
ICT4D: A model for engagement with indigenous communities for ICT-enabled change

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Abstract

Technology implementations in remote areas of South America, and, for that matter, other parts of the developing world have had limited success or final benefit for the recipients. In one particular case in the remote Peruvian Andes, a New Zealand team engaged with the local population to form an approach for rolling out the Internet with the result being one of the highest uptakes of technology in Peru and a huge benefit for the recipient communities. The approach, or method, developed for the project has been called "Community Centric Empowerment" (CCE). This paper outlines the reasons for the development of the methodology, describes its elements and how it was applied in the implementation of technology in the developing world.

Keywords

Peru, community, empowerment, research methodology, indigenous peoples, sustainability, ICT4D

Introduction

In 2001, at the request of the Peruvian Government, a team from the Department of Computing and Information Technology at Unitec Institute of Technology were asked to help the remote farmers in the Antabamba region in the high Andes. According to the Peruvian government, the people of the Antabamba

region were suffering from a decline in their standard of living despite the country's burgeoning economy. Initial visits to the Andes were undertaken by members of Unitec's Centre for IT Research and Development (CITRUS), and a situational analysis study was carried out to gauge exactly what was the plight of the local farmers. The journey led the team to two of the poorest areas in Peru - Huancavelica and Apurimac. There the team found communities that had only had road access to the outside world since 1995. Since the road went in, the carriage of Western products, culture and marketing had all but decimated these people's lifestyle and communities. Until then their traditions, practices and culture had sustained these communities for nearly 1000 years.

The purpose of the project therefore, was to see if technology and information and communications technologies could assist the Peruvian farmers to regain some control over their resources and minimise the negative impact of 'progress' ('progress' used in the western sense) on their societies. In order to achieve these aims the team had to devise an appropriate research methodology. This paper outlines the development and application of that research methodology.

Background

The project fell into the category of projects known as "ICT4D 1.0", prior to the pervasive use of mobile phone technology in developing world contexts and later projects known as "ICT4D 2.0" (Heeks, 2008).

ICT4D

"The term ICT4D refers to the opportunities of Information and Communication Technology (ICT) as

an agent of development. Research in that field is often focused on evaluating the feasibility of existing technologies, in the context of developing regions" (Sutinen & Tedre, 2007). As Heeks notes, there are three major reasons that we "should give priority to ICT application for the poor in developing countries" (2008). The first is a moral argument, that the majority of our resources in the 'developed countries' is spent on optimising the already wealthy as opposed to the potential for addressing the "planet's megaproblems" on the frontline of which the poor live. The second argument is one of enlightened self interest both to protect the developed world from threats from the angry and dispossessed and to raise their standard of living and align our interests. Third, the argument of personal self interest, developing systems for the third world and addressing fundamental human needs is intrinsically more interesting and satisfying.

The role of information and communications technology (ICT) in this development process is potentially critical. "Economic, social, and political life in the 21st century will be increasingly digital, and those without ICT will be increasingly excluded" (Heeks,2008). Moreover as Heeks noted communities themselves are choosing ICT enabled solutions as well as more physical solutions such as drinking wells. But as further noted ICT4D projects have had a mixed history and there is an increasing focus on "Sustainability: The failure of many ICT4D projects to deliver and survive prompted a new emphasis on ensuring the longevity of such projects." (Heeks, 2008)

Accordingly the team were motivated to avoid what we termed the "tractors for Africa" problem, where we merely delivered the hardware technology and failed to

focus on sustainability (fit to local context and needs, training, power, ongoing funding and maintenance).

Project Context

The Central southern Andes mountain region of Peru is permanently exposed to geophysical and geological phenomena, which have had catastrophic effects and pose an ongoing threat to the safety of the local population and the development infrastructure (National Committee of the International Decade for the Reduction of Natural Disasters and the National Institute of Defence, Peru, 1994). This includes earthquakes, landslides, floods and even droughts, all contributing to this being one of the harshest physical conditions on earth. By 2000 Peru was in the process of recovering from a Civil War that had left 69,280 people dead (Gass, n.d.). According to Gass, this war had been primarily fought in the very rural areas that the then-new Free Trade Agreement with the US was projected to hit the hardest. Much of the associated political violence and civil war had taken place in the most poor and abandoned rural areas such as the departments (regions) of Ayacucho, Huancavelica, Apurimac, and Junín located in the central southern Andes (Vasquez, 2005).

