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A New Socio-Economy in Africa? Thintegration and the Mobile Phone Revolution¹

By Pádraig Carmody

Abstract

Much has been written about the impacts of information and communication technology (ICT) in Africa and its transformational socio-economic potential. The penetration of mobile phones in particular has been particularly marked in recent years. This paper seeks to interrogate the hypothesis of transformation by examining the ways in which Africa is integrated into global mobile phone value chain, and the uses to which this technology is put on the continent. While mobiles are having significant, and sometimes welfare enhancing impacts, their use is also embedded in existing relations of social support, resource extraction and conflict. Consequently their impacts are dialectical, facilitating change but also reinforcing existing power relations. As Africa is still primarily a user, rather than a producer or creator of ICT, this represents a form of thin integration (“thintegration”) into the global economy, which does not fundamentally alter the continent’s dependent position.

Introduction

The impact of these developments in ICT in Africa, in terms of both ICT development (increased infrastructure and access) and ICT for development (adoption of ICT applications), has been to advance the process of development itself, in terms of ICT for development. The result of this duality of sector transformation has been itself dually vast. On the one hand it has facilitated the delivery of services such as education, health, better governance (on the part of

¹ I would like to thank Mark Graham for his insightful comments.

both leadership and governed), enterprise and business development, as well as their overall contribution to socioeconomic well-being (especially poverty reduction), political stability and self-actualization (Okpaku 2006, p. 153).

Writing in the late 1990s Manuel Castells (1998) characterized Sub-Saharan Africa as a “black hole of informational capitalism”. At that time there were more telephone landlines in Manhattan or Tokyo than in all of Sub-Saharan Africa. For him this “technological dependency and technological underdevelopment, in a period of accelerated technological change in the rest of the world [made] it literally impossible for Africa to compete internationally either in manufacturing or in advanced services” (p. 95). However “gloomy predictions of the impending Fourth World of structurally irrelevant ‘black holes of informational capitalism’ did not anticipate the privatization of the telecommunications industry (Nielinger 2004) across much of the African continent”, and its consequences (Moloney 2007, p. 68).

From 2000 to 2007 Africa was the fastest growing mobile phone market in the world as the number of subscribers rose from 10 to 250 million, with a 66% growth rate in 2005 alone (RNCOS, 2006; Africa Monitor, 2007; ITU, 2007a). This aggregate figure disguised even faster growth in some markets. Nigeria had a compound annual growth rate in its mobile market of almost 150% during 2002-4 (telecom week 2008). In South Africa by the end of 2007 mobile penetration reached approximately 84%, and it is projected there will be 560 million mobile phone subscribers on the continent by 2012 (telecom week 2008). Will this development fundamentally alter the nature of globalization in Africa, or does the new landscape of mobile telephony simply represent an overlay on existing economic structures – a form of thin integration?

Globalization is often defined as increased interconnectedness between places. The creation of a global economy characterised by “network trade” (Broadman, 2007), “deep integration” (Evans *et al.*, 2006), and information exchange is often presented in mainstream accounts as a benign phenomenon which enables the “connection of the disconnected” in the developing world. However, social and economic networks are not “flat” but structured by hierarchy, as the actors involved have different types and levels of power. Consequently uneven development continues to shape the evolution of the global economy.

The arrival of the information technology revolution in Africa is one aspect of globalization on the continent. What is its significance? Does the rapid spread of ICTs in Africa represent a transformative moment in Africa’s economic history or are previous power relations merely being partially modified, but reinscribed by the information revolution which has swept over the continent in recent years? What are the different nodes in the global value chains of mobile phones and where is Africa inserted into these? What are the power relations in the networks and webs created by ICT usage and do these alter patterns of extractive globalization which have characterized Africa’s relations with other parts of the world for the last several centuries (Bond, 2006)? This paper seeks to interrogate these questions drawing insights from global value and commodity chain analysis and critical ICT studies to assess the transformational potential of mobile phone technology on the continent.

The Information Revolution and The Mobile Value Chain

The potential of information and communication technology for development (ICT4D) is often related to the increased importance of the global knowledge economy or what Peter Evans (2005) has called “bit driven growth”. For some the revolutionary aspect of ICTs is that they decouple information from their physical repository, allowing for widescale non-rival knowledge diffusion that can contribute to innovative capacity (Wolf 2001). Some go further and argue that the internet, for example, represents not just a new form of communication but is instead a new form of societal organization (Castells 2002 cited in Graham 2008).

