

Wiring up Technology-led development in the emerging world

A report from the Economist Intelligence Unit



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Preface

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Executive summary

Governments in the emerging world are increasingly turning to technology to support their economic and social development goals, including things like strengthening competitiveness, improving quality of life, supporting disenfranchised population segments and ultimately boosting economic growth.

While in the past the focus of technology access programmes was largely on narrowing the “digital divide”—in other words boosting personal computer (PC) penetration—a new generation of programmes is taking a significantly different approach, which governments believe will make them both more effective and more cost-efficient.

These new initiatives differ from their first-generation counterparts in four important ways.

- Rather than focusing exclusively or primarily on getting large numbers of PCs into the hands of local populations, these new programmes take a more holistic approach, considering information technology (IT) as a means to a specific public policy end. This in turn involves delivering a wider basket of goods to end-users, combining not just a fuller suite of hardware, software and connectivity tools, but also services, support and access to credit. Even further, the best-run programmes aim to capture the much bigger second-order benefits of such programmes by creating a cadre of “e-citizens” qualified and eager to make use of new technologies.

- More broadly, governments are doing a better job of ensuring that today’s technology access initiatives are driven by a clear policy objective. Rather than

starting with the narrowing premise of addressing a digital divide, forward-thinking governments are looking at technology access as a tool for narrowing other “divides” in society, including those between generations, regions, socio-economic classes, and the underemployed.

- This has made it more important for public technology access programmes to include a tightly-focused end-user group. While some older programmes faced problems with lack of focus (which in turn made it difficult to sustain the commitment of either public or private-sector partners), today’s successful programmes are specifically targeting segments of the population which, when empowered with technology, have the greatest potential to stimulate development and growth. These can include teachers, students, healthcare professionals and underemployed citizens, among others.

- In turn, these changing objectives have made it easier to build robust and complementary public-private partnerships (PPPs) around technology access. PPPs minimise risk by spreading it across the consortium partners, and take advantage of the unique skills and abilities of the public and private sectors. Most importantly, a well-structured PPP—which includes well-defined targets that offer a clear return on investment for all parties—can deliver a far greater outcome than any of the individual consortium members would be able to achieve on their own, according to experts.



This paper examines a number of success stories from emerging markets around the world, and sets out several factors, listed below, that policymakers and consortium members should keep in mind when structuring their programmes.

- **Get the technology right:** different circumstances and on-the-ground conditions require different types of technology—PCs, kiosks, mobile phones or other delivery mechanisms should be chosen with these parameters in mind.
- **Engage stakeholders and demonstrate a clear return:** projects need to engage stakeholders, both the target groups and programme member organisations, by articulating clear benefits to all members of the consortium and demonstrating a clear

return on investment—be it social (in the case of non-governmental organisations—NGOs—and government agencies), economic (in the case of the government) or financial (in the interest of all partners).

- **Think big:** The first-order benefits of technology access initiatives—getting young people into jobs, linking senior citizens with far-away families, providing teachers with new educational skills—are extremely important. However, there is also a bigger second-order benefit to be had for societies at large. By offering underserved citizens access to technology, connectivity, and a relevant range of services, governments can begin to create a cadre of “e-citizens” who begin naturally to use technology not just in interaction with government, but also in creating new economic and social links with broader society.



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Using technology to boost economic development

Emerging markets are booming. Growth in the emerging world has been several percentage points faster than global growth since 2001, and on average almost five percentage points faster than OECD growth in the same period. Nonetheless, the gap in income per capita between the emerging world and the developed world remains massive, and governments in emerging markets are under pressure to stimulate even faster growth in an effort to catch up with living standards in the most developed nations. To do this, governments in Latin America, Africa, Asia and eastern Europe are increasingly looking to harness the power of information and communications technology (ICT).

Some years ago, the emphasis in these efforts was primarily on increasing technology penetration, access and use—narrowing the “digital divide.” And with some substantial justification: a range of studies from organisations such as the European Commission, World Bank, and OECD has established a well-documented link between technology adoption and increased productivity, which in turn drives faster economic growth. A 2004 study by the Economist Intelligence Unit¹, for example, showed that once a minimum threshold of information and communications technology (ICT) development is reached, countries with high penetration levels for fixed telephone lines, mobile phones, PCs and the Internet achieved significantly higher real GDP growth

than those with lower penetration rates. Moreover, the benefits seem to go beyond the economic. “It is clear that there is a pretty strong correlation between access to information and civil liberties, democracy and economic prosperity—all the things that would be regarded as benchmarks of a healthy society”, says Stephen Minton, an analyst at IDC.

