Business Models for Technology in the Developing World: 
THE ROLE OF NON-GOVERNMENTAL ORGANIZATIONS

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"Forget Tokyo’s schoolgirls and Milan’s fashionistas. Instead, try the world’s 4 billion poor people, the largest untapped consumer market on Earth,” write Allen Hammond and C.K. Prahalad. The reason businesses should turn their attention to the world’s poor, they argue, is that their collective purchasing power is huge, contrary to the “myth” that the poor have no money. “In reality, low-income households collectively possess most of the buying power in many developing countries.” They cite figures showing that the 18 largest emerging and transition countries include 680 million low-income households, with a total annual income of $1.7 trillion—roughly equal to Germany’s annual gross domestic product. “Multinational corporations have largely failed to tap this market, even though the rewards for doing so could be substantial,” they write.

Hammond and Prahalad make a convincing case that selling to the world’s poorest people can be a key source of growth for global companies and simultaneously benefit and empower poor consumers. Innovative product design geared towards the very different needs and circumstances of developing world consumers is clearly a vital step in addressing this market. Many organizations and businesses have made important progress in understanding product design for the developing world, including Design that Matters at MIT and HP Labs India. However, to achieve the scale of mass adoption in the developing world that will be profitable for global companies, innovative product design is necessary, but not sufficient.

Many well-intended technologies devised for the developing world have not become commercially viable and have remained in the realm of the design studio or as charitable distribution programs. In our survey of product deployments in the developing world, in areas ranging from farming equipment to
telecommunication devices, we observed that those products backed by organizations with a strong focus on the development of a comprehensive business model were able to develop commercially sustainable products.

We observed significant differences in approach and organization between the deployments that were able to move from nonprofit projects to commercially sustainable operations, when compared with initiatives that were not successful in making this transition. The successful deployments focused first on the design and implementation of a business model that commercialized the technology, and only second upon product design. We further determined that these business models took significant time and experimentation to develop. Owing to differences in the infrastructure of many developing countries—or, more precisely, the lack of infrastructure—implementing effective business models took 5 years or more. Thus, effective business models take longer to create than do the technologies that require their presence. This is the reverse of most companies’ approaches to the developing world.

This creates a significant problem for the investment time horizons of for-profit organizations seeking to tap “the bottom of the pyramid,” a problem neglected by others who advocate greater attention to these markets. In the successful cases we studied, it was non-governmental organizations (NGOs) that did much of the initial creation of the business model infrastructure. This suggests a way to resolve the time horizons issue for for-profit companies: engage with NGOs to assist in the creation of business models. From the NGOs’ perspective, enlisting the involvement of for-profit firms creates sustainability for a technology, and it enables the NGO to “exit” and search out the next opportunity.

**Beyond Appropriate Design:**
**The Contrasting Cases of ApproTEC and Simputer**

Two innovative products developed by nonprofit organizations specifically for developing world customers illustrate why it is important to build and develop an effective business model. These products are the ApproTEC “Super Money-Maker” water pump in Africa and the Simputer in India. We sampled these projects for three primary reasons: they span “low-tech” and “high-tech” industries, they operate in different regions of the world, and they encountered different outcomes. These were selected from a larger sample of projects that were evaluated.²

ApproTEC designed a water pump that was highly adapted for the needs, budget, and environmental conditions of small farmers in Kenya. ApproTEC worked with IDEO, a well-known design company, and its own engineering team in Kenya to develop the design. The original design used human power and accommodated barefoot users. The pump was small and light enough to be carried on public transportation, used materials and manufacturing techniques already present in Kenya, and could be installed and run with no special tools. The pump cost less than $150 and could withstand a harsh environment, such that it required little maintenance. However, the original design didn’t work well
in the local environment. When the pump design was complete and prototypes were being tested, women found themselves in culturally unacceptable positions when they were using the pump. The initial design required the women to position their legs very far apart to work the pump, so the pump had to be redesigned to allow the women to work the pump with their legs closer together to accommodate this cultural factor.

