ESSENTIALS

Information Communications Technology for Development

Background

This Essentials is a practical introduction to the complex area of Information and Communications Technologies for Development (ICTD).[1] The use of Information Communications Technologies in development programming is not new. However, in 2000 they assumed a new prominence, when the United Nations and G8 group of industrialized countries flagged ICTD as a global development priority. Since then, the understanding of ICTD as a core development issue has been rapidly evolving. Although this Essentials is written with an eye to the future, it is grounded in the evaluative evidence and case-study research of the past. It seeks to provide the development practitioner with evidence-based insights, synthesized from across a wide range of ICTD initiatives undertaken by UNDP and partners, and presented as a selection of generic

challenges and Lessons Learned. The analysis is divided into three parts:

- **Concept** reviews ICTD and its recent rise to prominence on the global development agenda;
- **Lessons Learned** presents six generic challenges (awareness, politics, access, relevancy, sustainability, and coordination) that can critically affect any ICTD initiative, whether it is at a global, national, regional or local level;
- **Further recommendations** provides some practical ideas for development actors to "lead by example" in ICTD.

Concept

What are Information Communications Technologies?

Few would disagree that technology underpins the unprecedented levels of prosperity enjoyed by developed countries. The world entered the 20th century without planes, radios or televisions. It enters the 21st with nuclear power, space travel, computers, cell phones and the wireless Internet. Within the span of a hundred years, entirely new fields of science and technology came into existence and the fundamental political and economic structure of the world changed not once, but several times.

The scope and pace of recent change is a function of revolutionary advances in Information Communications Technologies

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[1] Three factors condition the scope of this *Essentials.* First, ICTD is a newly emerging and rapidly evolving field. Second, ICTD encompasses a complex, multi-sectoral arena -- from ICTD as a sector in-and-of-itself, through to ICTs as enablers of other development areas like governance, poverty alleviation, the environment, health and education. Each of these topics deserves its own *Essentials.* Third, the strictly *evaluative* evidence of ICTD initiatives is sparse. Although much has been written about the *potential* of ICTD to improve people's lives, there is not yet a robust inventory of documented development outcomes (see Part 3 below). For this note, documented examples are drawn from initiatives in: e-Governance and e-Government, poverty alleviation, e-commerce, Small-Medium Enterprise development, and networking and rural access initiatives.

(ICTs). ICTs are basically information-handling tools – a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the "old" ICTs of radio, television and telephone, and the "new" ICTs of computers, satellite and wireless technology and the Internet. These different tools are now able to work together, and combine to form our "networked world" – a massive infrastructure of interconnected telephone services, standardized computing hardware, the Internet, radio and television, which reaches into every corner of the globe.

Technology is a double-edged sword. In the 20th century, rapid techno-logical advances led to rising standards of living, literacy, health and life expectancy. They also made possible a century of more deadly warfare, the industrialization of mass murder, global warming and ecocide. The promise of ICTs for the 21st century likewise presents both opportunities and challenges. ICTs, like all technologies, are tools. How they are used depends on the user and the context.

The revolutionary potential of new ICTs lies in their capacities to instantaneously connect vast networks of individuals and organizations across great geographic distances at very little cost. As such, ICTs have been key enablers of globalization, facilitating world-wide flows of information, capital, ideas, people and products. They have transformed business, markets and organizations, revolutionized learning and knowledge-sharing, empowered citizens and communities, and created significant economic growth in many countries.[2] ICTs have amplified brain power in much the same way that the 19th century industrial revolution amplified muscle power.

What is ICT-for-Development?

Against this backdrop of ICT-enabled social and economic opportunity are some sobering statistics: one-third of the world's population has yet to make a phone call, fewer than one-fifth has experienced the Internet, and most of the information exchanged over the Internet is in English, the language of some 10% of the world's population (UNDP et. al., 2001). These statistics illustrate one aspect of what is sometimes called "the Digital Divide" – the inability of a large portion of the world's population to access and effectively use ICTs and the potential benefits they enable. In fact,

the Digital Divide – the disparities between the "connected" and the "unplugged" -- is really a reflection of the age-old divides of poverty, education, and restricted human choices. Uneven access to ICT tools and networks -- within countries and between countries -- both reflects, and threatens to exacerbate, existing inequalities.

In July 2000, the G8 underlined this growing gap and the importance of harnessing ICTs in the service of equitable development, by declaring that "everyone, everywhere should be enabled to participate in…the benefits of the global information society." This statement was captured in the Okinawa Charter on Global Information Society, which signalled a new global focus on ICTD (Box 1). The hope of Okinawa is that given the right enabling environment, ICTs can be leveraged by poor countries, communities and individuals to "leap-frog" into a more empowered, equitable and prosperous future.

While Okinawa represents an important turning point for ICTs-for-development, the use of ICTs in development work is not new. In the 1970s, for example, the United Nations supported the

Box 1
ICTs for development: On the threshold of change

This "Essentials" is written at a time when the use of ICTs for development is on the threshold of a very active period of experimentation. Since Okinawa (July 2000), most of the world's major development actors -- bilateral, multilateral and NGOs -- have embraced the idea that, given the right context, ICTs can be important tools for addressing global and national inequalities. The focus is shifting from understanding ICTs as pure technologies to be used in addressing specific needs – the project approach -- to a holistic approach that sees ICTs as key development enablers. This new focus recognizes that the potential of ICTs is tethered to a complex mixture of international, national and local conditions, with the policy environments being paramount. Informed policy choices are critical, as are creative combinations of public-private partnerships (see, UNDP et al., 2001; UNDP, 2001).

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[2] For more extended discussion see: UNDP et al, 2001; DOT Force, 2001.

computerization of statistical services throughout most developing countries, while the International Telecommunications Union (ITU) was supporting the expansion of rural telephony services. Throughout the 1980s and 90s, ICTs were increasingly incorporated into development projects, as their value-added became more powerful and obvious, and the technologies themselves became more affordable and accessible. However, because ICTs were often hidden within other development initiatives, their growing importance as pervasive development enablers was not fully recognized.

Okinawa, and other efforts, have helped to change this situation by highlighting ICTD as a critical programming area for both governments and their development partners. The Okinawa agenda, however, is not uncontroversial. Some critics are sceptical about the role of ICTs in poverty reduction (Heeks, 1999, 2000; Brown, 2001). Others wonder about development opportunity costs, arguing that investments in basic literacy and healthcare will more directly address the problems of the poor than providing them with access to the Internet. Still others worry about the lack of evaluative evidence for ICTD outcomes: "Our euphoria is not matched by our understanding," (Gomez and Hunt, 1999). While the debate continues, a consensus appears to be emerging: although ICTs are not a magic bullet, they can provide "powerful ammunition in the fight against poverty," (Brown, 2001). Over the next few years, the growing corpus of real-world examples should help to illuminate how ICTs can and are being deployed to address long-standing development goals (Box 2).

Lessons Learned

Key lessons learned reflect six basic challenges that have affected the design, implementation and outcomes of ICTD initiatives so far: awareness, politics, access, effective use, sustainability and coordination.

1. The challenge of awareness

Challenge: Harnessing ICTs for human development requires awareness-raising and constituency-building across all levels of society.

Key decision-makers and stakeholders need to make informed decisions about which technologies are most appropriate for their contexts and needs. However, the technological aspects of ICTs can be highly intimidating for most people – even for those privileged few who feel comfortable using a computer and the Internet. Moreover, the link between ICTs and many development challenges is not always intuitively obvious, especially for countries with high levels of illiteracy, low levels of basic telecommunications infrastructure and electrification, and high levels of debt.

Understanding how ICTs can service specific development goals requires both knowledge of appropriate technologies and a grounded appreciation of how these technologies can be deployed to address concrete problems. At a national level, ICTD is a complex multisectoral endeavour, requiring analysis, political will and

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Box 2
Connecting the "D" to "ICT"**

If properly supported, ICTs can be important development enablers, especially in the areas of:
Government and Governance , by enabling more efficient management systems and service and enhancing transparency (e-procurement, on-line databases, registries, laws, rights etc), decentralization, citizen outreach and participation;
Poverty alleviation , by enhancing aid management systems and facilitating social inclusion, information access and knowledge sharing in remote areas and with/among disadvantaged groups. Opportunities include: health (telemedicine and early warning systems for epidemics), education (distance learning), social empowerment (through networking), and economic empowerment (for example: better access to relevant knowledge on agricultural production, disease control, and market prices can increase farmers' incomes);
Environmental management , including through the use of GIS and early warning systems, which can also contribute to enhanced food security;
HIV/AIDS and health , by facilitating interactive information/ knowledge-sharing, supporting coordination efforts, etc;
CPC contexts, for example by enabling inter-communal information flows despite geographical impediments, and facilitating economic reintegration, administrative rehabilitation, management of population movements. See UNDP-Bosnia (2000).
** For a comprehensive review of "digital opportunities" and a proposed ICTD strategic framework, see UNDP et al, 2001.

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concerted action across a wide spectrum of sectors and actors. Informed stakeholders -- be they top-level policy-makers or rural beneficiaries -- can help to ensure that technologies are matched to needs in a meaningful and sustainable manner. Key stakeholder groups include:

The highest level of government, the decision-makers who are critical for visioning, initiating, sanctioning and spurring ICTD initiatives and for legislating and enacting "enabling" policy frameworks.[3]

Mid-levels of government, the line managers who are often the implementers of ICTD initiatives. Mid-level managers can also act as important identifiers and promoters of new initiatives, especially when they have a good understanding of ICT potential.