In Egypt, for example, where several years ago household PC penetration was only about two in 100, the government launched a “PC for every home” initiative, in which it partnered with technology companies to offer PCs to home users. A similar programme in Romania offered subsidies to citizens under 25 years old to purchase home computers.

However, these and other similar programmes have run into difficulties, with take-up and usage falling below expected levels and little discernable economic impact having been achieved. Alex Wong, director of the global education initiative at the World Economic Forum (WEF), has seen many examples: “You hear too many stories of a big technology company contributing computers into a country’s education system, and a year later they are sitting unused as paperweights”. Even worse, in many cases programmes failed even to get off the ground. “The failure rate for these programmes—which the media can’t really capture—was tremendous, which was very discouraging for those of us involved,” says one senior practitioner.

1. Economist Intelligence Unit, 2004, *Reaping the benefits of ICT: Europe’s productivity challenge*, sponsored by Microsoft.



The new generation of technology access initiatives

This has led governments around the emerging world to conduct a wholesale rethink of how best to achieve their economic development goals through the use of technology. As a result, a new generation of technology access programmes is now emerging, which differ from the first wave of initiatives in four key ways.

Creating an ecosystem

Experience from earlier programmes, alongside the results of a number of academic studies, suggests that on its own, increased PC penetration is insufficient to support specific policy goals, let alone to stimulate growth.

When the WEF set up its IT Access for Everyone (ITAFE) programme, it decided to learn from the success and failures of digital access projects already in place. What it found, says Simon Mulcahy, head of Information Technology Industries at the WEF, is that projects will succeed only if they offer the right combination of services on the demand side, and the right combination of hardware, software and connectivity on the supply side: “For any project to really succeed you had to have this whole ecosystem of things working like a greenhouse. If you want a plant to live in this world, you need sunlight, water and soil, and if you remove one of those ingredients it doesn’t work. And it was the same thing with the majority of these projects: if they failed or succeeded it was on the basis of them having or not having a complete set of these critical factors.”

In the case of technology access, these factors go beyond the core hardware, software and connectivity—including things like access to credit, technology support, services, training and quality assurance.

The “ecosystem” goes even broader than that, however: our 2004 report on ICT and productivity found that without a strong education system and a healthy business environment that included opportunities for businesses to access venture capital, businesses were not able fully to harness the benefits of technology. ICT development, then, cannot take place in a vacuum: it has to be part of a wider programme of economic and social change, such as literacy initiatives, liberalisation of import laws and investment in skills.

Turning the premise on its head

First-generation initiatives revealed an often-fatal flaw in the fundamental premise. Starting with a singular focus on pushing technology out into the population resulted in the development of programmes to which none of the partnering organisations beyond the mainstream IT firms (governments, banks, and non-government organisations) were truly committed in the long term. Metrics focusing on number of PCs shipped pleased technology companies, but provided little incentive for governments to take an interest in longer-term use, let alone measurable economic impact.

Practitioners in the private sector are now realising that the premise behind these programmes needs to be turned on its head—and that the ultimate value they provide needs to be measured around a public service enhancement, rather than considering technology adoption as an end unto itself. New-generation initiatives now start with an economic policy objective, and look specifically at the economic “divides” that exist in a society—generational, gender-based, regional, health-based, educational, and the like—and aim to narrow one of those divides,



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rather than focusing on “the digital divide” itself. Embedding these initiatives within a broader policy context ensures that all parties—including the non-government sector—have a meaningful reason to commit resources and leadership to the project. This is a crucial difference, and a source of competitive advantages for those initiatives that are working best. As one leading non-governmental executive puts it, “the nations that are getting the policy aspects right are moving faster.”

Engaging the private and NGO sectors

This more fundamental mandate also means that governments need help. “Economic development is too important and too formidable to attempt unilaterally,” says Diana Pallais, Director of Microsoft’s *Partnerships for Technology Access* initiative. “For that reason actors on both sides of the public-private divide are realising the merits of collaboration through public-private partnerships (PPP).”

The typical PPP includes one or more government ministries or agencies, banks or development aid organisations to provide financing, technology companies to provide software, and service providers such as national telecommunications companies and IT training providers.

There are several advantages to such an approach. The government can harness the resources of the technology companies to provide training and support, both in business and technology skills, to the target audience. By including banks and financial services providers in the equation, it is possible to provide loans for the PCs to make them affordable for users.

