

3 ADAPT PRODUCTS AND PROCESSES

Kenya: M-PESA has developed a mobile phone money transfer service aimed at making financial transactions faster, cheaper and more secure. Photo: Vodafone



Tsinghua Tongfang (THTF) brought computing to farmers in China who had never used or even seen a computer. To accommodate their lack of computer literacy, the company created software that was intuitive to use (box 3.1). Through such innovations, THTF and many other companies have shown how inclusive business models can avoid constraints by adapting products or processes.

While other innovation strategies entail filling market gaps or engaging other stakeholders, adapting products or processes can allow a business to circumvent constraints by acting on its own. So, this strategy is often used to deal with constraints that are very difficult to remove, an ineffective regulatory environment or inadequate physical infrastructure. Filling the gaps can be unfeasibly costly and time-consuming. Designing products and processes that get around them is sometimes the only option for an inclusive business model. Adaptations are rarely used to fill gaps in knowledge and skills. That is partly because communication and training are easier than adapting products or processes

Box 3.1. Case study – Tsinghua Tongfang: bridging a digital divide

Not all innovations use new technology. Many product adaptations successfully reach the poor through what seem like steps down on the technological ladder. But their accessibility to the intended beneficiaries allows businesses to make leaps in growth and profitability.

Tsinghua Tongfang (THTF) is a high-tech Beijing computer company that identified a rich new market in a low-tech sector: China's vast rural agriculture industry. China's 900 million farmers have been slow to benefit from technological advances that have boosted agricultural output elsewhere. Farming depends on timely and accurate information as much as any other industry, if not more. But personal computers and the Internet are still largely absent from rural China and remain unfamiliar to its inhabitants. In 2003 THTF saw this situation as an opportunity to seize a large untapped rural market while helping to bridge the 'digital divide'.

THTF conducted three rounds of market research and identified several challenges. In 2005 a basic computer cost the equivalent of three months' income for a farmer—a prohibitive expense even before adding the monthly cost of Internet service (which was elusive, in any case, because of high startup costs for Internet providers). And farmers who could afford a personal computer usually did not know how to use one. Moreover, the quality of agricultural information available online was fairly low.

The solution for THTF was to tailor a product to farmers' needs and resources. Prospective customers made it clear that the most appealing product would offer what THTF called a 'systematic solution':

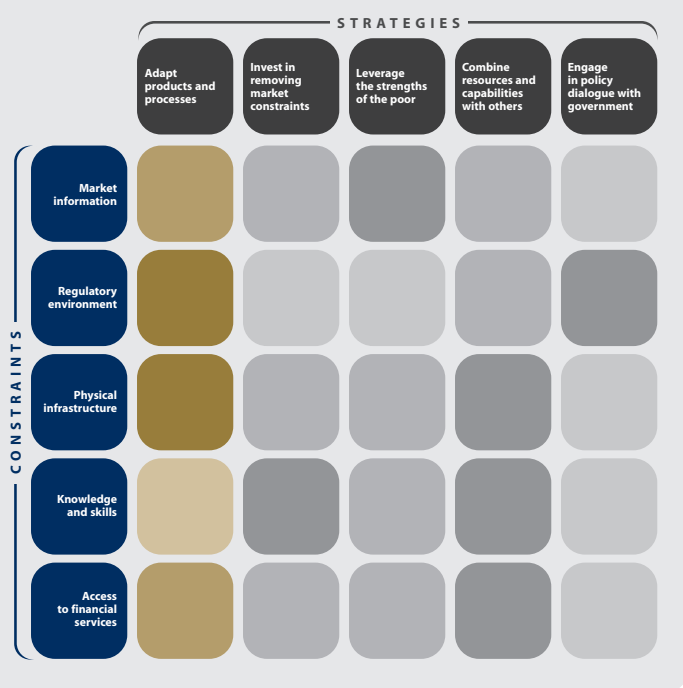
and promise more immediate payoffs. Another reason, however, is that certain basic skills can be indispensable for working with customers, employees or producers.