The private sector, which has the greatest capacity to invest and innovate, provided an enabling environment is in place. The private sector can be the critical motor for ICT development and key to its sustainable growth and outreach.[4]

NGOs or CSOs, who are often important initiators, implementers, intermediaries and beneficiaries of ICTD projects, especially those that target universal access and other, more developmentally-minded endeavours. CSOs are also important partners in policy dialogue: "…without the participation of organized civil society, policy formulation is incomplete since not all initiatives that contribute to human development are economically profitable (as the private sector would like) or politically attractive (as governments would wish)," (Gomez, 2001).

Beneficiaries of ICTD initiatives need to be centrally involved from the first stages of programme planning. This point may seem obvious. But the telecentre experience suggests

otherwise. For example, an evaluation of two Ugandan telecentre initiatives found most of the targeted population – the surrounding rural communities – did not know that the centres existed, and were completely ignorant of any practical benefits they might offer (Kyabwe and Kibombo, 1999).

> **Telecentres** are public access points for ICT resources. Some telecentres are commercially run. These usually offer limited services (like telephone) that generate profits. Commercial "cybercafes" are usually restricted to urban centres. By contrast, donor-funded centres, usually located in remote, impoverished, or rural areas, tend to offer a wide range of services like radio, fax, computers, e-mail and web. Although donor-funded centres are undertaken to service specific developmental objectives, none have proven to be sustainable to date. See Annex 3.

What to do?

Conduct workshops and training with key gatekeepers and stakeholders. Experience has shown that workshops and training can play an important role in raising awareness about the potential for ICTD.

Examples:
• *UNDP's Internet Initiative for Africa (IIA)[5] held high-level workshops for government ministers right at the start of the project. Many participants later ensured their countries' active engagement in the project (Kerby, 2001; Guengant et al. 2000).*

• *An evaluation of the Leland Initiative (African Global Information Infrastructure Gateway Project)[6] found that "training executives and managers to understand the implications of Internet use for their organizations is essential to the adoption process," (Academy for Educational Development, 2001).*

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[3] Public policies and legal and regulatory frameworks are critical for promoting and assuring: the competitive participation and investment of the private sector; the interoperability of technologies and networks; and the human development orientation of ICT growth.
[4] Chile's achievements with expanding commercially-viable rural connectivity illustrate the point: A judicious combination of deregulation, privatization and targeted subsidies led to the deployment of telephone lines to some 6,000 rural villages (Maturana, 1999).

[5] UNDP's *Internet Initiative for Africa (IIA)* aims to introduce or enhance Internet nodes in 10 Sub-Saharan African (SSA) countries, while ensuring equitable access and sustainability. Pilot projects are also envisaged, to demonstrate Internet use for sustainable human development.
[6] USAID's *Leland Initiative*, launched in 1995, aimed to extend full Internet connectivity to 20 SSA countries, and to encourage Internet use in the service of sustainable development.

Facilitate National ICTD Summits that engage a broad range of national stakeholders, including the state, private sector, academia and civil society. National Summits can help to nurture the formulation of national strategies and partnerships that encourage private sector participation, while placing broad-based development goals at the heart of ICT policies and action plans (see UNDP et al., 2001).

Example
• *Kyrgyzstan's National ICTD Summit was an important starting point for the articulation of a national ICTD strategy. The Summit took eight months of careful preparation to raise awareness, secure government buy-in, establish appropriate national and international partners and conduct a joint assessment of the local context, including the legal and regulatory "enabling" environment. The Summit greatly increased stakeholder awareness of ICTs as a key development issue for the country (enhanced by widespread media coverage of the event), underlined the importance of the private sector and CSOs in the policy dialogue and yielded recommendations for a national ICTD strategy with a distinct development focus (Misnikov, 2001).*

Cultivate ICTD champions. "Without enthusiastic champions, most Internet projects will fail," (Richardson, 1997). ICT champions are individuals who combine some level of technological expertise with an enthusiastic understanding of what technology can do for the targeted stakeholders within countries, governments, organizations, enterprises or communities. ICT champions encourage and inspire targeted beneficiaries – often their peers - to use ICTs for their information and communication needs. Many champions also act as key "troubleshooters" for ICTD projects. Champions come in different forms -- national visionaries, keen organizational cheerleaders, inspiring teachers, or community leaders or members (McConnell, 2000).

Examples:
• *Champions were crucial to the success of UNDP's Sustainable Development Networking Programme (SDNP), "by creatively solving difficult problems, while cultivating the widespread interest and involvement that made these programmes work; similarly, in the few*

cases where there were no champions, the programmes didn't work," (Zambrano, 2001. See Box 3 below).

• *The World Bank's review of its African Virtual University initiative highlighted the importance of identifying "enthusiastic and competent champions, well-integrated into the universities' power structures, who can overcome inevitable implementation obstacles," (Knight, 2000).*

• *A meta-evaluation of e-Governance initiatives found: "A critical pre-condition for success is an e-champion or small group of e-champions: leaders with vision who put e-governance onto the agenda and…can smash through operational barriers," (Heeks, 2001).*

• *The exemplary ICT-led progress of states like Malaysia, Costa Rica and Estonia is credited to strong national leadership, political vision, and determination (see UNDP et al., 2001).*

Consider carefully planned pilot projects. Well-conceived and implemented pilot projects can help potential beneficiaries discover how ICTs can be useful for their own needs. This is especially true for ICTD projects because of their "foreign" technology, which requires "hands-on" demonstration. The most successful pilot projects include all beneficiaries and stakeholders in their planning stages.[7]

Examples:
• *An experimental telecentre project in India – the Swaminathan Research Foundation's Village Knowledge Centres – is recognized globally as one of the very few telecentre "success stories." A critical success factor was the careful advance preparation that engaged the communities' views and needs (see Annex 1 for a fuller review of this illuminating example).*

• *Some twenty SDNP pilot projects became self-sustaining because the user communities were determined to ensure their continuation. The SDNP success stories demonstrate the usefulness of pilot projects for creating broad-*

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[7] See discussion in Section 2.4 below. In addition, pilot projects can furnish important learning experiences for the development agency, by revealing how user communities creatively adapt and use ICTs, often in unexpected ways.

based awareness and local demand. In addition to country-level impacts, SDNP had important influence on UNDP's own organizational awareness and understanding of ICTs as critical development enablers (see Box 3).

Box 3.

SDNP: Raising awareness abroad…and at home

UNDP's Sustainable Development Networking Programme (SDNP) was an early pioneer of ICTD initiatives. Launched in 1992, SDNP was designed to kick-start networking in developing countries and help stakeholders at all levels – government, academics, NGOs, CSOs and others – to share information and expertise relevant to sustainable development. By 2000, SDNP had helped to establish connectivity to national networks and the Internet, aggregate content and train users in 39 countries and 36 small island developing states (SIDSnet). Many of these initiatives grew to be fully self-sustaining via creative cost-recovery mechanisms (see, for example, SDNP Nicaragua http://www.sdnnic.org.ni/).

In addition to its country-level impact, SDNP also played an awareness-raising role within UNDP itself, by introducing the idea that modern information technologies could facilitate the development process and open up new modes of operation (Wild et al., 1998). SDNP provided technical inputs and advice during the creation of UNDP's regional ICT-programmes in Asia, Africa and Latin America, and later nurtured UNDP's new corporate focus on ICTD as a central programming area. See also: http://www.sdnp.undp.org/stories/

When raising awareness, ensure that the end-users are aware of the limitations (as well as the possibilities) of ICTs, so as to not to create false expectations. Experience has shown that exaggerated expectations of ICTs and the Internet can lead to disillusionment and eventual disengagement.

Example:
• *An interim evaluation of a Colombian telecentre project found that the project – and the arrival of new equipment -- had generated great expectations within the community: "In Kerigma, for example, people hoped that the neighbourhood information units could help them to [create] an 'observatory,' complete with maps of the local district and a database on supply and demand in the local labour market."*

Gradually, however, it became clear that these goals would require "agreements with other institutions, political support from social players, more sophisticated computer programs and more resources, time and work." As these complexities surfaced, many of the project's original supporters became disillusioned and lost interest, (Baron, 1999).

2. The challenge of politics

Challenge: Information-and-ICT initiatives are political. The effectiveness and potential of ICTD initiatives can be inhibited or circumscribed by national and/or local power relations. Political awareness and analysis is an important aspect of ICTD planning at all levels.

Control over information has always been a form of power in all societies. The many cases of state-controlled newspapers, radio and television stations underline this point. The "access for all" capabilities of the Internet mean that ICTD initiatives can be very political. For example, at the highest national level, not all governments are particularly keen to have their citizens make unbridled use of the Internet, fearing its destabilizing potential.[8] These same governments, however, may be eager to nurture Internet development in the service of economic aims. At the same time, not all governments (or government officials) see it in their interest to undertake reforms that would better enable Internet growth. These include reforms such as liberalization of the telecommunications sector, reforming telephone-pricing policies to make them more affordable, and resisting the temptation to level new taxes. Overall, it is fair to say that many governments have complex political positions concerning domestic Internet growth and use.

