

# Options on the Future:

THE ROLE OF BUSINESS IN CLOSING THE DIGITAL DIVIDE

THE BOSTON CONSULTING GROUP

BCG FOCUS

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## THE ROLE OF BUSINESS IN CLOSING THE DIGITAL DIVIDE

There is a gulf—often called the digital divide—between information-and-communication technologies in developed, connected communities and in less developed, unconnected ones (including some less developed communities in the developed world). Because access to information is a powerful enabler of economic and social development, it is essential for global prosperity that the digital divide be narrowed. Corporations can play a major role in helping to close the divide—and can earn great business benefits from doing so.

In 2001 a team from The Boston Consulting Group completed the first phase of an 18-month project to devise business methods of addressing the divide. To date, the work has consisted primarily of an ef-

fort to generate insights and hypotheses about how to apply business principles to the needs of communities that lack access to information. The remainder of the project will test our conclusions in pilot projects in India and south central Los Angeles.

This report summarizes our research and conclusions so far in an effort to enlist the collaboration of corporations, government agencies, and non-governmental organizations (NGOs) in the work ahead. We do not pretend to have all the answers or even most of them. But we have investigated the problem and arrived at what we believe is a sound business-based approach to it—subject of course to the practical experience of organizations willing to take part in pilot projects.

### SUMMARY OF KEY FINDINGS

Poverty and lack of access to information are linked. Better information-and-communication technologies can help accelerate human development.

Closing the digital divide requires solutions that are sustainable—economically, socially, and environmentally.

Philanthropy has its place, but market-based business initiatives are the only sustainable way to narrow the digital divide.

Business initiatives need to focus not on individual consumers but on communities whose purchasing power, sense of ownership, and commitment can be aggregated.

Successful business-based initiatives have six requirements. They must

- recognize the central role that communities play for unconnected populations and address community needs
- employ appropriate technology whose cost has been stripped down to an indispensable minimum

- adopt a suitable business architecture that builds partnerships to make use of existing local resources

And they must be

- economically viable
- scalable
- replicable

Corporations have sound business reasons to get involved:

- Tangible benefits include access to new technologies, new sources of skilled labor, and innumerable new customers
- Intangible benefits include brand building and employee goodwill

The best approach for corporations is to think of digital divide investments as real options on future returns.

BCG seeks to collaborate with corporations interested in tapping huge new markets by building information-access businesses in unconnected communities.

## THE DIGITAL DIVIDE

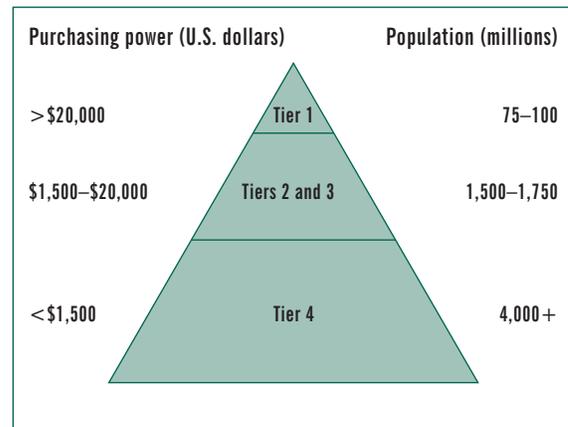
Half of the world's people live on less than \$2 a day. One adult in two has never made a phone call. Fewer than one in ten have access to the Internet. Poverty explains the lack of communications. Or perhaps the lack of communications explains the poverty. Certainly the two are linked. (See Exhibit 1.) Without a thriving economy, it is difficult to build a modern communications infrastructure; without good information, economies cannot thrive. In any case, information is a key driver of the global economy. More and better information leads to improved use of resources, more efficient production, more effective markets, better-served consumers, better education, greater democracy—the list goes on and on.

But even though information has always fostered human development, for hundreds of years not even the most modern infrastructure could completely overcome the problems of distance and the lack of rich information. Sailing ships were not just expensive and slow, they could carry information to only one place at a time. Railroads were faster but even more expensive. The telegraph was cheaper and had speed and reach, but it lacked bandwidth. Affordable information with both richness and reach simply did not exist. The developed world built railroads and telegraph lines, bought airplanes and telephones, but it still built suppliers' factories next door to customers' plants wherever possible to permit face-to-face communication. Meanwhile, developing communities continued to struggle unsuccessfully with their lack of connectedness, their lack of capital, and their lack of information.

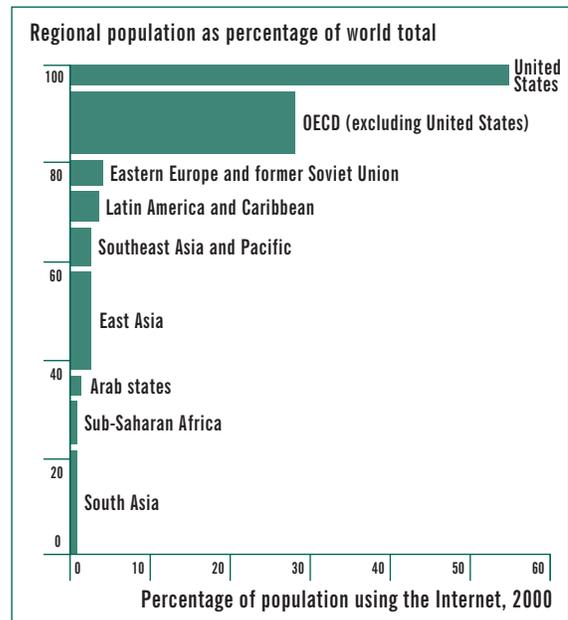
Today, information is more important than ever before. Production and agricultural processes, technical specifications, improvements in product quality, customization of established products and services, new products and services, and even entirely new information-rich industries such as biotechnology—all are dependent on the kind of complex, technical information and broad connectivity that now fuel progress and drive economies. Moreover, what is called the network effect multiplies the

### Exhibit 1 POVERTY AND LACK OF ACCESS TO INFORMATION ARE LINKED

#### The World Economic Pyramid

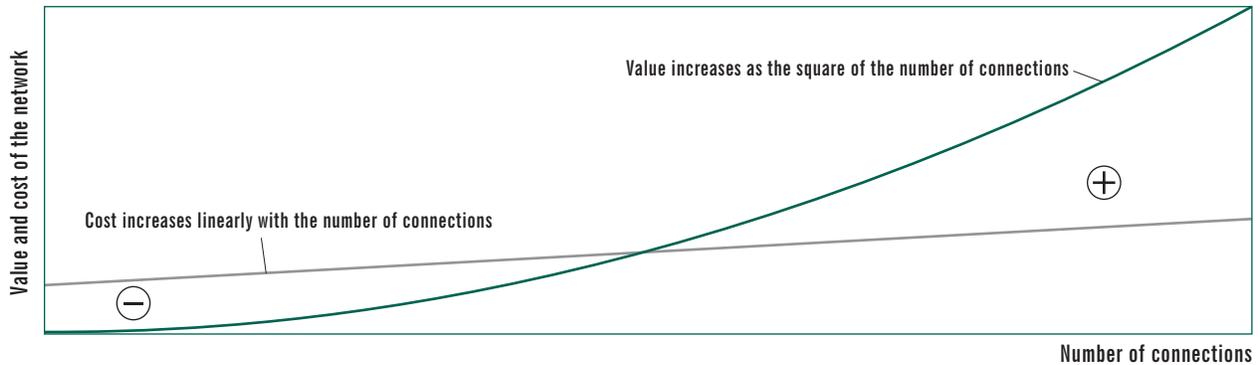


#### Global Internet Penetration



SOURCES: C.K. Prahalad and Stuart L. Hart, "The Fortune at the Bottom of the Pyramid," *Strategy + Business*, first quarter 2002; United Nations Development Programme, *Human Development Report*.