The Simputer was also was also highly customized and adapted product for developing world consumers, specifically, a mobile computer designed and created for the rural poor of India. Each person would have a SIM card that carried his or her individual information. The design took into account the lack of electricity in most target locations. Additionally, the device interface didn’t require literacy—it had a speech and a graphical interface.

The Simputer has not gained widespread popularity, while the ApproTEC pump has been proclaimed a success. ApproTEC sold over 24,000 pumps in Tanzania and Kenya, 70% of which were to women entrepreneurs, generating $30 million a year in new profits and wages. IDE in India sold water pumps to more than 300,000 small farmers, benefiting to 1.5 million persons, with each pump adding on average Rs5000 (about $100) in income per year, out of an investment of Rs638 to buy the pump. The Simputer project has been abandoned.

What explains such different outcomes? Both projects created an innovative product for a specific developing world market. Both took the needs of the target populations into account. Both were sensitive to the environments the products would operate in (in fact, it took ApproTEC longer than the Simputer to adapt to local customs). In short, both followed the practices that Hammond and Prahalad recommend for accessing the “bottom of the pyramid.”

The most important factor in why ApproTEC succeeded while the Simputer failed is that ApproTEC developed a sound business model for its product. ApproTEC also provided leadership and assistance to local entrepreneurs to build up a network of local companies that form the value network to deliver and sustain the product in the market.

Simputer, for various reasons, did not do so. The developers of the Simputer did not provide vital elements of the business model, such as a means of financing that would enable low-income consumers to purchase the device. They also failed to create distribution channels or incentives for local entrepreneurs to set up local dealerships. Furthermore, while the creators of the Simputer developed an innovative product, they failed to establish a connection between the product and value to consumers. The weak value proposition of the Simputer became an even larger problem when the price point for the product was driven higher than originally planned. Expected large orders from government agencies did not materialize, and revised production levels were not at sufficient scale to meet the target price point. As a result, the Simputer was a well-designed and forward-thinking product, but without a viable business model, distribution network, or consumers that were willing to pay for it.

We think that the vital role of a business model is one reason why “the fortune at the bottom of the pyramid” (to quote the title of Prahalad’s recent
book) has gone untapped for so long. The knowledge that wealth was building in the developing world has been around for many years. Only now, however, are we beginning to appreciate the need to fundamentally re-think the business models that firms can employ to tap into that emerging wealth.

Another successful example is Grameen Phone. Grameen makes collective loans to small, homogeneous groups of people, who are then collectively responsible for paying the loan back. Women then can buy a Grameen Telecom Village Phone and start their business of renting the phone on a per call basis to villagers. Collective responsibility does more than reducing the risk of individual credit default; it also encourages the sharing of best practices among these women and creates peer pressure towards making each business profitable. Grameen Phone turns each phone owner into an entrepreneur. Grameen Telecom's village phones provide phone coverage to over 28,000 villages, giving access to phone service to more than 50 million persons, with the average revenue per user standing at the double of the average business user in Bangladesh.

There are many indirect benefits resulting from the work of NGOs such as ApproTEC and Grameen Phone. An Indian woman said about a treadle pump: “It has definitely helped build my confidence. I can do a lot independently.” In the case of Grameen Village Phone, villagers previously spent 2 to 8 times the cost of a single phone call to travel to neighboring towns to obtain information that can be obtained in a phone call. Avoiding a trip to the city represents savings up to 10% of the monthly salary. Farmers using the ApproTEC pump increase their revenues up to tenfold and reportedly are able to send their children to school for the first time.

The Role of the Business Model

Others have observed that the successful penetration of developing country markets with new technologies requires a business model. Emerson describes the need for a “blended value proposition,” and Dees similarly describes the business value chain that must be created in order to sell effectively in developing countries. Hammond and Prahalad go further, advising companies in advanced economies to take a clean sheet of paper in the design of the business. They provide some tactical advice on how to reach these consumers: “To reach them, CEOs must shed old concepts of marketing, distribution, and research.” They specifically call attention to the need for new approaches in the following areas:

- Business Models: “Shed traditional business models developed with wealthy consumers in mind.”
• **Innovative Research and Development:** “Successful product development requires a deep understanding of local circumstances, so that critical features and functionality . . . can be incorporated into the product's design.”