Another advantage of PPPs is that they minimise risk, says Lance Bennett, professor of political science and communication at the University of Washington: “You shift the complexity in the PPP model to the construction of the partnership itself and the creation of the incentives of the different players. Once you

find something that looks like a winning scenario from the standpoint of different players, you are much more likely to get a stable result than if [government] were simply going it alone and looking for unilateral solutions.” This also improves the prospects for long-term buy-in of both the public and private sectors, which is particularly crucial given the time-lag on measurable returns in initiatives involving big up-front capital expenditure.

The trick with this approach is that the different players often come into the programme with aims and objectives that are different and even conflicting. Governments, for example, will aim to keep product costs down and seek to provide broad exposure to IT and the development of IT skills. Technology companies, on the other hand, will of course be looking to maximise their profits and push their own products. These partnerships must thus be based around carefully defined benefits that are articulated in terms that accrue directly to each consortium member’s mission. As one senior business developer from the technology sector points out: “It is important to know the public policy goals and the pains and aspirations of every partner in the consortium.”

The biggest benefit, though, is that when carried out successfully, a PPP delivers far more than any of the individual participants could have delivered on their own, as Hoda Baraka, first deputy to the minister of communications and information technology of Egypt, acknowledges. “The public-private-international organisations-NGO relationship is central to the success and implementation of the initiative,” she says of the Egypt Educational Initiative (EEI) programme. The private sector brought not just finance and technical knowledge, but valuable industry know-how: “We train supervisors and school heads not only on ICT skills, but the use of ICT in school management, class management, problem solving and decision making. We are implementing tools that encourage critical and analytical thinking, and encouraging competition. This is where the



private sector has experience and expertise.”

Another clear example of the synergies to be gained from PPPs is around the provision of credit. In many cases, technology-based initiatives target individuals who may have difficulty affording the kit. Banks can get involved to provide credit, but there’s often the problem that these banks would otherwise be hesitant to lend to vulnerable segments of the population—those for which risk ratings are incomplete, collateral tends to be insufficient or non-standard, and simple identification can be a logistical challenge. Here governments can offer guarantees, lend moral backing, or offer up their own information on targeted end-users, to make the banks more comfortable. Equally non-government players can help both governments and technology companies get more direct access to disadvantaged population segments, with which they work on a daily basis.

Taking a targeted approach

While getting broader in scope, new-generation technology access initiatives are also getting narrower in end-user focus. This is partly a function of the realities on the ground: in most of the world’s poorer countries PC penetration is extremely low, and Internet access virtually non-existent. When nine out of ten citizens lack proper access to technology, it becomes impractical to tackle the entire problem at once.

A narrow target end-user is also the natural extension of putting the economic policy objective first—the focus on narrowing a national “divide” automatically provides a clear target population with clear developmental needs.

Most importantly, though, experience from both developed and emerging market failures shows that PC adoption programmes that are too diffuse and open-ended can have sustainability problems. These programmes often run into political difficulties, as wide-ranging subsidies can get expensive and prove

politically difficult to sustain. At the same time, the lack of a specific target group and narrow policy objective can lead to operational difficulties—making it difficult to define metrics and measure success, for example. The lack of a narrow “raison d’etre” also makes it hard to sustain authorities’ interest over multiple budget cycles.

For these reasons, the new generation of programmes using technology to spur development in the world’s emerging markets are now focusing on specific target groups, such as the education community, rural populations, the elderly or small businesses.

In addition to bolstering a programme’s chances of long-term survival, the primary short-term advantage of targeting such groups is that it makes it easier for programme managers to really understand the target constituency and come up with solutions which are truly relevant to the end-user—in turn making it much more likely that uptake and longer-term usage will be high.

“[Focusing on a specific population segment] makes the realistic distribution quite a bit smaller, but it makes the utility of the technology higher, and it focuses the government end of things,” says Dr Bennett. “You may end up producing smaller numbers of actual computers in a given country, but that is where the virtuous cycle comes in—the hope being that if you generate enough of these ‘beacons’, you have people out there who are telling their friends and family members about their life online.”

This virtuous cycle leads to a derivative, but crucial benefit for governments: with a critical mass of users able to access the Internet, governments have a strong incentive to build out the range of e-government solutions that they offer. These services can improve administrative efficiency and in turn free up resources and money for other programmes to boost economic growth.



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Bridging the divides

Current initiatives in the emerging world are focusing on several population segments that are likely to not just benefit themselves, but also are well-positioned to unlock broader economic benefit through their networks with other population segments. These include (among others) students, senior citizens, rural citizens, unemployed workers, women and civil servants. Below we examine programmes in place today that address these segments.

