A good percentage of the population in many developing countries has low textual literacy, meaning poor ability to read and comprehend written text. In fact, almost the entire adult illiterate population of 775 million lives in developing countries.¹ Product designs that rely on textual communication to ensure that a product or service is used properly—for example, instruction manuals or product labels—are at risk of failing for this reason alone. Therefore, people who design products and services to be used in developing countries put literacy high on their list of challenges.

Products or services that involve a web- or mobile-based user interface must deal with the additional problem of a lack of technical literacy. Although global in reach, web and mobile technologies have not reached all markets equally. Average Internet penetration in Africa, for example, is just 21.3 percent, compared to 84.9 percent in North America.²

People in developing countries who do have access to mobile devices often use older phones that require triple-tap text entry and use soft keys whose meaning changes according to context—not an easy system to figure out, even for a fully literate person. Attaining technical literacy is challenged further by frequent power outages, poor network coverage, shared phones that are often swapped—and lost—by friends and family, and expensive data plans. Therefore, designs that rely on technical literacy to ensure that a product or service is used properly—to navigate menus, enter search terms, or use contextual soft keys, for example—are also at risk of failing.

Textual and technical literacy clearly are critical considerations for designers, particularly in the context of digital user interfaces in developing markets. This raises the question of what outcomes should be expected from designs that tackle these issues. Are the most desirable outcomes the ability to understand the com-

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novations / volume 9, number 3/4 113
complete textual content of a digital product and knowing how to use its complete set of features?

We believe that an expanded view of literacy that moves beyond the textual and technical to emphasize the cultural and contextual is a more important design consideration. We believe, furthermore, that designs that tackle this expanded view of literacy can have a significantly greater impact by enabling those generally considered illiterate to achieve fluency in their use of technology, and to apply it to make unexpected and unplanned gains.

DESIGNING FOR TEXTUAL AND TECHNICAL LITERACY

To understand this perspective, it’s useful to review how designers currently approach textual and technical literacy. A survey of recent work and thinking in this space reveals some common strategies for addressing these design considerations:

Design can address the textual literacy challenge by deemphasizing the use of text. There are numerous examples of success in pairing text with icons or other pictorial representations. Many designers have taken this approach a step further by removing text altogether and relying entirely on visual cues to communicate, which raises the question of what constitutes the right visual cues. While studies have shown that an icon that looks like a telephone is widely understood, an icon that looks like an envelope, which may be used to indicate an incoming email, may not resonate with those who have never mailed a letter, while younger populations may not relate to an alarm clock icon that looks like a clock with hands and bells. This debate about skeuomorphism—the use of visual cues based on objects from the physical world—is particularly hot among designers today.

Design can address the technical literacy challenge by incorporating multimodal interaction technologies. There are many successful designs that leverage assistive technologies like interactive voice-based response interfaces. Touch- and gesture-based interfaces have been heralded as the saviors of the technical literacy challenge, as evidenced by countless YouTube videos of two year olds using iPads. However, these capabilities typically only exist on smartphones, which are far from prevalent in the developing world; in 2012, smartphone penetration in developing markets averaged 8 percent. Although the price of smartphones is rapidly decreasing, with devices priced under US $100 gaining traction in some markets, the higher data costs, power consumption, and need for regular recharging makes smartphone use impractical for many.

Design is selling itself short if it concentrates on comprehension as the end goal, which is what a focus on textual and technical literacy will lead to. Design that deemphasizes text and incorporates alternative interaction technologies is making great strides toward tackling the challenge of textual and technical literacy in developing markets. Many designers believe these approaches represent best practice, and they do improve comprehension by optimizing what is delivered and how. The underlying premise is that this combination of the right content and
right format will improve user comprehension, which will increase user adoption, engagement, loyalty, love, and all the other things designers want for their products. Is this the ultimate goal for design in developing markets? We think not.

**DESIGNING FOR CONCEPTUAL LITERACY AND CULTURAL CONTEXT**

As we explore an expanded view of designing for literacy, we look beyond the what and the how and see the limitations of this approach. We consider other questions: where and when does usage take place and, perhaps more fundamentally, why should usage take place? Literacy that concerns itself with the where, when, and why is different from textual and technical literacy, and with it a new set of design considerations emerges.

Mobile banking appears to be a simple enough concept—a way to conduct basic banking transactions through a mobile interface. Much of the population across the developing world is unbanked, as they live far from urban centers that have bank branches. Thus it is no surprise that mobile banking has been hailed as way to bridge this gap and bring the rural poor into the financial system by giving them access to financial products and services that can improve their lives.

Mobile banking in this context typically means services run on low-end feature phones over SMS- and USSD-based interfaces, which allow access to standard banking functions by organizing them in menu trees with simple task flows. For example, a user initiates a USSD session by entering an alphanumeric string (for example, *123*123456#). The system responds with a set of menu options (for example, 1-check balance, 2-make a payment), and the user enters the appropriate number. The system will also send SMS messages throughout the session, typically to confirm transactions.

