making. But for this to be possible, attention needs to be paid not only to the technologies applied, but also (and more importantly) to the *relationships and processes* that underlie interventions and policies.

This places at the centre of project planning the question: How can the voices and knowledge of poor people be sufficiently represented in policies, technology design, and implementation? This is a question which the Reflect ICT project aims to highlight, but also to tackle through example and by developing transferable methodologies and tools.

A Critical View of ICTs

It is common to find evangelistic attitudes towards ICT for development, and this project and learning is based very much in a critical analysis of the tools and approaches in the field. ICTs may have a lot of potential for empowerment, but

they also have potential to be tools for exploitation and cultural imperialism. In fact, there is probably a lot more evidence of the latter than the former in existence.

As is argued in the publication *ICTs for Development: Empowerment or Exploitation* (Beardon, 2004), modern ICTs are generally the product of powerful western and commercial cultures, and both are designed to meet the needs of that community first and also to fit in with their existing logic and communications culture. If such technologies are promoted blindly throughout the world, it could in effect consolidate existing power relations between cultures and communities in the world. It could also have the practical effect on the ground of relegating traditional forms of knowledge and its expression to second-best or lower value.

Other negative effects of the introduction of ICTs can be the *brain-drain* effect of equipping people with skills and education without the accompanying opportunities, meaning that they leave the local community to find opportunities elsewhere. Even where this may be a positive impact for the individual involved and their family, it should still be recognised that any change in their individual circumstances does not constitute empowerment as such. While these people cannot determine the terms of their employment, or appropriate the technology to meet the needs of their own communities, they remain vulnerable to exploitation.

This means that ICT projects and initiatives which are aimed to empower and strengthen local cultures and strategies need to be explicitly designed for this. If technology is merely introduced with no awareness of these issues, then the exact opposite may end up taking place, weakening local traditions and structures which are the basis for survival strategies. ICT projects that are not explicitly aimed at empowerment of the poorest and most vulnerable — that is, real structural change — are also likely to end up replicating and consolidating the status quo.

Whether at household or community level, those who already have the best opportunities and advantages will be the first to avail of the new technologies provided. In all three of the Reflect ICT pilots, the groups noted that women have little access to, or control over, existing information technologies such as radio and newspapers. A gender analysis, as part of a wider power analysis, should form the basis of any empowerment-focused ICT project.

Learning and Recommendations

The Reflect ICTs Project was developed in order to combine the experience and techniques of participatory theory with the potential of ICTs for empowerment and development. This potential is great, and not to be ignored, since access to

timely and reliable information is the heart of a rights or empowerment-based approach to development. Only with strong communication capacity can people really influence the decisions — or access the rights and benefits — that affect them. Reflect participants across the world have shown how they can use a collective analysis of their situation to bring about real and significant changes.

The basis for the Reflect ICT project is a set of resource sheets for facilitators to use in order to encourage analysis of the value of information, the strengths and weaknesses of existing and traditional communication practices, and potential means of improving access to information and communication capacity. Existing Reflect groups in the three pilot locations of Ruyigi (Burundi), Bukuuku (Uganda), and Balangir (India) used the sheets to build a comprehensive picture of the context into which any new technologies would be applied. This includes analysis of the appropriateness of different technology to different sections of the community including women, youth, social classes, and so on. From this analysis was developed a plan for a community communications system, which combined new technology resources with clearly defined and accountable roles and relationships.

In the case of these three pilots, limited funding for the new system was pre-assured. However, it is hoped that the resource sheets will go on to be used either for community groups to develop clear proposals for funding and resourcing from outside, and/or for donor groups and implementing agencies to strengthen the participatory needs assessment element in their own programmes.

The Facilitated Process

The process was structured around five Reflect ICT resource sheets (Beardon, 2004), which set out some key issues for communication and provide simple exercises to encourage discussion and contextual analysis. The first of these looks at the value of information, and how it can make a difference to people's lives and livelihoods. Participants are encouraged to think of examples from their own experience and develop them into analysis of general factors and trends.

The second sheet explores the different factors which make a piece of information useful or meaningful, which can include the source, format, media, relevance of the information, or capacity or confidence of the person receiving it. It is this analysis which feeds into the design process of a communication system that really fits the needs and culture of a community. In many cases people may not use information unless it comes from an already known and trusted source. So new technologies and media must be introduced carefully and only to strengthen existing networks and information sources.

Another sheet helps groups to think through the value and purpose of documenting their own knowledge, then how best this can be done. Exercises and

facilitated discussions help them to think through who might wish to share their knowledge, what the implications might be, and what media could be used to store and transmit it. In the first place, it encourages people to recognise the knowledge they have, as often people take their own knowledge for granted. This is also an important step in building people's own confidence to communicate.

The other sheets help groups to identify specific information gaps and evaluate different strategies and resources for overcoming these. Visualisation techniques such as matrices can be used for groups to list and rank the different communications media and technologies in terms of their availability, appropriateness, or affordability. Finally there is a sheet to help with planning, highlighting areas to be considered in a funding proposal or work plan.

The Diverse Pilot Contexts

The three pilot locations emerged through a process of communication and consultation with active Reflect implementing organisations. When the project was in conceptualisation, Reflect practitioners and organisers were encouraged to get involved, share ideas, and participate through the Reflect network. Where there was clear convergence between the aims and ideas of the Reflect ICT project concept and the existing work and direction of Reflect implementing organisations or networks, strong links were made, and from there the three pilot locations were chosen. Although all three pilot locations are poor, rural areas, they each have marked differences in terms of size, terrain, infrastructure, social and economic realities, and as a result, in pertinent issues.

Burundi

In this society dealing with and emerging from conflict, Reflect is oriented towards promoting peace and strengthening the role of women in building peace and reconstruction. Communication is key to this, as mistrust and misinformation have been key factors in perpetuating the conflict at local and national levels.

There are currently 91 circles operating in Ruyigi province, offering a space for Hutu and Tutsi neighbours to meet and talk, share accurate information, and rebuild confidence and collaboration. Participation is around 60% male and 40% female, and in total approximately 1,000 people participate regularly in groups involved in the pilot. A newsletter called *Ejo* is compiled by ActionAid of contributions from Reflect participants, and is distributed in villages and in refugee camps to promote accurate and trusted information on conflict, development, gender, health, and other relevant issues. Cultural activities are also promoted and organised to bring communities together.

Table 1. Access to communications media: Burundi

	Women	Men	Youth	Aged	Leaders	Ex-combatants	Refugees	Students
Radio		X			X		X	
Radio magazines		X	X					X
Ejo newsletter	X	X	X		X	X	X	X
Mobile video	X	X	X		X			X
Letter		X	X		X	X	X	X
Telephone					X		X	X
Cinema			X					
TV					X			X
Markets	X			X	X	X	X	
Meetings	X	X	X	X	X	X	X	
Churches	X		X	X	X	X	X	X
Internet								X
Cultural events	X	X	X	X	X	X	X	X
Schools	X	X	X		X			X

As Table 1 shows, women and older people are specifically disadvantaged in access to communications media, relying mostly on face-to-face contact. This type of analysis, deepened through the Reflect ICT process, enabled the team and participants to devise a communications system which caters for these excluded groups. New equipment, including Internet-connected computers, are being used to strengthen the scope and quality of *Ejo*, while both content and receivers for video and radio are integrated into the Reflect process. The analysis shown in Table 1 also highlighted for Reflect facilitators the role of access to information as an indicator of vulnerability to conflict — a key for future programme work.

India

This pilot is located in Balangir in the state of Orissa, near the Bay of Bengal. The majority of the population live below the poverty level and literacy is under 40% (among women only 21%). Reflect is used by 19 local organisations in 344 villages to support popular planning and mobilisation processes. The organisations form a network known as Collective Action for Drought Mitigation in Balangir (CADMB) and supported by ActionAid India; 112 of these villages are involved directly in the Reflect ICT pilot, with the others indirectly involved through facilitators forums, public meetings, and collective planning.

In total, nearly 5,000 people participate directly in Reflect groups in Balangir, of whom 42% are women. Sixty-six percent are from scheduled castes and tribes,

Figure 2. Matrix developed by Patharla Reflect circle shows information needs

meaning the lowest social status, as opposed to only 37% of the general population.

The focus of the project in this area is transparent and accountable governance. A drought-prone area, many of the poorest people are forced to sell their land or migrate seasonally to nearby cities and industrial areas. Food security, land rights, and labour protection are all key issues, and at the heart of them all is good information about rights and entitlements available in the constitution and state laws. In many cases in the pilot area, information is withheld by the local elites, and the poorest people are kept in the dark about funds or entitlements which are their rights. In this situation it is clear that information is not neutral, and access to it needs (see Figure 2) to be carefully targeted and monitored.

The initial analysis carried out in Reflect circles showed that poor people depend on other people, such as facilitators, health workers, or elected representatives, for information (see Figure 3). Televisions, telephones, and even radios are out of reach of the majority of people, and literacy levels are so low as to make printed information require interpretation.

As a result of such analysis, the emerging communication system relies heavily on oral communication and accountable, informative relationships. There is great

Figure 3. Map by Kundamal Reflect group showing available sources of information

emphasis on not only the articulation of information needs at the village level, but the communication of these needs to the appropriate authorities and advocacy at different administrative levels to ensure that the needs are both heard and met. Equipment, including video and radio, as well as cultural troupes, leaflets, and public meetings, have been funded in order to increase information flow among and between village communities.

Uganda

Bukuuku sub-county is in Eastern Uganda, bordering the Democratic Republic of Congo. The area has 25 villages and a total population of slightly more than 25,000 people. Most households live in absolute poverty (less than $4 per day) despite fertile soils and good agricultural conditions. In large part this poverty is due to poor market information, leaving local farmers vulnerable to exploitation. Another key development issue is health, in particular HIV/AIDS, and with family sizes averaging 8 to 10, access to education is also a major problem.

There are 12 Reflect groups in the area, each with an average of 30 members, most of whom are women (see Figure 4). In addition there are seven school knowledge groups, which are Reflect groups based in the local primary (5), secondary (1), and tertiary (1) educational institutions to address issues relating to local youth. Since the introduction of the Reflect ICTs project, new circles have been introduced and the demand is increasing. Literacy and Empowerment, a local community-based organisation, implements Reflect, training and support-

Figure 4. Reflect participant listening to a radio set provided by project
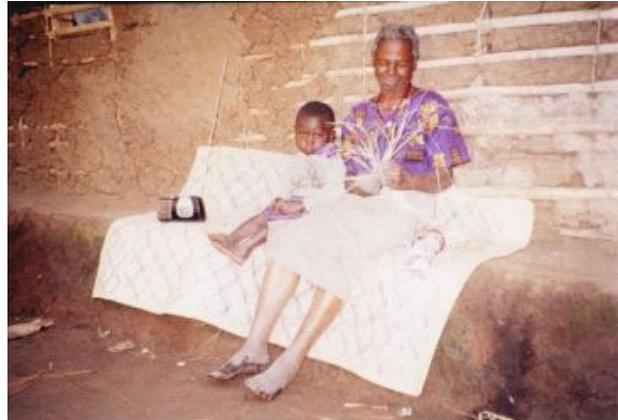
ing facilitators and circles, and manages the ICT project with support from ActionAid Uganda.

The Uganda pilot has the best access to telecommunications infrastructure and conducive ICT government policy, and both mobile and fixed-line telephones are widespread. However, the Reflect circles' analysis showed that poor people still rely on trusted, well-informed individuals and organisations to access required social and economic information (see Table 2). Meetings, cultural events, and social gatherings were ranked as the most widely used and useful media of communication, while radio, video, and telephone were desirable but less accessible. Internet awareness was quite low, especially among adults.

Due to the smaller scale of the pilot, the groups were able to plan for a centralised resource centre with Internet access and training, bolstered by radio sets for

Table 2. Matrix by Bulera Reflect group ranking ICTs

	Accessible	Available	Affordable	Appropriate	Rank
Posters	3	1	0	10	**6**
Local council	10	5	4	10	**4**
Alarm	10	10	10	10	**1**
Radio	5	10	5	10	**3**
Phone	4	10	2	10	**5**
Drum	10	10	10	10	**1**
Newspapers	0	1	1	10	**7**
Video	0	0	0	10	**8**
Oral	10	10	10	10	**1**
Music/drama	10	6	7	10	**2**
Meetings	10	10	10	10	**1**
Letters	5	8	6	10	**4**

each circle. Databases have been established to catalogue local knowledge of herbs which can be used to treat opportunistic diseases related to HIV, and another to list and monitor all orphans living in the area. Training is tailored to the needs of the groups, and additional funding and sponsorship is being sought to meet capacity needs. Women in particular are targeted for training on ICT use.

Some Interesting Insights

The actual findings of the pilot communities are part of the planning process and not to be taken as stand-alone facts and figures. However, they provide an interesting opportunity for researchers and policy makers to compare the outcomes of grassroots-level analysis with their own assumptions in applying new ICTs to poverty reduction.

In all three pilot areas, oral communication was the primary and most trusted source of information. This may be through local health or child care workers, leaders or facilitators, or through mutual exchange at meetings and gatherings such as church or market. Beyond this, media such as radio, cultural performances, posters, and leaflets or newspapers were considered useful and accessible. Due to high levels of illiteracy in all areas, textual information is only accessible to many through an interpreter and is therefore not directly effective.

Thus, literacy can be treated as one important factor in determining existing access to and control over ICTs. Other factors include social class, education, income, and gender. In Orissa, for example, the cost of a black-and-white television set is more than the value of the land of most villagers. In Uganda, where households do own radio sets, they are usually controlled and operated by the male head of household, who chooses what to listen to. In Burundi, Reflect facilitators noted that vulnerable groups, such as the very poor, widows, elderly, and displaced people, were less able to access reliable information about security threats which make them still more vulnerable to the effects of conflict.

The types of information that people wanted to access also differed between groups. For example, in Uganda, while everyone wanted market and credit information, men and boys were more interested in job opportunities while women and girls in health and women's rights. The youth were more interested in HIV prevention and reproductive health than their parents.

In each pilot the funds for ICTs were spent differently, but in all three places the resulting plan was a combination of technologies and people to transmit information and queries. In this way, the community communications systems continue to build on people's preference for face-to-face communication. The resulting systems were influenced heavily by the size and level of infrastructure in each area.

- Uganda, being a smaller-scale pilot, has been able to create a central information/resource centre, backed up by training and advice sessions, equipment, and continued activities of Reflect circles.

- In India, where the scale is much larger (over 100 villages), the groups have developed a complex network of local organisations, committees, and individuals to support the flow of existing information to Reflect participants and their communities, as well as advocating to different levels of government for better information provision. At different levels this network is using the Internet, video and radio programmes, travelling cultural troupes, and printed information.

- In Burundi insecurity has created a problem of mobility, and the main technologies being adopted are radio and video, and the Internet will be used to support and strengthen an existing community newsletter as well as linking Diaspora communities.

Future Trends for Action and Research

The Reflect ICT Process aims to enable groups to develop and define their own knowledge — about their context, needs, and existing patterns and prejudices. Theirs is not the only knowledge needed to ensure a good, effective ICT project or programme. However, it is necessary to ensure that their perspective is heard and informs the decisions of other players in the process, including technology experts, policy makers, and donors. It appears that effective and equal working relationships between these different actors, built on mutual respect and transparency, is the key to a sustainable intervention. More research is needed to understand the nature of such relationships and how existing modes of working in development need to adapt in order to allow them to flourish.

As such, the Reflect ICTs model is useful for strengthening the grassroots analysis element of any ICT for Development project. The model can be made more effective in combination with other perspectives, expertise, and resources.

Policy advocacy is also important in order to strengthen the impact and reach of the Reflect ICT Project, and approach this in two areas. Firstly there is the question of directly influencing ICT policy. Grassroots analysis of information needs and the applicability of different ICTs should be heard and considered by those making policy decisions at local, national, and international levels. It is up to projects, organisations, and research institutions to help to establish this link.

There is also the question of what happens to the types of information and analysis that participants in projects such as this are creating and documenting.

As documentation of analysis improves through participation in such projects, there is scope for forging greater linkages between the issues arising from such grassroots-level analysis and the development, advocacy, and aid agendas of NGOs and donors at national and international levels.

Conclusion

This chapter argues that in order to unlock the full potential of ICTs for empowerment and rights-based development, the knowledge and resources of the full range of stakeholders need to be combined. It is not only donors, technicians, and large implementing organisations who hold the key to successful project planning and implementation. A large and essential chunk of the knowledge and expertise needed rests with the people and communities who are the intended beneficiaries.

The Reflect ICT Project has been created to build on and complement existing participatory theories, approaches, and techniques, and make sense of ICTs and the digital divide in this context. The aim is to provide a model for developing this grassroots analysis of communication needs and appropriate technologies. However, finding ways to effectively bring this perspective together with all the other essential elements of good ICT for development policy and practice is a challenge still very much ahead of us.

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Terms and Definitions

Digital divide: The condition of one group (the dominant group) having an advantage over another group (the marginalised group) concerning computer or

technological skills. It can also refer to the general lack of access to computers and the Internet, which affects women, children, various ethnic groups, and older citizens.

Empowerment: Involves a process which pays attention to power relations and their impact on the opportunities individuals and communities have to create changes in their lives. Empowerment is about structural changes. More than simple service delivery, it is about building capacity of people to make demands and influence decision making.

Empowerment processes: The processes of empowerment can be at individual, group, or community level, and include capacity building and participatory approaches.

ICT for Development (ICT4D): When ICTs assist to meet development objectives, in particular global development goals for poverty reduction, education, health, and environment as a tool for economic growth.

Participatory approaches: Techniques to promote participation in development though a focus on Participatory Learning and Action (PLA) information exchange. In particular, participatory approaches allow a community to express and analyse the realities of their lives, plan themselves what action needs to be taken to change the situation, and monitor and evaluate the results by themselves. Participatory approaches have been used in many settings in development both in rural and urban aspects.

Participatory Learning in Action (PLA): An umbrella term of methodologies in participation of people in the processes of learning about their needs and opportunities, and in the action required to address them. PLA techniques are being used to encourage community members to express their ideas and needs.

Participatory Rural Appraisal (PRA): A label given to a growing family of participatory approaches and methods that emphasise local knowledge and enable local people to make their own appraisal, analysis, and plans. It evolved from rapid rural appraisal — a set of informal techniques used by development practitioners in rural areas to collect and analyse data.

Chapter IV

Affecting Change from the Grassroots:
Making a Difference without Power, Prestige, or Money

Timlynn T. Babitsky
Sohodojo, USA

James F. Salmons
Sohodojo, USA

Abstract

Information and communication technology (ICT) is a potentially potent force for empowering marginal communities in developing countries. To be successful, ICT projects must involve local stakeholders, provide participatory forms of communication, and take advantage of local networks of relationships. Drawing from concepts originally presented in the management classic Influence Without Authority *and the authors' fieldwork, this chapter helps grassroots organizers to develop a key set of skills for choosing community development agendas, and provides a practical step-by-step guide for mobilizing diverse stakeholders in support of desired*

outcomes. This chapter showcases empowering social processes that can prepare marginalized individuals to take best advantage of a well-conceived ICT project.

The goal of using ICT [information and communication technology] with marginalized groups is not to overcome a digital divide but rather to further a process of social inclusion. To accomplish this, it is necessary to focus on the transformation, not the technology. (Mark Warschauer — Technology and Social Inclusion: Rethinking the Digital Divide)

Introduction

The international community generally agrees that information and communication technology (ICT) is a potentially potent force for empowering marginal communities in developing countries (Okinawa Charter, 2000; UNDP, 2005).

They also recognize the likely social and economic inequalities that new technologies may exacerbate (Golding, 2000; Skuse, 2001; Peters, 2001) and agree that "optimism must be tempered with realism if a suitably effective and pro-poor ICT policy framework is to be developed" (Skuse, p. 12).

Thirty years ago the first project to apply ICT to solve problems of underdevelopment used a network of community radio stations based in colleges and universities to provide rural education in the Philippines (Chacko, 2001).

Today, ICT projects in developing countries use everything from radio and television to telephones (fixed and mobile) to computers and the Internet (Marker, McNamara, & Wallace, 2002). Projects include telecenters, telemedicine, online training, distance education, e-government, e-commerce, and innovative business applications (Peters, 2001).

In 1975, ICT was defined as "technologies to facilitate communication and the processing and transmission of information by electronic means" (Marker et al., 2002).

Now ICT typically implies "the collective term given to the technology spawned by the merger of computers and telecommunications…Web-enabled, networked, or stand alone…[to] make available an information or knowledge system…[or to] generate an information or knowledge product or service" (Chacko, 2001, p. 3).

Whatever the technology used, this generation now has nearly 30 years of ICT project experience in developing countries from which to assess its impact and to determine its future direction.

What Has Been Learned?

Despite a number of impressive gains (Chacko, 2001; PovertyNet, 2001), it is evident that poverty, marginalization, disenfranchisement, and social class exclusion are incredibly complex problems. ICT, although promising, is not a magic bullet that will change what has taken years, sometimes centuries, to set in place (Pruet & Deane, 1998; Skuse, 2001; Warschauer, 2004).

It has been learned that success or failure of even the best-conceived ICT project ultimately lies with its perceived usefulness by individuals in the community (Benjamin, 2000; Warschauer, 2004).

Most importantly, solutions that work in developed countries cannot simply be transplanted to developing country environments. To have any hope for success, solutions must be based on "an understanding of local needs and conditions" (Peters, 2001). They must involve local stakeholders (Chacko, 2001), be relevant to local contexts (Benjamin, 2000), provide participatory forms of communication (Balit, 1999; Skuse, 2001), and take advantage of local networks of relationships (Norris 2001; Chacko, 2001).

The Big Picture

Providing technology to marginalized communities is only part of the ICT picture. Solutions must engender a process of social inclusion that helps marginalized individuals to understand the environment that demeans them, to gain the power of choice, and to seek out and discover opportunities that can assist in changing their situations (PovertyNet, 2001).

Yet, individuals bring with them the *hidden rules* of the community in which they were raised. Hidden rules are the social codes they have internalized that guide their thoughts and behaviors. No matter how their economic situation may change, individuals will carry with them the internal patterns of thought, cognitive perceptions, strategies, and rules of social interaction that operate in the social class into which they were born (Mills, 1956; Anyon, 1981; Payne, 2003).

For marginalized individuals, hidden rules of the culture of poverty in which they were raised support and foster their continued marginalization (Payne, 2003; Devol, Smith, & Payne, 2000). Many communities are not yet ready to embrace the technology that can help uplift them from their poverty (Peters, 2001).

Marginalized individuals that live in poverty are often not yet ready to embrace the process that will empower them. At a fundamental social level, they often lack the ability to make choices and transform those choices into desired action (PovertyNet, 2001).

Drawing from concepts originally presented in the management classic, *Influence Without Authority* (Cohen & Bradford, 1989, 2005), and the authors' fieldwork developing microenterprise networks (Salmons & Babitsky, 2000, 2002) and mobilizing diverse stakeholders (Babitsky & Salmons, 2004), this chapter teaches practical skills for accomplishing social change at the individual and community level.

It provides a key set of skills to use for making choices, and a practical step-by-step guide for mobilizing diverse stakeholders in support of chosen agendas.

By embracing the processes that will empower them, marginalized individuals will be primed to take best advantage of the technology of well-conceived ICT projects that can help them change their lives.

Marginalizing the Poor

History suggests that people have made little progress in their basic thinking of how to address the needs of the poor and marginalized communities. Western views have oscillated between blaming individuals for their poverty and locating poverty in divine order or systemic conditions.

In the Middle Ages, the poor embodied the spiritual values of the day. They had little, prayed much, and focused on *other worldly* desires. They quietly accepted their lot in life and were thought to be morally superior to the rich. The wealthy gave alms and took care of the poor to enhance their own positions in the afterlife (Hanson, 1997).

By the late 14th century, poverty was no longer a spiritually superior state. As the numbers of itinerant poor swelled through famine, plague, hard winters, and lost land, the rich no longer gave to the poor. The poor were viewed as bandits, beggars, and thieves; they frightened the rest of society (Mollat, 1986, p. 251, as cited in Hansen, 1997).

During the Renaissance, when self-reliance, self-aspiration, and individual effort were considered the routes to personal success, the able-bodied individual living in poverty was reviled as an incompetent failure not worthy of respect (Waxman, 1977, as cited in Hansen, 1997), and as an indolent misfit draining the resources of honest-working individuals (Hansen, 1997).

In the 18th and 19th centuries, early notions on the laws of nature (Malthus, 1798) and Social Darwinism (Spencer, 1857) deepened the belief that individual effort

affected one's survival and success. The poor were largely left to their own devices, as they would survive if they were fit (Hansen, 1997).

In early 19th century America, people believed that destitution was the result of weak character, and that public help only weakened character further (Meyer, 1997).

Later, in the works of Karl Marx, and through the emerging fields of sociology and anthropology, poverty again moved away from individual responsibility. The poor were poor not because of divine fate or lack of individual effort. The conditions of modern industrial societies produced a *reserve army* of the desperately poor. The responsibility for poverty lay in the nature of the economic system, not the individual (Marx, 1992).

Culture of Poverty

The term *culture of poverty* was introduced and popularized by anthropologist Oscar Lewis (1966). Lewis found that the social and psychological consequences of poverty revealed a "unique way of life" for the generational poor. This way of life, or culture of poverty, was marked by a number of shared characteristics that transcended national boundaries, and was transmitted from parent to child by the age of seven (Lewis, 1966, 1968).

For the next three decades, both sides of the historical debate decried Lewis' theory. Yet his concept of a culture of poverty has been used to justify social policies and conservative politics since the 1960s, which blame the poor for their own self-indulgent misbehavior (Hanson, 1997; Meyer, 1977).

Regardless of how Lewis' concept of a culture of poverty was received 40 years ago, it is used as a general framework for discussing the marginalized poor even today (Harrison, 1992; Niskanen 1996; Samuelson, 1997; Hays, 2001; Hill, 2002).

Hidden Rules

North American sociologist and educator Ruby K. Payne echoes Lewis' theory that there are certain cultural elements among the poor that prevent them from accomplishing even minor economic goals. In *A Framework for Understanding Poverty* (2003), she identifies and describes the *hidden rules* — social class codes — that operate in poverty, middle class, and wealth across 14 general categories: possessions, money, personality, social emphasis, food, clothing, time, education, destiny, language, family structure, world view, love, and driving force. According to Payne, each area is perceived, valued, and understood differently depending on the social class in which the individual is raised.

In line with C. Wright Mills (1956), Payne states that individuals internalize the hidden rules of the class in which they are raised. Perceptions, attitudes, and behaviors are internally shaped by the social culture that surrounds them (2003).

Payne's work popularizes concepts related to the hidden rules or social class codes found by a number of other researchers, for example in education (Bernstein, 1977; Anyon, 1980; Kerlin 1995), language usage (Joos 1967; Gee, 1987), intercultural education (Kaplan, 1984), and corporate executive success (Hymowitz, & Schellhardt, 1986; U.S. Department of Labor, 1991).

Payne's work is influencing contemporary education and social work in the United States (Claitor, 2003). There is a growing acceptance that social class-based hidden rules of perception and behavior affect the ability of individual students to be successful in mainstream education.

According to Payne (2003), no matter how one's economic situation improves, marginalized individuals will carry with them the internal patterns of thought, cognitive perceptions, strategies, and rules of social interaction that operate in the culture of poverty into which they were born. Might the same be true for marginalized people in any society?

Marginalized Communities

The term *marginalization* refers to a process by which a person becomes distant from the conventional institutions in society (Eldering & Knorth, 1998).

It is a general condition that exists "when an individual or group is culturally, socially, and social-psychologically situated on the periphery of, has continuous interaction with, has a dependency upon, and deviates in certain socially normative patterns from a more dominant group" (Wright, n.d., pp. 3-4).

Cultural marginality occurs when two cultures co-exist and one is more highly valued than the other. Relations between the two are commonly defined in terms of acceptance or rejection, belonging or isolation, in-group or out-group (Billson, 1998).

Structural marginality "refers to the political, social, and economic powerless-ness of certain disenfranchised and/or disadvantaged segments within societies" (Billson, 1998, p. 185).

For many structurally marginalized groups, there is a tightly held belief that only those with power, prestige, or money can accomplish desired agendas. Seeing themselves as powerless in a world in which they have no influence, the marginalized do not develop the capacity to make choices and to transform those choices into desired action and outcomes — the essence of empowerment. They allow themselves to be acted upon by others rather than to move their own agendas forward (Jaggi, 2003).

In Latin America, for example, marginalized individuals and groups endure profound differences between themselves and others. These differences exclude marginal communities from open access to opportunities that could change their situations. The poor lack economic assets and economic opportunities. Without money, they lack political power and see little value in political participation. Without political participation, they can more easily be exploited and be kept in their traditional place at the bottom of the socio-cultural hierarchy. These complex interactions have a long history of excluding marginalized communities from participation in the world around them (De Ferranti, Perry et al., 2004).

But passive acceptance of one's subjugated status is not true for all marginalized communities. From surveys conducted in 16 shantytowns in Brazil, Chile, Kenya, and the Ivory Coast, findings show that the poor join interest groups and view politics as directly relevant to their situation. They see politics as a means to escape their poverty (Berg-Schlosser & Kersting, 2003).

Empowering marginal communities will require the transformation of long-standing exclusionary institutions and the development of environments in which historically subordinate groups gain greater access, voice, and choice in society (De Ferranti et al., 2004). Accomplishing institutional change could take years. But developing environments that provide choice and access can start today from the grassroots up.

ICT: The Global Equalizer?

There are high expectations in the global community that ICT and particularly the Internet will transform existing patterns of social inequality, facilitate new forms of individual participation in governance, and develop a global civic society. Yet since the mid-1990s and across most nations there have been growing inequalities of Internet access between countries, between groups within countries, and within genders, classes, and generations (Norris, 2001).

Used in the right way and for the right purpose, ICT can have a dramatic impact on achieving specific social and economic development goals (Chacko, 2001). But technology alone is not the answer to raising people from their marginalized situations.

There are infrastructure, skills, costs, and maintenance issues that intrinsically affect availability and access to technology in marginal communities (Beardon, 2004). A stable electrical system is critical, yet many marginal communities do not have an uninterrupted supply of electricity (Benjamin, 2000; Peters, 2001; Beardon, 2004), nor even basic electrical service (Bornstein, 2004, pp. 20-39).

Providing ICT to a marginal community without helping individuals understand how to use that technology, or in a language that they do not understand, will have little impact on altering their situation (Phipps, 2000; Warschauer, 2003). Expecting ICT to change a community without first understanding the values, social processes, and hidden rules that exist within that community will lead to disappointing results (Warschauer, 2003). And, failing to understand the potential impact on all the key community stakeholders could significantly stall a project and make it much less successful (Warschauer, 2003).

The ability to access, adapt, and create new knowledge using information and communication technology is critical to social inclusion. But people must be helped to make use of these technologies and to engage in meaningful social practices (Phipps, 2000; Warschauer, 2003).

The real benefits lie in how ICT is used to create social and economic networks by improving communication, information exchange, and cohesive participation of all stakeholders (Chacko, 2001).

When applied to the needs and agendas of local contexts, ICT can alter the mobilizing structure, provide new points of access into the political system, and create new possibilities for collective action through online networks of distant organizations and informal networks in the grassroots community (Norris, 2001).

Gaining the Power of Voice, Choice, and Desired Agendas

There are thousands of examples of ICT-supported empowerment strategies initiated by governments, and public and private organizations. In the past, many of these have focused their efforts on formal systems, supply-side equipment and resources, and Internet connectivity (PovertyNet, 2001; Norris, 2001; Chacko, 2001).

But despite the potential link between ICT and poverty reduction, direct access by the poor to ICT is extremely limited. Special efforts must be made to ensure that marginalized individuals and communities share adequately in the opportunities and benefits of ICT projects (Chacko, 2001).

Agents of Change

To date, some of the most successful projects operate at the grassroots level with small budgets, minimal staff, and few ICT resources (PovertyNet, 2001;

Chacko, 2001). In many cases, the grassroots project is largely driven by one or two highly committed, innovative, and tireless agents of change (Bornstein, 2004).

These *change insurgents* (Reich, 2000), *petty innovationists* (Salmons, 1976), and *positive deviants* (Sternin, 2003) are grassroots activists who gather information, share knowledge with their social networks, question bad practices, and invent new ways to solve old problems. They inject change into a constraining system from the bottom up, from the inside out, and from the outside in. They work in corporations and traditional institutions (Cohen & Bradford, 1989), in Vietnamese villages (Sternin, Sternin, & Marsh, 1998), among the street children in Bombay (Bornstein, 2004, pp. 68-89), and across the globe using art for peace (Josten, 1994).

Some projects focus on adult literacy (Beardon, 2004), some on economic development (Beresford & Beresford, 1997), webbed empowerment (Kirabo, 2001), and microenterprise networks (Salmons & Babitsky, 2000, 2002). Some use the insights of marginalized individuals (Sternin 2003); others work through social entrepreneurism (Bornstein, 2004).

Empowerment and Best Practices

Although no one type of project works better than others, experience has shown that successful projects almost always include: (1) access to information, (2) inclusion and participation, (3) accountability, and (4) local organizational capacity (PovertyNet, 2001).

Information is power. Without information that is accurate, relevant, timely, and presented in a form and language that can be understood, it is impossible for marginalized individuals to take effective action (PovertyNet, 2001).

Inclusion and *participation* require changing the rules to allow individuals to have voice, set priorities, make choices, and work together on desired actions and outcomes (PovertyNet, 2001).

Public *accountability* confronts institutional corruption. The widespread abuse of public office by corrupt officials constrains marginalized individuals more than others. They are least likely to have direct connections to public officials and service providers or the resources that can motivate officials to help them (PovertyNet, 2001).

Local organizational capacity refers to the ability of people to work together, to organize themselves, and to mobilize to support common interests. "Organized communities are more likely to have their voices heard and their demands met than communities with little organization" (PovertyNet, 2001).

Looking at the Forest,
but Appreciating the Trees

Before moving into the next round of ICT agendas, a step back to rethink project strategies is required. Attention must be paid to the human and social systems into which ICT is injected. They too must change if access to technology and information is to make a long-term difference (Phipps, 2000; Chacko, 2001; Warschauer, 2003).

Perspectives from social and cultural experiences and hidden rules that operate outside marginal communities must be put aside. Preconceived assumptions, expectations, and cultural values about the communities to be impacted, and ill-conceived expectations of what should be accomplished, must be abandoned (Balit, 1999; Jaggi, 2003).

The larger socio-cultural environment in which a marginalized community is embedded must be understood. Marginalized communities themselves must be studied with fresh eyes — without preconceived assumptions and expectations of what most needs to be accomplished (Babitsky & Salmons, 2004).

Trust, Exchange, and the Power of Networks

Taking a page from the change insurgents' handbook, to foster change in any kind of system — *work with what is already there and build change from it*: "Around the world, including in war-torn societies, the capacity of communities to make rational decisions, manage funds, and solve problems is greater than generally assumed" (PovertyNet, 2001).

Networks of trust already exist that can help empowerment agendas — the *committee* in Pakistan; *chit fund* or *nidhi* in India; *susu* in Ghana; *tontines* in Senegal; *njangis* in Cameroon; *cheetu* in Sri Lanka; *pasanakus* in Bolivia; and the *tanda*, *cundina*, *rol*, *fira*, *bolita*, *mutualist*, *quincela*, *vaca*, *vaquita*, and *ronda* in Mexican communities in both Mexico and the United States (Bari, 2001).

There are *entry points* — issues that individuals in the community passionately care about. Who can help marry those concerns with the ICT project agenda (Macdonald, 2004)?

Who are the stakeholders, gatekeepers, and opinion leaders — the informal power holders — who can help facilitate the agenda? Who will be affected by the ICT agenda? Who will be empowered, and how will this affect others in the networks of the community?

No matter what the intent to improve the lives of individuals within a community, someone could always be negatively affected. Who will be the winners, and who will be the losers? What can be done to find a solution where everybody wins?

Valuing Individual Assets

Finally, it is important to focus on the individuals in a marginalized community. Will their self-esteem be enhanced or demeaned by the project?

Will individuals be able to articulate their views in their own way (ActionAid, 1993) or are they expected to learn to use whatever media is provided?

Have their ideas been solicited and shown they have value, or have they been gathered up and just stored away?

Will individuals be shown the value they bring and be helped to assess their own assets — in themselves, their families and community?

Will they be guided to build on their own capacities (Gubbels & Koss, 2000) — or clearly shown that there is not much worth building upon within the community, and that little there has any value?

Every message sent to marginalized individuals that they do not hold within them anything worth building upon reinforces the hidden rules in their culture of poverty that constrain them and leave them powerless to develop their own agendas.

Making a Difference from the Grassroots

Empowering marginal communities will depend on ICT agendas. But nothing will change in the long run unless the human and social systems in which people participate are also transformed (Werschauer, 2003). How can they be changed?

If individuals have no understanding of the hidden rules that shape their perceptions (Payne, 2003), and have little or no experience making choices and pursuing desired agendas (PovertyNet, 2001), how can they can be empowered?

If individuals do not know what they should be doing with the technology provided in an ICT project to empower their community, how can they be helped to determine what to do?

If power and money are the key factors in wielding influence and accomplishing agendas (De Ferranti et al., 2004), how can those without either exert influence on others or move desired agendas forward?

In many community-driven development (CDD) projects today, government innovations are handed off to a local group. They are expected to build strategic alliances to accomplish those agendas across different levels of government and across their social environment (PovertyNet, 2001). How can they be helped to develop the skills to do this efficiently and effectively?

There is a growing need to provide grassroots-based training that will empower marginalized communities and help them use the resources they have to accomplish desired outcomes. The second part of this chapter provides a process and approach that can do just that.

Influence Without Authority: The Change Insurgents' Handbook

Best practices are known to be particularly powerful when they are borrowed from the context for which they were developed and used effectively in a very different space. For example, Stirnan's (2003) use of *positive deviants* to generate change in marginalized communities in developing countries has been recently adopted by executives in the United States to inject change into their large corporations.

In the authors' work with entrepreneurs and working families in rural and distressed urban communities, Cohen and Bradford's (1989) corporate management classic *Influence Without Authority* has been the field guide for infecting change from the grassroots up.

Influence Without Authority (IWA) provides a powerful approach for individuals to make choices and to transform those choices into desired actions and outcomes. The approach does not require any form of technology to operate. But, when used as part of an ICT project, the combination could be significantly empowering.

The IWA process is based on the content of naturally occurring, everyday interactions in which individuals engage no matter what their position, resources, and social class. The difference is, by understanding those natural processes and by paying attention to how they work, individuals gain a key set of skills to pursue desired agendas.

The IWA process builds on the idea that each person in any organization has goals and objectives (*agendas*) that he or she would like to accomplish, things that each values (*currencies*), and people to whom each is connected (*network relations*). Agendas are accomplished by identifying the network relation who might be most helpful, determining the agendas and currencies of this potential ally, proposing an opportunity for both self and this ally to gain something of value (*a win-win proposal*), and then accomplishing the *exchange*.

Influence Without Authority was written for accomplishing individual agendas within a hierarchical organization. Grassroots agendas more typically involve diverse stakeholders who do not belong to the same organization. In grassroots work, the general IWA approach applies, but the actual process is a little different.

To accomplish our grassroots agendas, we extended the IWA approach and developed it into a step-by-step strategic process that we use daily to accomplish desired agendas. By paying attention to each step in the defined strategy, individuals can learn how to make choices, and then transform those choices into desired actions to accomplish outcomes and agendas — no matter how few their resources of power, prestige, and money.

Informal Networks and Reciprocal Exchange

This grassroots strategic process operates through informal reciprocal exchanges and collaborations within informal social networks.

Poor individuals have used *informal networks* in their marginalized communities for hundreds of years to lend and borrow money (Bari, 2001), for support and strength to solve their everyday problems, and to lend each other resources in time of need (PovertyNet, 2001).

For many cultures, relationships based on *reciprocal exchange* — the giving and receiving of resources — and developing a social network for exchange are natural parts of the social process — formally, informally, subtle, or overt (e.g., *potlach* among *North American Indians*).

The notion of collaboration is used in so many different contexts that its exact meaning is somewhat fuzzy. Here we define *collaboration* as the interaction among two or more individuals encompassing a variety of behaviors, including communication, information sharing, coordination, cooperation, problem solving, and negotiation (Hall, 1999).

By understanding how to use informal networks for collaboration and reciprocal exchange, this *natural* process becomes a means to make choices and accomplish desired agendas.

A Step-by-Step Guide

To be successful in grassroots projects, the following step-by-step approach can be used by any individual working on any agenda at any level of an empowerment

Table 1. Seventeen steps for accomplishing grassroots change

Phase One.   Choose an Issue

1. Identify issues of greatest interest and potential for success

2. Select one key issue that inspires passion

3. Do homework to understand the big picture

4. Map the issue space to identify an agenda

Phase Two.   Identify Resources

5. Identify opinion leaders, stakeholders, and gatekeepers

6. Map networks of personal connections

7. Approach each person as a potential ally

8. Select potential allies for this agenda

9. Discover the currencies of each potential ally

10. Identify natural advantages and personal assets

Phase Three. Propose an Agenda

11. Present the agenda as a win-win exchange

12. Frame the message to generate interest

Phase Four.   Expand the Network

13. Use any and every communication device to promote the agenda

14. Expand resources by helping others accomplish their agendas

15. Build credibility through hard work and incremental success

16. Develop a Plan A, and alternative Plans B, C, …

17. Learn from others

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program. The steps are listed in Table 1. If used by a facilitator to train a group of individuals all at the same time, the facilitator should have had training in group process in order to ensure success.

Although presented as a step-by-step approach, the actual process involves four main phases — choosing, identifying, proposing, and expanding. Each phase embodies a particular set of steps.

Phase One: Choose an Issue

Successful projects in marginalized communities must be based on understanding local needs and conditions (Peters, 2001). The four steps of Phase One engender local discussion and debate, and develop grassroots skills to help people make choices — the foundation of empowerment (PovertyNet, 2001). Phase One is an iterative process; Steps One through Three will iterate around each other until Step Four is accomplished.

Step One: Identify Issues of Greatest Interest and Potential for Success

There are always many issues that need attention; it is important to determine which have the greatest potential for success.

World Neighbors has developed a process they use in marginalized communities to determine the *entry point* for injecting social change. The process starts with actively capturing community members' felt needs through open discussion and group process (Gubbels & Koss, 2000).

In marginalized communities with high rates of illiteracy, and where women in particular have traditionally been excluded from having voice and choice, open discussion and group process may not work or may need special attention (Balit, 2004).

One alternative, the Reflect approach, allows individuals to articulate their felt needs and issues through whatever media provides them self-expression — verbal, visual, kinesthetic, and so forth. This approach is particularly useful with illiterate adults and in settings where cultural rules of behavior constrain self-expression (ActionAid, 1993).

Regardless of how a set of issues is selected, at the end of Step One, the list should include no more than three to five most important issues with greatest potential for success.

For marginalized and disenfranchised individuals, participating in group process may be difficult and require a great deal of learning by doing. Time and resources are well spent at this first step of the grassroots process. It sets the course for everything that follows.

Step Two: Select One Key Issue That Inspires Passion

If a number of issues have potential, individuals and communities will be most successful if they work on an issue that most passionately excites them. In

grassroots activism, there will always be frustration and unexpected setbacks. If individuals do not care passionately about what they are involved in, it will be much too easy to give up.

For community-based projects, it will be difficult for individuals to agree on one issue when so many need to be resolved. Learning how to discuss issues and make choices is the groundwork for empowering marginalized individuals and communities.

Step Three: Do *Homework* to Understand the Big Picture

Feeling passionately about an issue can often cloud one's view of it. Perceptions based on incomplete information, personal bias, hidden rules in the culture, gossip, and hearsay will need to be challenged with real information.

Step Three is where background information is collected; assumptions are challenged; individual enthusiasm can build or disappear.

Seeing the larger picture in which an issue is embedded allows individuals to understand it better. It also helps to determine what part of an issue can be worked on with potential success. Individuals may care passionately about building a village hospital, only to find through homework that they must first work to have a doctor regularly visit the community.

Individuals in marginalized communities can certainly be involved in doing the homework in Step Three. Through members of their networks of social relationships and information sources at the local level, they can be actively involved in gathering information, even if their participation is at first somewhat limited. Develop with them a simple means for keeping track of what they hear and learn, and from whom. And encourage each member of the community to find information to share with others.

More than any of the other steps in this grassroots guide, Step Three can be tremendously enhanced by ICT support.

Step Four: Map the Issue Space to Identify an Agenda

Once the issue has been selected and background information gathered, it is useful to map the issue space.

First define the issue precisely. List all the elements of the issue itself and any other issues that may be related. (It is most helpful to do this in a brainstorming session, as it can provide perspectives and insights that easily could be missed.)

Mapping the issue space is most effective in helping to define a specific action area — an agenda — in which to begin working on an issue.

For example, in the economically distressed rural area of north-central Montana where the authors most recently did fieldwork, it was found that wind power to generate electricity would be an excellent issue to affect change at the grassroots level. Montana is the fifth windiest state in the U.S., but in 2003 there were almost no wind turbines being used to generate power.

Background information indicated that 30 years earlier Montanans enthusiastically embraced wind power and 60 years earlier Montana wind turbine design pioneers sold over 50,000 units across the United States. Yet in 2003, most Montanans dismissed the economic potential of wind power despite their keen awareness of powerful wind blowing across their land.

By mapping out the issue of wind power in Montana, we were able to determine that experimental failures, competing coal and oil interests, powerful political resistance, poor communication across a widely dispersed and sparse population, the high cost of turbine projects, power transmission regulations, and resistance from rural electrical cooperatives all had negative impact on the core issue of wind power.

On the plus side, there were a few environmental groups working on green power; a new wind activist group had just been formed by Montana's Secretary of State; the federal government had grants to cover 25% of wind project costs; alternative energy was gaining popularity across the country; and the cost of electrical energy to consumers had jumped significantly over the past six months.

Our issue map helped us decide that the best potential for making a difference on the wind power issue in Montana would be to work directly with consumers who were being impacted by the jump in their costs for power. By providing them with the most current information available on the economic potential for wind power and the cost savings potential of self-generating power with small wind turbines, we were able to generate *wind fever* in the region. Developing keen interest in wind power among the farmers and ranchers in an election year then pressured decision makers at all levels to begin considering the power of wind for generation of electricity (Babitsky & Salmons, 2004).

Mapping the issue space helps to determine the complexity of an issue and to find a course of action or agenda where to begin to make things change.

Phase Two: Identify Resources

The importance of informal networks at the grassroots level cannot be over-emphasized (Norris 2001; Chacko, 2001). The six steps of Phase Two are specifically focused on networks as resources. Iterating through this set will produce a list of potential allies to then approach in Phase Three.

Step Five: Identify Opinion Leaders, Stakeholders, and Gatekeepers

Every issue has at least one opinion leader. Every agenda affects at least one stakeholder. Every social group — hierarchical or flat — has at least one information/access gatekeeper. The *opinion leader* holds information and expresses it, gaining some measure of power and respect. The *stakeholder* stands to gain or lose something in any agenda. The *gatekeeper* allows access, or not, to special information, people, or places.

Map the network of people related to the agenda.

Opinion leaders who understand the agenda could be most helpful to have as allies. They may hold resources that could help, or have a social network into which they may offer some connections. On the other hand, opinion leaders could potentially be most resistant to an agenda. It is important to determine who the opinion leaders are and if they may potentially support or resist the project.

Stakeholders too can potentially support or resist a project. Those who think they will gain from an agenda will most likely support it; those who believe they will lose something most likely will not.

Gatekeepers are often quite powerful, although their public role may make them seem only marginal. The secretary who schedules appointments, the spouse who answers the telephone, the clerk who accepts an application — these are important people. It is good to determine their currencies (Step Nine) and to treat them each with respect.

Each opinion leader, stakeholder, and gatekeeper will be important to success. It is important to identify who they are and then to consider if they will likely support or resist the project.

It is most helpful to do this visually. Identify the key people surrounding the issue. Draw connections that may exist between members of this issue network, and begin to identify the key people to approach to move the agenda forward.

Step Six: Map Networks of Personal Connections

Each person (A) is directly connected to others — wife and husband, brother and sister, teacher and student, self and best friend, office mates, roommates, and any others with whom an individual has a direct connection. An individual A is separated from each of these with one degree of separation.

Each direct connection has his or her own network of direct connections. Some of these may also be directly connected to A; others may not.

For example, A's office mate, B, is directly connected to A. And, B's husband is directly connected to B. But, A may not know or have any direct connection to B's husband, C. If A needed to develop a relationship with C, A can ask B to make the introduction. A is separated from C with two degrees.

Everyone on Earth is said to be separated from anyone else by no more than six degrees of separation, or six friends of friends of friends. Regardless of how many degrees of separation exist between an individual and a random world of others, one's network of direct connections and connections of two degrees of separation is critical to grassroots agenda success.

Draw a map of the direct connections in the social networks of the individuals who are working on this project. This map will be useful throughout the process. Determine if any of their direct connections may be potential allies or have direct connections themselves to others who may support this project.

Step Seven: Approach Each Person as a Potential Ally

Put aside preconceived notions about what to expect when meeting with others. It is important to abandon assumptions, expectations, and cultural values about individuals and the support or resistance expected in any interaction. It does not matter if past interactions with a person have been frustrating. It does not matter if past experience has shown this person to be resistant.

Using the ideas found in this grassroots guide, the real challenge will be to generate interest in a project, to turn interest into support, and to transform a previous resistor into at least a neutral observer (Cohen & Bradford, 1989, pp. 155-164).

In Step Nine further discussions on resources will help to accomplish these objectives. For now, it is important to assess styles used for interactions with others and how they can affect success.

No matter how brief, every interaction with another produces a positive or negative effect. Developing a relationship with a person builds on each interaction. When working on an agenda and looking for potential allies, one's history of interactions can help or harm the progress. Using an approach to each person as if he or she were an ally is an important skill to develop.

A confrontational, aggressive, or demanding approach is much less likely to gain an ally no matter how worthy the agenda may be.

Using depressing messages to motivate another by projecting guilt and their responsibility for some pitiful situation will much less likely gain them as an ally, no matter how true it is that they may be responsible.

A sincere, interested, and non-judgmental approach (no matter how officious, obsequious, or rude the other may be) is much more likely to gain an ally sometime when their help is needed.

Many attempts to influence others will involve only one other person. In complex situations involving multiple, diverse stakeholders, a potential ally can be anyone. Build a history of positive interactions, and finding allies will be easier than expected.

Step Eight: Select Potential Allies for this Agenda

One of the most strategic assessments in grassroots activism is determining who to approach for help, support, and cooperation. Are there any overlaps in the social network maps developed in Steps Five and Six? It is usually easier to gain support from opinion leaders, stakeholders, and gatekeepers who are directly connected by only one degree of separation.

Who should be kept informed of progress? Who should be avoided entirely?

What resource does the individual control and how dependent is the agenda on that resource? Does a relationship with that person already exist or does a new relationship need to be built? How much time, effort, or other resources will likely be required in order to gain their cooperation? Are there alternative others?

If this person is likely a resistor, is there a direct connection that can help to influence them? Can they be reached at two degrees of separation?

Developing an exchange with a potential ally will cost time, effort, and some resources. As the list of potential allies is identified, it is important to carefully consider each ally choice.

Step Nine: Discover the Currencies of Each Potential Ally

During conversations with potential allies, listen carefully and pay attention as others discuss them. Gather information about a potential ally. On what agendas are they working? What interests them? What do they value; what are their currencies?

Cohen and Bradford (1989) use the metaphor of *currencies* to help determine the value of what might be offered a potential ally in exchange for cooperation. "Because they represent resources that can be exchanged, currencies are the basis for acquiring influence. If you have no currencies in your treasury, you do not have anything to exchange for what you want" (p.73).

Using the terms *currency*, *treasury*, and *resources to be exchanged* may seem to indicate that only tangible items are important enough to exchange for cooperation. This is not the case. There is a range of interests that might be satisfied in return for cooperation and support.

In *Influence Without Authority* currencies are grouped into five main categories (p. 79).

Inspiration-related currencies include having a chance to do important things and having the opportunity to do what is *right* by a higher standard.

Task-related currencies include providing resources, assistance, support, and information related to the ally's own agendas.

Position-related currencies include recognition, visibility, reputation, importance, and access to contacts.

Relationship-related currencies include understanding, closeness, friendship, emotional support, personal backing, acceptance, and inclusion.

Personal-related currencies include appreciation, indebtedness, ownership of and influence over important tasks, self-esteem, self-identity, and comfort.

"The premise of exchange as the basis of influence is that you have something to exchange for what you want" (Cohen & Bradford, 1989, p. 75). The key to a successful exchange will depend on figuring out which currency the potential ally prefers. Being a good listener is particularly useful for determining ally currencies.

Step Ten: Identify Natural Advantages and Personal Assets

Every person has natural advantages and currencies that they bring to this social process. Even the most marginal individual has assets — familial and community credibility, connections, and experience — that can help move an agenda forward.

List the currencies that exist in the treasury of each individual working on the agenda. Add assets from personal experiences — knowledge, skills, understandings, education, insights, and contacts. Include individuals' natural characteristics — warmth, sincerity, good listener, compassion, persistence, and objectivity. And finally, add in particular skills that each has developed throughout his or her life.

Of course it is not always easy to see our own selves clearly. This is especially true for marginalized individuals. There are self-assessment tools available that can be used to assist in listing personal assets and natural advantages. The *World*

Neighbors Field Guide is an example (Gubbels & Koss, 2000), but there are many others.

Developing a list of assets and advantages will help to identify resources available to offer in exchange for cooperation and support.

Phase Three: Propose an Agenda

These two steps form the basis of reciprocal exchange. How successfully exchanges are negotiated will depend at first on learning by doing. The previous activities of Steps Three, Eight, and Nine will be most useful here. Lack of success after several attempts means more work is needed on the first two phases.

Step Eleven: Present the Agenda as a Win-Win Exchange

Success in convincing a potential ally to support an agenda will depend to a large extent on things that have already happened. General reputation and earlier interactions will set the tone to warm or cool the reception from a potential ally.

Genuine interest and sincere concern for the issues and agendas that are important to a potential ally will smooth the way for potential exchange.

The two most common strategies to gain an ally's cooperation through exchange depend on a good understanding of the ally's goals and currencies. The degree to which the agenda and the interests of an ally match, the easier it will be to accomplish a win-win exchange.

The most common strategy is to show an ally how cooperating with a request or supporting an agenda will help them to achieve their own desired goals or agendas. This is not always easy to determine and a lot can depend on the quality of available information.

If goals are too dissimilar, the next most common strategy is to offer an ally something valuable to them in return for whatever is needed for the project. The five categories of currencies identified in Step Nine will be helpful. Cohen and Bradford (1989, p. 18-214) provide a number of other suggestions, but these two strategies will most often lead to a successful exchange.

Step Twelve: Frame the Message to Generate Interest

Come prepared to explain how the grassroots agenda will have positive effects on the ally's interests. Be sure to describe the importance to the ally of the success of the agenda so they can begin to see the potential of a win-win exchange.

For example, when seeking sponsorship for a workshop on wind power in the Montana case study, only those organizations standing to gain business if wind power projects were started in the region were approached for financial support. Getting more business was each potential ally's currency. No one refused to make a donation (Babitsky & Salmons, 2004).

Potential allies will often ask a number of questions. Some will not be familiar with the issue nor see their connection to the agenda. Others will want to make sure that the issue is understood within the big picture with which they are familiar. It is important to do homework on all issues related to the agenda. Access to information repositories through ICT would be most useful.

Be positive, informative, and brief. No matter how complex an agenda may be, it is important to be able to describe it clearly and succinctly.

Respect the importance of time, especially to busy people. Long-winded presentations or many details of little interest to a potential ally will likely foster an unsuccessful exchange. It is much better to be invited back for another round, or to be directly asked to go into greater detail than to have a potential ally disappear because time is their most highly valued currency.

Phase Four: Expand the Network

Phases One through Three develop skills that lead to empowerment. Phase Four takes measure of how empowered one has become. Developing networks is at the heart of grassroots activism (Babitsky & Salmons, 2004).

Step Thirteen: Use Any and Every Communication Device to Promote the Agenda

Typical media for promoting an agenda includes brochures, newsletters, newspapers, radio, and television. If there is access to ICT and means to use them, take advantage of every possibility. In marginalized communities, there are other ways to promote agendas. Use the power of informal networks that exist and individual networks of social relationships.