• **Modernizing Distribution Channels**

Hammond and Prahalad make a great case for why businesses should care about this market of 4 billion consumers. They give a number of examples of success stories of MNCs that have penetrated developing world markets profitably. However, the guidance they provide suggests that for-profit businesses can solve these challenges on their own. Our review of recent examples suggests that NGOs need to be part of the solution.

For example, with regard to shedding traditional business models, Hammond and Prahalad advocate adapting business models for local circumstances, but they give little guidance on what form this adaptation should take. While the Simputer had strong local input into its design and architecture, it nonetheless failed. What further adaptation was lacking? Also, we find that it is often the case in developing countries that there is no available effective distribution channel. In order for the technology to succeed, and for the business model to be enacted, such a distribution channel must be created.

To see the importance of creating a distribution channel, it is helpful to establish its role in a business model. The business model, as elaborated by Chesbrough and Rosenbloom, is a conceptual tool that connects product development and customer needs. In the context of technology innovations, “the business model provides a coherent framework that takes technological characteristics and potential as inputs, and converts them through customers and markets into economic outputs.” In this view, the distribution channel is a key element of the value chain that converts the potential value of a technology into realized value in the market.

In the developing world context, a coherent, locally relevant business model is critical in meeting the goal of developing profitable, sustainable markets. The success of products in developing countries, whether they are low-tech or high-tech, is highly correlated with the extent to which program managers thought through their implementation of their business model customized to the local conditions. In turn, building a distribution channel requires:

• enticing local entrepreneurs to invest alongside the technology to place orders, hold stock, break bulk, and make deliveries to often remote locations (usually on roads of poor condition);
• making sure that supplies needed are available within the country;
• training would-be entrepreneurs and helping them get started with seed financing;
• gaining the trust of established local entrepreneurs to franchise them and upgrade their standards of quality in manufacturing or customer service;
• creating original sales channels by leveraging advocates such as entrepreneurial women; and
• educating dealers and installers on new practices such as warranties.

In summary, the business model must create an architecture that coordinates a wide variety of actors and their investments. This is a more daunting task than in leading advanced economies, where the distribution infrastructure already exists and companies can hire or partner with distributors to get their products to market. In developing countries, enacting a business model must include the creation of key elements that may not yet exist in-country. Successful NGOs such as ApproTEC and Grameen have taken steps to create or strengthen each node in the value network so as to manage the external risk factors, such as weak infrastructure impairing transports of products or parts.

The extent of this challenge means that significant time is required to develop the distribution system. Nonprofits may better address developing world issues because of their long-term horizons and their comprehension of the overall system of use. Nonprofits primarily focus on social benefits and see the profit model as a means to that end. Enlightened nonprofits view the profit model as an exit option that facilitates sustainability once the nonprofits have moved on to new initiatives.

What is particularly notable about the Grameen phone story is the central importance of the business model to its success. Grameen Phone grew out of Grameen Bank, which provided a system of financing and support for individual entrepreneurs to develop small agricultural businesses. Grameen provides microloans that borrowers use to purchase a cow, for example, from which they are able to derive an ongoing stream of income from milk sales. Grameen provides training and support to enable the individual entrepreneur to successfully manage their micro business. In developing the agricultural business financing and support system, Grameen realized that they had in fact developed a fully functioning business model that operated efficiently in the developing world context and enabled sustainable, profitable businesses for the poorest segments of the population. Grameen Phone grew out of the realization by Grameen managers that they could simply replace the cow with a mobile phone, and the same value network that supported agricultural businesses would also support communications businesses. The dominant success factor for both Grameen Phone and Grameen Bank was the particular adaptation of the business model that they innovated for the particular circumstances of a rural, developing world community.

ApproTEC also illustrates the importance of an effective business model. It has focused on building a solid business model for its products by establishing an entirely local supply chain, from raw materials to manufacturing skills and distribution capabilities. As they have gained experience, they have developed a template that they follow to develop new business models (see sidebar).