It is important to examine how these mobile banking solutions fare in their particular markets in terms of textual and technical literacy. Many of these services are owned and operated by domestic banks and typically use local languages, but because they are delivered through text-only interfaces they face some textual literacy challenges. In terms of technical literacy, many users are familiar with the basic interaction patterns of SMS- and USSD-based interfaces, as they are the standard way to purchase airtime and enable basic communication—the primary user phone activity. The process may be clunky but it is at least familiar.

Most mobile banking solutions have struggled with adoption due to their misalignment with the cultural contexts that drive conceptual literacy.

This suggests that designers must take a different approach to tackling literacy.
The question is, how successful are these services? There are hundreds of mobile banking services worldwide, and most have a similar feature set. The Consultative Group to Assist the Poor (CGAP), which is housed at the World Bank, has studied them extensively and has found that fewer than 10 percent of mobile banking services have been able to scale beyond 200,000 active registered users. What is responsible for this low adoption rate for a product that seems to have so much promise? There are likely as many reasons for this low usage rate as there are mobile banking services.

Our work sheds light on a different set of design considerations that are bigger barriers to adoption than lack of literacy. We’ve had the chance to apply immersive ethnographic research methods to study poor, unbanked consumers in multiple markets worldwide, investigating their behaviors, preferences, needs, and motivations as related to financial products. In this research we used prototypes of mobile interfaces, such as low-fidelity mockups made of cardboard or dummy screens on mobile phones, to explore how people respond to new product ideas as well as higher fidelity digital simulations. (See Figure 1 for an example of a cardboard mobile banking prototype we used in Indonesia.)

A key theme in all our studies is savings behavior, as savings are critical to money management and financial planning. The concept of savings is understood and practiced in every market, if intermittently and meagerly, through informal means such as village savings associations, coops, or neighbors. The informal sector is much more pervasive than the formal sector, which includes commercial banks and microfinance institutions, and it reaches most people in some form.
However, a common insight emerged in four disparate studies we conducted for four different clients in five countries—South Africa, Rwanda, Kenya, Uganda, and Indonesia: that is, although the concept of mobile access to savings is well understood it is not fully appreciated, as it is not how consumers define savings.

We found that savings is a much more nuanced concept for many consumers than what is suggested by the simple transfer of funds into a savings account. In South Africa, for example, saving is strongly influenced by the traditional funeral ritual, an elaborate and expensive family activity that many South Africans save for; in fact, it is saved for more than any other expense, including school, medical emergencies, or transportation.

In Rwanda, saving at times extends beyond the individual, taking on a strong spirit of contribution to broader community-building objectives. Many poor Rwandese are happy to contribute, for example, to funds that bring electricity to the community or build a football field.

In rural agricultural contexts in Kenya and Uganda, saving behaviors seek to balance the predictable seasonal needs of purchasing seeds and fertilizer with the cost of sending children to school to obtain an education so they can move to the city and seek a better life. And in Indonesia, saving has a strong aspirational flavor that is closely tied to the country’s stunning growth. This translates into saving for big-ticket purchases like a home and a college education.

In each of these contexts, the default mobile banking service was a basic savings account, which people could use to deposit and withdraw funds. This service was too simple for saving in these more nuanced ways and therefore led many to reject the overall concept. This is not to say that mobile savings accounts were not used by anyone, but they were a solution that showed little appreciation for how people actually behave, including where, when, and why they want to save in the first place. Can product designs succeed if they target textual and technical literacy but ignore these cultural interests? And should providers be satisfied with this minimal performance?

These insights and those offered by other researchers and designers worldwide have prompted a wave of innovation in financial inclusion that involves a close...
study of the cultural norms that shape consumer needs, behaviors, and motivations. These insights have led to a variety of novel takes on the basic notion of a savings account: accounts that combine savings and insurance, including burial and funeral insurance in South Africa, into a more fluid overarching concept; savings accounts that contribute to community goals; savings accounts that incentivize payment of school fees; and “commitment” savings for specific purposes, such as education or medical treatment.

These cases suggest that there is a challenge in “conceptual literacy,” which concerns itself with understanding the concept of savings itself. The issue is not conceptual literacy in the conventional sense, however, as the consumers in these contexts understand the concept of savings and practice it in various forms. The issue is that conceptual literacy does not translate into usage because the concept of savings has not been culturally framed in the right way. Most mobile banking solutions have struggled with adoption due to their misalignment with the cultural contexts that drive conceptual literacy.

This suggests that designers must take a different approach to tackling literacy. Of course they must try to overcome the limitations of textual and technical literacy, but they also must consider conceptual literacy. To do this effectively, they must first appreciate how conceptual literacy is affected by users’ unique cultural contexts. This essentially refers to the context of usage—where and when does usage take place, and where and when should it do so—and not just in the physical sense of these terms but in terms of the cultural context that underlies where and when a design is used.

When we look at the role of design in this way, the very notion of literacy—textual, technical, conceptual—falls short.

