Beyond markets for mobiles: the development sector and pro-poor impacts of ICTs

A think piece for an African Studies Centre workshop on mobile phones and social space

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Background

The huge increase in uptake of mobile phones (mobiles) across developing countries is evidence of poor groups taking an active interest in this particular highly portable manifestation of an Information and Communications Technology (ICT). Of course there are other more traditional forms of ICT that are more ubiquitous and in high demand – such as radio. Yet the mobile has allowed for increasingly affordable two-way communications between people at the base of the pyramid – the world's poorest 4 billion – in a way radio cannot.

This large increase in demand for mobiles has been largely led by the market – which has offered increasingly cheap handsets and 'pay-and-go' tariff models with associated street corner distribution networks. These factors have led not only to increasing affordability and ease of access of mobile phone credit but an evolution of its use to provide de-facto currency for the poor. Mobiles have changed the way people interact and often how they make their livelihood.

With such a touted 'success' of a new ICT in markets of the poor – particularly by the mobile companies themselves – why then has this been a process dominated by the private sector? Indeed a recent World Bank report recently described mobiles as "the single most powerful way to extend economic opportunities and key services to millions of people"[1]. What then has the role of the public sector and development community been here in understanding and shaping the impact of the little electronic brick in many a farmer's hand?

The supply/demand nature of market-based models (led by the private sector and consumer level uptake) is argued by some as being a better form of introducing new technologies that benefit the poor than direct interventions from development actors. This so called passive diffusion view is based on the way mobile telephony has spread so rapidly. The approach holds that if ICTs do have developmental value for the poor, a combination of private firms' search for profit plus the poor's search for value will make it happen[2]. Development money is best spent elsewhere[3]. A long history of failures in national government rollout of telecentre networks across Africa to the village level along with a spike and lull in donor driven ICT projects is perhaps reason and evidence for the passive diffusion view becoming popular. Particularly evident is how a top-down supply push for perceived ICT 'needs' of the poor does not always match on the ground demands and realities.

Today services delivered via mobiles that have widespread availability and use at the base of the pyramid are predominantly left to market forces to deliver. There are of course a number of notable and innovative exceptions to this and it is certainly true that private sector mobile based services have often been less ambitious in terms of pro-poor outcomes than development sector pilots – as might be expected. Yet many of the innovative case studies involving development interventions have remained niche, difficult to replicate, and have often not been sustainable over time.

This paper seeks to give a brief overview of the history of development sector interventions of ICTs and where this positions 'ICTs for development' going forward. A key question to ask as we move into the

second decade of the 21st century is how the impact of ICTs on the poorest can be improved – and the role of the development sector and government in achieving this in what is today a predominantly market-driven approach to mobiles and more broadly to ICTs.

Development interest and ICTs

The rise of donor interest

Interest in ICTs for development (ICT4D) has evolved in a very particular way. This may help explain why the current explosion of mobiles in to the daily lives of the poor has not led to the level of integration of ICT recognition in modern development practice that one might expect.

There are several aspects of the evolution of ICT4D that are worth considering. In the mid 1980's ICTs were mainly seen as increasingly important drivers for big business to function and so were dominated by big companies in the private sector. Companies like IBM were king and seen by many development practitioners as at best irrelevant to developing countries and at worst threatening jobs. At the same time development thinking saw a push away from technology transfer and the green revolution thinking of the previous decades – the modernity ethos had pushback and ICTs fell under this banner.

As the Internet began to take off in the mid 1990's there was a resurgence in development spending on ICTs. The developed country ICT expansion was driven mainly by markets, and governments began to talk of the digital divide – particularly affecting rural areas. Development donors talked of the digital divide between the global north and south – the new watchwords being 'universal access' to ICTs. Large scale top-down infrastructure deployment occurred, funded by the public sector and development donors. The telecentre model– buildings/units at the community level with ICT equipment (PC's), Internet connectivity, and phone access– was most popular. However, the telecentre deployments saw widespread failure of take-up by the poor groups they were targeted at.