Exhibit 2  
**AS NETWORKS EXPAND, THEIR VALUE INCREASES EXPONENTIALLY**



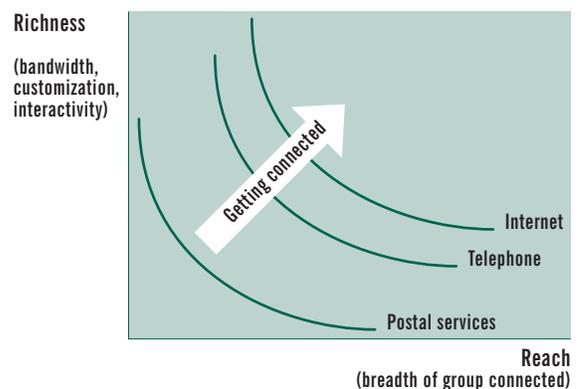
Connections	1	2	3	4	5	6	7	8	9	10
Value increases as the square of the number of connections										
Cost increases linearly with the number of connections										

SOURCE: Metcalfe's Law.

benefits of connectedness. (See Exhibit 2.) Developed communities are digitally connected, information rich, and wealthier than ever. Less developed communities—whether in Asia, Africa, Europe, or the Americas—are unconnected, information starved, and poor. The divide is not narrowing. It seems to be growing wider. One result is that distinctions such as *first world*, *second world*, and *third world* are losing some of their significance, while a new distinction—between connected and unconnected—is gaining more and more importance.

But today we also have the means of narrowing that economic divide and erasing the connectivity distinction. Today the information that drives economies is digital, which means that both its richness and its reach are vastly greater than ever before. (See Exhibit 3.) Yet the marginal cost—once the infrastructure is in place—is extraordinarily low. So the first step in using business models to solve the problems of the unconnected world is to connect it.

Exhibit 3  
**MODERN COMMUNICATION TECHNOLOGIES REDUCE THE TRADEOFF BETWEEN RICHNESS AND REACH**



SOURCE: BCG analysis.

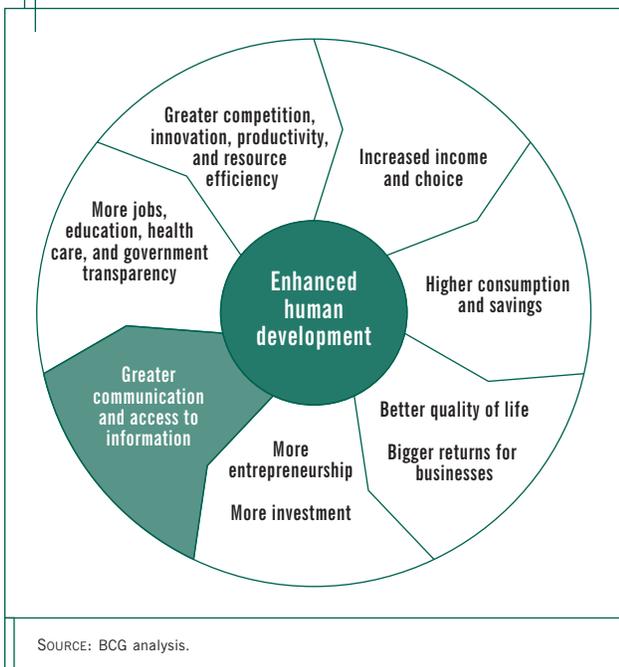
Corporations have a critical role to play in this effort—and critical benefits to win. They know how to use information and how to build new businesses. Their rewards will take the form of new customers, new opportunities to improve their processes, and an option on the future growth of undeveloped—but for the first time connected—communities. We believe that market-based business initiatives are the most effective way to address the digital divide and the only effective way to sustain a digital information economy once the divide has been bridged. Moreover, the use of business models to close the digital divide can set in motion a virtuous spiral of new enterprise, new markets, and new prosperity. (See Exhibit 4.)

To meet the need for realistic, cost-effective ways of providing developing communities with access to modern communications, all the stakeholders agree on one point: that an information infrastructure for these communities must be lasting. If it is going to make a difference, the connectivity that will bring individuals, organizations, and businesses into the information economy must be environ-

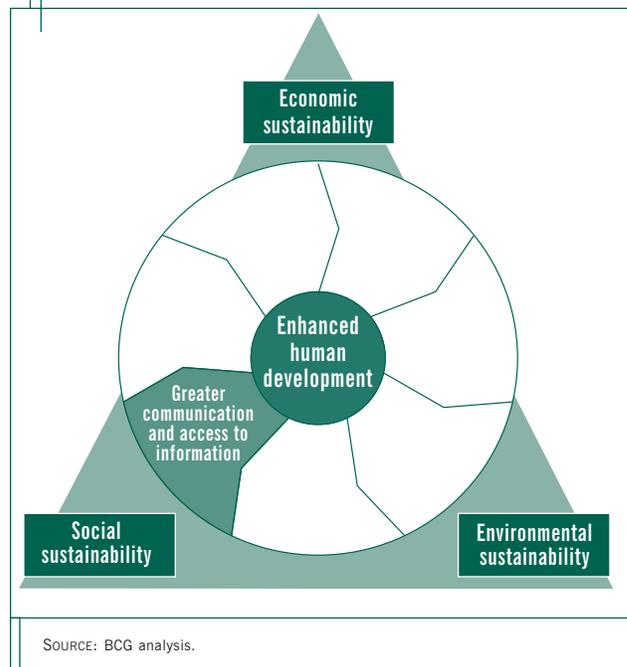
mentally, socially, and economically sustainable. To be environmentally sustainable, it must increase resource efficiency in production and consumption by promoting innovative technologies and products. To be socially sustainable, it must meet a clearly identifiable need and be culturally acceptable. To be economically sustainable, it must create value and be able to survive without continuing subsidies. (See Exhibit 5.)