BEYOND LITERACY: DESIGNING FOR FLUENCY

The public health world has been inundated with technology innovations, many of them mobile-based, that seek to improve the lives of those most urgently in need of medical care. We’ve been involved with UNICEF’s RapidPro platform, previously known as RapidSMS, in Rwanda, Zambia, Malawi, Uganda, and a handful of other countries in Africa as part of an ongoing partnership between UNICEF Innovation and frog. RapidPro provides a mobile reporting platform for community health workers (CHWs) that allows them to monitor and track pregnant mothers in their villages. In many developing countries, CHWs are de facto extensions of the public healthcare system. They are typically volunteers trained in basic maternal and child care who have positions of influence in their community; these women are incentivized by nothing more than the pride of providing care, as the position is unpaid.

RapidPro has ambitious goals: to reduce maternal and childhood mortality by ensuring that key health indicators of every mother and child are tracked and monitored from the prenatal period through the first one thousand days of a
child’s life. Appropriate interventions such as hospitalization or ambulance transports are made as needed.

There is no getting around the complexity of this SMS-based system. It requires CHWs to enter long codes that capture data about the mother. For example, a CHW will confirm a pregnancy by sending an SMS that identifies the patient, the date of the last menstrual period, appointment dates, gravidity, parity, previous pregnancies, current symptoms, location, weight, height, toilet presence, and hand-washing status—all in one consecutive string of individual codes. (See Figure 2 for an example of a CHW using the system.)

Despite the complexity of this system, CHWs don’t merely adopt and use the system, they do so enthusiastically and passionately, and overall satisfaction is very high in many communities. Many CHWs report that they use the mobile tool because it helps them feel more empowered to help their communities. The mobile system essentially becomes the symbol of their trade, analogous to a doctor’s stethoscope, and it gives these women a sense of pride in their role and motivates them to do even more to help their communities.

Awareness of the power of the mobile platform has prompted UNICEF to shift its design priorities. One aim is to improve the user interface and interaction design so less textually and technically literate CHWs can use the system more easily, but new design priorities focus more on providing a motivational framework that includes other ways to empower and strengthen CHWs.

We experienced this first hand while working with UNICEF in rural Zambia on Project Mwana, an early implementation of RapidPro that targeted mothers and infants in Zambia and Malawi who were at risk of contracting HIV. Most of the early development efforts of this service, known as Results360, focused on data delivery and literacy. The system optimized the transfer of HIV results from a central lab in Zambia directly to clinics, which reduced the time it took to get results out to the mothers and children and helped ensure that the results were communicated as clearly as possible within the constraints of SMS.

However, this system neglected the where, when, and why. Where would this information be delivered to a mother? Most likely not in a clinic. And when and why would it be delivered? CHWs are volunteers and they do not have set schedules. They often travel many miles to visit a family based on information shared informally within their community. Our design team worked with UNICEF to increase the relevance of Results360 by introducing a Twitter-like service that allowed CHWs to post messages to each other, which helped them make better use of the information within their own context. The result was a 56 percent reduction in turnaround time, not only to get results to the clinic but also to the health worker and, ultimately, to the mother and child at risk.

A NEW WAY OF LOOKING AT DIGITAL DESIGN

In the developed world, much has been argued about the declining “traditional” literacy of digital natives—that today’s youth are not learning how to read or write.
in this age of texting and auto-correct. However, a strong counter-argument has emerged that advances the idea of digital literacy, which encompasses new ways to find and process information, solve problems, and reach an audience in our digitally connected world. This type of literacy, which comes from having deep familiarity—or shall we say fluency?—with technology, is arguably a more valuable form of literacy than traditional textual literacy.10

Could a similar idea be adapted to the developing market context, where the population does not include digital natives who grew up with social networks and 3G data plans? The population does include individuals like the CHWs, who are finding and processing information, solving problems, and interacting with their

**Figure 2.** A community health worker tracking pregnancy on a mobile phone
Internet Design for Emerging Markets

communities in sophisticated ways. These sophisticated ways may be mainly non-technological—meaning that they involve real-world, live, in-person communications and interactions—but they can be strengthened by a technology-based solution if well-designed. If CHWs can be encouraged and incentivized to make even deeper contributors to their communities and become more highly valued representatives of the healthcare system, then the mobile platform itself has created behaviors beyond its limited digital frame. This is what we consider a powerful outcome of design.

The goal of design in this case is not to tackle the challenge of literacy but to convert illiteracy into literacy and literacy into fluency. When users achieve fluency, they know more than what is used and how it is used (the behavior of usage), and they know more than where it’s used and when it’s used (the context of usage). When users achieve fluency, they also know why a solution is used—the underlying purpose, intent, and promise. This awareness is what creates a sense of empowerment that extends the impact of a design beyond its core use.

The real literacy issues design must concern itself with are not the textual and technical, which must meet some minimum threshold of usability, or the conceptual, which ensures that the relevant cultural notions of a concept are employed. Design should instead focus on converting illiteracy into fluency, thereby empowering the user to use technology as a force for change and enabling them to have a positive impact on their own and other people’s lives.