ApproTEC's application of its 5-point model template led to the following impressive results:

• 33,000 new businesses started,
• 800 new businesses per month,
ApproTEC’s Template for Developing a Business Model

1. Research Markets to Identify High Potential Small-Scale Business Opportunities—Market and subsector studies identify profitable small enterprises that can be established by local entrepreneurs with limited capital investments. They examine raw materials, competing products, potential market demands and constraints and opportunities for small enterprises. By keeping the investment small, they enable participation. By looking throughout the value chain, they create a system of small complementary investments.

2. Design New Technologies and Business Packages—ApproTEC designs and develops the tools, equipment, manuals, and business plans required for establishing the identified small enterprises. It also designs and produces the tooling and quality control procedures required for manufacturing the new equipment. By taking on these specific investments, they help create a platform for the entrepreneurs to leverage in their own micro-businesses. This reduces risk for the entrepreneur; and promotes coordination throughout the business system.

3. Train Manufacturers to Produce the New Technologies—ApproTEC trains medium and large-scale private manufacturers in the major cities to mass-produce the new machines and tools. It trains them to set-up production assembly lines using the tooling designed by ApproTEC and trains them how to do quality control. ApproTEC then buys the technologies from the manufacturers. This ensures that, after ApproTEC moves onto other opportunities, a profitable infrastructure will remain in place to support the business.

4. Promote the Technologies to Local Small-Scale Entrepreneurs—ApproTEC promotes the new technologies and installs them in the private sector to ensure that they are well known, easily available, and purchased by thousands of small-scale investors. They recruit and train a network of local retail shops and then buy the technologies from the manufacturers and sell them with a mark-up to the retailers. Finally, they develop cost-effective marketing tools to promote and market the new equipment to local entrepreneurs, including: live demonstrations at the retailers; radio and newspaper advertisements; mobile truck mounted demonstrations in local villages; demonstrations at local shows and exhibitions; commissioned sales staff; and discounts and sales. The local entrepreneurs/investors buy the technologies from the retailers and use them to establish profitable new businesses. By reducing investment and risk, and increasing coordination, ApproTEC increases the chance that these entrepreneurs will be profitable, promoting sustainability for the business. Note, though, that ApproTEC does not attempt to eliminate risk from the distribution channel. Entrepreneurs must still make risky investments and compete with others for the business. This imposes market discipline on the distribution system.

5. Monitor Cost-Effectiveness and Impacts of its Program—It measures the number of new businesses and jobs created and the amount of new profits and new wages earned by the new entrepreneurs and their employees. These impacts are compared to the costs of the program. This enables ApproTEC to learn from its experience, and develop best practices for future initiatives.
- $35 million a year in new profits and wages generated by the new businesses, and
- new incomes account for over 0.5% of Kenya's GDP and 0.2% of Tanzania's GDP

**Analysis of the ApproTEC Model**

The success of the ApproTEC model in Kenya and Tanzania, among the world's poorest nations, indicates that there is much to learn from their approach that would be instructive for managers seeking to penetrate developing world markets. ApproTEC's approach can be viewed as an effort to build and develop the entire value network for its product in a market where the nodes of the network—e.g., manufacturers, distributors, finance providers, marketing partners—are not initially present and functioning at a level necessary for the success of the business model. ApproTEC takes a leadership role at all levels of the network with the goal of eventually allowing each node to achieve sustainable profitability.

ApproTEC's business model fundamentally seeks to create leverage. ApproTEC provides the design and intellectual capital for a new technology. Then it recruits anywhere from few to a few dozen manufacturers to build the design. Then a network of distributors, dealers, and installers (10 to 100 times more numerous than the manufacturers) are included. The final customers are, in turn, one to two orders of magnitude larger than the dealer/distributor network. This escalating volume through the value chain is necessary to supply enough demand to provide volume and profits to the upstream players.

This is also the pattern for IDE India, which sells water pumps. IDE India currently nurtures a network of around:

- 35 Manufacturers
- 100 Distributors
- 825 Dealers
- 1620 Assemblers/Installers

The goal is to empower the partners to be self-sufficient and capture a sufficient portion of the value from the network to sustain a living. Note that the NGO's role goes well beyond the initial development and design. The NGO must architect the distribution system as well. It even must provide for the training to build up local capabilities to get others into the system and to support them as the inevitable problems arise in the business.