Two types of adaptation can be distinguished: technological adaptation and business process design. The two often go hand-in-hand, but distinguishing between

them is important. The spread of mobile telephony in developing countries, for example, is technology-driven. Wireless networks free data transmission from reliance on landline networks or transportation. But the widespread adoption of mobile phones itself was attributable in part to a change in business processes—the move to selling air time on prepaid cards, which made it unnecessary for customers to have bank accounts and freed providers from having to follow up on payments.¹

Business leaders can develop effective adaptations by observing and understanding target markets. Napoleon Nazareno, chief executive officer of Smart Communications in the Philippines, recalls how the idea of prepaid cards in small denominations occurred to him: 'One of our field salesmen asked what turned out to be the right question: Why can't we sell phone credits in very small amounts—like sachets for soap or shampoo? Our lowest price phone card at the time was 300 pesos—roughly \$6. Affordable, yes. But it was too high for many Filipinos.'²

Smart took an existing innovation it observed in the market, the sachet model, and translated it to its own business.



a versatile, durable, easily repairable platform, with value not just for agriculture but also for children's education and for broader capacity building.

THTF needed a simplified, low-cost computer that could do many things and withstand the rigors of the rural environment. So it built one. Jun Li, vice-general Manager of THTF's computer department, says: '[The] computer comes from the minds of ... people in the agriculture industry. Putting our feet in the shoes of farmers is our basic principle. What we did is to turn their ideas into tangible computer products.' Using the open-source Linux operating system, THTF fit its product to the new market by contracting local vendors to replicate more expensive, brand-name programmes. To help its product work well in a difficult environment, THTF embedded electricity cables with rat-repellent materials. It adapted a specialized package of programmes for rural users, including agriculture, distance education and vocational skills training.

THTF adapted its product in ways that cater to the poor, and its customers are now seeing the difference that information technology can make to their jobs and lives. Before the rural computing initiative can become wholly self-sustaining, it must mature and grow. Yet THTF's innovation and skillful product adaptation showcase a strategy that can be used by other high-tech businesses looking to engineer a way into the markets of the poor.

The new model liberated Smart from a constraint—its poor customers' lack of access to financial services—that had prevented many from paying even \$6 for a phone card.

Business models that free themselves from the most seemingly formidable constraints in their target markets can quickly increase in scale. From 2000 to 2005 the number of mobile phone subscribers in developing countries grew more than five-fold, to almost 1.4 billion.³ In the Philippines alone, mobile banking counted about 4 million users in 2006—and the industry was still in its early stages.⁴ ☉



China: The cost of a basic computer equals three months of a farmer's income. Photo: UNDP

LEVERAGING TECHNOLOGY

Business in poor people's markets can benefit from technological 'leapfrogging'—skipping intermediate steps to rapidly bring an area with poor technology up to the state of the art and thus to greater productivity.

Today, information and communications technology is supplying inclusive business models with strikingly successful product and process adaptations. But other technologies are also being used to address constraints in industries that meet basic needs, such as utilities or health care. And technologies that reduce the use of resources offer ways to tie the goal of human development to that of environmental sustainability.

Leverage information and communications technology. Technologies used to process and transmit information—telephony, computers, the Internet and new data processing tools—have been the key to success for many inclusive business models. In addition, the adaptations that allow companies to do business with the poor sometimes lead them to an improved long-term position in higher-income markets.

One successful information and communications technology adaptation is mobile banking (m-banking), which allows millions of people living far from any bank branch to access financial services—saving money,

Box 3.2. Mobile banking: branchless and wireless

Mobile banking, or m-banking, offers financial services through mobile telephones or similar devices to millions of people who previously lacked access to banks. It allows customers to spend mobile telephone credits for such services as remittances, retail purchases and bill payments and use them as quasi-deposit accounts. With m-banking, people no longer need a bank branch or access to a wired network. Freed from these infrastructure constraints, m-banking is spreading across developing countries.