According to Orihuela (2009), by 2004 of the post-conflict era, there were over 40,000 rural development projects for a total of more than \$US2 billion and Huancavelica and Apurimac were among the “privileged” zones of infrastructural spending in conjunction with poverty-alleviation programmes for the repopulation of the most war-torn areas (Huancavelica and Apurimac). However, the programme failed to reverse the trend, as Huancavelica and Apurimac have had the lowest annual rates of

growth of adult population for 1981 to 2007 at 1.4% compared to a national average of 2.8%. It was into this background of new political stabilisation and government spending and support programmes that the Unitec New Zealand’s CITRUS team were invited, by the New Zealand representative of the Peruvian Government, Javier Leon, and the Centro Internacional de Papa (CIP), to submit a proposal to NZAid. The goal was to assist the remote highland farmers in the Huancavelica and Apurimac regions by distributing the centralised knowledge and the wired and wireless technology that is available in the cities to these remote areas in order to give these communities more control over their own resources, information on crop growing, markets, education and direction. The plan to achieve this was to link these areas via satellite to the Internet.

The CITRUS team believed the first step was to understand how these communities had lasted so long, and so successfully, living in some of the harshest physical conditions on earth, through a bloody conquest, a civil war and several political and economic revolutions. In lifestyles that appear as primitive, backward and undeveloped there clearly lay significant strength and knowledge that surpasses the developed world’s ability to be self-sustaining.

Research Methodology

The project team’s desire to effect change in a sustainable manner implied the need to shift the responsibility and ownership of the project to the participant communities. Therefore it was necessary to develop a methodology to ensure this happened. Several approaches were gleaned from the literature. While the team’s process was at times intuitive and

pragmatically driven, there were some underlying principles consistent with other research approaches that "undertake research in a culturally appropriate way, which operates in a mutually respectful partnership,[and therefore] requires forethought and agreement about the process to be adopted" (Charkova *et al.* 2003).

Research Approaches

Research in this area cannot escape the influence of Paulo Freire. Working in the neighbouring country of Brazil, in Recife in the early 1960's he specialised in the tradition of existential phenomenology - what later became known as the pedagogy of the oppressed and he subsequently published under this title. Freire (1972; as cited in Crotty, 2003; p149) said there was indivisible solidarity between humans and their world; that no dichotomy could be made between the two. "Authentic reflection considers neither abstract man nor the world without men, but men in their relations with the world" (Freire, 1972 p54; as cited in Crotty, 2003; p149).

He further says that not without dialogue can there be liberation and that true dialogue cannot exist without critical thinking and that only dialogue can generate critical thinking and reflection (1972; as cited in Crotty, 2003; p 153). Freire goes on to say that dialogical [processes] are where both parties are regarded as equally knowing subjects - engaging together in critical thinking and a "quest for mutual humanisation".

Freire (1972; as cited in Crotty, 2003; p 157) equates participatory action research with critical enquiry, and again (1972; as cited in Reason, 2001) emphasised the

importance of helping disadvantaged people develop critical thinking so they could understand the ways in which they were disadvantaged by the political and economic conditions of their lives and could develop their own organised action in order to address these issues.

While not consciously undertaken as an action research project the team's approach shared many of the features of action research outlined by Elden and Chisholm (1993) namely (a) a problem focus (b) action orientation (c) cyclical process (d) collaboration/participation.

Tupu *et al* (2005) use a similar approach with the Kaupapa Maori qualitative research method when reporting on the case of six Maori women enrolled in a Bachelor of Computing Systems at Unitec New Zealand. Their experience was to undertake research in a culturally sensitive manner operating on a mutually respectful partnership with the women in the study. The method they used to collect the data used the beginnings of "whakawhanaungatanga (establishing family-like relationships)" (Bishop, 1996). From this New Zealand experience, came some understanding of models for working with indigenous peoples such as the Quechuan Indian communities involved in this project in Peru.

Also Bishop and Berryman (2006) talk about the importance of building relationships and interactions that respected aspirations for self-determination, in the context of indigenous Maori. They talk about the concept of "Te Kotahitanga" which is "a collaborative response towards a commonly held vision, goal, or other such purpose or outcome" (Bishop and Berryman,

2006; p274). One of the prime tenets of "Te Kotahitanga" is that once those in external authority have had an opportunity to consider their own positioning, they are generally able to see that (re)positioning to be within discourses that offer solutions rather than blame and frustration, offers more opportunities to realise their own aspirations – along with those of those working towards self-determination.

