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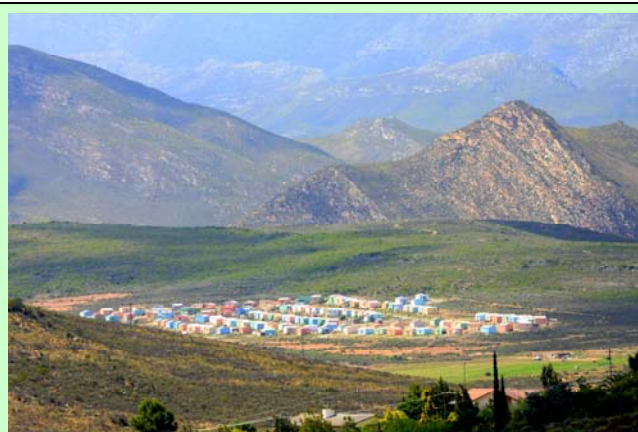
Global Research Award

Mobile Design for the Developing World

Hosted by University of Cape Town, South Africa

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The mobile phone as transformational technology

It is clear that the mobile phone has the potential to transform African society, commerce, and politics. One of the most powerful aspects of the **mobile is** that it has become the **computing platform** for the **continent**. Mobile phones, even the older ones more commonly found there, are powerful computers and have inbuilt communications.

First versus third

Major differences between technologies in the developed and developing world

1. The Internet is not king

Most applications that I design and work with have two cycles of interaction: an internet-based route, and a mobile-based one. Usually, the mobile augments the internet one, giving you access to the system on the move. In Africa, the internet part is almost always absent, and systems have to be designed for just mobile use.

2. Phones are not as personal

Owing to their relative expense, many township residents do not own their own phone - instead, they tend to have their own SIM card and borrow a phone from a friend or neighbour, or go to a local calling station (often built in a container).

3. Power is an issue

In the bush, electricity supplies may be nonexistent, unreliable, or in short supply: low power devices are important.

4. Literacy impacts life

Many township residents are not literate, meaning designs have to work for those that cannot read or write.

5. Social systems are stronger

Families are more important: the words of elders more listened to and respected. Introducing technology into this can cause problems if not done sensitively.

Projects

'Snap-Grab-Send' (or BigBoard) is a research project that utilises the **mobile phone camera** as an **input device**: the user photographs an icon or image shown on the BigBoard screen, which is simply a large display, and sends it via bluetooth to the attached computer. This processes the photograph to recognise the image or icon, and sends back associated information to the phone. It can be used to provide snippets of information to mobiles relating to any topic - healthcare, education, community information, and so on, and the users only need know how to operate their mobile phone. We took this into a community project in the townships for a user trial of the system.



A related project looked at how **political information** could be **disseminated** throughout **rural** communities using mobiles - coming straight after the riots in Kenya after the Presidential election, the role of reliable information cannot be underestimated. Part of the work was to look at the social issues with such systems - how they were much better received if the headman in a village was given more control of the board, so that information could still come through him: that tended to make it more trusted.

A very different issue of **trust** was addressed by another project, working on ways of **authenticating** users over mobile networks so that they could have banking facilities delivered on their mobile. This is much harder than it appears, for some people are sufficiently **numerate** to understand their balance, but **not** sufficiently **literate** to be able to reliably enter a password or similar.

I spent some time discussing a **virtual museum guide** project that aims to capture and effectively present the verbal histories of people who lived through major events and turbulent times. We discussed ethnographical approaches to information gathering, through to understanding how people used museums, and then looked at how that could be best incorporated into a virtual world and guide.

I also spent time working with an AIDS charity on the **redesign** of their **clinic management software**, freely available to rural and metropolitan hospitals. It provides a simple management service for patient records, drug inventories and ordering, etc. We evaluated the current design, and found that it met the needs of the users to a greater degree than the programmers had thought. We made a few minor suggestions for changes, but left them with the good news that it didn't need substantially reworking.

Location

The University of Cape Town is situated on the edge of Cape Town itself, at the foot of Africa.



I also travelled around South Africa to better understand the nature of the environment and the challenges that systems need to overcome - both geographical and social.

The Cederburg, to the north, is a mountainous, relatively sparsely populated area, with difficult rocky terrain that means that mobile signals are sparse. Out to the east, past the lush vineyards and prosperity of the winelands, the Little Karoo stretches for hundreds of kilometres between difficult-to-traverse mountain ranges, offering little but scrubby plains and occasional farms. However, here the geography is easier, and I obtained a more reliable mobile signal than I get on my journey into work here in the UK, along the major motorways of the Midlands.



Cultural issues in design: an example

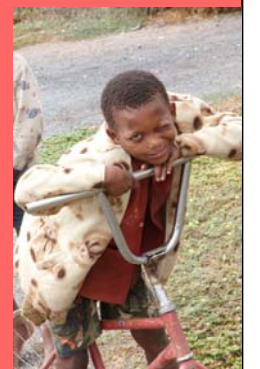
Father
Grandparents
Uncles
An' aunt

Some cultures have no notion of hierarchy - when asked to classify people, they do not conceptualise them in the same way that

we do. This means that, for example, a mobile system given to bushmen to classify animals they saw worked much better when it was redesigned to remove categories and present everything in a long, long list.

Ambient Information Representation

The aim is to find simple ways of providing awareness of lots of complex information in a simple way - for example, that family and friends are happy and well.



We ran some experiments to determine what people notice (did you notice the two occurrences of 'a' in the paragraph above?). The results of these can be used to feed into visualisation and representational ideas that we are developing for mobile devices to give awareness information to people wherever they happen to be.



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