

Not Your Average Farmer: Designing for Lead Users in ICT4D Research

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Information and Communication Technologies for Development (ICT4D) research has a history of making mistakes that, in hindsight, seem obvious. For example, many working in the field have a favorite story of a project gone wrong because of techno-centrism. Mine is the LINCOS telecenter project, intended to provide computing and internet access to a Costa Rican village via a high-tech shipping container, which was described as “an alien spaceship dropping from the sky” [1]. It closed after two years—the community began using a new cyber cafe, and the container was vandalized.

This and other early ICT4D projects conflated the goal of diffusing technology with meeting the real needs of a community. Richard Heeks called this “ICT4D 1.0” [2]. Fortunately, we are now moving into Heeks’s ICT4D 2.0: Most of the ICT4D papers at CHI 2010 deeply integrated needs-finding and community involvement into the design and development of the technology intervention.

But with this step forward come new pitfalls of which ICT4D researchers should be mindful. Before designers may have made the mistake of designing without a deep understanding of the community and its needs; now that real needs are being addressed, a potential trap is thinking the identified needs are shared by *everyone*. There are a few signs this is starting to happen. First, when describing whose needs are being addressed, ICT4D research (mine included) rarely gets more specific than “farmers,” “community health workers,” “slum dwellers,” or even “low-literacy users.”

Second, as others have noted, ICT4D research is often premature in presuming a local solution is generalizable and can, or should be, scaled up [3]. This is partly driven by tech-

nologists’ bias toward a large-scale perspective, but it’s also driven by external expectations. Caught up in a drive to develop scalable solutions, designers tend to be imprecise about who specific solutions will work for. It is probable that novel technology interventions in particular will see significant uptake with only a subsegment of the larger potential user community. My view is that rather than feeling disappointed about this, we should embrace it!

In the 1980s, Eric Von Hippel introduced the term “lead users” to identify those users who face needs that everyone else will face sometime in the future, and who stand to benefit greatly from solutions to those needs [4]. Through my own work, I have found that designing explicitly for lead users is an effective approach for an ICT4D intervention.

My collaborators and I have designed and developed Avaaj Otalo (literally “voice stoop”), a service for farmers in Gujarat, India, to access and share agricultural information using mobile phones [5]. Farmers dial a phone number and listen to automated prompts to navigate a voice message board, where they can post questions, listen to the questions and answers of other farmers, and post answers to the questions themselves. Avaaj Otalo was designed and launched in collaboration with Development Support Center (DSC), an NGO in Gujarat, and IBM Research India.

In the design and development phase, we incorporated input from DSC and farmers. One of those farmers, Babubhai Thakur, was particularly remarkable. Babubhai belongs to a nomadic community that lives in a remote part of Gujarat. When I met him, he was 17, having left school in the eighth grade to work full time as a farmer.

[1] Brand, P. and Schwittay, A. “The Missing Piece: Human-Driven Design and Research in ICT and Development.” In Proceedings of the IEEE Conference on Information and Communication Technologies and Development (2006): 2–10.

[2] Heeks, R. “ICT4D 2.0: The Next Phase of Applying ICT for International Development.” *Computer* 41, 6 (2008): 26–33.

[3] Burrell, J. and Toyama, K. “What Constitutes Good ICTD Research?” *Information Technologies and International Development* 5, 3 (2009): 82–94.

[4] Von Hippel, E. “Lead Users: A Source of Novel Product Concepts.” *Management Science* 32 (1986): 791–805.

[5] Patel, N., Chittamuru, D., Jain, A., Dave, P., and Parikh, T. S. “Avaaj Otalo: A Field Study of an Interactive Voice Forum for Small Farmers in Rural India.” In Proceedings of ACM Conference on Human Factors in Computing Systems (2010): 733–742.

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But despite his youth, Babubhai was recognized as an expert farmer in his community. Even the eldest farmers with decades of experience would come to him to consult about agricultural issues. He was a voracious learner and had an experimental nature, always looking to try out new techniques to improve his productivity. He was also a renowned inventor; on our field visit he showed off his latest, a wooden contraption on which he hung a lightbulb and natural materials that attract and then trap a pest that was common in the area. Babubhai told us that he wished to share the device with all of the farmers of Gujarat, so they could reap its benefits.

It was thus no surprise that Avaaj Otalo immediately appealed to Babubhai; he became one of its biggest proponents during our design process. He was eager to get access to an on-demand information system where he could share his experiences with other farmers.

But I quickly learned that not all farmers saw it the same way. In fact, it was a member of my own family who taught me that lesson.

