

RENEE KURIYAN  
ISHA RAY  
DANIEL KAMMEN

# How to Use Technology to Spur Development

*Merging technology and entrepreneurialism to meet the needs of the poor and improve their productivity has obvious appeal, but such efforts need more careful study and planning to deliver on their potential.*

**A**fter decades of global antipoverty efforts in which nonprofit organizations operated on a separate track from the business sector, disappointment with the results is leading a diverse group of institutions to test a new approach. In recent years, groups as diverse as the United Nations (UN), the World Bank, the U.S. Agency for International Development (USAID), nongovernmental organizations, national governments, and corporate giants such as Microsoft and Visa have backed the idea that philanthropy and profitability are not opposing forces. The central premise is that increasing the well-being of the poor while increasing the profits of the private sector can simultaneously be a sound development and business strategy. Operationally, this means marketing productivity-enhancing goods and services to millions of people, often poor and rural, who form what is called the bottom of the pyramid (BOP). Although this approach has generated much

enthusiasm and creativity in development circles, much remains unknown about how well this model works in practice. If implemented inappropriately, this well-intended approach will neither create opportunities for the poorest nor be financially self-sustaining for the private sector. We need to evaluate in detail what has been tried, as an essential step toward developing region-specific, pragmatic, and practice-based approaches for how companies and governments can serve the global poor and increase business opportunities.

The BOP model posits that the world is an economic pyramid with four billion people at the bottom who live on less than \$2 (in purchasing-power parity terms) per day. The 100 million people at the top collectively control more wealth and resources than the bottom four billion. That said, a joint report from the World Resources Institute (WRI) and International Finance Corporation (IFC) concludes that the BOP constitutes an enormous \$5 trillion global market. For the most part, however, these con-

sumers are not integrated into the global economy. They have significant unmet needs for financial services, technologies, water, sanitation, and health care. They often pay higher prices for basic goods and services than do their wealthier counterparts, a phenomenon known as the “poor penalty.” The BOP business approach argues that the private sector should lead the effort to develop this untapped yet lucrative market. These poor and usually commercially overlooked consumers, it is argued, need low-cost high-quality products, for which they are willing to pay, to raise their quality of life. The development of these markets would lead to poverty alleviation not through subsidies or handouts but through generating opportunities and choices for the poor.

This poor-as-consumers rather than poor-as-beneficiaries approach has received support and validation from a variety of influential stakeholders. The UN Development Programme supported the creation of innovative solutions to meet the demands of potential BOP consumers with the report, *Unleashing Entrepreneurship: Making Business work for the Poor*. USAID and the IFC recently joined forces to support a range of grassroots business-development projects that create sustainable economic opportunities specifically for the poor in the developing world. Also worth noting is that the number of small startups and entrepreneurs focused on the BOP is growing rapidly. Multinational and national companies are also attempting to meet the needs of the BOP, particularly with financial services, food, and consumer products. For example, Visa International has invested in BOP markets in Africa with low-cost banking technologies for use in rural locations.

The BOP model is in fact a continuum rather than a single model: Some proponents suggest that companies should be philanthropically oriented as well as profit-minded; others claim that simply doing business with the poor will lead to social and economic development; and yet others seem to conflate both positions without explicitly acknowledging the difference. Overall, the model represents a shift in business as well as development thinking in that it promotes private-sector-led efforts to serve the poor, instead of assuming that the government should take care of the poor while the for-profit sector caters to the middle and upper classes. The BOP model has obvious appeal to both sectors: The public sector is relieved of the huge cost of subsidizing basic services for the poor, and the private sector benefits from inroads into a consumer market of four billion people. And if the strategy works as promised, the poorest people in the world escape the poverty trap.

With the explosion of markets for low-cost cell phones, personal digital assistants, and personal computers, the information and communications technology (ICT) sector has been particularly influenced by the BOP business logic. More than half of the world’s population lives in rural or peri-urban areas outside the reach of ICT networks. To bridge this digital divide, the World Bank and IFC have invested \$5 billion in loans to ICT projects in more than 80 countries. Most USAID programs worldwide have an ICT component, with its latest report indicating that the U.S. government spent a total of \$120 million on ICT for development purposes (ICT4D). “Access to ICT for all” has also been identified as a means to achieve the UN’s Millennium Development Goals of sustainable development and poverty elimination. Many ICT4D projects strive for the dual goals of business viability and social development. The hope is that these technologies can be used to support health, e-governance, education, agricultural innovation, and market access, as well as create new business opportunities to lift communities out of poverty.