Celtel showed how m-banking can work in the difficult circumstances of postconflict insecurity. In the Democratic Republic of Congo, Celtel began offering m-banking shortly after the peace treaty was signed in 2003, when security was still poor and banking infrastructure debilitated. The service, called Celpay, uses encrypted short message service technology to allow its customers to wire funds across the country. An effective way to make payments in a war-torn country, Celpay proved so efficient that now the government is using it to pay its soldiers.

Users are finding their own ways to spread the benefits of m-banking further. Sente is the informal practice of sending and receiving money that leverages public phone kiosks and trusted networks in Uganda. Instead of sending money directly from phone to phone, someone with access to a phone can send airtime credit to a phone kiosk operator over the cellular network. Converting the airtime credit into cash, the kiosk operator gives the cash to a familiar person who lacks access to a phone or a bank account. In effect, the trusted kiosk operator and his or her phone take the place of an automated teller machine.¹ The final recipient may save

as much as the opportunity cost of a day's labour plus travel costs to a mobile banking centre. And the system eliminates the need to carry cash—an invaluable boon in insecure areas. Sente is an example of how business and grassroots innovation can build on each another. Soon there may be responses from technology providers to make the practice more secure and convenient.

1. Chipchase 2006.



Senegal: Pastoralists track cattle herds using cell phones and global positioning system devices. Photo: IDRC/Sy, Djibril

making payments,

managing loans and receiving remittances, all without entering a bank (box 3.2).

More generally, mobile telephony provides the infrastructure for delivering other data-based services. The data highway can often replace poor roads and missing logistics networks. For example, telemedicine is giving people in remote areas better access to quality health care: in rural India, Narayana Hrudalayanaya has established 'telehealth' centres linked to centralized facilities by satellite, allowing doctors to help patients at a distance.

Innovative software and voice recognition systems facilitate business with illiterate persons. In India, ICICI Bank and Citibank developed biometric automated teller machines with fingerprint identification and voice-enabled navigation, reaching users who lacked access to banking systems. And in South Africa and elsewhere, simple recognition systems based on smart cards are facilitating payment processes for vendors and consumers (box 3.3).

The examples discussed in this section show information and communications technology being used to address four of the five constraints in the Growing Inclusive Markets strategy matrix:

- Biometrics allow businesses to avoid problems with security, legal

documentation and contract enforcement in challenging regulatory environments.

- Wireless networks take the place of missing physical infrastructure and logistics networks.
- User-friendly software bridges gaps in customers' knowledge and skills.
- M-banking and smart cards make up for restricted access to financial services.

In addition, information and communications technology can be used to gather market information—for example, through electronic surveys. The applications in use today will surely be followed by many more technologies that will enable future inclusive business models.

Apply sector-specific solutions.

Do other technologies exist with as much enabling potential as information and communications technology? Though nothing rivals information and communications technology's ability to address a broad variety of challenges, several other types of technology are enabling inclusive business models in particular sectors, for example:

- New energy technologies overcome the limitations of grid-based utility services. In many areas, the cost of building a grid has deprived the poor of access to electricity. Off-grid energy solutions generate energy at the site of use, for households or for whole communities, without large investments in interurban infrastructure. Renewable resources—such as sunlight, wind, water or biomass—can be used. In Southern Mali, Électricité de France collaborated with local and international partners to establish two rural energy services companies that produce energy through photovoltaic facilities and diesel generators for 24 villages and 40,000 people. Access to energy, in turn, allows for more efficient production methods and the ability to use other products and services, preparing the ground for more inclusive business models.

- Water purification systems allow water that is locally available but unsafe to be made usable for drinking and cooking. Thus, no pipelines are needed for delivery. Across developing countries—from Haiti to Viet Nam to Pakistan—and in collaboration with nonprofit organizations, Procter & Gamble is selling sachets of a point-of-use purification powder called PUR. Nonprofit organizations buy sachets for \$0.04 per unit (the cost of production) and sell them for \$0.05 to local entrepreneurs, who, in turn, sell them to villagers for less than \$0.10. By the end of 2006 Procter & Gamble had sold 57 million sachets and provided 260 million litres of safe, clean water worldwide. The company is now selling the product in the United States for \$2.50 per unit.