Increasingly it is argued that as a matter of urgency Africa must compete in the global information economy. For example, the Africa Competitiveness Report argues that ICTs are vital to success in today’s globalized economy (quoted in Toure 2007). Likewise Obijiofor (2009) argues there is a “strong link” between the adoption of new technologies and the development of countries and communities. Consequently in mainstream accounts ICT is often presented as an unambiguous positive flow of globalization: a harbinger of integration into the global economy of the “borderless” world (Ohmae, 1995). However there is a particular vision and ontology which undergrids such conceptualizations which neglects the importance of the differential geography of research and development, production, raw material extraction, and the cultural adoption and adaptation of information and communication technologies.

ICTs can be broken down into distinctive value chains which contain pecuniary and non-pecuniary elements. Different places are integrated into the global mobile phone industry in very different ways. Much of the research and design takes place in the rich world, whereas China concentrates on assembly, while also developing design capability. Africa supplies the precious metal coltan, necessary for many ICTs to function, and serves as a fast growing market for mobiles. There is then a global, but mobile, division of labor in the industry comprised of “hard” networks, involving flows of physical commodities, and “soft” networks of social interaction and information exchange. Elements of the latter are prerequisites to the former.

China is now the world’s largest producer of mobile phones, accounting for over 40% of current world production (Imai and Jingming 2007). The industry is dominated globally by a handful of transnational corporations such as Motorola, Nokia and Samsung (one from each of the three triad regions of North American, Europe and East Asia). Nokia by itself accounts for 40% of global sales (Corbett 2008). However there are also fifty Chinese handset makers, which account for over half of domestic market sales in that country. These companies use independent design houses to develop their mobile handsets and sometimes produce phones for the African market, discussed later.

Ya’u (2005) argues that apart from a few assembly plants and some efforts at software production, Africa imports all of its ICT needs.² Very little of the research and development which goes into the making of mobile phones takes place in Africa, and

² There is, however, an incipient computer hardware industry based on the production of “clones” in Otigba in Nigeria, for example (Oyelaran-Oyeyinka 2006).

what research does appear to take place is based in South Africa and around functionality, rather than innovation *per se* (van Biljon, Kotze *et al.* 2007).³

Demand for mobile phones in Africa continues to grow strongly, as despite the global economic slowdown Sub-Saharan Africa's economy is estimated to grow at almost 6% for 2008 and 2009 (IMF 2008). This fast growth, combined with the even more rapid growth in demand for mobile phones has prompted some companies to set up assembly operations on the continent. For example, the Malaysian company M-mobiles is setting up a mobile phone assembly plant in Mozambique which will assemble between 50,000 and 70,000 mobiles a month (Telecoms 2008) and is building another plant in Lusaka (Zambia Times 2008). On a smaller scale, Link Technologies from China has set up a plant in Rwanda to assemble 200 mobiles a day (Telecoms 2008b). After being redesigned by a Chinese company these mobiles can be programmed in the national language, Kinyarwanda.

The South Korean company LG is also planning to set up a plant in Kenya and the introduction of television broadcasts to mobiles by Black Star TV has spurred an investment to assemble mobile phones which can receive the service by a Korean manufacturer in Ghana (Aftafori 2007). The Chinese company ZTE is setting up a new plant in Ethiopia given a recent shortage of mobile phones. In part this may have been a *quid pro quo* after ZTE was awarded the contract to expand Ethiopia's mobile phone

³ Nonetheless there is substantial, but latent, potential for the development of high tech industries through the African telecommunication firms (Marcelle 2003).

network (People's Daily 2008). There have also been closures however, paradoxically associated with "corporate social responsibility".

In Nigeria ZTE closed its mobile assembly plant because it could not compete on price with other companies. According to Malakata (2007) in most African countries Nokia and Motorola phones are priced from US \$40 while the cheapest ZTE phone is \$100. As part of the Emerging Market Handset Initiative of the GSM (global system mobile) Association to bring cheap mobiles to the developing world, Motorola now sells "ultra-low cost" handsets for as little as US \$21 in Kenya for example (fieldnotes Nairobi Kenya, December 2008). In this way major Western corporations are using Corporate Social Responsibility to outcompete rivals (Ponte, Richey *et al.*, 2008). Even at these reduced prices however, new mobile phone sellers face competition from second-hand mobile phones imported from Europe and other rich countries and "semi-legal" Chinese producers. Lee (2007, 36) recounts the following example given to her by a Ugandan trader:

A Ugandan trader will go to China and tell a Chinese cell phone company that they want them to make a phone that they can sell in Uganda for 10,000 shillings (approximately US \$5). The Chinese company designs it to look like a Nokia cell phone. A special symbol which is hard to see, is put on the phone to prevent Nokia from suing the company. The phone is put on the market in Uganda and sells for 10,000 shillings. Since it looks like a Nokia phone, people buy it thinking they are actually getting such a phone. The phone might last four months. Since it is not from Nokia, the consumer has no recourse to ask for a replacement.