Mobile telephony represents the most dramatic ICT4D and BOP success story. According to the joint WRI and IFC report, between the years 2000 and 2005, the number of mobile subscribers in developing countries grew to nearly 1.4 billion, a fivefold increase. Annual increases in cell phone subscribers exceed 100% per year in some nations, notably in sub-Saharan Africa. Mobile phones increase mobility, reduce transaction costs, facilitate communication with relatives, and extend market competitiveness to rural sectors. The rural poor are increasingly purchasing and using mobile phones, which can provide access to jobs, medical care, commodity prices for fishermen or farmers, and, increasingly, financial services. This growing demand has translated into financial success for mobile phone companies, which now operate in some of the poorest regions of the world.

India stands out as a leader in developing ICT4D projects, with over 150 private and public initiatives. Mobile subscribers per 1,000 people increased from 4 in the year 2000 to 48 in 2004. Internet users per 1,000 people went from 5 in 2000 to 23 in 2004. The Indian government has made a concerted effort to deliver low-cost connectivity and ICT-enabled services to the “common person” for development purposes. One of the most popular channels for the mass delivery of ICT4D services is through access to shared computers in rural ICT kiosks (also known as telecenters). The kiosks are equipped with one or more Internet-enabled computers and are generally owned and run by independent entrepreneurs. The Indian government is in the process

of installing 100,000 ICT kiosks for business and government services throughout the country through a franchise model. Microsoft Corporation India has committed to initiating an additional 50,000 kiosks on the premise that such kiosks can be drivers of growth and facilitate development through business opportunities. The most recent company to seek its fortune in rural India is Google, with a simplified search engine and mobile phone applications, customized to provide weather information, crop patterns, and other relevant data to rural customers. Reaching the BOP while remaining financially viable is an explicit goal in almost all of these efforts, so India's ICT4D projects provide a window into the BOP approach in practice.

The Akshaya project in the southern Indian state of Kerala is a public/private-sector collaboration that aims for rural development through access to information and computer literacy and financial viability through sustainable business models. The private partners in this case are local entrepreneurs. Akshaya began by establishing 630 Internet-enabled computer centers, each serving 1,000 households and each run by individual entrepreneurs selected and trained by the government. The government's role is to subsidize a basic computer training course for the rural population. The government also provides business training for entrepreneurs, facilitates loans, establishes Internet connectivity, develops curricula, and computerizes government forms. The entrepreneurs' role is to leverage the subsidized computer training phase to attract new customers and to maintain the profitability of the business. At the same time, the entrepreneurs provide services such as computer literacy training and electronic payments for both the poor and nonpoor. The kiosks are therefore a means by which the government can deliver education and other services to the rural population. BOP proponents support this emerging trend in which businesses and governments, individually and in partnership, invest in advanced technologies and low-cost services to meet the needs of the world's poor. Our empirical investigation of Akshaya, however, uncovered three aspects of the project that complicate the implementation of the BOP model.

First, contrary to the objectives of the BOP model, we found that many entrepreneurs are not actually catering to the poorest populations but to people who earn much more than \$2 per day. In the Akshaya project, as in other ICT4D kiosk initiatives in India, the individual entrepreneurs running the kiosks face tradeoffs between serving the poor and making their businesses viable. Although these efforts are launched in the name of, and aim to serve, the poorest, in reality it is rarely practical to work with those at the bottom

of the social hierarchy. Entrepreneurs get more business from the better-off, who are a step (or possibly several steps) up the economic ladder. In other words, the people in need of development services such as e-literacy or local-language computer education are often distinct from the people who are regular and paying kiosk customers. So entrepreneurs face branding, pricing, and marketing challenges in attracting both groups. On the one hand, cost recovery requires selling to clients who are middle or near-middle class, more experienced in computer use, and more interested in advanced courses than in subsidized educational offerings. On the other hand, the kiosk entrepreneurs are being asked to serve the poorest, who may attend the subsidized basic course but often cannot afford to continue using the centers or do not find applications they are willing to pay for. Several kiosk entrepreneurs who had made a good-faith effort to offer services and programs that the poor were supposed to "need" were not doing well financially. Even in a state such as Kerala, with its 91% literate population, we found that the financially successful Akshaya kiosks were used mostly by middle-class students and aspiring professionals, not by those who needed basic educational or e-governance services.