Moreover, all three dimensions of sustainability must work together. In the minds of many, economic sustainability has an adversarial relationship to social and environmental sustainability. Business interests are perceived to be the enemies of traditional culture, social stability, and environmental preservation. But for the digital divide to close, all three aspects of sustainability must operate arm in arm. The world knows from painful experience that economic development that does environmental damage can defeat its own purpose. The idea that economic development must be socially—as well as environmentally—sustainable is a less familiar proposition but no less true.

**Exhibit 4**  
**ACCESS TO INFORMATION DRIVES A VIRTUOUS SPIRAL OF HUMAN DEVELOPMENT**



**Exhibit 5**  
**INFORMATION SOLUTIONS MUST BE SUSTAINABLE ON THREE DIMENSIONS**



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Achieving all three dimensions of sustainability will be a complex process. Various groups have studied regulatory conditions, stakeholder interests, and the technical difficulties of providing access to information. Many initiatives are under way. To date, however, most studies have focused on technical, infrastructural, and regulatory issues. Our particular focus will be on economic sustainability and its prerequisites.

There is no simple prescription for using commercially viable business models to bridge the digital divide. Revenues will be much lower for quite some time than they would be from traditional customers in the developed world. Partnerships will assume a much greater importance. Organizations will have to learn how to gain access to assets they do not own, how to design cheaper ways of providing services, and how to aggregate the purchasing power of communities while serving their needs. We have therefore begun to develop a description of the factors that underlie success in this area. Our research, the initiatives we have studied, and our discussions with stakeholders in the digital arena have given us a basic understanding of the problem and helped us formulate a means of tackling its economic dimension. Connecting the unconnected can alter the course of human development—and dramatically narrow the divide that perpetuates economic stagnation, poverty, and ignorance.

## THE BUSINESS APPROACH

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Using business methods to narrow the digital divide requires a shift in conventional thinking in several areas. To begin with, we need to view the digital divide from a business perspective rather than a philanthropic one. We are not opposed to philanthropy. A certain amount of philanthropy may be necessary to get a digital economy up and running in areas that are not yet connected. But to sustain that economy—to keep it operating, contributing, evolving—the new infrastructure must not only empower businesses in the communities it serves, it must also *be* a business. Providing digital infrastructure and Internet access needs to be—at least potentially—a self-sustaining and therefore an economically viable enterprise.

Another paradigm that needs rethinking is the conventional distinction between the community and the consumer, because in unconnected areas the consumer and the community may be one and the same. The community is often a village, but it can also be a community of employees, of professionals, of health care workers, women, or social activists; and the community can cross political borders and even span the developed and developing worlds. At the very least, *community* appears to be one of the keys to building sustainable businesses. Individuals are rarely in a position to acquire their own computers and Internet access. Even a whole village might not be able to manage the necessary investment. But the village may be able to support a business that sells computer time and connectivity by the hour.

Yet the role of community goes further. In our experience, most successful approaches to the digital divide are community based—in fact, more than community based: community engaged. The community tends to be strongly—even emotionally—involved in the activity. Its members feel a common identity, communicate actively with one another, tend to make decisions collectively, and are inclined to participate in the business and have a sense of vicarious ownership. The community is more than a consumer base. It is a committed participant.

The work BCG has done to date suggests that a sustainable information business, with a community as its active customer, will have six critical requirements. The first three are contextual:

- It must address the specific needs of the particular community it serves
- It must employ relevant and appropriate technologies
- It must adopt a suitable business architecture

These three requirements secure the primary benefit to the community: social sustainability. They are also a precondition for meeting the three requirements for an economically sustainable information business:

- Economic viability
- Scalability
- Replicability

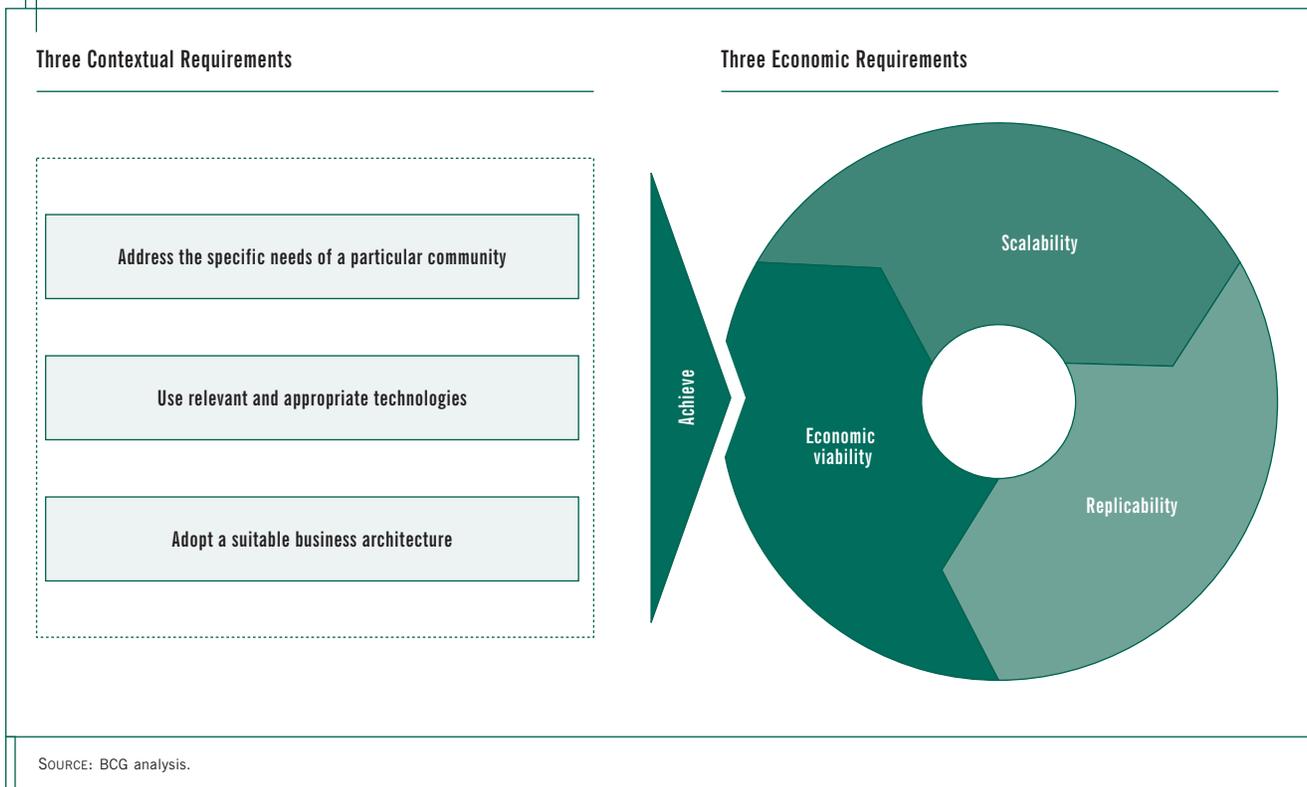
Let’s look at the six requirements one by one. (See Exhibit 6.)