- Sanitation technologies can treat sewage on site. In India, Sulabh uses a water toilet that dries sewage rather than removes it. Two pits are installed, and each is used in turn while the

Box 3.3. Smart cards: high-tech payments allow Amanz'abantu to bring water to South Africa's poor

To enforce South Africa's constitutional recognition of

water as a human right, the country's government contracted Amanz'abantu to supply water to rural and peri-urban populations. Before the company's arrival, villagers—mainly rural women—would walk up to several hours to fetch water from rivers or other sources. Now, they are issued smart cards with microprocessors that hold data and give them access to clean water from shared taps. They load money onto the cards using card readers in village shops.

Amanz'abantu's smart card system lets the government ensure free, equitable access to 25 litres of water a day for each person, and access to extra water at a low cost. (In Uganda, the Association of Private Water Operators achieved the same result with a less technologically advanced solution: coin-operated shared taps.)

other dries. Water that seeps out through the pit walls is naturally filtered and does not pollute ground water. Solid waste dries to form lumps, which users can then remove. Again, there is no need for a grid-based sewage system.

- Medical technology and biotechnology offer new ways to overcome infrastructure and logistics constraints. The 1980s saw a major breakthrough in the adaptation of vaccines for killer communicable diseases—measles, rubella, whooping cough, diphtheria, tetanus, tuberculosis—to developing country conditions. Older vaccines had required transportation along an uninterrupted cold chain to the point of use. The newly developed, freeze-dried vaccines are more heat-stable. Together with other adaptations, such as single-shot vaccine cocktails, these innovations boosted vaccination rates.⁵

Achieve environmental sustainability.

Technology helps companies do business in difficult conditions. It also helps them do

business in a more environmentally sustainable way. For example, renewable energy sources provide new electricity without putting new stresses on the world's climate.

Brazilian food processing company Sadia has built environmental sustainability into its revenue design. Its Programme for Sustainable Swine Production provides more than 3,500 swine producers with biodigesters, which use bacteria to ferment swine waste in closed reservoirs. By converting the resultant methane gas to carbon dioxide, the biodigesters reduce greenhouse gas emissions. Under the Kyoto Protocol Clean Development Mechanism, such sequestration of greenhouse gases earns carbon credits that can be traded with other companies. Selling the credits is estimated to cover the cost of the biodigesters. In addition, gases produced in the process can be used as energy—reducing operating costs for the producers. And a by-product from the fermentation process can be used as crop fertilizer or as food for fish breeding. ☉

DESIGN BUSINESS PROCESSES

Although technology promises to create new ways to deal with daunting challenges and facilitate scalable business models, it is not a silver bullet. Similar effects can often be achieved through business process design that leverages existing resources and capabilities to get around constraints.

Adjust to the cash flows of the poor.

Smart payment and pricing procedures allow inclusive business models to reflect the cash flows of their customers and suppliers, which are constrained by low and unreliable incomes and a lack of access to financial services. Low and unreliable incomes do not mean that people cannot afford to consume or invest—only that they cannot afford large expenditures for future consumption.

Without access to savings, credit or insurance, the poor have limited options for managing their financial resources. Many poor workers receive their income by the day and buy only what they need for each day. Farmers realize their income after harvests, which depend on crop cycles and may occur just once a year. Inclusive business models need payment procedures that reflect such cash flow patterns.

To make product offers match the purchasing behaviour of poor consumers, one solution that has been applied across the board—from soap to cell phones—is small-unit pricing.⁶ All kinds of consumer goods from shampoo to spices are now sold in tiny packages or 'sachets'. Apart from the example of mobile telephony, the model has been used for providing water (with smart

India: Sulabh's coin-operated toilet facilities provide low-cost sanitation to poor consumers. Photo: Sulabh



card-operated or coin-operated shared taps) and sanitation (Sulabh's coin-operated toilets). Since such business models work through prepayment, they free providers from the risk of nonpayment for services.