Contact as many direct relations in the social networks identified in Steps Five and Six — even those perceived to less likely care — to tell them about this agenda. Use the same strategies of Step Twelve.

Briefly describe the agenda within a context that is relevant to the listener. Explain how success could fit with the interests of the other. And then, ask for their help to spread the word. Asking people who believe they are powerless, to provide help that costs them nothing and they know they can provide, can begin to move them to take interest in helping to change the systems that constrain them.

Step Fourteen: Expand Resources by Helping Others Accomplish Their Agendas

Every time another is helped to accomplish an agenda that is of value to them, a potential ally may be gained. Doing so before being asked is often extremely helpful. However, keep in mind that providing unsolicited help is sometimes viewed suspiciously. Suspicion may be offset through frequency of interaction that is honest and candid about this grassroots approach to develop win-win exchanges.

Step Fifteen: Build Credibility Through Hard Work and Incremental Success

The greatest buildings ever constructed were built one stone or log at a time. The same is true of successful programs and successful agendas. Each one has many steps and milestones. Celebrate little successes and keep allies informed. As they see progress on the agenda described to them, they will feel a sense of ownership and be happy to be involved.

Spread the word to the opinion leaders, stakeholders, and gatekeepers identified in Step Five. By keeping them informed, they are included in the agenda. They are much less likely to become a resistor and much more likely to become an ally if they are informed directly of the progress being made.

Step Sixteen: Develop a Plan A, and Alternative Plans B, C,...

No matter how well planned, it is very likely that something beyond immediate control will impact the agenda. Spend time in Steps One through Four (and of

course throughout the process) developing possible scenarios of what could happen and alternative plans of action if it does.

What should be done if allies become more or less cooperative? Are there potential resources opening up? Are there others working on related projects who might want to collaborate on this one? Are resources drying up, and what alternatives need to be considered?

The important point is to be flexible. Be open to opportunities. Be willing to alter strategies and tactics as new information becomes available.

Step Seventeen: Learn from Others — Advice from the Field

Working to promote any agenda involves frustration on the way to success. Keep in touch with others who are working on similar agendas. Share information, ideas, and resources. Do not be afraid to ask for advice.

Learn to give help before asking for help. There will be others around who are trying to make a difference — become an ally to others in the field.

Keep on top of information that is related to the issue, the program, and the agenda. The more accurate the understanding, the more credible efforts will be.

Believe passionately in the agenda. When things fall apart, start over again. When something fails, learn from the mistakes.

Be positive. Obstacles, resistors, dwindling resources, and such are problems to be solved. Create a solution.

Do not take *NO* for an answer. Go back to Step Three, make revisions, and come back again. If all else fails, find a different path to accomplish the agenda.

Above all, do NOT give up! Your job is change — and it has never been easy.

Future Trends

The grassroots handbook provided in this chapter can be a powerful tool to empower marginalized *individuals*. But if used as a *community* empowerment tool, training in rural participatory communication cannot be ignored (Balit, 1999)

Inclusion of traditionally excluded individuals and marginalized groups in priority setting and decision making requires changing the hidden rules that have previously constrained them. As people *find their voice*, group process will not always be harmonious; ideas and opinions will often be contested. Facilitators

should be trained to use conflict resolution mechanisms in order to manage disagreements before they emerge (PovertyNet, 2001).

In societies with deeply entrenched norms of exclusion or a history of multi-racial or multi-ethnic conflict, it will be particularly difficult to sustain the participation of marginalized individuals. Reverting back to less participatory, more central-ized decision making will seem more efficient, perhaps less costly, and certainly tempting (PovertyNet, 2001).

Including groups that have been traditionally marginalized will have profound effects on the traditional stakeholders. Expect some resistance.

Empowering individuals to act in their own local environments will be less quantifiable than tracking the number of computers, cell phones, and Internet users involved in any project. Providing access to information to enhance that process is a realistic approach to transforming marginal communities. But the road to empowerment is built on learning to choose and organizing to act.

Conclusion

Grassroots training in decision making and organizing has promise for marginalized communities. When used as part of an ICT program, marginalized communities can make use of this process to shape their own destinies, and to develop a sustainable participation in the emerging global network society. In this context, the hardware and software provided through ICT programs become the vital tools of self-directed, community-driven change and development processes. Together, ICT and grassroots training can help marginalized communities change their lives.

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Terms and Definitions

Change insurgent: Along with the terms *positive deviant* and *petty innovationist*, refers to grassroots activists who inject change into a constraining system by gathering information, sharing knowledge with their social networks, questioning bad practices, and inventing new ways to solve old problems.

Culture of poverty: The social and psychological consequences of poverty are believed to produce a unique way of life for the generational poor that is transmitted from parent to child by the age of seven.

Currencies: Resources to be offered to a potential ally in exchange for cooperation. Currencies can satisfy a range of desired needs and interests, including inspiration, task, position, relationship, and personal values.

Empowerment: The capacity to make choices and to transform those choices into desired action and outcomes.

Hidden rules: The internalized patterns of thought, cognitive perceptions, strategies, and rules of social interaction that operate in the social class into which an individual was born which guide his or her thoughts and behaviors.

Marginalization: A process by which individuals become distant from conventional society due to social, cultural, economic, social-psychological, or structural differences between themselves and a more dominant group.

Win-win exchange: The basis for grassroots negotiation in which both sides gain that which they most value.

SECTION III:
SOCIAL AND HUMAN SCIENCE

Chapter V

Social Structures for Access, Use, and Development

Sarah Parkinson
University of Guelph, Canada

Abstract

This chapter focuses on the importance of social structures in enabling equitable access opportunities and useful applications of ICTs. It further argues for the importance of community involvement and organizational learning in designing ICT policy and projects with access and development-related objectives. Funders and policy makers have tended to overlook these and overemphasized technical dimensions of projects and accountability at the expense of social aspects and flexibility required to incorporate learning back into projects. After reviewing the literature, the chapter presents an example of a program in Uganda and a short project in Ghana which both used organizational partnerships and created strong community links to facilitate ICT-enabled development. This underscores the need for policy makers to create a climate in which not-for-profit organizations are able to create these kinds of partnerships and create meaningful community links.

Introduction

The importance of information and communication technologies (ICTs) and equitable access to such technologies in promoting development is now widely accepted. ICTs are central to global social and economic transformations taking place within the *global knowledge society*. They are versatile tools that have implications for development because they allow for increased access to a wide variety of information and communication at low cost, once the infrastructure is in place. Yet the development of ICTs is mainly driven by the needs of those who are perceived as most profitable to serve, who live within a technically developed infrastructure, are well-educated, and speak English. Those who do not fit within these parameters may therefore face a range of social, cultural, economic, and technical barriers when attempting to use these technologies.

The types of development benefits that ICTs allow are varied and often tied to other trends in labor and politics. For example, ICTs have proven to be versatile organizing tools for politically marginalized groups (although this may not always be a socially desirable *benefit* since such groups include organized criminals); have improved communications and transmission of remittances between migrant workers and their families; have improved the flow and accessibility of health information, educational exchanges, improved access to government benefits, and market prices; and have opened access to international niche markets.

In this chapter, the term *social structures* refers broadly to the non-technical aspects of ICT access and includes institutional and organizational structures and the links of these to community structures and processes. The key arguments of this chapter are that social structure is important, community participation is important, and organizational learning is important. In order to succeed, ICT for development projects should both build up and build upon existing organizational structures and community linkages using participatory methods that allow for organizational learning. Two case studies, one based in Uganda and one in Ghana, serve to exemplify and illustrate these key points, teasing out some of the challenges and complexities typically encountered in implementation. Before presenting the case studies, the chapter reviews the literature to argue that *demand side* characteristics of access must be addressed if ICTs are going to be relevant to local development, especially amongst socially marginalized populations — and that this is essentially a social, rather than a technical, issue.

ICTS, Development, and Access

Information and communication technologies have been an issue of interest for policy makers since the idea of the information society arose to prominence in the 1990s, with the implication of a major shift in the global social and economic fabric. Manuel Castells was one of the most influential theorists to raise the concern of a divided society, the notion that those without access to ICTs would be locked out of the emerging network society and the space of flows within which it operated (Castells, 1996, 1998). Policy makers around the world paid attention and launched a variety of high profile national and multi-national initiatives to address this (e.g., Shade, 2003). Telecommunications policies were the most common starting point for the formulation of universal access objectives — that all citizens should have reasonable access to ICTs, including telephone and Internet. In terms of their actions, these policies tended to focus on getting the physical infrastructure into place rather than giving equal or greater weight to social dimensions (Clement & Shade, 2001). For some observers, this was a matter of history repeating itself and giving an almost mythical power to the technology (Light, 2001; Gómez & Ospina, 2002).

Unfortunately, there is some empirical evidence to suggest that the introduction of ICTs into a country can actually serve to maintain or increase socioeconomic inequities (Gómez & Martínez, 2001; Kenny, 2002). This is not surprising, since those who have a stronger position in society also tend to have greater education and the ability to pay, and technologies are more likely to be influenced by their needs. Hence, their ability to access and use new technologies for their own benefit will generally be higher (Henwood, Wyatt, Miller, & Senker, 2000). This implies the need for a much broader conceptualization of access, one that explicitly considers not only the technical but also the social requirements (Clement & Shade, 2001; Van Dijk, 2001). This also implies the need, not only for regulation of the market, but also for public investment. Since there are many sectors that can justifiably demand attention for public resources, and since such resources are limited, this can pose a major challenge for many countries. This challenge can be best met through a clear public vision, public-private partnerships, and creativity.

Privatization and Liberalization as Tools for Access

Throughout the 1990s, there was a trend in countries across the world to privatize and liberalize their telecommunications sectors as a way of encouraging growth and improving both accessibility and quality of service. This was formalized by the World Trade Organization's General Agreement on Trade in Services

(GATS) in 1998. Signatories to this agreement committed themselves to this type of reform. This approach was intended to encourage private investment while increasing competition and reducing prices. In many countries, it has accomplished this, although not without numerous problems, since fierce vested interests often overpower or divert the intended function of regulators (Emdon, 2003; Tusubira, Kaggwa, & Mukholi, 2004).

Dymond and Oestmann (2002) propose that the access gap, the gap between current levels of access and universal levels of access, actually consists of two distinct gaps with different causes. The first gap can be addressed through the more efficient functioning of the market; this is the gap between the current market and the market under ideal conditions of competition. Increased liberalization and effective regulation are the planks with which this gap can be bridged. The second gap is between the number of people who would be able to access and use ICTs under perfect market conditions and those who would do so under conditions of universal access (i.e., 100% of the population). This gap requires public subsidy to address.

Reality is more nuanced and complex than this, however, since this conceptualization addresses only physical access, which as already discussed constitutes only one aspect of access. Effective demand, which constitutes the desire and ability of people to pay for services, is elastic depending on their awareness and capacity to use ICTs. Without tools for building demand, physical access is an empty goal (Melody, 1998, 1999).

Experience also suggests that it is quite difficult to accurately predict what the demand will be for a given ICT-related service, although communication-related services generally are more highly valued than information-related services (Odlyzko, 2004). Although the ITU suggests 3% of income is a reasonable indicator for telecommunications demand, there are many anecdotal reports of people in Africa spending much more than this. A small household survey in Khayelitsha, a large South Africa township, found that people regularly spent 25% of their incomes on telecommunications, with those who owned cell phones (one-third of the total population) spending the most (Parkinson, 2004). In Uganda, the second licensed cellular operator, MTN, exceeded most of the five-year targets set by the regulatory agency within the first month of operation (Tusubira et al., 2004). Meanwhile, research on many telecenters has shown that local populations, especially in rural areas, often do not demand computer and the Internet even when the costs of these services are subsidized (e.g., Gastor, 2001; Benjamin, 2001a; Dahms, 1999; Gumucio Dagrón, 2001a; Molo Thioune, 2003). Such empirical evidence again points to the importance of building up social structures, a process which can take time and effort.

Demand-Side Characteristics of Access and Use

Describing access and use of ICTs in terms of user demands can take a number of approaches. Technology transfer has traditionally focused on the diffusion of technology model, which categorizes the user population based on how quickly they begin to use the technology, where such technology is usually seen as unproblematic and beneficial, and adoption is the desirable outcome (Whale, 1989; Roman, 2003). This model has been criticized for taking an overly simplistic and technologically deterministic approach to technology adoption. In response to this, more recent approaches view the use and innovation of technology as a process of learning and negotiated meaning amongst various stakeholders (e.g., Engel, 1997).

Both Van Dijk (2001) and Clement and Shade (2001) propose concepts of access that differentiate between stages or segments. Clement and Shade's approach focuses on differentiating technical and social infrastructures in a *rainbow continuum*, building from carriage capacity up to governance, fusing between technical and social at the level of service provision. Van Dijk focuses on access and demand as dynamically interlinked concepts that "step up" in a ladder-like fashion as user capacity increases. This approach focuses on the individual decision-making process and the obstacles that specific actors may face when considering to use ICTs, and also emphasizes that access challenges and gaps are constantly changing.

Bridges.org (2004) takes a holistic approach in proposing 12 criteria for determining whether the conditions for *real access* exist. These include: physical access, appropriate technology, affordability, capacity, relevant content, integration, socio-cultural factors (including ascribed roles based on gender, class, or race), trust, legal and regulatory framework, local and macro-economic environments, and political will. These criteria emphasize the importance of social, economic, and political factors, and their interface with the technology. Of these, capacity can be said to be primarily a user characteristic, while trust, integration, relevance, appropriateness, physical access, and affordability are properties of the relationship between the technology and the user. The legal and regulatory framework, socio-cultural factors, the local and macro-economic environment, and political will are all broader environmental influences. Building demand within this framework requires creating an enabling environment, cultivating an appropriate relationship between user and technology, and building capacity within users (and future users).

While the market may be an appropriate mechanism for creating physical, affordable access to most of the population in most instances, other activities will need to occur within the public domain. The complexity of the relationship implies the need for a harmonized, cross-sectoral policy that links market regulation and

access goals with broader socioeconomic development goals. In fact, this is the approach that many governments are taking, although its complexity can make it a challenge.

Principals and Tools for Building the Demand Side

The techniques developed within the paradigm of participatory development and capacity-building are well suited to deal with the issue of building demand. These are techniques that can forge a meaningful relationship between people and technology by starting with the reality of the people who will be using it (Chambers, 1997). Besides the philosophical appeal of participation, it has the very practical advantage that it works. Uphoff, Esman, and Krishna (1998), for example, note meaningful participation in development as one of the key success factors in the projects that they reviewed. As a field, participatory communication for development has roots that reach back much further than the recent wave of ICTs, and includes community theater, radio, and video (Gumucio Dagron, 2001a; Quarry, 1994; Williamson, 1998).

Despite its relatively short history, ICT for development — in its more recent incarnation — already has a wealth of experience to draw upon, much of which corroborates the findings of development as a field more generally. This congruence with non-ICT-related development reinforces the observation that ICTs are not magical; they cannot solve social and political problems independent of social and political change (Gómez & Ospina, 2002). Heeks (2002) notes that ICT practitioners tend to be much more tentative about the potential benefits of ICTs and emphasize the relative importance of social processes and structures, which policy and those with less direct experience tend to overlook. Policy, in other words, tends to be technologically deterministic, while practice tends to reinforce a more socially deterministic position. Fuchs (1997, 1998), based on his own practical experience and case studies, also emphasizes the importance of the organizational structure of telecenters. The literature also suggests that there is no particular organizational model that is suited to all circumstances, but rather that the process of creating such structures needs to occur at the community level, with a high degree of community involvement and ownership characterizing the whole process from the early stages (Ramírez & Richardson, 2000; Gómez & Casadiego, 2002; Michiels & Van Crowder, 2001).

The danger of participation as a concept is that it is used quite broadly, and can range in meaning from complete community ownership to placation or manipulation (Arnstein, 1969). In ICT-related development, as elsewhere, the term can be used as a whitewash for projects that are, on closer examination, top-down (Beardon, 2004). The reasons for this often have root in the way projects and programs are administered, and the experiences and mindsets of those leading

them which are far removed from the *beneficiaries*. Participatory social processes are often messy, unpredictable, hard to schedule, and time consuming. This also has some strong implications in terms of the types of resources necessary to allow for such processes, especially on a broad scale. When determining whether such effort is justified, it may be well to flip the question on its head and consider whether a society can afford not to make such an effort. Evidence suggests that without appropriate social structures, the introduction of ICT in society is no *magic fix*, but will simply reinforce or increase socioeconomic inequality. Yet such social structures should, according to the literature, occur at the community level, and so policy makers should not attempt to engineer them from above, but rather create enabling environments where they may flourish. A competitive market is one important element of such an environment, but not all social structures and processes can take place within or emerge from the market.

The diagram in Figure 1 shows access and use result from the interaction between social and technical infrastructures. Both of these structures, in turn, should be capable of adaptation in response to the type of access and use. This feedback can happen at multiple levels — at an organizational level, a community level, and at a national policy level (in response to cumulative trends and in accordance with nationally shared priorities). Both technical and social infrastructures are likely to have a mix of privately funded, market-based elements and publicly funded elements, although the mix is likely to emphasize the private domain in technical infrastructure and the public domain in social infrastructure.

The following section of this chapter presents two recent examples of processes to create appropriate social structures for facilitating community-level ICT use: the case of RANET Uganda and the case of CITRED in Northern Ghana. New organizational structures must usually build on and link to existing organizational and informal community structures. Both of these examples were financed

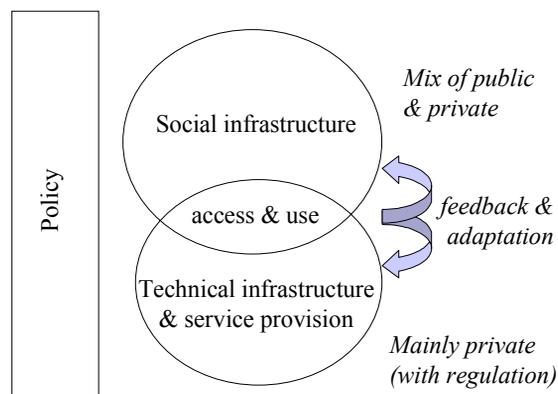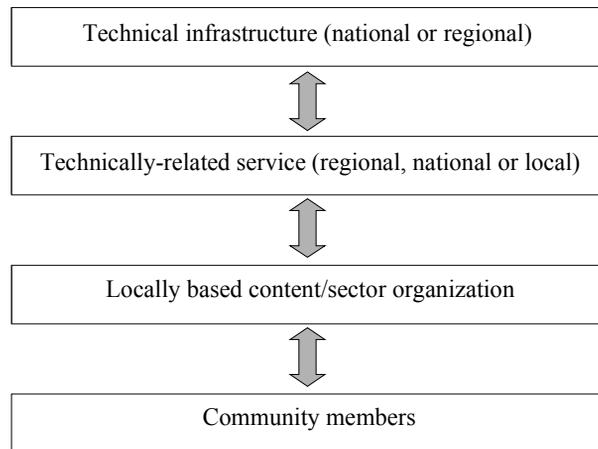*Figure 1. Interaction between technical and social infrastructures*

Figure 2. Organizational layers for locally relevant ICTs

Technical infrastructure (national or regional)

⇕

Technically-related service (regional, national or local)

⇕

Locally based content/sector organization

⇕

Community members

mainly through public and donor funding, and managed through the directives of not-for-profit organizations. The first case, of a climatic information delivery system in Uganda, highlights innovation and flexibility at both national and local levels. The second example of a pilot community research project, which used and built upon the resources of a telecenter in Northern Ghana, illustrates some of the promises and the challenges posed in community-based ICT work.

Both cases also demonstrate the way that organizational structure and partnership may reflect some of the different elements of access, especially in the *access rainbow* proposed by Clement and Shade (2001). These layers can be roughly categorized into four, as shown in Figure 2. The top layer is the technical infrastructure and the bottom is a specific community. The middle two layers are the main coordinating organizations. One organization (or it may be a department or individual within an organization) is responsible for technical expertise with ICTs as they relate to a particular functionality — such as responding to climate forecasts or conducting community-directed research. The second organization (or department or individual) has strong relationships with a specific community of potential participants/users and can serve as a kind of broker between the technical agency and the community.

RANET   Uganda

RANET is an international program in which a number of African meteorological departments participate. The title stands for *Radio and Internet*, emphasizing

the use of a range of ICTs. The program has focused on using data streamed over satellite radio to communicate information about climatic conditions to farmers. In Uganda, 82% of the population is in agriculture, which is the most important economic sector in Uganda. Ugandan farmers are usually small scale and subsistence based. Over two-thirds of farmers hold land less than three acres, and 80% of farming is subsistence oriented (UBOS, 2001; Oryokot, 2003). For this reason, supporting farmers and improving farming methods has been the focus of poverty reduction strategies. The 2002 National Participatory Poverty Assessment (Ugandan Ministry of Finance, Planning, and Economic Development, 2002) reveals that knowledge and information for farmers — both related to farm practices and especially to markets — features highly amongst those options that poor Ugandans viewed as critical to increasing well-being and security. Links between poverty and environmental factors also warrant greater attention, according to the same report. Thus RANET's aims are compatible with broad Ugandan development priorities, although the latter also emphasize the need for agricultural commodity market information. In fact, many local RANET sites were disseminating current market prices around the country along with seasonal climatic forecasts.

The information about this case study was gathered as part of a 2-month research visit to Uganda by the author in 2003 and included interviews with RANET Uganda staff, World Vision staff, and visits to two RANET community sites (located at World Vision area offices) in Tororo and Bukinda. At both sites, interviews with the staff were conducted. In Tororo, a group interview with seven of the community users was conducted, and in Bukinda, an interview with a community user/organizer. This case study draws primarily on the Tororo community experiences.

Milton Waiswa, the national coordinator for RANET Uganda and staff of the national meteorology department, explains that prior to RANET, the department prepared bulletins that contained advice to farmers regarding weather conditions. These were sent by courier to Uganda's 56 districts. In Uganda's decentralized governance system, there are three further administrative levels before the information would *trickle down* to the villages and eventually the farmers. From the department's own investigations, the bulletins actually reached the farmers only about 10% of the time. Because the information was time sensitive, even when it did reach the intended recipients, its value was often compromised through delay. In Uganda, as in most parts of the world, climate patterns are changing and farmers are in particular need of advice that will help them predict and respond appropriately to these changes.

Overall Organization

RANET Uganda is coordinated from the National Department of Meteorology, situated in Kampala, the capital city. It is a member of RANET International, a program created by ACMAD, a consortium of African meteorological departments, with funding primarily from USAID and the U.S. National Oceanic and Atmospheric Administration's Office of Global Programs. RANET International provides some funding, training, and networking opportunities amongst national members, as well as having negotiated the technical agreement with First Voice to provide satellite space for the program and to update the information.

Coordination of RANET in Uganda is based at the Department of Meteorology. Because the government has limited resources and the international program can offer only limited financial support, staff decided to implement the program through partnership with organizations that were already present in the remote rural farming communities to whom the climatic information was targeted. Chosen organizations had both direct established relationships with farmers and computer facilities on-site. This strategy allowed for the program to achieve its aims by capitalizing on existing resources and networks. It also reduced the complexity of implementing RANET because it required less invention of new structures and procedures, but could rather use and adapt what was already present. This national-level innovation differed from the approach other RANET countries took, and it had been noted as one of the most successful.

The first major partnership that RANET Uganda undertook was with World Vision. This non-profit organization has a national head office in Kampala and 10 field offices located primarily in rural and remote areas of Uganda. Since World Vision and RANET were both attempting to reach the same population — remote rural farmers and their families — partnership made sense. World Vision area offices were already established with physical infrastructure, independent power sources (generators and/or solar panels), one administrative computer per office, staff trained in development, and active links with the community, including farmers groups. Referring back to Figure 2, the Department of Meteorology focuses mainly on delivery of the technically related service, dealing primarily with technical, logistical, and capacity-building issues, while World Vision's field offices primarily serve to facilitate community-level linkages.

RANET later set up partnerships with Action Aid in 10 communities and Africa 2000 in four communities using a similar procedure.

The Community Context

The RANET site in Tororo was amongst those in the first wave of sites to be established. Tororo is a district in the east of Uganda, bordering on Kenya. The World Vision office is located in the rural county of Bunyole. It focuses primarily on four parishes comprising about 20,000 people, the majority of whom are farmers. It was established in 1997 to deal with HIV/AIDS issues and since 2001 began an area development program (ADP) to address local development priorities in a holistic manner. These priorities include a focus on education, health, agriculture, water, and sanitation. The first two years of the ADP focused on establishing transparent community-level organizational structures that could work with existing local government. These included village-level committees, parish-level councils, an elected inter-parish committee, and a subcounty advisory committee. These committees and an additional baseline survey were used to determine local development priorities and plan appropriate responses. The World Vision Tororo office used these same structures when introducing the RANET project, training people to champion it and to disseminate the information more broadly.

Technical Dimension

Technically, RANET Uganda depends primarily on WorldSpace radio satellite technology through a not-for-profit operated data-streaming channel called The African Learning Channel. It is over this channel that RANET climatic information is transmitted in Web-based format.

Unlike the Internet, satellite broadcasting is unidirectional. To receive information in any format, one needs a proprietary WorldSpace receiver connected to a computer by a modem. Users receive not only RANET information, but also any information carried over the Africa Learning Channel. Content-wise this focuses on a rich variety of development-related information, including health, education, agricultural information, and market and business information. In 2003, the offices' administrative computers (since these were the only computers present in each office) were being used for downloading and viewing RANET information.

RANET provided WorldSpace receivers and antennae, one ream of paper per annum, and training for World Vision staff, community partners, and other stakeholders such as local radio staff. RANET Uganda installed and maintains the equipment. Because of their limited budget and lack of transportation, maintenance and repair can take months, and may be the weakest part of the system. For this reason, about half of the original sites got off to a slow start, since they ran into technical difficulties and needed to await a visit. Most of these

difficulties were relatively simple and easy to fix, and once running, the system is relatively stable.

The Department of Meteorology produces the climatic reports and maintains a Web site that holds this information and other related information, such as drought monitoring and market prices on food products. Their international partners then upload it to the satellite channel so that those with WorldSpace receivers can download it.

Social Dimension

RANET Uganda's partnership approach relies on partner organizations to link to local communities and disseminate information. However, RANET also provides training through sensitization workshops held about twice a year. Local-level training held at the project site normally has between 30 and 40 participants. This training focuses not just on how to use the technology, but also on how to share it and how to respond to it. For example, they cover what time farmers should plant when the forecast predicts early rains followed by a dry period. Workshop participants have included World Vision area office staff and management committee representatives, local government officials, extension workers, farmers' organization representatives, adult literacy students, and local radio staff. These workshops have also operated to some degree as a planning mechanism where participants discuss how to disseminate information throughout the community.

The operation of each RANET site depends on the particular characteristics of the local host site. The most successful early RANET sites were those in which someone in the local office took a strong interest in the project and spearheaded efforts to get the information shared and used within local groups. This is consistent with literature, including many case studies, which highlights the importance of a local champion (e.g., Latchem & Walker, 2001; Fuchs, 1998; Williamson, 1998).

World Vision's Tororo office provides a specific example of how one local RANET site disseminates information. With RANET, new committees had been formed, but these built on this history of community involvement. Some committee members also served on local government. The central purpose of these committees was to disseminate RANET-related information, often through village meetings or other gatherings.

Access and Use

The ability of local farmers to access and use the information depended on the technical stability of the system and of the capacity of the World Vision staff to

use it and share it effectively. Those offices that were running well with strong community relations were therefore more likely to use the RANET information effectively. There was the potential to use it beyond the climatic purpose directly targeted by RANET because much of the other educational, health and agricultural information applied to other World Vision development priorities and activities. The area offices took an integrated approach to development based on the priorities of the area in which they worked.

In Tororo, those who had been involved in RANET reported using the information for season forecasts, food prices, to learn about weather-related calamities in other areas, to gain national news, to learn general information on farming methods, seed selection, and techniques to reduce the loss of crops. They gave detailed information about how they were able to respond better to climatic conditions because of RANET; for example, once a weather warning reported heavy rains, and so everyone uprooted their cassava. Those who did not believe the warning left their cassava and as a result lost it. RANET had coordinated a research project to collect indigenous knowledge of climatic conditions across the areas where it was active and to try to understand how scientifically generated climate forecasts compared to this knowledge and could perhaps be compatible with it.

Lack of training and lack of equipment meant that not everyone could access the information from the computer directly. More people needed to be trained to use the computer directly, and people also needed to translate information from English to the local language. Both of these had occurred, but needed to reach more people. Dissemination depended primarily on committees that operated at a village level and shared information at village meetings, and was further limited by the cost of printing. One problem is that women were often unable to attend these meetings due to duties in the home. In Tororo, the strategy was to explicitly involve women by placing them on the dissemination committees in equal or greater numbers than the men. Another issue is that of information control. In 2003, for example, both of the community members in Tororo who knew how to directly access information on the computers were also traders. This meant they had direct access to market information and little motivation to share it with the community. Mass media would allow for the greatest dissemination — locals estimated that about half the population had radios, and everyone could know about and possibly listen to a program. Yet almost all the FM radio stations in Uganda are commercial, and gaining their cooperation to broadcast information has sometimes been difficult.

Effective dissemination depended upon effective community mobilization. Those already engaged in the RANET process were very aware of this. Their ability to mobilize as far as they had depended very much on the networks that World Vision had built up with the villages, and upon the visible utility of the information itself.

Feedback and Adaptation

RANET hoped to expand and improve both locally and nationally. The greatest challenge was lack of resources and the risk of expanding beyond sustainability. Effectively disseminating information locally was an ongoing challenge, but one that the offices and their community allies were meeting in inventive ways.

Technically, a means of providing feedback to the national office and to other sites, so that people could directly share their experiences, was generally viewed as something that would improve things, but implied greater cost. Maintenance could be slow. A computer dedicated to RANET would mean that community members could directly access information without conflict with World Vision's administrative requirements. This could also allow for greater community ownership.

Socially, committees and community meetings were useful means of dissemination, but mass dissemination, especially over the radio, would be more equitable and avoid vested interests hoarding information. The biggest challenge in this was in building relationships with FM stations so that they would broadcast information freely, despite the fact that the stations were commercial.

Most of the technical issues required greater funding in order to address. Some of the social issues could and were being met through ongoing planning and building of networks. However, the capacity-building component of this often implied that World Vision staff assistance was also necessary, and this was also a limited resource.

Information and Communication Technology Participatory Action Research (ICT PAR)

The ICT PAR project was undertaken over a three-month period in 2004 as collaboration between the author, in the capacity of professional development awardee with IDRC, and a local NGO called CITRED. The main goal was to explore if and how local actors, especially those with limited previous exposure to ICTs, could access and use ICTs to improve their livelihoods through participatory action research methodology, and to analyze the broader implications for local relevance and sustainability of telecenters. As this was a pilot project, it was fully documented by the author and CITRED staff. Project participants gave feedback through a number of focus groups and individual interviews.

Whereas RANET had been motivated by the specific need to effectively transmit climate information and related advice, this project was motivated rather by the observation that many telecenters have underused potential because they have not yet managed to establish effective demand within the community for their services. CITRED has operated a telecenter in Tamale since 2000. While the telecenter was already well utilized at the commencement of the PAR project, its users represented a fairly select segment of the population. Its management was interested in increasing both the range of users and the range of uses, especially emphasizing an increase in usership amongst rural, female, and self-employed populations, and types of uses that would contribute to social and economic development in the region. Referring back to Figure 2 then, the goal of the project could be said to strengthen the *third layer* organizational capacity to develop local content and application of the technical services CITRED already had.

Overall Organization

The Centre for Information Technology Research, Education, and Development (CITRED) is a registered not-for-profit organization located in Tamale, the main town in the northern region of Ghana. It was established principally by Jonnie Akakpo, who had earlier been involved in initiating three community learning centers on the behalf of USAID (Akakpo & Fontaine, 2001). CITRED's mission is to lead the way in promoting and applying ICTs to social and economic development of the region. Its activities have mainly been provision of computer and Internet services at per-hour fees. In this sense, it operates similarly to local cybercafes and at similar rates. However, it has also engaged in a number of advocacy and training initiatives. For example, CITRED had previously facilitated a schools-partnership project that partnered students in Tamale schools with counterparts in the UK via e-mail and hosted a Northern Ghanaian public ICT conference.

At the time of the ICT PAR project, CITRED had five on-site staff and a project leader. Four of the staff were directly involved with the project as co-facilitators and trainee/observers. In addition, the ICT PAR project hired an extra person to work as a translator and research assistant. The author was the project leader and came to Ghana for the purpose of implementing the project, which included research components on several levels. IDRC provided the project budget, and CITRED also provided in-kind project support.

We convened four groups to participate in the ICT PAR research. Each group contained between six and eight participants. Group members were required to be interested and willing participants, able to commit up to two days a week to the project over the nine-week project duration, and preferably have limited prior

experience with ICTs. We also aimed to have a range of educational levels and an even gender mix.

The groups were:

1. *Farmers:* Members of the first group were all farmers from Cheshe, a village outside Tamale. They were all male (since farming in that community was mainly a male activity) and had a mix of education, from none to secondary school.

2. *Micro-entrepreneurs:* Group members were evenly mixed between men and women, and all were engaged in some form of micro-enterprise and belonged to a local community group — two members were drawn from each of four local groups. Educational levels ranged from none to some post-secondary.

3. *Post-secondary students:* Two students each from a nursing college, a teacher training college and a business polytechnic, participated in one group — all were young women and many were from outside the immediate community.

4. *Youth:* A co-ed group of youth from four different local youth organizations formed the final group. Their level of education ranged from junior secondary school to secondary school completion, and their ages ranged from 14 to 22.

Community Context and Linkages

Tamale is the capital of the Northern Region of Ghana and has a population of about 350,000 people. The Northern Region is home to about two million people, covers almost a third of Ghana's landmass, and is one of the poorest regions in Ghana (Government of Ghana, 2003). Most people in the region are rural farmers and traders. Other than major arterial roads leading in and out of the city, the road system is very poor, as are other services such as education, health services, and electrification. Lack of employment opportunities, very limited access to markets and to credit, and a large underemployed youth population are commonly cited problems in this area, borne up by formal research reports, although few regional statistics are available (Government of Ghana, 2003). Water and sanitation both within the city and in outlying villages are also major concerns since diseases such as malaria and guinea worm are very common.

The links forged between CITRED and *the community* through this project really represented a cross section of a variety of different communities and concerns. While most of the participants were local to the region, some of the

post-secondary students hailed from other areas and had come to Tamale for their schooling. About half of the participants lived within the city, while half lived in surrounding rural areas. The farmers' group was the most homogenous, since they all came from a single village. The current vocations of the people in the groups were the main factor influencing their decisions of what to research. The process of collective prioritizing within the groups was the only mechanism for determining whether and how the groups' work fit in with larger community and social priorities, based on the assumption that the concerns they had would likely be representative of concerns held by the larger communities of farmers, traders, youth, and young female professional students.

Technical Dimension

CITRED had a VSAT terminal at a transmission rate of 128/64 kbps, allowing for a relatively fast and reliable connection. In addition it had 20 public computers, a scanner, and several printers. CITRED had acquired most of this equipment through donor support. Power outages occurred about once or twice a week during the project and usually did not last long.

In addition, the ICT PAR project had access to a digital camera, a conventional camera, and five tape recorders. It also made use of public photocopiers and telephones that were readily available throughout Tamale. Tamale was also home to four local FM stations. Radio Simli, located in a village about an hour's journey from Tamale, operated as a community radio station. These radio stations also played an important role in the ICT PAR project.

Social Dimension

The ICT PAR process took place over nine weeks. In many aspects, it was a process of building social relationships within the groups and between the groups, the CITRED staff, and the facilitator.

The basic chronology of the research process was as appears in Table 1.

This varied from group to group, depending upon the specific research that each group decided to undertake. Groups met at CITRED twice a week for a total of six hours. Group members often came in early to use the Internet and the computers. Training was provided informally to orient participants to new technologies and to provide ongoing support and one-on-one instruction to aid in completing specific research-related tasks.

The author's role was temporary, as a foreigner (Canadian nationality) and a facilitator of the process. The hope was that if the process proved viable, the

Table 1. Basic chronology of ICT PAR research process

Week	Activities
1	Introductions, choosing a research topic and question
2	Developing the methodology and research plan
3	Basic training in relevant ICTs, developing the instruments
4	Data collection
5	Data collection, beginning of data processing
6	Data processing and analysis
7	Data analysis, producing outputs
8	Completion of data analysis, producing outputs
9	Completion of outputs, dissemination

local staff could take ownership of it, and that the process itself could help to forge a relationship between the staff and the community. One finding of this process, however, is that building such capacity is a difficult and time-consuming process — the project period was not sufficient to accomplish it.

Each group decided as a collective what problem it wanted to address through its short research period. The process of problem selection was collective, with very little direction regarding content provided by the facilitators. The farmers decided on the issue of whether it was possible to own a tractor as a group, given that they were having difficulty plowing sufficient land by other means. The micro-entrepreneurs were concerned with high default rates in micro-credit lending. The youth wanted to look at limited computer access and related skills. Finally, the young women chose the issue of poor drainage since they saw this as a key cause of poor health at a national level.

The groups then identified specific objectives and devised strategies for answering these objectives. This was done collectively through processes of brainstorming, prioritizing, and discussion. Each group also created a dissemination strategy for their findings. The use of ICTs was embedded within these strategies. In many instances, the group participants directly suggested them. In other cases, where the participants may not have been aware that a particular ICT might be a viable tool for a particular purpose, the facilitators discussed this as a potential option and the group usually adopted it. Most group members expressed interest in learning ICTs while they had the opportunity to access them within the context of the project. This was true of all groups, although the youth group was the most emphatic about this.

Most of the analysis took place through a discussion of information gathered through a wide variety of methods. These methods included reading books at local libraries, searching the Internet, interviewing people, surveys, focus groups, listening to the radio, scanning newspaper ads, and drawing on personal experience. Survey information, when carried out, was entered into a database or spreadsheet and summarized. The bulk of analysis, however, was qualitative.

The process of reporting back and discussing the results as they related to the initial problem and objectives proved to be a powerful form of analysis, since different group members could bring new suggestions and perspectives to the information. This was also an observably empowering process as the participants gained a sense of ownership over the process and recognized themselves as doing legitimate research. Participants also emphasized this aspect in feedback.

Access and Use

The ICT PAR participants came from a broader range of backgrounds than the average CITRED patron and were overall more representative of the general population in Northern Ghana in terms of education and background, especially the farmers' group and the micro-enterprise group. In comparison, a typical, paying client of CITRED's Internet services was a male student in junior or senior secondary school, lived fairly close to the center, and used the services primarily for Web-based e-mail to friends, relations, and online penpals. Older professionals and foreigners constituted a significant minority of users, and used the services for a variety of communication and work-related functions.

In the ICT PAR project, ICTs were both used as research tools and were explored because many participants had a strong curiosity about them, given the opportunity. Most had limited prior exposure to ICTs other than radio. However, a number of practical access barriers remained within the context of the project. One was literacy — for those without any formal education, interaction with the computers was relatively superficial and consisted mainly in watching others. Gaining confidence in operating other equipment such as the tape recorders and digital camera was easier and most participants had the opportunity to do so. Even those who could read and write in English found that the use of the computers could be challenging given the limited time. Although support was available, sometimes it was insufficient because the staff was often busy with multiple tasks and could only provide limited attention. The main criticism of the overall process on the part of the participants was that they had not been able to build up their ICT skills as much as they would have liked, although the process had sensitized them to the potential of ICTs. They also expressed general satisfaction with the research skills they had developed and the knowledge they gained on their research topic.

It is difficult to state definitively the degree to which the ICTs contributed to the overall research. The Internet was useful for locating information, but at a national and international level, whereas much of the research focus was local. For the farmers, it was a great source of information about tractors and more generally, on agricultural practices. For the group concerned with drainage,

online information proved to be their most substantial resource. The micro-enterprise group listened to Radio Simli to learn more about micro-credit in the area, and three groups also chose to broadcast their results over local radio stations. Word processing software helped in preparing interview and survey forms. The digital camera was used to capture some of the research process and also to document the state of drainage in several local neighborhoods. Tape recorders were especially useful for those participants with no or limited literacy as a way of recording both group discussions and interviews with others. ICTs, and especially computers, also seemed to boost the confidence of the research participants and legitimize their work in their own minds.

All the groups managed to successfully complete their research, share their findings, and discuss how they hoped to use these findings. The micro-entrepreneurs and the farmers generated results that were most likely to be of immediate benefit to them, since many micro-entrepreneurs belonged to groups that received loans, and the farmers developed a strategy to collectively purchase a tractor, including an analysis of its advantages and disadvantages in comparison to other options including hand ploughing, using oxen, and renting a tractor.

Feedback and Adaptation

The main issues related to the technology included the fact that people had to travel to CITRED to use the computers and the Internet — these were not portable. The issue of Internet content (mainly in English, little local content, and mainly text-based) was also a limitation on its use in this project. Very strong support was required for new users, especially older participants who often feared to experiment since they felt they might damage the computers. These observations, while not new, were important elements of the project experience.

Using ICTs had such strong symbolic value for the participants that it sometimes seemed to overshadow the practical aspects. ICTs were primarily a symbol of class and relative wealth. For this reason, many participants saw the role of ICTs as potentially transformative rather than something to be integrated into their own lives. One participant, a weaver, commented that the skills he had gained were of no value to him if he could not use them to get an office job. Weaving, in comparison, he saw as a poor way to make a living, since the profit margins were very low.

Through the experience of this brief project, a number of links with other not-for-profit organizations were made, both to share information and because some-times the aims of the organizations matched the aims of the participant-researchers. For example, a large number of organizations were involved with

micro-credit lending, and so the research findings from the micro-entrepreneurs' group was of direct relevance to them. Many organizations were contacted and interviewed by group members, who also followed up by sharing their research findings with the same organizations. Many other organizations worked directly or indirectly with farmers' groups, and equally were able to contribute and learn from the farmers' research. This suggests the possibility of longer term partnerships between CITRED and such organizations to share costs and expertise in facilitating community-based research using ICTs within specific geographic areas, or community sectors, similarly to the way that RANET Uganda has partnered with World Vision field offices.

To do this, CITRED would have to have the technical and staff capacity to support community research, and to depend on partner organizations to have the appropriate community connections that could ensure that relevant people were involved in the research, and that the same people were able to follow through and respond to results. The challenge for CITRED, and any similar organization, was in finding the necessary people and resources to support this. As a fairly small organization that depended in part on short-term interns, it faced some staff turnover and also some funding instability. This made it difficult to create the conditions to move this project towards a longer term endeavor.

Key Lessons

Both the RANET and the ICT PAR cases provide examples of participatory use of ICTs, in the general sense that they allowed for experimentation and learning with ICTs at a community level, and attempted to be responsive to this experience at a broader organizational level (Gumucio Dagrón, 2001b). Organizational responsivity and change were limited both by a lack of resources, and by the existing focus and character of the organizations. Both experiences corroborate the literature on the importance of social structures in ICT for development (e.g., Simpson, Lennie, Daws, & Previte, 1998). This is an issue that still lacks emphasis within most policy, although it is crucial within the experience and conceptualization of most practitioners.

From these two cases, some practical lessons can be drawn that are applicable both to the future of these specific projects and to the efforts of practitioners planning ICT-related community development elsewhere. Four key lessons are:

1. The need to balance technical and social competence in project management;
2. ICT projects need to build upon, but will also be limited by, existing organizational and community structures;

3.   Projects should have the capacity to learn, and this should include critical appraisal of existing social structures and processes; and

4.   Limited resources provide a constant constraint and potential threat to well-balanced responsive ICT projects.

1. The Need to Balance Technical and Social Competence in Project Management

Projects must practically address both technical and social dimensions simultaneously, and have the resources and the capacity to manage both. Partnerships and alliances can prove fruitful where a single agency may not have the capacity to address all angles. RANET provides a good example of a useful alliance where the Meteorology Department was able to address primarily technical issues and the World Vision area offices were able to address primarily social and organizational issues. Where either of these is not addressed, the results are likely to be minor. For example, some RANET sites were effectively inactive due to technical problems, whereas CITRED had historically limited success in meeting all of its goals due to a lack of community linkages.

2. ICT Projects Need to Build upon, but will also be Limited by, Existing Organizational and Community Structures

ICTs can recreate and reinforce social structures and inequities if unaddressed (Delgadillo, Gómez, & Stoll, 2002). For example, at the Tororo RANET site, those people who were already acting as middlemen in commodity trades were placing themselves in charge of market price information. Because the project had not yet explicitly addressed the control of this information, it risked reinforcing existing inequities in knowledge about varying market prices rather than equalizing them. ICT projects also operate within the constraints of existing structures, even where they may attempt to be transformational. In the PAR projects at CITRED, both staff and participants often acted in ways that assumed males had greater authority and knowledge than females, and formally educated people had a greater authority than less educated people. Facilitation of the groups had to actively counteract this to enable all participants to have legitimate input into their research.

3. Projects Should Have the Capacity to Learn, and this Should Include Critical Appraisal of Existing Social Structures and Processes

Learning means questioning what exists and being prepared to change it. Knowledge and the legitimization of knowledge are closely tied to power. For example, the legitimization of usually neglected voices in the PAR processes in CITRED occasionally caused group members or staff members used to positions of authority to feel threatened, and this occasionally resulted in conflict. Conflict resolution, formal or informal, can therefore become another necessary element to these processes. The fear of being wrong or admitting to being wrong can be, conversely, a powerful reactive force against learning at both individual and organizational levels.

4. Limited Resources Provide a Constant Constraint and Potential Threat to Well-Balanced Responsive ICT Projects

Finding and securing sufficient resources, especially to respond to issues emerging from use, was a major challenge for both projects. RANET had overcome this to some degree by the careful use of partnership and alliance — so that the increased burden of cost and staff time could be absorbed by existing structures. For project managers, recognizing the additional resources and costs required to build up the social aspect of ICT projects from the outset will help to maintain balance, or else equipment and maintenance may tend to dominate budgets without any structures for putting them to good use.

In terms of the benefits offered by an approach that explicitly takes social structures into account, quite simply without such an approach, projects are unlikely to reach their original aims. RANET and CITRED managed to reach many of their goals because they addressed both social and technical aspects.

Conclusion

For policy makers, there are three key lessons about what is important in achieving meaningful development through the use of ICTs. First, social structure is important. Second, community participation is important. And third, organizational learning is important.

While the first point is well documented and may seem obvious, most policy today tends to be too strongly focused on the technology. Social structure is not the only component of access and use, but it is a crucial one that is often overlooked by

policy makers. Social structure can be developed by partnerships with not-for-profit or public agencies focused on ICT applications, and not-for-profit or public agencies with strong links within a particular community and a commitment to development-related objectives, either sectoral or general.

The second point is that community participation is important — which means that those who are involved in using ICTs need to explore how they will use it, which often requires experimentation and some external support in terms of training and resources. A close relationship between at least one of the organizations and the community is important because it is through this relationship that locally meaningful use of ICTs can occur. The organization and the community work together to forge the appropriate social structures (local committees in the case of RANET and research groups in the case of the ICT PAR project) to apply them.

Organizational learning means that the organizations that are hosting and facilitating the use of ICTs for development must be responsive to the experiences of the community that arise as a result of this use. The relationship between organization and community may also be a main mechanism for much of the learning that must take place at the organizational level.

Policy makers can take a number of actions to enable these lessons to come into practice. They can explicitly recognize the importance of social structures in their policies, and recognize that such structures must be dynamically generated through interaction between locally based organizations and communities. Universal service funds, and other public and donor funds targeted for universal access initiatives, can be used to create the public spaces necessary for such efforts to flourish. When regulating the market environment, policy makers and regulators also need to consider the needs of these organizations. For example, if all organizations with VSATs are required to pay hefty annual license fees, how will these impact the efforts of grassroots organizations in the less connected parts of the country? The best way to answer these types of questions is to have transparent policy and regulatory review processes in which these types of organizations are included.

The nature of organizational learning required by these processes mean that top-down social engineering is unlikely to be effective, as with efforts that do not address social aspects of access. Early efforts by national governments already demonstrate this (e.g., Benjamin, 2001b). Rather, governments need to focus on providing enabling environments. Funding agencies can also be more sensitive to the flexibility that these processes require. Goal-based management practices of donor agencies and other funding sources can, for example, predetermine funding allocations in a way that prevents responsivity.

Another area in which much remains to be done is in learning, at a policy level, from such social processes. For example, in Canada, although the government

has spent over a billion Canadian dollars in rural connectivity and community access initiatives, there was no monitoring and evaluation component in place until a group of academics took the initiative to create one (Clement et al., 2004). Although a lot of evaluation activity has been done at the project and program level by various donor agencies, collective learning, and incorporation of such learning into policy remains limited.

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Terms and Definitions

Access gap: The gap between current levels of access and universal levels of access. It is the gap between public interest and private profit in the actions of information interchange. Similarly, the information gap in the role of media lies in the asymmetry of information flow.

Digital divide: Describes the gap between those who are able to access ICTs and participate in the information economy, and those who are unable to access ICTs and so are excluded. Socioeconomic factors play a central role in determining who is able to use and benefit from ICTs. This pattern, unaddressed, implies widening socioeconomic inequalities.

Social structures: Refers broadly to the non-technical aspects of ICT access, and includes institutional and organizational structures and the links of these to community structures and processes.

Universal access: An ideal situation in which all people are reasonably able to, should they wish, use a given service or technology. A common policy target for ICTs, especially telephony.

Chapter VI

Enacting and Interpreting Technology—From Usage to Well-Being:
Experiences of Indigenous Peoples with ICTS

Björn-Sören Gigler
London School of Economics and Political Science, UK

Abstract

Under which conditions can information and communications technologies (ICTs) enhance the well-being of indigenous communities? This chapter investigates this question, focusing on the role of information and communications technology in promoting indigenous peoples' development. First, the chapter analyzes key factors under which information and knowledge can be instrumental and substantive for the empowerment of marginalized groups. Hereby, it will be argued that improved informational capabilities*, similar to the enhancement of a person's writing and reading skills, can enhance poor people's capabilities to make strategic life choices and to achieve the lifestyle they value. The chapter develops an alternative evaluation framework for ICT interventions based on Sen's capability approach. This framework places, in contrast to the current discourse*

around the digital divide*, the human development of the poor and not technology at the center of the analysis. The chapter concludes that a direct and causal relationship between ICTs and enhanced well-being does not exist, but that in fact this relationship is being shaped by a dynamic, multi-dimensional interrelationship between technology and the social context.*

Introduction

What is the impact of information and communication technologies (ICTs) on indigenous peoples[1]? Can the introduction of ICTs enhance their human and social capabilities and thus improve their well-being[2]? The starting point of the following chapter is to investigate the impact of ICTs on development from the vantage point of marginalized communities themselves. This approach centers on people and their well-being rather than on technologies. It underscores the notion that communities are not mere *beneficiaries* of development, but have the capacity and creativity to define their own development priorities, goals, and vision for the future (Chambers, 1983; Cernea, 1991; Eade, 2003; Max-Neef, 1991; Korten & Klauss, 1984). Using this concept, an alternative evaluation framework of ICT programs has been developed that places their human development rather than technology at the core of its analysis (Madon, 2003) and which operationalizes Amartya Sen's capability approach.

The chapter addresses the two key questions, whether and under which conditions the improved access to information and knowledge facilitated by ICTs can enhance the capabilities of marginalized groups to better achieve the lifestyles they value. At the outset, it will be argued that information and knowledge can play an important role to improve the well-being of marginalized groups, as long as they are fully integrated into the broader socio-political realities of the communities (Castells, 1997, 1998; Madon, 2000; ITDG, 2001; O'Farrell, Norrish, & Scott, 1999). This approach places communities' assets and capabilities in the center, and examines the catalytic role of information and knowledge flows in expanding the capabilities of marginalized groups. Within this framework the chapter investigates key factors that enable marginalized groups to gain *real and meaningful* access to ICTs and allow them to appropriate these technologies as an instrument for their own development.

On the basis of two case studies, the chapter will provide a set of conclusions, which point out that it is in fact not possible to identify a direct and causal relationship between ICTs and the improved well-being of marginalized groups, stressing the complex and dynamic interdependency between people, social institutions, and technology.

Background: Indigenous Peoples
and ICTs for Development

Indigenous peoples have historically been the poorest and most excluded in Latin America. They have not only faced serious discrimination in terms of their basic rights to ancestral property, languages, cultures, and forms of governance, but also in terms of access to basic social services (education, health and nutrition, water and sanitation, housing, etc.) and the essential material conditions for a satisfying life. These conditions of extreme poverty and material deprivation — what might be best described as a denial of the fundamental social citizenship rights of indigenous peoples — are widespread in many parts of the world (Davis, 2002; Partridge & Uquillas with Johns, 1998).

In recent years, the potential of information and communications technologies[3] for development has gained a lot of attention in the development discourse (Braga, 1998; Heeks & Kenny, 2002; Panos, 1998; UNDP 2001; Wade, 2002; World Bank, 1995, 2000). Within this debate, critics highlight that the emphasis is frequently being placed on providing access to ICTs to the poor before analyzing the value information and knowledge exchanges play for development at the local level (Black, 1999; Mansell, 1998; Menou, 1993, 1999; Norris, 2001. But an unanswered question remains — what is in fact the impact of ICTs on the lives of indigenous peoples?

The analysis will draw on the contextual approach to ICTs, emphasizing the importance of the socio-economic and cultural milieu, considered crucial for a better understanding of the potential effects of ICTs on development (Avgerou, 2001; Kling, 2000; Walsham, 1993, 1995). This approach stresses that technology only receives meaning once it is *enacted* by users, and thus people can exert control over its use by interpreting and appropriating it to their specific realities (Orlikowski, 2000). In essence, it places human action rather than technology at the center, and emphasizes the interdependencies between technology and the social context (Orlikowski, 2000; Avgerrou, 2001). The chapter focuses on this very interrelationship between technological and social change, in effect, seeking to broaden the focus from simply studying the immediate and measurable effects of ICT diffusion and usage to a wider scope encompassing the analysis of social, economic, and cultural aspects of the local context in which ICTs are placed. This approach follows earlier empirical works (e.g., Harris, Bala, Songan, & Khoo, 2001; Madon, 2001; Miller & Slater, 2000; Nelson, 1996) which have demonstrated that the researcher has been able to discern the specific factors (i.e., local culture and social structures) influencing whether or not technologies have a positive impact on the daily lives of poor communities (Avgerou & Madon, 2003).

Key Factors for ICTs and Indigenous Peoples' Development

The chapter highlights the following main factors that influence whether and to what extent the access to and use of ICTs can enhance the capability of indigenous peoples, ultimately resulting in their improved well-being. These include the following:

1.   The role of existing indigenous information systems,
2.   The role of intermediary organizations,
3.   The appropriation process of technology, and
4.   The broader socio-political context.

The Role of Existing Indigenous Information Systems

In contrast to more conventional approaches to ICTs, this chapter highlights the key role indigenous information systems — which are based on indigenous knowledge and communication practices — play for securing the well-being of indigenous peoples (Agrawal, 1995; Chambers, Pacey, & Thrupp, 1989; Brokensha, Warren, & Wern, 1980; Harris et al., 2001; Wang et al., 1994). This approach emphasizes that the existing information and knowledge gaps are rather mutual in nature, whereby not only poor communities lack access to information and knowledge, but at the same time policy makers in capital cities lack knowledge about the local and cultural context of the poor and marginalized groups (Scoones & Thompson, 1994; Long & Villareal, 1994). It is thus crucial to first analyze the existing *information ecology* and traditional information systems and communications channels before exploring the impact of the introduction of ICTs (Madon, 2003; ITDG, 2001; O'Farrell et al., 1999; Slater, 2002).

These traditional information systems are embedded into the existing social and organizational structures at the community level. A common reason for the failure of ICT programs is that key community members (e.g., elders and other *information brokers*) perceive the new technologies as a mechanism to undermine the existing information systems embedded in the social and organizational structures of the community (Robinson, 1998; Long & Villareal, 1994).