**Community Needs.** Technology is not an end in itself. Providing access to it works as a sustainable business only if the technology enables people to solve problems and satisfy needs. In the poorest regions of the world, a community’s immediate needs are likely to be food, shelter, drinkable water, and basic sanitation; and closing the digital divide is not going to do much to meet those needs in the short term. (See Exhibit 7.) The most effective point of entry for an information business is therefore at the level of more general needs such as education, health care, and livelihood. And in fact, most digital-divide initiatives—about 85 percent—address those needs.

Above the level of general needs is a level of specific needs in which information is central. As we move up the hierarchy of needs into the knowledge economy, where so much complex problem-solving and so many modern businesses and good jobs are now found, digital technologies become not only helpful but indispensable. Wherever the community may be and whatever its level of development and connectedness, the key is meeting needs. Pilot programs should do research on the ground to determine exactly what those local needs might be, but it is safe to assume that rural and urban needs will differ, that relative wealth will have a marked effect on needs, and that richer and more urban communities will tend to address the higher levels of the needs pyramid. Of course, the culture as a whole and the national regulatory environment will also affect needs and influence how they can be met.

At the same time, however, access to information has an effect throughout the hierarchy of needs no matter what need it was originally designed to

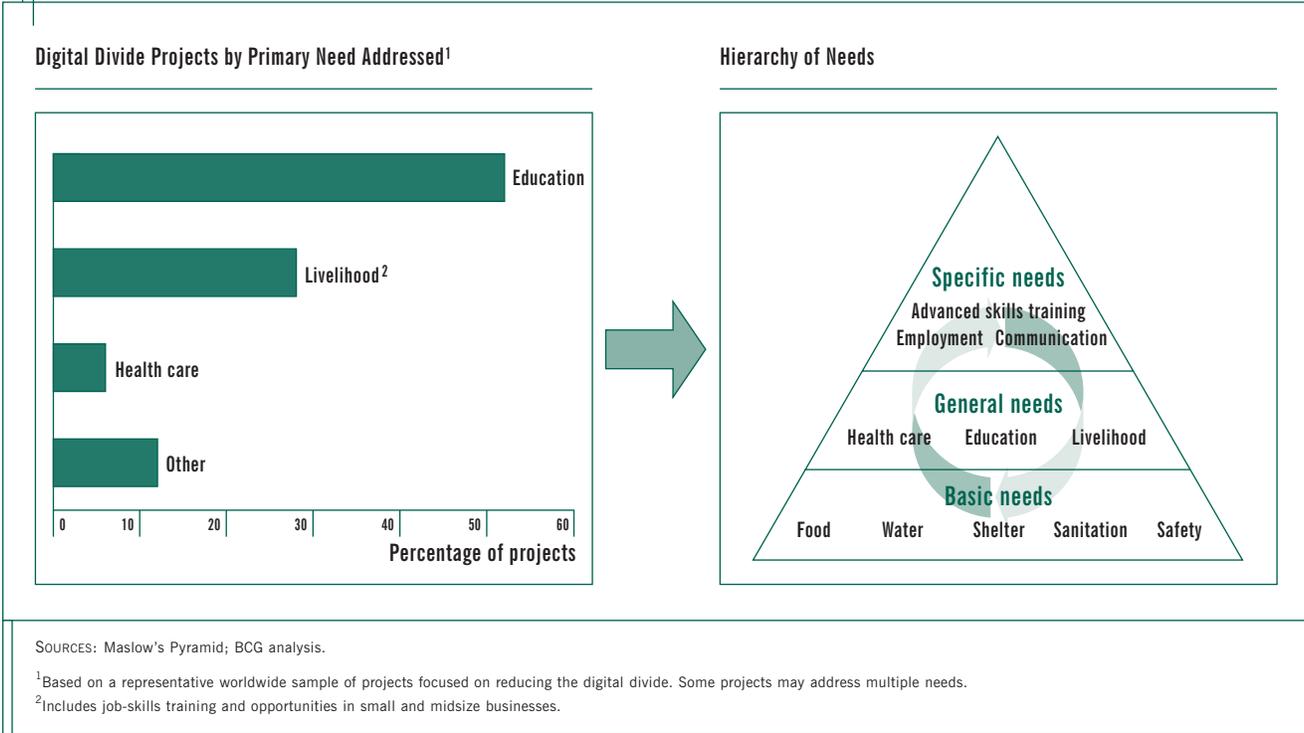
Exhibit 6  
A SUCCESSFUL INFORMATION BUSINESS MUST DO SIX THINGS



SOURCE: BCG analysis.

Exhibit 7

HEALTH CARE, EDUCATION, AND LIVELIHOOD ARE THE MOST EFFICIENT ENTRY POINTS, BUT ALL NEEDS ARE LINKED



address. Some of the initiatives already in place show that it is not necessary to meet every need at each level of the pyramid before addressing needs at the next level up. There is in fact a feedback loop, a virtuous cycle of development, in which programs designed to solve one problem may have secondary effects that help to solve others as well. Since every community problem has component parts that can be addressed independently, one good approach is to look for an entry need as a means of gaining traction and setting the virtuous cycle in motion.

Suppose, for instance, that better market information allows a community of farmers to get better prices for their crops. As their incomes rise, they can afford medicine and better health care. Perhaps they can send their children to school. Perhaps better health care will increase their productivity. In such cases, better access to agricultural market information has a primary effect on wealth and a secondary effect on education, health, productivity—and more. Or take the example of the

well-drilling equipment required to help communities meet their very basic need for drinkable water. Well-drilling rigs are expensive. But by improving logistics and streamlining the way equipment is moved and used, modern communications technology can help to increase the number of wells that get drilled—without anyone's having to purchase a single additional rig.

Another important consideration is the similarity of needs across different developing regions. Often, programs that work in one area will work in others as well, allowing existing solutions to be replicated at what is sometimes a considerable savings in development costs. We will come back to this question when discussing replicability.

**Relevant Technologies.** The subject of appropriate technology has been debated for decades. Fifty years ago, it was widely assumed that the technologies most suited to the developing world were necessarily simple and primitive. More recently, many have begun to argue that the most modern and

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sophisticated digital technologies are often the most appropriate.

The question is, What level and form of digital technology is relevant? The definition of relevance or appropriateness has several dimensions and must consider not only the technology itself but also its deployment. For example, are some components of the infrastructure already in place? Can the technology be adapted to leverage whatever *is* in place? Is the technology suited to local environmental and social conditions? Can it be serviced, scaled, and replicated? Finally, can the technology be made affordable? In most cases, making it affordable means lowering the cost of use or ownership by 90 percent, not just 10 or 20.

As it happens, technology firms and academics in both the developed and developing worlds are heavily engaged in finding answers to all these questions. (See the inserts “Voxiva” and “The Simputer” for brief descriptions of two of their initiatives.)

**Business Architecture.** Using business models to give a community access to information is in large part a question of cost and potential revenue. Infrastructure is expensive, and the community

served is likely to be poor—a dilemma that requires some creative thinking about an appropriate business architecture.