Africa is integrated then as a consumer, and in some places assembler, of mobile phones.

However it is connected through, and to, this technology in other ways too.

Mobile Africa and the Coltan Connection

In addition to the “information revolution”, the mobile phone value chain has also been associated with other revolutions, violence and forced migrations in Africa. The war in the Democratic Republic of Congo (DRC) from 1998-2003 and the ongoing conflict in the east of that country is partly a resource war over control of the precious metal coltan, which serves as an important component of mobile phones and other “new” ICTs. Coltan is an abbreviation for colombite-tantalite from which the precious metals Columbium and Tantalum are extracted (Tantalum-Niobium Study Centre cited in Tegera, Mikolo *et al.* 2002). Tantalum is twice as dense as steel and can capture and release an electrical charge, which makes it vital for capacitors in portable miniaturised electronic equipment such as mobile phones (Hayes and Burge nd). Eighty percent of known tantalite reserves are in the DRC.

Two days after the new government of Laurent Kabila in the DRC moved to nationalize the main coltan mining company in 1998 the rebellion to overthrow him began, with the support of the directors of the company which was being expropriated. The war in Congo brought in numerous African armies and was partly fuelled by coltan (Nest, 2006). In 2000 prices for coltan spiked ten-fold, largely as a result of the launch of the Sony Playstation 2 consol and new mobile handsets.

Much of the coltan in Eastern Congo is mined in two world heritage sites: Kahuzi-Biega National Park and Okapi Wildlife Reserve (World Conservation Union 2001). Outside of these, unregulated coltan mining destabilised hillsides, leading to landslides and

damaging future agricultural potential. Half of the land that was seized for unplanned artisanal coltan mining cannot now be used for agriculture (Tegera, Mikolo *et al.* 2002; Nest, with Grignon *et al.* 2006). The “resource pull effect” has also been in evidence (Basedau 2005). According to a coltan miner in the DRC:

We think that agricultural activities are a good thing, but we cannot see ourselves taking them up again in the short term because we earn much more money from coltan. However we are thinking of investing coltan money in agriculture and cattle once peace returns (quoted in Tegera, Mikolo *et al.* 2002).

Wildlife has also been affected. “I’m not in favour of killing gorillas,” says Dick Rosen, CEO of AVX a tantalum capacitor maker in Myrtle Beach, S.C. [South Carolina] but ‘we don’t have an idea where [the metal] comes from. There’s no way to tell. I don’t know how to control it,’ he says” (quoted in Essick nd). As the British MP Oona King noted “Kids in Congo are being sent down into mines to die so that kids in Europe and America can kill imaginary aliens in their living rooms” or text each other (quoted in Bush and Seeds 2008, p. 1).

When the price of coltan fell dramatically in 2001 rebels in Eastern Congo were forced to look for other sources of revenue and the war appeared to end in 2003 (*Gorilla Journal*, 2001). However, recent problems with the Australian coltan supply chain, which accounts for 41% of global production, has again led to rapidly rising prices. The spot price for tantalum ore rose approximately 30% from 2007-8 (Vetter, 2008) and is implicated in the current return to large-scale conflict in the Eastern DRC (John Prendergast interviewed on CNN Daily Show, Global Edition).

While a Conflict Coltan and Cassiterite Act was introduced in the US Congress to prohibit the importation of these minerals from Congo if any rebel groups would benefit from their sale, this may simply lead to geographical substitution effects as coltan mined in Congo is rerouted to other markets. In-any-event according to a British journalist 80% of Congo's coltan is sent to Australia for processing (cited in Bush and Seeds, 2008). The growth in demand for mobile phones in Africa then may be implicated in the resumption of large-scale conflict in the Congo.