**NGOs: Business Model Generators**

Organizations such as ApproTEC, Grameen Phone, and IDE India are a new breed of non-governmental organization. In our view, they are undervalued by for-profit firms seeking to penetrate the developing world. These NGOs
are business-savvy and results-oriented, and they are leading the way in adapting traditional business models to the developing world. They understand the environment of the world’s poor and have come up with successful business models in the developing world that the for-profit sector can both emulate and build upon. This new generation of NGOs views the private sector far differently from those who regard the private sector as exploitative. Instead, these NGOs regard the private sector as a source of new technologies to sustain themselves in the local developing economy. These NGOs realize that they operate in a world where government programs are limited and international aid is temporary. Only a profitable private sector can offer sustainability. Organizations such as these are exemplified by Bridges.org, whose mission is to promote the effective use of information and communications technology (ICT) in developing countries: “We bring an entrepreneurial attitude to our social mission, and we are committed to working with—instead of against—governments and the private sector.”

The positive results of nonprofit organizations such as IDE (India), Grameen Phone, and ApproTEC are all the more impressive when one considers that were achieved in countries or areas where infrastructure is almost or totally absent, basic products such as food and water are much more expensive than in the developed world, and capital is a scarce resource.

Creating Value Throughout the Value Chain

We have seen that the new breed of market-oriented nonprofit typically relies on local small entrepreneurs with a franchise model, which enables them to leverage local resources and establish sustainable economic development. Like the master franchisor in a developed economy, the NGO must develop the entire business architecture and recruit outsiders to invest their own time and money in a portion of that architecture in order to bring it into being. During the initial bootstrapping of the value network, the nonprofits are the hubs of that network. Unlike master franchisors in advanced economies, though, the NGO leaves the great majority of profits for local small businesses in order to build a sustainable economic ecosystem and provide incentives for local entrepreneurs. The creation of profits throughout the value chain is critical to NGOs being able to “exit” these businesses. Local small businesses can then sustain the manufacturing, sales, and installation of the products.

Much has been written about the success of micro-lending institutions in providing capital at affordable rates to the developing world. Micro-lending helps in the context of an appropriate business model by supplying the equity capital needed by various parties in the value network. Note, though, that the work of the NGO to establish the business architecture precedes the role of the micro-lender. Until there is a viable business to support (which in turn enables repayment of the micro-loan), the micro-lender cannot advance its loans.
Challenges Facing For-Profit Firms in Building Robust Value Networks in Developing Countries

Innovation is risky and time-consuming in the developed world. It is even more time-consuming in the developing world, since some of the infrastructure needed to support a business model (such as established distribution channels) is often absent. The west’s culture of innovation is not characteristic of cultures in developing economies where the same mode of living has been passed down through many generations, with far less variation than in the west. In these societies, changes are slower to happen. Typically, those at bottom of the pyramid have not yet developed consumer behavior patterns common among western populations. Therefore, the time frame for product deployment and customer adoption is fundamentally different from what it is in developed countries.

Creating and enacting a business model poses different challenges in developing countries as well. Contracts are seldom sufficient in developing contexts. Courts are slow to act, sometimes viewed as corrupt, and judgments can be hard to enforce. Relationships must be built through establishing trust and mutual interest. This is also true on the demand side. The benefits of the products in the local context have to be demonstrated in the local context before customers will buy. Additionally, it can take time for businesses to understand where a product is suitable, to experiment with changes to the product and business model, and finally adjust their perceptions of the marketplace before deciding whether and how much to invest.

Overall, the process of implementing a business model is slower because each step requires training and education of the consumers, as well as iterations of the business model. The poor or non-existent transportation and communications infrastructure in the developing world makes this process still slower. As a result, marketing requires a lot of time, and the adoption cycle is often protracted over a much longer period of time than we are accustomed to in the west. Patience, time, and resource-intensive efforts such as live demos at the retailers’ shops or at markets are required. These activities consume enormous amounts of time and likely render many business initiatives infeasible for profit-seeking firms from advanced economies. This is where NGOs come in.