At a more organizational or localized level, there are numerous (but often undocumented)

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[8] This political dynamic is rendered more complex by two practical considerations. First, the Internet can and is used to pursue illegal activities, and as such attracts a degree of state surveillance and policing. Second, as an increasingly critical component of national infrastructure, the Internet is a potential target for hostile action in times of war. Many governments consider the Internet to be a national security concern. See, for example, RBEC, 2001.

examples of ICTD projects that were compromised or closed because of emergent political considerations. For example, the ITU's recent evaluation of the Internet experience in Uganda found that security issues and politics were constraining the effective use and extension of administrative computer systems: "…government-owned financial and banking institutions have developed relatively sophisticated computer systems, but, due to security and other concerns, users are not encouraged to develop computer skills other than those needed for immediate tasks. The government is not, therefore, contributing towards improving the computer literacy levels of their own staff," (Minges et al., 2001).

Another example is furnished by the failure of an ambitious telecentre project in Mexico. In 1997, 23 telecentres were set up in rural towns. By 1999 only two telecentres remained in operation. The overarching reasons for the failures were cultural and political constraints. The political dynamics happened on two levels. First, the initiatives were buffeted by large-scale politics, when volatile elections caused changes in important decision-makers and municipal authorities, depriving the centres of their political "champions." Second, the telecentres ran afoul of local elders who saw them as a threat to their monopoly as knowledge brokers within the villages. The elders' wariness of the centres was compounded by their non-involvement in the project design and implementation:

| Local elders saw the telecentres as a threat to their monopoly as village knowledge brokers. |

"When confronted with a competitive information source, one that they had not yet mastered, the natural reaction was to discourage and discredit the information," (O'Farrell et all. 1999; Robinson, 1998a, 1998b).

Political obstacles to community access can assume more subtle forms. For example, an evaluation of two donor-funded Ugandan telecentres found that the centres remained unused by the targeted rural communities, who thought the facilities were for the "private" use of the government officials and politicos that ran them (Box 4). A different example is noted by the evaluators of a telecentre in Mexico suggest: "We asked a schoolgirl if her teacher encouraged her to use a computer for her schoolwork. 'No,' said the girl, 'the teacher is afraid of the computer because we might learn something she doesn't know," (Roman and Colle, 2001).[9]

Box 4
The politics of place

The evaluation of the two unused telecentres in Uganda notes: "In Buwama the telecentre was viewed as a private facility because of the way the project was inaugurated – a few politically well-connected individuals posed as owners. In Nabweru, the telecentre was viewed as a government facility because it was located at the sub-county administration headquarters… This location was a threat to some potential users [because the building also housed] the police, judicial court and local prison…These are institutions which most Ugandans would like to keep at a distance if possible," (Kyabwe and Kibombo, 1999).

In sum, political conditioning factors at many different levels can significantly affect the ways and means by which development actors can promote or pursue an ICTD agenda (Rohozinski, 1996).

What to do?

Ground ICTD initiatives in a good understanding of the local political context. As noted, ICTD initiatives can be perceived as a threat to certain members of the polity or community, especially existing power holders – be they government officials or traditional village leaders. A key recommendation from the failed Mexican telecentre project is to "identify the local elites, their factions and interests… A lack of…sensitivity to local political cultural codes and players can spell disaster. Factionalism may be intensified and/or elite dominance ratified when new technological tools are inadvertently delivered to their bailiwicks," (Robinson, 1998).

Encourage broad-spectrum participation in the planning of ICTD initiatives. At the national strategy level this means including all stakeholders in the policy dialogue (as discussed in 2.1above). At the national programme level,

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[9] Note: the issue of gender is discussed in Lesson 3 below.

National Steering Committees have proven useful. At a more local level, it is critical to involve all beneficiaries, local political gatekeepers and other intermediaries: "Without local political support, the barriers to achieving community buy-in will more than likely remain in place," (TeleCommons Development Group, 2000).

Examples:
• *SDNP programmes (see Box 3 above) used National Steering Committees to ensure broad-based ownership and encourage networking. In most countries, this approach proved highly successful. In some, however, the Committees did not materialize because the government partner was not keen to encourage civil society participation. In certain of these cases, the resulting networking systems were usefully appropriated by the Ministry itself (for internal communication purposes), but were not used in line with SDNP's broader networking aims (Wild, 1998; Zambrano, 2001).*

• *The terminal evaluation of a UNDP project to develop an on-line trade and investment system in Saudi Arabia found that the technological system had been successfully installed in the Ministry of Foreign Affairs, whose senior staff had been closely involved in the project throughout. However, the other major targeted beneficiary – the private sector – did not participate in the design or implementation of the project and by project's end had no access to, or awareness of, the system. The evaluators strongly recommended the formation of a National Steering Committee, including representatives of the intended beneficiaries, to act as a corrective and to attract users to the system (al-Aali and al-Saadon, 1997a; 1997b).*

Given that "participation" can also be affected and compromised by politics, aim for creative solutions. As one study states: "There are clear cases in development contexts where participation is not participation: where the culture and politics of an organization [or community] prevent apparently participative processes from producing truly participative outcomes by constraining who can say what and how within any kind of group activity," (Heeks, 1999; Biggs and Smith, 1998). There is no universal solution to deal with this complex problem. One useful strategy can be found in on-going training and outreach initiatives, combined with on-going project monitoring to assess beneficiary profiles and use (see, for example, Roman and Colle, 2001). The Ugandan telecentre evaluation suggests a similar strategy: "Constant sensitization of the community, as opposed to a one-shot sensitization exercise, will create better awareness and sense of ownership among the local communities," (Kyabwe and Kibombo, 1999).

3. The challenge of access

Challenge: Barriers to universal access are not only about the national availability of telecommunications infrastructure and computing equipment. Barriers to individual access are also economic, educational and socio-cultural.

The world's poor, and especially the rural poor, have extremely limited access to basic ICTs, let alone advanced services. Assuming that the global and national political will is in place, the most overt challenge is to extend the physical availability of ICTs. But more subtle barriers -- economic, educational, and socio-cultural – also block the individual's access and use of ICTs.

Physical obstacles to access and participation
In rural and remote areas, the combination of lower population densities, geographical distance and poverty leaves little commercial incentive for undertaking the huge investments required to: extend telecommunications infrastructure; provide an electrical infrastructure to power the technology; and, upgrade and retain a skills infrastructure to keep the technology working. Newer forms of ICTs like the Internet require even greater investments in equipment, training, maintenance, outreach and network access.

Economic obstacles to access
In both developing and transition countries, most people simply cannot afford to use new ICTs (UNDP et al., 2001; RBEC, 2001). New ICTs, and the human resources to run them, cost a great deal of money. As such, some level of

cost recovery is imperative. Realistically, this means charging end-users for services, which can render them inaccessible to most poor people.[10]

Educational obstacles to access

In most developing countries, access to new ICTs is dominated by a tiny educated, urban elite. In Ethiopia, for example, 98% of Internet users have a university degree [although 65% of the adult population is illiterate (Kenny, et al., 2001)]. Direct use of new ICTs usually requires literacy and often English literacy. These are formidable barriers for the estimated 50% of the population of low-income countries who are illiterate. Numerous telecentre evaluations report non-use of services by the targeted local population due to the lack of understandable and relevant content (see, for example, RBEC, 2001).[11]

Socio-cultural barriers to access

Socio-cultural/political barriers refer to factors that can cause individuals (or whole sectors of society) to "self-exclude" themselves from participation in ICTD initiatives (thinking that they are not intended for them). These factors can encompass everything from how machines are perceived, through to perceptions of accessible space and insecurities based on social category or age.[12]

An illustration comes from an evaluation of Neighbourhood Information Units (UIB) in Bogotá. Three UIBs were set up in the headquarters of three grassroots CSOs located in peripheral, working-class districts. The initiative had clear development objectives: the UIBs were to encourage citizen participation and support the conversion of information into knowledge that would be useful for, and desired by, the communities. The UIB staff was to receive technical training and then become trainers of community users.

From the start, however, the training process was "slow and difficult." Part of the problem was "technophobia," as the evaluation explained: "One of the subtle manifestations of power relationships in Colombia is that the use of certain kinds of equipment…has been restricted to certain people and groups. For this reason, many people are fearful and suffer feelings of inferiority when it comes to using this equipment,"(Baron, 1999).[13] This context meant that the UIB coordinators, who were supposed to act as ICT-champions, were themselves afraid of the new technologies. Their insecurities caused them to discourage people from using the services for fear they would be asked questions they could not answer.

Another challenge – one which is common in developing contexts -- was the cultural chasm between oral and "virtual" society: "We found difficulties in moving from the logic of perceiving the world based on oral tradition and the physical proximity of objects, places and persons, to a logic in which the world is converted into texts, files and windows that are closer to the idea of virtual reality," (Baron,1999). Overall, the UIBs were not well-used by the target community, although they did attract student users. Their location – inside school libraries – likely contributed to their perceived "accessibility" by students (Box 5).[14]

Gender inequalities

Women's use of ICTs is not equal to their share in the world's population. This gender gap is

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[10] Research suggests that the poor, under certain conditions, will spend some 2% of their income on telecommunications (Kenny et al, 2001). The Grameen Village Pay Phone scheme in Bangladesh demonstrates that poor rural communities will pay for telephone services, and that these services have facilitated economic gain for the users (see Annex 2).