The Role of Intermediary Organizations

The literature points to the critical role intermediary organizations are playing in the process of introducing ICTs to local communities (Madon, 2000; Heeks, 2002; McConnell, 2000). For instance, Heeks argues that intermediaries play a critical role in supporting rural communities to overcome some of the previously-mentioned barriers while providing ICT services (Heeks, 2002). However, the literature has neglected to specify the exact role that intermediaries play in the process. Instead it takes a more institutional perspective and analyzes the effects of ICTs within organizations (Avgerou, 2001; Powell, 1999; Meyer, 1997).

Based on this gap in the literature, the chapter suggests investigation in greater detail of the different types and levels of intermediation in ICT programs, hereby distinguishing between the following two types: (1) ICT or technical and (2) social intermediaries. The main role of ICT intermediaries is defined as an organization providing *effective* support to local communities in the use and adaptation of technology. Most commonly an ICT intermediary will be a specialized organization from outside the community, such as a non-governmental organization, local government, or international donor. On the other hand, a social intermediary is defined as a *local* institution from within the community, such as a community-based organization. This classification will be used to analyze the two main aspects of the intermediary process: (1) the manner in which ICTs are being introduced and which technical support services (i.e., training, content development) are being provided to the community, and (2) the extent to which the ICT program is embedded into existing social and organizational structures (i.e., the relationship between existing informal information systems and the ICT intervention).

The Process of Technology Appropriation

Based on this contextualized approach to ICTs (Avgerou, 2001; Madon, 2001; Walsham, 1998, 1993), the chapter emphasizes that the local appropriation of technologies by local communities and the contextualization of information provided through ICTs is a key factor that determines whether indigenous communities are able to derive real benefits out of the use of ICTs. Pure access to ICTs by the poor does not translate into improved well-being (O'Farrell, 2001). In fact, a tool such as the Internet is a very 'western' medium and needs to be appropriated by poor communities before real benefits can be derived. For instance, the content on the Internet often does not reflect the realities of local communities (Ballantyn, 2002). Also, language many times represents a prohibitive barrier for communities in their use of information, as most of the Internet's

content is written in a rather academic or business style, and thus is not directly applicable at the grassroots level. Another factor which acts as a barrier to access, stems from the fact that the majority of the content available on the Internet is in English — limiting access in poor communities across most developing countries (Gurstein, 2000).

The Broader Socio-Political Context

Several authors have argued that existing barriers to the use of ICTs are not simply about the lack of access to technology or inadequate access to relevant and timely information, but that these are in fact much more deeply rooted in underlying social and institutional structures which continue to perpetuate existing socio-economic inequalities between the elites and marginalized groups of society, ultimately reproducing themselves also in the uneven benefits accrued from ICTs (Castells, 1997, 1998; Hamelink, 1994; Hewitt de Alcántara, 2001; Mansell, 2004; Skuse, 2000). Thus, rather than the lack of knowledge of marginalized groups, the existing political, socio-economic, and cultural barriers between the urban elites and the poor inhibit them from making their information and knowledge known and disseminated, blocking their participation in the dominant society's political and economic system.

The Capability Approach

Amartya Sen argues that human development should be viewed first and foremost as a process of expanding people's capabilities. What matters, according to Sen, is what people are capable of being, or doing, with the goods to which they have access. A person's *capability* therefore refers "to the alternative combinations of functionings that are feasible to achieve. Capability is thus a kind of freedom: the substantive freedom to achieve alternative functioning combinations (or, less formally put, the freedom to achieve various lifestyles)" (Sen, 1999, p. 75). Capabilities include things that a person actually has done, as well as things people can possibly do. In other words capabilities refer to the extent of one's positive freedoms (Gasper, 2002, p. 5).

The concept of *functioning* "reflects the various things a person may value doing or being" (Sen, 1999, p. 75). They represent "various components or aspects of how a person lives" (Gasper, 2002, p. 4). A person's ability to realize her or his desired and valued functionings very much depends on her or his capabilities as well as entitlements or assets.

Operationalizing Sen's Capability Approach

In the last couple of years, there has been significant debate in the literature on ways to operationalize Sen's capability approach and to apply it in a more practical way to empirical research (Alkire, 2002; Comin, 2001; Corbridge 2001; Gasper, 1997, 2002; Stewart & Deneulin, 2002), On the one hand, as Comim has suggested, the capability framework is well suited for "evaluating and assessing social arrangements, standard of living, inequality, poverty, justice, quality of life or well-being" (Comim, 2001, p. 4).

On the other hand, however, several scholars have highlighted the difficulties to operationalizing the approach. Comin points out that these difficulties derive from the capabilities approach's "theoretical underspecification and inclusive view of operationalization which contest not only the evaluative but also the practical foundations of utilitarianism" (Comim, 2001, p. 2). Furthermore, a key challenge has been to define a-priori a set of basic capabilities, in order to have a baseline from which to start specific evaluations (Nussbaum, 2000; Alkire, 2002).

Another difficulty related to operationalizing the capability approach is that some capabilities are harder to measure than others. For instance, it is much more difficult to assess a person's ability to have self-esteem than their ability to write and read. This represents particular challenges for gathering data on the non-material aspects of people's well-being.

Comim highlights that the capability approach is particularly suited for micro-level studies, since to a large extent it focuses on non-income variables (Comim, 2001). Such an approach, he argues will reveal more interesting findings at the micro-level than at the macro-level, as research at this level can better analyze people's ability to choose what to do or be.

Toward an Alternative Evaluation Framework of ICT Programs

Based on the theoretical background discussed earlier, the chapter develops an alternative evaluation framework (AEF) of ICT interventions based on Sen's capability approach (Garnham, 2000). The center of the analysis focuses on whether or not and under which conditions the improved access to information and knowledge facilitated by ICTs can enhance the individual and collective capabilities of marginalized groups to better achieve the lifestyles they value.

This approach stands in contrast to the majority of existing ICT evaluations that have focused primarily on the issue of *access* and *usage*, and assume that the

improved access to ICTs will have a direct positive impact on the lives of the poor (Daly, 1999; Hudson, 1995; McConnell, 1995, 2000; Wilson, Daly, & Griffiths, 1998; White, 2000). These evaluations focus on measuring more immediate and quantifiable output indicators, such as the increase in total numbers of Internet hosts and computers per capita.

In an earlier analysis Richard Heeks (1999) has argued that information instead of technologies needs to be in the center of the analysis. The proposed approach, however, goes even one step further and places individual and collective capabilities in the center, with information and ICTs being placed at the outermost circle of the model. The aim is to underscore that ICTs are not a means to an end by themselves and that in fact only under certain conditions can they act to expand the capabilities of the poor and realize improved economic, social, political, and cultural opportunities. Although it is argued that the right to information and knowledge is an important entitlement and its absence can be a contributing factor to poverty, this notion needs to be balanced against the broader context of existing social and economic inequalities, which may reinforce themselves through the technology (Hewitt de Alcántara, 2001; Castells, 1997). Consequently, the sustainable livelihoods framework[4] will be integrated to attempt a more holistic socio-economic analysis of the possible effects of ICTs through its breadth and scope.

As a starting point, it is being argued that it is important to introduce information as an additional asset or capital into the sustainable livelihoods framework. The analysis of the role that information and knowledge can play for development and the view that the right to information represents an important entitlement of the poor serve as the rationale for including the concept of *informational capital* into the livelihoods approach. This concept is defined through the following four components:

1. The extent to which the poor have access to information from the formal institutions of the market, state, and civil society;
2. The ability of the poor to process and evaluate information;
3. The extent to which the poor do not only consume, but produce and share information within their community and networks; and
4. The extent to which indigenous knowledge is used.

As Table 1 shows, the *informational capital* has been added as an additional dimension to the set of livelihood resources of the poor. Thus the framework aims to underscore that the inter-linkages between informational capital and all the other capitals are crucial for evaluating the role information and ICTs play in the livelihoods of the poor. At the same time, it is being argued that information in its own right is an important asset for the poor to improve or secure their livelihoods.

Table 1. Empowerment through ICTs framework

CONTEXT	LIVELIHOOD RESOURCES	INSTITUTIONAL PROCESSES	CAPABILITIES	LIVELIHOOD OUTCOMES
Socio-economic conditions	Economic/financial capital	Existing social structures	Individual	Informational Capabilities strengthened
Demographics	Natural capital	Existing information system	- Material	
Cultural context	Human capital		- Human	
Political context	Social capital	Level and degree of ICT intermediation	- Social	Human Capabilities strengthened
ICT diffusion	Informational capital		- Informational	
ICT policy framework			Collective	Social capabilities strengthened
			- Voice	
			- Organization	
			- Networks	
			- Informational	

Stages of ICT Project

Existing information Systems and environments	Assess Information needs Informational capital	1) Community ICT access 2) Local and relevant content 3) Capacity-building	Local appropriation and use of ICTs	Ownership Sustainability
INFORMATION		ICTs		IMPACT

This approach contends that the capability of individuals and social groups to transform valued functionings into realized functionings depends to a large extent on their livelihood resources or capitals (Bebbington, 1999). The expansion of capabilities is hereby understood as the strengthening of people's capitals. However, questions remain such as: what is the role that information plays in this context, and what justifies broadening the livelihood approach by the additional dimension of the *informational capital*? The main argument for including this dimension into the framework is that information and ICTs can play an important role not only in their own right, but can act as a *catalytic agent* for the strengthening of the poor's capital in multiple areas. As the literature has demonstrated, only the combination of strengthened resources and agency can lead to enhancing individual and collective capabilities (Kabeer, 1999; Bebbington, 1999). Based on these findings, the AEF analyzes under which conditions the expansion of the informational capability can have a positive *multiplier effect* on the other capabilities. In other words, does the expansion of the poor's capability to make meaningful use of ICTs strengthen their capabilities to achieve valued functionings in multiple areas? This notion stems from Sen's concept on the role that human capital plays not only in enhancing a person's ability to generate income, but also in expanding her or his capabilities to lead a freer and more fulfilled life, and to reach her or his valued functionings (Sen, 1997, p. 1960). In this sense the focus is on the agency role of human capabilities for bringing about social change. The AEF applies this concept to the field of ICTs, arguing that better access to information and improved ICT skills similar to the enhancement of a person's writing and reading skills can increase people's capabilities to make choices in their lives in various areas, including the economic, social, and political spheres. Thus, as a result of expanded informational capabilities, individuals will be able to increase their control over important life choices — in this sense information and ICTs can contribute towards the empowerment of the poor.

It is, however, important to emphasize that in this scenario the improved access to ICTs has indirect rather than direct effects on the well-being of the poor. In fact the relationship between these variables is multi-dimensional and needs to be seen within the *broader socio-political context* of a country.

Moreover, the framework requires that at the outset of ICT programs, an assessment of existing *indigenous information and knowledge systems* be carried out (Brown, 1991). A common reason for the failure of ICT programs is that key community members perceive the new technologies as a mechanism to undermine existing information systems and as a challenge to the role of traditional *knowledge brokers* (Robinson, 1998; Long & Villareal, 1994). Thus, it is decisive to carry out an information needs assessment prior to introducing ICTs, and to use this tool in identifying the key stakeholders and their interests in the information system. Such an assessment will make explicit the role that

information plays for the community, and which information and communications channels (i.e., oral tradition, community-radios) have been used traditionally.

Furthermore, the evaluation framework underscores the importance of understanding the institutional structures and processes that mediate the transformation process from livelihood resources into the expansion of capabilities, thus contributing to the attainment of positive livelihood outcomes. Hereby, it is important to analyze the interrelationship between existing social structures and ICT inter-mediation. The framework contends that a successful mediation process by *an effective and local intermediary* is required before ICTs can have a positive contribution towards expanding the livelihoods of the poor. In addition, intermediaries play a decisive role in: (1) identifying and providing access to ICT products and services that suit the local communities' information needs; (2) supporting the generation of local and relevant content; and (3) providing ongoing support in the areas of training and capacity-building (Delgadillo, Gomez, & Stoll, 2003; Gurstein, 2003). Based on this contextualized approach to ICTs (Avgerou, 2001; Madon, 2001; Walsham, 1993, 1995), the AEF emphasizes that the *local appropriation of technologies* by local communities and the contextualization of information provided through ICTs is a key factor that determines whether indigenous communities are able to derive real benefits out of the use of ICTs.

An Overview of Experiences in Using ICTs for Indigenous Peoples' Development

In spite of tremendous challenges associated with the use of ICTs, indigenous peoples have been proactive in embracing the opportunities provided by the use of new ICTs. In particular, the indigenous leadership has used these new technologies to establish or strengthen existing national, regional, and international networks. Hereby indigenous peoples frequently stress the need to foster horizontal exchange of information, knowledge, and experiences among each other. Furthermore, many indigenous peoples have used the Internet as an instrument to strengthen their alliances with international NGOs, academic institutions, and international donor agencies, as well as to raise the awareness of the international community about their needs and concerns.

In order to analyze the specific effects of new ICTs on indigenous peoples, it is necessary to clearly distinguish the different levels at which indigenous peoples are making use of ICTs. In the analysis, the chapter will distinguish between the

following five levels: (1) international indigenous leaders, (2) regional leaders (i.e., in Latin America), (3) national leaders, (4) community leaders, and (5) indigenous communities[5].

At the *international level*, indigenous peoples are increasingly gaining spaces at the international fora, such as through the United Nations Permanent Forum of Indigenous Issues established by the U.N. Economic and Social Council, the U.N. Working Group on Indigenous Issues of the High Commissioner of Human Rights, or various global summits, such as the World Summit on Sustainable Development. As a consequence of this renewed international interest in indigenous peoples' concern, a new international indigenous leadership has been formed. This new indigenous leadership makes intensive use of the Internet mainly as a communication tool in order to coordinate their actions, to lobby for indigenous rights, and to maintain close contact to international organizations, governments, and international NGOs. A good example of this proactive use of ICTs by international indigenous leaders is the Indigenous Media Network (http://www.indigenousmedia.org). This network was established in May 2002 with the support of the U.N. High Commissioner for Human Rights and the Advocacy Project to bring together indigenous journalists from all parts of the world to "promote indigenous identity, language, culture, and human rights" (Indigenous Media Network Website, www.indigenousmedia.org). The initiative was conceived as a reaction to concerns by indigenous peoples that the traditional mass media is solely based on the values of mainstream society, and thus can lead to the erosion of indigenous peoples' culture or be misused as an instrument to stereotype against them. The indigenous leaders see their own initiative as a key vehicle for reporting more accurate and culturally appropriate news coverage from indigenous perspectives to a broad international audience, including indigenous communities, international NGOs, governments, and international agencies.

An experience that demonstrates the new opportunities ICTs can provide indigenous peoples to influence international policy dialogues is the program of *Indigenous Dialogues* jointly organized by the Rigoberta Menchú Tum Foundation (http://www.frmt.org), the University of the Autonomous Regions of the Nicaraguan Coast — URACCAN (http://www.uraccan.edu.ni), and the Development Gateway[6] (http://www.developmentgateway.org). In a series of seven videoconferences, the program connected indigenous leaders from up to 17 countries — primarily from Latin America and to some extent from Africa, Asia, Europe, and North America — to exchange their views and make their voices heard on such global issues as sustainable development, human rights and discrimination, cultural diversity, women and development, and free trade. The program enhanced the participation of indigenous peoples in international policy dialogues. For instance in October 2001, more than 300 indigenous leaders participated in a dialogue to evaluate the results of the World Conference

Against Racism, Racial Discrimination, and Xenophobia. Through the use of videoconferencing, hundreds of indigenous leaders, who were not been able to travel to this international conference, were enabled to participate in the debate and in the development of a joint indigenous peoples' position. This experience highlights that the new international indigenous leadership has proactively engaged with new ICTs and appreciates the value it can bring towards furthering their causes. Dr. Myrna Cunningham, the director of URACCAN, expressed this view by stressing:

We, the indigenous leaders have to take full advantage of this wonderful technology to continue discussing key issues of our concern and to prepare ourselves for international summits, as for instance the World Summit on Sustainable Development. (Gigler with Simmons, 2002, p. 1)

At the *regional level*, increasingly indigenous peoples are using new ICTs to better coordinate their activities and to develop joint regional programs. A good example of the use of ICTs at this level is the experience by the Fondo Indígena para el Desarrollo de los Pueblos Indígenas en America Latina y el Caribe (http://http://www.fondoindigena.org). This regional international organization, representing indigenous peoples of 16 countries in Latin America, has developed since mid-2000 a strategy to use new ICTs as an instrument to: (1) enhance the organization's transparency, (2) improve the information flow between its indigenous and government representatives, (3) promote indigenous peoples' issues at a regional and global level, and (4) enhance the capacity of indigenous leaders to make use of the new ICTs. In order to implement its strategy, the Fondo Indígena established a small communications team, which developed an institutional Web site as one of its first activities, containing information about the institution, specific programs, news, a calendar of events, and contact information. In addition, the organization started a quarterly newsletter, which provides its members and the general public with regular updates about its main activities.

A second main challenge of the institutions represented the need to improve the information flow between its member governments and indigenous representatives. As an important step the organization organized jointly with the Development Gateway in September 2001 the first of a series of capacity-building workshops in the use of ICTs for indigenous leaders. The core objectives of these workshops were: (1) to train national and regional indigenous leaders in the practical use of the Internet (i.e., use of e-mail, Web-searches); (2) to provide indigenous leaders with specific online tools and resources (i.e., through the hosting of Web sites and the provision of free e-mail accounts); and (3) to promote a culture of information sharing and enhanced information flows between indigenous peoples.

Third, the Fondo Indígena became the main partner of the Development Gateway in developing an international Indigenous Peoples Community Portal (http://www.developmentgatway.org/indigenous). The main objectives of this portal is to develop an interactive Web-based platform, where indigenous organizations, international NGOs, governments, and international donors can freely share information about development projects, best practices and lessons learned, research reports, contact information, current events, and related information on such issues as indigenous rights, cultural diversity, sustainable development, and indigenous health. The portal offers a broad range of information on indigenous issues; provides indigenous peoples with the opportunity to access information about the activities of international donors, NGOs, and governments; and disseminates its own information and content to a broad international audience. Moreover, the portal serves as a major source of information about the current situation of indigenous people for the international community.

Finally, one of the key objectives of this ICT program, aiming to strengthen indigenous peoples' capacity to design and develop their own community sites, has however encountered a series of important difficulties. Due to the lack of access to computers, Internet connectivity, and technical skills, many indigenous peoples remain de facto excluded from the services provided by the program. Even national indigenous leaders and organizations frequently lack the resources and capacity to make meaningful use of the portal and other online services. Furthermore, a key lesson of the project is that there exists an abundance of content on indigenous issues, which is more academic or theoretical in nature. However, it is very challenging to develop content that meets the local needs of indigenous leaders or local communities. Finally, due to the previously-described important differences within the indigenous leadership, the portal is confronted with the challenge of serving the information needs of a very diverse audience. For instance, the information needs of international leaders are entirely different from the needs of a community leader.

At the *national level*, there exists an abundance of experience of the use of ICTs by indigenous organizations which provide useful information about existing national policies, laws, and government policies; the current situation of indigenous peoples; and other issues relevant to indigenous peoples. In Ecuador, for instance, the national confederation of indigenous peoples, CONAIE — with the support of an international NGO and volunteers — is providing a broad range of information of the situation of indigenous peoples in Ecuador through its Web site (http://www.conaie.nativeweb.org). Furthermore, the organization has been quite effective in using its Web site and e-mail listservs in coordinating its joint actions between the different indigenous groups, as well as to influence the national and international policy dialogue on such issues as land rights or the structural adjustment programs.

In Canada, the main indigenous organizations have formed an alliance with the government in the development of a national Aboriginal portal (http://www.aboriginalcanada.gc.ca). The main objective of the portal is to provide a single, national Aboriginal window on federal, provincial, and local Aboriginal information and services. Many indigenous peoples however continue to perceive this program as a government-led initiative, since the content and the design of the portal has been coordinated by a technical group within the Ministry of Indian and Northern Affairs. In order to minimize this type of criticism and to allow the full participation of the main national aboriginal organizations, the government has created a Working Group for the project, where all the main aboriginal groups of Canada are represented. The main function of this Working Group is to define the strategic priorities of the portal's future development.

Another example of how the Internet can facilitate indigenous peoples' access to the political arena and can raise awareness about indigenous peoples' issues at the national level is the Mirror Art Group from Thailand. Since 1991, this small NGO composed of young professionals committed to social change has supported the Akbar hill tribe in the highlands of Thailand. The Group's Web site (http://www.bannok.com) has obtained on average 300,000 hits a month, making it one of the country's most popular Web sites. Through its Web site the organization has successfully promoted indigenous peoples' rights, and carried out many campaigns to support the Akbar people through the recruitment of volunteers and solicitation of financial resources and in-kind donations. Furthermore, the Akbar people have had some success in trading their arts and crafts through the site (Gigler, 2001).

These examples, however, illustrate in themselves a key challenge — that the large majority of information found on the Internet is produced by outsiders (i.e., international NGOs or academic institutions), rather than developed by indigenous organizations themselves. An evaluation of 200 Web sites from Latin America carried out by the author in 2002 demonstrates that approximately 75% of these sites are being produced and maintained by international volunteers, NGOs, and academic institutions, rather than by indigenous peoples themselves. An interesting case highlighting this issue represents the AymaraNet (http://www.aymaranet.org), which provides some of the most comprehensive coverage about the Andean Aymara culture on the Web. Although the site provides information in English, Spanish, and Aymara, it is significant that the site has been developed and maintained by an Aymara activist living and working in Washington, DC, instead of being locally developed and owned by indigenous leaders of the region.

At the *community level*, there seems to exist a discrepancy between the use of ICTs by community leaders and community members. Frequently, community leaders have started to use new ICTs by using cell phones and Internet services

(mainly in the form of e-mail), particularly when they are traveling to the nearby urban centers. For instance in Peru currently exist approximately 1400 public telecenters exclusively in urban centers, which enable community leaders and certain more privileged indigenous subgroups (i.e., indigenous professionals) to access ICT services. At the same time, the large majority of indigenous peoples living in their communities remain completely excluded from the access to new ICTs.

Furthermore, local indigenous leaders play a key role in deciding whether or not communities should engage with the new forms of ICTs. In the Ecuadorian community of Sumbagua in the Cotopaxi province, for instance, a proactive local community leadership cooperated with Chasquinet (http://www.chasquinet.org) — a local NGO dedicated to promoting the use of new ICTs for social change and sustainable development by developing a telecenter in the community. The center directly supported the livelihoods of the local community, when community members where able to find a solution to an insect plague that was threatening the local potato harvest via the Internet. This came about after connecting themselves with indigenous communities that had faced similar problems in Bolivia, Brazil, and Peru. The community leaders were able to use the provided information in order to launch an awareness campaign on how to combat the plague, and through a consolidated effort the community was able to control the plague (Gigler with Daly, 2003). On the other hand, in Mexico one of the main reasons for the failure of several community-based telecenter pilot projects located at the edge of Mexico City and in the State of Michoacán has been the opposition to the project encountered by local indigenous leaders, who felt that the introduction of new ICTs would undermine their position of power as the main holders of information (Robinson, 2000).

Based on this brief overview, it seems key to analyze the impact of ICTs on indigenous peoples in more detail through specific case studies. In the following section, the chapter will provide a more in-depth analysis of two cases studies, whereby ICTs have been introduced to indigenous peoples at the community level. The main reason for limiting the analysis to the community level is that it seems that ICTs have the potential to most directly impact the well-being of indigenous peoples at the community level. As the previous analysis has shown, many of the ICT programs at the international, regional, and national levels seem to reach only a relatively small number of indigenous leaders, as well as having rather indirect effects on the well-being of indigenous peoples. It is thus the aim of the following section to apply the previously-developed Alternative Evaluation Framework (AEF) to the analysis of the impact of ICTs on the well-being of indigenous peoples at the community level.

UNUMA: Bilingual and Intercultural Education Project from Venezuela

Since 2000, UNUMA — Sociedad Civil de Apoyo al Indígena (http://www.unuma.org) — a local NGO working for the promotion of indigenous peoples' development and rights in Venezuela, has focused on the innovative use of ICTs to support a bilingual and intercultural education project of indigenous peoples.

The key objectives of the program are to strengthen the capacity of indigenous teachers from the Wayuu (Guajira peninsula), Kari'ña (El Tigre, Anzoategui), Uwotjuja, Hiwi (Amazonas), and Pemón communities (Estado Boliviar) by providing training in linguistics; production of books in indigenous languages, mathematics, and psychology; and the use of ICTs (see Appendix 1). The role of the ICT capacity program was catalytic in nature and sought to reinforce the other training modules, rather than focusing exclusively on the field of ICTs themselves. Early findings demonstrate the high value of integrating an ICT intervention into a bilingual and intercultural education program. Most indigenous teachers had never used a computer before the training and were enthusiastic about the ICT program. During a field visit in December 2000, an indigenous leader showed the author his computer artworks — all of which were based on traditional Kari'ña cultural and spiritual motifs. He explained to me that this activity was also an important source of income, as he took his *digital artworks* (see Figure 1) and reproduced them on t-shirts and other prints, selling them in the local marketplace.

Based on the success of this pilot experience and the strong demand from indigenous peoples to continue the program, UNUMA was able to finance a second phase of the program in 2002 through a $50,000 grant from the

Figure 1. Artwork: Graphic designed by an indigenous leader of the Pemón community

Development Marketplace of the World Bank. As a first step, a series of consultation workshops with indigenous communities was organized, where it was decided that several computers needed to be purchased in order to expand the ICT program and provide the training to more indigenous teachers, in addition to organizing a series of capacity-building workshops at the community level. Due to the strong interest from many communities, the indigenous communities in all three regions developed a system of sharing the computers, whereby indigenous youth themselves were trained to maintain the equipment and organize the distribution of computers among the different communities. This model is based on collective identity and the strong organizational tradition of indigenous communities, drawing on their cultural value of reciprocity, which provided the basis for the sharing of computers among different communities.

Impact of the Project on the Well-Being of Indigenous Peoples

These first findings from the field clearly illustrate that ICTs can play an important role in strengthening the human and social capabilities of marginalized groups. It is, however, important to take a closer look at the program and to analyze the following questions:

1. What is the overall socio-political context in which the project is taking place?
2. What were some of the ingredients of this successful application of ICTs?
3. What role did the local NGO play in enhancing the individual and collective capabilities of indigenous peoples?
4. In what manner did the project build on and strengthen existing community structures?
5. What are the effects of the project on the cultural identity of indigenous communities?
6. What are some of the key challenges the project is facing?

Firstly, the overall socio-political context of the program is characterized through a permanent struggle of the cultural survival of indigenous peoples in Venezuela. With a population numbering between 2 to 3% of the overall population, indigenous peoples represent a very small minority within the Venezuelan society. For instance, the Kari'ña live in the surroundings of El Tigre, a city that has been for the past 70 years a major area of oil exploration in Venezuela. As a consequence of the *oil boom* in this region, the cultural identity and social

institutions of the Kari'ña communities have come under significant pressure. Many Kari'ña communities are today facing a situation of severe poverty, struggling to make their ends to meet and attempting to preserve their cultural identity.

In spite of this challenging socio-economic and political context, the project is demonstrating that the meaningful use of ICTs by indigenous peoples can significantly enhance their human and social capabilities. One of the key success factors of the project is the fact that the ICT project was fully integrated into the bilingual and intercultural education program. The main role of the ICT program is to enhance the other program components such as increasing literacy capacity, rather than to support the capacity-building of indigenous peoples in the use of computers and the Internet on a stand-alone basis. It is important to highlight that the overall program responds to a key priority of indigenous communities — the strengthening of their cultural identity by recuperating their own languages and improving the quality of the existing bilingual education programs.

This case study illustrates how ICTs can form part of a holistic approach towards promoting indigenous peoples' development, and they can act in a catalytic manner enhancing the human capabilities of indigenous peoples, thus ultimately contributing to improving their well-being. In the project, the instrumental value of ICTs are being well integrated into the more *substantive* aspects of the education program, thus contributing in a significant manner to its overall objectives. In this sense, the objectives of the ICT capacity-building activities are to enhance indigenous peoples' *informational capabilities* not for their own sake, but in order to enhance their skills and further their *human capabilities* in the cultural, social, and economic spheres of their lives.

A very positive aspect of the ICT program is the enthusiasm the project has created for the overall program, particularly among indigenous youth (see Figure 2). For instance, several youth were able to find employment as a result of their newly acquired computer skills. Furthermore, for the first time, six students from the Kari'ña community have been accepted to pursue a career in computer science in several universities in Caracas. A more intangible effect of the program was that the increase in self-esteem of most of the indigenous youth who participated in the training workshops. An important ingredient of the program's success has been the key role that the local NGO has played in acting as a facilitator in promoting the process of individual and collective empowerment of indigenous peoples. It is important that UNUMA has continuously been working with the same indigenous communities since 1992 and thus has gradually gained the respect and trust of many indigenous peoples. Furthermore, the executive director of the NGO has been a longtime ally of indigenous peoples in their struggle to maintain their cultural identity and affirmation of their rights.

Figure 2. Training workshop with indigenous youth in a Kari'ña community of Venezuela (photo by Haydée Seijas, Executive Secretary, UNUMA)

Finally, an important aspect of the program has been the emphasis on building all project activities on the existing traditional social structures. Hereby, indigenous leaders have played a key role in facilitating an open participatory approach that includes all community members, including the most marginalized groups (e.g., women and youth). A key aspect of this process encompassed a detailed needs assessment carried out in 2000 with indigenous teachers in order to better understand their attitudes, needs, and perceptions towards the role of information and ICT for development.

In spite of the overall positive outcomes of the program, several important challenges remain. Firstly, due to the overall difficult political situation in Venezuela, the execution of the program was seriously delayed. Furthermore, the indigenous organizations, particularly among the Uwotjuja, Hiwi, and Kari'ña communities, remain relatively weak, and thus the entire financing as well as a large portion of the program management responsibilities remain with UNUMA. Finally, the program very much relies on the personal commitment of the executive director of UNUMA, and it was not yet possible to transfer its management to the indigenous communities themselves.

Internet Access in the Peruvian Amazon

The following case study illustrates the significant challenges involved in promoting the use of ICT for indigenous peoples' development. In the year 2000, the Ashaninka community Marakiri Bajo (see Figure 3), with the support of IDRC Canada and the Red Cientifica Peruana, initiated the first telecenter project located in a remote indigenous community in the Peruvian Amazon.

Figure 3. Ashaninka leaders of Mari Kiri Bajo using the Internet

The Ashaninka represent the largest indigenous group of the central Peruvian Amazon region. They live in severe poverty, while their cultural identity and subsistence economy are under severe pressure due the exploitation of natural resources and invasion of indigenous lands since the early 1900s (Garcia Hierro, Hvalkof, & Gray, 1998). Moreover, their access to such basic social services remains very limited. Within this overall political and socio-economic context, many indigenous peoples had very high expectations about the potential benefits of the project, while others remained skeptical about the usefulness of ICTs from the beginning. This early enthusiasm about ICTs is best reflected in the words of Mino Eusebio Castro, the Asháninka leader, who spearheaded the project from inception. In an interview with the author in early 2001, he emphasized that "through the help of the Internet[,] indigenous peoples have the opportunity to overcome their exclusion and to have improved access to education, markets, and political participation. The Internet also enables us for the first time to directly contact international donors, to present our opinions in policy debates, and to directly negotiate funding proposals without any intermediaries."

In the first phase, the project focused on finding a technical solution to provide telephone and Internet connectivity to the remote village of Marakiri Bajo, a community without access to electricity and running water. Furthermore, since it was one of the key objectives of the program to provide distance education to indigenous youth, the program installed in the community a state-of-the-art videoconference facility (via a generator-operated satellite system).

What was the impact of such a high-level investment in technology at the community-level? How did the community react to the newly introduced telecenter? What were the reactions of the Ashaninka in the surrounding communities? Was it possible to maintain the interest of the community into the project? Were people really empowered and did they derive real value out of its use?

At first, it seemed that the project was quite successful. Many indigenous peoples — in particular, indigenous youth and women — started to explore the new technologies. Based on this demand, the project initiated a capacity-building program for indigenous peoples in the use of ICTs. As a result of the training, in particular indigenous youth quickly learned how to use the technology and started to make contact with the Ashaninka living in Brazil and other indigenous groups throughout Latin America. Based on the new skills, several community members developed a Web site for the community and began using the videoconferencing facility. At this stage of the project in late 2000, the international audience started to become interested in the project, and Mino Eusebio Castro, one of the community's indigenous leaders and *champion* of the project, was invited to several international conferences to present the case as a best practice on how the Internet can 'empower' indigenous peoples by providing them with an instrument for the reaffirmation of their cultural identity and to contribute to their economic and social *self-development*.

At the same time, however, the project ran relatively quickly into serious difficulties. Firstly, right from its inception only a relatively few number of people actually used the telecenter and the entire project was controlled by a small group of indigenous leaders. As a consequence many indigenous peoples from within and in the surrounding communities felt excluded and began to *envy* the ones who were able to use and manage the center. Thus the project aggravated existing social tensions between the different groups within the community. Due to the long *assimilation process* within the project area, about half of the population in Marakiri Bajo identifies themselves as Ashaninka, with the other half as *mesticos* who have settled in the community relatively recently. The telecenter was controlled by the Ashaninka and was not open for the general public, excluding the non-indigenous population from its potential benefits.

In addition, the telecenter did not meet the high expectations of many indigenous peoples about its potential benefits, in particular in economic and social terms. At first, many people hoped that the new technologies would enable them to better sell their products of fruits and artisans to the market in Lima. Unfortunately, this objective went unrealized due to the lack of an online market for such products within Peru, as well as the communities' limited knowledge and experience with e-commerce.

Moreover, many people encountered problems in terms of being able to relate to the new media due to the lack of local content in their own language. In particular, many women became relatively quickly *disinterested* in the technology, as they felt that the center did not provide them with any concrete information or services they could use in their daily lives. The only group that continued to use the center was indigenous youth. Finally, the videoconference equipment was entirely underused due to a lack of both the supply of educational programs and a very low demand for this service from the community.

On the night of August 29, 2001, these difficulties culminated, when the telecenter burned down and was almost entirely destroyed. It remains unclear to this date who was responsible for this incident or what the motives might have been for the destruction of the center. After this incidence, several community members decided to rehabilitate parts of the center and restarted the program the following year, giving it clearer objectives and grounding it in a much more realistic approach. After a 6-month period of reflection and internal discussion, the community relaunched the ICT program through the opening of a local radio station. The Ashanika radio station is now producing and broadcasting local programs about agriculture, education, health, and cultural topics in the Ashaninka language to about 10,000 people in the project area. The Internet continues to be used, but through existing telecenters in Satipo, the closest intermediary city.

This case study raises a series of research questions: What are some of the key lessons learned from this example? What are some of the key factors that led to the difficulties of the program? How could some of the problems have been avoided?

The first important factor that contributed to the difficulties of the project is the overall complex political and socio-economic context of the project area. As a result of almost 100 years of continuous colonization of the Ashaninka territory, many communities such as Marikiry Bajo have been divided and have suffered under tremendous pressure to maintain their cultural identity. In addition to invasion of their lands, many indigenous peoples became the victims of violence during the confrontations between the *Shining Path* and *government troops* in the 1980s. This violence had severe consequences for them, and in spite of the end to the widespread violence, several guerrilla groups remain sporadically active in close proximity to the project area (see Appendix 2).

Secondly, the project entirely bypassed the existing organizational structures of the indigenous peoples of the Amazon region in Peru. In order to represent the interests and to fight for indigenous rights within the political system of Peru, the indigenous peoples have formed AIDESEP, a national indigenous organization representing the large majority of the indigenous peoples of the Peruvian Amazon. AIDESEP as a membership organization has six regional offices, one of which is located in Satipo and represents the interests of the Ashaninka people of the central Amazon. By executing the project directly at the community level, without any coordination with the traditional organizational structure of the indigenous in Peru, the project created tensions between the different indigenous communities and alienated many Ashaninka leaders within AIDESEP.

Thirdly, the project's design overemphasized the role of technology and did not carry out the necessary groundwork for the ICT investment. It seems that the consultative process at the planning phase was much too scattered and did not provide sufficient space for discussion and dissent within the community. The

process did not include from the outset the non-indigenous population, which contributed to the raising of tensions within the community. Furthermore, the technological solutions, in particular the videoconferencing facility, were not based on real needs from the communities and thus remained underused.

Finally, the local community was not supported by any local intermediary organization; instead the project was being monitored by the Colombian foundation, Fundación Multicolor. In this way, the investment on the infrastructure was not adequately complemented by key preparatory steps identified earlier such as the carrying out of an information needs assessment, building of local content, or extensive capacity-building workshops in the use and maintenance of the technology.

Key Challenges in the Use of ICTs for Indigenous Peoples' Development

While the case studies mentioned have demonstrated that new ICTs have the potential to improve the well-being of indigenous peoples, there continue to exist tremendous challenges for indigenous peoples to make meaningful use of ICTs. The following section will highlight several key challenges.

Ownership and Trust

One of the most important issues for indigenous peoples is how they can control the process of the introduction and use of ICTs in their communities. Many indigenous peoples have expressed their concerns that this process is being driven by outsiders and emphasize that there exists a threat that these new technologies can lead to new dependencies for indigenous peoples. In order to avoid such new dependencies, it is particularly important that indigenous peoples are appropriating these technologies in order to be able to adapt ICTs to their own cultural and social context. It seems that the potential benefits of ICTs for indigenous communities can only be fully recognized, if indigenous peoples themselves acquire the necessary technical skills and know-how in managing and "owning" the technology (Gigler, 2001, p. 36). As shown earlier in the case studies, intermediary organizations that enjoy the trust of local communities play an essential role within this process by providing long-term technical assistance to indigenous communities.

Generation of Local and Relevant Content

Indigenous communities are rich in traditional and indigenous knowledge. At the same time, however, the traditional indigenous information systems are based on an oral tradition, and there are not many experiences through which indigenous communities were able to produce their own local content and to disseminate it through the Internet. As the previous analysis has shown, the large majority of information found on the Internet is being produced by outsiders to the communities, instead of being developed by indigenous peoples themselves. The experiences described in the case studies have demonstrated that the capacity building of indigenous peoples not only in the use of the Internet, but also in the development of their own content, is crucial to allow indigenous peoples to derive more meaningful benefits out of the use of new ICTs. The production and sharing of content is particularly important to enable indigenous communities to share information and lessons learned with each other, and learn from each other's experiences.

Intellectual Property Rights and Indigenous Knowledge

Another important challenge for indigenous peoples is the issue of how they can control and manage their intellectual property rights and protect their indigenous knowledge. Many indigenous leaders have expressed their suspicion about the use of information about their communities by outsiders. They emphasize that the introduction of ICTs has to be based on the recognition of indigenous peoples' basis rights (i.e., self-determination, land rights, etc.), as ICTs cannot be seen in isolation from the overall context in which indigenous peoples live. Consequently, a key demand of indigenous peoples is to establish clear international and national frameworks for the protection of their intellectual property rights, in order to avoid that the introduction of ICTs threatens their cultural heritage and indigenous knowledge (WSIS Global Forum of Indigenous Peoples and the Information Society, 2003). As the example of the telecenter project from Mexico has demonstrated, frequently ICT projects underestimate the importance of taking the cultural and political context of indigenous communities (i.e., the need to adequately protect indigenous knowledge) into account and subsequently face serious problems in their implementation (Robinson, 2000).

Literacy and Capacity Building

A large number of indigenous peoples speak and write their own indigenous language. In particular, indigenous women have frequently very limited access

to formal education and thus are monolingual. Consequently, they have great difficulties interacting with the world outside their own communities. Low literacy levels represent a major challenge in increasing the use of ICTs in indigenous communities around the world. The high correlation between being indigenous and poor is based to a large extent on the lack of equal access to education (Pscharapoulos & Patrinos, 1994). As the case studies have demonstrated, it is crucial that indigenous peoples gradually build up capacities to use and manage modern technologies, so that they can determine by themselves how to make use of ICTs for their own development. The objectives of ICT capacity-building activities hereby should not only be limited to train indigenous peoples in the practical use of ICT applications (i.e., use of e-mail), but also to enhance their 'informational capabilities' (i.e., capacity to analyze and evaluate information). In spite of the efforts to strengthen the capacity of indigenous peoples to use new ICTs, language barriers remain a major challenge when making use of the new technologies. It is estimated that approximately 75% of the content on the Internet is in English, and there exists almost no content in indigenous languages. Consequently the benefits of using the Internet are relatively limited to many indigenous peoples (Kenny, 2003). A very innovative solution addressing this issue represents the multilingual translation system, Atamiri (http://www.atamiri.cc), developed by Iván Guzmán de Rojas, a Bolivian scientist. This computer translation system is made up of a set of natural language processing programs based on a set of mathematical algorithms and is capable of automatically translating text from six languages into the Andean language of Aymara and vice versa.

Existing Economic and Social Inequalities

It needs to be stressed that the impact of ICTs has to be seen within a much broader context of existing economic, social, and political inequalities that are key barriers to indigenous peoples' development. It needs to be fully acknowledged that these structural constraints frequently limit the impact ICTs can have on the well-being of marginalized groups. For instance, the extent to which subsistence farmers can benefit from information provided by the Internet will vary according to other factors such as land rights, proximity to market, available means of transportation, and the overall existing degree to which large-scale producers are dominating agricultural markets. Improved access to market prices represents an important but not sufficient condition to address existing market failures (Curtain, 2004). Thus important challenges remain to make use of ICTs for social change. It seems that the introduction of ICTs can only incrementally improve the well-being of marginalized communities, and needs to be accompanied with complementary programs addressing existing structural

inequalities. For instance, in the case of subsistence farmers, they could form a cooperative in order to join forces and to enhance their overall negotiating power position within the marketplace.

Information Flows Between Different Levels of Indigenous Leadership

A key challenge for the effectiveness of ICTs is the lack of information flows between the different levels of indigenous leadership. This issue addresses the underlying power relationships within the indigenous movements. It seems that a very small number of international indigenous leaders have privileged access to information and do not share this information with national leaders or with the grassroots. While ICTs have contributed to the enhanced access of indigenous peoples to the political arena at the international level and have supported the establishment of strong international networks, it seems that these new technologies have not contributed to the same extent to the democratization and enhanced transparency of the indigenous movement. For instance, the participants of the U.N. Working Group on Indigenous Populations and the U.N. Permanent Forum on Indigenous Issues seemed to be very well connected with each other, while the large majority of national and local indigenous leaders are not aware of the advancements achieved at these global fora. Within countries, there frequently exists a conflict of interest and a certain degree of factionalism between different leaders which impede the free exchange and sharing of information. At the same time, the example of the Fondo Indígena has demonstrated that ICTs have the potential to improve the transparency of indigenous organizations and significantly enhance the information flows between the different levels of indigenous leadership[7]. It needs however to be stressed that ICTs solely remain an instrument, and the main challenge remains to find the political will of indigenous leaders and organizations to promote the open and free exchange of information.

Conclusion

The previous analysis has shown that ICTs under certain conditions can significantly enhance the human and social capabilities of marginalized groups. At the core of the process of introducing ICTs into marginalized communities stands the notion that ICTs can enhance people's control over their own lives. Similarly to literacy, newly acquired *informational capabilities* can act as an

agent for change for individuals and communities — enhancing their abilities to engage with the formal institutions in the economic, political, social, and cultural spheres of their life.

In this context, the issue of whether ICTs are channeling resources away from the real priorities and needs of poor communities seems to be misguided. Instead this question should be rephrased and address the issue of how ICTs could be used to meet the *basic needs* of the poor.

Furthermore, the chapter has illustrated that there is no direct and causal relationship between ICT and poverty reduction. This relationship is much more complex and indirect in nature, whereby the issue of its impact on the livelihoods of the poor depends to a large extent on the dynamic and iterative process between people and technology within a specific local, cultural, and socio-political context. Frequently, the most immediate and direct effect of ICT programs seems to be the psychological empowerment of poor people, whereby newly acquired ICT skills provide the marginalized with a sense of achievement and pride, thus increasing their self-esteem.

A key recommendation of the chapter is that the human development of people, rather than technology itself, should be the center of the design and evaluation of ICT programs. As has been shown, the important advantage of using the *capability approach* as the basis for the evaluation of ICT programs is its emphasis on the ability of ICTs to improve the daily livelihoods of poor communities, in contrast to more conventional approaches that overemphasize the significance of technology itself for social change. Furthermore, evaluations of the impact of ICT programs should focus on an analysis from the vantage point of the poor, rather than from the perspective of outside donors.

In addition the analysis provides the following concrete recommendations on the manner in which ICT programs should be designed in order to be most effective to enhance the well-being of marginalized groups:

- First, the potential benefits of ICTs are largest when they are being fully integrated into other sectoral development programs (i.e., in education or health). As the case study from Venezuela on the use of ICTs in bilingual education has demonstrated, ICTs can make a significant contribution towards reaching the core objectives of this development project — in this case improving the access to bilingual education to indigenous peoples.

- Second, it is essential that ICT programs prior to initiating any project activities carry out a detailed assessment of existing information flows and information needs. Hereby, the analysis should focus on how the new technologies can strengthen existing communication and information exchanges within and in between communities. The assessment should

furthermore identify key *information intermediaries* in the community and analyze existing power relationships as they relate to the transfer of knowledge within the communities. Thus it is essential that poor communities first identify and define their own needs and development priorities before, in a second step, a project can define whether and how ICTs can support the community's development goals. As has been shown in the Ashaninka case, in cases where such a process was not undertaken and the exact objectives of the ICT project were not defined, ICT programs frequently fail.

- Third, it is crucial for the evaluation of the impact of ICTs on the well-being of marginalized communities to analyze the process of how ICTs are being introduced. Hereby, outside agents or intermediaries are playing a key role in supporting communities in appropriating the technologies to meet their own local and cultural needs. Within this process, it is essential that community members gradually gain the skills to make meaningful use of ICTs as well as gradually take ownership of the management of the program. As the case studies have demonstrated, capacity-building activities and the provision of local content through intermediaries are the two important factors that influence whether or not an ICT program will indeed strengthen the capabilities of the poor and thus contribute towards improving their livelihoods.

- Fourth, ICT programs are most effective when combining traditional media with new forms of ICTs. As the case study of the Ashanika community has demonstrated, the convergence between two different technologies — the Internet and community radio stations — is combining the advantages of both media. While the Internet is a powerful tool to connect networks and to exchange large amounts of information across long distance, community radios have a very broad reach, and represent the most accessible and inclusive technology for the poor. Due to the oral tradition of indigenous communities, this is of particular importance, considering that its use does not require literacy.

Finally, the chapter has demonstrated that the most important factors influencing whether an ICT program has positive or negative outcomes are social, political, and cultural in nature, and in fact technical issues involved in the provision of ICTs frequently do not play a key role. The analysis highlights that frequently, ICT programs are not responding to a concrete need expressed within the communities, but are designed in a top-down supply-driven approach. In order to avoid the potential negative social effects, it is crucial to frame any ICT intervention around the existing social community structures. Thereby, the programs should strengthen traditional information systems, building on existing

indigenous knowledge and enhancing existing information channels without undermining the existing structures.

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Endnotes

[1]   No universal definition of indigenous peoples exists, and due to the history of political repression, and discrimination and assimilation policies by states, indigenous peoples usually reject being defined by external agencies. In order to be able to identify rather than *define* indigenous identities, I am suggesting to make use of the working definitions provided by the International Labor Organization (ILO) Convention 169 and by U.N. Special Rapporteur José Martinez Cobo, both of which emphasize that the self-identification as indigenous should be used as the main criteria for the identification of indigenous peoples.

[2]   The research will use Sen's multi-dimensional approach of well-being developed in the capability approach (CA) (Sen, 1984, 1992, 1993). The approach moves away from an income-based perspective of well-being (utilitarianism) to account for the constitutive plurality of human life. It thus emphasizes the non-material aspects of human well-being (i.e., spiritual, cultural, political aspects). The CA characterizes well-being in terms of what a person is actually able to do or to be (achieved functionings) and the combinations of beings and doings that a person can achieve (capabilities).

[3]   For the purpose of this research, I will use Hamelink's definition of ICTs: "Information and communication technologies (ICTs) encompass all those technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic systems, and among electronic systems" (Hamelink, 1997, p. 3). This functional definition of ICTs includes both the new (i.e., Internet, e-mail) and traditional (i.e., community-radio) forms of ICT into its definition.

[4]   The definition used for sustainable livelihood framework is one provided by Chambers and Conway (1992): "A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resources base" (pp. 7-8).

[5]   This classification was defined in an interview with Mateo Martinez, Technical Director, Fondo Indígena, on January 14, 2005.

[6]   The Development Gateway is a program of the Development Gateway Foundation (http://www.dgfoundation.org) that aims to bring together people, resources, and information on development and poverty. reduction. This interactive portal further provides a space for communities to share experiences on development efforts.

[7]   In the case of the Fondo Indígena, the introduction of ICTs supported an institutional change within the organization towards increased transparency. The impetus for the use of ICTs came during the organization's General Assembly held in 2000 in Mexico, in which the need to restructure the organization and to enhance its transparency was discussed by its international donors, as well as government and indigenous representatives.

Terms and Definitions

Capability: The chapter uses Sen's definition of capability as developed in the "capability approach" (Sen, 1999). A person's *capability* therefore refers "to the alternative combinations of functionings that are feasible for her to achieve. Capability is thus a kind of freedom: the substantive freedom to achieve alternative functioning combinations (or, less formally put, the freedom to achieve various lifestyles)" (Sen, 1999, p. 75). Capabilities include things that a person actually has done, as well as things people can possibly do. In other words capabilities refer to the extent of one's positive freedoms.

Indigenous peoples: No universal definition of indigenous peoples exists and due to the history of political repression, discrimination, and assimilation policies by states, indigenous peoples usually reject to be defined by external agencies. In order to be able to identify rather than *define* indigenous identities, I am suggesting to make use of the working definitions provided by the International Labor Organization (ILO) Convention 169 and by U.N. Special Rapporteur José Martinez Cobo, both of which emphasize that the self-identification as indig-

enous should be used as the main criteria for the identification of indigenous peoples.

Indigenous knowledge: There does not exist a single definition of *indigenous knowledge*; the literature however emphasizes the concept's main characteristics as being: (1) rooted in a particular local community and situated within broader cultural traditions; (2) experimental, meaning that it is being tied to action and based on experiences from trial and error; (3) implicit or *tacit*, meaning that it is often difficult for people to express this knowledge unambiguously and to find words to express what one knows (Gidden 1984); (4) transmitted orally, or through imitation and demonstration; and (5) being a dynamic mix of past traditions and present innovations.

Information and communication technologies: In the Chapter I use Hamelink's definition of ICTs: "Information and communication technologies (ICTs) encompass all those technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic systems, and among electronic systems" (Hamelink, 1997, p. 3). This functional definition of ICTs includes both the new (i.e., Internet, e-mail) and traditional (i.e., community-radio) forms of ICT into its definition.

Informational capital: This concept is being defined through the following four components: (1) the extent to which the poor have access to information from the formal institutions of the market, state, and civil society; (2) the ability of the poor to process and evaluate information; (3) the extent to which the poor do not only consume, but produce and share information within their community and networks; and (4) the extent to which indigenous knowledge is used.

Sustainable livelihoods: The definition used for sustainable livelihood framework is one provided by Chambers and Conway (1992): "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resources base."

Well-being: The chapter use Sen's multi-dimensional approach of well-being developed in the capability approach (CA) (Sen, 1984, 1992, 1993). The approach moves away from an income-based perspective of well-being (utilitarianism) to account for the constitutive plurality of human life. It thus emphasizes the non-material aspects of human well-being (i.e., spiritual, cultural, political

aspects). The CA characterizes well-being in terms of what a person is actually able to do or to be (achieved functionings), and the combinations of beings and doings that a person can achieve (capabilities).

Appendix 1

Map: Indigenous Peoples in Venezuela

Source: http://a-venezuela.com

Appendix 2

Map: Indigenous Peoples in Peru
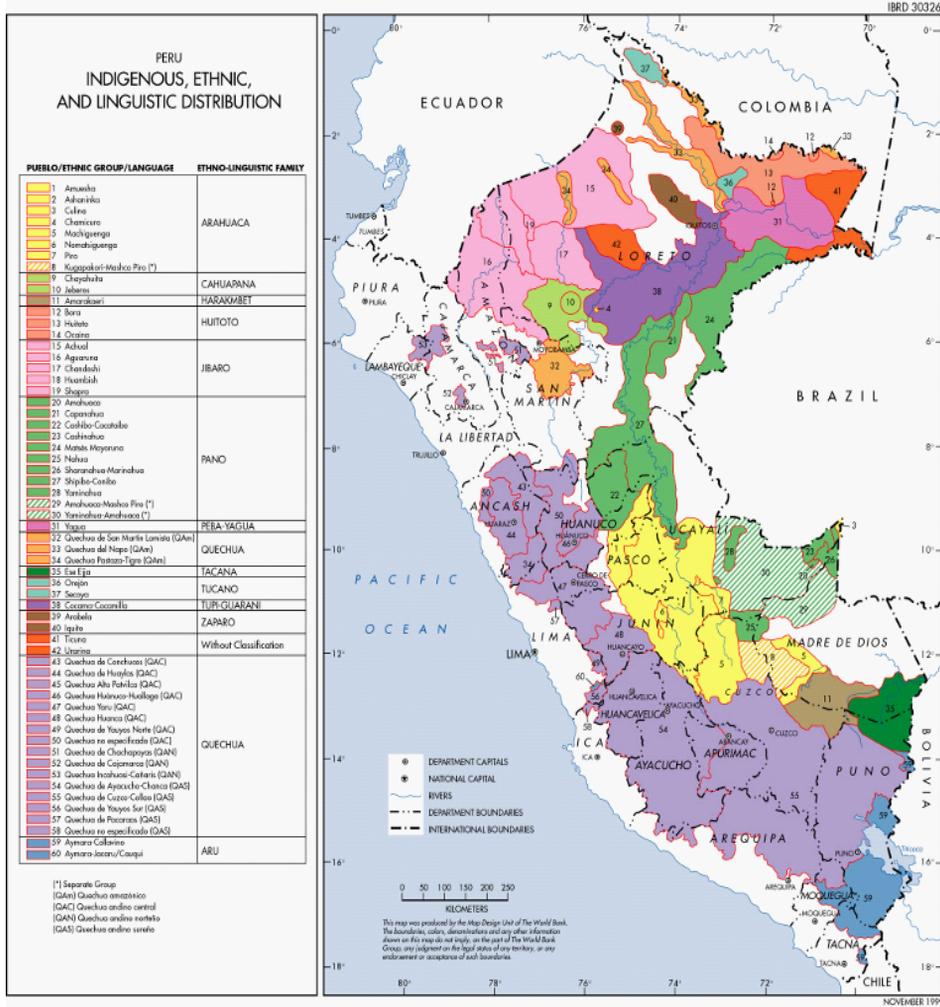
Source: World Bank, 1999

Chapter VII

Helping Close the Digital Divide for Financially Disadvantaged Seniors

Al P. Mizell
Nova Southeastern University, USA

Abstract

The Internet has become an essential element of all society today. Those who can access the World Wide Web have become active participants in the Information Age. Unfortunately, many individuals throughout the world do not have ready access to the needed technology. Furthermore, they do not have the required knowledge and skills to use the technology and cannot participate actively. As a result, this has created a world of information haves *and* have-nots. *In this chapter, after examining the concept of the digital divide, data is presented that shows that those with low incomes and those who are older have little access to technology and the use of computers. Low-income seniors are especially limited in their opportunities to own a computer, and they seldom have the skills needed to use one for e-mail, search the Internet, and so forth, even if they visit a public library where they could use a computer without any cost. Various approaches being used to help seniors learn how to use computers are described, and*

then the chapter focuses on two projects that have proved to be successful in this effort. SeniorNet is a national organization that helps establish learning centers around the country. The approach used at one such center, located at Nova Southeastern University in South Florida, requires seniors to pay for their courses. A second project is known as SeniorComp and is supported by private foundation funds. Ten low-income senior citizens are selected for each group of seniors in this project. They are given a complete Dell computer system, and their tuition is paid to take four of the SeniorNet courses. At the end of the fourth course, ownership of the computer system is turned over to the individual participant. To date, the completion rate has been 100%. The approaches used can serve as models for others to modify and use in their own communities. By adopting a similar approach, the impact of the digital divide can be significantly reduced for those low-income seniors that participate in the project. In this way, this portion of the marginal community can be empowered.