For bulky purchases that cannot be easily divided into sachet-sized packages, solutions resembling leasing and installment payments are being developed. Mexico's cement producer CEMEX offers a payment system, Patrimonio Hoy, that allows low-income families to purchase houses in installments—giving them incremental access to services, cement and other building materials through a group savings programme. And in Brazil, Microsoft offers a microleasing scheme, FlexGo, for computers that run its Windows operating system.⁷ Consumers pay a portion of the upfront cost to bring home a computer. They pay the balance by purchasing prepaid cards from local vendors that activate the computer for a limited time, putting it in a limited-access state when time runs out. When the computer is fully paid for the metering technology is deactivated.

Flexible payment gives consumers the option to pay at different times. In Électricité de France's rural electrification scheme in Mali, customers could pay a fixed price for their electricity supply on either a monthly or a yearly basis. The yearly option can

facilitate payment for farmers who receive income annually.

Credit arrangements should also match expected cash flows. Low-income producers find it difficult to make production investments that will pay for themselves only over the longer term. Rather than make large outlays with insecure payoffs, producers prefer to invest in shorter-term options—even if they are less profitable. Inclusive business models have met this challenge by matching credit service methods to cash flows. In Ghana, the Integrated Tamale Fruit Company offers mango outgrowers loans for their initial investments. The loans are not due until three to six years after planting, when the trees bear fruit. In Brazil, Votorantim Celulose e Papel (VCP) acts as a form of guarantor for loans to its outgrowers of eucalyptus, a crop that takes seven years to grow to harvest. The loans are provided by ABN AMRO without collateral. VCP guarantees that it will buy the harvest for least at the price of the loan plus interest.

Simplify requirements. The lack of knowledge and skills is another pervasive constraint facing inclusive business models. A common solution is 'de-skilling'—simplifying processes or making products easier to use. One example is the microfinance

company Edu-Loan, a provider of post-secondary education loans, which emphasized accessibility and made all documents easy for its South African clients to understand by clearly explaining the loan process. Another is the Chinese computer firm Tsinghua Tongfang (see box 3.1), which adapted its software to the skills of farmers—for example, by preinstalling agriculture programmes to spare users the complexities of installing them.

Businesses can address the lack of title among the poor by simplifying documentation requirements.⁹ Long-term service relationships—in utilities, banking or telecommunications, for example—have typically required much documentation. But poor people often cannot even document their own identity, much less their employment or their ownership of a house. Unlike traditional credit institutions, microcredit providers such as Mibanco in Peru do not require documentation to guarantee loans. Potential clients need only have official identification, prove a permanent address and show a significant cash flow. Onsite business advisers assess their reliability and ultimately approve the loan. So far, the model has provided credit to more than 300,000 clients, representing a portfolio that exceeds \$1.63 billion.

Avoid adverse incentives. Some micro-finance models do entirely without documentation or collateral, relying instead on incentives created through group lending, as does Forus Bank in Russia, for instance. Defaulting borrowers do not merely lose the opportunity to borrow more for themselves; they also prevent other members of their groups from obtaining future loans. Since failure to repay carries the cost of shame and social exclusion, the incentive to repay is high. Currently payback rates for group loans at the Grameen Bank exceed 98%.⁹ (Chapter 5 discusses other ways businesses can apply community engagement as a ‘tweak’ to avoid constraints.)

The weather index insurance offered in India by MFI BASIX is another example of adaptation to deal with adverse incentives.

Traditional crop insurance, in which insurers pay out claims based on loss evaluations, has failed in many countries mainly because of the high cost of monitoring and farm-level inspections. Such inspections are needed because the traditional system gives claimants an incentive to over-report or invent crop losses. The index insurance offered by BASIX circumvents these adverse incentives by basing payouts on widely available information about rainfall.¹⁰ The index insurance entails significantly less underwriting and administration.