[11] Local and relevant content can play a critical role in stimulating the commercial expansion of telecommunications infrastructure to under-serviced areas. Relevant content can stimulate demand for ICT access, which in turn can attract private sector investment in telecommunications infrastructure (given a supportive policy and regulatory environment). See Lesson 4 below.

[12] For example, a telecentre initiative in Canada had to set up separate locations for young people and adults, because "each intimidated the other, thereby impeding both groups' participation," (Roman and Colle, 2001).

[13] "Technophobia" takes on different socio-cultural forms, but is a common barrier to access, including in the technology-saturated cultures of the North.

[14] Two years on, the Bogata UIBs, with strong support from the NGO Colnodo, have overcome most of these problems, and are expanding their services. While still reliant on donor-funding, the centres are generating enough income to cover running costs. The user-base remains largely young students, who tend to be more disposed towards learning and exploring the technology. Female users are well-represented, probably encouraged by the women coordinators who run the centres (Cadena, 2001a; 2001b).

evidenced in both developed and developing countries, although often more pronounced in the latter. For example, in urban Latin America, 62% of computer/Internet users are men. A survey of African countries found that men dominated computer/Internet use, representing 86% of all users in Ethiopia, 83% in Senegal and 64% in Zambia. The factors that underpin this gap are complex, and beyond the bounds of this short Essentials. Suffice to say that many of the factors echo those that underpin other gender imbalances (see Marcelle, 2000; UNCSTD, 1995).

Box 5
Encouraging access:
    Perceptions of place are critical

In the South African township of Mamelodi, a community access telecentre was opened in the local library. After some time, it was moved to an independent location. The telecentre manager explains: "The library location was not appropriate because it appeared to the community as an official or government site. People were intimidated by the library; they think it is for 'intellectual people' only," (Roman and Colle, 2001). The centre's move to a location near the metro station enhanced broader community access, but its "accessibility" is still not universal: "...social exclusion is still a problem [a   s] illiterate people do not use the telecentre. [Also] most people in the community are unemployed, and they cannot afford our services," (Dagron, 2001).

In Mexico, by contrast, an early evaluation found that ICT access-points located in libraries staffed by women seemed to be encouraging girls to learn and use the technology. This was significant, given that previously, girls had had less exposure to computer technology than boys in the same area (Robinson, 1999).

What to do?

New technologies. A wide-range of new and emerging digital technologies can circumvent the problems of extending "hard-wired" telecommunications infrastructure and electricity lines to remote or under-serviced areas. Some of these new options include: solar energy, satellite, wireless local loop networks, and cellular networks. While promising, these new choices are not without limitations, which vary according to context. Overall, it is important to understand that each telecom environment is unique: the potential to extend the physical availability of ICTs depends on existing infrastructure, terrain, demographics, organizational capacities and the policy and regulatory environment (TDC, 2000; Jensen, 1999; Accasina, 2001)

Examples:
• *Bangladesh is one of the least wired countries in the world: 97% of homes and almost all rural villages lack a telephone (DOT Force, 2001). However, the Grameen Bank's Village Pay Phone scheme has begun to change this by leveraging mobile cellular technology to establish phone services in some 1,100 villages. While the cellular technology has successfully "parachuted" telephone access into rural areas – and demonstrated that rural service can be profitable -- evaluative evidence raises questions about the scalability, longer-term sustainability and replicability of the initiative (see Annex 2).*

• *In Honduras, the extremely isolated village of San Ramon became Latin America's "first solar village" in 1999. By 2000, this energy source was also powering school computers that were wired to the Internet (Verdisco, 2001).*

Combine new technologies with old. The Internet can be combined with "old" technologies like community radio to effectively overcome barriers of physical access, affordability, illiteracy, while also appealing to oral-based cultures. For example, in many developing areas, "wired" community radio stations operate as local broadcasting centres for Internet content, which they download and re-broadcast to thousands of illiterate listeners (Gomez, 2001; Kenny, 2001).

Examples:
• *In India, Village Knowledge Centres employ trained professionals to search out relevant information on the Internet and translate it into Tamil voice recordings. The recordings are then distributed via the Internet to various village centres and broadcast over loudspeakers to the illiterate villagers. Evaluative evidence suggests that the villagers use this information to make important decisions that affect their lives and well-being (see Annex 1). This example also illustrates the value-added of intermediaries – see next point.*

Empower intermediaries. Intermediary organizations that have the capacity to use ICTs can serve as important bridges by helping illiterate communities access the benefits of ICTs without having to learn the technologies themselves (O'Farrell et al. 1999; TDC, 2000). Research has shown that the most effective intermediaries are those who are members of, or have direct ties to, the beneficiary community (Heeks, 1999).

Example:
• *In Uganda, a fully "wired" indigenous NGO – the Uganda Rural Development and Training Programme (URDT) – has been actively sharing appropriate, Internet accessed-information with its unconnected, rural community stakeholders. For example, when one of its communities was interested in acquiring a solar energy system, URDT staff used the web to locate information on the various technological options and costs. This information was repackaged in non-electronic format and distributed to community members for assessment. The result was that community members were able to use micro-credit to purchase 130 solar energy systems that were appropriate to their needs and financial capabilities (McConnell, 2000).*

Incorporate gender awareness in policies, planning, implementation and evaluation of ICT projects, and actively encourage women's participation as ICT users, managers and vendors. Evidence from a number of telecentre evaluations underlines that women's use of ICTs is increased when women are managing or teaching in the centres (Robinson, 1999; Cadena, 2001b).

Examples:
• *The Grameen Village Pay Phone scheme in Bangladesh placed women entrepreneurs in charge of the cellular handsets. Evaluative evidence shows that this encouraged high rates of women's usage, while generating important income for the entrepreneurs (see Annex 2).*

Embrace an "upstream" focus. Ultimately, pursuing universal access at the national level requires a holistic approach. See Lesson 5 below.

4. The challenge of relevancy and meaningful use

Three inter-related issues are identified for this challenge:

Issue 1: ICT initiatives will not be appropriated unless they deliver information that is relevant and useful to the end-users.
Evaluative evidence from ICTD experiences targeting rural access, poverty alleviation and SMEs highlights the importance of relevant content. Merely "plugging in" poor communities to global information flows is generally unhelpful: "A focus on ICT-based information in development means the systems and knowledge that arise in poor communities are often ignored. In fact, it is this local information that is often most relevant and useful to the poor," (Gomez, 2001; see Box 6).[15] This places a premium on recognizing the poor as information producers and on collecting, packaging and more widely disseminating this

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Box 6
Information supply and demand in South Africa: Irrelevant and relevant information**

In 1995, the Office of the Premier of the North-West Province initiated a high-level project to provide information to six rural communities through touch-screen computer kiosks. The kiosks provided general demographic and economic information about the province, details of main government programmes, and speeches by the Premier and President. This information did not meet community needs. It became apparent that the exercise was more for public relations than for community development. The project was scrapped in 1997.

In 1995, the local government in Alexandra township created a database of local resources. All township organizations were asked for input, a process often organized by school children as homework. The database was made accessible over the Internet. Not only did it provide information about local capabilities to community members, it also enabled community enterprises to win contracts from larger firms in Johannesburg.

** From Heeks (1999)

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[15] Poor entrepreneurs, for example, get their most valuable information via informal and trusted information systems from those around them (Duncombe & Heeks, 2001; Pigato, 2001; Lake 2000).

local knowledge based on a good understanding of information needs. The scale of this challenge is evidenced by the following statistic: Africa (excluding South Africa) generates only 0.02% of Internet content (Wilson and Rodriguez, 1999).

Issue 2: Even if the information accessed is useful, development outcomes will be negligible unless the end-user has the capacity to act.

ICTs can deliver potentially valuable information to end-users like market prices to poor rural farmers and medical advice to rural healthcare workers. However, market information is useless if there are no roads to transport goods, and medical advice is meaningless if there is no money to purchase medicines. As evidence from research on Botswana SMEs confirms, information is important, but it is only one part in a chain of resources (infrastructure, skills, money) required for the end-user to have a capacity to act. If these other resources cannot be sourced, then, "there is no point providing information via ICTs (or via other means) as it will be of no value," (Duncombe and Heeks, 2001).

An important illustration comes from the failure of numerous initiatives that sought to alleviate poverty by enabling "southern" craft producers to sell directly to "northern" consumers by way of World Wide Web. Recent research reveals the false hope: "Despite the hype and promises of new business models, our research with craft producer networks in India and Bangladesh found no evidence of significant sales of craft goods using e-commerce. Most quoted "success stories" are anecdotal only," (Webb, 2001 – see Box 7).[16]

Issue 3: ICTs work best when they render more effective existing or clearly desired information flows. Research suggests that up to 80% of e-Government initiatives have ended in total or partial failure (Heeks & Davies, 1999).

This figure underlines the disjuncture between what ICTs can achieve in theory and how they can be foiled in practice. Problems often arise when the project focus is on installing the technological system, rather than on understanding the organizational culture and the dynamics of existing information flows. An example comes from a local e-Government project in India that showed very marginal impact after 15 years of implementation. The objective was to use ICTs to improve administrative effectiveness and transparency in 440 districts. However, the ICT systems were deployed without any accompanying reform effort. The result was a considerable investment of resources, with no real improvement in

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Box 7
Failure and success of South-North e-commerce initiatives

Although much hyped in 1995, the US-based Earth MarketPlace initiative – which linked organic agricultural producers in Kenya and other developing countries with consumers in the US via the Internet – had collapsed by 1997. The US company had developed an elaborate web-site with the capacity to sell products; however, it was unable to raise sufficient capital to undertake marketing activities. Moreover, and most critically, the US company was unable to guarantee the quality and delivery of the imported produce (Panos, 1995; 1998).