Businesspeople tend to get locked into traditional views of consumers, organizations, and resources. They see the consumer as an individual. They see organizations as fundamentally hierarchical. And they tend to view with suspicion all assets and resources that are not their own. But these conventional views are untenable in developing communities. The facts of life in such communities tend to encourage quite different—but fortunately quite effective—solutions to the problems of expense, revenue, and business architecture.

Anyone setting up a pilot program or incubating a business in an unconnected community should look to the most successful local entrepreneurs for tips on how to think about business architecture. They know that consumers are more likely to be communities than individuals, that local organizations are more likely to operate from the bottom up than from the top down, and that assets are likely to be limited but serviceable. The best entrepreneurs form partnerships with local institutions, governments, and commercial networks.

## VOXIVA

Large organizations in developing countries need more effective ways to interact with their employees, customers, suppliers, and affiliates, and in the less developed world the Internet is either unavailable or unaffordable or both. At the moment, most communications take place person-to-person or on paper, making critical information flows slow, expensive, difficult, or simply impossible. Now a U.S. company, Voxiva, has solved this problem by extending the reach of voicemail and automated business applications to anyone with access to a telephone. Voxiva provides an integrated set of voice and data services that can be accessed over fixed-line or mobile telephones.

Users need no training—they don’t even need to be literate. They merely dial an access number and log in. Then they can use the keypad—or their voice—to send and receive voicemail, submit data, order goods, check an account balance, access libraries of prerecorded informa-

tion, monitor delivery status, or reach an operator. Voxiva services are also available on the Web, but in the 20 Latin American countries where these services operate, there are 540 million telephones and only 60 million Internet users.

Voxiva is being used in health care in Peru, where it enables the Ministry of Health to monitor disease reports, handle pharmaceutical orders, disseminate information, send lab reports, and provide doctors and health care workers in 6,000 offices with a means of communicating among themselves. Microfinance institutions use Voxiva to receive applications and communicate with remote borrowers. Small-business owners can use it for inventory control and restocking. Voxiva is not only relatively inexpensive to use, its widely varied applications give social and commercial networks an invaluable shot in the arm. Like all effective technologies, Voxiva fights poverty in several ways at once.

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## THE SIMPUTER

If the digital divide is to be bridged or narrowed, then one requirement is some way of delivering modern information to common people in their own language—perhaps even to people who are illiterate. But the first requirement is a low-cost computer. In December 1998 the Global Village—an international seminar on information technology for developing countries organized in Bangalore, India—set itself the task of producing such a device. The task force was spearheaded by four faculty members from the Indian Institute of Science (IISc) at Bangalore and three technology experts from a company called Encore Software Limited, also in Bangalore. The result—in March 2002—will be the Simputer (short for simple computer).

The Simputer is an inexpensive, portable alternative to the personal computer. With a screen size of 240 X 320 pixels and with 32 megabytes of RAM, it is smaller and less powerful than a PC but larger and much more powerful than a PDA. It runs on a chip from Intel's StrongARM line (known for low power consumption) and operates on three AAA batteries or can be plugged in. The operating system is GNU/Linux. There are two ways of entering text: through a “soft” keyboard that can be brought up on the screen and touched one character at a time, or by means of character-entry software called tap-a-tap that is similar in spirit to Palm's Graffiti. If someone absolutely must enter a great deal of text—which is not a recommended use—it will be possible to attach a USB keyboard.

The Simputer features simple, natural user interfaces based on touch and audio. It will connect to the Internet through an analog modem and will be compatible with a GSM interface or a wireless LAN. The browser uses

Information Markup Language (IML) that will enable the Simputer, with its limited display and input capabilities, to access content from the Internet and make it usable. A smart card will permit personal (and private) information management for an unlimited number of users. Other features under development include a color panel, text-to-speech software, and a high-capacity battery.

The projected cost of each Simputer—once production has reached a volume of approximately 100,000 devices—will be about 9,000 rupees (roughly \$180). Even this is beyond the means of most common people in less developed communities, so the Simputer, with its smart card, is designed to be shared. The village school, a kiosk, the village postal clerk, or a shop owner can act as the Simputer keeper and rent it out for defined periods to different individuals in turn. At an affordable price, the device can take on applications areas as diverse as microbanking, data collection, agricultural information gathering, schoolwork, and much more.

In early 2000 the faculty members of IISc Bangalore and the Encore experts formed what they called the Simputer Trust, which now owns the rights to the Simputer design. The Trust's mission is to harness the Simputer's potential for the benefit of all segments of society. It expects to derive revenues from licensing the design to manufacturers and intends to use the funds to set up infrastructure to support the Simputer project. For example, the Trust plans to obtain licenses to act as a rural Internet service provider, and to fund NGOs that could help to expand Simputer use. The Trust's vision is to promote the Simputer not as a product but as an evolving platform for social change.

We've already talked about the role of the community as consumer—the village effect. There are two points to bear in mind here with regard to business architecture. First, the marketing model is not many-to-one but one-to-many. The familiar paradigm is the individual consumer approached by many companies. But the village paradigm is a collective. In less developed communities, the individual is unlikely to be a significant source of revenue. The collective can be. Collectives have the potential to produce enough revenue to amortize infrastructure and sustain a business, so businesses should try to bundle and leverage local purchasing power.

The second point is that the “village” in question may be one segment of a larger population or a group that is dispersed geographically—say, the community of people seeking adult educational opportunities in south central Los Angeles or the community of health care providers in the developing world. Such groups act like communities, share information, and use technology collectively.

Business architecture is not only a matter of working from the bottom up. It is also a question of marshaling resources—and resource partners. The challenge for a digital business or pilot program

faced with a huge infrastructure investment is figuring out not how to build or import its own assets but rather how to aggregate, configure, and leverage the assets and resources that already exist: entrepreneurs, local and national governments and government agencies, community centers, schools, banks, NGOs, merchants, suppliers, and others.

Government relationships are particularly critical. Governments control the regulatory environment that permits, facilitates, or impedes the diffusion of technology. They often provide initial investments or ongoing subsidies. Local officials may also be opinion leaders and can influence the community's decision to use the services that the business offers. Local entrepreneurs are almost equally important because of their resourcefulness, creativity, and local knowledge. NGOs are also valuable partners, partly because they are experienced in the kind of public relations efforts that draw international attention to needs and causes.

To create a business architecture in the unconnected world, it is essential to align the interests of all stakeholders—communities, businesses, governments, and NGOs—and make sure they understand the contributions they can make and the benefits they can enjoy. A good business model can be the catalyst that lets stakeholders work together to achieve their separate objectives. (See Exhibit 8.)