Running a research project in Gujarat, I have the unique benefit of working in a place where I have family—many of my uncles and cousins are farmers. Shortly after we had deployed Avaaj Otalo, I showed it to my uncle Kishore Patel, whose family has been farming cotton and sugarcane for generations. When I explained Avaaj Otalo to him and had him listen to some of the questions and answers that were on the message board, he tried to suppress his laughter. “This is not new information; I already get all the information I need from TV,” he said. Some of his farmer friends mocked the system, saying that it was useless to them because they already know what to do—it’s the same thing they did the season before and the season before that. What’s the use of new information? To my uncle and his friends, farming was a business activity, not a craft. They bought the same seeds, fertilizer, and pesticides every year, applied them the same way, harvested and sold to the same buyers. They saw changing their farming practice as a headache, not as a need.

Through these and other encounters I got a sense for the spectrum of Gujarat farmers, in terms of motivations, willingness to change, and openness to new ideas. On one end, there is Babubhai, a lead user: a progressive early-adopter,



a thought-leader. Near the other extreme is Uncle Kishore: conservative, resistant to change, skeptical. In evolving Avaaj Otalo in terms of its capabilities and value proposition, I realized I should no longer think about what “farmers” need. I decided to design specifically for Babubhai.

There are at least two advantages in designing for lead users. The first has to do with motivation. I am not going to easily convince farmers like my uncle that they should use Avaaj Otalo, but Babubhai hardly needs any convincing at all—he is already motivated. While many farmers may need Avaaj Otalo, Babubhai also wants it. At CHI’10, Tom Smyth and his colleagues at MSR India highlighted the distinction between needs and desires in their study of mobile video sharing in Bangalore, India [6]. They pointed out that while many ICT4D projects are developing mobile services for health or education, users are highly motivated to be entertained. They routinely overcome a slew of obstacles (cost, time, legality, even the complexity of the computing device itself) to meet this desire. To attract use of a new service or practice, addressing a clear need isn’t enough; users should have a genuine willingness.

Smyth and his colleagues also suggested ICT4D projects may be overlooking the importance of generating demand for a service while focusing on making that service more easily accessible for scalability purposes [6]. But catering the technology intervention to a lead user’s wants and needs can drive both demand and scaling up. By focusing on delighting the Babubhais of the world, we shift the focus from diffusion at scale to serving a small but dedicated user community.

Ultimately I predict nurturing this community can indirectly meet the scale challenge. In Indian villages, where the social fabric is very dense, lead users like Babubhai hold a lot of sway as thought leaders. Diffusing Avaaj Otalo through the empowerment of lead users decentralizes the process, and the word-of-mouth approach may help the message stick more effectively than when the technology is pushed by outsiders. As a researcher, I come from another culture, have no social capital in the local community, and my personality is not necessarily the most persuasive. Thought leaders like Babubhai win on all of those counts.

I have seen the power of the persuasive farmer firsthand during my time in India. During the

summer of 2007, I worked on a project with Jatan Trust, a pioneering NGO for the organic-farming movement in Gujarat. We worked on developing an innovative organic certification system in which we co-designed the standards for certification (the very definition of what it meant to farm organically in Gujarat) with local farmers. Through the project, I came into contact with many of Gujarat’s most advanced organic farmers. A question I began routinely asking was, “How did you get started farming organically?” Almost invariably, I would get the same one-word answer: “Sarvadamanbhai.” Sarvadaman Patel is an organic farmer in Gujarat, running a 40-acre marvel outside the city of Anand. Sarvadaman came from an upper-class family and received a Western education. He studied agronomy and settled back in Gujarat to experiment with farming practices he learned from reading the likes of Sir Albert Howard and Masanobu Fukuoka. Over the course of decades he mastered many aspects of organic agriculture, and other farmers took notice. Soon he was spending much of his time giving tours to farmers who would travel great distances to see his operation. Many of today’s committed organic farmers in Gujarat got their start from an inspirational visit to Sarvadaman’s farm.

After I first met Babubhai, I gushed to the staff of DSC about how impressed I was by him, how I thought he was a rare diamond in the rough. One of the staffers responded by saying, “He is impressive, but not rare. All over Gujarat, there are thousands of Babubhais.” It is my belief that leveraging the Sarvadamans and Babubhais is the key to sustainable and impactful ICT4D interventions. Supporting lead users with the appropriate tools to amplify their natural intent, capabilities, and influence is what will drive diffusion and ultimately development—economically or otherwise.



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[6] Smyth, T., Kumar, S., Medhi, I., and Toyama, K. “Where There’s a Will There’s a Way: Mobile Media Sharing in Urban India.” In *Proceedings of ACM Conference on Human Factors in Computing Systems* (2010): 753–762.