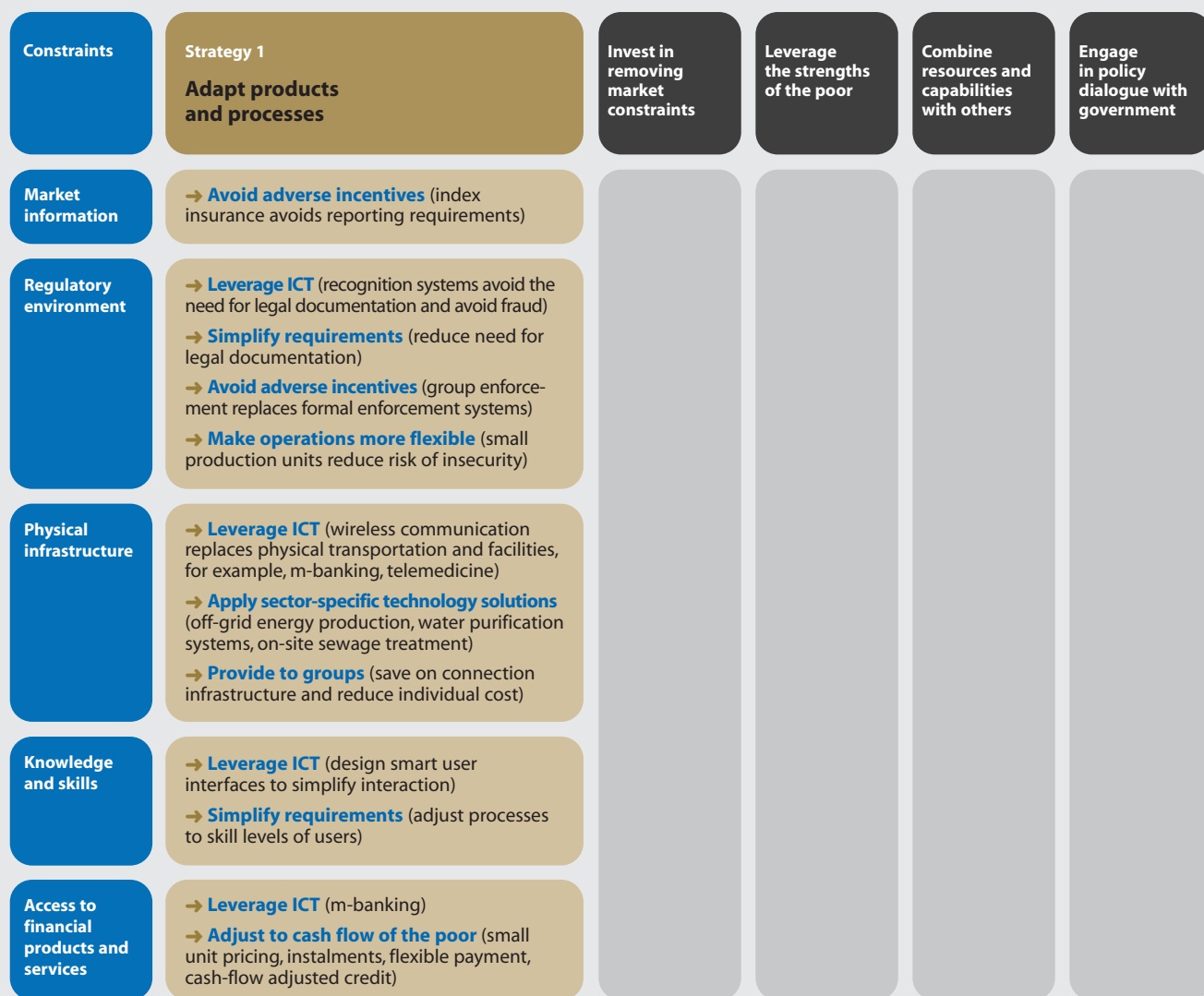
Make operations more flexible. ‘Smart tweaks’ can enable inclusive business models even in the most apparently discouraging circumstances, including conditions of lasting political instability and insecurity. In Guinea, an association of cashew producers sought to prevent the business failures that neighbouring countries, such as Côte d’Ivoire, had suffered from a combination of political instability and capital-intensive units. Using efficient, inexpensive technology, the cashew association established small-scale processing units close to the villages of producers. That move avoided the initial cost of investing in a large central processing facility, and it made production processes more independent from the effects of political turmoil (such as road blockages). In addition, it made disinvestment easier in a worst-case scenario.