Introduction

The Internet has become important to all elements of society today. Those who know how to access the World Wide Web and have the equipment to enable them to do so have become active participants in the Information Age. Unfortunately, there are also many individuals throughout the world who do not have ready access to the needed technology. In addition, they do not have the knowledge and skills to use the technology to be able to participate electronically. It has developed a world of information *haves* and *have-nots*.

The gap between these two groups is commonly referred to as the *digital divide*. Those at the lower end of the digital divide are at a growing disadvantage everyday. It becomes harder and harder for them to interact with those who are involved in the Information Age. For example, the grandmother who cannot send e-mail to her grandchildren, join in an online discussion group on knitting, or even go online to find an article or a topic in which she is interested feels she is just too old to learn all *this new electronic stuff*. She misses great opportunities to become more independent and to be able to interact with her grandchildren.

Although there are a number of factors that contribute to the digital divide, the focus in this chapter will be on the impact of age and financial differences in terms of their influence on the use of technology. In addition to exploring these two particular factors that contribute to the digital divide, this chapter also contains a detailed description of two projects that can serve as examples of projects that are currently helping to overcome the digital divide for senior

citizens. Many interesting statistics are provided in the government report "Falling Through the Net: Toward Digital Inclusion" (see http://www.ntia.doc.gov/ntiahome/fttn00/contents00.html). This is the fourth in a series of reports called "Falling Through the Net" that began in July 1995. Information from this report and other articles that relate to senior citizens and low income will be discussed in this chapter.

Background

Technology has become a dominant force in today's society for people of all ages. However, certain elements of society have less access to technology than others. In the literature, discussions and research on these discrepancies tend to focus on factors such as gender, sex, socioeconomic status, race, education, and employment. Occasionally, age is taken into consideration.

The term *digital divide* is often heard and freely used, but what is it? It has been defined by Carvin (2000): "The Digital Divide, simply put, is the gap between those people and communities with access to information technology and those without it. Yet, the fact is there are many divides, characterized by community, ethnic, economic, and age groups" (p. 1).

A number of definitions may be found on the Internet. Four of these definitions and their sources, as retrieved from the World Wide Web on January 23, 2005, are listed in subsequent paragraphs. The digital divide is variously defined as:

The gap that exists between those who can afford technology and those who cannot. (http://www.pixel8.com.au/training/textsite/glossary.htm)

The risk that those with lower incomes or living in more remote areas will have access to a lower quality of telecommunications services than available to others, and as a result may not be able to adequately participate in the information economy. (http://www.med.govt.nz/pbt/telecom/response/glossary.html)

The gap between those individuals in our society who are computer literate and have access to information resources like the Internet and those who do not. (http://myphliputil.pearsoncmg.com/student/bp_jessup_ist_1/JessupGlossary.html)

This term is used to describe the gap between the technology "haves" and "have-nots". It is not simply a question of the provision of equipment, but can also be attributed to poor phone lines, antiquated equipment, limited access through over-booked public facilities, expensive user fees, and lack of confidence or technical skill to use the technology. (http://www.air.org/ topic_digital_divide.aspx)

In reviewing online articles related to the digital divide, it appears that there are many articles, reports, and projects that focus on factors other than age. This may be because there is only a small percentage of seniors who use computers to go online. This may be why there has not been much research on their uses and attitudes. In the last few years, however, there has been a flurry of surveys on Internet use, so now we do know something about the relative use of the Internet by seniors as compared with other age groups. Fox (2004), in her article "Older Americans and the Internet" (2004), reports:

The percent of seniors who go online has jumped by 47% between 2000 and 2004. In a February 2004 survey, 22% of Americans age 65 or older reported having access to the Internet, up from 15% in 2000. That translates to about 8 million Americans age 65 or older who use the Internet. By contrast, 58% of Americans age 50-64, 75% of 30-49 year-olds, and 77% of 18-29 year-olds currently go online. (p. 1)

Information about the digital divide makes it clear that younger citizens with medium to high income are the main beneficiaries of the Information Age. In fact, Norris and Conceição (2005), in their article "Narrowing the Digital Divide in Low-Income, Urban Communities," report:

Access to computers has been decidedly unequal, however. According to U.S. Census data ranging from 1990 to 2000, the typical computer user in the United States is white, between the ages of twenty-five and forty-four, college educated, and married with an annual household income above $75,000. (Kominski, 1992; Newburger, 2001, p. 2)

The article continues: "The Internet is relatively new on the scene, but usage statistics from 1997 and 2000 indicate a similar demographic" (Newburger, 1997, 2001, p. 70)

In *Minimizing the Digital Divide and the Inter-Generation Gap*, Aphek (2001, p.1) states that "New technologies have created a situation rather

unknown in human history wherein young children master a skill much needed by adults in general, and seniors in particular." The impact of this is that there are many older Americans who do not own and do not know how to use a personal computer for even the basic skills of sending and receiving e-mail and searching the Internet.

Kirby (2000) wrote in an article in the *San Francisco Chronicle*:

The "digital divide" that separates Americans connected to the Internet from those who aren't is increasingly being defined by income, not ethnic background, according to a study being released today by Jupiter Communications, an e-commerce research firm. (p. 1)

In the Executive Summary of the most recent government report on the digital divide, we find that:

Nonetheless, a digital divide remains or has expanded slightly in some cases, even while Internet access and computer ownership are rising rapidly for almost all groups. For example, the August 2000 data show that noticeable divides still exist between those with different levels of income and education, different racial and ethnic groups, old and young, single and dual-parent families, and those with and without disabilities. (National Telecommunications and Information Administration, 2000, p. 18)

Carvin (2000) states that "Households earning incomes over $75,000 are over 20 times more likely to have home Internet access than those at the lowest income levels" (p. 1).

Austin (2004), in a recent article "Pinpoint your Profits with Diversified Digital Dollars," writes:

By 2007 senior citizens will comprise about 25% of the percentage of people that buy products via the Internet. Presently, there are about 7.6 million senior citizens online. This population is predicted to grow to 16.3 million by 2007, with the biggest growth period being in 2004. (p. 2)

If the seniors with low income are not to be left out, then it is critical to find ways to bring these citizens into the Information Age.

The 1997 report, "Falling Through the Net II: New Data on the Digital Divide" by the National Telecommunications and Information Administration (McConnaughey & Lader, 1997), included the statement that:

Despite this significant growth in computer ownership and usage overall, the growth has occurred to a greater extent within some income levels, demographic groups, and geographic areas, than in others. In fact, the "digital divide" between certain groups of Americans has increased *between 1994 and 1997 so that there is now an even greater disparity in penetration levels among some groups. There is a widening gap, for example, between those at upper and lower income levels.* (section 3, para. 3)

The report informs further that "for computers, households below $35,000 in annual income all have PC and online access levels below the national average (36.6%, 26.3%)" (McConnaughey & Lader, 1997, Income section, para. 1). However, this section of the report on income concludes, "By contrast, households earning more than $75,000 in urban areas have the highest PC-ownership rates (76%) and online access rates (50.3%)." Therefore, it is seen that low income is one of the reasons that the digital divide exists. However, age can also be seen to be a significant factor in the digital divide when it is read, "With respect to computer penetration, as in 1994, seniors account for the lowest age category (21.0% for PCs, 8.8% for online access)" (McConnaughey & Lader, 1997, Age section, para. 1).

Norris and Conceição (2004) again stressed that if ways could not be found to help bring low-income citizens into the information age, this failure is helping to create barriers to their progress and participation in society. They go on to add: "Lack of money; time; access to technology, information, and resources; skills in the use of information technologies; and literacy are considered barriers in urban adult life." (Coley, Cradler, & Engel, 1997; Danziger, 1999; Mineta, 2000; Merriam & Caffarella, 1999). "Thus, the significance of supporting adults in low-income urban communities is critical for narrowing the digital divide." (Norris & Conceição, 2004, p. 74)

In another article, "The Internet and Older Adults" (U.S. Administration on Aging, 2004), relevant data is presented that supports the observation that most seniors do not use computers:

- Many seniors engage with life by reading news or pursuing a hobby, but a very few have followed the lead of younger Americans and shifted those activities online. Most seniors do not use computers and do not think they are missing anything by not going online.

- While 56% of all Americans go online, only 15% of Americans over the age of 65 have access to the Internet.

- Fully 81% of people who say they definitely will not go online are over 50.

- Fifty-six percent of those over age 65 say they definitely will not go online, compared to just 6% who say they definitely plan to go online (para. 3).

The report also confirms that older, retired citizens are not active in the Information Age:

Individuals 50 years of age and older are among the least likely to be Internet users. However, individuals in this age group were almost three times as likely to be Internet users if they were in the labor force than if they were not. (p. 17)

The Executive Summary from this report concludes that "Internet access is no longer a luxury item, but a resource used by many" (p. 17). Data from the report, "Falling Through the Net" (2000, p. 16), indicates that those using the Internet are increasing rapidly in the U.S. In December 1998, approximately 26% of U.S. households had Internet access. In August 2000, the percentage had increased to over 41%. In 2000, over two-thirds of all households earning more than $50,000 had Internet connections. Therefore, while usage is increasing across the board:

divides still exist and has expanded in some specific areas. These differences still exist between those with different levels of income and education, different racial and ethnic groups, old and young, single and dual-parent families, and those with and without disabilities.

This gives a double, negative impact on financially disadvantaged seniors; they are in the low-income group so they are in the bottom of the digital divide, and they are also elder citizens who did not grow up with or use computers. This is a group that needs special attention if the gap is not to widen beyond repair.

The lack of use of the Internet by senior citizens may be a temporary problem that needs to be addressed vigorously for the next few years. It may not be a major problem after that, because today's active college students will be overtaken by surfing seniors in the future.

Main Focus of the Chapter

Issues, Controversies, Problems

A major issue of concern in this chapter is how to solve the problem of overcoming the digital divide for low-income senior citizens. It has been clearly

reported that low-income seniors do not have the same access to technology that many other citizens enjoy. In a report by the U.S. Department of Commerce Census Bureau (Newberger, 2001, p. 5) using Current Population Survey (CPS) data to give estimates of computer use by different elements of the population, it is estimated that "More than half of all adults 18 years old and over, 55%, lived in a household with at least one computer in 2000." However, "The oldest adults had the lowest rates of home Internet use. Only 13% of those 65 years old or over used the Internet at home." In addition to age differences, "More affluent and more highly educated adults are more likely to have computers or use the Internet" (p. 6).

A report on the Pew Internet & American Life Project by Madden (2003, p. 3) states that "African-Americans and seniors are among least likely to go online." The report goes on to explain:

The least wired age group, those 65 and over, has come online slowly but steadily since 2000, and showed only negligible growth over the course of 2002 and 2003 — 20% of seniors were online in December 2002, and 22% reported use of the Internet in our August 2003 survey. (p. 6)

The report further reiterates that experience is the major predictor for use of e-mail, and younger users tend to use other facets of computer for communication to a greater degree than older users. For example:

As is the case with instant messaging, teens and young adults clearly occupy most of the traffic to chat rooms and other online discussions. That age gap has been consistently reproduced every time we ask this question, with users over the age of 50 being the least likely to use these communication tools. (p. 15)

According to Madden (2003), by December 2002:

Everyone under age 65 was equally as likely to have searched for product information online. Though wired seniors' interest in researching according to products on the Web has grown considerably over the course of our research, they are still the most reluctant to consult the Web for product information.

Of course, there are many other activities that seniors avoid but younger individuals engage in on the Internet, such as downloading music, online bill paying, blogging, using instant messaging, chatting, and uploading digital photos.

Therefore, even for those seniors who do use computers to send e-mail and access the Internet, their overall use is still limited as compared with younger users. The challenge to help seniors take greater advantage of technology to become more active online is still one that needs attention.

It is also interesting to note that it is not only in the U.S. where the digital divide is of concern. There are concerns from countries around the world. For example, in England a presentation to the "Unions and the Internet" conference in London on May 12, 2001 (and modified on July 10, 2002) by Roger Darlington on his Web site. The unnamed presenter describes the concern in the UK:

On the one hand, more and more people are becoming increasingly familiar with the Internet — we can call them the "Internauts". On the other hand, the majority of citizens still have no regular access to it — we can call them the "Internots". In fact, there is not a "digital divide" — this is too simplistic an analysis. Instead there are many digital divides. (p. 1)

In this same presentation, the presenter adds that:

There is a direct correlation between age and Internet use. At one end of the spectrum, 88% of those aged 16-24 (in England) have used the Internet. At the other end of the spectrum, a mere 11% of those aged above 65 have done so. (p. 2)

Nan Bosler, President of the Australian Seniors Computer Clubs Association, wrote in an article, "I'm a Senior: Why Should I Learn to Use a Computer?" (2002), that:

It is not difficult to realize why seniors appear to be behind in ownership and use of computers and the Internet. Many of our older seniors have never been in the workforce. The next group did work but were probably not involved in the use of a computer. (p. 1)

As expected, Bosler reminds us that seniors are hesitant to use new technologies. This may happen because they do not think they can do it, their memories are not what they were so they will forget the processes, they cannot afford it, and so forth.

Solutions and Recommendations

Two of the main factors holding seniors back from becoming computer literate are: (1) lack of training and motivation for older citizens that encourages and enables them to use a computer, and (2) low income so they cannot afford to buy a computer. So, what is being done today to try to help overcome the age barrier to computer use? A review of the Internet reveals that there are a number of initiatives and special projects that have the goal of helping seniors learn to use computers.

Having the right equipment, training, and success are essential elements for seniors to be successful in becoming computer literate. In fact, once fluent in the use of the Internet, seniors can find other satisfactions. For example, Marjorie and Dick Piaget of Wilbraham, Massachusetts, both age 70, found love on the Internet as reported in the *Microsoft PressPass* on February 15, 1999 and featured on *The Today Show*. After each acquired basic computing skills, they met in a SeniorNet online chat room. When they eloped, they e-mailed the news to their children!

Solutions are being tried in other countries than the U.S. For example, in Australia, Seniors Computer Clubs or Groups are creating a friendly and non-threatening approach to help solve the problem for seniors. Through this approach, seniors are able to gain information and become active participants in society.

The concerns in the U.S. over the digital divide in terms of age and income are also a worldwide concern. There are other groups in the U.S. and around the world that help senior citizens learn how to use a computer. These include public libraries, health maintenance organizations (HMOs), cities and towns, schools, colleges, and organizations that devote themselves exclusively to this effort.

Many governmental and non-governmental agencies are trying to help those who do not have access to the use of technology to access the Internet (Norris & Conceição, 2004). Their focus is mainly on improving the infrastructure in the form of training and access.

A few typical examples of such projects in the U.S. are cited in subsequent paragraphs.

- **Example 1: Technology Opportunities Program (TOP)**

    In 2004 the National Telecommunications and Information Administration awarded grants to nonprofit organizations and governments in the U.S. and Puerto Rico. Although TOP funding was not approved for new projects in FY 2005, existing projects were funded to continue. By enhancing public access, it is hoped that more non-computer owners can gain electronic

access to information. Descriptions of existing TOP projects may be found at http://www.ntia.doc.gov/top.

- **Example 2: Digital Promise Project (DO IT)**

  The project beginning in 2001 is described in this press release:

  The proposal would create the Digital Opportunity Investment Trust (DO IT), funded with $18 billion from the auction of the publicly owned electromagnetic spectrum, today's equivalent of public land — "an electronic land grant" for the Information Age.

  (Lawrence K.) Grossman said that the wiring of America is a monumental achievement. "Now is the time to connect those wires to content worthy of the technology," he added. "We have a window of opportunity to put our remarkable Internet, wireless and information technologies to their highest and best use for every American." (p. 2)

  More information is available at http://www.cni.org/Hforums/ninchannounce/2001/0037.html.

- **Example 3: Community Technology Centers (CTCs)**

  In a presentation to the December 2000 Third Annual Community Network Technology Conference in Austin, Texas, Paul Lamb and Michael Roberts describe CTCs:

  A community technology center (also called by many other names including: computer labs/rooms, computer learning centers, CTCs) in its broadest possible form is a multi-purpose education and training facility that can provide a wide range of computer technology related services to many different kinds of people. There is no one ideal type or model for a computer technology center. CTCs are located all over the United States in churches, housing projects, job training centers, settlement houses, cable public access centers, shelters, schools, human service organizations, museums, etc. Some are stand-alone programs in their own site. Others are a part of a larger organization. Some CTCs are fully staffed with paid, well trained [sic] program managers, computer instructors and computer systems support personnel. Others are staffed solely by volunteers (including senior citizens and college/high school students). Some CTCs are equipped with

fairly modern, networked, multi-media computers with high speed Internet access, laser printers, scanners and digital cameras while others have outdated computers, slow printers and dial-up Internet access. Their shared mission is to provide underserved populations in rural and urban communities with access to free and/or low cost computer and information technology resources. (p.1)

The full paper is available at http://www.rtpnet.org/tact/planning.

Several examples of approaches and programs designed to help seniors acquire computer literacy are given in the following paragraphs. Among them, a few were retrieved from the Internet — as indicated by the listing of their URLs.

- **Senior Centers**

  Senior centers are a popular effort to help overcome the digital divide. There are many such centers in the U.S. and in other countries that have developed computer clubs, community learning labs, and so forth. They are sponsored by profit or non-profit organizations with public or foundation funding. They may charge a course fee or offer services for free. Seniors who understand the need for patience and moving slowly with repetition and encouragement so the seniors do not get discouraged or overwhelmed often teach these courses.

- **Wallingford Seniors Spanning "Gray Gap"**

  A specific example of a senior center is one run by Jim Olney, a volunteer computer lab instructor at Wallingford Senior Center. He describes his experiences as a teacher of seniors in these words, "I'm kind of a tech weenie at heart. I enjoy sharing my knowledge. I just enjoy teaching."

  Jim's computer lab is located in the lower level of a huge brick classic revival building where he covers computer basics, Internet, and word processing in his four-week course for seniors. Details are available from the Seattle Community Technology Program (2004), on the Web at http://cityofseattle.net/tech/wallingford.htm.

- **College and Vocational School Courses**

  Another approach that some seniors find helpful is taking courses at their local school or community college which give them an inexpensive way to learn how to use computers. However, for many seniors, their comments are that the classes moved too fast, the instructors and some of the other

students were younger and took for granted that the seniors could catch on to a large amount of information and needed skills (e.g., using a mouse) at the same speed as the younger students.

- **SeniorNet**

    One of the most successful efforts in the U.S. has been that of the national SeniorNet organization. With over 250 senior learning centers in the U.S. and several in other countries, seniors have an organized and effective way to learn how to use e-mail, search the Internet, use word processors, handle digital pictures, work with genealogy, manage their finances on the Internet, and many other interesting topics. The national organization provides a Web site for chats, discussions, news, help, discounts, and so forth for members, and a Leadership Exchange site for the volunteer senior instructors and coaches. On this site, course syllabi are provided that each center can download and modify to meet their local interests and needs. They also provide software for the learning centers and help them obtain new equipment as needed. More information is available at http://www.seniornet.org.

- **A Personal Story**

    The story of Sheri Stover in "Technologies that Help Senior Citizens Utilize the Internet and Computers" is another example that seniors need more than a computer to use it practically. A summary of the story is being shared:

S*tover describes how her 70-year-old father began to express a strong desire to learn about computers. Since he didn't have a computer, she got one for him. She then sat with him to help him learn the basics. He wrote down everything she told him and he was excited. However, as time went on, he made no progress. She found out that the real reason for his lack of use was that he didn't know how to type and would be embarrassed in a class.*

She got him a typing tutorial but he couldn't see the screen. So, now she bought a larger screen. It took patience and resources to get her dad to a point where he could actually use a computer. Similar problems will occur in the learning centers where a group of seniors come together to learn. But with patience and instruction, they will learn. (Stover, n.d., Background section, p. 1)

The full story may be found at http://users.erinet.com/35588/.

Now, a few of the approaches that address the issue of access for those with a low income are described in the following paragraphs.

- **"Westwood Seniors Have An Edge"**

  The following is a brief excerpt of an article that was an extension of the original article published in Brainstorm in October 2004.

"If they have the courage to walk through the door, I know I've got it made." These are the words by Jacque Cook, lab coordinator at Westwood Heights Computer Center in West Seattle. Jacque teaches beginner's classes for seniors.

The focus of these classes is on those who are over 50. Participants feel they not only learn at this senior learning center, but they also have fun. Most of them feel they would still be beginners if it weren't for the classes offered at the lab. Jacque goes on to say: "I will never be bored in this business. It's great to get a 90-year-old going on computers. It's very affirming to me. I was born a teacher, but never had any formal teacher training. It's what I love to do and who I am. I enjoy empowering people and helping them. Computing is such a powerful tool. I tell my students, if you don't get at least the basics, you're going to be illiterate in a few years."

This center in Washington State is fortunate in that they do have funds to do more than many such centers in other states.

Another story of Jacque reveals that some extra funding can make a real difference in someone's life. As he stated:

My most inspiring anecdote is the story of a 63-year-old resident who grew up in Harlem. I began giving him a tour of the Internet, but after 15 minutes, he told me that he never learned to read. I had a good budget at the time, and found an online literacy tutorial that cost $150 for a one-time use. He was so eager that I spent the money. He worked an hour a day, five days a week to complete it. I eventually got him enrolled with Goodwill, which offers a literacy program. It changed his life.

Westwood Heights is a *senior preference* Low Income Public Housing building, owned and managed by the Seattle Housing Authority. This building offers an affordable combination of independence and nearby services. While some people may not have access to such facilities, there are usually a few such organizations that are willing to provide room for a learning lab for seniors if a volunteer is willing to put in the time needed to find the right host and to set-up the learning center. At least, from these examples, it is clear that learning centers are one viable way to begin to chip away at the digital divide.

Similarly, a testimony by Marta Shaw shared that "My mom's live [sic] completely changed after the computer lab was set up at the nursing home. Her last year of life was significantly enhanced by being able to stay in contact with family and friends through e-mail" (Shaw, n.d., last section, p.1).

- **Generations on Line (GOL)**

  This national project provides free software to non-profit organizations that wish to provide a public access computer where seniors can run a self-instructional tutorial to learn quickly (30-60 minutes) how to read and send e-mail, search the Internet, and so forth. It is designed to whet their appetites and to encourage them to sign up for in-depth classes where they can become truly computer literate. Through a grant with IBM and SeniorNet, SeniorNet Learning centers are able to get a free IBM computer plus free access to the GOL software to set up GOL stations in public areas near their SeniorNet Learning Centers. Additional information is available at http://www.generationsonline.org/.

- **SeniorComp**

  This is a two-year-old project that began in South Florida at Nova Southeastern University (NSU) in cooperation with the NSU/SeniorNet Learning Center. After obtaining a series of foundation grants, groups of 10 low-income senior citizens were selected to receive a new Dell computer system and a year's computer training through SeniorNet classes. The grant pays for all of the expenses except for a $49 lease fee for the first year while the classes are being completed before ownership of the computer system is turned over to the individuals. Additional information is available by calling the author at NSU, 800-986-3223, ext. 8642.

A closer look at two such projects reveals the typical characteristics of successful approaches designed to bring computer literacy to senior citizens.

The first one is the SeniorNet Learning Center in South Florida that provides both motivation and training at a reasonable cost for seniors who own or are buying their own computers. The second one is the SeniorComp project at NSU that provides both computers and training for groups of low-income senior citizens. In the following subsections, details of the SeniorNet Learning Center are described, synthesizing its operation and its rationale. Further on, the author describes another project to help overcome the digital divide, namely SeniorComp.

SeniorNet at Nova Southeastern University (NSU/SeniorNet)

For those with a computer and sufficient income, SeniorNet is an example of the training opportunities available to those over 50 years of age. Approximately six years ago, Nova Southeastern University (NSU), in North Miami Beach, Florida, teamed up with the national SeniorNet organization to establish learning centers at NSU's Fischler Graduate School of Education and Human Services to help bring senior citizens into the Information Age, thus helping to narrow the digital divide. However, while this initiative has helped overcome the age aspect of the digital divide, it does not bridge the economic diversity aspect. Although affluent seniors can afford to pay the minimal fee that the national SeniorNet organization charges for membership ($40/annually) and the NSU/SeniorNet Learning Centers' charge for classes ($50 for seven weeks), there are many seniors on fixed incomes who not only cannot afford the classes, they cannot afford to purchase a computer.

As a partial solution to the income issue, if a potential student told the staff that she or he wanted to take the courses and had access to a computer, but could not afford the SeniorNet annual membership fee ($40) or the course fee ($50 for seven sessions), a scholarship for both was provided. However, the awards were limited to only one or two scholarships each year.

The majority of the SeniorNet students come from those who have retired in the area and have sufficient income to afford to buy a computer and can afford to pay for the classes. One instructor and one or two coaches lead each class of eight to ten senior participants. Thus, each student has immediate assistance available as needed. Since the instructors and coaches are all volunteers and they are seniors themselves (our oldest and probably most successful instructor is 92!), they understand the need to go slowly and to be very clear in their instructions and demonstrations. Hands-on practice is critical to the student's success, so this is heavily emphasized throughout all courses.

Each course consists of seven two-hour sessions once-a-week. After a week's break, another term begins with the same variety of classes offered. Students

can move from the initial *Getting Started* class to a class on MS Works, Windows XP, genealogy, digital photography, graphics, word processing, and so forth.

If a student appears to have a good relationship with the other students and offers to help them when they are stuck, he or she is invited to become a coach. Coaches and instructors receive complimentary SeniorNet membership and are entitled to take any of the SeniorNet classes without charge. However, they are encouraged to coach even new courses so that they can learn as they coach. This group of some two dozen volunteers becomes a social group of its own. Their only reward is to see other seniors move from a novice level to become active computer users who are excited about their new abilities and skills. The SeniorNet Learning Center provides a staff luncheon meeting each term and one or two appreciation banquets for the volunteers and their spouses. SeniorNet shirts are also provided so the instructors and coaches can be easily recognized and have a good feeling about their SeniorNet identity. Figure 1 shows SeniorNet instructors and coaches working with a class of seniors in the NSU/SeniorNet Learning Center.

Every other year, SeniorNet sponsors a statewide conference for the volunteers from the two dozen or so learning centers in Florida. This offers not only a chance

Figure 1. NSU SeniorNet Learning Center instructors and coaches helping senior citizens overcome the digital divide

to meet with the national staff, but also to hear presentations where they learn where the organization is going and the challenges being faced, and they have an opportunity to exchange information and experiences with other learning centers. Many ideas gained here can be taken home and put into use at the home center.

In the case of NSU/Learning Center, the host organization, Nova Southeastern University, provides the lab space, a university liaison person, and an administrative assistant to provide the needed support service for the center. This is one of the key element to the success of this particular center. With this support, the center can offer a course each morning and a different course each afternoon to provide about eight to ten different course sections each week, with an average of six to eight students in each class. This means the center serves about 65 to 85 students in each of the four terms during the year.

During the six years of teaching seniors how to use computers, several important facts have been observed:

- Most of the students who registered and paid for these courses were able to afford the purchase of their own computers,

- There were very few minority students enrolled in these classes,

- Some students received their computers through their families, and

- Having paid for the classes, virtually all of the participants were eager to learn.

However, over time, some of the leaders began to feel uneasy. They realized that there was a large group of seniors who, due to financial restraints, were not able to afford the purchase of either a computer or the tuition to take SeniorNet courses. The Center staff became concerned about the rest of those seniors — those who cannot afford their own computers but still want to become part of the information age. Afterwards, it was realized that these were members of the digital divide who needed help to overcome the obstacles of age and low income. They have pride and motivation, but lack the needed financial resources. What can be done for them?

Eventually in virtually every instance, the senior citizen being taught has to acquire or arrange for the use of a computer outside the classroom. Either he or she must buy a computer or use one that is available to the public. In the latter case, this is not always convenient; in the former case, buying a computer with its necessary accessories is too expensive for a senior with an income of less than $18,000 a year. The next project that is described is an effort to help these low-income seniors.

SeniorComp: A Model for Overcoming the Digital Divide

It seems evident that if a cost-effective model approach could be developed to help low-income senior citizens move into the Information Age, then that model could be used to help seniors across the country. Therefore, a model was developed and foundation financial support was sought. Fortunately, the Mandel Foundation saw the potential in this concept and agreed to provide a $10,000 grant to fund a small group of seniors in a pilot project to test the validity of the model. The pilot program began in Broward County, Florida, in an attempt to bridge both of these gaps — the age gap and the economic gap. For this project, those who are earning below $18,000 annually are classified, for the purposes of this project, as "financially disadvantaged."

Once the initial funding was secured, several computer manufacturers were contacted and arrangements were made with Dell, Inc. for an additional small grant to help reduce the cost of obtaining 10 new Dell computer systems.

A unique feature of the model was the assumption that if these seniors (many over 80 years old) partially disassemble their new computers and remove key parts and then, after learning what each part does, replace them correctly — and their computers still work — they will have, at least partially, overcome their natural fear of the machine. With help from Nova Southeastern University's Health Professions Division, space was located to set-up a small lab for the new machines for the disassembly/assembly phase of the project.

Through the combination of the $10,000 grant from the Mandel Foundation (Ohio), small hardware grants from the Dell Corporation, and support from Nova Southeastern University, the pilot project was ready to begin. To combine the idea of seniors learning to use computers and stress its emphasis on the assembly and ownership of the computer while maintaining its link with SeniorNet, the project was named *SeniorComp*.

After talking about it for more than a year, Cecil Sugarman, one of our senior volunteers, pursued a foundation grant. Then a formal funding proposal was prepared for a small pilot program and submitted to Nova Southeastern University, the SeniorNet host and sponsor, for approval to submit to the funding agency.

To make a short story even shorter, the project received a $10,000 one-year grant to run on a pilot basis. When it was found that the grant did not provide sufficient funding to obtain the needed computers, monitors, and printers at the regular price, Dell Computers provided several thousand dollars to offset the retail cost so students would receive the right computers and software to make the project successful. As a result, 10 financially disadvantaged seniors (i.e., those with less than $18,000 annual income), who demonstrated the interest,

motivation, a secure location, and a telephone, were provided with a fully assembled computer, monitor, and printer. During an initial computer assembly class, they were shown how to partially disassemble and then reassemble their computers. Although they only install a few major parts, they acquire a hands-on understanding of the internal workings of a computer in the process, and allay their fears and concerns about damaging the computer while they are learning how to use it. An NSU technician remained present during the initial classes to assist the instructors and coaches to help the seniors feel comfortable in the assembly process. However, later on it was found that the instructors provided sufficient support to help the students.

After the initial three-week orientation (assembly/disassembly), the students take their computers home with them and connect them to their own phone lines so that they can practice their new skills at home between classes. The grant then pays their fees to attend four SeniorNet courses. These classes begin with the first SeniorNet course Getting Started, which is followed by Introduction to Works, Introduction to the Internet, and one more class that best meets the needs of the particular group (e.g., Intermediate Internet, Word Processing, Graphics, Genealogy, or Digital Photography). At the end of the project, the students are encouraged to become coaches; they may then take additional classes without any charge.

The students are helped to feel ownership in the project because they are asked to pay approximately 10% of the computer cost when they are accepted (that is, approximately $50). This is considered a leasing fee for the first year; ownership of the computers is turned over to the students at the end of the year. Having a *leasing fee* insures that the computer remains available for an alternate applicant in case the current student drops out of the program during the year. However, to date, no students have dropped out and, amazingly, the project has a 100% completion rate!

It is assumed that those participating, following the interview and initial orienta-tion, will appreciate the opportunity to remain active during the entire year. As expected, the project continues to be successful, and plans have been laid to seek extended funding to enlarge the project. Sharing the model with the rest of SeniorNet was anticipated to encourage other centers to seek similar grants. Using this program as a model for success, SeniorNet's mission was fulfilled, thus "…to provide older adults education for and access to computer technolo-gies to enhance their lives and enable them to share their knowledge and wisdom."

The initial pilot, with 10 seniors from local subsidized housing facilities in Davie and Hollywood, began in October 2003. Each student paid the $49 lease fee for his or her first year's use of the computer. At the end of their four SeniorNet training courses, ownership of the computers was turned over to each individual.

It was felt that keeping the computers as lease items for a year would help insure that everyone had a stake in completing the entire year of the pilot. This seemed to work well.

Following three weeks of hands-on assembly and disassembly of their new computers, the 10 seniors were helped to take their brand new, state-of-the-art Dell computers, including a monitor, printer, and so forth, to their homes. A Nova Southeastern University technician was on call if the students needed help getting their system set-up at home. It was found that the seniors tended to help each other when they had problems.

A videotape of the initial pilot group's reactions and activities was shown and so moved the Mandel Foundation Board of Directors that they provided an additional $10,000 grant for a second pilot group of another 11 financially disadvantaged seniors. This enabled the staff to work with two different pilot groups to test the concept. Both of them proved to be highly successful and the participants became active users of their computers. The completion rate for the year's training and turnover of ownership of the computers for all 21 of the pilot participants was 100%. No one dropped out of the project and all completed it successfully. Thus, the project benefited both the individual seniors and the community. The model proved to be a viable approach to reduce the digital divide.

Future Trends

Recognizing that low-income seniors are an important part of the marginal communities, the literature and past experiences suggest that by providing these seniors with the ability and tools to access information networks electronically, they can be empowered . Thus, there is a way to reduce the size and impact of the digital divide on low-income seniors. Using the model established in the SeniorComp project, further empowerment of additional low-income seniors can be attained.

Since it was found that the project could meet the needs of a group of 10 seniors for a total cost of $10,000, the initial success of the program has led to an expansion of the project. However, this time it reached out to other organizations and received a matching grant of $5,000 from the Community Foundation of Broward to match another $5,000 grant from the Mandel Foundation. This is now leading the project personnel to write an expanded grant proposal to enlarge the project and enhance the model. The project continues and is presently teaching a third group of additional seniors the wonders of computing. Tentative plans are underway to expand the project a little further north and to affiliate with another SeniorNet

Learning Center to offer classes right in the subsidized housing unit where most of the students for the next group will be recruited. The future is unlimited, and the potential for reducing the digital divide is a bright hope on the horizon.

This model, now that it has been proven to work so well, can be shared with others so that they may modify it to meet their local needs and resources. It should prove to be a valuable tool to help other agencies create a similar solution to the needs of low-income, marginalized seniors in their communities. As the model is replicated, the results could lead to a significant decrease in this portion of the digital divide.

With a significant number of seniors completing the SeniorComp project in Florida, it will soon be possible to develop an evaluation plan to gather both anecdotal and quantitative data to help validate the success of this new model.

These examples make it clear that helping senior citizens become comfortable using a computer, and enabling them to acquire the motivation and skills needed to use the computer effectively, helps to reduce the digital divide.

Conclusion

Both age and low income have been shown to prevent a large proportion of this element of the population from overcoming the digital divide. Without the computer tools needed to get online, and lacking the experience and basic skills needed to operate a computer online, these citizens are left out — marginalized. They can be ignored with the hope that as the baby boomers mature, they will bring the income and skills needed into retirement with them so that this gap disappears. However, this is unrealistic from at least two viewpoints. Firstly, not all upcoming retirees will be affluent. There will always be a significant portion of senior citizens who are *financially disadvantaged*. Secondly, it would be inhumane to *throw away* these fellow members of the society. They are valuable individuals with much wisdom and love to share.

It is the task of the community to find ways to help provide the avenues that will enable them to communicate with their relatives, friends, and to make new friends over the electronic spectrum. They must be helped to learn how to locate information and resources online so they become active participants in the Information Age.

Companies and foundations that are interested in investing a few thousand dollars can bring a new world to formally isolated senior citizens. From their own rooms, these seniors can move out into an entirely new world! They can be in immediate touch with their grandchildren and old friends. They can locate lost friends from years ago. They can trace their family roots. They can join

discussion groups and share feelings, opinions, and experiences. They can seek and find information on any subject that interests them. They can find out what has happened to former acquaintances. Finally, they can become part of the Information Age; no longer marginalized and no longer a non-participant — lost in the digital divide.

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Terms and Definitions

Internet access: Those that have at least one member using the Internet at home (U.S. Census Bureau).

Digital divide: "The digital divide, simply put, is the gap between those people and communities with access to information technology and those without it" (Retrieved May 28, 2004, from http://www.edu-cyberpg.com/Teachers/andycarvin1.html).

Hardware: "Hardware is a concrete piece of your computer that you can actually see. Hardware comes in many forms." Common pieces of hardware are: CD and DVD drives, hard drives, keyboards, modems, monitors, and a mouse (computer term glossary; retrieved May 28, 2004, from http://allsands.com/Computers/computertermsg_shs_gn.htm).

SeniorComp: The name given to the project designed to provide computers and training in their use for seniors with limited incomes (below $18.000 annually).

SeniorNet: An international non-profit organization headquartered in California that has established senior learning centers for technology throughout the U.S. and in some foreign countries. A Web site is maintained with technology news

for seniors, chat rooms, resources for the volunteer instructors, and so forth. Information may be found at http://www.seniornet.org.

Software: "Software is a portable medium that you can install on your machine. Software is transported by floppy disc, compact disc and is downloadable from the Internet. Once installed, the program will run independently of the disc or CD" (computer term glossary; retrieved May 28, 2004, from http://allsands.com/Computers/computertermsg_shs_gn.htm).

Chapter VIII

Community-Based Information Technology Interventions for Persons with Mental Illness

Rosanna Tarsiero
University of Pisa, Italy

Abstract

The chapter provides the reader with an overview of the problems persons with mental illness experience in their everyday life, and guides readers through how ICT access and usage can be approached in order to empower such a marginalized population in both developed and developing countries. It argues that, since isolation is their main problem, networking those people with reliable sources of medical information, providers of distance training and learning, and online self-help communities can have a profound impact on lifting their marginalization. The author hopes that the role ICT can play for these people will no longer be overlooked or neglected, and that policymakers will be inspired to use ICT worldwide to defeat mental illness by implementing solutions tailored on these people's needs.

Introduction

In thinking about information and communication technology (ICT) helping people with disability, what generally comes to the minds of the researchers are assistive technology tools, like haptic devices providing tactile representations for visual stimuli on a display to persons with visual impairments (e.g., Colwell, Petrie, Kornbrot, Hardwick, & Furner, 1998), similar to the principle of Braille. However, physical disabilities are not the only disabilities that can benefit from ICT assistance.

When one thinks of ICT for development, the thought goes to the pioneering work of the United Nations Development Program (UNDP) in information technology for development initiated in 1993 (UNDP, 2001). Since the United Nations (UN) Secretary-General's words: "Communication and information technology have enormous potential, especially for developing countries, and in furthering sustainable development" (Annan, 1997, p. 1), and the annual World Bank report two years later, new perspectives and understandings led to the inclusion of widespread availability of ICTs into the Millennium Development Goals (UN, 2000b). In order for ICT to help generate changes, it needs infrastructures, domestic and external human resources (Mansell & Wehn, 1998). Thus, the UN launched the United Nations Information Technology Service (UNITeS) initiative (UN, 2000a; UNITeS, n.d.), in which external human resources, the United Nations Volunteers (UNV), join domestic people to solve local development problems through ICT (UNV, 2005). Nevertheless, people in developing countries are not the only ones who can benefit from ICT as a means to their daily development, as reported in many studies on ICT interventions. Populations living in rural areas of the developed countries are also in need of ICT interventions for their development (Huggins & Izushi, 2002).

Finally, the thought of ICT and networking for marginalized communities usually leads to thinking of a group of people who share one or more characteristics, values, and goals, and whose members proactively escape marginalization through some technology-mediated interaction with other people and/or through access to some valuable empowering resources (Phipps, 2000).

People with mental illness somehow belong to all of these categories and more. Many of them have a disability, in that they have special needs to be accommodated and fulfilled, mainly pertaining to emotional skills (MacDonald-Wilson, Rogers, Massaro, Lyass, & Crean, 2002). They need resources for a safe, strong, and sustainable development of their own community, in terms of information on illness and benefits, social networks, job opportunities, housing, and so forth. Finally, they are marginalized, not only and not just because mainstream people exclude them, but also due to the illness and its consequences which generate accessional relational impairment, along with chronic external and internalized stigmas.

In North America, studies on ICT services for persons with mental illness mainly focused on mental health records (Puskar, Aubrecht, Beamer, & Carozza, 2004), telemedicine (Gutierrez, 2001), and e-therapy (International Society for Mental Health Online & Psychiatric Society for Informatics, 2000), while in Europe they focused on delivering community-based mental health services (Draper & Rigby, 2000; Rigby, Lindmark, & Furlan, 1998) and enhancing communication between mental health providers and consumers (Castelnuovo, Gaggioli, Mantovani, & Riva, 2003). As far as nonprofit organizations, the most common use of the Internet for activities related to mental health is advocacy (e.g., National Alliance of Mentally Ill in the United States and Mind in the United Kingdom). In developing countries, ICT solutions have been implemented for general health only and with the specific purposes of delivering continuous medical education, telemedicine, and health e-governance (Chandrasekhar & Ghosh, 2001).

It goes beyond the scope of this chapter to examine cultural differences in causative beliefs on mental illness and in its treatment options (for a review of current theories, see Lonner, Dinnel, Hayes, & Sattler, 2004). Because of the cultural appropriateness of community-based treatments and its therapeutic successes in both developing countries (Barrio, 2000) and in developed countries (Simmonds, Coid, Joseph, Marriott, & Tyrer, 2001), and because of the potentiality of ICT to address such interventions worldwide, this chapter will focus on community-based approaches involving ICT in both these settings, highlighting differences whenever encountered. This chapter will try to show how it is possible for people with mental illness to achieve empowerment through community-based ICT interventions, and how ICT can be an appropriate answer as well as a powerful tool in both developed and developing country settings.

For this to happen, however, it needs to carefully address the issue from three unfolding perspectives: (1) psychosocial factors involved in mental illness, (2) ICT intervention design, and (3) strategic planning.

Background

Mental health is a main problem even in countries with high rates of infectious disease (McKenzie, Patel, & Araya, 2004). In fact, people with mental and behavioral disorders are about 450 million worldwide, as many as overall Internet users in 2002 (McKenna & Green, 2002). It is calculated that one person in four will develop one or more mental or behavioral disorders during their lifetime (WHO, 2001). These rates clearly dispel the myth that mental illness is due to some sociological issues linked to higher income or education (McKenzie et al., 2004) and that it is just a problem of rich countries.

Low-income countries estimated direct mental illness costs do not reach developed country levels. That is because the lower availability of resources and coverage of mental health care services in low-income countries tend to raise productivity loss and other indirect costs instead, which account for a larger proportion of overall costs (WHO, 2001). Also, in most developing countries, available resources are misallocated, in terms of favoring low-cost-effective provisions, are not equally available to all the population, and are ineffective, while in middle-income developing countries health costs are exploding (World Bank, 1993). Using the *disability-adjusted life years* (DALY) as an indicator of burden due to the illness (World Bank, 1993) is very useful for psychiatric disorders, in that it accounts for both premature deaths due to suicide and years wasted to chronic disability. Nevertheless, even if mental illness outcome does not imply psychiatric disability in the majority of cases, neither in the developed nor in developing countries (Goldberg & Lecrubier, 1995), and people in the latter have a better prognosis for schizophrenia (Hopper & Wanderling, 2000; Sartorius et al., 1986) and mental illness in general (Jilek, 2001), 5 of the 10 actual leading causes of disability and premature death worldwide are still due to psychiatric conditions (WHO, 2004).

While rich countries neglected community-based approaches in favor of more individualistic ones (McKenzie et al., 2004), a joint paper from ILO, UNESCO, and WHO suggested community-based ones to be the best approach to use in low-income countries (1994). More individualistic Western approaches can be dangerous on other ethnicities (Barrio, 2000), while community-based approaches on Westerners are beneficial (Simmonds et al., 2001), and both the European Union (WHO European Ministerial Conference on Mental Health, 2005) and the United States (U.S. General Accounting Office, 2000) are adopting them. Developing countries, focusing on community-based interventions, obtained significant successes, most noteworthy for post-partum depression in Hong Kong and Fiji (Becker & Lee, 2002). However, those studies mainly focused on prevention, which can be successfully exerted in community-based settings without generating personal feeling of stigma, therefore leading to overall lesser drop-out rates.

Even though effective and appropriate, community-based interventions for persons with mental illness still present some difficulties in their actual implementations, mainly because of such community hallmarks: (1) mental illness as main, shared characteristic; (2) marginalization as social determinant; and (3) remitting impairment in communication among members as peculiarity to address.

One of their major problems is how to overcome difficulties with respect to communication among members, because the definition of community does not fully apply in these settings, unless interaction among members is proactively fostered. They share some characteristics (e.g., mental illness, stigmatization,

marginalization, low self-esteem), some goals (e.g., stability, recovery, empowerment, self-determination), and under certain conditions (e.g., belonging to the same kind of self-help group) even values and methods to accomplish those goals. Nevertheless, since psychiatric illnesses are invisible and often concealed or denied in fear of stigma, members of the same theoretical community may be unknown to each other. This accounts for the possible lack of interaction, interaction that is essential to create and sustain a functional community of peers with which to share values and pursue common goals.

A second problem of community-based approaches is, paradoxically, the meeting settings. Again in fear of stigma, people with mental illness are tempted not to make use of available face-to-face community-based programs. Regardless of the benefits, enrollment can force disclosure, in that workers for the supporting association and any other person on the street might see them getting to the meeting place. Something similar is known to happen in both developed and developing countries when accessing mental health care (Eapen & Ghubash, 2004) and/or welfare, where just being enrolled generates fear of stigma, to the point of avoiding enrollment or withdrawing from an awarded benefit (Stuber & Kronebusch, 2004).

Addressing community-based interventions through ICT also poses other problems, in terms of ICT, Internet access, and issues arising from it. Depending on countries and actual location within that country, in both developed and developing countries ICT infrastructures, telephones, and power lines can be more (or less) available (ITU, 1997, 2004). Usually, developed countries have a lesser number of under-served areas and less people living in rural areas, while in developing countries, an average of 70% of citizens live away from urbanized areas. In both settings, cities are better served in terms of infrastructures, telephones, and power lines. Since the success of the "Asian Tigers," especially Korea, is largely due to the heavy investment government put in building infrastructures such as Internet backbones and letting the market do the rest (ITU, 2004), some governments of middle-income countries already invested into providing the country with a discrete number of backbone nodes (Mansell & Wehn, 1998).

However, access to ICT is still distributed in a very unequal way between developed and developing countries (Paua, 2003; Pentland, Fletcher, & Hasson, 2004). Within developed countries, there are many smaller digital divides (ITU, 1997), depending on income, education, and location of Internet users (Phipps, 2000). In developing countries, higher costs and lack of infrastructures and reliable continuous electric power (Mansell & Wehn, 1998), costs of hardware equipment, use of a non-English language and non-Westerner cultures sum up with lower income, education, and computer literacy. Higher rates of population living in rural areas (Chandrasekhar & Ghosh, 2001; Paua, 2003) extend the divide.

In developed countries, governments, businesses, and nongovernmental and nonprofit organizations addressed those divides by lowering Internet access fees and/or supporting tax-exempt personal computer purchases (European Council, 2000). These provisions can have an impact on actual Internet user numbers because infrastructure and electric power are already present and reliable in most countries, and even when they are not, those governments usually have or can easily get access to funds for their realization. Furthermore, there are a lesser number of people living in rural zones, average income allows users to purchase required hardware and software, education is high enough to know (or easily learn) how to use ICT, English is spoken as a first or second language, and users belong to the "dominant" Internet culture.

In developing countries, higher relative costs (especially when compared with lower wages), lack of infrastructures, and lack of reliable electric power induced many governments and non-profit organizations to opt for implementing a system of shared accesses rather than personal ones (Pentland et al., 2004). These authors also highlight the widespread use of wireless technology as a possible alternative to shared access, similarly to what happens in rural areas of developed countries, in that wireless is less expensive than copper lines, and cables in general have difficulties reaching remote areas (ITU, 2004). Pentland et al. advocate the use of an asynchronous wireless service like DakNet, implemented in India with success. Rural populations, thanks to a bus with a wireless device, get asynchronous Internet access that allows them to send and receive e-mails, for example with the purpose of interacting with governmental offices and thus saving in high transportation costs.

Aside from infrastructure, in many countries Internet access still has its own, separate costs, and universal Internet access is not a reality yet. In general, access fees are higher in Europe than in North America, because flat rates are less common in Europe. However, both Europe (European Council, 2000) and North America (Greenstein, Lizardo, & Spiller, 1997) enacted access policies for lowering access cost with the aim of reaching rural and low-income areas. A way both developed and developing countries addressed this problem is shared accesses in public places. In developed countries, hospitals, schools, and libraries generally have some provision for citizens to freely access e-government and information. In developing countries, public kiosks have this function (Badshah, Khan, & Garrido, 2004).

Even if all these considerations are necessary beyond any doubt, especially when considering ICT implementations in developing countries, Mansell and Wehn (1998) observed how too often ICT debates are geared on hardware requirements rather than software design and information content. Knowledge, its production, its circulation, and its sharing confer to a society the capability of sustaining development via the Internet (Lundvall, 1992). The appropriateness of those attributes can make all the difference in the demand for ICT applications,

more so for people with mental illness for which Saraceno and Barbui (1997) theorized that the service-delivery richness, not service availability in itself, is responsible for better outcomes in developing countries.

Aside from information retrieval, the Internet can be used for online networking, since online networks can use asynchronous communication to promote a sense of community (Schuler, 1996). Community-based ICT has theoretical grounds to be employed for people with mental illness. Online settings are of help because of their remoteness and lack of physical cues. Remoteness can play a pivotal role for different, converging reasons. Most importantly, it eliminates barriers to service fruition, especially the ones consequent to symptoms and medication side effects (e.g., agoraphobia, anhedonia, low energy, dizziness) that most characteristically prevent people with mental illness from venturing outside and interacting with others. In developed countries, person with mental illness can be helped to get low-fee home Internet access, because of widespread connectivity. In developing countries and wherever resources and connectivity are limited, asynchronous wireless communication similar to DakNet is a possible way to allow participation into such online communities, because sending and receiving e-mails does not take much bandwidth. Secondarily, online settings are more disinhibiting (McKenna, Green, & Gleason, 2002; Suler, 2004) and people with mental illness are less afraid of being judged for their appearance and for what they have just disclosed (McKenna & Bargh, 1998). Since it is extremely unlikely for participants in the same online community to also live in the same physical community, advantages of disclosure might be full (for an overview on disclosure, see Ralph, 2002).

Though the findings related to virtual community behavior originated in rich countries, they have been already transposed with success to virtual communities in the developing world (Wagner, Cheung, Lee, & Ip, 2003). According to these authors, online communities in developing countries (in this study, Africa, Armenia, Bangladesh, China, India, and Peru) differ from their counterparts in developed countries because they: (1) are knowledge oriented, (2) require an e-mail hub to save bandwidth, (3) have interaction-generated content, and (4) are highly autonomous in nature. However, these findings were relative to virtual communities generated for e-governance purposes only, ruling out a virtual community as a source of emotional support a priori due to its expensive settings. Though this might be true for illnesses whose treatment is promptly available, because professionals are available and/or because the person does not have problems in reaching out to such professionals, those considerations might not apply to people with mental illness, for which self-help can cut costs in terms of favorable outcome of the illness. It is also important to highlight how the Chinese virtual community, that also served as support, became integrated at the same cost as others, possibly because of the higher value such culture poses on collaborative behavior.

Online self-help groups overcome participation barriers, because they are available in timing and locations in which face-to-face groups are not. If members have home computers and access, such as in developed countries, online groups are available every day of the week for as long as the member wishes to use them. If members access through kiosks, like in developing countries, they are available whenever the kiosk is open.

Physical cues take a heavy toll on contributing to prejudices and stigma. They determine whether a relationship of any kind will develop, just on some external characteristics. Some mental illnesses can be evident from just the way a person dresses, so appearance is a major concern for such people and rejections based on look are not that unusual. Therefore, the lack of physical cues, so characteristic of computer-mediated communication (Sproull & Kiesler, 1991), is a very important tool to foster acceptance, trust, and relationships in marginalized online communities. The richer a media is, in terms of immediate feedback, focus on the recipient, language variety, and communication cues/channels availability (Daft & Lengel, 1986), the more overwhelming it can be, especially to persons with mental illness that already tend to have a lower stimulation threshold. Therefore, an impoverished media could be a consistent advantage for such persons.

Empowering Escape from Mental Illness

The Mental Illness Circle

Stigma, marginalization, isolation, and low self-esteem influence each other deeply (Figure 1). Interventions addressing one of these problems, therefore, have repercussions on all the others, but rarely does addressing one problem at a time lead to any resolution. For this reason, it is preferable to implement strategies that simultaneously address each of the problems, even if every one is addressed just partially.

The most common kind of stigma people with mental illness face is the interpersonal one, or external stigma. A growing body of literature from developing countries (for a review see Jilek, 2001; for some country profiles see: Hugo, Boshoff, Traut, Zungu-Dirwayi, & Stein, 2003; Karim, Saeed, Rana, Mubbashar, & Jenkins, 2004; Khandelwal, Jhingan, Ramesh, Gupta, & Srivastava, 2004; Raguram, Raghu, Vounatsou, & Weiss, 2004; Regmi, Pokharel, Ojha, Pradhan, & Chapagain, 2004; Shibre et al., 2001) confirms that external stigma is also a problem for people with mental illness located outside the developed world.

Figure 1. Vicious circle of stigma, low self-esteem, isolation, and marginalization
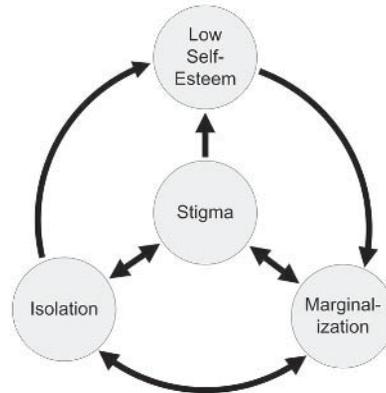
However, only five Western psychiatric disorder constructs were found to be applicable transculturally: schizophrenia, brief reactive psychoses, major depression, bipolar disorder, and anxiety-related ones (Ameen, 2002). Constructs like *trauma* are culturally bound syndromes (Eyber, 2002), as well as *koro* (Jilek, 2001). Even disorders found to be transculturally applicable manifest themselves with symptoms (Bhugra & Mastrogianni, 2004; Jilek, 2001) and verbalizations (Draguns, 1990) that still vary with culture, in a process called *pathoplastic*.

Different cultures stigmatize people for different reasons and in different ways. In developed countries, often because of media, persons with mental illness are frequently stigmatized as violent (Angermeyer & Matschinger, 1996; Glasgow University Media Group, 1996) and/or incompetent (Byrne, 1997), while in Nigeria they are regarded as being possessed by an evil spirit (Kabir, Iliyasu, Abubakar, & Aliyu, 2004) and in Haiti as being voodooed (Desrosiers & St Fleurose, 2002).

Also, different mental illnesses carry different degrees of stigma. As an example, Balinese people stigmatize people with obsessive-compulsive disorder much more than people with schizophrenia or depression, while the reverse is true for Japanese (Kurihara, Kato, Sakamoto, Reverger, & Kitamura, 2000), Latin Americans, and Caribbeans (de Toledo Piza Peluso & Blay, 2004).

Finally, within the same illness, different symptoms raise different reactions and concerns, which strongly depend on culture. In India, sadness is stigmatized more than physical complaints, and the difficulty to find somebody to marry because of mental illness is a major concern (Chowdhury et al., 2001), while in Western countries the concern is more about losing a job and inability of performing.

For all these reasons anti-stigma campaigns need to be tailored on cultural determinants of stigma (Angermeyer, Buyangtus, Kenzine, & Matschinger, 2004).

Whichever the set of mainstream assumptions contextual to the culture of people with mental illness live in, they are defined in terms of their disorder. This process of dehumanization creates a behavioral stereotype believed to be truly and accurately reflective of persons with mental illness, who become therefore marginalized through the culture of blame (Farber & Azar, 1999). Also, symptomatic experiences of persons with mental illness are reframed by mental health professionals through a technical jargon that is not always respectful of their feelings and experiential knowledge. This is an implementation of the culture of blame typical of stigma related to mental illness (Burton & Kagan, 2005). Because of past episodes (Hayward, Wong, Bright, & Lam, 2002), acute symptoms, medication side-effects, labeling due to diagnosis (in some cultures), changes in social status, and feelings of disempowerment, persons with mental illness internalize the stigma, which leads them to think to be the way the behavioral stereotype defines them to be. This internalized belief results in giving up on hope for the future and in feelings of impossibility to change their lives to attain people's respect and self-respect. According to Dinos, Stevens, Serfaty, Weich, and King (2004), stigma also influences acceptance of the diagnosis, adherence to treatment, and even daily functioning.