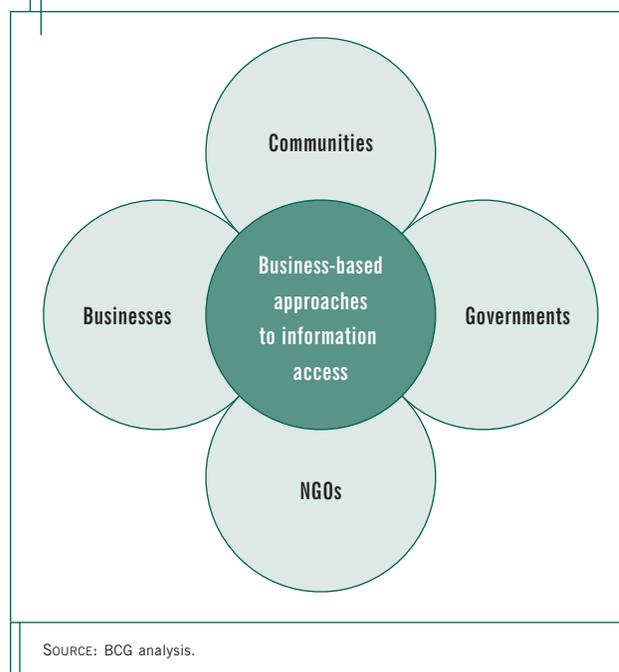
What much of this discussion comes down to is a different approach to control. In their traditional businesses, companies work with stakes of 50 percent or more, set up hierarchies to manage the workload effectively, and refuse to allow goals to migrate far from the original plan. This kind of control helps companies manage costs and maximize revenues. In the connecting world, however, tight controls may backfire. Corporations must learn how to move from control to collaboration on the basis of trust and common interests. They need local partners to help them understand the community and find ways to work within it; they need corporate partners to help them build investment synergies and increase commercial viability. Networks of conventional and unconventional partners—some of them thorny and difficult—have to work together toward common goals.

### **Economic Viability, Scalability, and Replicability.**

Community needs, relevant technologies, and business architecture are primary considerations. They shape the business model and the offering. The final three requirements for an information business provide for the survival and expansion of the business itself.

*Economically viable* means self-supporting. The trouble with subsidized programs that cannot support themselves is that they vanish when the subsidy is withdrawn, which can happen for any number of reasons that have nothing to do with the program's success in meeting its goals. The difference between a subsidy or gift on the one hand and an investment on the other is that an investment is expected to produce a return, and as long as it does so, the survival of the enterprise depends on nothing but its own ability to create value. Few businesses make a profit at the outset, of course, but a proper business plan is designed to measure progress toward self-support and eventual profitability by setting up milestones and metrics along the way, and to signal the need for corrections and

Exhibit 8  
**BUSINESS-BASED APPROACHES CAN BRING RELEVANT STAKEHOLDERS TOGETHER**



SOURCE: BCG analysis.

adjustments whenever the interim goals are not met. Economic viability is the cornerstone of any business model. Scalability and replicability may contribute to it, but there is little point in scaling or replicating a business that cannot stand on its own two feet.

*Scalable* refers to how readily a business can expand its customer base, either by attracting new customers or by selling more to the customers it already has—or, preferably, by doing both. It can reach out to new locations, add new products or services, alter its pricing structure, offer more and better market information, or, in the case of an information business, expand the size of its network. The last approach adds new customers and also makes the basic offering—connectedness—more valuable. Another way to scale up is to expand the offering by partnering with other companies and adding their products or services.

To accomplish any form of scaling up, a business must have access to new capital, new sources of labor and technology, or new forms of governmental and regulatory support. The benefits of increased scale are great. First and foremost, increasing the number of customers means lower unit costs because fixed costs can be spread across a wider base. Efficiency and effectiveness rise, learning accelerates, and the value of information goes up as the network grows.

*Replicable* means that the business—or at least the business model—can be reproduced in a new location. In the case of an information-access business in the developing world, there are two key questions to answer. First, are there other communities or regions that have similar needs? An agricultural community in Peru may be wrestling with much the same set of communications issues that affect a village in India. Second, are the regulatory environment and the infrastructure comparable? Even within a single country there may be little standardization of, say, electrical power, and regulations can vary hugely from one place to another.

In looking for similarities, begin with these three criteria:

- geography (primarily rural versus urban)
- relative wealth (which defines the level of need)
- jurisdiction (because the regulatory environment is so important)

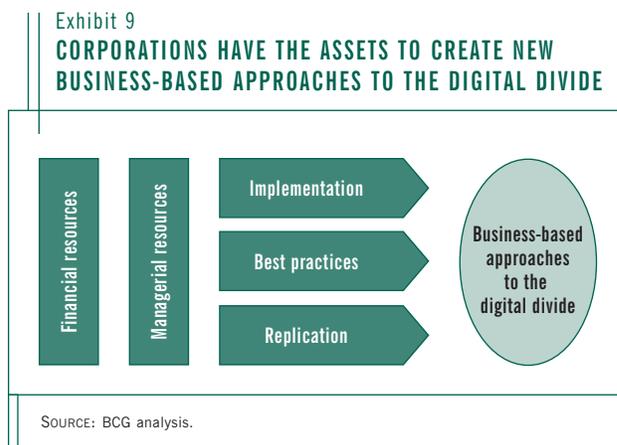
What form the replication takes—franchises, branches, new partnerships—will depend on economic and financial circumstances.

For one example of how all six requirements play out in practice, see the insert “Drishtee” (page 12). BCG acts as business consultant to this pilot project.

## THE ROLE OF CORPORATIONS

Corporations, regardless of their industry, can play a valuable role in connecting unconnected communities to the global information economy. They have most of the skills, capabilities, and assets needed to create vehicles for sustainable development: financial and managerial resources, physical assets, and extensive experience in enterprise building. Corporations also understand markets and how to create, penetrate, use, and leverage them—vital skills in any effort to build sustainable economies in underdeveloped areas. (See Exhibit 9.)

What corporations do not yet seem to have is a clear, self-interested reason for getting involved in the struggle to close the digital divide. Many of them do have an office of social responsibility that recommends philanthropic organizations and tries to focus the company’s giving on worthy causes. But



## DRISHTEE

The Boston Consulting Group had three objectives for its pilot project in India:

- To prove that a sustainable, scalable, replicable business model could be created for providing connectivity and services to rural areas
- To define what it would take—relationships, roles, critical processes, investments, catalysts—to get such a business model up and running
- To gain firsthand experience in rural development and in the area of wealth creation in Indian rural markets—the holy grail of business in a country where about 74 percent of the population live in villages

The company we chose to work with, Drishtee, is a for-profit start-up operating more than 20 Internet kiosks in the Sirsa district northwest of Delhi in Haryana state—and another half dozen kiosks in three other districts in other parts of India. Drishtee's short-term business model is focused on district government online services.

India's 550 district governments are the country's main administrative units, providing daily services to the Indian population. They maintain vital statistics (including caste identity), issue business licenses, document land transfers, disseminate government information, and handle applications for scores of permits and certifications. Drishtee persuaded the Sirsa district bureaucracy—which includes many young, ambitious civil servants with a taste for technology—to allow the company to use its kiosk network to collect requests for these services and supply government responses.