The concept of "people-centered development" was carried out by the Katalisis project team who worked in the same Andean regions of Huancavelica and Apurimac (and several other regions as well), according to Sherwood (2008). Sherwood reported that they compared a "people-centered development" with a "technology-centered development" process. They found that from the view of the indigenous people the "people-centered development" process produced an active outcome with the locals capable of solving their own problems; as opposed to the "technology-centered development" process which produced a passive outcome with the locals continually in need of assistance.

Sherwood (2008) also described one of the processes used by the Katalisis project team in Peru as "taking a spin" by using a spiralling outwards process with a central starting point and then going through the stages of encounters, historical analysis, initial test, first results, hope, broadening, experimentation, confidence, diversification, deepening, autonomy, and finally, organisation.

According to Bartle (2009) poverty is a problem because there are disparities in wealth; some have more than others. If genuine equality were possible,

then poverty would not be a problem. Closely associated with wealth are power and capacity. Communities (and individuals) that have lots of one, usually have lots of all three. So to improve the conditions of people in low income communities, poor communities, marginalised communities they need to have more wealth, power and capacity. Closely associated with these three concepts is democracy. The meaning of democracy is "power to the people" (demo = people, cracy = power) (Bartle, 2009).

"When we say we want to empower a community, we mean that we want to democratize it. That does not necessarily mean we want them to have votes to choose their representative (as in the British or American political model). It means we want the people (not just individuals) as a whole (collectively) to have power. We want to find ways for the community to have more power, wealth and capacity." (Bartle, 2009)

Partnership and Understanding

These approaches then, informed the team's dialogues with the local communities. After overcoming the initial distrust, scepticism and curiosity around the presence of the Unitec New Zealand's CITRUS team in these areas, the team learned that the Huancavelica and Apurimac people were desperate to provide a healthy future for their children and were agonising over the rapid slip and decay of their society. Each farmer, mother, politician, alpaca farmer, schoolteacher, missionary, child and youth interviewed, had a story to tell. In a population of 35000, over 400 were interviewed (some many times) and another 1200 attended community instigated meetings to convey their thoughts and impressions.

Phenomenology, the Qualitative Research approach of focusing on people's subjective experiences and interpretations of the world (Husserl, 1982), was the approach the team took to understand the challenges, sadness, and frustrations these people were feeling around the decimation of the society and environment that had sustained them for so long. Over a period of one year the CITRUS team listened and moved through the phases of community storytelling, Fig 1 below. These phases included the initial cry for help and the desire to show to the team what was happening to their society.



Figure 1. Depicting the community meeting

The second phase was dominated by stories of how things were and what things used to be like. The third and perhaps the most crucial part was understanding from the stories the values, philosophies and the informal networks that were entrenched in the culture. These formed the fabric that had knitted these people together for over 1000 years. The solid foundations on

which to build technology which might have impact, lay within these philosophies that had withstood the centuries of external assaults.

It was during this last phase, after coding and analysing hours of conversations that strong themes began to emerge. Once the team thought they understood an important theme they would bring it back to the farmers, the women and the elders. The team asked them to show and teach them their way, in their terms, using their resources, to check that the team had understood the essence of these common themes. In many cases as time went by the people would approach the team to explain more, sometimes coming back as many as 10 times. To build common understanding the people were encouraged to tell their stories in a visual way. One of the easiest ways of sharing knowledge was a set of drawings done using paints from one of the local primary schools.

The first concept explained to the CITRUS team by the locals was *family*. Without family, the team were told, their young could not be nurtured and learn from the experience of the elders. Without family they could not exist and grow to support future generations without solid role modeling and nurturing.

The second concept explained by the locals was *community*. Without community the team were told, families could not share their wisdom and experiences. They were not able to learn from the experiences of other families to grow and be wise about matters of life, love and the respect that needed to be bestowed on their environment and community. The community is an extension of the family as shown in Figure 2. From here the wisdom is nurtured shared and passed

on. It is here that the wisdom of their elders is cast and passed on for centuries.