Regardless of causal mechanisms differing from developed to developing countries, there exists a very well-known association between poverty and mental illness (Saraceno & Barbui, 1997). Mental illness can induce economical marginalization, through disability and job loss, but also social marginalization, due to incarceration, stigma, symptoms, and low income. In developed countries, the lack of community ties and support is considered to be responsible for the worse outcome mental illness tends to have (Jilek, 2001). In developing countries, where societies are not so much fragmented and attention to social relationships is higher because of poverty (Payne, 2001), outcomes tend to be better (Sartorius et al., 1986). Marginalization prevents excluded people with mental illness from full personal, interpersonal, and social lives (Burton & Kagan, 2005), thereby lowering their self-esteem even further. Social status, to which marginalization is partly linked, shifts according to degree of activity and type of illness. Marginalization itself can lead to low self-esteem and isolation other than disempowerment (Burton & Kagan, 2005). Marginalization due to joblessness, low-income, lower education, and disability also lowers connectivity in developed countries like the United States (Pew Internet and American Life Project, 2003). Limited access to resources also diminishes greatly the opportunity of exiting this vicious cycle and creating meaningful relationships.

Internalized stigma and the shame elicited by symptoms are reinforced by lack (or unavailability) of accurate de-stigmatizing information and resources on the

illness and its course. That leads to possible symptom hiding in the attempt to avoid facing a hopeless illness that, in turn, enhances stress levels and worsens the illness itself. A recrudescence of the illness endangers the characteristics of available social networks, possibly severing such availability. Internalized stigma also correlates negatively with self-esteem (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001), empowerment, and recovery orientation (Ritsher, Otilingam, & Grajales, 2003). For all these reasons, "existential loneliness" is often the hallmark of the person with mental illness (Nystrom, Dahlberg, & Segesten, 2002).

On a personal level, any illness has the potential to make a person feel defective, more so mental illness, especially in those societies whose fulcrum is mind, intelligence, control, power, performance, and rationality. Though culture can influence the weight such constructs have, self-esteem and life satisfaction are cross-cultural (Diener & Diener, 1995). This, too, endangers pre-existing social networks and these persons' trust in their capability of forming new ties, generating a self-fulfilling prophecy.

There are many kinds of initiatives to attenuate stigma, marginalization, isolation, and low-self esteem. Anti-stigma campaigns are based on the contact hypothesis — that is, people who had previous contacts with persons with mental illness have less stigma. Many campaigns are also based on the biomedical model of mental illness. In both cases, however, results have been contrasting. The contact hypothesis has been confirmed in several studies conducted in Germany (Angermeyer & Matschinger, 1997), in the United States (Roth, Antony, Kerr, & Downie, 2000), and in Russian populations (Angermeyer et al., 2004), but refuted in those conducted in Nigeria (Ohaeri & Fido, 2001), Oman (Al-Adawi et al., 2002), and Hong Kong (Callaghan, Shan, Yu, Ching, & Kwan, 1997). Social distance, defined as unwillingness to get close to people with mental illness, has multiple components, each needing to be addressed (Lauber, Nordt, Falcato, & Rossler, 2004). Nevertheless, attributing mental illness to biological causes seems to be counterproductive, in that in most recent studies it was repeatedly found to increase social distance (Angermeyer, Beck, & Matschinger, 2003; Dietrich et al., 2004). A way to explain these findings is to think the biological metaphor associates persons with mental illness to some degree of unpredictability (Read & Law, 1999) or perceived lack of power over the condition itself. In some settings, the biological model of mental illness can enhance stigmatization by depicting persons with mental illness at par, resulting in patronization. At the same time for some other reasons, the sociological model of mental illness can reduce the sense of personal responsibility and control. Blaming the illness on something external to a person, such as trauma or society, does not address the psychological reaction to the illness and the person's role in reacting against the illness. However, in both the cases, persons with mental illness are reduced to by-products of a chemical imbalance or victims of society malfunctions.

Other ways to provide against stigma, isolation, and low-self esteem are self-help groups, some of which also address resource development and/or mental illness advocacy. The main characteristic of self-help groups is their aim at individual change (Kurtz, 1997, p. 4), and the mechanism by which the change happens is the individual actions to help themselves (Borkman, 1999, p. 4). The self-help movement was born in the United States with Alcoholics Anonymous, but it quickly spread to the rest of the world (Armstrong, 1993). Self-help groups have a defined goal or a set of defined goals (e.g., alcohol moderation for Moderation Management, sobriety with the help of a Higher Power for Alcoholics Anonymous, sobriety without the help of a Higher Power for Rational Recovery, etc). They also have a well-defined method to accomplish their goal that varies from ideology to ideology, each being unique of that group (e.g., a book of Abraham Low's for Recovery Inc., the Big Book for Alcoholic Anonymous, etc). Other than being change-oriented, self-help groups are led by peers, participation in them is voluntary and are free of charge (Kurtz, 1997, p. 4).

In developed countries, the interest in self-help groups was promoted by the high cost of medical services, the lack of alternative to the bio-medical model, and the emphasis on prevention (Reissman & Carroll, 1995). This model can be adopted in developing countries as they lack medical services due to high cost, lack alternatives to traditional healing models, and often focus on prevention as a requirement of mental health assistance programs. So, in 1997, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), in an attempt to improve the condition of persons with disability by supporting the spreading of self-help to developing countries, published the *Guidelines on Establishing and Strengthening Self-Help Organizations of Disabled Persons*. Self-help ideology matches the sustainable development concept because "…the capacity to acquire and generate knowledge in all its forms, including the recovery and *upgrading of traditional knowledge*, is perhaps the most important factor in the improvement of the human condition" (Bezanson & Sagasti, 1995, pp. 5-6). It is useful to remember how the success rate in treating mental illness depends on the *number* of available options, *not* on the kind of options available (Halliburton, 2004). Among the many benefits of self-help groups are: (1) information sharing, (2) engaging in problem solving, and (3) developing social networks. Self-help groups also allow the ability to assist more persons with less money, a useful characteristic for both developing country setting and developed countries with managed care systems (Murray, 1996).

To date, there is no online community-based outreach program that systematically addresses reduction in marginalization, stigma, isolation, and low self-esteem of people with mental illness through the use of ICT and networking. Even if some of the self-help groups mentioned above have an online presence, there is not any online self-help group advocating for this kind of provision to be

extended worldwide as first-line community-based intervention for people with mental illness.

Breaking the Cycle Through Community-Based ICT

There is at least one moment in the lives of persons with mental illness in which they come to experience isolation. All of a sudden, they become sick with basically no information on the illness, no idea on where to start searching, no social support, and no available community resource.

Community-based ICT solutions have to take into account possible hurdles in their implementation, mainly: (1) literacy and culture, (2) ideology and culture, and (3) peculiarities of online self-help and culture.

Literacy and culture. Online groups tend to be multicultural, because their members usually join from several countries. Unless the group is a regional one or speaking a language spoken in only limited parts of the world, online communities require higher literacy in participants (in terms of knowing a second language and being fluent in text-based communication). However, multicultural environments have better chances for a positive outcome in helping people with mental illness, because they offer more options than a one-culture-only would.

Ideology and culture. Any self-help group intervention needs to be designed in terms of ideology (approach to the illness and its drawbacks), shared values (kind of interaction among members that is being proactively fostered), and shared goals (ways to overcome everyday problems created by the illness). It is essential for a self-help group to trust members enough to share stories and experiential knowledge in an accepting and respectful climate, so the ideology has to encompass some provisions for encouraging people of all cultures to express themselves.

Peculiarities of online self-help and culture. Self-help is a "holistic approach to people's cultural, economic, and social needs" (Braithwaite, Waldron, & Finn, 1999) that is a strong asset in an intercultural, distributed environment. However, Internet groups differ from face-to-face groups in their dynamics (McKenna & Bargh, 1998, 1999; McKenna & Green, 2002) and present special challenges, because group member fluency, as well as their computer literacy, social condition, formal education, financial status, sex, ethnicity, and age, can vary greatly. Cultural barriers are not immediately apparent and when they become so, they can be surprising to deal with, especially because of the disinhibiting effect of the medium.

Of the many possible community-based ICT interventions, three are worthy of being suggested as starting points: (1) medical information retrieval, (2) online learning and training, and (3) online self-help.

Information retrieval. According to the Pew Internet and American Life Project (2003), more than 8 out of 10 Americans have searched specific information on the net and 93% of those surfers searched medical information at least once. Among medical disorders, 39% of people search information about psychiatric disorders (Pew Internet and American Life Project, 2002). In the developing world, kiosks have the purpose of connecting people to information. People with mental illness are in particular need of online information about their disorder, because even buying books on mental illness in a bookstore can be somewhat stigmatizing, since families and friends of persons with mental illness also get stigmatized, in a process called *courtesy stigma* (Angermeyer, Schulze, & Dietrich, 2003). Furthermore, asking the doctor for the exact diagnosis and explanations connected with it is a behavior that depends on culture and pre-existing patient-doctor relationship (Bensing, Roter, & Hulsman, 2003; Ohtaki, Ohtaki, & Fetters, 2003).

Though most medical information on the Web is available for free, availability does not imply reliability, any more than reliability implies comprehensibility. The first quality initiative, Health On the Net (HON) foundation, was launched in 1995. HON has multiple aims: codifying a set of features that qualifies a site with medical information as reliable, issuing a certification of medical information quality (HON seal), defining a procedure to check on sites that display the HON seal, and doing some sort of *post-marketing surveillance* on certified sites (Nater, Boyer, & Eysenbach, 2000). Though the site assessment is a rigorous process, unfortunately HON certification is released on a voluntarily basis. That means it cannot be imposed on every site with medical information, but just revoked in case of non-compliance with HON Code of Conduct. For a review of all Internet health information quality initiatives, see Risk and Dzenowagis (2001). In searching the Net for medical information, some basic medical literacy skills are required, in order to also discriminate what is evidence-based from what is not (Sackett, Rosenberg, Muir Gray, Haynes, & Richardson, 1996). Medical information is of particular importance for people with mental illness, because psycho-educational interventions are shown effective in mental illnesses management and relapse prevention, especially bipolar disorder (Colom et al., 2003, 2004). Online psycho-education has been recently proven effective as well (Christensen, Griffiths, & Jorm, 2004). Furthermore, from an individual perspective, knowledge is empowering in itself, because it gives people the sensation that they are able to gain control over their lives.

The Internet is also useful in helping people with mental illness to gather information and connect to resources that can assist them in improving their

income status (e.g., welfare, cash and energy assistance programs, housing, etc). To show all the importance of such provisions, Thomson, Petticrew, and Morrison (2001) report how housing improvement has a promising impact on physical and mental health outcomes. Many advocacy and governmental sites have useful link collections, nevertheless they rarely explain laws and regulations in layman terms, or offer assistance of some sort in filling out the paperwork. Some states in the U.S. and some European countries have benefit portals by which it is possible to check qualifications in advance, so not to apply uselessly. In developing countries, asynchronous broadband connectivity may ensure this same kind of service (Pentland et al., 2004).

Online training and learning. As Lundvall (1992) stated, "The most fundamental resource in our economy is knowledge" (p. 1). In the United States, over half of surfers used the Net to perform a search somehow related to online training and/or education (Pew Internet and American Life Project, 2003), and improved access to education is another strategy suggested by WHO (2004) to fight mental illness. Online training and/or learning can be a way to include persons with mental illness into a productive society. For this reason, its designers have to know which kind of training content they might need. Macdonald-Wilson et al. (2002) found that the most important functional limitations people with mental illness have regarded both interpersonal and cognitive skills. This implies that the training people with mental illness need more is on soft skills. Online learning, being self-paced and remote, is highly susceptible of accommodation, satisfying the most frequent kinds of accommodation requested by such people: flexible schedule (EEOC, 1997) and interpersonal facilitation with colleagues (Zuckerman, 1993). However, this is not always possible in developing countries, because of bandwidth and hardware limitations (Mansell & Wehn, 1998). Effective online learning environments are learner centered, knowledge centered, assessment centered, and community centered (Bransford, Brown, & Cocking, 1999). That means it takes into account the learning style of the learner but also of the discipline that is being taught, giving many opportunities for assessment, peer-assessment, and self-assessment, without neglecting the online social interactions upon which learning depends (Kreijns, Kirschner, Jochems, & Van Buuren, 2004). Staying at home even when regularly taking classes, asynchronous communication brainstorming and socialization, course material flexibility, and accommodation (in terms of colors, fonts, and formats) allow people with mental illness to better cope with symptoms, and possibly complete course materials and assignments even in conditions under which they would not be able to go to school and perform. More accommodations enhance performance, and that in turn increases self-efficacy (Bandura, 1994) and self-esteem. Online learning is more cost effective (Mansell & Wehn, 1998), especially when it takes cultural differences into account.

Online self-help. According to Moore (2000), social interaction is the primary use of home computers, and e-mail is the most used computer application in the United States (Pew Internet and American Life Project, 2003), as well as in Ghana (Dzidonu, 2004). Surfers do not limit their interactivity to private e-mails. In fact 84% of American Net surfers contacted an online community and 79% stayed in contact with it, while 26% used e-mail to contact a local group (Pew Internet and American Life Project, 2001). Social support and strengthening community networks are strategies recommended by WHO (2004) as primary prevention for mental illness. Creating an online community network is a sustainable target, because many search engines also offer free group member- ship, and that does not raise costs of this intervention, nor require special software. In order to make it an attainable goal as well, some considerations on online communication and dynamics are mandatory. Online written communica- tion is a hybrid between oral and written communication (Bordia, 1996), more precisely a written substitute for oral communication (Jonsson, 1998). Pennebaker and Seagal (1999) studied written expression of emotions comparing it with talking, showing how they have the same effect, as long as emotions are involved in both cases. By storytelling, even in written form, people are helped in reframing and overcoming their stories. Also, people with invisible stigmatized conditions can benefit more from this intervention if they focus on what makes them different from non-stigmatized populations rather than what makes them similar. Computer-mediated communication is less inhibited than face-to-face (Suler, 2004) and has a hyper-personal effect (Walther, 1996). According to this theory, online communication can exceed face-to-face, especially in that person- ality cues that would normally go unnoticed assume stronger meanings. Further- more, the information flow in computer-mediated interaction is slower (Liu, 2002) and less overwhelming, especially to people with mental illness. Having the possibility of thinking more before replying is a definitive advantage for people dealing with impulsivity. Some of these theories could be why computer- mediated communication has such an excellent impact on virtual groups for marginalized people (McKenna & Bargh, 1998). McKenna et al. (2002) also noticed how people experiencing social anxiety, difficulties with social interac- tions, and isolation prefer to locate more often their "real self" online.

There are a number of reasons why online settings could be an appropriate tool for people with mental illness as far as social support is considered. Because having a solid support network is essential to recovery and the need of socialization is part of the feeling of empowerment, the main problem to address is how to form a stable community for people with mental illness, and which type of community to form. Both support and self-help groups are available alterna- tives. Self-help groups are more suitable to this task, because their ideology and method are well-defined: theoretical foundations can be tested, effectiveness and outcome evaluated, they can be both reproduced in similar realities and

adapted to different settings. On the contrary, support groups often do not have a codified method, rely too much on the individual that leads them, and outcomes are unpredictable and difficult to even detect since there is no expected behavioral change as a consequence of attendance. Peers volunteering to lead such a self-help community have to be trained in that specific ideology. They also have to be trained in online group dynamics and in online community design, because creating community networks cannot be done successfully without considering the community members right from the start (Andrews, Preece, & Turoff, 2001). Group size (Foth, 2003) and dynamics (McKenna & Green, 2002) are important variables to consider for successful community design.

Future Trends

Using information technology and networking for the empowerment of people with mental illness worldwide is a very stimulating challenge. For what pertains to people with mental illness in low-income countries, it involves bridging the existing digital divide between developed and developing countries (Paua, 2003). It also involves bridging the many smaller digital divides embedded in the developed societies (Mansell & Wehn, 1998; Paua, 2003). Such a complex process is not only about finding funding sources to bridge those gaps, but it is about allocating resources and using existing technologies and infrastructures in a quite creative way (UNCSTD, 1997).

Some implementation ideas on how to move from this point on can be borrowed from a managerial perspective. In strategic planning, needs and nature of the services to be offered have to be assessed, along with its possible competitors.

Possible interventions for people with mental illness can be roughly divided in two categories: one provided by professionals (like psychiatrists, psychologists, and social workers, more present in developed countries, and Ayurvedic and religious healers, more present in developing countries) and another provided by peers (in the form of self-help or support groups). A third form would be group therapy, in which a professional leads a group of peers. Potential competitors of online self-help groups are face-to-face groups and e-therapy. The former have the same advantages of their online counterparts, save for timing and locations, plus the big advantage for people who are not literate enough to use a computer. In developing countries, where population is mainly rural, transportation costs for going to a self-help face-to-face meeting have to be considered. E-therapy does not have transportation costs, but fees are quite high and it could be culturally inappropriate for people in developing countries. Competitors of medical online information are face-to-face medical information and information following

other paradigms of treatments for mental illness. The latter could be culturally more appropriate and therefore could be inserted in community-based ICT informational intervention as one more option to have, thereby enhancing outcome responses (Hulliburton, 2004). Finally, online learning/training's main competitor is an onsite one, which in developing countries is feasible mainly in urbanized areas.

Among risks and pitfalls of community-based ICT approaches, the refusal of this perspective by policymakers because of cultural shock has to be considered. Linguistic analysis of written communication nowadays allows us to distinguish persons with depression or prone to have it from persons without it (Rude, Gortner, & Pennebaker, 2004), persons with suicidal ideation from persons without it (Stirman & Pennebaker, 2001), and even liars from honest people (Newman, Pennebaker, Berry, & Richards, 2003). Therefore, existing tools should be able to understand written communication with much higher reliability than in the past. Though missing of physical and social cues (Sproull & Kiesler, 1991), computer-mediated communication does not lack in nonverbal cues. In fact, time (chronemics, see Walther & Tidwell, 1995) and distance (proxemics, Jeffrey & Mark, 1998; Krikorian, Lee, Makana Chock, & Harms, 2000) are nonverbal cues that do convey, for example, the importance of the conversation topic for a given person. Emoticons are used (Walther & D'Addario, 2001), as well as verbs, to transform equivocal into univocal statements, like for example during jokes. Therefore, the effective use of these tools allows the user to utilize computer-mediated communication in a far richer way than in the past. Nevertheless, many persons, also among information technology professionals, are still polarized on neglecting social communication nuances in favor of task orientation, and interpreting differences between computer-mediated and face-to-face communication as pre-mediated inferiority (or superiority) to one over the other. They often still insist in not modifying their communication style according to the media they use. Working with information technology and networking for empowering people with mental illness teaches both researchers and policymakers how to overcome old myths and rigid constructs. Ultimately, what technology is able to bring us strictly depends on how the medium is being used. Researchers can decide to shape the technology or be shaped by it (Schuler, 1996), and it is up to them to make a responsible choice, never forgetting how the choices will have repercussions on the rest of society, nevertheless.

In order for an information technology organization to be able to lead the change, it also needs a shift in its attitude toward leadership. Just recently, Sosik, Jung, Berson, Dionne, and Jaussi (2004) analyzed the differences between the older *strategic leadership* and the newer *strategy-focused leadership*. In the latter case, leaders do not focus on strategy, but on how to produce an organization that is focused on strategy. They connect people, technology, work processes, and business into a community. This construct has the big advantage of adding social

capital to the leadership process. In ICT organizational settings, this is even a more precious skill, especially when dealing with initiatives for developing countries.

Convincing mainstream funders, donors, developers, and colleagues of the theoretical foundations, practical effectiveness, and cost effectiveness of such approaches will be necessary in order to create the required shift to use existing resources, technologies, and infrastructures in a different, more creative way. An excellent way to do so is to validate the theories with research, within an evidence-based framework. Mutated from medicine (Sackett et al., 1996), this approach to implementations and policies are, slowly but increasingly, substituting opinion-based and consensus-based guidelines and becoming *best practices*. With an evidence-based approach, the implementer may be able to have a theory, produce evidence of its appropriateness, and implement reproducible programs based on it. Moreover, the other users will be able to use the same words meaning the same definitions. These concepts will be portable from one situation to another.

In developed countries, information connectivity is already very high, so using this viable and available technology for people with mental illness and scientifically testing the outcome not only has its rationale, but is definitely more sustainable than insisting in reaching consensus-based approaches or in using old opinion-based methods. In developing countries, another reason to favor evidence-based approaches is because resources for marginalized people of any kind are spare and misallocated and cannot be unethically wasted in implementing solutions whose effectiveness is unproven.

In ICT in general, but especially in those programs designed to technologically assist developing countries, the social aspect of interaction is often neglected in favor of a more technology-based approach. Rather than exporting the "developed" approach, they could rather learn how to use the focus on community that is used in other countries. Because connectivity alone does not ensure community (Foth, 2003), the developer's attention has to shift from how to access information to how to *use* information (Lundvall, 1992; Menou, 2001) and assist this shift with careful community design as opposed to mere system design. Factors to take into account when designing a community are: provision of socio-cultural animation, population of the network, attention to sociability, and care for human-to-human ties (Foth, 2003). This is even more important for people with mental illness for whom empowerment, positive personal interactions, social support, and community networks are social protective factors (Hosman, Jané-Llopis, & Saxena, 2005). Therefore, interventions addressing ICT and network usage for people with mental illness have the potentiality to be the primary prevention, thus opening up a further unexplored scenario.

Implementation of online psycho-educational, self-help, and training projects, even in isolation from one another, could test the feasibility of this model and

discover its possible pitfalls, with particular regard to gathering and packaging information for psycho-education, searching, and selecting possible old and new self-help models that want to try online delivery of service, training of peers providing online services, feasibility of cheap online training and learning for this population, and usability of online learning materials, also in terms of culture.

Given the high potential for the sustainability and effectiveness of this approach, researchers in the field should focus on: how to build fully functional and effective online self-help groups, how to promote standardization in medical information site user ratings, and how social learning can be integrated into online communities.

Conclusion

People with mental illness worldwide are a very large community, often marginalized for concomitant socio-economical factors. Among poorest members, not just access to medical care, but even access to reliable information about the illness, and social and network support — including training resources — are denied, impaired, or otherwise jeopardized by the absence of resources, infrastructures, and economical support to provide reliable Internet access to their population. Illness, poverty, but also lower social status, low self-esteem, stigma, and no hope for a better future make it virtually impossible for them to exit from this vicious marginalized cycle. To persons in these conditions, empowerment sounds like nothing but a word. And it is precisely for this reason that empowerment at personal, interpersonal, and societal levels becomes essential.

People with mental illness might have difficulties interacting with others, both other persons with mental illness and *normal* ones. This may be true whether they are actively symptomatic or not. If symptomatic, the Internet can be their only access to low-cost reliable medical information, as well as providing networking opportunities with other persons with mental illness. If not symptomatic, access to ICT and networking can be a valid answer to many practical problems to escape poverty and marginalization. With a computer and Net access, they can connect with resources of any kind, even when low self-efficacy and self-esteem rather than the illness itself do not allow them to venture into the world. This is especially true for persons with mental illness who also belong to another stigmatized population (e.g., LGBT, minorities, people with physical disabilities, jobless, HIV-positive, low-income, etc.). Therefore, in both developed and developing countries, ensuring low-cost connectivity is the starting point to move further in assisting people with mental illness, whenever literacy is high enough to utilize it.

But even when they have the financial and material resources to buy what they need in order to get connected, like in developed countries, they might not know where they need to go to address their informational, social, and learning needs. Financial provisions to consistently enhance the connectivity of people with mental illness would be a beginning, but that has to be followed by a package of designed resources to acquire information, social networks, and resources that could really make a difference in their life.

Many online interventions could empower them. Ensuring psycho-education, e-learning, and supportive facilitation interventions to people with mental illness is a challenge that will give them capacity and skills to overcome these challenges and participate equally, as they deserve.

In this context, bridging the digital divide has become a rehabilitative challenge, particularly bringing affordable ICT, network access, and sustainable interventions to jointly address stigma, marginalization, isolation, and low self-esteem. Unfortunately, the world cannot be changed as long as the initiators are reluctant to change their mindset, adopting an eclectic approach and being open to paradigm shifts on how to utilize the available resources.

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Terms and Definitions

Community-based approaches: Strategies that address problems of disadvantaged populations through the involvement of the community they belong to, as a whole but at different levels. Community-based interventions encourage promotion of service delivery, equitable opportunities, human rights, and quality of life of such populations through implementations taking place into venues familiar to the target populations (i.e., churches, libraries, schools). This kind of approach is becoming increasingly popular due to both its sustainability and transcultural effectiveness.

Computer-mediated communication: Communication between two or more persons that happens through technological devices, such as a computer and the Internet. These interactions differ from face-to-face ones in that they are written, remote, and lack physical cues. They can be synchronous (like chat rooms or instant messaging) or asynchronous (like e-mails). However, they are able to foster a sense of community, thereby generating social capital.

DALY: Method for calculating the health impact of a disease in terms of reported (or estimated) cases of premature death, disability, and days of infirmity due to illness from a specific disease or condition. For each disease or risk factor, DALY is calculated as the annual sum of the years of life lost due to premature mortality and the *years lived with disability* in the population for that health condition. DALY extends the concept of potential years of life lost due to premature death to include years of *healthy* life lost by virtue of being in states of ill health.

Online self-help: Online self-help groups aim at individual change by helping people help themselves, like traditional self-help groups but in online settings. They overcome the participation barriers traditional self-help groups have by taking advantage of the anonymity and disinhibition characteristic of online settings, in order to foster deeper disclosure and acceptance, with particular respect to embarrassing situations, non-mainstream preferences, and stigmatizing health conditions.

Patient education: Interventions for providing persons with an illness with some medical education about their disorder in order to improve compliance to hygiene measures and medications, recurrence prevention, management of the illness, short-term and long-term outcomes, and quality of life. Health care

professionals, qualified publications, and/or trained peer-counselors usually distribute medical information. For many illnesses this is a low-cost, evidence-based intervention.

People with mental illness: Mental illness displays itself as difficulties in behaving, thinking, and/or interacting with other persons, and has very high rates worldwide. Symptoms vary from accessional relational impairment, along with chronic external and internalized stigmas, to actual psychiatric disability that needs accommodation. Furthermore, people with mental illness also experience stigma, marginalization, isolation, and low self-esteem that influence one other and the illness course deeply.

Virtual learning: Consists of acquiring formal education through the Internet, generally in a self-paced way. A variety of online environments are available (Web interface, e-books, e-mails, e-groups, tele-classes, chat rooms, instant messaging, one-to-one tutoring, study buddy, group work, and others), and all are learner centered, knowledge centered, assessment centered, and community centered. Even though virtual learning is not suitable for all kind of learners, it is usually more cost effective than traditional onsite learning.

SECTION IV:
INFORMATION NETWORKING
AND KNOWLEDGE MANAGEMENT

Chapter IX

Connecting the First Mile:

A Best Practice Framework for ICT-Based Knowledge Sharing Initiatives

Surmaya Talyarkhan
Practical Action, UK

David J. Grimshaw
Practical Action, UK

Lucky Lowe
Practical Action, UK

Abstract

This chapter characterises the use of information communication technologies (ICTs) to share information with people at grassroots as connecting the first mile. *It examines the literature about connecting the first mile and identifies the key debates: whether solutions should be participatory or top-down, technological or social, whether they should focus on global or local information, and the overall potential of ICTs for development. The chapter synthesises the lessons from a range of practical studies to identify*

the factors that contribute to the success of a project. A framework of best practice is offered, divided into three dimensions: the environment, the project level, and the local level. Whilst recognising that initiatives will vary according to the local context, the authors offer the best practice framework to support practitioners in addressing the challenges of connecting the first mile and empowering marginal communities to participate effectively in the information society.

Introduction

The international development sector has focused in recent years on the need to share knowledge more effectively in support of poverty reduction efforts. Multi- and bi-lateral agencies and NGOs are increasingly putting knowledge sharing at the centre of their organisational strategies. And, in the context of a perceived knowledge divide, they are addressing the challenge of how to respond to the knowledge needs of people living in poverty in developing countries.

Information and communications technologies (ICTs) such as the Internet, mobile phones, and radio offer opportunities to connect people to information quickly and in large numbers, transcending geographical barriers. The challenge for information providers in development is how to share information with people who have little access to ICTs, low levels of literacy, little time or money, and highly contextualised knowledge and language requirements. For many years reaching people living in poverty with information was characterised as the *last mile* problem, a term borrowed from the telecommunications field, where it referred to difficulties of improving connectivity in remote rural areas. In recent years, this *problem* has been reconceptualised in terms of *connecting the first mile*, which privileges the needs of people living in those remote areas (Paisley & Richardson, 1998). In this chapter, connecting the first mile refers to ICT-based projects aimed at sharing information at grassroots.

This chapter aims to identify best practice in development projects using ICTs to connect the first mile, through a review of existing literature and case studies. It begins with a discussion of the role of ICTs in development and an examination of the different ideological approaches adopted by authors, before drawing together a framework based on the lessons and recommendations from the literature. It concludes by examining the trends that will impact on information networking for communities at the first mile and discussing potential applications of the framework.

Development and ICTs

The concept of development has been evolving since its origins after the Second World War. Sachs (1992) dates the age of development as beginning when President Truman at his inauguration described regions in the South as *under-developed*. International organisations such as the World Bank and the United Nations (UN) were established to support international relations, and their agendas have influenced the discourse on development ever since.

The priorities of the international development community have shifted over the years. From a focus on economic development and growth, international bodies have begun to focus on poverty as a multidimensional phenomenon and to acknowledge the various contributory factors to poverty such as a lack of access to markets and services or vulnerability to shocks.

Communication has consistently been central to the work of development agencies, but in recent years the recognition of information and knowledge as contributing to growth, as well as the vogue for knowledge management and the massive expansion of ICTs, has highlighted the importance of knowledge for development.

Many international initiatives have been established to harness ICTs for development on a global scale, in particular since the publication of the World Development Report on Knowledge for Development (World Bank, 1998). These include the Global Knowledge Partnership (founded in 1997), the DOT-Force (created in 2000), and the UN ICT Task Force (created in 2001). The International Telecommunication Union (ITU) hosted an international summit on the Information Society in 2003, the second phase of which took place in early 2005. These initiatives aim to build partnerships among civil society, the public, and private sectors to harness ICTs for development (Chapman & Slaymaker, 2002).

There is a consensus that ICTs can play an important role in development, for example by connecting people to more accurate and up-to-date information, equipping them with new skills or connecting them to an international market. However, there is concern that the digital divide is increasing the gap between the *information haves and have-nots*, and this is the preoccupation of many of the initiatives established to address ICTs for development.

Perspectives in the Literature

In recent years, many studies have been published, particularly by practitioners in the development field, on the use of ICTs for development. The term *ICTs for*

development incorporates a variety of different uses of ICTs, for health, e-governance, agriculture, advocacy, and many more. There is not a coherent body of literature one can search for about connecting the first mile. This framework is based on a review of case studies collected from the Eldis portal, where development practitioners publish their findings (http://www.eldis.org). Studies were selected according to the following criteria:

- Is there a knowledge sharing and development focus to the ICT project?
- Are the end users people at grassroots?
- Is the document a good source of information?

The studies which scored highly against each criterion were reviewed to compile the framework.

This chapter also refers to more general literature on ICTs and development selected through cross-branching from existing literature reviews and searches of academic journal databases. The database searches (on Proquest and EBSCO) found fewer articles or studies relevant to the first mile, perhaps because the majority of this research is conducted by practitioners.

The gaps that exist in the literature about connecting the first mile either represent areas where there has been little convincing evidence collected to date or where authors cannot reconcile their perspectives on the role of ICTs in development. Previous literature reviews in this field have commented on the promotional nature of literature, the paucity of baseline and evaluation studies to date, the relatively recent emergence of frameworks for evaluation, and the emphasis on telecentre projects and literature about Africa (O'Farrell, Norrish, & Scott, 1999; Adeya, 2002).

This literature review highlights key concepts around which practitioners are polarised. An understanding of the different perspectives is essential to illustrate the different meanings of best practice in discourse on ICTs and to situate this study against an ontological background. Commentators have attempted to divide the literature in development into different factions: sceptics and pragmatists, optimists and pessimists, globalists and localists. In this study, it is suggested that authors diverge along four dimensions:

- Top-down vs. participatory solutions to development problems,
- Global vs. local solutions to development problems,
- Technological vs. social solutions to development problems, and
- Optimism vs. pessimism about the role of ICTs in development.

These different perspectives shape authors' discourse and priorities, their concept of impact, and their understanding of best practice. The rest of this section examines each perspective in turn. The clash of perspectives is illustrated for example in the terminological debate over the *last mile problem*. For some authors the term typified a top-down approach to development, viewing the delivery of technologies to people living in remote areas as a solution to development problems (Paisley & Richardson, 1998). In contrast, the concept of *connecting the first mile* starts from the needs of marginal communities and marks the connection between the local context and global information systems.

Top-Down or Participatory Solutions

ICT for development projects are criticised for failing to build on existing systems or work in a participatory way. Critics argue that top-down projects, driven by the donor agenda, fail to achieve local ownership (Aley, 2003b; Gumicio Dagron, 2001; Lloyd Laney, 2003c). The concept of the *design-reality gap* (Duncombe & Heeks, 1999) highlights the distinction between the context in which an ICT project or application is designed and the context of its use in developing countries.

In many cases projects are driven by the donor agenda, which has a short-term horizon and may not recognise or be able to address the multi-dimensional causes of poverty due to a narrow focus on donor objectives (Stoll, Menou, Camacho, & Khellady, 2001). Gumicio Dagron (2001) is especially critical of the role of donors and their focus on large-scale projects:

The international donor community is still reluctant to acknowledge 30 or 40 years of failures and millions down the drain because of ill-planned macro programmes. The eagerness to go fast, to show short-term results, and to extend coverage to large numbers of people has actually backfired. (p. 11)

For him, donors' concern with scale serves to multiply models that clash with culture and tradition and paralyse communication, instead of linking communities and facilitating exchanges.

Global or Local Solutions

ICTs for development initiatives often seek to increase access to a *global pool of (codified) knowledge* (Stiglitz, 1999), but have been criticised for failing to

acknowledge the local context (Gomez & Casadiego, 2002; Moroow, 2002). Ballantyne (2002) highlights the emphasis on external content pushed at people living in poverty and the struggle faced by efforts to push local content (e.g., research conducted in the South or Southern arts) onto a global stage. Many initiatives are criticised as offering one-way transfer of information (usually from the global to the local level), but failing to promote genuine, two-way knowledge sharing. For example, van der Velden's (2002) analysis of the Development Gateway suggests that the project was designed without a concept of knowledge as contextually defined, and therefore does not address the needs of key audiences:

The critique of the Bank's approach in this case indicates that knowledge needs to be presented in the appropriate context and be meaningful in the local situation in order to be useful and effective. (p. 31)

Technological or Social Solutions

There is a distinction between authors who see technology as a solution to development problems and those that seek social solutions. Articles cite particular types of technologies and applications, such as Wireless Fidelity (WiFi), open source software, low-cost devices, translation engines, as *stepping stones* toward *digital inclusion* (Primo Braga, Daly, & Sareen, 2003). This technological determinism recognises the difficulties of communicating to the local context (such as language or access barriers), but locates the potential to overcome them in new technologies, rather than in social factors. Concerns are raised by other authors (Boyle, 2002) that technology is increasingly determining the solutions sought to development problems:

What I am concerned with is the degree to which complex social development goals become seen as functional or technical problems when ICTs are introduced and how technology becomes particularly determinant in how larger goals are understood and acted upon. (p. 102)

Optimism or Pessimism

Some authors are extremely optimistic about the contribution that ICTs can make to development goals. Heeks (2002) comments on the *current prevalence of positive and technologically deterministic viewpoints*, which he sees as influenced by the climate among international development agencies:

A number of factors among agency staff may explain the emergence of this viewpoint. They include naivety about ICTs, desire for career advancement, pressure from ICT vendors, a lack of alternatives to the trends/fads of the Northern private sector, and pressure from political masters for quick solutions to development problems. The viewpoint also emanates from those seeking funds or guidance from the development agencies. They tend to mimic the views and messages of those agencies. (p. 4)

An examination of the different perspectives in the literature leads to the conclusion that different ideologies shape authors' understandings of best practice and what they conceive of as a successful project. For some authors ICTs are in themselves a contribution to development, whereas for others they need to be part of a wider development solution, a means rather than an end. Authors' perspectives determine how project impact is evaluated in the studies and how lessons are drawn for best practice. The next section examines the different approaches to evaluating the impact of projects at the first mile.

Best Practice and Impact

In this chapter, impact is conceived of as the reported outcomes of the project, and best practice is taken to mean the processes that have contributed to a project's success. In order to identify examples of best practice from the literature on connecting the first mile, in addition to understanding authors' perspectives, it is necessary to understand how they are defining impact and why they choose to view the project in a particular light. For example, the power relations inherent in development projects affect how impact is demonstrated (Stoll et al., 2001; Gumicio Dagron, 2001). Practitioners need to demonstrate success to receive further funding, donor organisations are unwilling to invest in monitoring activities by donor organisations, and 'beneficiaries' have relatively low input into the monitoring and evaluation process. Factors such as these suggest that demonstrating results can be more important than demonstrating a development impact for beneficiaries.

Practitioners and academics struggle to define a causal link between development outcomes and ICT projects. Although frameworks and targets exist that aim to model how poverty reduction can be achieved and where interventions could be successful, the contribution ICTs can make is not easily defined. The rest of this section compares authors' differing concepts of impact at the first mile — where some start from frameworks and targets to assess how ICTs contribute to development, others look to the sustainability of ICT projects or

their ability to disintermediate transactions to demonstrate their success. Other authors adopt a universal access approach whereby access to information is seen as a human right and the use of ICTs is in itself a developmental outcome.

Applying Frameworks to Define Impact

The Sustainable Livelihoods Framework has been used to illustrate some of the contributions of ICT projects, for example their contribution to social capital, human capital, or improved livelihoods strategies (Batchelor, Norrish, Scott, & Webb, 2003; Chapman, Slaymaker, & Young, 2003). The World Development Report of 2000/2001 identified three priority areas for reducing poverty: increasing opportunity, enhancing empowerment, and improving security. Some studies have taken these as ways of assessing the contribution of ICT projects to poverty reduction (Op de Coul, 2003; Cecchini & Scott, 2003). These studies group examples of projects according to the three priority areas, but little evidence is presented that, for example, increased empowerment has led to poverty reduction. In places these case studies seem to present ICT adoption as increasing opportunity in itself, which becomes a circular argument. The Rockefeller Centre has adopted a model of communication for social change (Figueroa, Kincaid, Rani, & Lewis, 2002) which theorises communication as "dialogue rather than monologue, as a cyclical process of information sharing which leads to mutual understanding, mutual agreement, and collective action" (Figueroa et al., 2002, p. 2), and develops indicators on that basis although this review has not located cases where these are used.

Defining Impact in Terms of Sustainability

Some studies evaluate ICT projects on the basis of sustainability. The emphasis on sustainability partly reflects donor concern with short-term investments, but also a more commercial approach that suggests that sustainability represents demand for a service. Batchelor et al. (2003) evaluated projects according to how sustainable they were in terms of economic sustainability, social sustainability, and institutional sustainability. In their definitions, economic sustainability is achieved when a given level of expenditure can be maintained over time, social sustainability is achieved when social exclusion is minimised and social equity maximised, and institutional sustainability is achieved when prevailing structures and processes have the capacity to perform their functions over the long term.

Economic sustainability is seen by some as a key indicator of success of a project because it is seen to reflect a genuine demand for that service. At the same time, in many development projects, donors are funding information dissemination as

a public good as Tschang, Chuladul, and Le (2002) comment: "The nature of telecentre sustainability is complicated by the point that it may initially be a public good, especially in disadvantaged areas, yet must be ultimately self-supporting" (p. 130).

A great deal of research has been published on economic sustainability, in particular with regard to access initiatives such as telecentres or information kiosks, which have high set-up and maintenance costs and customers with little spare cash. The complicated objectives of providing information services as a public good and making them self-supporting have proved extremely difficult to reconcile, and few initiatives have succeeded in covering their costs, even if they have developed viable charging mechanisms (Batchelor et al., 2003).

Authors concerned with participation tend to identify it as the locus of social sustainability, arguing that the active involvement of users minimises social exclusion and perpetuates support for the project:

The concept of establishing a dialogue with beneficiaries all along the process of conceiving, planning, implementing and evaluating a project has been gradually consolidating. At first, implementers understood that beneficiaries should be involved in the activities leading to social and economic development of a community, for the purpose of building up a sense of ownership within the community. This was at last perceived as important especially in terms of the sustainability of the project once the external inputs ended. (Gumicio Dagron, 2001, p. 10)

Institutional sustainability is primarily a question of resources and capacity building, amongst project staff and partners, empowering those institutions to take control in local development issues.

Defining Impact in Terms of "Disintermediation"

ICTs are also seen as contributing to poverty reduction through *disintermediation*, whereby local producers have direct access to the market and can therefore charge market rates for their goods without having to pay an intermediary. Op de Coul (2003) cites an example from Central America:

Agronegocios in El Salvador helps farmers to become traders as well and to establish direct contacts with buyers, instead of selling to middlemen (called "coyotes"). This is done through bi-weekly markets in the capital but also through a virtual market on the Web site where offers and demands are

published. In Agronegocios centres spread around the country the farmers and their children are taught how to enter their offers and how to find possible buyers. Though the farmers in general prefer personal contacts with their customers, the virtual market has the advantage of offering "business to business" opportunities and bigger quantities can be sold. Furthermore, trade is not restricted to the province or country the farmers live in; deals with foreign traders are an option as well. (p. 7)

Although some ICT initiatives succeed in disintermediating commerce, Batchelor et al. (2003) comment that there is a need for ICT intermediation instead (although the users are less vulnerable to these intermediaries than in traditional transactions).

Defining Impact in Terms of Universal Access

Donor agencies have focused on improving access to ICTs since the early 1990s, and telecentres have been seen as playing a key role in that strategy (Etta, 2003). Practitioners and policy makers who aim for universal access to ICTs can perhaps demonstrate impact most easily because for them access to information and ICTs in themselves can constitute a developmental impact. Therefore, indicators such as the number of people who can access the Internet in rural areas will be meaningful indicators of development for them, regardless of how useful they find the content they access.

Best Practice and Impact in this Chapter

This literature review has demonstrated that in the literature on connecting the first mile, authors have very different ideologies and evaluate project impact according to different types of outcomes. There is a strong case for working in a participatory way and connecting local and global information, as the field is littered with examples of failed initiatives that did not prove to be useful to the end users.

It is also clear that monitoring and evaluating the impact of a project is a political undertaking and that reported best practice may not represent development outcomes for the beneficiaries, but the achievement of goals set by donors or development agencies, such as sustainability or access to ICTs. Therefore, when researching best practice, the author's definitions of impact must be considered before accepting that an experience has been valuable at grassroots.

In this chapter, the development needs of people living in poverty are prioritised over the technologies shaping current discourse. However, the next section

reviews existing research and highlight the critical factors at the local level, the project level, and in the environment of the project, which make the projects successful and how projects can achieve these.

Identifying Best Practice

In the literature on connecting the first mile, best practice is described through the use of examples of successful projects, examples of unsuccessful projects, and recommendations based on project experience. Several studies have collected a group of cases and compiled guidelines for practitioners or highlighted the lessons learned from existing projects. The success of many projects is *situated success* in the sense that the project has worked due to a particular combination of local factors such as a strong champion or good timing. This framework focuses on the processes that contribute to the success of a project, in order to make it applicable in wider contexts.

This framework divides the success factors into three levels of analysis: the local level, the project level, and the environment. The local level is the point at which end users at grassroots access information services. The project level deals with the project planning and implementation. The environment consists of all the factors that affect a project's success but are external to the project.

All of the elements in the framework have an impact on connecting the first mile and on the project as a whole. The distinction between the levels is artificial, but is a convention that helps to identify which actors are key to success and the nature of their contribution. Each level can impact on the others, for example delayed funding from donors can have an impact at the project level and local level. Project managers need to find ways to integrate the levels so that, for example, information from the local level reaches policy makers outside the project.

The sections below detail the success factors identified in the literature (i.e., WHAT elements appear to lead to successful projects) and also highlights suggested best practice (i.e., HOW practitioners can work towards these factors).

The Environment

Forces external to a project, such as the regulatory context, infrastructure, or the role of donor organisations, can play a key role in the success of the project.

Policy Environment

The policy environment can affect the day-to-day working of an ICT initiative. Batchelor et al. (2003) cite the example of ACISAM, an NGO in El Salvador that was unable to bid for radio or television space due to policy restrictions. An analysis of ICT stories collected by Infodev suggests that dealing with local authorities can be an issue if the project challenges their power:

Co-operation from local government is to be taken into account in a lot of projects. Either because project initiators need authorisation from the local government to start their project, or because the local government may even be a partner…they will not co-operate to the fullest if they feel that the empowerment coming from the project will challenge their positions of power. (Infodev, 2004, p. 1)

Studies on advocacy suggest that best practice is to research the policy environment, recognise the existing power relationships, and develop strong relationships where possible with policy makers (Lloyd Laney, 2003a). One example of good practice is the Gyandoot initiative in India, which adds value to existing policy structures by giving communities to access government services locally from kiosks.

Infrastructure

In ICT projects, the lack of local telecommunications infrastructure can be "one of the biggest challenges, especially in developing countries" (Infodev, 2004). Best practice in overcoming this challenge includes analysing telecommunications and IT infrastructure deficiencies to plan for realistic measures (Chapman et al., 2003), adopting innovative technologies such as the wireless connectivity technology used by the n-Logue project in India (Badshah, Khan, & Garrigo, 2004), or developing more accessible devices such as the Simputer (Primo Braga et al., 2003). A most recent contribution in this aspect could be the $100 computer that Nicholas Negroponte at MIT is designing with the ICT industry.

Relationship with Donors

The role of donor organisations can also be a determinant in the success of a project: "The initiatives having less financial problems are the ones implementing

online activities and the ones whose hosting organisations have good relationships with donors" (Op de Coul, 2003).

A case study on a project in Thailand that stalled suggests it was partly due to poor donor relations:

APRTC had only been in existence for a short time and did not have the solid relationships of more established organisations. Also, its approach was unique and relatively unproven even though initial results were promising. That it was an NGO with no connection with any national government or focus on a particular country seems to have put off potential supporters. Donors seem to prefer working with government agencies or organisations closely aligned with national efforts. (Infodev, 2004, p. 12)

Practical Action's experience would suggest that forming individual relationships with donors is important, as well as communicating project progress in a timely way. An analysis of the impact of research on policy (Crewe & Young, 2002) suggests that establishing credibility and communication, influence, and legitimacy contribute to help an organisation to achieve policy change.

The Project Level

In managing a project connecting the first mile, much of the literature suggests that success depends on understanding development priorities at the community level, and planning, monitoring, and evaluating to ensure that projects are having an impact on those priorities. For implementation to be successful and sustainable, there is a need to partner with other organisations and devise a sustainable business model for the project. Projects need to share best practice with other practitioners to understand how replicable a project can be.

Working with Communities

Recent articles on ICTs have made powerful arguments for participation by target groups throughout a project, from inception to evaluation and beyond:

If technologies are to be developed that suit poor end users, then these people must be a part of the design process from the outset. The principles of participatory technology development are as important as ever, whether it be

designing a bullock-drawn plough or an electronic information technology. Poor people must be empowered to express their requirements and allowed to play a leading role in technology development. People living in poverty understand their situation better than any "external expert". Without end-user involvement, well-intentioned outsiders will make mistakes, which poor people might not even be inclined to point out! (Aley, 2003a, p. 33)

The key to best practice at the project level is to start from communities' development priorities (Stoll et al., 2001) and begin with a needs assessment which could draw on PRA or RRA methodologies (Bridges.org, 2004; Cecchini & Scott, 2003; Lloyd Laney, 2003c). Cecchini et al. (2003) point to the failure of an Indian e-governance initiative due to a lack of local understanding:

In Rajasthan, the state-sponsored RajNidhi e-governance program has failed to deliver, despite the fact that the software is easy to use and in Hindi, because of extremely centralised planning that did not take local conditions into consideration. Content, in fact, lacks regular updating because of communications problems between the state and the local government. (p. 13)

Project Planning

Like any development project, a successful ICT for development project will have clear objectives, clearly identified target groups, and realistic plans for implementation (Batchelor et al., 2003; Bridges.org, 2004). An example of good practice on the ICT Stories Web site is the Jharkhand-Chattisgarh Tribal Development Programme (JCTDP), an 8-year livelihood improvement and empowerment programme targeted at resource-poor rural households in nine largely tribal blocks in the Chattisgarh state in India, which has identified its audience and developed its project plans according to their needs.

Monitoring and Evaluation

Although many initiatives are too new to demonstrate impact (Meera, Khamtani, & Rao, 2004), commentators are concerned that monitoring and evaluation indicators relate to use of technology more than to the impact for example on livelihoods (Stoll et al., 2001). There are suggestions for best practice in the literature, which ensure that in addition to data collection, the process supports learning and change. These include linking the project goals, variables, and

indicators to community priorities (Stoll et al., 2001), critically evaluating efforts, reporting back to clients and supporters, and adapting as needed (Bridges.org, 2001). Best practice involves monitoring throughout the life of the project, not only once a project is completed (Lloyd Laney, 2003b).

Partnerships

Partnerships and institutional arrangements are given central importance in the literature. In order to deliver information services to the poor, information providers need to form strong partnerships with other information providers (Batchelor et al., 2003) and organisations that promote services, and raise awareness amongst end users (Cecchini & Scott, 2003) as well as organisations offering the technological infrastructure and finance to keep the project afloat. Best practice involves selecting partners from the public, private and civit society sectors (Saravia, 2005). Bridges.org (2003) describes the case of the Satelife PDA, whereby physicians, medical officers, and medical students tested PDA devices in the context of their daily work environments. Partner organisations working on that project in Uganda included the American Red Cross, Makerere University Faculty of Medicine, and HealthNet Uganda, which provided technical support and project assistance. Medical texts were obtained from Skyscape, an online information provider.

Incentivising partners to participate in the project is crucial to success. Donor organisations are looking at public-private partnerships (Carlsson, 2002), and there is a case for businesses to partner with businesses, NGOs, and community groups already established in developing country markets to minimise risk and maximise infrastructure (Prahalad & Hammond, 2002).

Few studies make recommendations for best practice because each project will require a different set of stakeholders to be involved, but the comments from the Max Lock Centre (1999) are instructive: "The key to achieving real partnership in local development is negotiating conflicting interest, discovering overlapping interest and mutually beneficial means of achieving individual interest" (p. 1).

Partnerships with organisations at the local level are also key to the success of a project and will be discussed in detail in the next section.

Sustainability

Many studies relate best practice to how sustainable a project is. Badshah et al. (2004) highlight some initiatives that have developed innovative solutions to financial sustainability:

Several projects have a self-sustaining commercial focus as the driving factor — Drishtee (India), Cabinas (Peru), Warnet (Indonesia), n-Logue (India), Telecottages (Hungary), are all based on a business model. According to Amin, one way to structure a business driven kiosk model is as a franchise and many of the successful efforts analysed have adopted this approach. (p. 223)

Tschang et al. (2002) suggest that for telecentres, returns are increased through economies of scope and scale, network externalities, vertical integration and agglomeration. They also highlight the importance of partnerships to overcome initial costs:

The high initial investment costs in equipment and infrastructure make it difficult to base expansion plans on local owner-operators' means. In-kind investment partnerships — e.g., the Indonesian government's vocational school system's partnering with local businesses to sponsor cybercafé, and private sector assistance; or the Indian Andhra Pradesh state government's scheme to involve long distance telephone companies — may be solutions to these problems. (p. 130)

The involvement of the private sector in sustainable ICT projects can often reduce costs and improve service quality and efficiency (Badshah et al., 2004). The private sector is waking up to the "bottom of the pyramid" as a potential market, and multinational corporations are adopting new business models and partnership models to exploit these markets, such as the shared access model popularised by the Grameen Bank (Prahalad & Hammond, 2002). Whereas public initiatives can be slow to recognise services that fail to meet demand, Prahalad and Hammond (2002) suggest that through competition, multinationals are likely to bring a superior level of accountability for performance, which could benefit end users.

Therefore, best practice in developing a sustainable business model will include identifying which services are being provided as a public good and where the project could adopt a commercial model and increase returns through partnerships, in particular involving the private sector.

Building Staff Capacity

Op de Coul (2003) raises the high turnover of trained technical staff in ICT for development projects as an institutional sustainability issue. Best practice suggestions are offered by Batchelor et al. (2003):

Institutional sustainability is said to be achieved when prevailing structures and processes have the capacity to continue to perform their functions over the long term ... The studies show three mechanisms for gaining capacity: it is possible to buy-in expertise when necessary, to hire specific skilled staff or to train existing staff (or volunteers). (p. 17)

In knowledge sharing projects there can be a need to extend capacity building to partner staff such as intermediaries or technical partners.

Scaling Up Through Communication and Replication

Sharing findings with other development practitioners is important to communicate best practice (Op de Coul, 2003) and to understand the degree to which a project could be replicated in a different context (Cecchini & Scott, 2003). Besemer, Addison, and Ferguson (2003) make a convincing case for sharing findings with donors to influence policy and recommend donor dialogue as a best practice. A recognised problem with ICT for development is that most initiatives are pilot projects, which are then not scaled up into programmes (Weigel & Waldburger, 2004), although the warnings from Gumicio Dagron (2001) suggest that concern with scale can lead to more failures. In any case, it is necessary to develop an exit strategy to ensure that projects are sustainable after funding is withdrawn (Ballantyne, Labelle, & Rudgard, 2000).

The Local Level

Knowledge management theory recognises the centrality of context to meaning. For Nonaka and Takeuchi (1995), information and knowledge are context-specific: "…both information and knowledge are context-specific and relational in that they depend on the situation and are created dynamically in social interactions between people" (p. 59). Therefore taking account of the local context is crucial when sharing information at the first mile, to make sure that information can be understood and internalised by local people.

Building on Existing Systems

In the literature relating to the first mile, there is an emphasis on building on existing systems (Chapman et al., 2003; Lloyd Laney, 2003c) instead of introducing new ones

and undermining the ways people currently receive information. "The ICTs revolution can undermine traditional, local communications, by supplanting them and by taking attention away from them" (Chapman et al., 2003, p. 2). Recommendations are that projects conduct research into existing information systems and design initiatives that build on these. Projects should also connect to traditional knowledge (Ballantyne, 2002) and promote local participation throughout the project.

Appropriate Materials

There is a vast amount of literature recommending approaches to designing information appropriate to the local context (Batchelor et al., 2003; Lloyd Laney 2003c; Aley, 2003a; Aley, Waudo, & Muchiri, 2004). Authors highlight the following dimensions to appropriate information: language, cultural context, information delivery channel, information format. For instance, in an assessment of WorldSpace radio, Aley et al. (2004) found that:

A common request is for more information that is appropriate to their specific context, meaning it must be locally relevant and applicable. Many people prefer information to be exchanged orally in their own mother tongue, and appreciate practical face to face demonstrations and follow-up. (Aley, 2003a, p. 5)

Therefore, best practice requires that practitioners research the information systems of their target group and understand their information needs, address local language issues, and then develop materials in the right format for use.

Appropriate Technology

The studies also highlight the need for appropriate technology to be chosen. In terms of sustainability, Batchelor et al. (2003) highlight the need for local repair and operational skills to maintain the technology. Primo Braga et al. (2003) discuss the use of low-cost technologies and free or open source software at the grassroots. Chapman et al. (2003) highlight the need for *realistic technologies* to be used that are appropriate to the local context and suggest the need to blend communications approaches, citing the example of the Kothmale project in Sri Lanka where a community radio station browses the Internet at the request of listeners: "A combination of linking old and new technologies, use of mass media and technology sharing can reach the greatest number of people, over the largest distances and with the least infrastructure investment" (p. 28).

Schilderman's (2002) research shows that successful examples of strengthening the knowledge and information systems of the urban poor are rarely based on a single method of communication and that incorporating traditional media can promote two-way knowledge sharing.