Targeting the education system: contributing to a knowledge economy

There are clear benefits to targeting schools with technology adoption programmes. Children tend to be more receptive to new technology than adults, and the opportunity to acquire ICT skills when young will serve them well in the job market later. Targeted use of ICT in the classroom can also make for more effective teaching, providing pupils with access to a wide range of educational materials and the ability to research information outside the local environment.

One prominent example of a public-private partnership set up to provide greater access to technology in the education system is the Jordan Education Initiative (JEI). The JEI, which has been running since 2003, was launched under the aegis of the World Economic Forum (WEF) as a partnership between several interested parties: the Jordanian government; global technology companies such as Microsoft, Hewlett-Packard and Cisco; local Jordanian businesses; and non-governmental organisations (NGOs). Between them, private-sector partners have contributed more than US\$25m to the programme.

The objective of the JEI was not just to improve the quality of education offered in schools, but to build the capacity of the local technology industry and to

develop a model that could be used in other countries (the Indian state of Rajasthan has since launched a similar initiative). Jordan was an ideal location for such a project, says JEI's executive director, Haif Banayan, because it has high literacy rates and a young population, but it has been experiencing a brain drain. With few natural resources, the country needed to put a new emphasis on the acquisition of skills: "The aim was to enhance the critical thinking skills of the Jordanian people, to start developing research skills and entrepreneurship—these are all skills that we felt were important to building a knowledge economy in addition to the standard modes of education".

In general, though, programmes focused on pushing computers into schools run the risk of falling into the same trap as other insufficiently-targeted programmes: they can lose relevance over time. Laura Mellow, chief operating officer of NGO Inveneo, describes the organisation's experience of visiting villages in Uganda: "As we visited different schools, we saw computers that had been stacked up in the corner because they were not sustainable."

New-generation practitioners are thus also focusing on the wider educational ecosystem in order to ensure this sustainability. The government of Guatemala, for example, covers 80% of the cost of the hardware and software in a programme which provides low-paid public school teachers access to PCs, technology training on demand and a modern digital curriculum. The financing partner in the programme has committed to provide interest-free loans for the estimated 60,000 teachers who will be involved in the initiative. The initiative offers PCs pre-loaded with professional development material, enabling teachers to conduct training locally which previously



had required time-consuming and expensive travel to the capital city to complete. For the government this represents a cost savings, but it's also a big investment in morale for the country's teachers.

The Egyptian Education Initiative (EEI), launched in 2006, has developed ICT projects that focus—among others—on education system staff and adult learners. The multi-partner programme, supported by technology companies such as Microsoft, IBM, Intel, Cisco and Oracle, has trained some 6,000 university administrative staff and faculty in ICT skills and trained adult students in the use of advanced ICT tools. The country's universities have been equipped with student labs, enabling students to access electronic content.

Small businesses: kick-starting the economy

The emerging market economic policies that tend to find their way into the headlines most are those which impact on the mega-firms in these economies—restructuring, privatisation, and mergers and acquisitions. However, in virtually all emerging market economies—and in fact around the world—small and medium enterprises (SMEs) represent at least 95% of total private firms, and account for the substantial majority of employment. This means that governments in emerging markets are increasingly looking to find ways to stimulate the development of these firms in order to boost employment, encourage entrepreneurship, and spur faster economic growth. Given the imperatives that these small and dispersed firms face, technology can play a particularly important role in supporting policy objectives in this area.

Small and medium-sized enterprises (SMEs) stand to gain a great deal from digital access, because it enables them to automate backend processes and to connect with suppliers and customers. "ICT is highly relevant to small businesses," says Sarbuland Khan, executive co-ordinator of the UN's Global Alliance for ICT and Development (GAID), an organisation that

Sample technology access initiatives

Initiative	Description
Jordan Education Initiative	A PPP programme to introduce computers and ICT facilities to 100 Jordanian schools. Has been running since 2003, and as a result of its initial success has been copied elsewhere.
Botswana Partnership for Technology Access project	A programme to encourage Botswana's 25,000 civil servants to buy PCs. Two key elements were providing a useful network of services and devising a loan scheme that would make the PCs affordable.
Common Services Centre project in India	A project by the Indian government to put 100,000 Internet kiosks in community centres throughout India, mostly funded by the private sector. The aim is to give citizens access to both e-government and microfinance services. Trained assistants will be on hand to help users.
Mi PYME Avanza (My Small Business Grows) (Chile)	An initiative providing small and medium enterprises (SMEs) in Chile access to affordable and targeted PCs, internet access, training, and preferential credit terms. The immediate appeal of this initiative is the ability to participate in online tenders with <i>ChileCompra</i> , the government of Chile's e-procurement portal through which 100% of the government's purchases are transacted.
PC for every home (Egypt)	A PPP between the Egyptian government, Microsoft, local PC manufacturers, eLabs (an organisation representing local software providers) and national banks to offer affordable PCs to home users. The initiative has resulted in PCs going to 300,000 homes.