In contrast to the above failure of South-North "direct" marketing, an example from Chincheros, Peru, demonstrates how the Internet helped local producers to indirectly access Western markets, via a highly successful partnership with a national export company. Local village leaders established an Internet-enabled partnership with the national company, which was already set up to trade produce in overseas markets. Reportedly, village income has increased five-fold as village vegetables are now sold daily in New York (UNDP, 2001).

EthioGift is a profitable on-line gift shop based in Addis Ababa. The gift shop enables Ethiopians living in the diaspora to buy traditional gifts (like goats, cakes and flowers) via the Internet and have them delivered within 48 hours to their families in Ethiopia. The site's success is linked to the large number of expatriates, the strong cultural traditions of gift-giving, and the fact that goods are delivered locally (i.e., not shipped abroad). EthioGift shows that a well-conceived business model, grounded in an accurate assessment of the needs of the target market, can drive a successful e-commerce venture, despite poor quality infrastructure and very little capital (Lake, 2000).

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[16] The study focused on ASHA Handicrafts in India and HEED Handicrafts in Bangladesh, representing some 16.500 producers in total (producer numbers from www.peoplink.org). This research also found that Internet and related technology is most likely to bring immediate benefits for producers and craft networks by making small efficiencies in the overall supply chain (rather than providing instant sales on-line).

operations. In the absence of wider reforms, the "new" technology could not penetrate the "old" administrative way of doing things (Bhatnagar, 2000).

What to do?

When assessing "information and service needs" of communities or organizations, be demand driven, not supply driven. Development outcomes can be greatly enhanced by including the targeted end-users in the project planning stage, to establish what types of information and services are most appropriate. Participatory assessment methods -- like Participatory Rural Appraisal – can yield useful results.

Example:
• *In India, the highly successful Village Knowledge Centre initiative used PRA methods to raise awareness of the project, assess the information needs of the villagers and determine which villages would be most likely to appropriate the services offered by the centres (see Annex 1).*

Focus on local knowledge dissemination. Local knowledge, more widely disseminated, can often be more useful to meeting every day challenges than "foreign" information available on the Internet, especially in poor communities (Gomez, 2001; Munyua, 2000).

Example:
• *An FAO regional project in Latin America (1994-1997) used video-based training to collect local knowledge from subsistence farmers and then "integrate it with modern scientific knowledge," for training purposes (Balit, 1998). The project also had an Internet-dimension, whereby trained intermediaries gathered, packaged and disseminated information to individual farmers and their associations, based on an initial assessment of their respective information needs. The project evaluation found the methodologies and technologies to be appropriate, cost effective and sustainable in Argentina, Costa Rica, Honduras and Mexico (Balit et al., 1996).*

Ground ICTD initiatives in a careful study of existing information systems and flows -- be they of rural communities, small entrepreneurs or government ministries. Base-line studies -- to ascertain how information is gathered, stored, shared and evaluated -- will help to better identify appropriate technologies and opportunities, as well as potential bottlenecks and areas for reform.

Example:
• *In India, ICTs are effectively enhancing a Dairy Cooperative Society's already existing system of milk collection. Prior to the application of new technologies, the milk collection process was time-consuming, with farmers having to wait in long queues. Often, their wares would become spoiled in the heat, and payment was very slow. The new technologies -- AKASHGANGA – greatly increased the speed and accuracy of the measuring, testing and payment process, thereby maintaining the quality of milk and resulting in higher profits for the producer. A review of the project stated: "AKASHGANGA… does not generate any new concepts or re-engineer any activity. Rather its power lies in its effective facilitation of existing processes and transactions, in order to deliver value and speed to the farmer," (Parghi, 2001).*

Provide auxiliary support to enhance the end-user's capacities to act on information acquired by ICTs. As noted, access to relevant information is only one step in the process of empowerment and choice. Often additional support is required to enable the beneficiaries to act on their newfound knowledge.

Example:
• *A USAID project in Guatemala trained members of collective farmers' associations to download daily pricing information and market trends, and then to disseminate this information to all members. Farmers underwent complementary training, including in bargaining and negotiating techniques, to enable them to act on this information. As a result, farmers were able to demand a fairer price for their produce from intermediary buyers, and to balance their production with supply and demand trends, thereby accruing a better rate of return (AERDD, 1999).*

Empower Intermediaries. As discussed above, intermediaries can play a critical role in mediating (capturing, translating, packaging and disseminating) relevant information to impoverished end-users (see Annex 1).

Young people are an important target group for training. "Naturalizing" ICTs within as-yet-unconnected communities may require generational change. Evaluative evidence from numerous telecentre and educational initiatives show that young people and students are much more inclined than adults to quickly and un-self-consciously explore and appropriate new ICTs and their creative possibilities (Proenza et al, 2001. See also: Pek, 2001; Mutler, 2001; Chandrasekaran, 2001 and the Bosnian NHDR (2000), which focuses on youth in CPC contexts.).

5. The challenge of sustainability

Challenge: **Sustainability is compromised by unrealistic timeframes, insufficient training, and when the technologies chosen do not suit the task; sometimes the simplest technologies can produce the best result.**

Over the past decade, very few donor-funded ICTD initiatives have proven to be self-sustaining once external assistance (financial and material) has run out. While the reasons for non-sustainability are varied and context-specific, often they can be traced to insufficient consideration of the challenges reviewed above (awareness, politics, and the many barriers to access and effective use of ICTs). Overall, sustainability is largely dependent on end-user appropriation and ownership of ICTD initiatives. This places a premium on beneficiary and stakeholder participation from the very start of the project, as well as on-going monitoring and feedback, to ensure that the technologies are both appropriate and being appropriated by the user communities.

In addition to these points, many evaluative studies highlight the overly ambitious time-frames allocated to ICTD initiatives. Project timeframes are often determined by bureaucratic fiat and linked to broader budgetary considerations governing the overall operations of the development actor. However, experience has shown that a time horizon of even a few years is simply insufficient to overcome the myriad challenges involved in most types of ICTD initiatives. For example, the "terminal" evaluation of UNDP's *Internet Initiative for Africa* found, after three years, that only five of the 10 targeted countries had reached Phase 1 of the three phase project cycle, while the other five had not yet reached Phase 1. The reasons for delay were linked to the sheer complexity of the tasks involved. The evaluation recommended that the project be funded for a further four years (more than double the original project duration) to enable it to meet its original targeted objectives. Most ICTD initiatives require a long incubation period between the initial task of raising awareness through to implementation and social appropriation.

Insufficient training is also a major limiting factor. Training, and on-going training, is critical to instilling the confidence required for trainers and end-users to use the equipment and its programmes, as the Colombian telecentre example illustrated (see Lesson 3 above). Much like the "rusting tractor" tales of the 70s, so there are "rusting ICT" tales of the 90s, although these often go undocumented. One study comes from Zambia, where computing equipment remained unused due to a lack of skills within the recipient organization (Odedra, 1992). More recently, the authors of this study noted a similar situation in Sub-Saharan Africa, where a World Bank-financed audio-video production studio and computer laboratory lay fallow for three years within the Ministry of Education, due to lack of trained staff. The issue of training is complicated by the economic difficulties of retaining trained staff, who often take their newly acquired technical skills elsewhere, for far greater rewards (see, for example: Kyabwe and Kibombo, 1999; Bifani and Ayashe, 2001).

Sustainability is compromised when the technologies chosen do not suit the task.
As ICTD has grown in prominence and profile so has the temptation to apply ICTs – and often the latest, most advanced ICTs -- to an ever-widening range of development challenges. In general, this kind of experimentation is healthy as it helps test the limits of what ICTs can and cannot achieve across a wide range of applications and contexts. However, as this

Essentials has underlined, the formidable barriers that stand in the way of ICT appropriation – especially for poorer or rural communities – in combination with the considerable costs involved, necessitates sober consideration of which technologies are best suited to the needs, capacities and contexts of the intended beneficiaries.

An illustration of the pitfalls comes from an EU-sponsored project in China, where a cooperative of 38 dairies requested the installation of a state-of-the-art MIS system, as well as computerized milking and processing rooms. At the same time, however, these dairies lacked basic inputs, like water and food for their herds. The model MIS system was installed on a trial basis in five of 38 dairy plants, at considerable cost. Only one is still in operation (EC, 2001). Other research on poor communities suggests that the telephone and radio remain the most important (direct-access) ICT tools for changing the lives of the poor (Heeks, 1999; O'Farell, 1999).

Perhaps sustainability should not be the only, or best, criteria against which to judge the value of ICTD projects that target the most disadvantaged and "unplugged" (at least for the immediate future). In some contexts, when ICTD initiatives are making a real contribution to poor communities, some level of public or donor subsidy may be warranted. The issues here are complex; see Annex 3 for further discussion.

What to do?

Match activities to realistic timeframes. Where possible, seek to understand the beneficiaries' absorptive capacity as well as their informational needs and navigate the time horizon accordingly.   A good method for fixing this social reference point is by combining technical and policy focused "e-readiness" assessments with more traditional methods such as participatory assessments and focus groups.