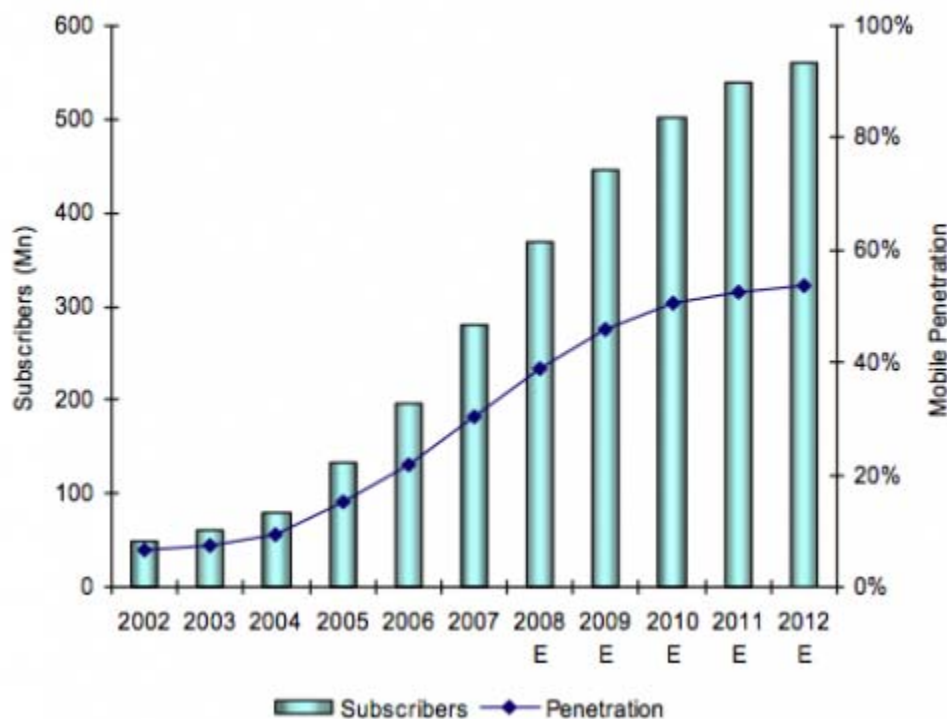
Diamonds have also been associated with conflict in Africa (Le Billon 2008), and Africa undoubtedly supplies many of the diamonds for encrusted mobile phones, sold to the super-wealthy in the rich countries. One vendor of these notes that "buying an Athem luxury phone is also an alternative way of investment in diamonds. The phone by itself might not be of considerable value but the diamonds encrusted on the phones are" (www.athem.ch), although this vendor notes that their diamonds are certified "conflict free". Even if they are conflict free however the conditions under which artisanal and formal miners work are often extremely dangerous and highly exploitative, paying poverty wages (Hilson 2006). We now turn to the extent and usage of mobile phones in Africa and whether they can help reduce, rather than reproduce poverty.

Mobile Phone Penetration, Usage and Social Impacts in Africa

The number of phone subscriptions per 100 people constitutes the subscription "penetration rate". It is also possible to measure the penetration rate based on the number of phones per head of population, with some rich countries recording rates in excess of

100%. By the end of 2007 there were 280.7 million cell phone subscribers in Africa (Africa Telecom News 2008), with roughly one mobile phone for every three people on the continent (See figure 1). In terms of access, one estimate suggests that 97% of people in Tanzania have access to a mobile phone; that is they live under the “footprint” of a mobile phone (James and Versteeg 2007). This is not necessarily to suggest that they use one on a regular basis, but rather that they could access one if they had to through mobile phone kiosks, for example.⁴ In Ethiopia SIM (subscriber identity module) cards can be rented (Adam 2005).

Figure 1: Africa – Mobile Subscribers and Penetration (2002-2012)



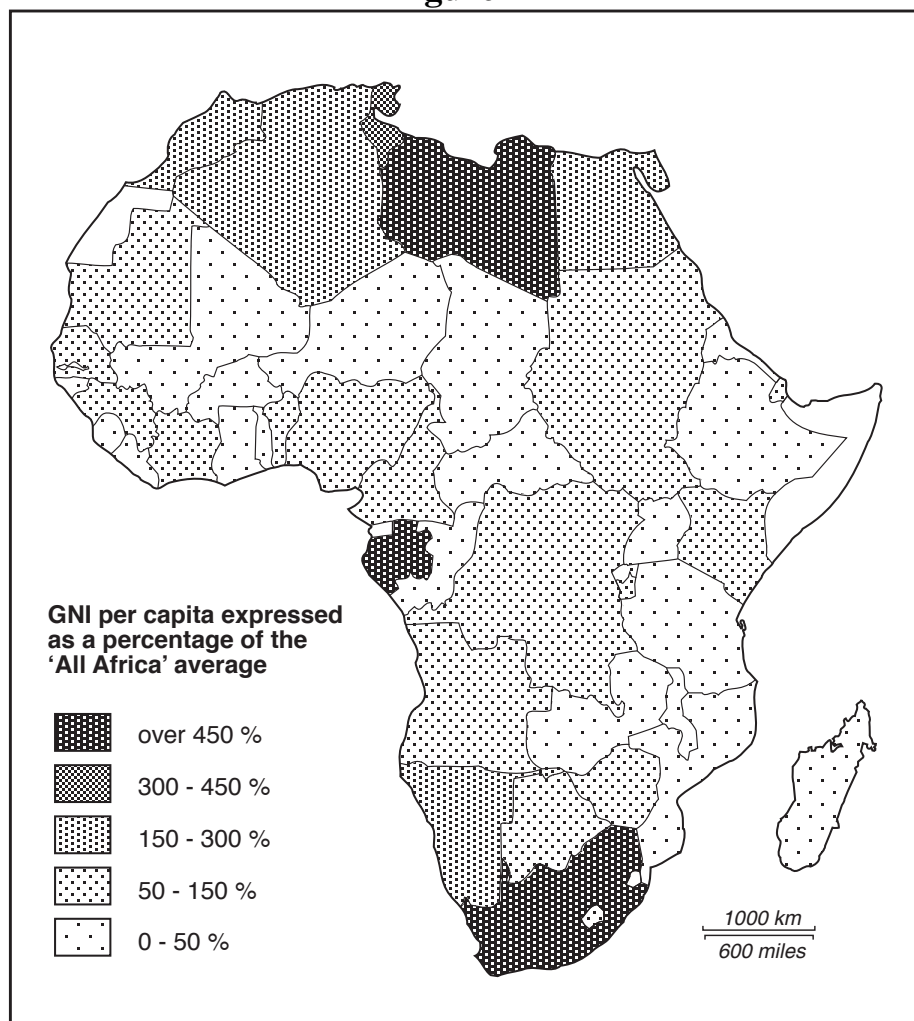
Source: Blycroft Ltd, in Africa Mobile Factbook (2008), by permission.