is bringing together organisations such as the World Bank and the International Telecommunication Union (ITU) to improve broadband penetration in Africa. "If they can take advantage of basic ICT, they can advance their business, eliminate middle men and get better access to market information. They can produce more effectively at lower cost, and they can sell at a better price. The issue there is how to reduce the cost and improve the speed at which they get the information."

Affordability will always be an issue, but SME-focused PPPs also need to establish relevance for small businesses, many of whom may have established



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Senior Citizens: bridging the generational divide

In 2002, the financial crisis in Argentina left senior citizens in a particularly vulnerable position, and the government began to look for ways to specifically target this population segment with new services which would improve their quality of life and help them find ways to better support themselves financially. As part of this effort, the Administración Nacional de la Seguridad Social (ANSES, the social security provider) began to dabble in finding ways to transform its service delivery through technology. However, it soon became clear that ANSES would have to address the “access” gap—low PC penetration—among pensioners. It made little sense to invest further in e-government unless the target constituency—the 4.3 million pensioners—would be able to access the new services in volume. This was the genesis of the *PC Abuelos* (“Grandparent PC”) PPP, which focused on bringing technology and connectivity to this traditionally underserved segment as a way to provide them government services more efficiently, enhance their ability to stay in contact with family members, allow them access to the world of information on the Internet, and even build new skills.

ANSES project managers running the PC Abuelos initiative, which launched in July 2007, took the important step of seeking to understand the characteristics and preferences of their target segment before developing their offering, and what

they found was encouraging. Some 10% of the population of Argentina is over 65, so the target group provided plenty of scope for economies of scale. At the same time, more than 50% of the senior citizens are located in the interior of the country, so the delivery of the PC to the user’s home as part of the offering provides real value for the end-user segment. Perhaps most importantly, Argentina benefits from a very high literacy rate (above 97%, according to the latest census figures), meaning most seniors would be relatively easy to train on using unfamiliar technologies. The solid market research conducted in advance of the project was one of its key success factors, according to Amado Boudou, the general secretary of ANSES.

The social security agency realised that it would need to bring in outside expertise and resources, and chose to partner with Microsoft and Banco Nación (BNA), one of the country’s largest banks, in a public-private partnership (PPP). The first challenge the consortium tackled was the development of a relevant and effective product. Studies conducted by the consortium suggested that seniors were particularly interested in using computers to stay in better touch with family. The solution is thus centred around a high-quality PC, pre-loaded with software targeted to senior citizen use, a broadband connection, and delivery and installation options. For those senior citizens most unfamiliar with technology, extra digital literacy training was offered as well.

The consortium faced several key

challenges in encouraging uptake of the offer. First, given that most of the country’s pensioners live on around 1,000 pesos (US\$320) per month, affordability was a constraint to overcome. Because of the size of the customer base, BNA was able to offer loan terms well below the prevailing rate.

Mr Boudou explains: “Forty months’ financing and a zero percent rate is very attractive for our target end-users—consumer credit for pensioners in Argentina is generally either inaccessible or only available at very high rates.” The bank already managed ANSES’ monthly pension payment distribution, so the consortium was able to take monthly payments for the PC solution out of these payments directly, minimising hassle for the end-users and mitigating credit risk for the consortium.

The programme has thrown up some huge technical hurdles. “The whole back office process that we implemented to carry out this programme was a big challenge,” says Mr Boudou. “PC manufacturers had to integrate their systems with Banco Nación’s branches in order to automate sales and deliveries, and we at ANSES had to link our databases with those of BNA so that credit approval could be granted online. This was a major operation.”

The results have so far been impressive. “Without an advertising campaign—only having distributed leaflets in pensioners’ centres and BNA branches—and only seven weeks into the programme, we have distributed 9,000 PCs, and we are receiving around 2,000 orders per week,” says Mr Boudou.

“off-line” business models. Mohamed Azzam of eLabs says, “Awareness is the key success factor in this operation. I don’t think cost is the only problem. People have been working for years without automation. Things are changing: they need the computer to communicate with clients, they need

the computer to manage the files, the records, and to manage and control the inventory, production plans and so on.”