Example
•   *In China, a major UNDP ICTD project on rural poverty alleviation has predicated its work-plan with a six-month preparatory study to conduct a comprehensive e-readiness exercise*

(to examine infrastructure and policy challenges) and a wide-ranging participatory rural assessment to determine the informational needs and absorptive capacities of the beneficiary populations. The pace and scope of subsequent activities will be determined on the basis of these two studies.

Allow for generous and on-going support for training, with success criteria linked to "use and appropriation" (not just "use"). A key idea coming from the Latin American "community of practice" is that an investment in improving access and appropriation for a smaller number of users will have greater returns than investing the same amount of resources in improving more widespread access only (with the idea that social appropriation will somehow follow): "This…goes against the dominant view that first we provide access, and then we deal with use and appropriation," (Gomez, 2001).

Match technology to the context of what is needed. Don't encourage the adoption of a high maintenance "Ferrari" when what is needed is a bicycle (unless you are prepared to make the commitment in terms of time and resources to see the initiative through to sustainability). And, as the China dairy project suggests, resist beneficiary requests to install the latest high-tech systems when there are more basic problems to be solved first.

Example
•   *The Aravalli Hills project in India (which successfully reversed the process of serious environmental damage due to population pressures and unregulated access to common lands) used a fairly simple ICT-based management information system (MIS) to substantially enhance the project's success. The original project proposal had specified a state-of-the-art Geographic Information System (GIS). However, project management realized that geo-referenced data would be "overkill" and that the sophistication of the system would impede the project's implementation, and perhaps compromise its sustainability. Instead they developed the much simpler MIS, which effectively captured the information necessary to plan interventions specifically targeted to the needs and capacities of each village (EC, 2001).*

"Upstream" policy frameworks are critical.
In the post-Okinawa era, policy frameworks are all important to the long-term sustainability and impact of ICTD initiatives, which require holistic and context-specific attention to regulatory structures, public-private partnerships, financing schemes, business support and training, human resource development, content-creation, outreach networks, and technical assistance, all within a clear development focus. As suggested above, these elements require a new focus on national dialogue, partnerships and strategic policy-making (see UNDP et al., 2001).

6. The Challenge of Coordination

Challenge: ICTD is becoming a major focus for a wide range of development actors. Lack of coordination can lead to duplication of effort, incompatibility of technical solutions and compromise sustainability.

The new awareness of ICTs as the backbone of national development is prompting a proliferation of actors (development, national, private sector) and initiatives in ICTD. Coordination is critical, to avoid duplication of effort, shoulder the large costs involved, and ensure a holistic approach. Given that this is a newly emerging area, this Essentials underlines only two points based on past experience:

Wasted resources; unexploited synergies

Duplication of effort is a common problem in the development enterprise overall, but especially in "high visibility" areas like ICTD. Too often, development actors end up as competitors, rather than partners in the service of national interests. In Uganda, for example, a recent ITU study found that the many donor-funded ICT initiatives (in education, telemedicine, rural access and national strategy formulation) were completely uncoordinated: "This is unfortunate as there will undoubtedly be duplication, a lack of resource sharing, and no coordinated strategy. As a result the projects will operate in a vacuum and their long term sustainability is questionable," (Minges et al., 2001).

Multi-partner assistance and inter-operability of systems

Experience shows that ICTs are most effective when they operate as part of a networked system. In government, for example, the value of one computer may be marginal; the value (and possibilities) of two or more networked computers, however, is substantially greater. When multiplied across several ministries, the value-added increases exponentially by sheer virtue of the networking effect. However, large-scale computerization efforts – such as across governments – are both complex and expensive.[17] Public-private partnerships (which tap into a pool of resources and entrepreneurial talent not found in the public sphere) are now recognized as critical for ICTD initiatives. These factors place a premium on multi-partner coordination within the rubric of a well-articulated national strategy. To date, however, this has too rarely been the case (see Box 8).

Box 8
Donor competition and public-private partnerships in ICTD

The lack of strategic ICT cooperation is illustrated by a case from the early 1990s in a former Soviet republic. Country X's Ministry of Nuclear Safety was looking for donor assistance to put in place a new computerized system to monitor more effectively its nuclear power stations. Three donors came forward, each promoting its own national vendor and system, which were linked to its own nuclear industry. The three different systems were incompatible with each other, and could not be made to interoperate easily. However, the donors were not prepared to work together. Not one would forgo its own system in order to work with the others to ensure that Country X received a unified system. Not one would shoulder the full cost requirements to service Country X's needs. The result? The Government rejected all three offers of assistance and stayed with the existing system, which provided a much lower level of safety and effectiveness. This case illustrates the problems of non-coordination and system incompatibility, as well as the dilemmas that can occur when development actors team up with private industry to offer solutions, given that private enterprises may be in direct commercial competition with each other (Source: confidential communication from UNDP consultant).

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[17] By way of example, a World Bank study notes that ICT-enabling a single Indian state administration involved training 5,000 staff and installing 4,500 computers in 1,124 sites over a quarter million miles of territory to handle a database of over 80 million records (Kenny et al, 2001).

What to do?

Build partnerships around key areas, and programme in your area of competency. Partnerships in ICTD programming are essential. Development actors have different competencies based on their respective mandates and other specificities. Some have more resources; others (like NGOs/CSOs) have special links to the "grassroots" and special interest groups; others (like UNDP) have close links to top national policy and decision-makers. The private sector is also a critical player. A first important step in any ICTD initiative is to identify the other players and to review the capacities and competencies of potential partners. Working in a consortium with other actors can leverage these synergies, pool expertise, concentrate resources and support national governments in making the best, and most strategic choices for national ICTD initiatives.

Memoranda of Understanding (MOUs). MOUs can be effective tools for clarifying and solidifying partnerships. An MOU represents a quasi-legal vehicle that outlines: the scope and guiding principles of the partnership; each partner's responsibilities, resources, activities and expected deliverables; and the expected outcomes and timeframe (UNDP, 2001).

Work within national frameworks and strategies. Where a national framework exists, use it as a coordination tool. Where a framework does not yet exist, encourage its elaboration (see UNDP et al, 2001).

Further Recommendations for Development Practitioners: "Lead by Example"

As many of the world's development actors focus on making ICTD a core programming area, so too should they aim to understand and leverage ICTs within their own organizational practices, from internal management functions through to programme delivery, knowledge-sharing and coordination/consultation with partners and stakeholders. "Practice what you preach" should become a core mantra for ICTD

development actors. For the purpose of this Essentials, three areas are highlighted.

1. Become an "e-expert" in your programming area

ICTD touches all aspects of development work. While some ICTD activities require specialist technical knowledge, all programming staff need to develop an understanding of how ICTs fit within their respective areas. It is no longer acceptable to leave those "ICT-issues" to the "computer-guy" down the hall. As some experts note, the current obsession with adding "e"-prefixes to things is surely only a short-term blip: the 'e' in e-governance, for example, is soon going to disappear, as "governments will operate in electronic space as seamlessly and as naturally as they operate today in big ugly buildings," (Weber, 2001). This process will happen unevenly, no doubt. Development practitioners should be able to advise their national counterparts in a credible, forward-looking and creative manner. To best meet this challenge, all programme officers within an organization should be aware of the possibilities and synergies that ICTs can enable. Broad-based understanding within the development organization will also nurture a more holistic approach to ICTD by the agency overall.[18]

What to do?

Invest in ICT education and training for all programme staff. Briefings, workshops and organizational learning in ICTD for all programme staff can help, as can guidelines that outline parameters and possibilities of ICTs within different sector areas. Raising awareness about ICTs as overall development enablers (within the perspective of national development strategies) is also important, to encourage programme staff to appreciate possible synergies across projects. Where a national ICTD strategy

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[18] An EC meta-evaluation noted that the ICT-dimension of programmes in governance, poverty etc, was often subject to the discretion of individual desk-officers. This meant ICT incorporation was beholden to the individual's own understanding (or lack thereof), which restricted development opportunities and led to a disjointed approach to ICTD by the development organization overall (i.e., because individual desk officers were unaware of each others ICT portfolios).

exists, all programme officers should be aware of it, and seek to link their activities within it.

Appoint ICT champions. Just as ICT champions facilitate and encourage ICT use and organizational learning in development contexts, so too can they do this within development organizations (see Section 2.1 above).

Join an ICTD "community of practice." Many major development organizations have set up either private or public electronic discussion lists or forums on ICTD to share knowledge, experiences, and ideas amongst development practitioners and others. Find out what is available, and join up!

2. Leverage ICTs in your work

The use of ICTs by development actors as a way of doing business – managing projects, communicating with partners, sharing with communities of practice etc. -- not only contributes to efficiencies, but also builds confidence in partners and beneficiaries. Many development actors, however, have been slow to leverage ICTs as enablers of their own work.[19] This situation is gradually changing. Perhaps some of the most visible examples have been the use of the Internet for on-line knowledge-sharing and consultations in preparation of development strategies and programmes. As early as 1995, for example, the UN system (particularly UNDP) was pioneering the use of electronic discussion lists to seek broad "public" participation in various global development summits.[20] More recently, DFID (UK) engaged in extensive "virtual" consultations when preparing its White Paper on International Development (2000).