Second, those entrepreneurs who did succeed in attracting poor as well as middle-class clients had to engage in continual trust-building efforts, regularly update their assessments of local needs and demands, and occasionally offer below-cost discounts for the very poor. At the same time they had to communicate effectively with the aspiring and emerging middle classes and to convince them that their kiosks were as good as privately run telecenters that had no mandate to serve the poor. In effect, and somewhat against the spirit of the BOP model, these socially conscious entrepreneurs subsidized the true BOP with the profits generated through serving the non-BOP. This balancing act was achieved by only a few of the Akshaya entrepreneurs, showing that the "strong" BOP model, which claims that savvy entrepreneurs can serve the poor profitably without being philanthropically inclined, is too simplistic.

Third, we found that public perceptions can make or break a business model. The BOP approach encourages partnerships between the private sector, local governments, and nongovernmental organizations, but its advocates are often ahistorical in their prescriptions. Determining the right level and nature of public support for the private sector is crucial for the implementation of this model. But these variables are highly dependent on the historical relations between the government and the private sector in specific locations. The Akshaya project was implemented in Kerala, a region with a long history of government leader-

ship in development programs for the poor. The middle class and poor alike thus had preexisting perceptions of what public-sector services look like. Because the project is a public/private partnership, with social goals in mind, both users and nonusers of Akshaya services indicated that these services were cheap, of low quality, and targeted toward the rural poor. Many people did not realize that the kiosks were private businesses intended to benefit the middle classes as well as the poor with relevant products and services. Consumers therefore tended to self-select out of Akshaya, with the relatively better-off using privately run, non-Akshaya computer centers, even if Akshaya centers offered comparable courses and services.

But why underestimate the value of serving the emerging middle classes or those who earn above the \$2-per-day threshold? Many of these people have also had limited access to high-quality low-cost products and services in the past. It is too soon to comment on the overall economic effects of kiosk projects for the poorest populations, but households earning between \$6 and \$10 a day could represent significant market opportunities and (possibly) development prospects through BOP-type projects. But the projects initiated thus far have been significantly motivated by the need to serve the poorest populations. Governments, corporations, and international donors need realistic expectations of who in fact can be served and can benefit from the market-oriented approaches espoused by the BOP model. At present, the rhetoric and expectations often do not match the actual outcomes on the ground.

**U**SAID, the World Bank, WRI, and other leading organizations have all accepted versions of the BOP philosophy as a win-win situation for ICT4D and entrepreneurship. If their ICT4D efforts and interventions are to have a real impact on less developed economies, they need to take a more transparent and nuanced approach to the BOP. The existing model, despite its good intentions, is in practice ambiguous about how to target a vast and internally differentiated market and impractical in its insistence on profitably serving the poorest. We propose a set of locally specific practice-based recommendations that can help the BOP approach evolve from an appealing idea to an effective strategy.

For companies and entrepreneurs:

- Supply will not create the expected demand. Only context-specific market research can assess the priorities and the purchasing power of the BOP. The USAID-brokered Internet telephony project in Vietnam is a successful example of

serving the BOP, because it was implemented only after a market survey indicated strong local demand for cheap voice communications. In addition, because the transaction costs of launching a local project can be high, USAID's facilitating role in bringing together multiple local, state, and private stakeholders helped ensure a long-term commitment to the project. For ICT4D projects to serve the BOP and remain commercially viable, committed stakeholders and accurate demand estimates are critical. This will lead to more viable ICT products, services, and pricing structures.

- The BOP is not a monolithic block of 4 billion people. Entrepreneurs must learn to segment and leverage the enormous variation within even the local BOP.