In Vietnam the government—via the Ministry of Post, Telecom, and IT—partnered with Intel, a host of local service providers, and Vietcom Bank (a state-



held commercial bank and the country's leading payments provider) to build a programme supporting the development of interlinkages and skillbuilding among the country's SMEs. The "Smart PC Smart Business" initiative offered a choice of hardware and software solutions along with broadband connection, and the bank partner in the consortium offered users one year interest-free financing.

Chile's government set up an electronic portal, called ChileCompra, to centralise its procurement process at all government levels in 1999. The portal initiative was begun with the central objectives of cutting red tape and equalizing the bidding process.

By 2006, the portal incorporated the buying power of nearly 900 government agencies seeking bids for work amounting to over US\$3bn. Bids per tender rose substantially and average procurement costs for most agencies fell. By 2007, 224,000 companies have registered as suppliers, and they are now bidding on 35,000 contracts a month.

However, programme leaders realised that not all companies were benefiting from the new ChileCompra offering—those without a computer and broadband connection have no way of accessing the service. The government calculated that some 80,000 small businesses remained unregistered, and for these companies, ChileCompra hadn't really made much difference—worse, it had put these small firms at a significant disadvantage with respect to getting work from the government. With an aim of recruiting 10,000 small businesses by the end of 2007, the government set up the "Mi PYME Avanza" (My Small Business Grows) initiative in public-private partnership with a range of domestic and global technology providers. The initiative provides small businesses with an affordability package for a PC and connectivity, along with credit at preferential rates. The key issue for programme developers was how to make the solution relevant to the end-user. "The problem that entrepreneurs have isn't 'I need a PC,' it's 'How do I get to know my customers better?

How do I make fewer errors on an invoice? How do I handle my payroll?'" says Roni Lieberman, of Memory Software, a private partner in the Mi PYME Avanza initiative. The answer was in part to pre-load the PCs with business-relevant software (a small business accounting package, for example) and to provide end-users with training up front, given generally low levels of digital literacy among the target user group.

All of the thought put in at the beginning seems to have paid off: as of late 2007, the initiative was looking likely to triple its original target of 10,000 small businesses signed up.

Rural communities: ensuring development opportunity for all

The emerging markets also suffer from extreme income inequality, and the impact that such inequality has on both social harmony and the ability to grow the economy rapidly. Many of these countries are also disproportionately rural, with a very high overlap between the rural and poor populations. These populations also tend to exhibit higher unemployment rates than those in urban areas. Governments are thus looking at ways of encouraging rural development in order to boost employment in distant rural areas and thus bridge socio-economic and geographical divides in their economies. Here too, technology can be a key enabler of these policy objectives.

Rural communities, though, provide a unique set of challenges for technology access initiatives. They are the least likely group to be connected to grid electricity; they are unlikely to be connected to the Internet backbone; they tend to have high rates of illiteracy; and they may speak languages for which no software is yet available.

The temptation is to say that such communities are not yet ready to use advanced technology, and that there is no point attempting to introduce PCs in areas where the local conditions make them difficult to install and harder to use. Yet such communities have



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Adapting to the conditions

The rural population arguably throws up the most complex logistical and technical challenges for governments and consortia looking to introduce technology in support of growth. A number of smaller players in the field have found innovative ways around some of the most intractable barriers, which can provide interesting lessons for the larger PPPs when constructing new programmes in challenging environments:

- The rural population generally lives under more demanding physical conditions, which can make introducing delicate technological devices tough. Inveneo, a US-based non-profit social enterprise, has developed a set of robust, inexpensive, low-power hardware and open source software

components, including a computer, server and wireless networking gear that can be used in extreme physical conditions and can be powered by alternative energy sources such as solar power. Depending upon the location, the unit can also include a voice over IP (VoIP) handset and access to long-range wireless technology (Wi-Fi).

- Language can be a big problem too. Rajdeep Sahrawat, vice-president of NASSCOM, which represents the Indian software industry, notes that in his country at least 15 languages are commonly spoken, and about one-quarter of the population is unable to read or write. Mr Sahrawat argues that technology firms need to think about creating relevant content in local languages, and finding different channels for it beyond just the PC-based model.

- Sometimes PCs themselves aren't the right delivery mechanism. The kiosk

approach has been successful in many countries where the cost of PCs puts them beyond the reach of most ordinary people.