Information Intermediaries

Where there is little access to technology, an information intermediary can help communities to find the information that they seek. Different studies define information intermediaries in different ways. For Cecchini et al. (2003), they are the human intermediary between poor people and ICTs. For Lloyd Laney (2003), they represent the face-to-face contact which is essential in turning information into knowledge for poor people. For Raab, Woods, and Abdon (2003), they are employed to provide information: "Knowledge intermediaries are the many individuals employed by government extension systems, non-government organisations, academia and the private sector who have the responsibility to provide information and educational opportunities [for farmers]" (p. 269).

For Schilderman they are "information producers and suppliers, who do so out of duty or desire" (2002, p. 5), such as the public sector, NGOs, or religious organisations.

Cecchini et al. (2003) offer examples from rural India of best practice by intermediaries:

Successful examples of ICT projects for poverty reduction are conducted by intermediaries that have the appropriate incentives and proven track record working with poor people. In Andhra Pradesh, ANMs have been working with poor villagers on a daily basis for years. SKS, the microfinance institution, adheres to a philosophy of reaching out to the poorest women in rural areas. In Gujarat, dairy cooperatives have been the best agent to target small farmers. If these intermediaries are grassroots-based and understand the potential of ICT for social change, they can be tremendously effective in promoting local ownership of ICT projects. In rural India, many telekiosks operators are young, educated, computer-savvy, and very attached to their communities. They are also extremely entrepreneurial. In the case of Gyandoot, successful telekiosk operators — besides offering e-government services — often create and manage database and work on data entry for private clients, offer PC training, provide voice, fax, copy, Internet and many other services. (Cecchini et al., 2003, p. 12)

In working with infomediaries then, best practice involves identifying grassroots-based infomediaries with a track record of working with poor people. There is

a need to provide appropriate incentives for partnership and perhaps to find entrepreneurial infomediaries who can make a living. In ITDG's experience of running an online service offering information for small, informal enterprises in Kenya, the infomediaries were crucial in connecting to the first mile. One infomediary sold new information to a local businessman about the availability of a peanut butter making machine for Ksh 2,500 (about US$35), which illustrates some demand for information services at the first mile that can currently be met best through infomediaries.

Building Capacity of Infomediaries

Schilderman (2002) recommends best practice for projects with regard to infomediaries, which includes developing appropriate materials, sharing good communications practice, and capacity building:

Development agencies should sensitise state institutions towards more courteous and efficient information provision and, where resources are a real constraint, aim to provide additional resources and capacity building. Where this research has shown that smaller authorities are often better at communicating with their target population, this could be an argument in seeking wider decentralisation [...] There is furthermore a need to recognise, document and share good practice in communicating with the urban poor. Whereas many infomediaries are obviously not functioning optimally, some do exist that do well or have some exemplary projects or services, but often these are not widely known. (Schilderman, 2002, p. 49)

Infomediaries need to acquire what Ballantyne (2002) terms *adaptation skills*, for example translating information materials to suit local conditions.

Two-Way Knowledge Sharing

As the term *connecting the first mile* shows, development organisations are moving away from one-way knowledge transfer models towards the ideal of two-way knowledge sharing:

Community knowledge partnerships that can develop mechanisms to deal with the problems of connectivity and information literacy, and incorporate local and external knowledge, can directly benefit poor people. This approach could replace the traditional process of a "one-way" flow of

information from a scientific, information rich core to a remote information poor community, with dynamic information sharing partnerships with a two-way flow of information at every level. (Chapman et al., 2003, p. viii)

Ballantyne (2002) comments on the importance of local content in this two-way flow and suggests that best practice in facilitating local content creation includes valuing and motivating local content (through rights and incentives) and building the capacity of the target group in content creation. For him, best practice involves making local knowledge visible — for example by incorporating local and external knowledge into information materials and connecting the target group to policy makers.

Many of the most inspiring ICT projects have involved local appropriation of ICTs such as community radio or video, which have empowered communities to make a political impact: "Content provided through ICT should not be limited to the knowledge that can be accessed from outside sources, but rather extended to ensure that the poor have the means to speak for themselves" (Cecchini et al., 2003, p. 14).

For example, Practical Action's Women's Voices project (Practical Action, 2003) trained women's groups in the slums of Nairobi in using video so they could communicate directly to policy makers about their situation and development priorities. The videos were shown to an audience of government ministers, housing directors, donors, and NGOs. Later the videos were shown on national television and won an international award, the Betinho Award for Technology and Social Justice. The women gained confidence and made contacts regionally, and now have plans for setting up a local resource centre with access to information on tenure, health, training, and job opportunities.

Chapman et al. (2003) also emphasise the importance of horizontal knowledge sharing, in particular between communities: "Knowledge transfer and sharing at a local level can have a particular impact on livelihoods because it is at this level that the majority of the poor are located within local knowledge and information systems" (p. 31).

Minimising Social Exclusion

Best practice in connecting the first mile requires that the projects be socially sustainable. Minimising social exclusion in project planning can involve developing an understanding of the power dynamics at the local level (Michiels & Van Crowder, 2001) and focusing on marginalised groups such as women or the disabled:

Too often, agencies solely communicate with the more active members in a community, leaving others behind who may remain poorly informed, thus perhaps increasing their exclusion. Agencies should avoid that and may also have to specifically target groups that have difficulties accessing information or have particular information needs, such as female heads of households, the young, the disabled or ill, or the homeless. (Schilderman, 2002, p. 48)

For Schilderman (2002), building community social capital supports improved information sharing through social networks, which is how people living in poverty tend to get information. He distinguishes between bridging social capital, bonding social capital, and linking social capital, and suggests that best practice includes deliberately stimulating people to undertake a joint activity or action related to particular local needs and providing a space for the community to get together and meet.

Table 1 draws together the success factors and examples of best practice highlighted above into a best practice framework. The aim of the framework is to guide practitioners through the key processes that contribute to successful knowledge sharing at grassroots through ICT projects.

Reflections and Trends

Lessons learned from a first generation of ICT projects have shaped thinking about how to proceed. Development agencies recognise the difficulty of creating sustainable solutions at the first mile and highlight the importance of multi-stakeholder partnerships for the success and sustainability of ICT projects. Local appropriation is understood as necessary to the success of projects, and projects are therefore privileging participatory methodologies, capacity building, interactive solutions, local content, and knowledge. Projects acknowledge the need to understand existing information networks and power relations to support local appropriation, and methodologies are being developed to support those processes (Beardon, 2004). The monitoring of ICT projects focuses increasingly on the social or economic impact for the beneficiaries (such as increased participation in decision-making processes, increased incomes, etc.) instead of the use of the information systems. Although many lessons have been learned from pilots, few projects have yet been able to scale up their initiatives or replicate them in other contexts.

Developments in the IT industry will have an impact on information networking for marginal communities. ICT tools are becoming cheaper and more efficient,

Table 1. A best practice framework

Dimension of best practice	Success factor	Best practice
Environment	Working within the policy environment	Research the policy environment
		Recognise power relationships
		Develop strong relationships with policy makers
		Work within existing policies
	Understanding and addressing infrastructure issues	Analyse telecommunications and infrastructure deficiencies
		Plan for realistic measures
		Adopt innovative technologies
		Develop more accessible devices
	Building relationships with donors	Establish credibility, influence, and legitimacy
		Communicate project progress in a timely fashion
Project	Starting from communities' development priorities	Work in participation with communities
		Conduct a needs assessment
		Involve target group in project planning and design
	Planning the project effectively	Define clear objectives
		Identify the target group
		Plan realistically for implementation
	Learning from monitoring and evaluation	Link project goals to priorities
		Evaluate efforts critically
		Empower target groups to evaluate
		Adapt the project in response to findings
		Monitor regularly
	Forging strong partnerships	Select partners with complementary strengths
		Provide partners with incentives
		Negotiate conflicting interests
	Developing a sustainable business model	Identify which services are provided as a public good and which can be commercial
		Involve the private sector
	Building staff capacity	Buy in experience
		Hire skilled staff
		Train existing staff/volunteers
	Scaling up	Communicate best practice to practitioners
		Share findings with donors
		Develop an exit strategy
Local level	Building on existing knowledge systems	Research existing systems
		Incorporate existing systems into the project
		Connect to traditional knowledge
		Promote local participation in the project
	Creating appropriate materials for local context	Research information systems of target group, literacy levels, and so forth
		Understand information needs of target group
		Address local language issues
		Develop materials in the right format for use
	Using appropriate technologies for communities	Adopt technologies that local people can repair
		Choose technologies that people can afford to use
		Blend communications approaches
	Working with infomediaries	Identify grassroots-based infomediaries with a track record of working with poor people
		Provide appropriate incentives for partnership
		Find entrepreneurial infomediaries

Table 1. A best practice framework (cont.)

Dimension of best practice	Success factor	Best practice
Local level	Building capacity of infomediaries and target group	Provide training in efficient information provision
		Provide useable information resources
		Recognise, document, and share good practice in knowledge sharing at grassroots
		Build adaptation skills, such as translating content to suit local conditions
	Two-way knowledge sharing	Value and motivate local content through rights and incentives
		Build capacity of target group in content creation
		Incorporate local and external knowledge in information materials
		Connect target group to policy makers
		Promote knowledge sharing at a local level
	Minimising social exclusion and building social capital	Understand power dynamics at local level
		Focus on marginalised groups
		Build social capital through joint activities and communal space

digital convergence is changing our understanding of traditional media and interactivity, and the Free/Open Source Software movement offers opportunities for developing countries to develop affordable solutions and customise them to suit local contexts. Mobile telephony is allowing many developing countries to leapfrog fixed-line telephony solutions, and innovative business models are being developed to make it affordable, for example by Grameen Telecom. As media converge, combining technologies and combining online and off-line media offer positive lessons for the future, with many commentators highlighting the importance of radio as a communications tool in conjunction with the Internet (Girard, 2001; Chapman et al., 2003).

ICT policy need to be integrated into development programmes such as Poverty Reduction Strategy Papers (PRSPs) and national strategies. To create an information society, commentators highlight the need for freedom of expression, competitive markets, independent regulators, and a universal service fund in countries (Weigel & Waldburger, 2004). Policies are required to fund content from minority language groups and support the design of ICT applications in local languages.

There has been so much hype about ICTs and their role in development that ICT projects appear to have taken on a life of their own, becoming an end in themselves. Just like biotechnology or nanotechnology, ICTs are just a technology, and marginalised communities need to be empowered to participate in the debates about how the technologies are used and how the use could affect their lives and livelihoods.

There is a danger that ICTs could reinvent the paradigm of development, without learning the lessons of the Green Revolution or other extension programmes, or

of participatory technology development (PTD). This framework aims to offer practitioners a way of critically examining ICT projects to ensure that they are adopting best practice and putting the needs of people living in poverty first.

Conclusion

This chapter has examined the literature about connecting the first mile and shown that authors are polarised around key debates: whether solutions should be participatory or top-down, technological or social, whether they should focus on global or local information and overall how optimistic to be about the potential of ICTs for development. Authors' ideological perspectives around these debates determine how they evaluate the impact of a project and what they determine best practice to be.

The best practice framework proposed in this chapter has synthesised the lessons from a range of practical studies to identify the factors that contribute to the success of a project. Recommendations for best practice are divided into three dimensions: the environment, the project level, and the local level. The framework focuses on processes that contribute to project success in order to offer lessons in a wide variety of contexts. Whether a project chooses to define impact according to poverty reduction, ICT access, or project sustainability, the processes outlined in the framework will still be relevant to the practitioner.

Further research would take a set of primary case studies from various contexts and develop the framework on the basis of their experience. Adding measurable indicators would allow practitioners to benchmark their projects against the framework. An analysis of the lessons of previous development initiatives such as participatory technology development or the Green Revolution could offer further suggestions for best practice.

Recent research used the framework to evaluate an ICT for development project in Cajamarca, Peru (http://www.infodes.org.pe/siru). The project aims to share livelihoods information with local producers (predominantly agricultural producers) and connects a network of local infocentres to agricultural information providers via a central information processing unit. The exercise generated learning about the project's successes and deficiencies and also about the viability of the framework. Applying the framework helped project staff to view their activities in a more holistic way and understand the impact on the project of actors outside the information value chain, such as funders, telecommunications companies, and local government bodies. It prompted a re-evaluation of partnership models and the need for reformatting information for rural audiences, and a reconsideration of the role of ICTs in reaching illiterate rural populations.

In the future, the framework could be used to evaluate potential projects prior to funding, so projects meeting many of these criteria could be prioritised. The framework could also be used to benchmark different projects, for example by the Ministry of Agriculture in Peru to compare the various agricultural information systems in the country. Learning from the research in Peru, it is necessary to provide practitioners with a clear explanation about the distinction between the local level, the project level, and the environment. The framework needs to be integrated with other tools (such as an information value chain or a matrix of actors and activities) in order to understand the information flows in knowledge sharing projects at the first mile, and latent and explicit demand for information.

In this chapter it has been shown that ICTs can make a valuable contribution to development outcomes, provided they are viewed as a means, rather than an end in themselves. It is also abundantly clear that initiatives will vary according to the local context, if they are to share knowledge with local communities. It is possible, however, to generalise about the processes that practitioners can adopt to constitute best practice. In the best practice framework, the authors' aim to synthesise these processes to support practitioners in addressing the challenges of connecting the first mile and empowering marginal communities to participate effectively in the information society.

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Terms and Definitions

Best practice: A set of guidelines or recommendations based on a study of the most effective approaches to performing a given activity.

Information communication technologies (ICTs): The technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic systems, and among electronic systems (Hamelink, 1997, p. 3).

Information sharing: The exchange or transfer of information between people or systems.

International development: Efforts, by developed and developing countries, to bring people out of poverty and so reduce how much their country relies on overseas aid. Many different things can contribute to development which

reduces poverty, such as settling conflicts, increasing trade, and improving health and education (DFID, 2005).

Knowledge: A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers (Davenport & Prusak, 1998, p. 5).

Chapter X

The Internet as a Fundraising Tool for Marginal Communities in South Africa

Fazila Farouk
SANGONeT, South Africa

David Barnard
SANGONeT, South Africa

Abstract

This chapter discusses the challenges facing social justice organisations working in the South African non-profit sector in their attempts to harness new technologies to promote their causes as well as their sustainability. The chapter uses online fundraising as a medium to elaborate on the difficulties that social justice organisations face engaging with an online audience that is racially skewed and not close to its issues. It goes into length discussing the limitations of a sector that is further hamstrung by a lack of appreciation for the online platform and which is not being driven into adopting ICT solutions due to the sluggish transformation of the ICT policy landscape.

Introduction

(The) new world order…can be better understood in terms of the paradox of a situation in which we are increasingly witnessing dazzling technological and economic breakthroughs without corresponding social, political, and normative innovations. These epistemological lags are inducing economic growth without employment, political mobilisation without political efficacy, and cultural diversity without tolerance and civility. (Tehranian and Tehranian, 1997)

A restricted portion of the global village, fuelled by innovation and technology, is leapfrogging into the new millennium building a life of comfort and convenience for themselves. The rest of the world stands by the wayside watching wantonly as their dreams fade away with each jump that the chosen few take away from them. At the same time, social justice actors wring their hands in frustration at the resultant exponentially expanding gap between rich and poor and the escalating challenge it poses for them.

The context of current development is complex and challenging. With the new global economy built on technological innovation, countries that prosper are those that both produce and consume high-technology products, while the non-consumers slip out of the sustainability loop. Moreover, the producers of new technology products and solutions are largely accepted to be Western countries where innovation is given a helping hand by an abundance of resources.

In this part of the world, even sectors that are not conventionally associated with high-tech solutions, such as the non-profit sector, have integrated technology into the routine of their business. One innovative idea that has emerged in the last decade or so is the use of new technologies to consolidate the resource base of civil society organisations (CSOs). In this regard, the use of the Internet as a fundraising tool is one of the most popular technological innovations to be introduced to CSOs in recent times.

In the West, Internet fundraising has grown enormously, becoming an integral part of the sustainability of the non-profit sector. Its growth is based on the ease with which it facilitates the act of donating in a society where the Internet has become the first port of call for information and services. Indeed, the response to the December 2004 South Asian Tsunami disaster has demonstrated the might of the Internet as a fundraising tool. For example, in January 2005, *PND News*, an online newsletter of the Foundation Centre, argued that in the United States, 85% of the $35 million raised by UNICEF within 10 days of the disaster came by way of online credit card transactions. It is interesting to note that disaster relief is amongst the most popular causes in the online fundraising world (Farouk

& Prytz, 2003). However, even more interesting to note is the fact that most disaster relief donors are once-off givers who have no sustained interest in social issues.

One cannot for an instant question the value of relief organisations in restoring the lives of those affected by the South Asian Tsunami tragedy. Nevertheless, as the saga of relief funding and efforts unfolds in the aftermath of the disaster, an emerging and valid critique is that prevention is by far better than cure. All over the world, an increasing number of voices concur that it would have cost far less in financial and human terms, had a Tsunami warning system been in place, had appropriate infrastructure been developed; and had sufficient resources been allocated to the eradication of poverty so that the poor did not have to eke out an existence in flimsy huts in cash-strapped fishing villages. Indeed, it is argued that it is precisely the *profits before people* mindset that prevented Thai officials from issuing a public warning. An online article analysing the disaster contends that the Thai Meteorological Department, who were given early notice of the undersea earthquake, feared that a public warning of a potential Tsunami would have threatened the tourist industry (Lyon, 2005).

From the point of view that the more logical route to effective development is not through the support of organisations and institutions established specifically to mop up the mess of mindless profit mongers, this chapter is concerned with examining the role of technology in advancing the work of development organisations that promote social justice by challenging systemic issues that lead to poverty and inequality. These are organisations that, in the course of their work, advocate for changes to society that will eliminate, if not substantially reduce, the need for welfare and charity.

Thus, the mission of this chapter is to demonstrate the effectiveness of the Internet as a fundraising tool for social justice CSOs operating within the development arena in the developing world. It focuses on the challenges facing social justice organisations in their quest to harness information communication technologies (ICTs) as a tool to mobilise resources.

The chapter uses South Africa (SA) as a case study. SA provides an excellent test case as it possesses, within its borders, a dichotomy between the first and the third world. Moreover, as an emerging democracy, it is also a country that exists in a largely transitional phase as it undergoes comprehensive policy and legislative changes. These provide excellent cases for scrutiny as they are being revised by a state that has won the recognition of the international community as a legitimate and stable democracy that has prioritised the poverty eradication agenda.

This chapter seeks to answer two important questions. First, given existing trends in online fundraising, is fundraising through the Internet the sole domain of welfare organisations hooked into the psyche of a prosperous self-protecting

public undermining social justice through short-sighted acts of charity? Second, within the context of a technologically advancing society, does policy reform translate into practices that create an enabling environment for the eradication of poverty? In this regard, this article will provide insights into sectoral linkages and coordination at the policy and legislative levels.

Background

Fundraising can be seen as building of a sympathetic relationship between an organisation and a potential donor, whether an individual, a foundation, or a corporation (Poets & Writers, 2005).

Locating Social Justice Organisations within the Broader South African Civil Society Sector

An important point of departure would be to try and locate social justice organisations in broader civil society. Civil society in SA represents an enormous force. According to a recent study on the South African non-profit sector, there are approximately 100,000 civil society organisations operating in SA (Swilling & Russell, 2002). The sector employs approximately 650,000 people, and a significant proportion of these are Black women. The total operating expenditure of the sector was R9.3 billion in 1998, representing 1.2% of gross domestic product (GDP), and trends since that period indicate that this figure has risen.

It is immensely important to understand that the South African CSO sector is highly diverse. In fact, it can be classified as quite divided. SA's history of racial separation has left a legacy of division within the country that also finds expression in the civil society sector. The South African CSO sector is largely characterised by two vastly different types of organisations. On the one hand, there is the highly professional and well-organised welfare sector that has its roots in the historically privileged white SA, while on the other, still working within the domain of welfare, there is the disorganised and under-resourced community-based sector that has its roots in the historically, but enduringly underprivileged, black SA.

These poor community-based organisation (CBOs) are mushrooming at a rapid rate as the post-apartheid state fails to meet its social and development obligations in underprivileged communities. More than half of the 100,000 CSOs in SA are CBOs from underprivileged black communities, demonstrating the link to the predominance of black women working in the South Africa non-profit

sector. Many lack the necessary skills and requirements for running organisations and simply initiate community projects in a desperate attempt to alleviate the plight of their community members. Often these organisations or projects limp along as a result of meagre contributions from *community collections*. They have neither the networks nor the resources to draw on the support of more affluent communities.

At the same time, it would be unfair to argue that there is no transformation in the historically white welfare sector as these organisations increasingly attempt to find a racial balance in their work (albeit under the yoke of legislative reform). However, to a large extent, executive and operational decision making remains firmly under white control.

While racial re-dress is an important issue in SA, an equally important issue is that of development taking place while promoting social justice. In this regard, critical contributors to SA's development are CSOs working in the social justice arena promoting human rights, land reform, gender equity, economic justice, environmental justice, and so on. Many of these organisations have their roots in the anti-apartheid struggle and have a history of being well resourced as a result of international support from foreign donors keen to support the struggle for a democratic and non-racial SA. However, for these CSOs, the toppling of apartheid also created the paradoxical problem of establishing political freedom while re-routing international aid to the newly legitimate government that the entire donor community enthusiastically supports in post-apartheid SA.

Consequently, these organisations are at the forefront of a sustainability crisis as their traditional donor base diminishes. Some of the so-called *struggle organisations* survived the transition to democracy by adapting to the new funding environment, largely by becoming service delivery arms of the new state. However, those that have maintained a critical perspective from the state, in an effort to promote social and economic justice, struggle to find financial support. Even within the social justice arena, there are those causes that are less controversial than others and therefore more likely to generate donor support. For example, those working towards changing attitudes and behaviour tend to be more successful than those trying to alter the very structure of society, threatening the material base of entrenched elites. Thus, organisations working in the gender advocacy field are often better resourced than those working in the land redistribution field.

Finally, while research in this area is thin, it is widely acknowledged that the social justice CSO sector is outnumbered by both the welfare and CBO sectors and has a negligible public profile. This is an important point in the information age, as non-profit sustainability is increasingly linked to public profile.

Main Focus of the Chapter

Challenges to the Uptake of ICTs within the South African CSO Sector

Embracing and integrating ICTs as a tool presents enormous challenges in the process of transforming the South African CSO sector as a whole. The challenges present themselves at two levels: firstly, at the level of raising awareness and, secondly, at the level of implementation.

At the level of awareness, the challenges present themselves in the form of an ongoing struggle to expose CSOs to ICT issues, encouraging them to take an active interest in these issues, and sustaining and expanding this interest to the point where the power of ICTs is realised as a strategic tool to meet development goals. Very few CSOs are interested in ICT issues in the same way as their interest and/or involvement in other development issues such as housing, land, human rights, and so on. Moreover, only a handful of CSOs specialise in ICT issues as their primary and/or secondary focus.

At the level of implementation, South African CSOs simply do not make the necessary adjustments to promote *e-readiness*. Many CSOs have very little internal ICT capacity and infrastructure, and the vast majority are not planning for and/or making technology investments. They are also not typically developing and implementing electronic communication strategies, internal organisational and educational processes, or staying abreast of the wide range of ICT policy issues that impact on the sector. South African CSOs have yet to realise the important role that ICTs play in improving communication, organisational development, advocacy, service delivery, and resource mobilisation within the information age.

Factors that contribute to this situation are the exorbitant cost of ICT products and services, unreliable service providers, a rapidly evolving operating environment, a lack of training, a lack of appropriate support, and the aforementioned highly regulated telecommunications industry. Without a significant change in the status of any of these factors, the potential impact of ICTs on the work of CSOs in SA will continue to be limited.

Be that as it may, some initiatives do provide a glimmer of hope in trying to improve the situation. For example, many of the earlier observations were made by SANGONeT (http://www.sangonet.org.za), a pioneering South African CSO that has had ICTs as its primary focus for 17 years. SANGONeT has conceptualised and implemented a number of initiatives aimed at dealing with the twin challenges presented previously — fast-tracking ICT awareness and promoting the application of ICTs by CSOs.

In trying to raise ICT awareness, during 2003 and 2004 SANGONeT hosted a series of 13 discussion forums called *Thetha* (meaning *to talk* in the indigenous African language of Xhosa), over an 18-month period in various and far-reaching parts of the country. This discussion series was a groundbreaking initiative that provided CSOs with the first ever opportunity to talk about issues of common concern and to learn from each other's experiences in applying or attempting to apply ICT technology to their work. In remote parts of the country, the forums were commonly the first introduction to ICTs for CSOs.

At a more practical level, SANGONeT has launched NGO.ZA (http://www.ngo.za), which aims to provide affordable ICT products and services to CSOs, thereby increasing access. The initiative is a joint civil society and private sector venture, where SANGONeT has struck a partnership with ICOZA, South Africa's first independently empowered tier one Internet service provider (ISP). Through this partnership, affordable solutions are provided to meet the CSO sector's connectivity, hardware, and e-business infrastructure requirements.

Moreover, in March 2005, SANGONeT hosted the first ICTs for Civil Society Conference ever to take place in SA. The conference brought together a large number of South African CSOs to discuss and debate a wide range of ICT issues, from policy to practice. Participants also participated in technology demonstrations and practical training sessions, which covered a range of topics geared to enhance their application of ICTs for social objectives. The event, which was enormously successful, was opened by Dr. Kumi Naidoo, Chief Executive Officer of CIVCUS: The World Alliance for Citizen Participation. The challenge he posed was for delegates to reflect on whether they were moving towards a situation where critical questions could be asked about ICTs for development. It is anticipated that the SANGONeT conference will become an annual event.

The SANGONeT initiatives represent a unique drive to reach South African CSOs. Nevertheless, unless they are complemented by other initiatives targeted specifically at the sector, their potential impact is likely to remain limited. Indeed, an appreciation for the electronic medium is all but absent in the South African CSO sector. This is cause for concern as the private sector has started integrating the electronic medium almost in its entirety. Moreover, the South African government is increasingly developing electronic platforms for public engagement and information dissemination. The implications of these developments could potentially isolate and cripple a CSO sector that is largely *e-disabled*.

Internet Fundraising in SA

Given the context of ICT issues within the CSO sector outlined earlier, Internet fundraising has yet to prove itself as a viable resource mobilisation strategy in

SA. The challenges it faces are enormous and centre on the affordability of and access to ICTs for the non-profit sector and its donor constituency. It is incredibly expensive for an ordinary South African CSO to establish an online credit card donation processing facility.

In a feasibility study conducted for two South African CSOs, Farouk and Prytz (2003) found that Internet fundraising in SA is in its early stages and that most CSOs that utilise the method do so as part of a wider organisational fundraising strategy. They argue that volumes of online donations are extremely low and that the sizes of grants are small. As few as five online transactions are processed on a monthly basis, each not exceeding a value of a thousand Rand (equivalent to approximately US$160, where US$1 = ZAR6,23).

This problem is compounded by the fact that the local online donor population is very small, as the vast majority of South Africans cannot afford Internet access, with access still echoing traditional patterns of privilege. According to Collins (2004), 3.7 million South Africans have access to the Internet. This statistic can be broken down further to reveal more about gender and race by looking at an earlier study conducted by a private Internet research company called Webcheck (http://www.webcheck.co.za). By conducting interviews with a randomly selected sample of 500 men and women each, in the black and white race groups respectively, Webcheck found that white men (12.2%) followed by white women (10.6%) had the greatest access to the Internet in SA. By comparison, a dramatically different outcome was detected in black communities. The research revealed that computer access and Internet usage in black communities is extremely poor. Only 0.2% of black men in SA have Web access at home and 1.8% access it at work. The Webcheck survey did not provide results for the proportion of black women with Internet access — seemingly because the figure is negligible.

In the South African Internet fundraising world, much like any other part of the world, online donors have computer savvy and are comfortable making online transactions. Webcheck argues that South African Web users consist mostly of *upper income earners*. They also found that in comparison to women, South African men tend to connect to the Internet more regularly and engage in more online banking and shopping. They are also more likely to click on banner or pop-up advertising.

What is most interesting about Webcheck's work is the insight that it provides into the types of causes that are most likely to be successful in the South African online environment. The previous statistics are shattering, if one considers that more than 70% of South Africans are black. They highlight a digital divide articulated along racial lines, which exacerbates the country's social divide. This raises concerns for CSOs struggling to promote social and economic justice as the vast majority of SA's predominantly white middle class is quite happy to

maintain the status quo. Problematically, it is from this pool that potential online donors emerge.

Indeed, SA's Web constituency and its behavioural patterns underscore serious challenges for the social justice sector as there is an ideological rift between this sector and the majority of Internet users. This rift is evident in the kinds of South African causes that enjoy the greatest Internet support. The following section of this chapter brings more clarity to this assertion by providing an understanding of *who gives* on the Internet and what type of causes are more likely to *receive* support in an online environment within the South African context.

Popular Online Causes

Making a donation, whether in the online or off-line environment, is a very emotional and subjective issue. As human beings, our natural reaction is to respond to crises for the simple reason that the instant satisfaction derived from responding to emergency issues as quickly and unexpectedly as they occur is a quick-fix emotional response that is hard to beat. Not surprisingly, the Farouk and Prytz (2003) study found that disaster relief is the second most popular cause in SA.

Nevertheless, more generally, people tend to respond to issues within the realm of their experience. For example, if an individual loses a loved one to cancer, then they are more likely to support cancer-related causes, such as research and care facilities. What is interesting about this emotional attachment is the link between the donors, their class positions, and the causes that get support. In SA, those with time and money tend to be middle-aged white women, who strongly believe in the philosophy of charity. Swilling and Russel (2002) argue that welfare organisations are "…central to the social structure of white society." Hence, the continued existence of the still very active, white welfare sector in SA.

From an Internet fundraising perspective, Farouk and Prytz (2003) argue that the vast majority of welfare-oriented CSOs with Internet fundraising facilities are sophisticated organisations operating in the urban realm at a national level. They list the most popular online welfare causes as children's causes, hunger, the aged, HIV/AIDS, environmental issues, disaster, and the disabled. Issues affecting children appear to have mass appeal, and Farouk and Prytz (2003) established that children's CSOs were most likely to have a donation button on their Web sites.

Their findings are largely based on an examination of three South African donation portals, eBucks, GivenGain and Isisa, which in 2003 were the only ones in existence in SA. The donation portals collectively promoted the work of 177 CSOs. A significant 146 of these CSOs could be found on the GivenGain

donation portal, which is a Christian-faith-based donation portal that was established in 2000. Accordingly and for example, the Politics/Advocacy category on this donation portal promotes the work of a Christian political party. GivenGain is the most successful of the three portals.

Isisa, established in 1996, is the oldest initiative. However, it was an experimental project started by an ICT company that has no particular interest in online fundraising, nor does it appear to have any particular social agenda. As such, the project suffers from a complete lack of attention in the company, yielding poor results for the 20-odd CSOs listed on it (see Table 1). eBucks is the youngest of the three donation portals and is linked to a loyalty scheme for a local bank's clientele. The 11 causes promoted on this portal appeared to be selected randomly on the whim of the company's relationship development manager.

One of the biggest challenges facing the Farouk and Prytz (2003) study was finding CSOs with dedicated online donation processing facilities. In total, just seven organisations were located. They were all from the historically privileged white welfare sector and largely working with children's issues. In this regard, the Farouk and Prytz (2003) study argues that to a large extent, these welfare organisations are currently not servicing an exclusively white beneficiary group. However, they contend that the historical advantage of the white welfare sector has significantly boosted its resources and public profile, which has left it financially better off and with a stronger skills base than organisations that have their roots in black communities. As a result, the Farouk and Prytz (2003) study concludes that there is a strong connection between the number of organisationally mature white welfare CSOs that have online fundraising facilities and their historical legacy.

At a more general level, an important driver of support to social causes is the media. Accordingly, Farouk and Prytz (2003) argue that successful Internet fundraising is closely linked to the public profile of organisations. In this regard,

Table 1. Distribution of causes on South African donation portals (Farouk & Prytz, 2003)

Causes	eBucks	GivenGain	Isisa
Welfare/Social services	●	●	●
Lifestyle/Sports/Recreation	●	●	●
Conservation/Wildlife	●		●
Disaster relief/Emergency services		●	●
Education		●	●
HIV/AIDS	●	●	
Community development	●	●	
Religion/Spirituality		●	
Politics/Advocacy		●	
Other			●

they make an important link to the publicity provided by the mainstream media. Citing the unique case study of the South African National Council for the Conservation of Birds (SANCCOB), their study argues that the news media holds the power to open up the hearts and purses of the public. Some four years ago, SANCCOB was able to raise 80% of seven million Rand (just over US$1.1 million) budget through the Internet for the rescue of 18,000 penguins covered in oil, spewing from a ship that had sunken off the west coast of SA. The plight of a penguin population on the verge of decimation was helped tremendously by a media frenzy. Remarkably, CNN came to Cape Town (as did many other major news networks) to follow the trials and tribulations of the penguins that were plucked from the sea, washed down, and relocated. The ensuing and relatively consistent media coverage resulted in an outpouring of international support, which was demonstrated by the vast amounts of money donated to SANCCOB through the Internet.

SANCCOB's success, though an unmatched story in the South African online fundraising arena, points to a glaring universal truth — that there is a strong relationship between the focus of the media and causes that appeal to people. This phenomenon demonstrated itself in the aftermath of the September 11, 2001, attacks in the United States, as well as in the period following the South Asian Tsunami disaster of 2004.

This trend is particularly problematic for organisations promoting social justice as they are unable to package their issues in a manner that is palatable for the media, because the challenges that they grapple with work insidiously and consistently at a systemic level. Thus, a major obstacle facing these organisations is the lack of sensationalism in the newsworthiness of their issues.

To make matters worse, difficulties are further entrenched by discordant policy changes in other, but related spheres. For example, the South African Revenue Service (SARS) bestows public benefit status to certain categories of CSOs. The advantage of having public benefit status is that these organisations may receive donations, up to a certain limit, that are tax deductible for the donors. Given that this donation limit is quite modest, it tends to have the most benefit for middle-income earners. In the Internet fundraising world, this is a significant issue, as most online donations come from individuals making modest donations, as opposed to institutions that make very large donations.

However, the process of acquiring public benefit status often tends to be a time-consuming and costly exercise for the average CSO. The challenge here is that, while the SARS have defined large categories for CSO inclusion, what they have not done is defined what they mean by public benefit, leaving it up the CSOs to prove their benefit and relevance to the public. For most CSOs this places too much of an administrative and financial burden on the organisation. Accordingly, the vast majority of under-resourced black organisations simply do not bother to

apply for public benefit status. In this way, they lose out on a critically important incentive scheme.

The challenge is even greater for social justice CSOs. For as much as the SARS have developed wide categories for CSO inclusion, the activities that they prioritise within these categories are more orientated towards welfare and service delivery. This makes it quite difficult for social justice organisations to acquire public benefit status as they engage with issues at a more intellectual level. It results in social justice organisations slipping further out of the online fundraising loop as they reduce their chances of attracting online donors without the promise of tax rebates.

Other global initiatives like Quest-net (http://www.quest-net.org), VolunteersOnline (http://www.volunteersonline.ca), Fundraisingonline (http://www.fundraisingonline.com), and Fundraising (http://www.nonprofits.org) are working in this aspect. The Ukrainian Red Cross adopted and successfully implements a long-term Internet fundraising strategy (URCS, 2005).

Future Trends

The Impact of ICT Policy Reform on the South African CSO Sector

CSOs and the poor themselves are highly dependent on the state as a catalyst for change in the ICT arena. Opportunities present themselves in the transforming communication landscape that is being driven by new developments in technology, which in turn are triggering changes at the policy level.

However, whether policy adjustments will fundamentally improve the question of affordability for the CSO sector or for the vast majority of poor Black people making up more than half the country's population is an issue that remains ambiguous. For the moment, it seems that policy initiatives aimed at reforming the telecommunications sector have been developed with limited vision. The intended incentive of the South African government is to create a more enabling environment for ICTs to become key drivers in response to the social and economic challenges facing the country. Its fundamental policy thrust is de-regulation and racial re-dress.

As much as these developments have started the process of transforming the ICT landscape, the ICT arena continues to be highly regulated. Presently the telecommunications sector is completely monopolised by one company in which the state holds majority shares. Accordingly, South Africans pay amongst the

highest rates in the world for telephone calls. As a result, one practical implication of this situation is the persistently high cost of telecommunications services in general and its related impact on the cost of all other business and economic activity. Given the financial constraints that generally characterise the CSO sector, this situation contributes to the slow and reluctant uptake of ICTs by the sector.

In an attempt to start addressing this problem, in September 2004 the Minister of Communications made a number of announcements, which will result in the liberalisation of the telecommunications industry. Among other things, the industry will see the introduction of a Second National Operator (SNO), which will be launched at some point in 2005. However, whether the principal of competition will drive prices down remains to be seen as the launch of the SNO appears sluggish at best and, with most CSOs struggling to cover core costs through limited project funding, the future remains tenuous.

It is too early to tell whether other legislative reforms could potentially transform the South African ICT sector. As of February 1, 2005, Voice over Internet Protocol (VoIP) was officially authorised, along with interconnection between mobile network operators, liberalisation of the payphone market, and subletting of telecoms facilities. Key expected results of these developments include a reduction in cost, the availability of a wider range of ICT options, and the strategic integration of various telecommunication services. These initiatives present wonderful opportunities for the private sector that has the resources to capitalise on them; however, any immediate impact on the CSO sector is questionable.

Furthermore, in recent years the South African ICT industry has been involved in drafting an ICT Empowerment Charter which will guide and regulate the behaviour of all actors in this sector. Effective March 1, 2005, the Charter began measuring companies against seven criteria (with a total weighting of 100), namely preferential procurement (22); skills development (20); equity ownership (15); enterprise development (12); corporate social development (11); management and control by black people, women, and the disabled (10); and employment equity held by black and female staff (10). Each category has clearly defined targets to achieve by 2010 and 2015.

A Black Economic Empowerment (BEE) Council is being created to steer empowerment in the sector and will be staffed by representatives of the industry, government, and organised labour.

However, a criticism that is emerging from civil society is that the charter is limited in its handling of the poverty eradication agenda. The charter has chosen an economic empowerment model — BEE — that is predominantly defined in racial terms. While BEE was touted as the panacea to reverse the ravages of apartheid, which left SA with an economically powerful white minority supported

by a destitute black majority, 10 years into democracy, BEE has failed hopelessly to reverse the situation. It has done nothing more than create a fabulously rich elite black minority with strong political connections. The criticism from civil society, of course, is that for the status quo to be truly transformed, what is required is a definition of economic empowerment that is defined in social development terms. In this regard, it is being argued that the social development sector requires preferential treatment if it is going to use the Internet as a tool to transform society.

Thus, civil society groups cautiously welcome all the developments mentioned as positive steps in transforming South African society in general and the telecommunications industry specifically. However, concerns with the charter in particular relate to the limited scope and conceptualisation of the principles of re-dress and transformation in the ICT sector. These include a lack of consultation with civil society, a lack of reference to rural and under-serviced areas, and a lack of emphasis on the role and impact of free and open software.

A number of concerns have been raised, especially in relation the equitable impact of these developments beyond just the ICT sector. The reduction of cost in general is not sufficient to respond to the needs of specific priority areas such as education and health care where one could argue for further cost concessions, for example, a no-cost e-rate to facilitate access to the Internet in schools.

Furthermore, while the issue of access in poor communities appears high on the state's agenda, this lack of consultation and engagement with the CSO sector is demonstrating itself in a poorly designed outreach programme. For example, questions are being raised about the work of the Universal Services Agency (USA), a statutory body established by the Telecommunications Act of 1996 to administer South Africa's Universal Services Fund, which is intended to increase access to computers in poor communities. The United States has rolled out more than 200 computer centres in impoverished communities throughout the country, providing hardware and related infrastructure. However, training and other aspects of capacity building, including much-needed long-term support, fall outside the scope of the U.S., as it is not mandated to ensure the sustainability of its centres. Thus, a key concern within the CSO sector is that the U.S. intervention amounts to little more than a *box drop*. At the broader community level, without the necessary support, the potential impact of these centres as community resources that develop skills, support the local economy, and promote a learning culture remains restricted.

Racial re-dress and de-regulation remain important factors for the transformation of the South African ICT arena. In this respect, the various strategies employed by the South African state are honourable; however, its endeavours are hampered by a superficial handling of the crisis on the ground. For the CSO sector, the challenge is to engage the state to drive an ICT development agenda,

which demonstrates a depth of understanding of the fundamental causes of poverty and inequality in the solutions that are proposed.

At present, policy changes have yet to filter their way to the increased practical application of ICTs by the local CSO sector. Indeed, the application of ICTs in the sector itself continues to mirror traditional patterns of access and privilege, persistently tarnishing South Africa's development towards a truly non-racial and equitable society.

Promoting Social Justice Organisations in an Online Arena

The recommendations in this section have been summarised from the Farouk and Prytz (2003) Internet fundraising study. If the social justice sector is to use the online platform as a tool for sustainability, it needs to consider some very practical issues. This section of the chapter is concerned with offering practical advice that can be used not only by South African CSOs, but also by the vast majority of CSOs that exist in the developing world. Two important factors require urgent attention. The first is the packaging of CSO information for public consumption and the second is driving the public to CSO Web sites.

CSOs wishing to mobilise support and financial resources in an online platform must re-package their mission to the extent that it is presented in a fashion that maximises its appeal to potential individual donors. This implies that CSOs should present their work in terms of concrete examples with emotive appeal. For this approach to achieve any success on the World Wide Web, CSOs must present their work in accessible terms, framed as specific stories with pictures that make a clear and touching appeal. Needless to say, this approach presents serious obstacles for certain kinds of social justice organisations, such as those working in the economic justice arena. However, it can be successfully employed by others. For example, a CSO advancing citizens' constitutional rights to shelter could use its Web presence to present articles and pictures of particular families that have acquired housing through its interventions.

A key challenge in attracting online donors is making them aware of a CSO's Web site in the first place. This problem is particularly acute with international donors, as the local population often gains a generalised name awareness of local CSOs through local publicity campaigns. Similarly, people in the region will be far more likely to hear about specific local crises through local news media. These factors make it more probable that local donors will seek out local causes online and donate. International donors, however, will generally not benefit from name awareness of local CSOs. A partial exception to the previous observation is CSOs with personality-based international name-awareness such as the Nelson Mandela Children's Fund.

Nevertheless, once it has packaged its information in a manner that is palatable for the public, a CSO must find ways to drive people to its Web site. This can be achieved by tweaking the functionality of its Web site as well as by an outreach campaign.

In order to engage the donor community, CSOs needs to be in frequent communication with them. This necessitates Web site functionality such as content management (to allow for frequent updates on project progress), a user database (where donor details should be captured in electronic form to allow for communication and tracking), e-mail campaign management (in order to send out appeals or update donors regularly on project progress), and reporting (to allow both donors and administrators to track levels of donations and who they go to).

Moreover, CSOs must register their Web sites with both local and international search engines. Using a search engine optimisation consultant will increase the probability of donors finding the CSO via Internet searches. These consultants are companies or individuals that provide the service of expediting Web registration and optimising the Web site design to raise the organisation's position in the list of results returned.

Given the demands of this high-level communications strategy, it would appear that the administrative and marketing functions of a CSO are greatly increased. However, since many of these functions can be entirely automated through software, the administrative burden to the CSO need not be onerous.

With respect to outreach, building local donor awareness for social justice organisations presents enormous challenges given dominant Web user demographics and preferences in SA. However, there is some merit in identifying private companies with corporate social responsibility or community involvement programmes as potential online partners. Care should be taken to choose partners with an excellent local reputation and high visibility. CSOs should actively seek out local sites such as corporate intranets that are prepared to display links to the non-profit Web site. Companies that run matched giving programs are a natural target for this sort of approach.

International donor awareness is a trickier proposition, but an important constituency for the CSO sector, particularly as expatriate communities are widely acknowledged to support causes in their countries of origin.

In the international arena, it is quite expensive to launch paid-for awareness campaigns, and there is less possibility of prevailing upon personal networks in order to obtain free or cheap services to publicise a cause. Thus indirect techniques need to be employed. Full use should be made of expatriate clubs with a Web presence. These represent a centralised focus for tapping into the expatriate community. In a similar way, offline newspapers targeted at the expatriate community should be part of this strategy.

Viral marketing is another way of targeting this community. Local donors should be encouraged to forward e-mail newsletters and appeals to friends and colleagues both locally and abroad.

Finally, options for free news exposure in the international media should be actively sought. The SANCCOB success story shows the incredible power of this technique. CSOs may need to hire consultants or be trained in media outreach techniques in order to facilitate the success of this technique. For example, it is not inconceivable that the local CNN or BBC correspondents could be convinced to write a news story about a local cause. However, it should be noted that such exposure can only be expected to occur around special events or emergencies.

Conclusion

In countries like SA and probably the rest of the developing world, it is plain to see that the road to successful Internet fundraising is strewn with difficulties. Indeed, it must be acknowledged that for the foreseeable future, Internet fundraising will not replace traditional fundraising methods.

For online fundraising (including advocacy and marketing) to have a significant impact on the CSO sector, ICTs and the Internet in particular must be integrated into the core business practices of non-profit organisations. Indeed for CSOs to succeed in the online environment, their Web sites must become the first port of call for any individual or institution seeking engagement at any level.

This presents an enormous challenge for the social justice CSOs working in SA. In answering the questions posed at the beginning of this chapter, it is clear that in SA, there appears to be an ideological rift between Internet givers and the social justice sector. Overcoming this problem requires a dual strategy. Firstly, like-minded supporters should be encouraged to engage more effectively in the online environment. This is not an unreasonable appeal in light of ICT policy shifts that are potentially reducing its cost to consumers. Secondly, the social justice CSO sector itself needs to strengthen the depth and width of its advocacy campaign in its efforts to win over new supporters. This is not an insurmountable task in the current climate where a number of broad-based social movements are increasingly calling for political, social, and economic justice.

This may sound like a tall order, given the lengthy discussion of challenges in this chapter. However, the online environment, and Internet fundraising in particular, represents an enormous opportunity for the CSO sector for one very significant reason: it has the potential to force the sector to keep abreast of technological

and particularly ICT developments. This is an important consideration as information is becoming a highly sought-after commodity in today's world, which has been labelled as the Information Society. Indeed, the related evolution of ICTs has become a key driver in how information is obtained, digested, and disseminated, influencing decision making at all levels, and in this way shaping the future of our society.

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Terms and Definitions

Civil society organisations: The Civicus Index on Civil Society South Africa Country Report (2000, p. 4) defines *civil society* as:

Civil society is the sphere of organisations and/or associations of organisations located between the family, the state, the government of the day and the prevailing economic system, in which people with common interests associate voluntarily. Amongst these organisations, they may have common, competing or conflicting values and interests.

This chapter accepts this definition of civil society, however, with the added dimension that the organisations located within this sphere are established on a non-profit basis to promote public benefit.

Development: According to Nobel Laureate Amartya Sen, development can be defined as the freedoms that allow individuals to what they value, such as education, good health, democracy, freedom of speech — in the context of trade and sustainable development (source: http://www.eldis.org). This chapter applies this definition of development.

Online fundraising: The mobilisation of financial resources through the Internet. There are four primary techniques that non-profit organisations employ to mobilise funds through the Internet:

1. *Online transactions:* One of a number of mechanisms is used to allow a user to transfer funds directly from an account belonging to them into an NPO's account. The most common method is probably online credit card payment.
2. *Online product purchasing:* The Web user/donor purchases a product sold by an NPO (such as a branded toy or T-shirt), which is advertised in the online environment. The product is then shipped to the user via standard fulfilment channels.
3. *Sponsored clicking:* An innovative method of online fundraising as it does not require that the online donor actually part with any money. The NPO Web site has a link that is sponsored by one or more local private sector companies. Clicking on this link automatically triggers a micro donation from the sponsors to the NPO. The user may be taken through to a page

giving more information about the sponsors.

4. *Supplying off-line details:* Here the NPO Web site acts as an information portal only. The *donate* page simply supplies the NPO's bank account details, print-out fax-in form, or e-mail pledge sheet.

Social justice: This term is used within the framework arguing that a socially just society is one where political liberties increasingly bring about social and economic equity. It is important to highlight this distinction because current political liberty does not necessarily translate into an improved standard of living and quality of life for the vast majority of people around the world.

Welfare: In this chapter, the notion of welfare refers to acts of charity and more specifically to those organisations operating within the non-profit arena and involved in altruistic activities in support of the needy and destitute. These are traditionally organisations that interact directly with the poor, providing handouts. However, these organisations do not as a matter of principle or practise question the reasons underpinning the current global expansion of poverty and inequality, nor do they engage in activities and processes that could potentially transform the status quo. In short they deal with the symptoms and not with the causes of poverty and inequality.

Chapter XI

Building Virtual Communities Through a De-Marginalized View of Knowledge Networking

Kam Hou Vat
University of Macau, Macau

Abstract

The chapter investigates an actionable context of knowledge networking, from the perspective of sustainable development which should accommodate the building of communities in cyberspace so much exemplified in today's Internet and World Wide Web. The premise of this exploration is that members, or participants, in any community are engaged in learning that is critical to the survival and reproduction of that community. Through community participation, learners find and acquire models and have the opportunity themselves to become models and apprentices of others. This investigation provides a basis for thinking about the possibilities of a virtual community and the dynamics of its construction across a variety of computer-based contexts. The design and refinement of technology as the

conduit for extending and enhancing the possibilities of virtual community building is an essential issue, but the role of the individuals as participants in such a community is as important. The idea of sustainable knowledge networking is to bring about continual learning and change for the community in need. The emergent challenge of such a mission is to de-marginalize many of the non-technical issues of building virtual communities for knowledge transfer and learning. The chapter concludes by reiterating the challenge of expositing what it means to create an appropriate context of knowledge networking through which purposeful actions can be supported with the elaboration of suitable information technologies.

Introduction

The term *virtual community* today mostly refers to many types of Internet-based social interaction. In fact, the term *community*, according to Williams (1973), in the English language referred primarily to a geographically localized group of people until approximately the 17th century, and it expanded somewhere between the 17th and the 19th centuries to include the idea of a group of people who hold something in common, or who share a common sense of identity even if they do not live in a single locale. Interestingly, the term *virtual* came into the English language from Latin by way of French at about the same time as did *community*, around the 14th century. Initially, it referred to things that had special and effective physical capacities, linking it closely to our ideas of virtuous. Yet, its meaning underwent changes in the 17th and the 18th centuries to refer to something that seems almost completely real to the people in so far as the effect or result is concerned, although not formally or actually real in the physical sense, according to *The Complete Oxford English Dictionary* (1971).

Rheingold (1994), who appears to have coined the term *virtual community* in the first place, provides a definition that accords reasonably well with the context of being virtual: namely, people in virtual communities do just about everything people do in real life (meet one another and exchange ideas and information), but we leave our bodies behind. We cannot kiss anybody and nobody can punch us in the nose, but a lot can happen within those boundaries (Rheingold, 1994, pp. 57-58).

In the virtual community, relationship is typically defined not by proximity but by contents of individual interest — classes of objects, ideas, or events about which participants have differing levels of both stored knowledge and stored values (Renninger, 2000). Participants' connections to the community are often based on cognition and affection rather than simply spatial and temporal. Such a

connection is also supported by affordances (Gibson, 1966) that invoke imagination about and identification with a site, such as autonomy, support, and depth of content. Besides, the learning that is undertaken as participants work with a site has an opportunity for changed understanding of our self. Thereby, it is important to consider what a virtual community means, what it offers, what it affords its participants, and what its boundaries are at the advent of the Internet that has undoubtedly created numerous possibilities for interaction that people did not have before (Cherny, 1999; Davis & Brewer, 1997; Herring, 1996).

The Background of Knowledge Networking

The last decade of the twentieth century saw explosive growth in discussions about knowledge — knowledge work, knowledge management, knowledge-based organizations, and the knowledge economy (Cortada & Woods, 2000). Against this backdrop, enterprises including educational institutes are challenged to do things more collaboratively in order to remain vital in an increasingly global environment of knowledge networking (Stalk, Evans, & Shulman, 1992). By knowledge networking, it means there is a strong need to share knowledge in a way that makes it easier for individuals, teams, and enterprises to work together to effectively contribute to an organization's success.

This idea of knowledge sharing has well been exemplified in Rheingold's (1994) description of the WELL project (Whole Earth 'Lectronic Link), which is one of the first virtual communities, still going strong today. Rooted in the San Francisco Bay Area, the WELL (http://www.well.com) is an open-ended and self-governing community that started in 1985. Attracting people from a wide diversity of backgrounds, many of them professionals, it hosted computer conferences on a wide range of topics — education, arts, recreation, computers, and entertainment. It went on to the Internet in 1992 where over 200 separate conferences are hosted.

Its introductory Web pages emphasize that it is not just another Web site or collection of Web pages: "More than just another 'site' or 'home page' the WELL has a sense of place that is palpable." One spin-off of the WELL was the Global Business Network (GBN; http://www.gbn.com), created in 1986, that drew together planners and strategists from companies like ABB, AT&T, Volvo, BP, and Bell South. This group used a mix of face-to-face meetings and online conferences to develop scenarios of the future. Through GBN, company executives and leading thinkers in a variety of fields would openly share their knowledge and insights. This interplay of knowledge generated new thinking

about the future. It also led to increased collaboration among GBN members.

Interestingly, the WELL and the GBN could both be considered as instances of the notion of learning organizations (Senge, 1990; Garvin, 1993; King, 1996; Levine, 2001). Essentially, a learning organization could be considered as an organization that focuses on developing and using its information and knowledge capabilities in order to create higher-value information and knowledge, to modify behaviors to reflect new knowledge and insights, and to improve bottom-line results. Practically, there are many possible instances of a learning organization that could be incorporated into the daily experiences.

An obvious example as mentioned earlier is the concept of community of practice, which according to Wenger, McDermott, and Snyder (2002, p. 4), refers to groups of people who share a common concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise by interacting on an ongoing basis. As people in the community spend time together, they typically share information, insight, and advice. They help one another to solve problems; they ponder common issues, explore ideas, and accumulate knowledge. Often, they become informally bound by the value that they find in learning together. This value is not merely instrumental for their work. Over time, they develop a unique perspective on their topic as well as a body of common knowledge, practices, and approaches. They also develop personal relationships, a common sense of identity, and established ways of interacting.

Indeed, communities of practice are not a new idea (Wenger, 1998). They were the first knowledge-based social structures, back when humans lived in caves and gathered around the fire to discuss strategies for cornering prey, the shape of arrowheads, or which roots were edible. They have captured the attention today because with the advent of the Internet, especially the World Wide Web, it has been realized that knowledge sharing, coupled with the possibilities of technological advances, is the key to the sustainable development regardless of the temporal and spatial boundaries. Undeniably, in the emerging knowledge society, people are expected to continually improvise and invent new methods to deal with unexpected difficulties and to solve immediate problems, and share these innovations or lessons learned with others through some effective channels. In this regard, the idea of the virtual community has inspired many an organization to initiate their collective learning based not so much on delineated learning paths, but rather on experience sharing, the identification of best practices, and reciprocal support for tackling day-to-day problems in the workplace. Importantly, cultivating virtual communities in strategic areas is considered as a practical way to manage knowledge in terms of critical knowledge domains. Organizations need to identify the people and the specific knowledge needed for their growth, and explore how they connect them into suitable virtual communities of practice so that together they could steward the necessary knowledge.

A Definable Context
for Virtual Communities

Literally, the term virtual community is not hard to understand, yet it is slippery to define owing to its multi-disciplinary nature. In order to develop virtual communities — a complex practical activity — a disciplinary definition is needed to guide the practices. According to Preece (2000, p. 10), an online community consists of four important elements: the people, who interact socially as they strive to satisfy their own needs, or perform special roles, such as leading or moderating; a shared purpose, such as an interest, need, information exchange, or service that provides a reason for the community; policies, in the form of tacit assumptions, rituals, protocols, rules, and laws that guide people's interactions; and computer systems, to support and mediate social interaction and facilitate a sense of togetherness. Indeed, this definition is sufficiently general to apply to a range of different communities, including physical communities that have become net-worked and those that are embedded in Web sites (Lazar & Preece, 1998).