⁴ These kiosks can be relatively lucrative for their owners; bringing in a reported US \$75 per kiosk per day in one case in Gabarone, Botswana (Okpaku 2006).

There is however, a highly uneven geography to mobile phone usage and penetration with subscription rates ranging from over 70% in Reunion to under 1% in Burundi (Vodafone 2005), roughly mirroring the distribution of wealth on the continent (See figures 2 and 3). However there are significant differences in penetration rates which cannot be accounted for by per capita income. For example Morocco has a penetration rate twice as high as Namibia, with only half of the gross national income (GNI) per capita and despite the fact that Namibia was the first country in Africa to have built a digital network (Balancing Act cited in James, 2002). World Bank researchers attribute this to better collaboration between the state and the private sector in Morocco and different regulatory environments (Bhavnani, Chiu *et al.* 2008). However, they neglect the fact that distribution of income may also play a very important role. Namibia has the world's highest level of income inequality, with a Gini coefficient of 70.7, whereas Morocco's is "only" 39.8 (World Bank 2006; Progressive Policy Institute 2006).

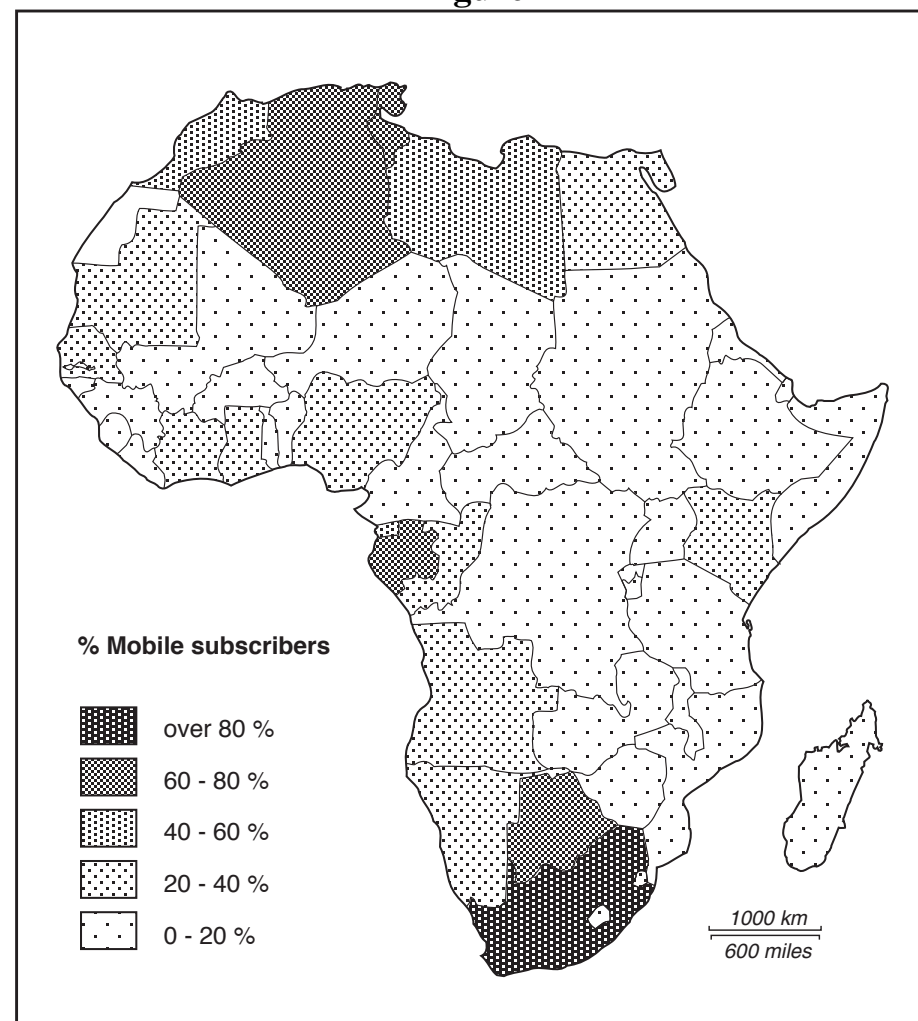
Given the capital cost implied in buying a mobile, there are more mobile phone subscribers than there are phones in Africa (see figure 1). This is because sometimes people buy SIM cards which they then use in other people's phones. In Botswana over 60% of phone owners share phones with their family members, 44% with friends and 20% with neighbours, but only 2% of people charge for this "service" (Sebusang, Masupe *et al.* 2005; James and Versteeg 2007). This suggests that in addition to instrumental functions, mobile phones are also used and shared on the basis of non-pecuniary utility or *ubuntu*.