ICTs were seen as tools to assist development along the following theory of change:

Telecentres -> Access to ICTs -> Provide services -> Assist in development

Not only did the reality of implementation not reach beyond rollout of infrastructure (access to ICTs) but the elements later in the chain did not come under sufficient scrutiny to assess the validity of this chain e.g. what evidence is there that Internet access as a service can assist rural development?[4] What types of services would be most relevant to marginalized groups?

Despite criticisms of the top-down approach to ICT access – exemplified by the telecentre model – rollout of telecentres continued up until the mid 2000s, although at a decreasing rate. Initiatives like the UN ICT Taskforce were mandated to "lend a truly global dimension to the multitude of efforts to bridge the global digital divide, foster digital opportunity and thus firmly put ICT at the service of development for all"[1].

The fall from favour – ICT for Development in a bubble

This initial hype around ICTs which broadly failed to deliver on the ground development benefits led to donor funding for ICTs going out of fashion. The UK's Department for International Development (DFID) for example closed its ICT4D dedicated programme in 2006 – citing reasons of mainstreaming ICTs. Canada's IDRC, a strong proponent of research in ICT4D, restructured in 2009/10 and dispensed of its

[1] See http://www.unicttaskforce.org/

ICT4D group. The early hype and failure cycle has left ICTs stigmatised in the mainstream development community. Mainstreaming – as with other mainstreamed focus areas such as gender – has likely outcomes of pushing ICTs out of view. An area to be ignored, until the relatively small ICT4D community 'proves' the value of ICTs for development to the mainstream.

Heeks, a leading thinker in ICT4D, expresses the evolution in interest in ICTs in several useful ways. Figure 1 illustrates perceived importance of ICTs on development through the 1980's (which he calls ICT4D 0.0), the top-down programmes of telecentre rollout from the mid-1990's (ICT4D 1.0) and contemporary perceptions on ICT4D which include adaptation and integration to local context and development of targeted pro-poor services rather than just 'access to ICTs', asking in a more robust manner the question ICTs for what? (ICT4D 2.0).

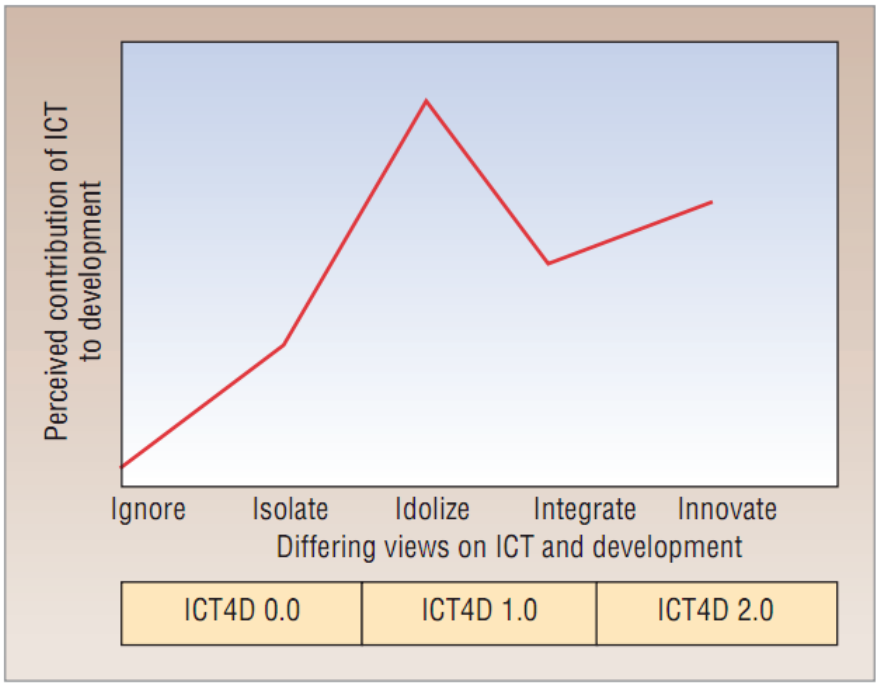

Figure 1 – Perceived contribution of ICTs to development (Heeks 2008)

The negative image ICTs have developed during early failure has led to the small ICT4D community evolving in somewhat of a bubble from mainstream development. Figure 2[5] illustrates where the relatively new field of development informatics – the relationship between ICTs and socio-economic development – sits relative to other disciplines. The dotted arrows indicate weak relationships.