Undeniably, the idea of virtual community has somehow become a blanket term to describe any collection of people who communicate online, as exemplified by the networked communities (Cohill & Kavanaugh, 1997), also known as the community networks (Schuler, 1996) to which citizens can link through the Internet to discuss typical community issues. For better or worse, people are shaped by the communities to which they belong. As more people gain Internet access, they are increasingly empowered to organize themselves across local, national, and international boundaries. A call to action, a warning message, a cheer of encouragement, and the inspiring words of a leader can be distributed to members at lightning speed and at almost no cost, with just the click of a few keys.

Yet, developing successful virtual communities is not trivial. Successful virtual communities satisfy their members' needs and contribute to the well-being of society. The role of a community developer is to work with community members to plan and guide the community's social evolution. Putting basic policies in place helps members know how to behave, what to expect from each other, and provides a framework for social growth. As the community develops and forms its own character, its social policies and structure also evolve. Sociability is concerned with planning and developing social policies that are understandable and acceptable to members, to support the community's purpose.

The software that supports the continuous evolution of a community must be dynamically designed and adapted to its growth. More importantly, the software must be designed with good usability so that people can interact and perform their tasks intuitively and easily. Software with good usability supports rapid learning

and high skill retention. Understanding a community's needs is essential for developing virtual communities with good sociability and usability: the former focuses on social interaction, and the latter focuses on human-computer interaction. Developers and users have the responsibility to plan, guide, and mold communities to support the people in them. Like contemporary town planners and architects, the researchers can profoundly shape the virtual community landscape, paying particular attention to the issues of usability and sociability therewith to support the activities of knowledge networking.

Virtualization of Knowledge Networking Activities

The move to virtualization has been developing rapidly over the last decade, and has attracted a corresponding vocabulary, such as *virtual communities* (Rheingold, 1994). A virtual community, like its local counterpart, gives people a sense of identity and belonging, except that instead of being rooted in a physical place, it is a locality in cyberspace. Such communities emerged in the 1980s based around bulletin board systems. Today, they exist on the Internet in newsgroups, e-mail discussion lists, and conferences, and on company intranets or groupware systems.

Virtual communities come in many shapes and sizes. Some are open to anyone who cares to join, attracted by the topic of interest. Others are closed, in that they can join by invitation or subscription. In practice, people in such communities may or may not work together on a day-to-day basis, but they do value the learning that takes place when they spend time together. What they know may seem trivial or of great value, but their interactions with one another are crucial to their ability to do what they can do. What these groups or communities have in common is that engaging with each other around issues of common interest, sharing insights and information, helping each other, or discussing new ideas together are all part of belonging to the group. Interestingly, this is also the community's process of stewarding knowledge, which can hardly be separated from the communities that own it.

Today, many organizations have realized that unless knowledge is owned by people to whom it matters, it will not be developed, used, and kept up to date optimally. Knowledge is not a thing that can be managed at a distance like in an inventory. It is part of the shared practice of communities that need it, create it, use it, debate it, distribute it, adapt it, and transform it. As the property of a community, knowledge is not static; it involves interactions, conversations, actions, and inventions. Thereby, networking knowledge in a virtual community is not primarily a technological challenge, but one of community development.

Addressing this kind of dynamic knowing that makes a difference in practice requires the participation of people who are fully engaged in the process of creating, refining, communicating, and using knowledge. The thrust to develop, organize, and communicate knowledge must come from those who will use it. What matters is not how much knowledge can be captured, but how documenting can support people's abilities to know and to learn when the community itself becomes the living repository of people's knowledge. In the following discussion, the author examined a case study of community development through looking into the design considerations and strategies for creating online learning communities in order to facilitate the transformation and sharing of resources to support integrated understanding within the communities of teachers and students.

The Case of WISE

WISE, short for the Web-based Integrated Science Environment (Slotta & Linn, 2000; http://wise.berkeley.edu), is used to scaffold teacher and student communities as they exchange resources, develop coherent ideas, and support individual understanding in scientific investigations. From a community-building perspective, WISE defines learning communities as supporting networks of personal relationships that enable the exchange of resources and the development of a common framework for analysis of these resources. WISE also defines resources as a collection of ideas or interactions that are accessible to community members and can be incorporated into their practice. Besides, members of the community are expected to jointly analyze resources and develop a common set of criteria for evaluating those resources. However, it is important to discuss how different strategies can progressively involve individual members by helping them become resources for other community members.

The WISE Rationale

WISE is informed by a scaffolded knowledge integration (SKI) framework, which emphasizes coherent understanding by supporting participants as they compare, contrast, sort out, and organize their ideas. The SKI framework is inspired by cognitive apprenticeship (Tudge & Rogdoff, 1989) and the work of Vygotsky (1978). The framework has four design tenets that jointly encourage students to link and connect their ideas so that they develop more integrated and cohesive ideas. These tenets are: (1) to make the process of thinking visible, (2) to make science accessible, (3) to encourage students to learn from each other, and (4) to foster lifelong learning. WISE stresses the coordination and integration of ideas as well as encouraging different paths for learning.

By mixing hands-on learning with online discussions and modeling tools, WISE helps create a repertoire of experience representations that aid students as they become part of a community of learners. Such representations also provide support for teachers and curriculum designers as they collect resources for constructing learning projects. In many WISE projects, the presence of a shared resource (mostly from Internet sites) is used as evidence to support theories and to ground discussions, creating the potential for negotiation, clarification, justification, synthesis, and other processes that contribute to knowledge integration. Learning to use WISE requires teachers to adopt a new stance toward teaching where they serve more as a guide-on-the-side than as a sage-on-the-stage, transmitting knowledge.

By designing resources to scaffold and support interactions, WISE provides models of constructive engagement, as well as offering community tools for connecting people working on shared projects. Examples include: seeding discussions with comments to illustrate how evidence is used to support different theories; using video clips of student-teacher interactions to anchor discussions about pedagogy; and developing templates for activities to guide project authors as they create projects involving theory debate, critique, and design. The WISE software lets teachers and researchers track how resources circulate through communities, providing insights into the processes of community development. In addition, by making the process of critique visible, it encourages students to reflect upon the credibility, reliability, and usefulness of those resources.

Design Strategies for Teacher Communities

WISE involves teachers in communities for teaching WISE projects, customizing projects, and authoring new projects. Many teachers use curriculum units as they exist in the project library. As they begin to localize and customize projects, they interact with other teachers who have used the project as well as with the project designers (Linn & Slotta, 2000). Eventually, some teachers join or form partnerships with other community members to author new projects (Linn, 2000). In practice, curriculum design is the arrangement of parts, assembling conceptual, strategic, and material components in a pattern that functions to support specific goals (Mollison, 1990, p. 36).

The WISE NetCourse introduces teachers to the pedagogical framework and the technical supports for WISE through which individual teachers can move from peripheral participation to more sophisticated involvement over time (Lave & Wenger, 1992). In particular, WISE makes authoring accessible in a number of important ways, for example, through project templates for critique, theory debate, and design of projects. It enables community members to learn from one

another with collaborative tools such as shared white boards, resource libraries, and task lists.

Indeed, community exists only in the sense of teachers having access to a collection of online discussions about their teaching experiences and strategies. As these teachers reflect on their own practice and begin to customize projects with WISE, they contribute to the community by exchanging ideas with other teachers using similar projects. Therefore, recognizing the need to support teachers' actual practice as a way of involving them in a broader community is a crucial step in the design of self-sustaining communities.

Design Strategies for Student Communities

The instructional designers and teachers need to ask how they can structure relationships within learning communities so that the community members share resources and help refine each other's ideas. WISE offers innovative strategies for creating personalized electronic discussions that help elicit self-explanation and clarification from students (Cuthbert, Clark, Slotta, & Jorde, 2000). In fact, WISE projects have made advances in supporting students to share ideas in online learning communities, by investigating reflection and knowledge integration through scientific inquiry (Hoadley & Linn, 2000; Linn & Hsi, 2000).

Two of the most successful approaches involve personally seeded discussions and peer review discussions. In personally seeded discussions, WISE uses students' scientific explanations as initial comments in the discussion. Students work to clarify and justify their own scientific principles, comparing and contrasting them with other students' principles. Thinking is made visible for students as they elaborate upon and justify their ideas. By having students explain and defend their own principles, WISE gets students not only to take an interest in their own ideas, but also to take interest in responding to and critiquing the other ideas in the discussion. In peer review discussions, WISE uses students' shared research findings in an online question-and-answer session, creating resources that are accessible to the entire community of learners through such peer review activities as making comments, asking questions, and offering suggestions. In either case, the overarching design is for students to begin to adopt an orientation toward discourse that is based on comparison, critique, and justification, and the critical resources are the community members and their ideas. The common goal is the refinement of the community members' ideas.

Accordingly, the WISE strategies employed typically involve contrasting students' perspectives on a given topic of interest, and increasing students' personal relevance by making them responsible for pursuing specific areas of knowledge. Indeed, contrasting one's perspectives about a given topic can encourage an

individual student to clarify his or her own formulation while considering the relevance of other students' opinions (Chi, Lewis, Reimann, & Glaser, 1989; DiSessa & Minstrell, 1998). Besides, by increasing personal relevance around the process of contrasting different students' understanding, WISE helps elicit community members' collaborative thinking (a valuable resource itself) to refine the community's ideas.

Design Considerations for WISE

According to Cuthhert, Clark, and Linn (2002), there are four main design considerations behind the design of WISE which serve as general guidelines for creating effective online learning communities: (1) support the actual practices and daily tasks of the participants, (2) collect experiences and represent them in an accessible and equitable manner, (3) provide a framework to guide the learning process, and (4) represent the identities of the community members. It is worthwhile to examine some of the strategies related to the four design considerations aimed at creating effective online communities.

- **Support the actual practices and daily tasks of the participants:** WISE communities support the actual practices and daily tasks of teachers by helping them guide students' learning process through the creation of a visible history of student work. For students, WISE communities support learning practices and tasks by making the thinking of their peers visible, and by illustrating the process of group inquiry. Moreover, WISE elicits teachers' ideas and helps them develop curricula through its authoring communities.

  From a knowledge integration perspective, the practice of teaching and learning involves developing a repertoire of models for explaining situations. The scaffolded knowledge integration framework mentioned earlier can help students and teachers in their daily practice by illustrating the repertoire of models which provides general guidelines for designing projects and serves as an inspiration for creating design considerations for online communities.

- **Collect experiences and represent them in an accessible and equitable manner:** WISE communities collect experiences and represent them in an accessible and equitable manner to promote the process of connecting ideas so that participants (students and teachers) can use them in consequential tasks such as during arguments and debates. Communities, if viewed as a network of relationships and resources, can be structured to elicit ideas, develop shared understanding, and promote the integration of

a diverse set of ideas. It is important to investigate the potential of structuring discussions in different ways based on the type of discussion and the associated pedagogical goals.

Linking different types of pedagogical goals to design strategies is a challenging task because most community members are not accustomed to reflecting on the nature of their contributions. For instance, there are important differences between discussions depending on whether the purpose of the discussion is debate, brainstorming, or peer review. Each of these discussion types has a distinct structure and format, and hence demands different requirements for setting up, running, and assessing the discussion.

- **Provide a framework to guide the learning process:** WISE requires participants to support their ideas with evidence (e.g., Internet sites, references to laboratory work, scientific principles, or everyday experiences). This creates a culture where people ask each other for justification and clarification (Linn & Hsi, 2000). It is essential to investigate how participants adjust their behavior as their peers prompt them to support their ideas with evidence (Cuthbert et al., 2000).

  One strategy is to create commonly agreed-upon criteria, and examine how these criteria are adopted and transformed by community members as they interact with one another. For communities to maintain coherence and develop a sense of what is appropriate behavior, it is important that a strong community culture be established with a common set of values and criteria for making contributions (Brown, 1992). Communities need a general framework to help define the mission and vision for the learning process.

  In WISE, the knowledge integration framework characterizes the learning and curriculum design processes. This framework lends a shared focus to teacher professional development discussions, creating the potential to view instruction as a design problem that is interpreted to have multiple solutions and can be improved by selecting appropriate solutions and testing them in context. For example, it is important to understand how the WISE strategy off-loads the procedural guidance for students onto the learning environment, so as to free teachers to engage students individually, elicit their ideas, and encourage them to reformulate their ideas by considering other alternatives and supporting their ideas with evidence.

- **Represent the identities of community members:** Socially relevant information helps participants recognize the coherence of an individual's comments (Hoadley, 1999). WISE provides ways to represent the identities of community members, to illustrate the refinement of ideas, and to mark departures from past views. One common strategy is to link identities to resources based on who contributed or accessed a resource. Another is to

display the identities separately in the profiles section of the community site. Representing people's backgrounds and interests can help develop personal relationships, especially when face-to-face interaction may be limited. However, entering profile information needs to be part of an ongoing process linked to the use of the community system (WISE) so that the task of entering descriptors (say, background, area of expertise, and instructional topics) does not deter members. The idea of mutually revealing information (not being able to see other members' pictures until someone submits) is another way to motivate people to complete their profiles.

Knowledge Networking for Learning Communities

As the WISE story indicates, it is often necessary to coordinate in joint action — more precisely, collaborate — to achieve tasks larger than any one person could accomplish alone. Through the processes of acculturation in learning communities, knowledge and culture are perpetuated and transformed as people interact, define new problems, and take on new challenges. The primary question for any learning community is how they can learn from one another so as to increase their knowledge together. One term for this type of learning community is a *knowledge-building community* (Scardamalia & Bereiter, 1994), where individuals are committed to share information for the purpose of building understanding (knowledge) in all the participants.

When attempting to design technology in support of such learning communities, it is important to remember the triad of components (Bedny'i & Meister, 1997; Kuutti & Bannon, 1993) which involves in every situation the interdependence of tools, activities, and people; namely, a change in one element affects the others. When a new tool is introduced, people and their activities change to accommodate it. Over time, people begin to change, learning the new possibilities of the new tool, and adapting their practices (activities) to take advantage of its benefits and work around its shortcomings.

Thereby, in contrast to typical information and knowledge management tools, where the focus is on helping to route information, knowledge networking tools should help foster the constituent activities that increase knowledge building. Hence, these activities include not only information capture and transmission, but also the establishment of social relationships in which people can collaboratively construct understanding.

Future Trends of a De-Marginalized Context for Knowledge Networking

The development of virtual communities for knowledge networking is a complex and multi-faceted endeavor. If the goal is to help solve the puzzle of how to nurture such communities, there are quite a number of issues to be examined according to Hoadley and Pea (2002, pp. 345-351):

...defining learning communities, examining existing practices, identifying potential changes to improve practices, finding ways that technology might effect these changes, designing and building the technology, cultivating a community of use, understanding the consequences of the technology, and evaluating the community with respect to the original goal.

The investigation of these issues constitutes an important de-marginalized context to understand the intricacies behind the building of such virtual communities for the purpose of knowledge building and learning. In practice, each of the eight types of inquiry mentioned draws on a different research paradigm, demonstrating the multi-disciplinary nature of virtual communities. Here the term *de-marginalized* is used to emphasize the holistic nature of these issues. Oftentimes, the issues of technology seem to have marginalized the other issues in the discussion of virtualizing learning communities.

In the following discussion, some of the issues have been elaborated that must be de-marginalized in the study of building virtual communities. This is followed by some reflective recommendations on the value of community networks on knowledge sharing.

Defining Learning Communities

Loosely, almost any group of individuals who interact might be called a community, and certainly people change and learn in some fashion as a result of every life experience. Yet, it is often not easy to answer the question of what defines a learning or knowledge-building community. There have been a number of important efforts to offer such definitions.

Organizational behaviorists identify the learning organization as the important proponent (Garratt, 1987) that offers a few concrete measures of learning as a community. Woodruff (1999) describes some features that distinguish learning communities in terms of cohesion. Hsi (1997), following Pea (1993), defined

learning communities as communities in which participants construct productive discussions (defined in terms of inclusiveness and knowledge integration processes). Research inquiry is still needed to examine the possible spectrum of communities which may be characterized as learning or knowledge building.

Finding Ways Technology Can Help

Oftentimes, technology is thrown at problems with an attitude that it can solve any problem. The study of human-computer interaction tells a different story. A user is unlikely to adopt tools that do not support his or her goals at least, as well as other alternatives. Since technology affects the community only through its impact on individual people, supporting a community often means encouraging individuals to behave in a group-oriented fashion through the use of enhanced technology which minimizes costs to the individual users. The idea of participatory design (Bodker, 1991; Ehn, 1989), coupled with the research findings from human-computer interaction, should predict the impact of different technologies on various human activities in the learning communities.

Cultivating a Community of Use

In the process of virtualization, community-oriented tools need nurturing for adoption (or appropriation) to take place, as do the communities they are intended to help (Newman, Griffin, & Cole, 1989; Pea, 1992). Typically, community users come to appropriate a tool by establishing its fitness with their work practices, or changing their work practices to accommodate special properties of the tool as they come to perceive them. The proponents of the technology must help users overcome initial hurdles to appropriation.

They must also help the community and the tool to reach a productive equilibrium, which may include the development of very new practices or ways of working. In fact, creating this culture of use is an important person-to-person task that goes beyond simply taking a technology and throwing it over to the intended user community.

Use is a design issue which does not end with what the technical designers have created, but continues in ways the user community makes out of it in context. It is a form of reciprocal evolution of technology, work practice, and basic research (Allen, 1993), whose action-oriented nature should be understood by technology coordinators, community facilitators, and reformers who help advocate the use of the tool and its participation in the community.

Evaluating the Growth of a Virtual Community

Obviously, the growth of a virtual community depends on the goals against which it used to measure whether the technology, the community, and the individuals are successful. In the case of learning communities, individuals might be assessed for learning, or groups of students might be assessed on their group skills for problem solving in the learning domain. Entire communities might be evaluated on the amount of participation, the degree to which members of the community help other members, or the net quality of the community's output.

A tool's success could be measured by changes in the individual's or group measures, or by looking at the tool's direct use, for example by investigating whether the tool is appropriated, by asking users how they use the tool and whether they find it helpful, or by documenting stories of how the tool changes the community and individuals (Gay & Bennington, 1999).

Reflecting on Community Networks for Knowledge Sharing

The idea of a networked community dates back to 1984 when Tom Grundner in Cleveland, Ohio, USA (Bajjaly, 1999), using a small computer and a single modem line, established an online bulletin board dubbed *St. Silicon's Hospital and Information dispensary*. His goal was to test the effectiveness of online access as a way to deliver health information to the general public. Local citizens there were able to dial into St. Silicon's, leave medically related questions, and receive an answer from a board-certified physician within a day.

This experiment proved so successful that Grundner secured enough funding to start a full-scale *community computer system* to provide free e-mail to the people around Cleveland and electronic information in areas as diverse as law, medicine, education, the arts, science, and government.

In July 1986, this system, called the Cleveland Free-Net, went online. Over the following three years, that system registered more than 7,000 users and handled between 500 and 600 calls per day. A second system, the Youngstown Free-Net, began operation in July 1987. Over the next couple of years, three more systems became operational: Tri-State Online in Cincinnati, Ohio; the Heartland Free-Net in Peoria, Illinois; and the first rural system, the Medina County Free-Net in Medina, Ohio.

In 1989, the concept of a community computer system was expanded and formalized and the National Public Tele-computing Network (NPTN) was born. Its goal was to help new systems come online and to support them afterward with

services and information resources. Today, well over 200 communities in the U.S. and Canada host their own community networks.

Although Grundner is now no longer a visible part of the community networking movement and NPTN is no longer a functioning organization, his insights remain true today even though much in the world of computing has changed. Firstly, it is clear that these community computers represent the leading edge of what can only be described as a new telecommunications medium. Secondly, it is clear that a critical mass of people now exists who are prepared to utilize this new medium. Thirdly, there is a certain sense of inevitability to the development of community computing.

Simply stated, people find themselves unable to imagine a century in which they do not have community computer systems, just as the last century had the free public library. Moreover, it is believed that the community network, as a resource, will have at least as much impact on this century just as the public library has had on the society in the last century, such as to satisfy basic information needs of the physical community, to improve community collaboration through joint efforts and resource sharing, to promote and encourage individual lifelong education, to expand the knowledge base of the citizens of the community, and many others to be thought of.

Conclusion

For the past few decades, it has been witnessed that many cities and towns all over the world have established their respective community computer systems, more appropriately called community networks (or virtual communities) based on the discussion of knowledge networking so far. Such community networks help people and organizations to experience the transition from the face-to-face world they know so well to the online, electronic, networked world of the future.

Today, every community can easily connect to the Internet so that distant people and locals alike can tap into the repertoires of local information, communicate with one another, and experience almost firsthand the benefits a particular community has to offer. With this worldwide connectivity, even the smallest, most rural community can become an important part of the burgeoning *global village*.

Hence, every community can make its appearance in the global platform, telling its own story of growth, and relating why it is a good community to experience. Indeed, as people move into an electronically driven world, the story of each virtual community needs to be told online in terms of its various information or knowledge services offered to its physical members. Thereby, the author has examined in this

chapter a specific story in the WISE community, and presented some perspectives on the de-marginalized aspects of building virtual communities.

In closing the discussion, it is essential to articulate the challenge of knowledge networking in virtual communities. In the broadest sense, the major theme of knowledge networking in and among virtual communities could be understood from the perspective of effectively applying information and communications technologies (ICTs) to improve the lives of local people in different locales, in terms of getting knowledge to those of a community who need it in the right amount of time.

Of much concern here is an effort to theorize the social dimensions of ICT-based knowledge networking. In the words of David Hakken (2002, p. 362), it has to be asked: "What kinds of theorizations make sense in analyzing what happens when a concerted effort is made to introduce a technology supportive of knowledge networking in a *holistic* way — that is, to try to anticipate and address the social context/consequences of the interventions?" In simpler terms, it can be said, while a community network is based upon technology, its success rests with its people — organizers, information and knowledge providers, sponsors, users, volunteers — who support the virtual community in a variety of ways.

Most importantly, it must be ensured that a level playing field exists between the *haves* and the *have-nots*: those who have access to technology and those who do not. These underserved members of the community include those who are poor, uneducated, members of minority groups, elderly, or those with disabilities. But providing access to technology to these groups is not sufficient. It must be ensured further that no discrepancy exists between those who are computer literate and those who are not: the so-called *cans* and *cannots*. This is especially important as more and more information goes online and may not be available in any other format.

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Terms and Definitions

Community network: A term often used to refer to a networked community of people (or a virtual community), with subsequent emphasis on three more elements of concerns besides the people: (1) a shared purpose, such as an interest, need, information exchange, or service that provides a reason for the community; (2) policies, in the form of tacit assumptions, rituals, protocols, rules, and laws that guide people's interactions; (3) computer systems, to support and mediate social interaction and facilitate a sense of togetherness.

De-marginalization: A term often used to squarely offset the idea of marginalization, which often means the minimal effect rendered to influence the whole, given the marginal position of the issue in consideration.

Knowledge networking: An emergent activity of people or an organization to share knowledge in a way that makes it easier for individuals, teams, and enterprises to work together (or collaborate) to effectively contribute to one another's success in today's Internet-based knowledge society.

Virtual community: A group of people — be they geographically localized or dispersed — who hold something in common, or who share a common sense of identity, through maintaining some types of social interaction over some electronic medium, such as the Internet and the World Wide Web.

Virtualization: A term often used to describe the electronic transformation of some organization in today's Internet era, such as in the context of people's transitioning from a physical bricks-and-mortar village to an electronic clicks-and-mortar experience.

Chapter XII

Sustaining Internet Accessibility

Robert Jordan
University of Maryland, Baltimore County, USA

Worachat Buranapunsri
University of Maryland, Baltimore County, USA

Zane Berge
University of Maryland, Baltimore County, USA

Abstract

In this chapter, accessibility is defined as providing barrier-free Internet applications for those with physical and other disabilities. In some nations, accessibility to government Web sites and Web-based applications is the law. In the private sector, providing accessible Web sites makes good business sense. It increases productivity of employees who use it, expands the markets of businesses that provide it, and enhances the reputation of organizations that employ it. Although there are cost and time challenges for Web designers who incorporate accessibility, these may be overcome through careful planning and a through understanding of accessible design principles. Accessible design means simple design, which benefits all users.

Introduction

This chapter focuses on accessibility to the Internet for those with disabilities. The Web serves as a bridge between nations, and all people should have effective access to it. The Web is used increasingly to transact business, enhance communication, and spread culture beyond national borders. Increasingly, it is also being used as a learning medium. What are the challenges to ensuring accessibility for all? What are the benefits to individuals and society? What Web design elements are necessary for maintaining accessibility? What is the U.S. law for accessibility? What is the international community doing to successfully promote accessibility?

Accessibility and Web Design Culture

Sustaining accessibility requires overcoming challenges. These challenges are often rooted in a lack of understanding. Some are the result of misconceptions regarding the difficulties of implementing accessible Web-based programs. Web design culture is occasionally inhospitable to accessibility. Web designers are often young people lacking physical disabilities, which may contribute to a lack of awareness of the issue of accessibility (Accessible Web Sites, 2004). Kiser (2001) points out in *Online Learning* that Web designers often incorporate flashy graphics and gadgetry in their applications, which can conflict with simple designs necessary for accessibility.

Organizations sometimes encourage misconceptions regarding accessibility. Online learning developers and providers, for instance, place a premium on interaction in their products and believe that incorporating accessible features into their products will erode interactive features (E-Learning: Conforming to Section 508, n.d.). In addition, institutions that provide learning are often at a loss on how to deal with the disabled, and lack of experience in dealing with them is often to blame (Cook & Gladhart, n.d.). Many organizations do not view accessibility as a priority, and even those who recognize the need for it often do not have the experience to successfully implement it in online learning. A survey of literature in the distance learning field reveals a lack of information on accessible online learning. In addition, disabled users are often invisible online, so their problems are often not fully understood or appreciated by Web developers (Schmetzke, n.d.).

There are other factors that discourage accessibility. Web designers often feel overwhelmed with work assignments and may believe that they do not have the

time to implement accessible features into their Web designs (Schmetzke, n.d.). Web products are often rushed into production without adequate planning (Mueller, 2003, p. 328). Careful planning is essential in providing accessibility. Marketing plays a role. It can lead to extraneous applications and gadgets, which may diminish accessibility (Mueller, 2003, p. 112). It is even thought that a lack of understanding about the legal requirements regarding accessibility may result in some U.S government agencies shying away from implementing online learning at all (E-Learning: Conforming to Section 508, n.d.).

U.S. Accessibility Laws

As mentioned earlier, several nations mandate accessibility in their government Web sites. The U.S. has a stringent legal requirement for accessibility in its government's Web sites that may serve as a model for other nations. The legal mandate in the U.S. for ensuring accessibility is Section 508 of the Rehabilitation Act of 1973. The act was amended as part of the Workforce Reinvestment Act of 1998 (Kiser, 2001, p. 32). Section 508 requires U.S. government agencies to provide full, accessible Web sites for use by government employees and members of the public with disabilities (Section 508: Scope, 2001). The law applies to all U.S. government Web-based applications (E-Learning: Conforming to Section 508, n.d.). The law also applies to all disabled persons, including those who are not severely disabled, such as those with limited hearing and low vision (EOP Foundation, 2000, p. 19).

Covered Disabilities and Impairments

Burgstahler (2002) describes several types of impairments covered under Section 508. These impairments include the following potential disabilities:

- Mobility and motor skill impairments
- Visual impairments
- Learning disabilities
- Hearing impairments
- Speech impairments
- Seizure impairments

Exemptions

There are several U.S. government activities exempted from complying with Section 508, including intelligence activities, National Security activities, and military activities (Section 508: Scope, 2001). It is important to note that Section 508 allows any adversely affected individual to sue the U.S. government for compensation (Tang, 2000).

Section 508 and the Private Sector

Although Section 508 does not directly apply to the private sector, many private sector vendors who deal with the U.S. government must provide accessible Web applications for their government clients (Mueller, 2003, p. 13). The U.S. government often sets trends for U.S. private sector companies and is a major buyer of software, which often must adapt to the government market (Kiser, 2001, p. 32). Many large corporations, such as Microsoft, have incorporated accessible features into their products.

Accessibility in the International Community

There are several nations, including Australia, Italy, Portugal, the UK, and the U.S., that legally mandate some form of accessibility for the disabled. Many other nations actively support and encourage accessibility for their citizens. A few similar initiatives are discussed in this section.

The Web Accessibility Initiative

The World Wide Web Consortium (W3C) provides a forum for the international community to promote accessibility for disabled persons around the world. The W3C's program for ensuring accessibility is known as the Web Accessibility Initiative, or WAI (Web Accessibility Initiative Activity Statement, n.d.). The WAI is part technological and part educational. As part of the WAI, the W3C has developed a standards and guidelines for incorporating accessibility (Web Accessibility Initiative Activity Statement, n.d.). The W3C recognizes the fragmentation of accessibility standards worldwide and promotes the harmoni-

zation of these standards (Web Accessibility Initiative, n.d.). Australia and Canada have adopted the WAI standards as their own national standards (Australian Government Information Management Office, n.d.; CLF for the Internet — Accessibility, 2004).

Rehabilitation International

Another worldwide accessibility initiative springs from Rehabilitation International (RI), an organization dedicated to gaining effective Web access for the disabled. RI is particularly committed to improve accessibility in developing nations. They have established a presence in the Asia Pacific, Africa, Europe, Latin America, and North America (International Access and Equity Perspectives, n.d.).

The Access Board

The Electronic and Information Technology Access Advisory Committee (EITAAC) was established in October 1998 to develop accessibility standards for U.S. government agencies. These standards were published in December 2000 (Web Accessibility for Section 508, 2002). The following list contains the basic standards and requirements established by the EITAAC and the U.S. Architectural and Transportation Barriers Compliance Board, commonly referred to as the Access Board. These standards are addressed in detail later in the chapter:

- A text equivalent must be provided for graphics;
- Alternatives must be provided for all multimedia applications;
- Alternatives must be provided when color conveys information;
- The organization of the Web site must be readable without a style sheet;
- Frames should be used sparingly, and alternatives must be provided;
- Screen flicker is limited to between 2 Hz and 55 Hz;
- A text-only equivalent must be provided if accessibility cannot be provided in the application; and
- Plug-ins and applets should be used sparingly if at all (EOP Foundation, 2000, p. 13).

The Access Board works closely with nations and international organizations around the world, including China, Norway, and the European Union among others (Board Plans for International Outreach and Coordination Efforts, 2004). Similar to W3C, the Access Board supports the development of harmonized global accessibility standards. Regulations related to international community accessibility are provided in subsequent paragraphs.

Exemptions and Waivers

Section 508 contains provisions for variances and waivers, although they are narrow in scope, and U.S. government agencies should not attempt to obtain them without good reason. Undue burden is one reason for obtaining a Section 508 waiver. Agencies may be exempted from providing fully accessible Web sites if it cannot be done without significant difficulty or expense (E-learning: Conforming to Section 508, n.d.; Section 508: Scope, 2001). The concept of undue burden is ambiguous, but the Access Board emphasizes that agencies should not take advantage of the undue burden provision of Section 508 without good reason (Mueller, 2003, pp. 36-37). Economic burden must be demonstrated by the government agency seeking waiver, and the burden is often dependent on the size and resources available to the agency (Mueller, 2003, pp. 36-37; Section 508: Scope, 2001).

There are two other variances to Section 508 that may apply. If accessible equipment is commercially unavailable, a variance may be obtained. Government agencies must provide extensive documentation. Another variance is known as *equivalent facilitation*, which encourages flexibility and innovation in promoting accessibility. If a U.S. government agency discovers a more efficient way of providing accessibility than what is mandated by Section 508, it may do so (E-Learning: Conforming to Section 508, n.d.). Moreover, Section 508 permits Web developers to update Web sites as resources permit (Mueller, 2003, p. 112).

Text-Only Alternatives to Accessibility

Section 508 permits Web developers to provide alternative *text-only* Web sites if it is not possible to provide fully accessible primary sites. This is a poor alternative for two reasons. Firstly, there is a positive aspect to living within the limitations of accessible design; it creates a simpler design, free of often useless gadgetry that can plague non-impaired users. Secondly, Mueller (2003) argues that "separate is often not equal" (p. 350). Thereby, developers who decide on maintaining an alternative site rarely provide any accessibility on the primary site and often neglect to regularly update the alternative site (Accessible Web Sites, 2004). It is an inefficient use of resources to build and maintain two separate

sites. Therefore, developers should strive to build accessibility in their sites during the development process to sustain distance learning.

Challenges to Sustaining Accessibility

There are many challenges related to sustaining accessibility. Many of these can be overcome with foresight and careful planning in the development process. Several challenges are highlighted in subsequent paragraphs.

Costs of Accessibility

There are many challenges for incorporating accessibility. Technology provides opportunities and creates challenges (Opitz, 2002; Schmetzke, n.d.). McCall (2003) describes the major challenges as cost and the time it takes to develop accessible products and Web-based applications. The EOP Foundation highlights three major costs to developers interested in incorporating accessibility into Web-based applications:

- Modifying existing systems;
- Training federal agencies and software manufacturers to market, support, and use accessible products; and
- Translating existing documentation into alternatives (p. 3).

The EOP Foundation (2000) maintains that these upfront costs will decrease over time as systems are adapted to meet accessibility standards. Section 508 acknowledges that adapting systems places an economic burden on U.S. government agencies and has built flexibility into the law for agencies that need time to fully implement accessibility. Adaptation costs underscore the advantage for developers to build accessibility into their programs as they are being developed, rather than attempting to retrofit existing products (Accessible Web Sites, 2004; Blaser, 2001).

Accessibility and Design

The nature of many Web applications available today poses challenges. For instance, most online learning is based on text. Text-based programs challenge

those with vision impairments and those who have specific learning disabilities, such as dyslexia (Cook & Gladhart, n.d.). For those with vision impairments, technology such as screen readers may assist, but it may not be a complete solution. Schmetzke (n.d.) argues that users with print disabilities have particular difficulty in an online environment. The problem is not only accessibility of Web sites, but accessibility of online resources and instructional materials as well. Many Web sites rely on *point-and-click* and *mouse-over* events that may pose problems for users with manual disabilities (Opitz, 2002).

Accessibility and Interactivity

Online assessments and tests, particularly timed tests, may also be problematic (Cook & Gladhart, n.d.). Disabled users may need a way to override timed response questions (Lance, n.d.). Synchronous chats may be difficult for the disabled, who may need time for screen readers to read text or lack the manual dexterity to respond quickly in such formats (Burgstahler, 2002; Cook & Gladhart, n.d.; McCall, 2003). Alternatives (e-mail is an example) to chat responses should be considered (Burgstahler, 2002). These challenges can be overcome in a development process attuned to accessibility.

Accessibility and Resources

There are also resource challenges facing online users. Cook and Gladhart (n.d.) suggest that the disabled may lack the financial resources for software and hardware accessibility. To sustain accessibility, resources must be available for anyone who needs it.

Benefits of Incorporating Accessibility

There are many benefits to organizations when accessibility is built into programs. Several benefits are described in detail in subsequent pararaphs.

Accessibility and Productivity

The benefits of incorporating accessibility are numerous. The EOP Foundation (2000) cites the September 1998 *Monthly Labor Review* in reporting that there are almost 30 million disabled workers in the U.S., out of a total workforce of 123

million, that would be positively affected. EOP assumes that many of these disabled persons will have direct benefit from accessible Web sites. As measured per U.S. government employee, productivity increased between 5% and 10%, from $2,241 to $4,482.

Accessibility and Learning Institutions

Disabled learners populate higher learning institutions. The National Center for Education Statistics reports that 98% of public colleges, 63% of private colleges, and 47% of private junior colleges serve the learning disabled (Cook & Gladhart, n.d.). The center also reports that approximately 29% of American students have some form of learning disability (Cook & Gladhart, n.d.). Under the Americans with Disabilities Act, colleges and universities must accommodate disabled students by providing assistive technologies, such a screen readers and video text displays. Assistive technologies also assist aging, non-traditional users (Opitz, 2002). Online learning must be designed to be used with these technologies. Schmetzke (n.d.) argues that Section 508 will ultimately have a positive effect on disabled users in colleges and universities.

Accessibility and Simple Design

Accessibility leads to simplicity in design and improved usability for all users (Accessible Web Sites, 2004; EOP Foundation, 2000, p. 39; Mueller, 2003, p. 5). The concept of simple design assists all users, including non-English speakers, and it may be a boon in open office environments that require silent computers or have computer or Internet limitations (Burgstahler, 2002).

Accessibility and the Private Sector

Organizations that implement accessibility may benefit from a boost in reputation as a *good corporate citizen* (Accessible Web Sites, 2004). Burgstahler argues that implementing accessibility is the ethical thing to do and the U.S. government's Section 508 requirements will serve as model for the private sector (2002).

The productivity increases cited among U.S. government employees do not include potential spillover benefits to the private sector (EOP Foundation, 2000, pp. 4-5). Mueller (2003, p. 5) argues that Web sites and other vendors should incorporate accessibility in all of their products to create greater return-on-investment, rather than attempting to target specific products to the U.S. government marketplace.

There is research that supports the idea that software companies, including those that develop Web applications, are on their own moving forward with the development of accessible software and technology (EOP Foundation, 2000, p. 7). The disabled are an important online community, and it would be in the best business interest for developers to acknowledge a growing market for accessible applications and products. Hence, sustaining accessibility requires a complete understanding of the potential markets that are available.

Accessibility, Usability, and Universal Design

One of the primary themes that emerges from sustaining accessibility is the need to incorporate it into the design process. Accessibility equals good, simple design, and that is good for all users.

Accessibility and Usability

Are accessibility and usability the same thing? They are not. Accessibility addresses how users interact with a system, while usability addresses how a user understands an application (Mueller, 2003, pp. 42-43). Accessibility is a subset of usability. Accessible Web applications enhance learnability, memorability, effectiveness, efficiency, and learner satisfaction (Accessible Web Sites, 2004). The emphasis is on interaction, making it both accessible and usable. An application might be accessible but not effectively usable (Mueller, 2003, p. 43).

Accessibility is not the same as *connectivity*, although some Web developers confuse the two terms (Kiser, 2001, p. 30; Schmetzke, n.d.). Being easily Web accessible does not ensure that a Web application is barrier free and accessible.

Accessibility and Universal Design

Mueller argues that legal requirements help "make applications almost light switch simple to run" (2003, p. 54). One way that has been suggested to ensure consistent application of accessibility is the concept of universal design, a process to create products. The Center of Universal Design at North Carolina State University declares that universal design is "the design of products and environments to be usable by all people, to the greatest extent possible, without

the need for adaptation or specialized design" (Burgstahler, 2002, n.p.). Universal design reinforces the idea that Web developers can best sustain accessibility by incorporating it into the overall design, rather than attempting to add it as an afterthought. Universal design demands a high level of interoperability.

Methods for Incorporating Accessibility

Several impairments may limit accessibility for users. In this section, specific methods of incorporating accessibility are discussed. One general suggestion is to keep design simple by limiting gadgetry. Designers should strive to incorporate options that users need and will use (Mueller, 2003, p. 283). Table 1 contains specific impairments and possible solutions.

Mobility and Motor Skill Impairments

Some learners cannot use a mouse to navigate Web sites. Section 508 requires that full keyboarding applications be incorporated. All mouse "point-and-click" controls and movements must be possible via tab movements and through keyboard shortcuts and speed keys (Mueller, 2003, p. 60). Shortcuts should be simple and avoid what Mueller refers to as "finger gymnastics" (2003, p. 60). Microsoft provides useful solutions for avoiding this problem in its accessibility options applet available in recent versions of Windows XP. Users should be made aware that they can enable these features in any application.

Table 1. Accessibility impairments and possible design solutions

Accessibility impairment	Solution
Mobility and motor skills	Keyboard shortcuts Speed keys
Visual	Alt tag for graphics Limit use of color High contrast text and background Limit use of frames
Learning disabilities	Consistent navigation Consistent commands Limit use of timed tests and controls
Hearing	Open or closed captioning
Speech	Limit use of audio-conferencing E-mail and instant messaging
Seizure	Do not use flashing or flickering text

Visual Impairments

This is a common impairment that creates significant accessibility challenges. Blind or low vision learners may need screen readers that convert text to spoken word. One popular screen reader is JAWS (see http://www.freedomscientific.com), but there are others, including Ereader, Easy Access, and Write Outloud (Cook & Gladhart, n.d.; Mueller, 2003, p. 196). The problem with screen readers is that they cannot read graphic images. Alternative descriptions must be provided that describe graphics that convey necessary information that can be read by screen readers. There are two attributes that should be provided:

- Alt tags, and
- LongDesc

Both of these attributes can be readily incorporated into Web design. Alt tags are usually 10 words or less, while LongDesc is usually at least 205 characters and is best reserved for describing tables and graphs (McCall, 2003). Alt tags, commonly referred to as balloon help or tool tips, must be provided for all controls and buttons in Web applications (Mueller, 2003, p. 172).

In addition to alternative descriptions, the use of color must be considered. Color blind learners may have difficulty in distinguishing colors on Web sites. In general, it is a best practice to limit the use of color to convey information (Cook & Gladhart, n.d.; Houck, 2004; Mueller, 2003, p. 66). A Web site that can be used to view Web sites from a color blindness perspective is found at http://www.vischeck.com/vischeck/vischeckImage.php (Mueller, 2003, pp. 132-134).

Web designers can employ other methods to enhance accessibility. High contrast text and backgrounds should be employed and use of white space should be maximized (Opitz, 2002). The learner should be able to resize text with scalable fonts, and element counts should be adjustable and reduced to the minimum necessary to accommodate large text displays and magnification devices, such as ZoomText (Cook & Gladhart, n.d; Mueller, 2003, p. 66). The use of frames should be minimized or eliminated altogether, as they often do not work well with screen readers (Mueller, 2003, p. 336). Finally, the use of applets and plug-ins should be reconsidered as they can adversely affect the use of screen readers (Cook & Gladhart, n.d.).

Learning Disabilities

Mueller points out that cognitive ability is not equal to intelligence, although many Web developers believe it is, and this can impact the way they design their Web sites (2003, p. 63). Perception and reasoning may be affected. Consistency in function and interaction is an important way to ensure accessibility to those with cognitive disabilities (Mueller, 2003, p. 46). Navigation links must be consistent (Cook & Gladhart, n.d.). Consistency should be incorporated in the following design elements:

- Buttons and controls
- Error messages
- Prompts
- Labels
- Organization
- Speed keys and shortcuts
- On-screen text (Mueller, 2003, pp. 47-48)

Users with cognitive disabilities may have difficulty completing timed controls, including tests, within limits. They should be warned of timed responses (Cook & Gladhart, n.d.). Developers should provide the ability for users to request more time to respond to timed controls (Mueller, 2003, p. 245).

Hearing Impairments

Users with hearing impairments may not be able to hear audio and streaming video files. Captioning must be used and in synch with streaming video and transcripts provided (Mueller, 2003, p. 59). There are two types of captioning: open or closed (Burgstahler, 2002). Open captioning is when captioning is included on the screen, while closed caption appears in its own box on the screen (Mueller, 2003, p. 59).

Speech Impairments

Alternatives to audio-conferencing should be provided for users who have speech impairments (Burgstahler, 2002). E-mail and instant messaging are

possible alternatives. Coombs (1989) describes how e-mail opened doors for learners with various impairments at the Rochester Institute of Technology, which has been at the forefront of creating barrier-free education. E-mail may replace faculty office visits, and instant messaging can serve as a forum for classroom discussion. E-mail and instant messaging, collectively referred to as computer-mediated communication (CMC), has, in Coombs' (n.d.) view, allowed the disabled to be more easily incorporated into the student mainstream.

Seizure Impairments

Some people are susceptible to seizures when viewing flickering or flashing text. These seizures may in rare cases result in death. In general, it is best not to use flickering text (Mueller, 2003, p. 67). If flashing text is used, it must be between 2 Hz and 55 Hz.

Online Accessibility Evaluation and Assessment

Accessibility should be thoroughly evaluated before being released for use. Mueller suggests that more time be spent in evaluating accessibility than in developing it (2003, pp. 68-69). There are numerous online evaluations that may be used even before alpha and beta testing begins. One of the oldest online accessibility evaluations is known as Bobby (http://bobby.watchfire.com/bobby/html/en/index.jsp) (Mueller, 2003, pp. 311-312; Opitz, 2002). Bobby provides an extensive check on various accessibility factors and a detailed analysis of a Web site's accessibility. It also provides a "seal of approval" that can be affixed to Web sites that meet all of its checks (Mueller, 2003, pp. 316-317).

Mueller highlights are other online checks that may be employed. LIFT (http://www.usablenet.com) provides extensive testing and detailed feedback (2003, pp. 322-323). AskAlice (http://askalice.ssbtechnologies.com:8080/askalice/index.html) is another site that is useful in assessing accessibility (2003, p. 322). One of the newest online checks is WAVE (http://wave.webaim.org/) (2003, pp. 324-325).

Once these online checks are complete, the Web site should be put through extensive user testing, as with any new application. If possible, the application should be tested with a variety of browsers and assistive technologies (Burgstahler, 2002).

Further Research

There are important directions for further research emerging. Future research may someday allow severely disabled patients to communicate or even regain lost movement. Research may involve lifestyle factors and also research to clarify how issues of access and accessibility will evolve from here. Examples are research into areas such as faculty attitudes toward students with disabilities (Jensen, McCrary, Krampe, & Cooper, 2004), fitting learning models with students having disabilities, and building community and awareness regarding accessibility for all students.

One topic for future research is the link between accessible Web sites and applications and increased productivity, particularly in terms of meeting the strategic goals of objectives of organizations. As was previously cited, some studies have shown increased productivity for disabled users. It would be insightful to research whether the claim that accessible Web applications equal well-designed Web applications results in increased productivity for all users, not just disabled ones.

Another potential topic for future research is within the specific field of accessible online learning. Does accessible online learning have any affect on whether the learning itself is conceptually sound? Most research in the field revolves around the legal requirements of accessibility and implementation techniques, rather than the impact on learning theory itself. Do accessibility requirements place constraints on instructional designers? Or does it open up opportunities?

Another possible topic for research is Web accessibility for older adults. Older adults may also face challenges when using the Internet. They may experience problems with color of Web pages, navigations, fonts, design layout, and so forth. Does Web accessibility have any impact on older adults? How can Web developers make the Web sites accessible to older adults as well as the disabled? What design considerations should Web developers take into consideration when designing any Web site for older adults? Are accessibility requirements or guidelines applicable for older adults?

Conclusion

In this chapter, Internet accessibility was discussed. In some governments, accessibility is the law. For the private sector, accessibility provides a way of expanding markets and enhancing corporate reputation, as well as doing the right thing.

This chapter highlighted several useful ways to incorporate accessibility. Resources are essential, as is careful needs assessment, planning design, and evaluation, which are all characteristic of any good Web design. Commitment to accessible design principles at the outset is vital. Accessibility does not happen overnight. Time, resources, and education are all needed by Web developers. It is suggested that developers keep an open mind about accessibility as they begin developing their Web programs. With understanding and foresight, incorporating accessibility need not be particularly difficult. There is value in equating accessibility as solid design that will ultimately benefit all Internet users, not just the disabled.

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Terms and Definitions

Disabilities and impairments: These refer mainly to disabilities and impairments covered in Section 508 of the United States Rehabilitation Act of 1973 such as mobility and motor skill impairments, visual impairments, learning disabilities, hearing impairments, speech impairments, and seizure impairments.

Instructional design: The emphasis in this chapter is for instructional designers to incorporate accessibility in their Web-based design for training through careful planning and a through understanding of accessible design principles. Accessible design means simple design, which benefits all users.

Internet accessibility: Providing barrier-free Internet applications for those with physical and other disabilities.

Online accessibility evaluation: The focus in this chapter is to systematically and thoroughly evaluate Web-based instruction before it is released for use.

Web-based training: In this chapter, the focus is on providing accessible Web sites for training purposes that often increases productivity of employees who use it, expands the markets of businesses that provide it, and enhances the reputation of organizations that employ it.

Chapter XIII

Capacity Development Initiatives for Marginal Communities:
A Few Case Studies

M. Aminul Islam
United Nations Development Program, Bangladesh

Elena Murelli
Università Cattolica del Sacro Cuore, Italy

Frederick Noronha
Bytesforall, India

Hakikur Rahman
Sustainable Development Networking Program, Bangladesh

Abstract

Capacity development initiatives for marginal communities with information and knowledge under the contemporary global scenario perhaps could be one of the effective instruments to make a meaningful change towards sustainable human development in developing countries. Information networking can play a key role in the initiatives toward enhancing opportunities for improved livelihood, health for all, food security, disaster

management, and sustainable development. Best practices are already known in this regard such as e-commerce for better livelihood and employment, telemedicine for health, tele-food for food security, early warning for disaster preparedness, and sustainable development *network as a comprehensive treatment for the* sustainable *development. This chapter focuses on how capacity development initiatives for marginal communities work with reference toward achieving the Millennium Development Goals (MDGs) in developing countries. It approaches the issues and concerns related with the empowerment of the marginal communities, problems, and apprehensions in human and social capacity development in the information and communications technology (ICT) sector. A lot more effort is required from governments, NGOs, and other multilateral agencies in order to bring about a sustainable mechanism of ICT planning, implementations, and development in developing countries. This chapter aims at highlighting the importance of ICT development, and the issues and concerns that are related for its expansion in the developing world for securing sustainable development.*

Introduction

The 21st century predominately constitutes an information- and knowledge-based society, where every country hopes to achieve its goal of social and economic development, including education, food security, health, environment, gender equity, and cultural pluralism. However, the most important problem remains attaining and sustaining these goals. Therefore, every continent should concentrate on building its own information society, until a global village is formed.

In contrast to the developed countries that have been steadily capitalizing the rapid pace of information and communications technology (ICT), a large number of developing countries, particularly low-income countries, have failed in the adaptation of these technologies by contributing to the *digital-divide* (UNDP, 2001). This is also true for rural villages where modern technologies have yet to reach. The majority of people living in rural areas has neither access nor the means to obtain modern ICT because of their low economic position (Gunatunge & Karunanayake, 2004).

For the past seven years, it has been fashionable to speak of the *global village*, yet the *Human Development Report of 1998*, published by the United Nations Development Program (UNDP, 1998), indicates that not everyone is a full member of this village. The benefits of globalization have largely gone to the

developed and wealthiest nations (Landes, 1998). In fact, information technology is scarcely available in parts some areas of the developing world. This is especially true for Africa. According to the UNDP report, the 22 nations with the lowest human development index are in Africa.

ICT brings profound changes to every community. It influences how the community knows and understands the world. It changes working methods and the ways in which people communicate. Similarly, it affects how the community accesses and shares it with others and establishes information as an important source of power (Heeks, 1999). By acquiring the equipment and necessary skills to use information effectively, the poor and marginalized population can gain access to power. The Internet can act as the tool to raise their skills and share knowledge-based information among communities.

Even though there have been increased global initiatives to reduce digital divides, the technology gap is expanding at the periphery. An electronic divide is amplifying between developed and developing countries; between *reached* and *unreached*, the *haves* and *have-nots*, especially in developing countries (Norrish, 1998, 1999). According to the Global Reach (2001) survey, about 218 million of the world's population use English (45%) as their medium of communications, while 266 million use other languages (55%). However, the first cluster is representing a community of English-spoken countries of about 500 million (44%) and the other cluster is representing the rest of the global population of nearly 5,600 million (5%).

Another survey by NUA (2002) found that the number of users connected to the Net is about 605.60 million: World Total 605.60 million, Africa 6.31 million, Asia/Pacific 187.24 million, Europe 190.91 million, Middle East 5.12 million, Canada and USA 182.67 million, Latin America 33.35 million.

It is an indicative picture that Internet subscribers are rapidly increasing in Asia, Africa, and Pacific regions. Thereby, taking pragmatic steps (discussed in following case studies), marginal communities in these regions can be brought under an ICT-based development umbrella. This chapter discusses three case studies that proved to be successful in raising the capacity of the marginal communities through the use of ICTs.

Background

ICT can facilitate economic development by availing information to make the choice of development priorities easier and to plan and manage development activities better (Waema, 1996; Robinson, 1998). Many developing countries have made economic management their prime agenda and use opportunities

provided by the ICT to overcome the problems of rural poverty, inequality, and environmental degradation (Bhatnagar, 2000). In these countries, it is believed that management of information systems, such as document management, electronic data exchange, file sharing, electronics groups, groupwares, open source software, and the Internet, can lead to innovative planning, and thereby become a means of empowering the communities through raising their capacity (Bhatnagar, 2000; Kiangi & Tjipangandjara, 1996; Traunmuller & Lank, 1996; Gunatunge & Karunanayake, 2004).

At the same time, knowledge networking and information networking are becoming a basic instrument of development society. To substantiate these, ICT development had sped up at a much higher rate than ever before. During previous years the number of Internet subscribers increased many times in the U.S., Europe, and Asia. ICT is providing a dramatic impact on achieving specific social and economic development goals as well as playing a key role in boarder national development strategies. The real benefit is the creation of the powerful social and economic network by improving communication and the exchange of information (Benjamin, 1999; Duncome, 1999).

In the beginning of the information technology revolution, governments in many of the developing countries were not only slowly catching up with the new communication technologies, but also in a few cases adopted a negative view on the expansion of electronic networks to the community level. At the same time, networking at the civil society level was found to be increasingly challenging to national governments on many issues (Slim & Thompson, 1993). However, as NGO networking within and among countries of common peripheries, as well as in many outreach programs related to marginal people increased over time — mostly through the use of e-mail, private sector TV, radio, and cell phones — their leverage vis-à-vis national governments has also increased.

ICT offers new opportunities for individuals and communities in two ways: one as information consumers and the other as information generators. Through media convergence, ICTs can also build on and integrate the capacities of other media (e.g., cell phone, radio, and television) to cover people at large. This facilitates low-cost infrastructure development, access, and distribution of information, which requires a distributed approach rather than a centralized one (Stillitoe, 1998). There is a need for people-centered ICT institutions in the public and non-profit sectors to seize these new opportunities. With that objective in mind, this chapter recognizes that the key to the impact of ICTs is not technology itself, but the networking and information exchange, with particular emphasis on the information that marginal people need. This chapter focuses on both ICT strategies and program activities with reference to eight broad areas of intervention of Millennium Development Goals (MDGs), including community mobilization, capacity building, information networking, ICT policy issues, sustainability, and ICT applications and research.

The turn of a new century is often marked by reflection on the past and fresh aspirations for a better future. In one way this has been addressed at the global level through the Millennium Declaration, adopted by 189 Member States of the United Nations at its 55th General Assembly in September 2000. Through the Declaration, some 147 Heads of State and Government reaffirmed their commitment to working together to uphold the principles of human dignity, equality, and equity at the global level, and to reducing poverty.

The Millennium Declaration expresses some targets that the UN is trying to reach in the near future. Target 18 says that "in cooperation with the private sector, make available the benefits of new technologies, especially information and communications technologies to developing countries." The three indicators expressed above are being used to evaluate the case studies included in this chapter.

Issues and Concerns

At the outset, promoting a culture of information management and inclusion of new skills has always been considered as a necessity. Human and social capacity development through ICT, aiming at empowering marginal people, involves establishment of targeted, goal-oriented, horizontal and vertical linkages. First, capacity development should be achieved through development at the individual level, then bringing the individuals under a network, and finally through congenial national, as well as international policy support; the whole initiative can be turned towards a result-based outcome. At the horizontal level, each individual should be brought under a network of multi-faceted information blankets for creating a positive change in the marginal society as a whole.

At the vertical level, adequate awareness-raising programs need to be initiated for decision makers, researchers, academics, and stakeholders on the investment assessment in ICT capacity building through formal and non-formal methods. This may include training of development workers incorporating ICTs in their activities with emphasis on training of rural women, youth, and deprived groups. With respect to content and its applications, it is observed that currently available and practiced networks have limited scope of empowering marginal communities as well as rural uplift. To make it applicable to the community beyond physical access to information, it has to be made timely, retrievable, and easily applicable by a broad range of users, accessible in their own languages and consistent with their need, and it should be demand driven.

To improvise these processes further, needs assessment for information flow in various network layers should be implemented to enable feedback and widen

participation in developing these resources with user-specific, locally sensitive content and applications. This calls for piloting, monitoring, evaluating, and documenting of successful and unsuccessful applications of ICTs for the marginal community. From these applications, models should be developed for identifying strategic future investments and replication programs.