Figure 1



Data from World Bank (2006)

Figure 2



Data from telecomsmarketresearch (2008). Maps by Sheila McMorrow

Multi-country studies across Africa have shown that mobile phones are used primarily to maintain social networks, although they are also used to maintain “weak links” to business associates (Miller, Skuse *et al.* 2005; Souter, Scott *et al.* 2005; Moloney 2007). According to Slater and Kwami (2005), mobiles are used to manage local embedded reciprocities. Rather than being used to connect to the “global economy” the majority of calls in Ghana, for example, are “used to maintain family relations” (Slater and Kwami 2005 cited in Hahn and Kibora 2008). Adoption may also represent part of a defensive livelihood strategy given widespread poverty and the importance of extended family networks (Rettie 2008).

Given the relatively high cost per unit of time, people on low incomes in Africa also use mobile phones differently than people in high income countries, by using “beeping” or “flashing”, for example. This is where someone calls someone else but hangs up before the call is answered to avoid call charges. Often it signifies that someone should call back, but the number of rings may also serve as a type of code; such as two rings meaning “pick me up”. “Flashing involves a clear and much discussed economic rationality, designed to win the fierce battle to keep a mobile in permanent operation. But this battle itself indicates the great importance attached to staying connected by mobile, and this importance we would argue is tied to the costs of maintaining, managing and expanding already existing social networks” (Slater and Kwami 2005).

Respondents to one survey noted “mobile phones bring poverty” as a result of the high costs of ownership (Diga 2007) and some people substitute mobile phone usage for

consumption of food and clothing. In South Africa respondents to a survey spent an average of 10-15% of their income on mobile phones (Samuel, Shah *et al.* 2005). Despite the relatively high cost, the disadvantages of not being in the network would seem to outweigh the costs, however. For some having a mobile phone may be the least bad option. This logic reflects the importance of the extended family in livelihood strategies in adverse economic circumstances.

Donner (2005) found in his survey found that there was no salient cause effect between people having mobiles and their families being more prosperous, suggesting the importance of other reasons for adoption.

Another reason why the rural population feels the imperative to adopt mobile phones ... is related to [the] notion of being already subjected to the violence of social change and globalisation (social change, disinterest of young people to make their living in the village) and its benefits (direct communication over distance) leads to the local perception that adopting the new technology is an imperative. Therefore access to mobile communication is felt as a peremptory necessity, if rural people are not ready to accept that the decomposition of their identities and social structure will accelerate (Hahn and Kibora 2008, p. 103).