- In rural Mali, the NGO Geekcorps developed a programme to connect radio stations in remote communities wirelessly to the Internet. Traditional wireless (Wi-Fi) antennae from the US would have been expensive and difficult to replace. Instead, Geekcorps used an antenna, known now as the BottleNet, made from a plastic water bottle, wire mesh and a motorcycle tyre valve stem. One community radio station in the remote Mali location of Bourem Inaly now downloads films from WorldSpace and transmits them wirelessly, using Wi-Fi repeaters made out of tin cans, to televisions. They now have 50 "CanTV" subscribers paying US\$3 a month for the films. The radio station, originally dependent on USAID money, now supports itself and has been able to take on an extra member of staff.

as great a need for access to information and services as urban communities, and as such increasingly emerging world governments are explicitly including rural development in their broader economic development frameworks.

In the Chinese province of Guangdong—one of China's richest—the government faced the problem of managing economic development in a situation in which the fastest-growing parts of the province were expanding at around 20% per year in real terms, while the rural areas were being left behind. The authorities felt that these areas' remoteness and inaccessibility was an explicit factor in their inability to achieve faster growth, as was a general lack of skills and access to information in these isolated regions.

A public-private partnership was set up between the provincial government, Intel, and a number of local partners to set up technology centres in the

poorest farming villages in the region, each equipped with a handful of PCs and an internet connection (provided by China Telecom), and roll out entry-level training on basic IT literacy and skills to the farmers themselves. Locally relevant content, including agricultural trading information and farming techniques, and access to e-Government services for land registration and policies—is provided via a portal installed on the PCs.

As of early 2007, the consortium had set up more than 1,000 of these centres, and government officials expect the programme to drive increased income for farmers and thus start to chip away at the growing income inequality in the province.

There is also a role to be played by third-party international organisations in setting up PPP consortia, especially when the target segment—as in the case of the rural population—is already being



served in some form by these organisations. USAID, for example, runs a “Last Mile Initiative” in which it brings together governments, NGOs, and private sector players to push connectivity and technology solutions out to remote and underprivileged citizens in countries like Vietnam, the Philippines, Nigeria, and Macedonia.

In the Philippines, USAID provided funding and facilitated a partnership between local authorities in the municipality of Manolo Fortich and the local telecommunications company, which resulted in the creation of a “community e-centre”—a dedicated PC and broadband station—within the municipality’s employment services office. The e-centre also included a webcam and VOIP facilities, enabling candidates to interview directly with Manila-based agencies from their remote location. In the first month of operation, 10 users found jobs via the new e-centre.

A key success factor in the initiative, according

to programme managers, was the recognition that training on digital literacy and other business skills would have to be an ongoing process, in order to ensure the long-term usability of the e-centre itself. The USAID-led team built a capacity-building training program for the local government personnel involved before launching the service, which focused on building the strategic and business skills necessary to operate the centre. However, the training efforts also included the creation of train-the-trainer modules for basic computer and Internet literacy.

In Vietnam, USAID’s Last Mile Initiative brought together private and public-sector partners in a consortium which delivered cutting-edge Wi-Max internet connectivity to Lao Cai, one of the country’s remotest and poorest regions. In this case, a crucial factor in bringing the programme partners together was the development of a “joint vision” for the project’s outcome—the enhancement of economic opportunity for Vietnam’s rural communities.



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Ensuring success up-front

There are a number of factors that have helped to ensure the success of the PPPs outlined above, and which practitioners point to as crucial in the programme design phase.

Engage stakeholders and demonstrate a clear return

Projects need to engage stakeholders, both the target groups and programme member organisations, by creating clear benefits to all members of the consortium and demonstrating a clear return on investment—be it social (in the case of NGOs and government agencies), economic (in the case of the government) or financial (in the interest of all private sector partners). Crucially, these benefits need to be above and beyond those which any of the consortium members could achieve working on their own.

Often, the metrics used to judge performance require individual consortium members to “get outside their comfort zone”—private-sector partners need to widen their definition of success to go beyond the usual number of units sold, and think beyond their usual go-to-market strategies, in order to become genuine stakeholders in the developmental results sought by the public sector. “This is what makes these initiatives so interesting: the stakeholders go outside the norm in terms of process, and have to rethink how they define success metrics to be able to justify the investment. But when it is done well, the benefits transcend the traditional success metrics for all, and the PPP’s sustainability is ensured by this ‘equilibrium of incentives’,” says Diana Pallais of Microsoft.