Unlike for-profit organizations, nonprofits are freer from time constraints than for-profits. Nonprofits operating in the developing world are very familiar with the huge need and with the slow adoption of solutions to that need. They have proven to be both innovative and successful in this early-stage market-building work (as in some of the cases cited above) and they are willing to work with longer time frames. Nonprofits justify long time frames by accounting for the social benefits of their efforts, such as empowering local entrepreneurs or increasing participation of marginalized segments of the population in the local economy. Their willingness to exit the business once it has become profitable enables them to act in ways that enhance the sustainability of the business after they have departed.
HP Labs India and i-Communities

HP has been experimenting with alternative ways to get its technologies into developing country markets for some years. One such experiment involves HP connecting with local governments and NGOs through HP's i-communities initiative.

The first HP i-community was created in Kuppam, in the Andhra Pradesh province of India, in 2002. HP made a three-year, $3 million commitment to see how its technologies might find a market in this poor town. The program sought to test applications of HP technologies for agriculture, education, health, and e-government. While many activities were developed and tested, a key goal of the experiment was to see if a viable business model could be found, such that the activities could continue after HP stopped donating its equipment and expertise.

The i-community initiative has yielded a broad range of products and services. One major program was to deploy a mobile van, loaded with solar-powered HP gear. Each day, the van would go to a different village, and return to that village a month later. There were technologies in the van for testing soils, for evaluating literacy levels, for testing eyesight, for children's computer games, and for digital photography. There are now three such vans, operated in partnership with a local medical college. In addition to the services they bring to residents, these vans also play "Bollywood" movies on a portable screen at sundown, which is immensely popular with villagers and helps them to trust and accept the technology solutions inside.

The digital photography services offered by the i-community pointed to another potential opportunity. Local residents in and around Kuppam needed photographs for a wide variety of reasons, from government documents to bus passes to school papers and health certificates. There were many people who did not own a picture of themselves, their elders, or their children. However, the technology of digital photography could not be imported wholesale by HP. In rural India, the camera's ruggedness is more important than the number of pixels it can handle. Humidity, temperature, and dependable, renewable power sources were also key issues.

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The Promise of Partnerships with NGOs

This structural patience makes NGOs attractive partners for aspiring technology leaders who wish to expand their businesses to the bottom of the pyramid. Companies such as HP are now engaging with local NGOs to seed the initial market for HP technologies (see sidebar).

An even more ambitious attempt to leverage NGOs comes from Pfizer's initiative to combat HIV/AIDS in Africa. Pfizer has engaged in a number of actions to address the need to access drugs to combat HIV/AIDS, including sponsoring the formation of the Infectious Disease Institute in Kampala, Uganda. Here, NGOs are playing a critical role in educating the local market about the causes of AIDS, the ability to manage the disease, and dispelling the stigma that has accompanied the disease in many parts of Africa. The NGO further helps to distribute the drugs, since the local health system is not always able to do this.
The business model for introducing digital photography also had to be different. HP trained 12 women in the basics of photography and printing with digital cameras and portable printers. These women would then put the camera, printer, and needed supplies in a backpack, and go from village to village, charging a small fee for photographic services. Perhaps not surprisingly, in addition to necessary government photos and passes, people became interested in capturing weddings and family events with these digital cameras, which was previously almost impossible due to cost and equipment constraints. Initially, HP donated the equipment, and charged a low replacement price for the supplies, but the success of the program has allowed them to refine the model. Now, “village photographers” throughout the province rent the equipment for $9 a month and keep excess proceeds for their families. Some have doubled their monthly income and have used the money to improve the level of education for their children, bring running water into their homes, or transform a mud floor into a concrete one.

A different business model was being tested for towns such as Kuppan. There, community information centers contained kiosks staffed by local entrepreneurs, who would assist townspeople with their photographic needs. Again, the equipment was donated by HP. The kiosk entrepreneurs were recruited to the project by World Corp., an NGO interested in the project.