Within developing countries, the World Bank has used on-line discussions to seek input from civil society on its Comprehensive Development Framework. In a more management and planning vein, UNDP Kyrgyzstan used Internet portals to support the management and coordination of work leading up to the National Summit on ICTD and to disseminate the findings. In Rwanda, a Geographic Information System (GIS) was used to plan and coordinate the work of the UN's Joint Reintegration Planning Unit. In addition, numerous development actors are increasingly using ICTs for monitoring and evaluation (see, RBEC, 2001). Overall, ICTs are transforming the way in which aid is managed and delivered, a process that will accelerate as development actors themselves gain greater understanding of, and proficiency in, ICT applications.

What to do?

Aim to "lead by example." Increasingly strive to use ICTs for all aspects of information-sharing, coordination and programme formulation and delivery. Encourage innovation. Arrange for in-house training if skills or confidence are lacking.

Use Internet based tools to solicit and mobilize interest and participation. A project web-site is an easy way to enhance transparency, while generating local interest and inputs on your activities. Although access issues can limit the breadth of participation, the site can solicit greater participation than would otherwise be possible, while acculturating members of the local community to the benefits of ICTs.

3. Monitor, evaluate, disseminate

The past decade has seen large investments in countless development initiatives featuring new ICTs as either major or minor components. This wealth of experience, however, has yielded relatively scant evaluative evidence (Heeks, 2001; McConnell, 2000; TeleCommons Development Group, 2000; EC, 2001). Rather, the literature is dominated by positive anecdotal stories, or evaluations that focus on administrative and management issues rather than development outcomes (Gomez, 2001).

The relative paucity of the existing empirical base is related to the "newness" of ICTD as a clear development field, inadequate

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[19] Many development agencies have only recently turned to e-mail as a principle communications medium (while some still default to fax). In some cases corporate systems remain fragmented, unable to leverage fully the synergies of wide-area networking. In many cases, computer equipment is used sub-optimally – as a means to automate existing administrative practices, rather than as a mechanism for transforming management culture.

[20] "Virtual" participation is not without major limitations – see, Lawrence (2001).

methodologies, the "expense" of conducting evaluations (meaning they are sometimes seen as "luxuries") and the tendency to under-report project failures, of which there have been many (Duncombe and Heeks, 1999; see Box 9). However, this situation is starting to change.

Three inter-related principles are attracting some degree of consensus. First, understanding the impact of information and new technologies on development and social change is an

enormously complex and long-term task. The exploration of relevant and effective indicators, tools and methodologies is on-going (see, for example, Gomez, 1999, 2001; Kenny, 2001). Second, evaluation should be approached as an adaptable and iterative learning process that encourages the participation of stakeholders and beneficiaries, as well as organizational learning.

The objective of evaluation should be to understand the changes that have occurred in individual or community well-being, to improve on past experience, and to influence decision-making and future policy formulation.[21] Third, evaluation results should be effectively disseminated, which often means producing different products for different target audiences (Menou, 2001).

What to do?

Plan from the beginning to undertake on-going monitoring and participatory learning evaluations. Within this process, base-line user surveys can be helpful.

Plug-in to on-line monitoring and evaluation group that is wrestling with the challenges involved. For example:
http://www.bellanet.org/leap/

Document and share project "weaknesses" and "failures," as well as "unintended" outcomes. Challenges and unanticipated factors are critical to learning.

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[21] A World Bank study makes a useful distinction: **monitoring** involves tracking the progress in achieving goals, whereas **evaluation** looks at changes in beneficiary well-being (see Kenny, 2001).

Box 9
Some reasons behind the lack of evaluative evidence for ICTD

In part, the lack of evaluative evidence reflects the fact that the global project of ICTD is still in its infancy, with July 2000 (Okinawa) representing its official birth date. However, the issue is more complex than this; after all, development agencies have been using new ICTs in development initiatives for close to a decade. At least four other factors have foiled the distillation and aggregation of clear lessons learned:

- A focus on "technology transfer" rather than on development outcomes. Project "success" or "failure" was measured on the basis of whether a technical system was deployed or not; the actual development outcome (or relevance) of the system was neither monitored nor measured;

- The "iceberg phenomenon," meaning that ICTs have been hidden beneath the surface of other development projects. As mainstreamed enablers of other development sectors, ICTs were rarely tethered to impact indicators;

- Inadequate tools, methodologies and time-frames, with a focus on management issues and project cycles, rather than longer term social change.

- The desire to justify projects and hide failures. A fair number of ICTD experts state that although many ICTD initiatives have failed, very few failures have been documented (Gomez et al., 1999; Duncombe & Heeks, 1999; TDC, 2000). There are few incentives in the development system to encourage project managers, development agencies or implementing partners to critically report and make public project shortfalls or failures.

Disseminate evaluation results widely, with a view to recycling useful insights into future development practice. This may require producing different products for different target audiences.

ANNEX 1 – Case Study: Enabling Access and Meaningful Use

Enabling access and meaningful use: "Village Knowledge Centres" in India

In 1998, the M.S. Swaminathan Research Foundation initiated an experimental telecentre project that established four Village Knowledge Centres in South India. The villages were chosen by way of a comprehensive information-needs analysis and potential user survey, using Participatory Rapid Appraisal (PRA) techniques, in 20 villages. Six villages were chosen based on the perceived willingness of the community to engage as partners with the Foundation and contribute to the support of the centre[22] as well as an assessment of village political dynamics.[23] When two of the chosen villages proved unable to meet these obligations, the Foundation closed their centres. In the end, four centres became operational, located in villages with illiteracy rates of between 50-67% (Burton, 2000).

The project is based on an understanding that information, and especially networked information, requires "mediation" by professionals or trained individuals if it is to be accessible to poor rural villagers. As such, trained project staff are concentrated at a "Value-Addition" telecentre located in Villianur, a large village with good telephone and Internet access. The Villianur staff use e-mail, the Web and local newspapers to compile and collect information that is relevant to (and often requested by) the village end-users.[24] This information -- which includes items like commodity prices, weather, daily news, government announcements, methods for dealing with crop diseases and the location of schools of fish – is then translated into Tamil, packaged into audio-files and distributed via the Internet to the four Village Knowledge Centres. The local centres broadcast the audiofiles over loudspeakers to the illiterate villagers. Evidence suggests that the villagers use this information to make important decisions that affect their lives and well-being. One example of how this works comes from the village of Veerampattinam, where local fishermen requested daily information on sea conditions and wave heights. The Villianur centre downloads this information from a US Navy web-site and sends it to the Veerampattinam centre, which plays it through village loudspeakers. Local villagers report that this information has "saved lives."

Key development outcomes

The centres have generated a good number of positive stories and anecdotes like the Veerampattinam story recorded above. User logbooks reveal that: the proportion of women users is 16%; the proportion of poor users (below the poverty line) is 16%; 30% of use is for voice telephony; and, the information most requested is on government welfare schemes (33% of all requests). While the user profiles and anecdotal stories provide important insights, they are not generally indicative of development outcomes, such as improvements in the general social and economic well-being of the wider communities. It has been recommended that such a study be undertaken, to better determine if the benefits derived are worth the investments required to sustain the project (Burton, 2001).

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[22] Chosen communities signed contractual obligations to provide safe space, free electricity and volunteers to run the centres (half of whom were to be women).

[23] A number of potential villages were eliminated due to "negative dynamics from internal politicking," (Burton, 2000).

[24] For example, the staff compile databases of government welfare schemes, and local emergency and health care contact information. In addition, interactive health-related CD-ROMs have been developed, which use videotaped interviews (organized by the village communities) with medical practitioners (See Balaji et al., 2001).

Key aspects of success: participation, ownership, intermediation, relevancy, new & old technologies

The evident success of these centres underlines the importance of: community participation in the identification, planning and implementation of ICT initiatives; the Foundation's careful selection of the village sites, and requirement for community ownership of the initiative; the Foundation's willingness to withdraw from sites were community involvement was insufficient or politics too debilitating; the utility and necessity of using intermediaries to tailor ICT services and information to meet local demand; and, the power of using old ICTs (recorded voice) to bring the benefit of new ICTs (information from the Internet) to illiterate end-users.

Key constraints: sustainability

The financial investment in this initiative has been high, and self-sustainability is unlikely. One evaluation envisaged that some degree of financial autonomy would be possible within five to seven years by gradually instituting minimal charges for services. User-fees would allow for a reduction in donor support, but not full withdrawal (Burton, 2001). However, a different evaluation casts doubt on this proposal: it found that the community is not ready to pay for the information services. Although the information accessed is valued, the user community believes that it should be free. Many of the villagers are accustomed to receiving government subsidies, and they believe the telecentre should be supported by state funds. However, the villagers are trying to find creative solutions by adapting community banking practices to generate income to maintain the centre.

Sources: Burton, 2000; Roman and Colle, 2001; Dragon, 2001; Balaji et al, 2001.

ANNEX 2 – Case Study. Village Pay Phones

Case Study on Rural Connectivity: Grameen Village Pay Phones in Bangladesh (adapted from UNDP et al. 2001 and Dragon, 2001 and Richardson, 2000)

In Bangladesh, Village Pay Phones is an initiative of the Grameen Bank aimed at reducing poverty through the economic empowerment of rural women and by providing cellular phone services to some of the poorest people in the world.