Mobiles make people feel more important and “connected”. For yet others they are a livelihood and relationship enhancement and management tool. In a sense they instantiate the contradiction between hierarchization and the desire to offset it. The very lack of socio-economic opportunities up the occupational ladder or through emigration for much of Sub-Saharan Africa’s population is offset by the (social) “mobility” offered by cell phones. It represents a form of high-tech connection to the global information society and domestic social peers, which may serve to legitimate unequal globalization. The mobile phone then achieves its “value” through not only its functional utility, but as signifier of

inclusion and “development” for populations who are excluded. In Burkina Faso “using this technology is locally perceived merely as a tool for keeping up with global trends, rather than reducing poverty” (Hahn and Kibora 2008, p. 88).⁵

While some argue ICTs connect elites in Africa more closely to their counterparts in the rich world, they maybe of dubious use to poverty reduction (Sonaike 2004 cited in Obijiofor 2009). ICTs are implicated in further and new forms of social stratification between the “information rich” and poor. Rather than leading to spatial and social homogenization new ICTs create geographies and social topologies of “enablement and constraint” (Law and Bijker 1992 cited in Graham 2008). That is to say ICTs allow for certain space transcending activities to be undertaken, while being influenced by the agent’s position in physical space (Graham, 2008). ICTs are then implicated in new bordering practices, where participants in the information (IT) revolution are included within the “virtual world” or information economy and society, while others are excluded. Indeed some go so far as to argue that they are helping to constitute new class.

The ownership of, or access to, a mobile phone and having business cards displaying the phone number applies more to the self-employed – those who (Lugalla 1997; Seekings 2003) at the lower end of the informal-sector spectrum who lack social capital and to whom mobile phones are unlikely to feature in their list of priorities. Indeed, the stratified ownership of mobile phones along these lines is a good indicator of what is now perhaps the biggest split in employment in many developing economies. No longer the formal-informal dichotomy, it is increasingly the split between the stratum of employers and middlemen (mostly using mobile phones), and a stratum of employers, apprentices, family laborers and marginal-owner operators (generally not using a mobile phone), who constitute a majority “informal proletariat” (Moloney 2008a, p. 187).

⁵ Similarly for internet users in Tanzania one of its main functions is as a marker of modernity (Mercer, 2005).

Even for those with access to mobiles, necessity is the mother of invention and Africa has been associated with some of the most innovative uses of mobile phones.

African mobile phone services have dramatically affected my life as well. In the small Kenyan town where I live, I can pay for my taxi rides and even groceries through my mobile (impossible in Boston and most places in the West). I have Wi-Fi throughout my house thanks to the new GPRS/EDGE data services ubiquitous throughout the country and priced at 7 MB per one US dollar – more than 10 times cheaper than my mobile data service in the States (Eagle 2007, p. 15).

Kenyans are repurposing phones to take the place of other infrastructure they lack, ranging from MP3 players to credit cards. The Kenya Agricultural Commodity Exchange sends farmers up-to-date commodity information via text message (Mobiles 2007).

Tradenet takes this idea further and connects sellers and buyers in 380 markets around the continent by mobile (Crisscrossed 2007). The Kenyan company, Safaricom, which is 35% owned by Vodafone became the first company in the world to provide a money transfer service by mobile (Rice 2007). Mobile banking or m-banking, where accounts can be transacted on over a mobile phone and purchases made, has also become popular in a number of African countries (Yarney 2007). M-learning, where education is delivered via mobile, is also an emerging area.

Economic and Business Impacts of Mobile Phones

Large-scale claims for the transformative economic impacts of mobile phones are sometimes made. Below are two examples:

ICTs can enhance enterprise performance through indirect cost savings such as labor costs and increased labor productivity, and direct cost reduction of firm's input such as information costs. On top of these short-run impacts of ICT adoption in the production process, the use of ICTs in the transaction process can foster input and output market expansion. However, in the long run, ICT may

have an even bigger impact as it can completely restructure the production process and transaction methods, increase flexibility and improve outputs (Chowdury and Wolf 2003, p. 2).

There is some evidence that mobile phones raise long-term growth rates, that their impact is twice as big in developing nations as in developed ones, and that an extra ten phones per 100 people in a typical developing country increases GDP growth by 0.6% points (Waverman, Meschi *et al.* 2005 quoted in James and Versteeg 2007).

There is evidence that small and medium sized businesses in Africa have taken up mobile phones with enthusiasm and vigor. Donner (2005) in his survey of 31 micro and small enterprises found that there were two perspectives on mobile phone adoption. One saw it as a device for pursuing instrumental business goals and functions, whereas others saw mobiles as satisfying intrinsic emotional needs. Small businesses may also adopt mobile phones without seeing their utility, for fear of the disadvantage that not having them may entail (Muller-Falke 2001 cited in Wolf 2001). Consequently they may be used in both “offensive” and “defensive” business strategies.

Mobile phones offer advantages to businesses, particularly as they are a vector of what are termed network externalities. The value of a network increases the more participants there are (Chowdhury 2006). They also allow small businesses to access new customers (Donner 2007) and allow for economies of time, by substituting for time consuming trips for example. There is danger, however, for small and medium-sized enterprises that use of ICT by larger firms exposes them to greater competitive pressure, with which they may not be able to cope.