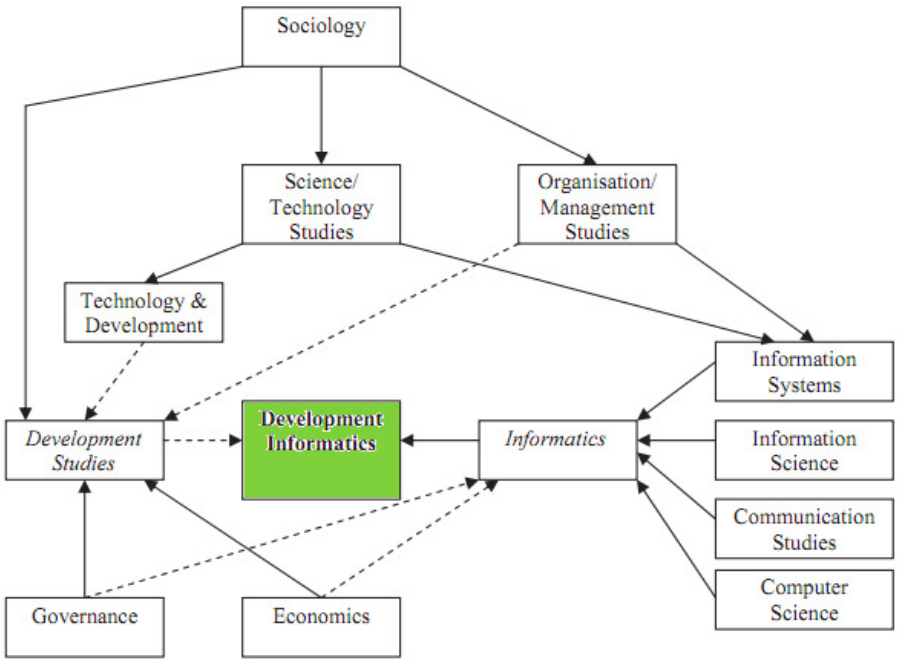

Figure 2 - Disciplinary foundations for development informatics research (Heeks 2010)

The evolution of development informatics has been steered most strongly by the Information Systems (IS) discipline. This discourse has had relatively little connection to the literature on social embeddedness from development studies. Neither has it had familiarity with the range of tools and techniques for measuring and maximises impact across a broad range of socio-cultural, institutional – as well as economic - indicators.

The IS discipline when applied to developing countries has instead focused on understanding issues of technology innovation, transfer, and implementation and has focussed on reasons for failure in scale and sustainability on deployments such as telecentres rather than on the development impacts themselves[6]. Norms on design and diffusion have been assumed from western experience, including assumptions of a cause/effect relationship between technology diffusion and economic growth which do not take into consideration other processes of change of social and individual behaviour which may differ from those of western historical experience[7].

Many positive interventionist examples remain

ICT4D has moved on significantly since the days of top-down infrastructure deployment. The fall in interest in the mainstream development community has not meant a complete lack of work on pro-poor ICTs. Recognition the need integrate thinking about ICTs into a broader 'information/communication for what?' approach has led to more participatory approaches to developing ICT services for marginalised groups. Interest in integration and innovation – as shown in figure 1 - by working closely with local community groups and NGOs to develop new ICT services that build local ownership, content, capacity, and acceptance of ICTs has shown promise.

One interesting approach that uses knowledge centres to foster local innovation and acceptance can be seen with the Arid Lands Information Network (ALIN) in East Africa and the MS Swaminathan Research Foundation in India. These NGOs take participatory knowledge networking to another level. The ALIN

approach builds community trust by involving existing people networks and empowers communities to drive their own information needs. Local outreach volunteers, who both train and act as 'infomediaries', are available, along with a wide range of ICT-based and traditional tools, including community radio and drama focal groups, participatory video, PCs with Internet access, a cross-network online web portal, mobile text message services and newsletters. ALIN communities have a strong, sustained interest in ICTs, predominantly because of the benefits they have perceived from shared farming techniques suitable for the semi-arid – which have been communicated either by ICTs either directly or indirectly (through the infomediaries). The centres are looking to achieve long-term sustainability, for instance through self-funding. However, questions of how to better measure the impacts of these knowledge centres and how to adapt and replicate the model on a larger scale remain.

