

Resolving User Contradictions through Fieldwork

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User-centered design is all the more critical in design of technologies for poor communities, because end users are typically so unlike the designers of the technology. Unlike, say, software design for investment banking – where both designer and user work in air-conditioned offices, are likely to have college degrees, earn comfortable livings through manipulation of information, and otherwise travel in similar social circles – technology design for rural or urban development almost necessarily means that those with technical expertise come from very different backgrounds than those for whom they are designing solutions, and this difference occurs across every social dimension: economic, educational, political, linguistic, religious, legal, and otherwise. (For the purposes of this paper, I will put aside questions of whether innovation for development should happen amongst the very people needing the innovation, if only because I anticipate that the vast majority of readers will not be *of* those communities.)

Of course, user-centered design has many benefits, chief among them that if taken seriously, the designed product actually meets the needs of the ultimate user. I argue further that the most important function of user-centered design is in determining how two contradictory generalities apply to a particular community or scenario, and that the importance of making these subtle distinctions becomes more acute as research in development accumulates a rich lore about supposed community inclinations.

For example, it is frequently cited that potential users from poor communities have various barriers to using technology [1]. If the technology requires reading, then illiteracy can be a barrier [2]. Often, the physical location of a technology can pose barriers that parallel social barriers of caste or religion [3]. Others suggest that fear of breaking electronic equipment as a barrier. And, so forth. Based on such findings, one might conclude that poor communities have an aversion to adopting new technology.

Yet, at the same time, we also find that technology has a powerful attraction that transcends socio-economic differences. Especially in a country like India, where the IT industry is well-known for its part in the country's economic growth, even the most remote rural villagers see a glamorous aura around technology. There is anecdotal evidence that rural schools witness an increase in student retention rates when PCs are placed in schools [4]. Their parents are eager to have their children learn about computers in the hopes of better future prospects. In rural PC kiosks, or telecenters, the kiosk operator is known to experience a boost in self-confidence and social prestige, because of their association with modern technology that is otherwise unknown in the village [3]. Finally, in a survey conducted in our offices in Bangalore to better understand our cleaning staff's attitudes toward technology, we found that while no one was able to name a single task that a computer could help them perform, they were unanimously interested in learning how to use a PC.

So, for any given application, how should we interpret these findings? Would fishermen from a coastal village appreciate a new technology that gave them better access to state-issued weather forecasts? Or, would they find the jargon of modern meteorology incomprehensible? Ultimately, such questions can only be settled by close interaction with potential users, likely requiring iterations of prototyping and testing.

Another pair of such apparently contradictory findings is the amazing robustness and functionality of households in the face of oppressive and self-sustaining poverty. On the one hand, poverty is systemic and stubbornly stable. A lack of money means struggling just to survive, which means no time to learn additional skills, which in turn prevents upward mobility... such cycles are everywhere and difficult to break. Yet, at the same time, households are functional, and life goes on; needs are met, though possibly in diminished ways. Microfinance rhetoric, for instance, sometimes suggests that the poor have no access to credit, but this is not true everywhere. In south India, for example, there are a range of credit instruments that are available to the poor, both formal and informal, and microfinance institutions offer just one of many solutions. Healthcare is another example, where a mix of traditional medicine, state-sponsored healthcare clinics, and off-the-shelf drugs provide some elementary support for the poor. For a given product or service, should we assume that households are in real need, or that the available solutions are adequate? Again, only through scrutiny of potential users and their social context can such questions be answered.

A couple of other such polarities: Money is absent (to a degree that is difficult to fathom for those of us with secure livelihoods), but consumption on entertainment and luxury items is not infrequent. Based on local standards and an increment to assuage personal guilt, I pay the woman who cleans my house Rs. 700 (~US\$15) for twenty hours of work a month. Her greatest fear is that others migrating into town from rural areas will undercut her. Yet, her children would think nothing of spending money on mobile-phone ringtones and her family might spend Rs. 90,000 (~US\$2,000) for a wedding.

Information is critical, yet information is rarely the bottleneck. There is no doubt that some communities lack knowledge of government schemes meant to address their problems, but access to that information in and of itself would not bring the expected relief. There may be difficulties with physical transport or corruption which prevent delivery of the “cure” even when it is known to exist. Providing access to the immense wealth of information on the Internet rarely solves problems rooted in lack of education, deficiency in physical goods, and so forth.

Thus, there are generalizations that can be made about development, but these generalizations, like proverbs, often come in contradictory pairs. It is true both that “he who hesitates is lost” and that you should “look before you leap!” “Many hands make light work,” but “too many cooks spoil the broth.” The challenge is in knowing when to apply which piece of wisdom, and in designing technology for development, there is no substitute for engagement with the potential user. It is only through an understanding of the potential user’s context, that apparent design contradictions can be resolved.

[1] E Brewer, M Demmer, Bowei W. Du, M Ho, M Kam, S Nedeveschi, J Pal, Rabin Patra, S Surana, and K Fall, "The case for technology in developing regions" (2005). *Computer*. 38 (6), pp. 25+.

[2] Medhi, I., Sagar, A. and Toyama K. (2006) Text-Free User Interfaces for Illiterate and Semi-Literate Users. International Conference on Information and Communication Technologies and Development (Berkeley, USA), May 2006.

[3] Toyama, K., K. Kiri, D. Menon, J. Pal, S. Sethi, J. Srinivasan. (2005) [PC Kiosk Trends in Rural India. Policy Options and Models for Bridging Digital Divides \(Tampere, Finland\)](#), April 2005.

[4] Pal, J., Pawar, U. S., Brewer, E. A., and Toyama, K. 2006. The case for multi-user design for computer aided learning in developing regions. In *Proceedings of the 15th international Conference on World Wide Web* (Edinburgh, Scotland, May 23 - 26, 2006). WWW '06. ACM Press, New York, NY, 781-789.