Provide to groups. Communities often access resources through joint investments, especially for such large expenses as durable goods and infrastructure-based services. From tractors and water taps to telephone and television networks, shared use can spread costs and make purchases more affordable. And providing infrastructure to a group saves individual household connection costs.

Shared access can be organized in two ways:

- One community member makes the purchase and charges others a fee for

Figure 3.1. Summary: Approaches to adapting products and processes




access. In this widely used model, the entrepreneur is the company's only client. The 'Mamans GSM' in the Democratic Republic of Congo are a good example, purchasing mobile telephones and airtime and renting them to others. In South Africa, SharedPhone developed a SIM application that lets the reseller set a minimum charge and limit call length (which the system accurately displays).¹¹

- Users are billed individually for what they consume. This model requires a

transparent and efficient method for accounting and billing. Technical solutions were developed by Uganda's Association of Private Water Operators, with its coin-operated water kiosks in small towns, and India's Sulabh, with its pay toilets in public areas. In the Philippines, Manila Water combines a technical adaptation with community engagement, making user groups responsible for payments while providing them with information about individual use through submetres.

India's e-Choupals, or Internet kiosks, are a model for providing shared resources to producers. To make weighing and paying for soybeans more efficient, Indian agriproducts company ITC Limited installed the kiosks in suppliers' villages. A kiosk serves an average of 600 farmers in 10 villages within a radius of about five kilometres. By eliminating the need to carry beans to a market and the middlemen, the kiosks improve the farmers' bargaining power while allowing ITC to source soybeans at more favourable prices—so much so that it is profitable for ITC to provide them for free. ITC intends to reach 100,000 villages with the network in the next decade.¹²

Not surprising, the creative solutions featured in this chapter have received the most attention from the business community in the search for business models that include the poor. However, adaptation is not the only strategy for dealing with difficult market environments. Indeed, it is not even the most common strategy among the 50 case studies that inform this report. At least as important to inclusive business models are the other four strategies: investing in removing constraints, leveraging the strengths of the poor, combining resources and capabilities with others and engaging in policy dialogue with governments (figure 3.1). 

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- 1 An example: "The introduction of prepaid services has been one of the main contributing factors for the explosive expansion of the mobile sector in [least developed countries], where more than half of the population lives on less than one dollar a day. Prepaid cards allow subscribers more control over their mobile telephone expenditure, releasing operators from performing time-consuming credit checks that are essential under the subscription option" (ITU 2006).
 - 2 Quoted in Gancho 2007.
 - 3 Hammond and others 2007, p. 22.
 - 4 Porteous and Wishart 2006.
 - 5 UNDP 2001, p. 27.
 - 6 Small unit pricing does not necessarily make the product cheaper. On the contrary, it often leads to a price increase when comparing the price-quantity relationship of small unit and larger unit products. But this pricing model increases affordability by adjusting the required expense of the purchase to the buyer's cash flow.
 - 7 For more information on Microsoft's FlexGo prepaid scheme, see www.microsoft.com/presspass/press/2006/may06/05-21EmergingMarketConsumersPR.mspx.
 - 8 Subject to central bank requirements regarding know your customer, anti-money laundering, combating financial terrorism regulations.
 - 9 Grameen Bank website (www.grameeninfo.org/bank/ataglance/GBGlance.htm).
 - 10 However, where such infrastructure as reliable weather stations are not in place, this information may not be available. Index insurance has its own issues, such as with respect to the reliability of the information. Damage due to weather may vary greatly due to topographical differences, which are not reported in the weather data.
 - 11 SharedPhone website (www.sharedphone.co.za).
 - 12 Annamalai and Rao 2003, pp. 1–2 (www.echoupal.com).