Through licensed hub operators and village kiosk operators, the company sells its intranet connection—and help with the forms—to village residents for modest fees. For 20 rupees (about 40 cents), the computer operator will help a young person fill out the application for a permit to learn to drive, then submit the application over Drishtee's intranet. (Because of the cost—and poor quality—of connectivity, Drishtee does not use the Internet. Instead, it employs a dial-up connection to a hub server that synchronizes data with the kiosks once or twice a day, avoiding lengthy connections that would encounter frequent interruptions.) The applicant avoids the cost of a round-trip ticket to the district center (also 20 rupees), saves the time it would take to make the round trip and wait in the necessary lines (at least a full day), and eliminates the risk of having to pay a “greasing” fee to the official

accepting the application. The increased transparency of the intranet system helps to ensure that services are delivered.

Drishtee's longer-term business plan calls for a wide variety of commercial services as well: a job exchange, inventory management for shops, banking services, agricultural market information, and matrimonial services, to name a few. And the company has already begun to add some educational services. For example, its computer training courses have been very popular because they offer marketable skills.

Drishtee's business architecture has three levels. The company's head office in Delhi has responsibility for building the network, recruiting partners and hub operators, managing and upgrading software, and coordinating relations with state governments and with corporate clients and partners. The company currently owns or licenses hubs in four districts and is setting them up in three more. (In some cases, the company builds and operates the hub before turning it over to a licensee.) Hubs are responsible for recruiting village partners and for maintaining hardware at the village kiosks, providing service fulfillment, and working with district governments. The village kiosks, finally, market and deliver services to village residents.

Kiosk operators pay a one-time license fee of 9,000 rupees (about \$180), of which 5,000 go to the hub and 4,000 to Drishtee. At the moment, kiosk operators keep 80 percent of their local operating revenues, the hubs get 13 percent, and Drishtee, 7. The business plan yields a quick cash-flow break-even point at both the village and the district levels (as early as the second quarter of operations) and a slightly later one at the network level (in the seventh or eighth quarter). In addition, village operators need to lay out about \$920 for hardware, and hub operators a little more than \$5,000. At these investment levels, they recover their capital in about two years. Of course, returns at each level depend on business success at the next level down.

Drishtee began operations at the beginning of 2001, and results so far are generally positive. Government online services and educational opportunities are popular in rural areas, and the business is clearly sustainable at the kiosk level—probably at the hub and network levels as well. The Indian business community senses an opportunity, and a number of commercial partnership initiatives

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are already under discussion. A national tractor company, for example, will use village kiosks to provide product information and reward kiosk operators with a commission on every lead that converts to a sale. In addition, the Indian federal government offers below-market financing for kiosk operators as part of its rural development program. Moreover, all parties are preaching the right message: that access to information at the village level is provided most effectively and sustainably by private enterprise, and that a network of partnerships is the way to make the business work.

The necessary partnerships are indeed numerous. The delivery network—itself a partnership at three levels—must partner with district government as well as with state and federal governments, with infrastructure hardware and software providers, with online service providers, with financial institutions, with the local community and its social and agricultural organizations, with local governments and local businesses, with regional and national businesses, with NGOs, and even with multinational corporations. This is not a wish list but a realistic, even a minimal, summary of the partnerships required to make the business work. It should be noted that a great many of these entities already work closely with each other, often in traditional, well-established partnerships. The job of the information and communications provider is not so much to build the network as to fit itself into the networks that already exist. Drishtee and BCG have given partnering considerable attention, with very positive results for the business as a whole.

At the same time, however, the challenges are great. To begin with, there is not yet an adequate solution to the problem of connectivity. The dial-up, copper-wire connec-

tions now in use are far from dependable. Wireless-in-local-loop technology has a great deal of promise but has been rolled out so far only in South India—with subsidies to compensate for the lack of enough traffic to support the infrastructure. A second problem concerns the district bureaucracies. Government services are the most popular online offering, but Indian bureaucracies are cumbersome, conservative, and hard to work with efficiently—despite the enthusiasm of some young civil servants.

A third problem has to do with building out the network. Finding the right people is a considerable challenge. Hub and kiosk operators often lack capital, business experience, and technological know-how. Drishtee and BCG are experimenting with various ways of finding better hub and kiosk operators, improving collaboration with district bureaucracies, finding a better mix of services, developing technologies more suited to rural environments, and building additional partnerships with the Indian business community.

In the meantime, Drishtee has aggressive plans for further expansion. The company has been in operation for one year and has some 30 kiosks. By the end of the first quarter of 2002, it could well have 60 kiosks—an excellent beginning. The company's plans call for eventual penetration of all of India's 550 districts with 40,000 kiosks or more. Although the company's time frame for achieving this goal (five years) is probably too ambitious, there is good reason to think that most districts could support an initial average of 100 kiosks, with each one serving four to eight villages. Meeting that goal, however long it takes, would alter the face of India forever and move the country decisively closer to the age-old vision of rural wealth creation.

rarely do companies think of their gifts as investments in anything but corporate image and self-image. Some corporate officers would be wary of the suggestion that a generous corporate impulse should have an eventual payoff (except, of course, in terms of global brand equity). A gift should be given without strings.

There is nevertheless a useful distinction to be made between charitable gifts—to an emergency relief agency, a school, a clean water program—and investments that aim to build economically sustain-

able development. We define *economically sustainable* to mean that an enterprise is independent of subsidies that can be withdrawn—a definition that presupposes revenues, self-sufficiency, and eventual profit. Consequently, business models—and the planning, pilot programs, seed money, and investments that go into them—are the very essence of sustainable development.

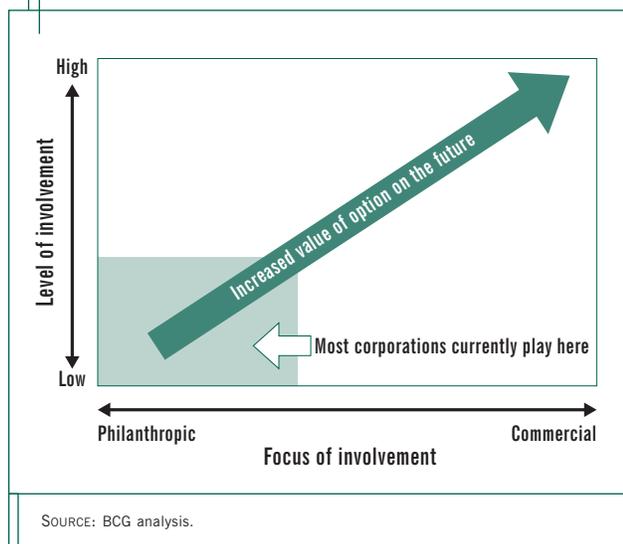
What we suggest is that corporations think not only about their social responsibilities but also about their social opportunities, and that they think about

those opportunities in terms of real options on future returns. Real options are more than just a leap of faith. They are a way of getting into a market at low cost with a high upside. Technically, real options are potentially profitable equity investments that can be abandoned if the project shows clear signs of failure or increased if it shows signs of long-term success. Corporations should understand that their ultimate return will be in proportion to the size and risk of their investment. (See Exhibit 10.)