More broadly many initiatives talk about participation and livelihoods but are still dominated by the information systems influence, and still stigmatised from the bad years by many development practitioners who consider ICTs still 'needing to prove their worth'. Passive diffusion of ICT innovation - through 'people who do ICTs' - has been the mantra of many a development practitioner.

The public sector

Beyond the telecentre years, what of the current role of the government? Much of the focus that still occurs at government level is focused on connectivity (access to ICTs). The Commonwealth African Rural Connectivity Initiative (COMARCI) is one example of an African focused initiative that has had some convening power on policy level ICT changes over the last few years.

Deregulation and effective regulation of markets

Public sector spending on ICTs, advocated by initiatives like COMARCI, has moved towards removing the incumbent (single) telecom provider, establishing competition and hence encouraging a market driven service provision model with the aim of reducing prices for access and increasing service choice. Political efforts have also been made to encourage faster sea cable telecommunications connections along the East and West African coasts.

The result has been mixed (see figure 3) but mobile network pricing in particular, through these regulatory frameworks for telecoms providers, has had some success across Africa in reducing access costs and hence increasing uptake. It is hoped that the cost of Internet connectivity will also reduce substantially over the next few years as some of the sea cables come online – with outstanding risks for local digital divides where national high speed networks are lacking.

Reform initiative	Countries	% of Africa
Privatization of incumbent	Ghana, Nigeria and Tanzania (distressed privatization)	35%
	Cape Verde, Côte D'Ivoire, Guinea, Guinea-Bissau, Lesotho, Madagascar, Mauritania, Sao Tome and Principe, Senegal, Seychelles, South Africa, Sudan and Uganda (more than 50% sold)	
	Central African, Republic, Equatorial Guinea, Mauritius (less than 50% sold)	
	Somalia (fully private)	
Regulatory institutions in (43 countries)	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Comoros, Congo, Côte D'Ivoire, Democratic Republic of Congo, Egypt, Ethiopia, Gabon, Gambia, Ghana, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe	80%
Competition in cellular market	The rest of Africa, except for Comoros, Cape Verde, Eritrea, Ethiopia, Equatorial Guinea, Guinea-Bissau, Namibia, Sao Tome & Principe	85%

Figure 3 – overview of telecoms sector reforms In Africa (InfoDev 2008)

However, despite increasing the number of providers and market competition, the role of a strong regulator is missing in most developing country models. This is viewed by many as a positive thing because government interference is regarded as a barrier to innovation.

There is also the question of what governments have done in addition to facilitating affordable access. The record here is not so positive. National 'e-strategies' in developing countries, where established, have tended to be "cut and paste" from developed country models rather than analysing the underlying development challenges and how ICTs can address these (along with other measures). There has been very limited interaction between reforms that address affordable access to ICTs – *regulation* - and integrated national ICT polices and e-strategies that focused on *application and content*. This was partly due to absence of capacity to develop integrated policies that bring reform objective together with poverty and growth dimensions of ICT infrastructure, content and applications[8].

Hence the public sector in terms of on the ground implementation has in more recent years been focused on fostering private sector competition – which has effectively continued to foster a model of passive diffusion rather than active intervention.

The private sector

Back to passive diffusion and the natural uptake of ICTs by the poor through market interactions. Other than cheaper access to ICTS, what has been the contribution of the private sector, including mobile operators, in improving the development impact of ICT services? In addition is this market driven 'passive diffusion' adequate in addressing information and communication asymmetries that the poor face? There are two factors here worth considering.