Solutions and Recommendations

Overcoming the barriers toward empowering marginal communities through information networking vary over place and time, which need to be addressed horizontally and vertically. Literature so far reviewed with respect to policy formulation (Accascina, 1999; Gurstein, 2003; Keniston & Kumar, 2004; UNDP, 2001; World Bank, 2000; Bridges, 2004; OECD, 2004; G8DOT Force, 2001; DFID, 2001; ITU, 2003) indicate that contemporary trends tend to be biased against marginal populations. There is, therefore, a need for broad-based and equitable access to ICTs in areas consistent with the processes of decentralization, democratization, mobilization of targeted population, and policy revisions with good governance. Adequate ICT education and capacity-building programs should facilitate a coalition of stakeholders and organizational partners, in conjunction with other agencies, to develop policies for supporting the application of ICTs to empower marginal communities. Integration of ICT application in achieving MDGs at the community level through networking with marginal communities would be one of the most effective tools to meet the challenge.

To achieve long-term benefit out of ICT integration, ICT initiatives have to be self-reliant and financially sustainable as well. A recent report (UNICTTF, 2004) reveals the fact that development of open and proactive policies for the rural telecommunication sector is attaining considerable demand for expansion of its services at a grassroots level. However, this type of development process should proceed within a social accountability context and specific demand from deprived populations. A portion of revenue from the telecommunications sector can be used to support the expansion of ICTs for the marginal community as well as in rural areas. In turn, there is a need for integration of policies and extended investments to stimulate initial demand for reducing investment risk for rural ICTs. This could include, for example, enabling the potential of e-commerce for rural producers.

At the national level of ICT design, there is a need to develop strategies and planning for rural areas by taking care of the differences in languages, culture, socio-economic conditions, and infrastructure. This should be reflected in participatory needs assessment and development of the technology itself. The forms of information content, including linkages to more conventional communi-

cation media such as rural radio, can be thought of as development media. There is also a need to move away from a centrally managed hub of information towards a distributed repository system, which should not assume ownership of information resources that are generated by a variety of providers.

A few cases have been included in the following sections, portraying success stories on ICT initiations for empowering marginal communities.

Case 1: ICT and the Millenium Development Goals (MDGs)

By M. Aminul Islam, UNDP, Bangladesh

ICTs can be potentially an important instrument of poverty reduction in poor countries which can directly help improve the welfare of the poor through its many innovative applications in the areas of health, education, dissemination of market information, disaster management, and creation of new employment opportunities. Integration of ICT application in achieving MDGs at the community level through networking with the marginal communities would be one of the most effective tools to meet the challenge.

MDGs represent a fundamentally new way of doing business development. They are both a mobilization and accountability tool; a call for action and a means of keeping track of results (WSSD, 2002). Capacity development initiatives for marginal communities towards achieving the MDGs need to establish horizontal and vertical linkages in: (1) development of ICTD strategies and policies; (2) strengthening citizen participation and promoting entrepreneurship; (3) enhancing government capacity and public services; and (4) coalescing stakeholders on global issues for local responses. This includes assistance and capacity development in formulating and implementing ICTD strategies and programs, mainstreaming ICTs, to achieve poverty reduction, democratic governance, sustainable environment, and HIV/AIDS prevention and mitigation strategies. To bridge the gap between local needs and the level of human rights and equity, in particular by strengthening the role of community-based initiatives toward achieving the target of MDGs including poverty reduction, could be learned from the following case study (see Table 1).

Way Forward

It is important to understand whether and how an information network might further marginalize disadvantaged communities, and determine what could be

Table 1. MDG goals and different ICT projects

MDG	ICT projects and challenges
GOAL 1: ERADICATE EXTREME POVERTY AND HUNGER	Grameen Phone in Bangladesh introduced the first of its kind distribution of cell phones to poor women as a source of gainful income earning. Sangam Krishi Sangam (SKS) is a micro credit project in one of the poorest parts of India — the drought-prone Medak District. SKS has developed a robust backend management information system through the use of a smart card to record details of savings and loans. The use of a smartcard enables data collected at the field level to flow seamlessly to top management. Staff, many with only five to 6 years of schooling, are able to easily record data on the smart card through the use of a handheld computer. Smart cards eliminate the need for manual collection sheets and passbooks. This means that SKS staff can multiply their client load to help the micro finance project achieve financial sustainability more quickly. Additional benefits of the smart card include more flexible financial services and stronger financial controls.
GOAL 2: ACHIEVE UNIVERSAL PRIMARY EDUCATION	The Bangladesh Friendship Education Society (BFES) established a knowledge-based comprehensive village development program, including universal primary education through application of ICTs. Katha's poverty alleviation through IT initiative is a project in India that combines educational programs with IT tools to educate the children of the rural poor in computer-based technologies. Katha's IT project focuses on street children. It helps breaking class and caste barriers by expanding the reach of English into poorer communities. Katha's innovative curriculum combines leadership training, holistic learning, and IT skills with traditional subject learning.
GOAL 3: PROMOTE GENDER EQUALITY AND EMPOWER WOMEN	Dimitra in India and SDNP in Bangladesh are working with the aims of highlighting rural women's contributions to their communities and their countries. Both projects seek to promote information exchange, and update and disseminate information on gender and rural development issues. The Dimitra database is accessible in both French and English. It contains profiles on organizations based in Europe, Africa, and the Near East that have organized projects or programs involving rural women and development. Dimitra values local knowledge and works closely with local partners' participation to exchange information on good practices, ideas, and experiences.
GOAL 4: REDUCE CHILD MORTALITY	The tele-medicine program of SDNP in Bangladesh in collaboration with the professional organizations helping women in remote offshore islands for health care for mother and child. The Naujhil Integrated Rural Development Project for Health and Development in India seeks to emancipate women and children below the poverty line. Computerized health records enable that the due date for vaccination is given to the village health worker so that when he/she reaches the village, he/she does not have to look for the users. Other related data are also computerized and are used for pregnancy detection.

Table 1. MDG goals and different ICT projects (cont.)

MDG	ICT projects and challenges
GOAL 5: IMPROVE MATERNAL HEALTH	Creating local digital health content in Ghana, a project aims to create and distribute local knowledge relevant to maternal and child health in a digital format to help the illiterate and semi-literate. Working with local communities in rural Ghana, this research project is testing ways to help the 'push' for local content by building community capacities to create and distribute local knowledge on mother and child health in digital format (Appleton, 1995).
GOAL 6: COMBAT HIV/AIDS, MALARIA, AND OTHER MAJOR DISEASES	Health & Development Networks (HDN) through its HIV/AIDS E-Forums seeks to promote a more effective response to HIV/AIDS and other health- and development-related issues by improving information, communication, and the quality of debate. The HIV/AIDS E-Forums initiative uses electronic networking to increase the number of voices and perspectives in the preparation and follow-up to major HIV/AIDS conferences. Radio was used to promote AIDS awareness in Africa. The entire program in Mozambique was presented by children with their music. Bangladesh has made substantial advances in prevention of cholera and malaria, and near elimination of polio and leprosy through several NGO-driven programs (ASA, BRAC, etc.) and a few government initiatives from the Health Ministry.
GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY	E-governance in the Ministry of Environment and Forest of Bangladesh has brought the Forest Department and the Environment Department under Wide Area Network and linked to all environmental NGOs as well as development agencies that are working together to achieve the MDGs and ensure environmental sustainability in the country. SDNP programs in many countries are also devoted to facilitating public and private sectors in achieving MDG 7.
GOAL 8: DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT	The Urban Poor Consortium (UPC) in Indonesia is working with marginalized groups to develop strong community-based organizations and networks. The UPC, in collaboration with local communities, has recently launched three radio stations with a broadcast range of approximately 10 kilometers. The community centers are used as the station bases, and are usually managed by unemployed youths of the community. Current programs broadcast have covered religion, health, politics (land rights and updates on the community's ongoing court battles), education, and entertainment. Future programs plan to address substance abuse and domestic violence.

done to mitigate those adverse effects. The concern is how modern ICTs can be utilized to strengthen and develop the information systems for marginal communities in developing countries and contribute to poverty reduction. However, recent trends of information and communication technologies are rapidly consolidating global communication networks and international trade with implications for communities in developing countries.

Despite this, there is a grey area of empirical evidence or analysis on the actual experiences and effects of ICTs upon poor people's economic and social livelihoods. The implications and constraints of existing information systems on poor marginal communities and their intersection with ICTs are also little understood in relation to their livelihoods. There should be a paradigm shift from technology-driven projects to content-driven ones by considering the wider economic, social, and communication demands of marginal communities with a focus on MDGs.

Case 2: e-HL Project in Bangladesh

By Elena Murelli, UCSC, Italy

In Bangladesh, as in many other developing counties, medical practitioners often operate in relative isolation, dealing with diverse health care needs, poor health care infrastructure for diagnosis and treatment, and limited specialist doctors. Worldwide there is difficulty in retaining specialists in non-urban areas. Tertiary care hospitals are also concentrated mainly in urban areas, where large segments of the population have no access (Murelli & Arvanitis, 2003). Barriers to accessing continuing medical education (CME) are raised by the remoteness of major academic centers, especially for rural physicians, limited time *owned* to practice responsibilities, and cost of the CME training.

Limited CME in Bangladesh, isolation of health operators, and the growing need to acquire skills for accessing and critically appraising Web-based medical literature make the use of information and communication technologies increasingly relevant. The e-Health & Learning Project aims to actively promote the idea of accessing Web-based medical guidelines and medical literature as part of the medical practice in developing countries such as Bangladesh. The *E-Health & Learning* (e-HL) project was financed by the European Commission under the Asia IT&C Program in January 2003 for 15 months. The coordinator of the project is the Center for Research of Applications of Telematics to Organization and Society (CRATOS) of Catholic University in Italy; the partners are: Birmingham University (UOB), Bangladesh University of Engineering and Technology (BUET), and Sustainable Development Networking Program (SDNP), Bangladesh.

The project aimed to train health operators to keep them informed about new diseases and treatments. The project explored the feasibility of Web-delivered distance learning courses by using the evidence-based medicine (EBM) approach and proposed indicators of educational effectiveness in different types of Web-based seminars. Practicing EBM requires a positive attitude, use of information

Figure 1. Index page of e-HL Bangladesh Web site
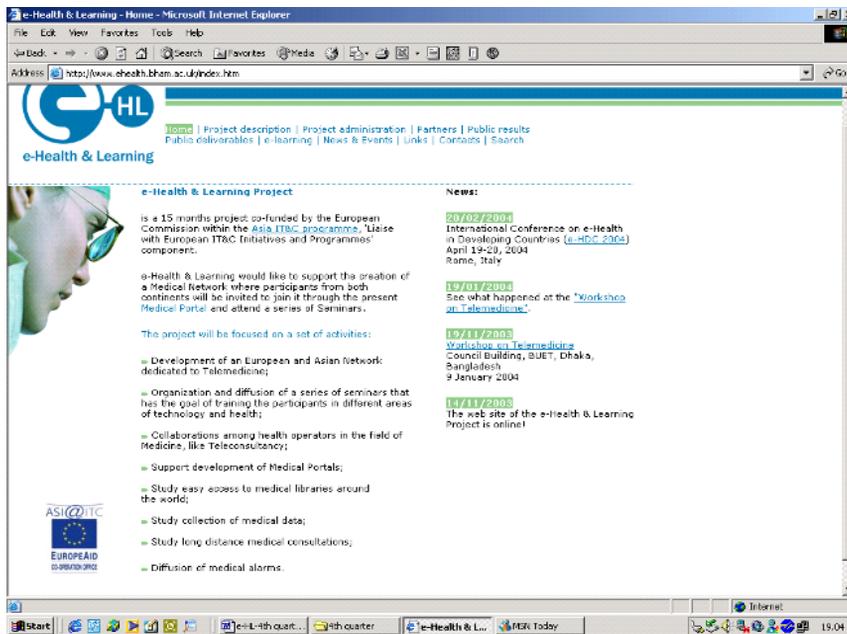
and communication technologies (ICTs) to access relevant guidelines, reviews and primary literature, and relevant critical appraisal skills (Straus et al., 2000).

The e-HL project activities include the organization and diffusion of a series of seminars on diagnosis, therapy, and prevention of common diseases or other medical conditions relevant to the Bangladeshi population. These seminars attempt to raise awareness about EBM. The seminar themes were accompanied by studying easy access to medical database and improving skills for critically appraising medical literature, and concluded with a *discussion room* for exchanging information between European medical experts and Bangladeshi medical practitioners. Figure 1 shows the index page of the project's Web site (http://www.ehl-bd.org).

The e-HL project was developed in five phases, described in following paragraphs.

Phase 1: Collecting Information About Bangladeshi Clinicians

In this phase 300 medical practitioners were randomly selected from a database maintained by one of the external experts of the project, the Comfort Nursing Home Ltd. in Dhaka. The questionnaire assessed attitudes and practices concerning EBM and ICT. The practitioners were given personal invitations to

participate in the survey. Of the 226/300 (75%) who accepted the survey, there were 157 general practitioners, 14 cardiologists, five clinical epidemiologists, eight oncologists, nine orthopedists, 17 respirologists, and 16 gynecologists.

According to the survey, in Bangladesh there is limited access to and use of ICTs. Nevertheless, the practitioners showed a very positive attitude towards EBM and strongly acknowledged the need for further training. However, as noticed in other surveys (Dwarakanath et al., 2000), the respondents' confidence in assessing research evidence did not reflect their ability to critically evaluate medical literature.

This questionnaire survey (Arvanitis et al., 2004) allowed the construction of a database of doctors who were potentially interested in participating in the seminars. A subset of 61 clinicians, out of the total of 226 who replied to questionnaires, was identified according to their limited ICT skills. Those participants more familiar with IT were invited into the third phase of the project — in the Web-based asynchronous interactive seminars. However, a needs analysis phase focusing on Bangladeshi clinicians' views, attitudes, and practice concerning evidence-based medicine and ICTs remained unexplored.

Phase 2: Building the Missing Infrastructure

The project built two network segments, using a point-to-point radio link with transmitter and a receiver in bi-directional way, with a bandwidth of two Mbps. The first network is in Dhaka and connects the SDNP node with the Comfort Nursing Home, covering a distance about eight km. The second network established is from SDNP node in Mymensingh (120 km away from Dhaka) to a Community Based Medical College and Hospital (CBMCH), about 6 km away from Mymensingh node, creating a length of 134 km (including existing 120 km of SDNP backbone) of radio link with four hops in between (see Figure 2). Figure 2 shows that Comfort in Dhaka reaches CBMCH via SDNP, Dhaka to Bangabandhu Agricultural University, Salna to Rural Electrification Board Mymensingh, Bhaluka to Bangladesh Agricultural University, Mymensingh. India

The total network established by the project was comprised of:

- Janet University Network in the UK connecting UoB to London node;
- HDSL Telecom Network in Italy connecting UCSC to Cilea node in Milan;
- Public network connecting London and Milan nodes to Singapore;
- VSAT connection from Singapore to SDNP node in Dhaka;

Figure 2. Comfort, Dhaka to CBMCH, Mymensingh radio link
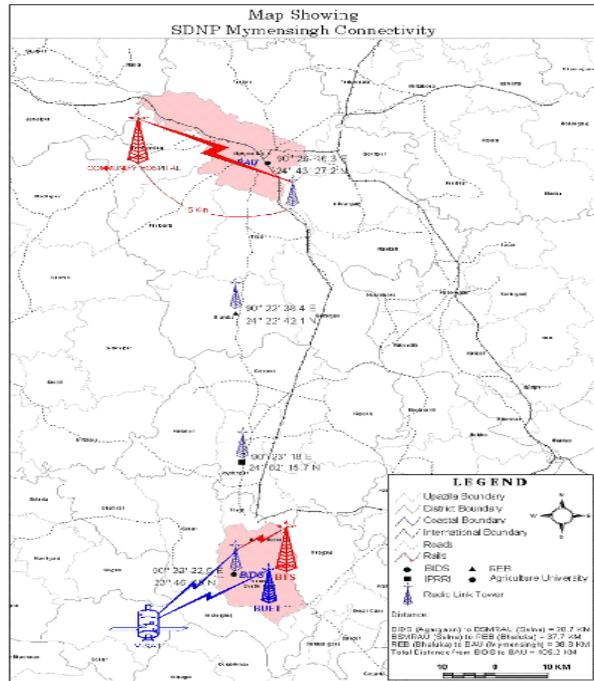
- Radio link connection from SDNP Dhaka node to Comfort Nursing Home in Dhaka; and
- Radio link connection from SDNP Mymensingh node to Community Hospital in Mymensingh.

Phase 3: Making a Comparison Between the Different Technologies Available

In this phase a comparison analysis for delivering content over a public network was done. Particularly, the following technologies were selected and analyzed:

- Specific e-learning platforms,
- Videoconference over ISDN,
- Videoconference over IP,
- Downloading media content,

- Streaming media content, and
- Microsoft Live Meeting.

After various analyses, comparisons, and tests, the streaming technology was selected as the best possible available technology to deliver content under different hypotheses and constraints. Thus, the project choses four streaming solutions to be tested and validated through questionnaire feedback from final users and statistic tests. The seminar typologies (corresponding to different streaming solutions) chosen were:

Real-time streaming, in which a medical expert was filmed while taking a seminar. The captured audio and video are used as input for a Streaming Server. The Streaming Server streams the live audio and video content. A client for each hospital in Bangladesh was connected to the server, and the seminar was displayed with a projector to the doctors in a common room. After the seminar, the doctors could ask questions of the experts using an instant messaging (IM) software.

Recorded media streaming over a public network, where a medical expert was filmed and recorded while taking a seminar, and the audio/video were stored in a file in uncompressed format (e.g., AVI). A media file was produced then made after a post-production phase. The produced file was published on a Streaming Server located in Europe for the streaming experience over a public network. At the time scheduled for the seminar, a computer from each hospital/ health center in Bangladesh involved in the project was connected to the Streaming Server with a streaming media player. The seminar was displayed with a projector to the doctors in a common room or watched directly from the doctor's personal computer in his/her office. At the end of the seminar, the doctors and the expert could interact in a synchronous way simply using an IM software.

Recorded media streaming over a local area network is similar to the second method, but in this sequence the produced file was published in a media server located at SDNP node in Dhaka for the streaming experience over a LAN.

Web-embedded streaming content, where the media file from the seminar was published on a streaming server that feeds its content to a Web server containing some specific Web pages written during the post-production phase. The Web pages showed the video link and synchronized with the slides used by the *teacher*

during the seminar. These files were made available on the e-HL medical portal. People from each hospital/health center in Bangladesh involved in the project could connect to the Web portal and access the seminar on their own personal computer whenever they needed. The only requirement in terms of software was having a Web browser installed in their computers. The participants could then ask any questions to the expert by e-mail by starting an asynchronous communication.

Phase 4: Delivering the Continuing Education Medical Seminars via Videoconference

This was eventually implemented with *video-streamed seminars* downloadable from the project Web site, in lieu of the planned videoconference seminars, which were technically impossible to deliver.

One of the purposes in this phase was to appreciate the effectiveness and acceptability of interactive video-streamed seminars as a medium for providing continuing medical education in Bangladeshi urban and rural communities. The project linked specialists of the Faculty of Medicine of the Catholic University (UCSC) in Rome, Italy, and of Birmingham University, UK, with a small rural medical hospital (Community Hospital, Mymensingh) and a larger urban private clinic (Comfort Nursing Home, Dhaka) for the provision of continuing medical education.

Eight seminars were delivered to doctors in Dhaka and Mymensingh in Bangladesh. The original plan was to deliver the seminars via videoconference, however a series of technical problems obliged the project to abandon that solution for a less technologically demanding one, *video streamed seminars*. However, the project delivered the medical seminars on a different selected subset for each group of clinicians using different technologies mentioned before.

The arrangement of video-streamed seminars compromised the interactivity between the lecturer and the participants during the seminar. To moderate this effect, a live interactive question-and-answer (Q&A) session took place after every seminar, using the Windows Messenger platform (a live chat platform). On one side, the questions of the Bangladeshi participants were coordinated by a local seminar assistant and typed into Windows Messenger. On the other side, the lecturer of the seminar responded to the questions online. The chat was projected in the seminar room for all the participants to read.

After the end of the seminar and the Q&A session, the participants were asked to fill in a questionnaire addressing issues related to the delivery, relevance, and resources (e.g., handouts) of the seminar. Their understanding of the seminar content was also informally addressed.

Phase 5: Data Analysis, Outcomes, and Results

Several indexes were built to show and describe both the level of satisfaction for each seminar/methodology and the quality of the learning experience for the final user. The main outcome from the project showed how the technology used to deliver the seminar can strongly affect the overall level of satisfaction of the end user.

The first two streaming methods (real-time streaming and recorded media streaming over a public network) were evaluated poorly in terms of quality of service by the end users. Hence, the first conclusion was that these technologies are not suitable for medical distance learning in a context of poor bandwidth and lack of financial resources to adopt more sophisticated technological solutions.

The most significant results came from the comparison between Web-embedded mode and the seminar delivered over a local network. It was noticed that any improvement in favor of the Web-embedded mode was significant when the seminar quality level and seminar available resources were compared. It was producing a notable result when it was considered that in the *Web-embedded* mode the users were free to access the Web searching for additional resources, whereas in the *streaming over a LAN* mode they were not given the access to the Internet.

The result could be justified by the lack of skills on ICT of the project target groups. The initial survey showed that 49% of medical practitioners have never accessed the Internet. This data explains how the target group has not understood the Web access as an added value. This demands extensive capacity development of the stakeholders for successful implementation of ICT-driven projects.

Impact of the Project

This project received tremendous dissemination through the medical practitioners and the news media in Bangladesh. It generated a lot of interest among the doctors' community and the general public regarding telemedicine. It will not be an overstatement to affirm that with the implementation of this project, a large portion of the doctors' community and the educated population of Bangladesh have developed considerable awareness about the telemedicine method. Furthermore, as the European commission remained actively associated with this

project, it helped to generate a lot of confidence in the minds of the doctors' community and the general public about the success of telemedicine projects in Bangladesh.

Case 3: Building Low-Cost, Non-Profit Information Bridges: Case Study of a Mailing List in Cyberspace, the Goanet

By Frederick Noronha, Bytesforall, India

When a few friends started chatting via the Internet in mid-1994, little did they think their light-hearted banter would lead to a network that linked thousands of expatriates from this former Portuguese colony. Ten years on, it has clearly turned into something larger than anyone dreamt.

Goanet uses old-fashioned technology, that of the mailing list. Like Usenet newsgroups (before it got clogged with all that spam, in particular), mailing lists too can be very useful tools. They are less glamorous than Web sites — at first glance they do not seem as obviously useful as e-mail and definitely not as luring as chat. They are not even buzz words like blogs and wikis currently are. Yet, the simple but priceless tool of mailing lists, which comes from an earlier Internet era, has an important role to play in the developmental debate of the Third World.

Goanet today acts as a link among the Goan diaspora — Goans, who come from the tiny region (3,700 square kilometers and 1.4 million population currently) along western coastal India, which was a Portuguese colony from 1510 to 1961, for over four and half centuries, and has the strongest and most-impactful tradition of migration among most South Asian communities.

Spread across two mailing lists, Goanet (http://www.goanet.org/pipermail/goanet) and Goanet-News (http://www.goanet.org/pipermail/goanet-news), this decade-old venture links an estimated 9,000 readers each day who get their news, meet old friends, discuss and sometimes fight, and even get married via Goanet.

An Academic Perspective

Writing in *Social Analysis: Journal of Cultural and Social Practice* on the theme of computer-mediated communication, a Goan-expat Alberto G. Gomes takes a detailed look at Goanet. The article was titled "Going Goan on the Goa-Net: Computer-Mediated Communications and Goan Diaspora." (Reflecting its

non-hierarchical and loosely knit network, Goanet has been called GoaNet, Goa-Net, and a range of other terms, varying both the case of the alphabet and the use or non-use of the hyphen in the name. As if this confusion was not enough, there are at least three *Goanets* in Goa today. Besides this mailing list scattered across cyberspace, the Goa government opted to call its own wide area network as *Goanet*. There is another service offering cable connections to the Internet that also calls itself Goanet, and advertises fairly heavily on local TV channels.)

Currently, the rules of Goanet are simple and few. No foul or abusive language, no personal attacks, and no name calling. Spam is, obviously, not allowed. Attachments are not allowed. Use your real name as the sender of the message, with a meaningful subject line. No posts in HTML or MIME. Post only URL with a brief description from a Web site. No advertisements, and commercial messages have to be paid for. Discussions which go "on endlessly" may be closed. Fundraising on Goanet needs the consent of the Admin team.

Guidelines suggest posting material which is "relevant to Goan communities worldwide" and keeping "your message brief." Private mail is not to be forwarded without permission of the author. Complaints (over dealings with other members) ought to be brought to the Goanet Admin rather than the entire list. Avoid changing subject lines midway through a discussion, or posting admin-related mail to the entire list.

Some of Goanet's archives are located at these sites:

http://www.goanet.org/pipermail/goanet/
http://groups.yahoo.com/group/Goanet2003/
http://groups.yahoo.com/group/Goa-net/

though because of the shifting of servers on which it was based, and poor archiving possibilities on the Internet, specially for mailing lists, earlier on, much of the early archives seem to be unavailable. This is especially true for the 1994-2000 period.

Of a New Generation

As one has argued elsewhere, places like Goanet can be the *cyber-kudds* of the 21st century. (The *kudds* were *clubs* of sorts set up by Goans migrating to bigger cities such as Bombay or Mumbai, where they stayed together, shared experiences and living space, mainly to help newer migrants cope with the harsh realities of the *new worlds* they were migrating to. Today too, some derelict *kudds* exist in parts of downtown Bombay.) Just as an earlier generation of Goans set up places for

Goans to stay in the hostile environments of a new city (Bombay), networks with Goanet help to build networks that are mutually beneficial, linking people in cyber terms, across the globe, wherever they might have migrated to.

Today, as things stand, Goanet has some plusses and minuses. It lacks sufficient participation from all its membership: like any mailing list, it would have about 5 to 10% of its membership who have ever posted to the list. Women's voices are not much heard. Debates — which sometimes get too personalized or impolite — tend to be dominated by the voices of a few. In such a setting, newcomers tend to be wary of introducing themselves. While Goanet does occasionally talk about building *social capital*, there is still an overall lack of understanding of what role such networks can play in networking communities, especially those divided by generations of migration and the distance of continents.

But there are other positives: the spirit of sharing still exists. Goanet remains an interesting place through which to keep informed about things Goan. It offers a mix of news and discussion, while the voluntary and not-for-profit nature of this list has its own advantages.

Goanet has also played a role in inspiring other initiatives. It drove home the point that low-cost, simple-tech tools like mailing lists can play an influential and useful role. In its turn, Goanet has influenced the setting up of a number of other mailing lists, within India and beyond. Some of these include this author's network at http://www.indialists.org.

With a minimum budget and loads of volunteer work, an ezine (electronic magazine) was brought out by a retired university librarian in the UK who is maintaining old links and building new ties among the Goan diaspora widely spread out across the globe. Goanet-UK (since converted to GoanVoiceUK, http://www.goanvoice.org.uk) is published weekly by former University-College of London Engineering Librarian Eddie Fernandes, who sends it out to hundreds of readers each week without charge by e-mail. Some months back, the number of *subscribers* to this list was over 1,400.

Keeping abreast with the latest Net techniques, Fernandes who is in his fifties and who grew up in Kenya though of Goan origin, scours the globe for every small bit of information he can come across relating to Goa. For a community that has been migrating overseas for a hundred years and more, this brings out a variety of news which otherwise most are simply unaware about.

Updates on one recent issue of this list looked at the local Goan community in the east African city of Mombasa celebrating the 100th anniversary of their club there, and the municipal corporation of Lisbon giving a new purpose-built headquarters for an association of Goans settled there. There were links to the *Goans of Arusha* (GOA), and a goa_youth network set up on http://www.yahoogroups.com.

Reports meanwhile spoke of how the Goans in Toronto celebrated the feast of 16th-century Catholic Saint Francis Xavier. (Goa has a significant Catholic minority, and most who migrated internationally from this region are of this religious affiliation, meaning they are often mistakenly not recognized as South Asian).

This ezine also manages to keep Goans in touch with community events — whether it is a shopping trip by UK Goans to France, or the Young London Goans Social *Salsa Nite* organized recently in Middlesex, UK. Treading its unusual path, it breaks new ground in low-cost, community-run media initiatives in a world where the Internet is opening up new possibilities.

What Makes It Different?

Other Goa-related ventures have also come up in cyberspace; a few were formed around the same time or earlier than Goanet. *Goa-Web*, an Internet site now amalgamated with another site to form *Goacom* (http://www.goacom.com), was the first elaborate Web site devoted to Goan issues and information. Then there is *Goenkar* (http://www.goenkar.com), set up by Joseph "Boogie" Viegas and currently run by Mario Alvares.

For those interested in research in Goa, there is a Web site, *Goa Research Net* (http://www.goenkar.com), which focuses on research themes in Goa. In 1999, there was a proliferation of new Web sites with at least six new sites and a number of mergers. A new site called GOYAN (http://www.goacom.com/goyan), which stands for Goan Young Adult Network, was established for young Goans in North America.

While many of the earlier-generation sites pertaining to Goa were clearly directed to non-resident Goans and travelers who might be lured to this coastal destination, almost all the Web sites provide a range of information from news from Goa to advertisements of real estate, hotels, and travel agents in Goa. On Yahoogroups.com, a search for the word *Goa* at one point resulted in 511 hits (with some false-positives wholly unconnected to Goa).

What makes Goanet different is its non-commercial nature (though admittedly there are other prominent ventures which are also non-commercial), its ability to run 10 years on volunteer-driven lines, and the fact that it seeks to build itself through a participative network.

Volunteers play the main role in keeping Goanet going. In February 2004, the first advertisement on Goanet was accepted, and this is still an insignificant factor in the network. Appeals have been made to volunteers to help publicize the lists, volunteer their time, encourage "the newer and silent members" to post to the

lists, send in e-mail addresses of people who might be interested in signing up, and overall giving feedback.

Goanetters have been involved in organizing some ventures to benefit their home state — including campaigning against pedophilia, lobbying for better Internet access, building a computers-for-schools initiative back home, and networking between the diaspora and the resident population in a way that is often easy to overlook. It has acted as a channel for building links among various specialized interests of Goans and a tool for mobilizing overseas expat populations.

Carneiro estimates that Goanet is read by expat Goans in about 50 countries globally. Subsequent to the formation of Goanet, other mailing lists have also been set up and host discussions by diasporic Goans. Some like Goa-Goans and GoanCauses (both on Yahoogroups) are general purpose discussion lists. Others are being set up to focus on certain villages (like Vasco, Sancoale-Cortalim, or Saligao) and yet others on issues (education, gardens and horticulture issues, etc.).

Case 4: Capacity Development Initiative at the Grassroots: e-SriLanka

By Hakikur Rahman, SDNP, Bangladesh

Rationale

Sri Lanka is categorized as a dynamic adopter in ICT (HRD, 2001), and has been ranked 71 among 104 countries in the networked readiness index ranking (Global IT Report, 2004-2005). It is among the developing nations that have made impressive growth in the communication infrastructure (David & Liyanage, 2004). During the period of 1999-2002, the number of Internet users has doubled, and personal computer users have increased by 130% (ITU, 2002).

However, like in many other developing countries, a majority of the progress is being confined to the urban areas. It is estimated that about 90% of the Internet users are in the capital of Colombo and 70% of landline telephones are in the Western province (Gunawardana & Wattegama, 2004). Furthermore, according to the census of 2002, the urban sector scored 1.7 on the poverty gap index, while the rural and plantation sectors scored 5.6 and 6.0 respectively (David & Liyanage, 2004). Hence, by looking at a wider socio-economic environment, an inner-country digital divide seems inevitable.

To improve the ICT perspectives within the country, Sri Lanka has made significant strides in telecommunications liberalization since the inception of

sector reforms in 1991. An important step in this context is the enactment of the Sri Lanka Telecommunications Act in 1991, which has separated the policy and business wings of the Ministry of Post and Telecommunications, and carved out Sri Lanka Telecom (SLT) as a separate entity.

In 1996, SunTel and Lanka Bell were issued local loop licenses utilizing Wireless Local Loop (WLL) technology, and in 1997 the government divested 35% of its stake in SLT to the Japanese company NTT (Zita & Kapur, 2004). The vision of the National Information Technology Policy (NITP, 2002) of Sri Lanka envisages providing information on the country to the world at large and as a tool for the acquisition of information as one of its objectives. In order to achieve this objective successfully, they have realized that human resource development must be enacted into the policy decisions. Along this perspective, with several other policy initiations, at the end of 2003, the Sri Lankan Parliament passed an act to create a new implementing agency, namely the Information and Communication Technology Agency (ICTA) of Sri Lanka.

As a way forward, among the key responsibilities, ICTA has started to implement an extensive *e-SriLanka* program, which has been pledged an estimated $65 million from the World Bank. The program encompasses a range of activities, most of which are development oriented, and many of which will have an impact on the country's rural uplift. Within this program, up to 100 rural telecenters (Vishva Gnana Kendras, or VGKs) will be built to support the demand in rural areas, and a number of e-government initiatives will be undertaken, including connecting thousands of government agencies and offices.

In this context, ICTA has a vision, which is "To harness ICT as a lever for economic a and social advancement by taking the dividends of ICT to every village, to every citizen, to every business and to re-engineer the way government thinks and works" (see Vision under http://www.esrilanka.lk). This statement clearly indicates capacity development of a marginal community for economic development of the country.

The Project

The government, private sector, and other stakeholders in Sri Lanka development arena share a belief that ICT is the bedrock upon which a society can be built through equitable distribution of opportunity and knowledge. This belief has resulted in a shared vision for e-SriLanka — an initiative that uses ICT to develop the economy of Sri Lanka, reduce poverty, and improve the quality of life for her people.

To realize the vision of ICTA through e-SriLanka, a five-pronged strategy program has been initiated which embraces building the implementation capacity and sets out a national ICT Roadmap. They are:

- Building information infrastructure and an enabling environment;
- Developing ICT human resources;
- Modernizing government and delivering citizen services;
- Leveraging ICT for economic and social development through public-private partnerships; and
- Promoting Sri Lanka as an ICT destination.

A key element of the implementation policy for this national ICT Roadmap is a stakeholder-led approach with the creation and use of focus groups in all program areas and implementation through public-private partnerships. In the meantime, e-SriLanka has gained the national momentum to apply ICT at the marginal community level to reduce poverty; it has also increased economic development in Sri Lanka (e-SriLanka, 2001).

However, before launching the main phase, several pilot projects have been initiated under e-SriLanka. The Pilot Project Program plays a key role with regard to the success of the e-SriLanka vision. It was envisaged that, before embarking on a number of larger projects that will impact the citizens of Sri Lanka, the potential success of key areas in the ICT Roadmap need to be tested. The Pilot Project Program aims to do this by testing critical hypotheses in a number of crucial areas.

One aspect of the e-SriLanka initiative is that the ICTA will address the current ICT infrastructure deficiencies in rural areas. A key objective of this program is to establish multi-service community information centers, or Vishva Gnana Kendras (VGKs: meaning global knowledge centers), providing access to Internet, telephones, and other information services, along with training and so forth to the public in rural communities. The main aim of VGKs is the dissemination of positive economic, social, and peace-building impact on a long-term and sustainable basis. In the first phase of the current plan, it is estimated that around 100 VGKs will be created in Northern, Eastern, and Southern regions.

In this phase, VGKs will need managerial, logistical, and technical support from partner institutions, which have professional expertise in the operation of community information centers. Therefore, VGK initiatives initially address the *to-build* capacity of such institutions, which will be known as VGK Support Institutions (VGK SIs). As part of the planning process for the VGK implemen-

tation project, ICTA requested proposals from different organizations that wish to establish themselves as VGK SIs. A mandatory criterion for a Full-Service VGK SI was to submit a sub-proposal on how to set up a pilot VGK.

As the *rural telecenter* (VGK) concept has not been tested and experienced earlier in Sri Lanka, it was decided to implement up to six pilot VGKs before the beginning of the main project. The selection process is underway from the VGK pilot sub-proposals that were received along with the VGK SI proposals. That selection process was kept independent from the VGK SI selection.

The objectives of the pilots were to obtain information about the services a VGK could provide to the people, to determine the services and content people may demand from VGKs, to gather information on connectivity issues, to formulate ideas on different VGK models, and to gather experience on the process and issues for setting up and running a VGK.

Selection Process

Altogether, 42 proposals were received from different organizations that wished to be considered as VGK Support Institutions. The VGK SI evaluation and selection process was carried out as a separate activity, independent of the VGK pilot selection.

From those 42, 30 submissions were Full-Service VGK SI proposals and also had (as a mandatory requirement) proposals on how to set up pilot VGKs.

Out of the 30 complete submissions, 18 included the relevant financial proposals to set up pilot VGKs. The submissions without financial details were rejected. Those 18 proposals were initially reviewed for implementing pilot VGKs. The evaluation process looked at the completeness (comprehensiveness) of the proposal, the capability and experience of the organization in setting up the VGK, and the realistic ability to have a VGK up and running by the end of the year.

At that stage, 11 proposals were short-listed after initial evaluation. During the second evaluation, cost of implementation, suggested models, financial sustainability, technology requirements, organizational commitment (how much are they investing), locations, and geographical spread were considered.

Finally, six proposals were selected to implement pilot VGKs. The selection was approved by the External Approval Committee and the ICT Agency's Board of Directors. The selected pilot VGKs are shown in Table 2 with their names and locations.

Table 2. Organization's name and location of who will implement VGKs

Organization	Location
Vanik Incorporated Ltd.	Embilipitiya
Sarvodaya	Nuwara-Eliya
David Pieris Information Technologies	Matara
Sewa Lanka Foundation	Dick-oya
Spectrum Training	Jaffna
Ceylon Chamber of Commerce	Kurunegala

Pilot Project Programs

Similarly, ICTA invited proposals to participate in different pilot project programs under the following issues:

1. Training
2. Educational content
3. IT promotion/VC
4. Consultancy
5. Infrastructure
6. Telecenters
7. Company automation
8. Portals
9. Media related
10. Government services
11. Market services
12. Digital security
13. Services/Call centers
14. Agriculture and fishing services
15. Distance e-learning services
16. Health
17. Rural or wide area finance
18. E-government main study

In total, 150 proposals were received. They were evaluated and 14 projects were initially chosen as pilots. Table 3 gives the name of pilots with their implementing organizations.

Table 3. Pilot projects and their implementing organizations

Name of pilot project	Implementing organization
Sinhala Fonts	ICTA
Public Registry	TBA
Government Printer On-line	ICTA
National Operations Room	PricewaterhouseCoopers
Empowering the Workplace	Informatics Information Systems (Pvt) Ltd.
Distance e-Learning	Arthur C. Clarke Institute of Modern Technology
Govi Gnana System	e-Development Labs/Interblocks Ltd./Pricewaterhouse Coopers
e-Money Order	University of Colombo, School of Computing
SME Portal	National Chamber of Commerce of Sri Lanka
Internally Displaced Persons	Finder2000 (Pvt.) Limited
Legal Draftsman	e-Futures (Pvt) Ltd
e-Cabinet	ICTA
e-Parliament	ICTA
e-Office of the President	ICTA

The Pilot Project Program plays a key role with regard to the success of the e-SriLanka vision. Similar to VGKs, it was thought that, before embarking on a number of larger projects, the potential success of key areas in the ICT Roadmap should be tested. The program aims to do this by testing critical hypotheses in a number of areas. The results from each pilot will provide invaluable input into the main projects' specifications, ensuring greater efficiency during implementation. As a result, each pilot project undertaken has scope for replication and scalability across the country in the future.

The pilot projects comprised top-ranked pilots received in response to the requests for proposals. Certain projects, which were initiated from CINTEC, have been brought into the Pilot Project Program. All proposals received for pilot projects were interesting, demonstrating a high quality of innovation and a variety of ideas across many sectors. However, out of the diverse range of projects received, for the purpose of this particular venture, the chosen pilots had to encompass a variety of sectors and types, satisfying the strict evaluation criteria.

Apart from these initiatives, e-SriLanka has taken a specialized approach to human resource development with the following vision, objectives, and strategies.

Human Resource Development: e-SriLanka

The Vision: Use ICT to enhance education at the school and tertiary level, to increase the number and quality of high-level ICT professionals, and to develop a computer-literate citizenry.

Objectives:

- To establish a multi-layered and multi-skilled pool of ICT-trained staff at workforce, professional, and managerial levels;
- To provide ICT education to students in schools throughout the country;
- To increase the number of undergraduates at university courses in ICT and provide higher-level training to university staff;
- To enhance the opportunities and incentives for improving English and ICT literacy; and
- To increase the supply of ICT professionals to the rest of the world and to encourage foreign ICT professionals to set up training institutes in Sri Lanka.

To achieve these objectives, a three-pronged strategy has been adopted. First, build an ICT skilled workforce and increase the employability of school leavers with the help of the government, the private sector, and academia to:

- Facilitate the establishment of quality, affordable ICT skills enhancement programs and recognized ICT qualifications, both at a foundation and a diploma level;
- Facilitate the upgrading of the skills of trainers at IT training institutes, especially in the outstations; and
- Improve the quality and availability of textbooks and course materials for IT training.

Second, strengthen teaching in primary and secondary schools, tertiary education, and universities, so that:

- All school children would obtain basic ICT training and user-level skills through e-learning programs;
- The management of school IT centers would be strengthened;
- ICT could be introduced into national curricula; and
- Schools could be connected to the Internet.

Third, strengthen management and professional skills in ICT industry by:

- Organizing scholarship programs for postgraduate/specialist qualifications;
- Providing grants for short courses;
- Assisting national conferences, seminars, and study tours; and
- Empowering the ICT industry to attain excellence by strengthening HR and promoting innovation.

Similar Ventures in Sri Lanka

Two other projects — the Telecenter project (an initiative of Sarvodaya, Sarvodaya Shramadana Movement) which has expanded its network into 15,000 villages, and the Kotmale Community Radio project (a community radio-based pilot project), the first of its kind in Sri Lanka (Gunawardana & Wattegama, 2004; Slater, Tachhi, & Luvis, 2002) — can be included here. Both of these successful projects are continuing to date, expanding into many regions by adapting new technologies and building up new partnerships with the latest ICT-based project initiatives in Sri Lanka (David & Liyanage, 2004).

Way Ahead

By following modular expansion of these successful initiations, countries of similar socio-economical, cultural, and geographical context may be highly benefited. It has been found that the Sagarmatha Community Radio project in Nepal is a replication of the Kotmale Community Radio project. e-SriLanka is a follow up of many *e-country* projects around the globe; e-Korea, e-Singapore, e-Thailand, and so forth are but a few. Telecenter projects attained high interest at the recently concluded WSIS (World Summit on Information Society) in Tunisia in February 2005. Most of the developing countries are adopting these types of projects by accommodating into their communities. To wrap up this chapter on these case studies, a few recommendations can be made in support of capacity development initiatives through utilization of ICT, a stated in the next section.

Conclusion

The basic objective of human capacity development is to broaden the range of people's choice and make development more participatory and democratic (UNDP, 1991). ICT can improve the knowledge and awareness of people by providing information about social and economic programs, markets, employment opportunities, medical, agricultural, educational and training, weather, and disaster warning. These can be achieved by establishing integrated knowledge centers/information centers within the communities and integrating them into the nearest communication/local/regional center (Barton & Bear, 1999; Gunatunge & Karunanayake, 2004; Rahman, 2004).

In this cyberspace context of developing countries, a mixture of adoption of innovations and of the national cultural values, as well as the cooperation among all the nations, is creating a positive atmosphere for providing easy access to information and knowledge which can be used for the development of the country and to eliminate the gap between the rich and the poor. This demands integration of available lower-level information networks to form bigger networks covering wider areas and regions opting for updated contents of local demand. It will create not only positive attitude of the participants, but also enhance their knowledge and capacity. Eventually these networks of networks will emerge as knowledge hubs for the entire community, region, and country.

In conclusion it is imperative to recommend a coordinated network of access centers acting as delivery nodes for community empowerment, which in turn could be powerful resources in developing countries' contexts (Fouche, 1999; Robinson, 1998). These access centers should support marginal communities and at the same time have their sustainability by providing accurate information about local needs, and facilitating cooperation and interaction among organizations, institutions, and communities distributed throughout the country. They may be termed as information centers or knowledge centers or village centers where appropriate. But their rationale lies in shared-access models that allow provision of a wide range of services to more users at lower cost than commercial entities, which are often out of financial reach of poor people (Digital Dividend, 2003). Widespread rollout of these access centers, however, can be achieved only by mobilizing private sector entrepreneurship and investment (Wellenius, 2003).

Finally, looking into causes and effects of these case studies, it can be derived that to address policy issues related to information management and access to needs-based information at the community level, it is essential to improve not only the capacities of the outreach communities, but also capacities of decision makers and professionals for achieving community empowerment, sustainable development, and sustainable livelihood.

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Terms and Definitions

Economic development: A sustainable wealth creation process that works within the framework of community parameters to maximize the efficient and effective utilization of community resources for economic gain of the local population. It is the process of raising the productive capacities of societies, in terms of their technologies (more efficient tools and machines), technical cultures (knowledge of nature, research, and capacity to develop improved technologies), and the physical, technical, and organizational capacities and skills of the elements.

Human Development Index (HDI): A measurement of human progress introduced by the United Nations Development Program (UNDP) in its *Human Development Report* of 1990. HDI is a composite index based on real GDP per capita (PPP), life expectancy at birth, and educational achievement that measures socio-economic development of a country.

ICT-based development initiatives: A complicated term to define. ICT-based development initiatives are a key resource for identifying creative ways that ICTs are being deployed at the grassroots level and support development

activities across a variety of sectors, in helping developing nations move into the information age. Through information and knowledge transfers, these initiatives have become the *network of networks* for global sustainable development and improved the lives of societies across the globe. ICT-based development initiatives are based on a participatory model to be effective and sustainable, and resources are most effectively mobilized to help harness the potential of ICT to promote basic human development.

Information-based society: A type of society in which economic and social aspect is critically dependent on ICTs and information becomes the main product or essential to other products, with recognition that society's success depends on the ability to exploit information. An information-based society is a society integrated by complex communication networks that rapidly develop and exchange information, and which makes extensive use of information networks and ICT, produces large quantities of information and communications products and services, and has a diversified content.

Knowledge-based society: Knowledge is the awareness and understanding of facts and figures, truths, or information gained in the form of experience and/or learning. Knowledge is an appreciation of the possession of interconnected information which, in isolation, is of lesser value. Society is a system, composed of many parts, which may be called members, and which are intelligent systems or societies themselves. A knowledge-based society creates, shares, and uses knowledge for the prosperity and well-being of its community.

Social development: Encompasses a commitment to individual well-being and volunteerism, and the opportunity for society to determine their own needs and to influence decisions which affect them. Social development incorporates public concerns in developing social policy and economic initiatives.

About the Authors

Hakikur Rahman (Engr., PhD) is the project coordinator of the Sustainable Development Networking Program (SDNP) (Bangladesh), a global initiative of the United Nations Development Program (UNDP) since December 1999. He is also the secretary of South Asia Foundation Bangladesh Chapter. Before joining SDNP he worked as the director of the Computer Division of Bangladesh Open University. He has written several books and many articles/papers on computer education for the informal sector and distance education. He is the founder-chairperson of Internet Society Bangladesh Chapter; editor, the *Monthly Computer Bichitra*; founder-principal and member secretary, ICMS Computer College; head examiner (Computer), Bangladesh Technical Education Board; executive director, BAERIN (Bangladesh Advanced Education Research and Information Network) Foundation; and involved in activities related to establishment of an IT-based distance education university in Bangladesh.

* * *

Timlynn T. Babitsky is co-founder and a research director of Sohodojo (USA), an applied R&D lab developing sustainable Small Is Good World economic ecosystems. She is an educational specialist, executive level manager, and accomplished grassroots activist. Most recently, she led grassroots organizing campaigns to promote community wind power projects in economically-distressed north-central Montana, which gained national recognition. Her home is in Fairfield, Iowa, USA.

David Barnard is executive director of SANGONeT (South Africa), an NGO at the forefront of ICTs for development in Southern Africa for 17 years. He has an extensive knowledge of ICT policy and development, and has achieved local and international acknowledgement for his contribution to the debate by being invited to speak at a wide range of events. Mr. Barnard is the past editor of *PRODDER: The Southern African Development Directory*. He is presently a commissioner on the Presidential National Committee (PNC) on Information Society and Development (ISAD). He holds an honors degree (cum laude) in development administration from the University of Stellenbosch.

Hannah Beardon is the international coordinator of the Reflect ICTs Project, with overall responsibility for developing the methodology and disseminating findings of the research. She has several years experience of working for national and international NGOs in the UK and Africa on different aspects of communication for development: whether methodologies to enhance the communication capacity of poor and marginalized communities, such as Reflect; or developing systems and products to enhance internal communications, shared learning, and policy advocacy. This experience, combined with research on the potential of ICTs for development organizations done as part of her MA in development studies, fed into the concept and eventual design of the Reflect ICT Project, which runs until December 2005.

Zane Berge (berge@umbc.edu)is an associate professor teaching in the graduate Training Systems programs at The University of Maryland, Baltimore County (USA). His research is in the area of distance training and education. He holds a PhD.

Worachat Buranapunsri received a bachelor's in psychology in Thailand in 1999, and a master's of science in industrial/organizational psychology in 2003 from the University of Baltimore, Maryland. She is pursuing a master's degree in instructional systems development at University of Maryland, Baltimore County (USA).

Fazila Farouk is the information services manager at SANGONeT (South Africa). She has extensive experience in the South African NGO sector, initially in the urban development arena, and more recently in the non-profit financial sustainability field as a researcher and trainer. Ms. Farouk is a director on the board of the Southern African Institute of Fundraising Education and Training (SAIF E&T), an NGO that provides fundraising training. She earned her master's degree in urban and regional planning from the University of Natal, and

is currently working toward a PhD at the University of Witwatersrand; her focus is on non-profit sustainability.

Björn-Sören Gigler is a PhD candidate at the Development Studies Institute at the London School of Economics and Political Science (UK). He holds an MSc (international economics) from the Ludwig-Maximilian University of Munich, Germany, and an MA (international relations) from George Washington University (USA). Mr. Sören's main research interest is the impact of information and communications technologies (ICTs) on the well-being of marginalized groups. He is particularly interested in operationalizing Amartya Sen's capability approach and measuring the impact of ICTs on human development. From 1997-2003, he worked as a consultant and information officer at the Social Development Unit, Environmentally and Socially Sustainable Development, Latin America & the Caribbean Region, and in the Informatics Program at the World Bank. Currently he is carrying out fieldwork in Bolivia on the impact of ICTs on the well-being of indigenous peoples.

David J. Grimshaw is the international team leader of the Responding to New Technologies Program at ITDG and visiting fellow at Cranfield School of Management. His areas of expertise are in information systems strategy, usability, knowledge management, ICTs for development, and geographical information systems.

M. Aminul Islam has served as the sustainable development adviser of the United Nations Development Program (UNDP) (Bangladesh), since August 1996, with overall responsibility for program development in the area of sustainable development, environment, climate change, and ICT4D. Before joining UNDP, Dr. Islam was involved in teaching and research at the Institute of Bangladesh Studies at the University of Rajshahi, and was founder coordinator as well as associate professor of Environment Science of the School of Environment Management at the Independent University, Bangladesh. He also served as the research fellow of the Bangladesh International Institute of Strategic Studies.

Robert Jordan is an economist with the United States Bureau of Labor Statistics in Washington, D.C. (USA). He has been designing and delivering training for 10 years. He is currently pursuing a master's degree in Instructional Systems Development at the University of Maryland, Baltimore County.

Lucky Lowe is a professional manager with 20 years experience. She began her career as a site manager working on refurbishment contracts in London before

moving to Nepal to be a low-cost housing adviser. She subsequently gained experience and qualifications in marketing, promoting professional standards in UK building. Her interest in the international human settlements sector developed with ITDG as an international project manager and adviser on building materials and shelter planning and production processes. More recently she worked on knowledge sharing issues as ITDG's Knowledge and Information Services Unit Manager.

Al P. Mizell is coordinator of special incentives in the Fischler School of Education and Human Services at Nova Southeastern University (NSU) in Ft. Lauderdale, Florida (USA). Following 12 years teaching in Dade County, Florida, he earned his doctorate at Indiana University in 1970 in instructional systems technology. He then became associate dean at Howard Community College in Columbia, Maryland, for eight years before coming to NSU in 1978. He developed an online doctoral degree in computer education in 1984 and currently helps seniors become computer literate. He is co-author of the Allyn and Bacon text, *Teaching and Learning with Technology*.

Elena Murelli graduated in economics and commerce from the Università Cattolica del Sacro Cuore, Piacenza, in March 1999. She won the 2nd prize for the "Best Degree Thesis 2000" from the Istituto Poligrafico e Zecca dello Stato, Federazione Stampa Italiana and CRUI in 2000 and won 2nd prize for the "Best Entrepreneurial Project" at the Master of MiNE Program, organized by Fondazione di Piacenza e Vigevano in 2001. She assisted in research work on virtual organizations and developing countries. In December 1999 she joined CRATOS as research assistant. Since 2001 she has worked as a lecturer of general informatics at the Università Cattolica del Sacro Cuore, Cremona (Italy). She is internship coordinator of the Master of MiNE Program. In addition, she has been appointed as e-learning research project manager for managing research projects. Her main interests are in ICTs, in particular the development and application of new technologies in developing countries, and everything related to e-learning. During her research, she authored several papers and articles.

Frederick Noronha (fred@bytesforall.org) is a Goa, India-based freelance writer and co-founder of *bytesforall.org*, a network that looks at how ICTs can be relevant to the marginalized in South Asia; the site was founded in 1999. He has worked in journalism for the past two decades, both within Goa and on themes of development, environment, and ICT-for-development in the rest of India and beyond.

Sarah Parkinson is a PhD student in the University of Guelph's Rural Studies Program (Canada). She earned an MSc in Rural Planning and Development, also from the University of Guelph, and a BA in cognitive science from Simon Fraser University. She has researched ICTs for development, with a focus on access and equity issues, in Colombia, South Africa, Uganda, and Ghana.

James F. Salmons is co-founder and a research director of Sohodojo (http://sohodojo.com) (USA), an independent, non-profit R&D lab with an associated educational mission supporting solo and family-based entrepreneurs, and their microenterprise and small business networks in rural and distressed urban communities. His area of expertise is software design and development of infrastructure systems for small producer supply chains and e-commerce platforms to create alternative markets powered by "Who, How, and Why" consumer purchase dynamics. His home is Fairfield, in rural southeast Iowa, USA.

Cecilia Stanton received her bachelor's degree in psychology from Bloomfield College and her master's in sociology from Lehigh University. She has more than 10 years experience in industry and higher education. Her primary research interests include multicultural issues and community building. Ms. Stanton's inspirational writings can be found in *Colors* magazine, the *Amaranth Literary Journal*, and *The Diversity Challenge*. She currently resides in Minnesota and serves as director of faculty diversity for an online institution, and president of The Stanton Group, a diversity and leadership consulting firm.

Surmaya Talyarkhan is a researcher specializing in knowledge and information systems for development. She has experience in knowledge management consultancy and ICT projects. She has run workshops and training courses for various public sector organizations, particularly focusing on Internet strategies. In 2004, she presented a paper at the 2004 Organizational Knowledge, Learning, and Capabilities Conference in Innsbruck. Ms. Talyarkhan recently completed an evaluation of an ICT for a development project in Peru and is working on a case study to be published by ITDG Publishing in 2005.

Rosanna Tarsiero, born in Italy in 1971, is a mental health consumer and medical student at the University of Pisa (USA). She also is a voluntary sector student at the University of Wales, Lampeter, as well as a volunteer manager for Bipolar Dream, Web-based organization she founded in 2003 that provides online self-help for persons with bipolar disorder. Her life experiences, work interests, academic publications, and conference participations cover a broad spectrum of

interconnections and overlappings among mental illness, psychiatric rehabilitation, self-help, volunteerism, volunteer management, and ICT, examining all of them from a variety of perspectives.

Kam Hou Vat is a lecturer in the Department of Computer and Information Science, under the Faculty of Science and Technology, at the University of Macau, Macau. His current research interests include learner-centered design with constructivism in software engineering education, architected applications developments for Internet software systems, information systems for learning organizations, information technology for knowledge synthesis, and collaborative technologies for electronic organizations and virtual communities.

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