How it works

Women members of Grameen Bank's access micro-credit to purchase cellular phones, which they then rent out to village farmers and other community members. Repayment of the loan is processed through the Bank's existing loan granting and collection procedures.[25]

Because Bangladesh is a labour-exporting country, many rural families have members living and working abroad (especially in the Gulf states). As such, phone services in rural areas are highly valued, allowing family members to stay in touch and to communicate about financial matters like remittances, which play a critical role in meeting the subsistence needs of many households.

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[25] The Village Phone is part of the GrameenPhone commercial operation that also provides cellular services in urban areas. Rural demand has proven to be high, and remittances per rural phone are twice as high as for the urban phones. However, rural phones represent less than 2% of GrameenPhone's network, and bring in only 8% of the total revenue. The rural business model, therefore, relies on subsidies from urban users (UNDP et al, 2001).

The Village Phone programme is the first rural micro-credit facility in a developing country to: target the creation of rural micro-enterprises based on ICT services; create village telephone service businesses using digital, wireless telephony; and, target poor village women for establishing a micro-enterprise.[26]

Illustrative Impact

• Phones have been placed in 1,100 villages.

• Village Phones have increased incomes and savings accumulation among phone owners, mostly women. 42% of all calls are reported to concern remittance transfers from relatives working abroad: "Transferring cash from a Gulf State to a rural village in Bangladesh is fraught with risks. Remittances are thus a key factor in demand for telephone use (Richardson, 2000). Villagers are willing to pay for these services, which replace (and require far less household income) than a physical trip to the city. Local farmers use the phones to access to market information, weather reports and pest alerts. Farmers in phone villages receive up to 10% higher prices for farm products and improved security of supply for inputs. The phone service has also contributed to improvements in disaster response, crime rates and livestock mortality through better access to public services. Women are important users of the phones, probably encouraged by the fact that most of the handsets are operated by women.

Challenges:

While Village Pay Phones is a model for community development, the Grameen network is not integrated with the national fixed line phone network. This is due to telecommunications regulation in the country, which is being challenged by the rapid expansion of GrameenPhone. The wireless technology chosen by Grameen, based on well-known international standards, is expensive and not optimal for rural areas. In this sense, limited cellular coverage of rural areas may only be viable under the current set of cumbersome regulatory practices. GSM cell phone technology also places much higher tariffs on rural phone users than would be the case for wireless local loop (WLL) technologies.[27]

ANNEX 3 – Note on Telecentres and Sustainability

Note on telecentres and sustainability

Over the past decade much focus has been placed on bringing the perceived benefits of ICTs into economically disadvantaged areas, particularly those located outside urban centres. Several indigenous efforts (such as the Grameen Bank's Village Cell Phone project in Bangladesh) are considered to be proof positive that ICTs can help redress existing development imbalances and create new economic opportunities for under-served populations. Initiatives in Senegal and Peru, for example, have heightened donor attention to the potential utility of using ICTs as l enablers of development (see Espitia, 2000; Sanga, 2000). [28]

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[26] As one review stated: "The beauty of Grameen Village Phone as well as of other Grameen Bank initiatives is that the project is not only socially beneficial but also profitable. Few social development oriented organizations have been as successful in effecting such deep structural changes in society on such a large scale…" (Dragon, 2001).

[27] Moreover, cellular phone technology is currently not a viable option for inexpensive e-mail, Internet and data connectivity.

[28] By allowing private operators to re-sell telephone services, while forgoing the option of placing unmanned pay phones into low service areas, the governments and PPTs in Senegal and Peru created an important mechanism to ensure universal access, while generating income for members of disadvantaged communities.

However, the evaluative evidence of numerous donor-funded telecentre efforts – including several high profile initiatives in Africa – reveal fundamental problems and limitations. For example, three wide-ranging assessments of the telecentre experience in Africa, Latin America and the Indian sub-content reveal that none of the major donor-funded initiatives have managed to become self-sustaining, and most have not achieved their expected development outcomes (leading, for example, to the premature closure of the highly visible, Canadian-led ACACIA initiative in sub-Saharan Africa). The reasons for these apparent failures are complex, and beyond the scope of this brief note. However, three generic issues are worth mentioning:

a)   Donor-assisted efforts have focused on the creation of multi-purpose telecentres – providing computers, e-mail and Internet, not just telephones and fax -- which are expensive to install, operate and maintain. While the multipurpose centres provide a broad spectrum of ICT services to peripheral areas and disadvantaged communities, they lack a basis for economic sustainability. Indeed, several recent surveys commissioned by the World Bank, IDRC and the Government of South Africa, highlight this dilemma: while multipurpose telecentres seem to benefit disadvantaged communities, they cannot exist without sustained and continued donor assistance. In most cases, the poverty of the targeted user communities means that, even under the best of circumstances, the economic base needed to cover operating costs and replace worn-out equipment is not present. In addition, the lack or poor quality of basic infrastructure (electricity, phone lines) in most rural or peripheral areas means that Internet access is painfully slow and unreliable, or requires enormous investments and maintenance (in the case of satellite based services). Moreover – as detailed in this Essentials – the challenges of illiteracy, lack of relevant content and other social factors often cause the more advanced ICT services of multipurpose centres to remain unused (see, for example, Gomez, 2001; Benjamen, 2000, 2000a; Telecommons Development Group 2000).

b)   Although rural or under-serviced communities may consider information obtained through ICTs to be useful, they may not see the information as crucial (i.e., be willing to pay for it). In India, for example, the M.S. Swaminathan Research Foundation's Village Knowledge Centre initiative (see Annex 1) surveyed its beneficiaries on the usefulness of the services that were on offer for free to the community. Although the majority of beneficiaries stated that the telecentre provided needed and vital information services, they were not prepared to pay for them our of their own available resources.

Private and indigenous telecentre initiatives that seek to extend services to rural or under-serviced areas also have specifically commercial aims and objectives. The oft-cited success stories of rural service provision in Bangladesh, Senegal and Peru, which have been undertaken without the benefit of donor assistance, are based on a business model that allows entrepreneurial operators to provide for-profit services; in all three cases the ventures have thrived. The downside of this approach is that the services on offer are geared to what the market currently wants and can support (and not to any broader development agenda). Consequently, many commercial rural telecentre services provide only basic telephony, photocopying and typing services. Very few offer Internet (for the reasons given above), and a fair few even discourage incoming phone calls, which are considered unprofitable because they tie up resources without generating revenue for the operator)[29].   In addition, commercially-run centres may improve availability of services, but not necessarily equitable access, especially for the very poor. As the FAO/ITU/IADB assessment of the Peruvian case notes: "[The telecentres served] those populations that already possessed the skills to escape poverty (by using ICTs). The downside of this finding is that the impact of [the

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29 In South Africa, it was found that adding Internet services to these centres was not considered to be a viable commercial proposition. The capital cost for equipment was high, staff time needed to service the machines and clients detracted from other more profitable services, and the revenues generated could not cover the sunk capital costs, much less the price tag of upgrading or replacing worn out equipment.

telecentres] on poverty is not likely to be broad enough to reach the mass of low income people with little formal schooling." This observation underlines the fact that, in the absence of any complementary support, the very poor often have no one to phone.

What to do:

Telecentre initiatives continue to be attractive to many donors. In recent years, mobile telecentres are being increasingly deployed to address development and reintegration issues in crisis and post-conflict countries, particularly in the Balkans' region. Impact studies and evaluations of these and other newer efforts, which are seeking to remedy past telecentre mistakes, are not yet available. In the meantime, the following list of "what to do's" – which is by no means comprehensive-- represents a preliminary checklist for practitioners.

• Decide on the development intent of the proposed initiative from the outset. Long-term sustainability may not be the desired development outcome, if the intent of the activity is to expose and sensitize the population to economic opportunities available through new technologies, or if the initiative is seeking to address an immediate or specific need.[30] For example, pursuing broader development or humanitarian needs may be more important than sustainability in some situations. If this is that case, then this emphasis should be made explicit in the project planning phase, and the donor should define an "exit strategy" that is clear to both partners and beneficiaries.

• Use proven assessment methodologies to help design the initiative and ensure community buy-in. Using assessment methodologies such as participatory rural assessments can give a better sense of the information needs and absorptive capacities of intended beneficiaries, and can lead to better designed initiatives[31].

• Address accessibility as a muti-tier issue. As discussed earlier in this paper (section 2.X) access to ICTs goes further than a presence or absence of telecentres. Be sensitive to the politcs and demographics of information and aware that the relevance of content will play an important role in stimulating interest in, and ownership over the resource.

• Use common sense. Telecentres are unlikely to be a panacea for long-standing development challenges. Be realistic about what can be achieved, and base your expectations accordingly.

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[30] In Egypt, for example, the UNDP-financed Technology Access Community Centres (TACCs) provide Internet access to under-serviced and/or disadvantaged urban users. Although the centres are highly popular, they remain economically unsustainable because the users are unable to pay for services at a level sufficient to recover basic running and staff costs. However, the TACCs are considered to be a valuable community resource, because they provide access to the Internet and related training, to avid users who cannot afford to pay for commercial services. The TACCs are also creating local Arabic content, which is key to making these technologies relevant to local communities, and is considered to be a highly valued resource by both the communities and the government (See UNDP, 2000b; el-Tokali, 2001).
[31] This approach was recently taken by a major rural poverty alleviation project in China that intended as one of its activities the creation of a network of village-based information centres and resources.

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