Firstly accessibility – how many people use mobiles under a passive diffusion model? The costs of mobiles and network accessibility still exclude many despite costs being reduced. For example, in a recent IDRC report, 83% of the mobile subscribers surveyed in Ghana were from major towns, 16% from other urban areas, and only 0.4% from rural areas. And although there are some country level differences, the extent of shared use is generally low – for instance, in South Africa, 50% of the IDRC respondents never allowed friends to use their mobiles while in India and Sri-Lanka only 7% of owners allowed non-household members to use their mobile phones[9]. These numbers should be taken with a pinch of salt and mobile penetration rates are increasing rapidly – particularly where competition is thriving.

However the numbers touted by mobile operators (based on subscribers) are most likely over-estimates of numbers of users and do not tend to be broken down by demographic or rural/urban divide. Even if mobile penetration rates reach a predicted 50 per cent of Africans by 2012[10], the rural divide still needs bridging. A recent survey targeted at the telecoms industry estimates African rural mobile penetration to be below 10 per cent even where national penetration is 50 per cent[11]. There is clearly a role for stronger and smarter regulation here.

Speaking of sharing mobiles as a cost reduction mechanism - this is partly driven by culture, but has shown increases where active interventions have been made by donors/NGOs. The most famous example of an active intervention to encourage sharing of mobile phones is perhaps Grameen Telecom (an NGO) based in Bangladesh - one of the world's least 'wired' and poorest countries. Through its Village Phone Programme, women in poor communities buy phones using microcredit loans, and become community phone 'operators' running a service which has a strong demand from the surrounding community.

Secondly the types of content services that go beyond the network access itself to provide useful services that the poor use. The introduction by larger companies of specific services that target the poor has been limited. One interesting and well known example where a big mobile operator has delivered an innovative product that has revolutionised financial services for the majority of 'un-banked' poor is M-PESA in Kenya. M-PESA (M for mobile, pesa is Swahili for money) is a mobile phone based money transfer service available to anyone who owns a basic mobile phone and network subscription. M-PESA started as a DFID funded initiative between Safaricom Kenya (the lead mobile operator) and Faulu, a microfinance institution (MFI), to provide easier access microfinance money transfers using the huge network of Safaricom airtime distributors[12]. Complications with Faulu alongside customers seeing potential for the payment to be used in a more organic person to person way[2] led to a shift in the Safaricom business model.

M-PESA now has 13 million users in Kenya, 6 million in Tanzania and the model is spreading across Africa. Evidence is emerging of positive outcomes in improving social safety nets through affordable remittances and unintended outcomes of M-PESA on poor groups – including a latent demand for financial savings mechanisms[13]. The success of M-PESA is due to a combination of factors. It is based on traditional payment practices, the technology backing it is an extensive mobile phone network, and there is a large network of distributors who work with established agents, each of whom is given basic training[14].

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[2] Safaricom noticed during the initial trials that people were already using mobile phone pre-pay credit as a form of payment and remittance in the informal sector.

Yet, as stated, M-PESA started with finance from a development donor and involved an MFI (NGO) programme. When looking at whether the passive diffusion view has merits one must take into consideration this initial active intervention Only later did M-PESA evolve into a specific private sector product – and there was also the key factor of government regulation.

An initial lack of regulation in the area of mobile banking in Kenya allowed Safaricom to innovate in the first place to create the M-PESA product. However importantly to secure the long-term status of M-PESA, 'smart' regulation was introduced ex-post the launch of M-PESA which has proved to be far more joined-up in terms of policy. Here the regulations were put in ex-post and firmed up the status of M-PESA, allowing telecoms agents to act as deposit takers — cash in/out points. Conversely Vodafone (owners of M-PESA) have been ready to launch a similar service in India for two years but regulatory barriers have prevented a mobile-based money transfer system from being established.

Other examples of content related services delivered by private companies are the various market pricing platforms and agricultural extension services via SMS. Google Trader and Farmers Friend in Uganda have won innovation awards for applications targeting content at the poor. However, Google did not develop these services alone. They worked together with the mobile operator (MTN), the Grameen Foundation's Applabs, and a Ugandan NGO specialising in rural use of ICTs particularly around extension services, the Busoga Rural Open Source Development Initiative (BROSDI), – to ensure the services meet the information wants (versus perceived needs) of the poor and are delivered in an appropriate way. The initial pilot also relied on the trust networks that BROSDI, as an NGO, had established in the communities it works with.

