

Computer Science and Global Development

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ABSTRACT

This position paper argues that we should set ourselves the Grand Challenge of creating tools that people in the developing world appropriate for their own purposes.

I suggest that one such Grand Challenge is a tool that makes all telcos obsolete. Our allies in this might be the mobile handset manufacturers.

I also argue for community based values and methods that embrace the egalitarian principles of Action Research. I point out that Monitoring and Evaluation Tools are useful as a metric for development projects but need to be adapted for ICT Design.

1. GRAND CHALLENGES

I want to nuance the need for a “Grand Challenge” approach to Computer Science and Global Development. As a working definition of “Grand Challenge” in this context I’ll use “a specific critical barrier that if removed would help to solve an important Global Development problem”.

My own experience over a number of years is to see many large policy initiatives come and go with very little lasting effect. One of the early failures was the notion of Telecentres (or Multi-Purpose Community Centres) which were rolled out in South Africa as a way of bringing ICT benefits to disadvantaged communities from about 1998 [1]. The one size fits all approach, even with the best of intentions, leads to implementation failures.

I now think that the mindset of using Grand Approaches in tackling development must be limited to a very specific area, namely that of creating technological tools that people can take over for their own purposes. (This is not to say that Grand Challenges aren’t an effective way to mobilize funding and research effort in the Developed World.)

I believe that tackling actual problems in specific places cannot be dealt with in a grand fashion; rather tackle them by enabling many small scale initiatives which people can themselves adapt to their needs. Unfortunately, in terms of mobilizing resources, saying that you want tools to deal with the Billion-and-One challenges of situated development might not be the catchiest of slogans.

The reason I am excepting “tools” from the restriction is that an enabling technology at a low enough level (consider mobile phones, but see below for caveats even there — Section 1.2) empowers people to find their own solutions. Giving people the power to improve their own lives seems to me the best way to achieve real and lasting development [2].

1.1 Why Are Tools the Exception?

The real reason building tools with a grand scope does not seem to violate Easterly’s criticism of Big Push approaches is because

tools inherently defeat “planners”. People will take over a product and use it for their own purposes. Third wave HCI seems to have embraced this. Nokia’s researcher Jan Chipchase says: “however we design this stuff — carefully design this stuff — the street will take it and will figure out ways to innovate, as long as it meets base needs” [3].

1.2 Grand Challenge: Replace Mobile Telcos

I believe one grand challenge worth pursuing is to replace all telecommunications operators with a web of local meshed communications systems. Where long haul backbones are required these can be provided by National Governments: the natural monopoly holders of last resort.

To me this seems like the most basic of tools for empowerment of communities.

I believe Onno Purbo has shown the way with his model of “Bottom Up Self-Finance Community Based Approach”. He emphasizes that the people in a community can manage their own upliftment if they tap into the financial resources which they already have to exploit the resource sharing that ICT can enable [4]. He argues that the “champions” in this case are the younger people from the community. He draws a distinction between the members of the community who *talk and listen* (that is, older, semi-literate and resistant to change) and the *younger generation*.

The younger generation in the developing world are keen to embrace change and technology. The South African mobile banking company Wizzit that targets the unbanked has used this same insight in its marketing by recruiting young “Wizzkids” as the lever to take its technology to the townships and rural areas [5].

So the challenge is to develop a very low-cost communication system that is locally self-sustaining and has the potential for national and inter-national connectivity.

How? Not exactly sure: there are many alternatives to centrally provided communications services. In fact the whole notion of a single national telecommunications operator seems curiously anachronistic in the Internet age.

Why? Because I think mobile telcos are becoming an impediment to further development just like their fixed line predecessors.

Mobile Phone Operators Considered Harmful

The mobile phone operators have put up a scaffold for development. It is time to thank them but to stand free from them. From now on they are turning into a burden. Many people are beginning to comment on this in their blogs: William Easterly, Steve Song [6], and Richard Heeks [7].

People are spending all their extra disposable income on mobile access. This money is leaving the community and is not fed back into local businesses. Mobile service provision under the current model is a natural monopoly and as we put more and more ser-

vices onto this monopoly (take banking) we are handing more and more power to these monopolies: not a healthy situation.

2. VALUES AND METHODS

The earliest lesson that we learnt was that an approach to ICT in Development has to be community based. At the Information Society and Development (ISAD) Conference in 1996 South Africa already developed a notion of an “Information Community”¹ as opposed to the information society or information superhighway. The pervasive African philosophy of *ubuntu* provides the grounds for this approach since it regards one’s identity as a human being as causally and even metaphysically dependent on a community (which may include the living and the dead). In deriving principles of right action from this, the philosopher Thaddeus Metz has come up with statements like: “*An action is right just insofar as it promotes shared identity among people grounded on good-will; an act is wrong to the extent that it fails to do so and tends to encourage the opposites of division and ill-will*” [8].

Not only do these values argue for a community based approach to ICT, they also point to a community based approach to research ethics. This is an approach in which researchers and target users are equal members of the same community. It seems to me that such an approach leads to some kind of *Action Research* where the legitimate needs of the users for action are combined with the equally legitimate needs of the researchers for research results.

The cyclical nature of action research where questioning and reflection are tied to intervention neatly solves the need of users to learn about ICT while the researchers learn about the community within which they are working. Many popular ICT development methods have assumptions, frequently unarticulated, about users’ knowledge of information technology artefacts, one such is participatory design. Such approaches have largely failed to meet the challenges of ICT Design for Development.

3. METRICS

We have looked at adapting some of the metrics used by development agencies in order to evaluate our projects for socio-economic development in deprived areas. Our projects essentially constitute a design problem. When we used Monitoring and Evaluation (M&E) Tools in ICT design we first had to acknowledge that this was not the intended use of these M&E tools.

The advantage is that such tools have focussed for a long time on development issues and are sophisticated instruments for evaluating impact, sustainability and so forth. We have used both the *Real Access/Real Impact* criteria of bridges.org[9] and the *Outcome Mapping* method developed by the IDRC [10]. In both cases we were assisted in this by experts from these organizations.

The problem with using M&E Tools for design is that they do not readily provide design guidelines. One relatively easy way to incorporate such tools in design projects is to use them in the evaluation cycle of one of the modern iterative and agile software design methods, or equivalently in the evaluation phase of an action research cycle.

That still does not remove the fact that such tools do not really give the ICT designer assistance such as, for example, design

patterns. More subtly, from the point of view of an ICT designer, M&E tend to treat ICT in a static fashion and not as something that is easily mutable and adaptable. This means planning incremental adaptation is more difficult.

4. CONCLUSION

While I do not think that Grand Projects are an effective way of dealing with development, this does not mean that producing good tools for people in developing countries to solve their own problems is a bad idea. We should try to set up the grand challenges so that they produce such tools.

One of the most important tools to aim for is one that turns the provision of communication services into one of “plumbing” communication pipes. By this I mean a activity that involves a large number of agents with relatively simple ICT skills and no large and expensive communications monopolies to feed. It may be possible to recruit the telephone handset providers in this drive: Nokia has already decided to build Skype into their N-series mobile phones, now we need a developing-world-phone that is capable of peer-to-peer communication.

5. REFERENCES

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¹ See www.cs.uct.ac.za/~edwin/OldWeb/isad-pm/node6.html