The nature of that return can begin to take shape quite rapidly. Companies need to think not only in terms of the bottom line (profits) but also of the top line (revenues) and the middle line (costs). The identification and development of new customers and distribution channels, the chance to build brand recognition, the ability to test innovations and create new offerings, the opportunity to source new labor markets and increase productivity through skills training, and the development of new local relationships—all these count as tangible benefits even before the advent of profits and positive cash flow. (See Exhibit 11.)

In our opinion, the real-options approach has a greater chance of success than any approach that lacks the element of self-interest. An investment

**Exhibit 10**  
**CORPORATIONS MUST RECONSIDER THE LEVEL AND FOCUS OF THEIR INVOLVEMENT**



**Exhibit 11**  
**CORPORATIONS HAVE SOUND BUSINESS REASONS TO INVEST IN DIGITAL DIVIDE SOLUTIONS**

Tangible Benefits	
Cost reduction	Market development
<ul style="list-style-type: none"> <li>• Access to new or more skilled labor markets</li> <li>• Shorter product-development cycle times</li> <li>• Lower cost to reach and serve customers</li> <li>• Reduced cost of purchasing</li> <li>• Improved asset utilization</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of underserved communities with aggregated spending potential</li> <li>• Test bed for innovative products and services</li> <li>• New distribution channels</li> </ul>
Intangible Benefits	
<ul style="list-style-type: none"> <li>• Increased brand equity and early-stage brand recognition</li> <li>• Employee goodwill</li> <li>• Local relationships and know-how</li> </ul>	

SOURCE: BCG analysis.

requires due diligence; due diligence requires the discipline of a business model; and a promising business model has a set of prerequisites for success—the six we have described. A program of option investments is more likely to produce real change—and to produce it over a shorter time span—than even the highest of ideals when they are not tied to a business plan.

Corporations can serve the world best by catering to the needs of millions of potential new customers in less developed communities. In other words, they can serve the world best by serving themselves. We invite corporations to take the modest risk that any option investment requires and to join BCG, the World Business Council for Sustainable Development, a variety of NGOs, and hundreds or thousands of individuals, businesses, institutions, and government agencies of the unconnected world in an effort to explore the synergies and benefits of crossing the digital divide.

### MOVING FORWARD

This report summarizes what BCG has learned in phase one of our program. Phase two, now under

way, is an effort to research and leverage the experience of digital divide investors, to bring together stakeholders to test and challenge our hypotheses and insights, and to initiate new pilot programs to test what we have learned. We are also continuing our pilot programs in India and south central Los Angeles.

We hope to continue these efforts to close the digital divide by working in collaboration with other organizations, institutions, and corporations—corporations in particular, for all the reasons we have discussed. Any corporation that wants to get involved in this kind of business-building, connectivity-building, prosperity-building venture can begin with what we think is an effective, reasonable four-step program that calls for actual investment—initially on a small scale—aimed at actual returns. (See Exhibit 12.)

**The first step is to reevaluate the way the company views developing communities.** To see unconnected communities as charity cases is to condemn them to the status of perpetual beggars. Far better for them and for the company to see these communities as potential markets and therefore as investment opportunities! Assess the hurdles and horizons, the risks and potential benefits. What’s needed is an options perspective, not a philanthropic one. The number of potential customers in these markets is immense.

Every corporate investment, including this one, must set hurdles and horizons. An investment in developing markets will have a lower hurdle rate and a longer time horizon than many other investments—certainly lower and longer than the ones the business world grew accustomed to in the 1990s. The tradeoff is the size of the potential prize. Seen in that light, such investments should find a place in a company’s portfolio as venture investments.

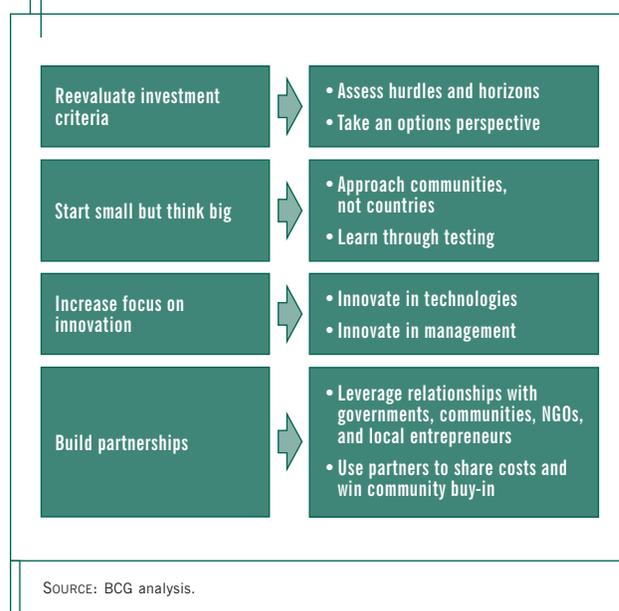
**The second step is to start small—but envision big.** At the outset, think in terms of communities, not regions or nations. Begin with a test or a pilot. Experiment. Learn what works. But if the option starts to look promising—which means viable, scalable, and replicable—then begin to think in terms of countries or continents. Fifteen or 20 years from

now, India, China, or Latin America could be enormous markets.

**Step three is to innovate in every possible way.** Abandon presuppositions about what constitutes an “appropriate” technology. Cut known technologies to the bone or come up with something completely new. Do the same with business models and architectures. Reconsider what you know about doing business in developed markets. Find new solutions to the problems of shipping, distribution, marketing, and after-sales service. Never forget how crucial it is to lower the cost of serving the customer.

**The fourth step is to build partnerships.** Use your own assets, of course, but focus particularly on those of the community, region, and country you’ve chosen to connect. You may be able to use government infrastructures for connecting rural centers and villages. You may be able to use local shops, schools, or libraries as resource centers. You can look for a successful local entrepreneur as a potential business partner. You may also be able to partner with an NGO that has an initiative already under way. An NGO in Africa has developed a network to allow African doctors to share experience

Exhibit 12  
CORPORATIONS CAN USE A FOUR-STEP PROGRAM TO BUILD POTENTIALLY PROFITABLE INFORMATION BUSINESSES



and information with doctors in the West. That means the NGO has developed relationships with a community that a partnership could leverage to provide other services as well. Winning buy-in from a community in the developing world can be very hard for an organization that enters cold.

Corporations need to remember that they are in this for the long haul. It will be more interesting

than most people imagine. It should also be more profitable. Charity has its place, but the way to give unconnected communities access to the information they require in order to develop fully is to build sustainable businesses. Fortunately, although business building is a marathon and not a sprint, the rewards of running the race begin long before the finish line comes into sight.

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