# Establishing Relationships For Designing Rural Information Systems

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Designing and evaluating technologies for the developing world presents unique contextual challenges - such as limited time and resources in the field, lack of infrastructure and cultural differences that lead to misunderstanding and inefficiency. It is essential to establish rapport with local partners to overcome this unfamiliarity and ensure the relevance of proposed solutions. For this workshop, we propose to share our experiences establishing such a relationship while designing a CAM-based mobile data capture system for Asobagri, a rural coffee cooperative in Barillas, Guatemala.

### Asobagri: The Coffee Cooperative

Asobagri is a producer/exporter cooperative founded in Barillas - a remote city in the Guatemalan highlands with a population of about ten thousand people. Asobagri is responsible for the process from soil care, seeding, harvesting and processing until the unroasted coffee beans leave the port on their way to one of Asobagri's five international customers. Asobagri's coffee carries three certifications: organic certification ensures that the coffee is produced making efforts to care for the environment. Fair trade certification ensures that producers are paid a fair rate. Finally, bird-friendly certifies the maintenance of native trees, preventing erosion and providing sanctuary to migratory birds.

Asobagri provides market access to over 800 small coffee producers of the Barillas region and promotes maintenance and respect for the environment. The staff at Asobagri's office is almost all college-educated. The coffee producers live in the remote, mountainous areas around Barillas, where there is often no electricity or phone coverage. Many are illiterate. For them, access to schools and medical help can be hours away.

### CAM Framework

CAM is a mobile phone software platform specifically designed for the rural developing world [2]. The CAM user interface was designed based on fieldwork with microfinance groups in India, in which existing paper data formats were found to be extremely important. As a result, users navigate CAM applications by capturing barcodes printed on paper forms using the mobile phone's built-in camera.

For the last six months, we have been working on designing two CAM applications for automating Asobagri's delivery and production monitoring processes. CAM DPS (Delivery Processing System) allows the cooperative to accurately and efficiently capture coffee deliveries and farmer payments. CAM RANDI (Representation AND Inspection tool) allows farm parcel inspectors to gather multimedia data based on a multiple-choice inspection form.

CAM is also being used as part of a live Management and



Fig. 1. Walking in mud on the way back from a coffee producer village.

Information System (MIS) for Self-Help Groups (SHGs) in India [1]. For this project, we have sustained a four-year relationship with our partner - the Covenant Centre for Development (CCD), a rural development NGO (non-govermental organization) supporting community enterprises in southern Tamil Nadu, India. Building on this experience, we now discuss those design practices that have helped us establish another potentially succesful relationship with Asobagri in Guatemala.

### Establishing Rapport

Local partners understand and can work within the local context much more effectively then outsiders. Establishing rapport requires the design team to show they are committed and capable; and providing the local partner the freedom and respect to do the same.

*Show you are tough.* We travelled on the 14 hour chicken bus from Guatemala City to Barillas and back. We ate all the precious food the producers' families prepared for us. We walked in the mud for hours to coffee parcels (see Figure 1), slept on wooden boards with a five-person producer family and lived in a 3 square feet guest room instead of a hotel room. This established the important precedent that we were working on equal terms.

*Show you are capable.* We showed we were committed to working as long as our partners were. We asked relevant questions and stayed focused on the task. We referred to and showed videos of our success in India - arousing further confidence and interest.

*Show you care.* We brought food to field trips, invited the local staff out for beer, taught salsa dancing and played

in friendly soccer matches. We had conversations about the latest town gossip, their hardships during the recent civil war, their food, and our food (everyone was amused that the second author was a vegetarian). The first author played coffee producer, weeding coffee plants and learning about worm-compost.

*Be willing to help wherever you can.* The first author filled in as secretary for a week during Asobagri's busy payment season. The second author won over the staff by hooking a LCD projector up to a broken VCR to watch the Champions League final.

*Be local.* For the first author, who is from Mexico, speaking Spanish, the most common language in Guatemala, and having a native understanding of Latin culture, was a great asset. It was also important to learn about and respect the local culture.

*Clearly establish roles.* Producers at Maxbal, one of Asobagri's producers villages, listed every conceivable village requirement during our first discussion, probably because so many of their basic needs are not met (transportation, health care, electricity, shelter, etc.). Also, they are used to being visited by charitites (such as the private donors from Canada that built the village school). Clearly expressing who we were and what we could do greatly clarified the discussion.

### Designing Relevant Solutions

The next step is to leverage each stakeholder's inherent expertise, and their newly established relationship, to design appropriate and relevant solutions to local problems.

*Identify natural champions.* After we gained the confidence of the internal control manager at Asobagri and the village technology champion in Maxbal, we received more support in our work and achieved better communication with the farmers.

*Listen.* CAM RANDI was designed after many formal and informal conversations with Asobagri's staff. We had our ears open all the time, not only during the "official" usability testing.

### Overcoming Evaluation Challenges

It is difficult to evaluate computing systems in the developing world with the same rigor as in an academic or industry research lab. Obtaining statistically relevant empirical data requires patience, flexibility and planning.

*At first, be patient and flexible.* Due to long travel times between producer communities and the Asobagri staff's busy schedule, we fit our iterative design and evaluation sessions with scheduled field visits wherever possible — limiting the time and attention we got from participants. To achieve our goals, we had to voice our needs early and often, and also be patient and flexible.

*Conduct experiments that are clearly relevant for local stakeholders.* Limiting experiments to those that have a direct long-term benefit for local stakeholders is the best way to get sincere participation in design exercises.

*Strive for a balance between control and enthusiasm.* It was difficult to maintain a sterile testing environment, given that everybody was excited to witness the use of new technology. The users got distracted, both with people and nature (for example, see Figure 2). While this was a distraction for the



Fig. 2. A producer showing his organic orange tree during one of RANDI's in-situ evaluations.

design process, letting natural interest and excitement carry forward also helps build rapport and user involvement.

*Use accumulated social capital to achieve better testing conditions.* In India, once the design team had established a long-term working relationship, and the initial novelty had warn off, they were able to conduct statistically relevant experiments under controlled conditions [1]. We are hoping for the same result with Asobagri during the next round of internal inspections in May 2007.

*Take compliments with a grain of salt.* People in the rural developing world are often polite and will not plainly give a negative answer. Some are also keenly interested in acquiring new technology (for example, fancy mobile phones).

### Discussion

After four years of iterative design and evaluation, the CAM SHG MIS application is now being used with live data at CCD. During the same period, the academic outputs have also been fruitful. Neither would have been possible without mutual commitment and respect.

In this paper, we have listed a set of practices that we used to establish what we hope will be a similar relationship with Asobagri in Guatemala. We have been very lucky in the partners we have chosen — both Asobagri and CCD have been incredibly open and cooperative throughout the course of this work. However, with success comes responsibility. We have been afforded this opportunity in the expectation of mutual benefit. Carrying out these projects to a sustainable hand-off point is the next challenge on our horizon. Without local adoption and ownership of systems, the end goal is still some distance away.

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