It is also obviously critical to ensure in advance that a project will have buy-in from the end-user population. For instance, pensioners should be able to see clearly the benefits, such as accessing their

government entitlements more effectively. Civil servants should be able to envisage an increase in their efficacy at work, as their workplace is transformed by technology. Teachers should be able to keep up with pedagogical advances and invest in professional development in novel ways. Stakeholders will often include NGOs, which may have a fuller understanding of a particular group’s requirements than either the government or the private sector.

International organisations, such as USAID, the World Bank, and the World Economic Forum, can also play a critical role in this sense, helping to facilitate links between consortium members and playing an “honest broker” role at the objective-setting phase—although often their work cycles are considerably longer than the typical gestation period of a PPP.

Get the technology right

It may sound obvious, but getting the technology right is crucial to the overall success of policy-driven initiatives—and not something that all programmes have achieved. Different conditions on the ground, and differing policy objectives, necessitate a flexible approach to the kind of technology put in place. In regions where literacy is low, even if the infrastructure is sound, most citizens will not have any use for a PC in their home. Their need for information is not diminished, however: they just need a different way of getting access to it. That could be through paying someone in a local community centre to look up information on the Internet, or it could be through using a mobile phone to make an appointment. In a region where the climate is consistently hot and electricity is supplied by local generators, a robust PC with low power use will be more suitable than a traditional desktop or laptop computer.



The key advantage that the emerging markets possess is that they are not hindered by legacy infrastructure, and they have the opportunity to leapfrog developed nations by introducing cutting-edge technology where none existed before—for example, by deploying wireless broadband technologies such as WiMax to provide last-mile connectivity, as in the case of the Last Mile Initiative in Vietnam, for example.

In this sense, emerging markets are often ahead of the curve. As Dan Shine, director of AMD's 50x15 initiative, says, "Emerging market governments, with an eye toward the future, are beginning to take advantage of an increasing number of innovative and personalised solutions and services hitting the market today. The catalyst for this trend is choice, pure and simple, and everyone in the equation benefits."

Think big

The fundamental importance of long-term buy-in on the part of all consortium members makes big-picture thinking a prerequisite. Short-term metrics around expanded technology footprint and usage within the target segment are essential for keeping these initiatives on track, but the second-order effects of giving underprivileged citizens access to technology—the creation of new economic networks, greater inclusiveness in society, and an expanded appetite for

e-government and online services in general—require a focus on creating the "e-citizen" of the future.

The role of government is most important in this sense, as for emerging market citizens access to e-government services is often a more important motivating factor in the take-up of PCs or other devices than access to online commerce opportunities. For citizens, the ability to access government services online can have a dramatic impact on their lives, largely because of the substantial cost of getting these services through "real-world" distribution channels. Ethan Zuckerman, a fellow at Harvard's Berkman Centre for Internet and Society describes an example: "In India, if you want to get a birth certificate that declares you to be a dalit [member of a low caste], which means you have access to different social services, normally you would have to get on the bus, get on a truck, travel to the regional capital, and that might take you a day in either direction to do it. If you offer the ability to access those government services at a fraction of the cost you have created something of value."

The aim, though, should be to think beyond the first-order impact and focus on creating a cadre of "e-citizens" who begin naturally to use technology as an enabler not just of their relationship with government but also of their economic and social interactions with broader society.



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Conclusion

Emerging-market decision makers around the world are increasingly looking to the power of technology to help them to achieve a range of public policy goals, and crucially to speed up economic development and catch-up with the developed world. The challenge of using technology to narrow the socioeconomic, generational, and gender divides in countries where few people are familiar with computers is immense, and the most effective approach is “to eat the elephant one bite at a time”, says one expert.

Targeting specific groups, such as the unemployed, the young or the elderly, with a specific developmental objective in mind is more effective than attempting to introduce PCs to everyone. It provides governments with a stronger long-term incentive, but also creates motivation for the

technology, software, connectivity, and financing partners needed to run these programmes. It also ensures that the solution is indeed relevant to the end-user, which will in turn drive faster uptake—the bottom line of programme success.

A focus on the potential broader impact of getting disadvantaged communities linked in to the information society is also crucial for long-term success.

The trick, says Mr Mulcahy, is to bring the different partners, objectives, motivations, and project elements together effectively: “If you can get the elements of the value proposition right, and deliver in such a way as to unlock real social value, you are really onto a winner.”

Whilst every effort has been taken to verify the accuracy of this information, neither The Economist Intelligence Unit Ltd. nor the sponsor of this report can accept any responsibility or liability for reliance by any person on this white paper or any of the information, opinions or conclusions set out in the white paper.

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