So evidence of pro-poor impacts of the private sector, although patchy, points to passive diffusion not being as effective as some proponents believe. Innovation that delivers content rich services to the poor is few and far between and where examples do exist they tend to involve a combination of local knowledge – usually through an NGO/CSO – backed by technical inputs from the private sector and often financial input from a donor.

Overall evidence of livelihoods impacts

Whether active intervention or passive diffusion, what do we know about how to measure the impacts of mobiles on livelihoods?

This question is too in-depth to answer fully in this paper. But in brief - a number of studies have taken a livelihoods approach in explored the impacts of mobile phones on livelihoods of farmers and of fisherman. One of the most quoted being the study of fish prices in Kerala India which found strong evidence of the micro-economic impact of mobile based market pricing on fisherman's profits and reduction in wasted fish[15]. Yet there are also studies which show that 'easy win' market pricing information systems are not always beneficial. For example Molony found that workers in Tanzania's tomato and potato trade highly valued personal relations with their buyers in the city. The buyer supplier relationship was important both in maintaining trust and in a providing a line of credit for suppliers. Mobile phones facilitated frequent communication but did not replace the need to meet in person and form the trust relationship with a single buyer – here market pricing systems were not being particularly useful[16]. Direct impacts are less obvious in other studies which show greater use of mobile

phone for social purposes and emergencies, rather than dedicated economic activity such as calling suppliers or customers[17 18].

In general there is still a lack of evidence to strongly determine whether mobile phones are a tool to solve development problems and possibly this kind of statement in itself is part of the problem. The delivery of information and communications needs in formats that can be understood and are culturally acceptable is not easy – and it is certainly not a matter of just throwing technology fixes alone at problems. Rather than taking the backseat due to lack of systematic evidence of developmental impact, more research needs to be done to understand **how** services delivered across such a broad tool as a mobile can be tailored and adapted to suit socio-cultural context – what do best practice processes look like for creating, appropriating and integrating such services into the diverse lives of marginalised groups, how can impacts better be measured, and where is the use of ICTs is less appropriate?

The 2009 ICT4D conference held in Doha called for better and more systematic techniques for measuring the impact of ICTs on livelihoods of the poorest. One suggestion is to take a thematic research approach, i.e. a focus on different developmental domains, such as health, education, agriculture etc. Such analysis can assist in determining the sectors or areas where mobile phones can have the highest developmental impacts and identifying the sectors where further research is needed[19].

Existing frameworks can also be used and built on, such as the ICT for Rural Livelihoods knowledge map[20]. Summaries of tools and techniques that draw on the various disciplines of development studies and Information Systems are also useful as a starting point to synthesise new approaches – for example the recent Heeks compendium of impact assessment approaches in ICT for development projects[21].

Challenges

There are a number of challenges moving forward with ICT for development in general, and more specifically in understanding the many applications and impacts of mobile-based services on the poorest.

1) There is a need to improve techniques for measuring impact of ICTs. For this to work effectively the development sector needs to fully re-engage with this agenda taking learnings from the past and moving forward.
2) As such mainstreaming of ICTs in development is unlikely to work. There is also a need to build in local innovation and innovation from bigger business. 'Learning labs' involving multiple stakeholder from different disciplines and from public, private, and third sectors are one way of doing this – but failure must be expected. Changing business mind sets on more tailored ICT-based services for the poor may prove challenging.
3) Public sector involvement is needed. There is a need to link national strategies which include PRSPs with e-strategy and regulation. Equally e-strategies must be grounded linking with local ownership, innovation, and diversity.

There is a need to move beyond markets for mobiles – passive diffusion is not the most effective way to create equitable information and communications services for the poor which utilize ICTs. Donor driven active intervention has also shown its problems, particularly with scaling. A middle ground is needed, and further research on impact methodologies combined with multi-stakeholder learning by doing is one way of achieving this.

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