- With respect to ICT, the most popular model for shared access—the computer kiosk—is not necessarily the best way to serve the rural poor. Although ICT4D kiosks are widespread internationally, it is expensive to maintain kiosks with PCs and Internet connectivity, and it is a challenge to develop services that contribute to social development as well as profits in a differentiated market.

- If the target market were just the emerging middle class and not the BOP, profitability would be less of a challenge.

- Mobile phones, with their low power requirements, low upfront costs, durability, and short learning time may be more useful than the personal computer in the BOP market. It has repeatedly been shown that the BOP, even the very poorest, has substantial communication needs.

For governments and international development organizations:

- To determine the right level of public support for business-with-development partnerships, institutions must account for the legacy of past government services and their effect on consumer preconceptions.

- The path from affordable products and services for the poor to social development is neither short nor direct. Investing in e-governance mechanisms for the BOP market will not automatically lead to meaningful development or an improved standard of living, especially if these consumers lack access to the most basic services such as water, roads, or health care.

- In addition to enabling the poor to become consumers of products and services, it is important to enhance their capacity as producers and innovators. Buying from the poor and developing their marketing opportunities are at least as important as selling to them, because poverty reduction requires raising real incomes. Although BOP advocates have indeed voiced support for this idea, this is not the central proposition of the model.

- Realistic expectations and policy transparency with

respect to who can be served by BOP-based services are critical. Maintaining profitability with a customer base of the emerging middle classes is much more feasible than with a base of the rural poor and is valuable on its own terms. Serving the poorest may require targeted policies, some subsidized services, and facilitation efforts for longer periods than the current BOP discussions seem to recognize.

With a significant portion of the world still poor, hungry, and powerless, investing in the BOP is an uplifting idea for both companies and governments. But there is an inherent struggle between serving the poorest and commercial success. Governments must do more to encourage the private sector to make clear commitments to support the poorest. Companies and entrepreneurs may find that they need to cross-subsidize the true BOP, perhaps with a portion of their overall profits. We must think creatively but pragmatically about meeting both social and commercial goals so that the perceived rather than hypothetical needs of the BOP can be met and the capabilities of and opportunities for the poorest can be enhanced.

*Renee Kuriyan (rkuriyan@berkeley.edu) is a Ph.D. Candidate, and Isha Ray (isharay@berkeley.edu) and Daniel Kammen (Kammen@berkeley.edu) are professors in the Energy and Resources Group at the University of California, Berkeley.*

#### *Recommended reading*

E. Fife and L. Hosman, "Public Private Partnerships and the Prospects for Sustainable ICT Projects in the Developing World," *Journal of Business Systems, Governance and Ethics*, in press.

International Finance Corporation and World Resources Institute, *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid* (2007) ([http://www.wri.org/business/pubs\\_description.cfm?pid=4142](http://www.wri.org/business/pubs_description.cfm?pid=4142)).

A. Karnani, *Fortune at the Bottom of the Pyramid: A Mirage* (Working Paper No. 1035, Ross School of Business Working Paper Series, University Of Michigan) ([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=914518](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=914518)).

R. Kuriyan, I. Ray, and K. Toyama, "Information and Communication Technologies for Development: The Bottom of the Pyramid Model in Practice," *The Information Society*, in press.

C. K. Prahalad, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits* (Delhi, India: Wharton School Publishing, 2004).

United Nations Development Programme, *Unleashing Entrepreneurship: Making Business Work for the Poor* (Commission on the Private Sector and Development, Report to the Secretary General of the United Nations, 2004) (<http://www.undp.org/cpsd/documents/report/english/foreword.pdf>).

World Bank, *Global Trends and Policies-2006: Information and Communications for Development 2006* ([http://www.wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000012009\\_20060420105118&searchMenuPK=64187283&theSitePK=523679](http://www.wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000012009_20060420105118&searchMenuPK=64187283&theSitePK=523679)).

*Sekulula & Mzansi-Financial Access at the Bottom of the Pyramid* (World Bank Institute 11th International Business Leaders Forum, 2006) (<http://www.businessactionforafrica.org/documents/CaseStudiesVisa.pdf>).