As the three-year test period comes to an end, HP is learning how much time is involved to craft business models for the developing world. To date, the project has not broken even financially. Even where there is a compelling market need, as with the photography technology, many of the other building blocks of a business model still need to be built. HP now holds a more conservative view of the time required to develop its business at “the bottom of the pyramid.” In order to improve the financial performance going forward, it expects to work more closely with NGOs in the future, to leverage their experience and local connections, and to harness their longer time horizons. The bulk of its own investments will follow after the preparatory work of their NGO partners.

Pfizer’s own ability to deliver its drugs effectively in Uganda depends in part upon its ability to work effectively with local NGOs in the region. Just as Western firms have come to appreciate the wealth of local market knowledge possessed by micro-lending institutions, so too should they tap the pool of local knowledge developed by NGOs.

**Making the Connection**

If companies and NGOs are going to work together, they will have to agree on a division of labor between them in building appropriate business models. The goal should be a working partnership, as opposed to a joint legal entity. The NGO rightly guards its independence and does not wish to be seen as the agent of any single company. NGOs’ models, for example, are well suited for the long lead time work that is necessary to lay the foundation for later business success. Activities such as recruiting, training, and coaching personnel for functions such as distribution are best left to them. Indeed, companies are well advised to seek out NGOs who have experience in recruiting and training...
personnel from prior work. NGOs can often raise training and development funds from philanthropic sources, who in turn prefer projects where a for-profit concern will provide matching funds. This gives financial leverage to contributions by the for-profit and stretches its initial dollars farther.

Formal advisory relationships are another mechanism to advance the business model. Applicable government ministries from the local or regional government and important local leaders (e.g., tribal leaders) might also be appointed. Both the company and NGO should provide representatives whose role is to provide "voice" and advice, not to make decisions.

If all goes well, the NGO will be able to "exit" the project after it has become financially viable. At that point, the project's leadership will shift to the company, while the NGO will move on to another project opportunity, using the success of this most recent venture as a key selling point to future donors and private companies.

In conclusion, there are tremendous long-term business opportunities for companies to market technologies to the developing world. However, addressing these opportunities will require substantial local knowledge and an abundance of patience. Companies that jump into this on their own will become frustrated with the time required to get results on the ground. Realizing these opportunities will require both appropriate technologies and appropriate business models. In the developing world context, it will take longer to build the latter than the former. Therefore, companies that wish to prospect for gold at the bottom of the pyramid should seek out partnerships with savvy, structurally patient NGOs. Together, they can build the business models that will drive sustainable business success in these untapped markets over the long haul.

Notes

2. Other projects included the Grameen village phone network, the Computador Popular in Brazil, and the Institute for Design Excellence Treadle pumps.
4. IDE (India) is an Indian not-for-profit organization. "At IDE (India) we use donor funds to stimulate a sustainable and free market by creating demand for affordable technologies and ensuring a sustainable supply chain." In areas with shallow water table, IDE promotes the use of a manually operated water-lifting device called the treadle pump (also known as pedal pump). See <www.ide-india.org/about_india.htm>.
10. From presentation by Khalid Quadir, member of the founding team of Grameen Phone at the 2004 U.C., Berkeley-UNIDO “Bridging the Divide” conference.

11. [www.approtec.org].

12. IDE water pumps are built with two metal cylinders with pistons operated by a natural walking motion on two treadles. It can be manufactured locally in simple metalworking shops. The treadles and support structure are made of bamboo or other inexpensive, locally available material. This makes the pumps able to be maintained with standard replacement parts available in local markets at a low cost. The efficient step-action operation makes it possible to pump the large volumes of water necessary for irrigation. All household members are able to operate the pump, allowing farmers to make efficient use of family labor. The low cost makes it accessible to even very poor farmers who can use it to grow dry-season vegetables for home consumption and for sale. On average, farmers are able to generate more than US$100 per year in extra income. Since 1985, when these first became available in Bangladesh, about two million treadle pumps have been installed worldwide.

13. [www.bridges.org/about/index.html].

14. For details on recent HP projects with community organizations, see [www.hp.com/e-inclusion], last accessed October 29, 2004.