Figure 2. Picture of family and community

The last concept explained to the CITRUS team was the *environment* and this was explained in a manner that was so clear and obvious that the team could not help but reflect upon the modern world's perception and neglectful attitude towards the environment. Clearly, the team were told, the environment provides the very air everyone breathes, the water everyone drinks, the grass that feeds the animals which provide meat and clothing, the soil that grows the vegetables. See Figure 3 below. To the locals, the environment and ecology is what gives them, and everyone else, life. Whatever it was the team was going to do, clearly they needed to nurture and enhance it with every action.



Figure 3. The peoples' interpretation of the environment and life cycle.

This depiction of the core values of the community, showed the contrast between their present existence and key challenges facing them. Two major needs were perceived at this point. The first critical need was to gain ready access to markets and information in order to sell crops and animal products at viable prices, rather than those gouged by venal middlemen. The second was knowledge to grow better crops and improve animal husbandry.

Action and Change

The community had collectively and collaboratively drawn on the central values which had sustained their past and saw new forms of knowledge and technology as a way of enhancing the quality of their and their children's lives. In dialogue with the team the communities identified the ways in which computer

technology would address their pressing needs and match their values.

The team identified the need for suitable hardware and communications technology to link the remote communities to the internet as a vehicle to gain access to markets, information and knowledge to support the farmers, their families and communities. The team working with local technology capable partners duly implemented CIC's (Centres de Informacion y Comunicacion) and internet connectivity enabled by satellite communications.

The communities then empowered themselves by using computer technology as a vehicle to gain knowledge to improve their existence. Initially the computers were used by the farmers, who were trained by local community facilitators, and in the evenings accessed the internet to gain knowledge of market conditions in the cities, link to buyers of their products and to CIP the potato research centre in Lima. As a byproduct of the availability of the centres during the day (when they were unused by the farmers), they were taken advantage of by the local schoolteachers, community and womens' groups, youth and even the preschoolers (in a form of kohanga reo known as 'wawa wasi'). This appropriation of the technology was driven by local wishes and needs and supported by local facilitators who saw opportunities and provided education and training.

Unexpected byproducts of the centres were the enabling of such projects as the winning of contracts for work on local river irrigation schemes by the Mujeres Despladas (the displaced women evicted from their homes by the shining path guerillas).

The Unitec New Zealand's CITRUS team called this:

"Community Centric Empowerment". (Young & Muller, 2006).

Community centric empowerment therefore encapsulates a community identifying what it cares about and empowering its members to take actions that support the very basics of life, social interaction, and relationship with their environment. The Quechuan people have a very highly developed awareness of the interconnectedness between their life, their social structures, and their environment. How these things relate to the quality and provision of future generations is also clearly understood and embedded in the very foundations of their culture. Technology can now link them to knowledge and education both for the present way of life and the generations yet to come.

Evaluation

A first hand view of six of the centres and their active use by the communities was evident in a mid project inspection visit carried out in 2005 by the first two authors of this paper.

As noted by Clear & Young (2007) the project has positively impacted the lives of many remote communities in the highlands of Peru, resulting:

"...in over 40,000 people in four remote regions and hundreds of communities being able to increase their standard of living and communicate with suppliers and advisors in major cities and research centres".

A Masters thesis sponsored by an NZAID Postgraduate Field Research Award 2005/06 has evaluated the impact of the project (Newman, 2006). The findings were positive about the project's impact and the sustainability of the intervention, and reported how the community ownership of the centres had led to an absence of negative uses of the technology.

Conclusion

This paper has reported on the development of a methodology to introduce computing and technology in an ICT4D context. Approaches to engaging with indigenous communities in a manner which respects their values and needs and generates true partnerships, have the potential to bring about technology enabled change in sustainable and useful ways.

After living through the Andean experience and being humbled by the clear priorities of this ancient culture, the CITRUS team saw that there are philosophies that could be adopted as underlying values for the computing disciplines.

These philosophies focus on the core human values of family, community and environment. These communities already have a sophisticated awareness of how to coexist in their environment, whereas many ICT4D projects have had a mixed history and have been required to rethink their approach with an increasing focus on sustainable interventions (Heeks, 2008).

The 'community centric empowerment' model outlined in this paper illustrates a proven research methodology for building sustainable partnerships to jointly

undertake IT enabled change. The model is one with the potential for addressing the "planet's megaproblems" (Heeks, 2008) on the frontline of which the world's poor live.

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