Mobile phones also offer numerous economic advantages to workers and the self-employed in Africa. For example, casual laborers can leave their phone numbers with potential employers rather than having to wait and see if a job materialises. These “economies of time” may enable them to engage in other economic activities in the meantime and thereby supplement their income (Best, 1990). Fisherpeople can call ahead to local markets to see where they will get the best price when they land their catch (Coyle 2005). However, in some cases market information is not sufficient to redress the balance of power between small farmers and traders. In other instances, traders can use their positions as suppliers of credit to get farmers to sell their produce only to them (Moloney 2008).

In reference to the adoption of mobile phones by micro-entrepreneurs in Africa it has been noted that “even if the majority of microenterprises are not sources of phenomenal growth, any gains in productivity, profitability, and even basic stability are of the utmost importance to the livelihoods of the households involved” (Donner 2007, p. 4). However is there a fallacy of composition here? Might the use of ICTs merely enable some businesses to capture business from other micro and small-scale enterprises (MSSE’s) rather than grow the economy *per se*?

Mobile phones can reduce transaction costs and allow export markets to be accessed. One survey of South African SMEs found that most companies considered mobile phones to contribute substantially to regional market expansion, more than other ICTs (Wolf 2001). This is echoed in another study in another study in Tanzania where the majority of firms

responding to a survey considered cell phones to be the most significant contributor to regional market expansion (Song and Mueller-Falcke 2006). Another study found a positive relationship between mobile telecoms and the ability to attract foreign direct investment, although causality remains unproven (Williams 2005). ICT can additionally provide coordination economies for small and medium-sized enterprises (SMEs) through umbrella groups such as cooperatives and associations (Song and Mueller-Falcke 2006).

Duncombe's (2007) research suggests that ICT applications may only bring marginal poverty reduction, but that it may be effective if they are used to build a broader range of social and political assets. That is that microenterprises need to build social capital and trust in local networks more than they need to access new information through ICTs.⁶

Cell phone kiosks, repair shops and unlocking or decoding services also offer small business opportunities and mobile phone companies are often some of the biggest corporate tax payers. Although the amount of ICT capital invested by small and medium-sized enterprises in East Africa seem not to be associated with higher productivity.

Chowdury and Wolf (2003, p. 16) attempt to explain this counter-intuitive result by arguing that "a certain threshold of ICT investment may be needed to make it effective, and that this threshold might not have been reached in SMEs in the case of East Africa".

Bollou and Ngwenyama (2008) found that the adoption of ICT was associated with a

⁶ The fact that analogue still accounts for 40% of the total means that call completion rates are low and faults per mobile line are high, raising costs for small business (Ya'u 2006). In Zambia, the government owned company maintains a monopoly on the "gateway" for international calls, making them much more expensive than they would be otherwise and depriving companies of revenue that might otherwise be invested in network expansion (Arnold, Guermazi *et al.* 2007).

once off increase in productivity, followed by falling rates of growth as economies of scale have not been realised in (West) Africa.

Nonetheless “bridging the digital divide” represents a substantial business opportunity, with the World Bank estimating that mobile phone companies have invested US\$ 25 billion on the continent (Economist 2007). When Nigeria opened its GSM licenses to bidding in 2001, only one local company put in a bid, and had to forfeit because it was unable to raise the required funds. For mobile phone companies Africa represents a “frontier market” where higher risks may bring higher returns. Consequently according to some many African countries have found themselves “saddled with a new monopoly: foreign investors” (Ya'u 2005). Although there are also large indigenous mobile phone companies such as MTN (Mobile Telecommunication Network) from South Africa, Orascom from Egypt and Celtel, which was started by a Sudanese but subsequently sold to a Kuwaiti company and rebranded as Zain. In fact most mobile phone operators are “home grown” as multinational investors have preferred to operate in the initially more lucrative Asian and Latin American markets (telecom week 2008). In 2005 the seven largest mobile phone companies accounted for over half of mobile subscribers (Toure 2007), with the South African company MTN accounting for 26% of the total (calculated from telecom week 2008).

From the above discussion it is clear that mobile phone usage by itself is not fundamentally altering Africa's dependent position in the global economy, as much of the research and development for this and other more production-enhancing technologies

continues to take place in the rich world. Indeed there is recognition perhaps from somewhat surprising quarters that, cumulatively, technology is widening the rich-poor gap globally. According to the International Monetary Fund for example “the main factor driving the recent increase in inequality across countries has been technological progress... supporting the view that new technology, in both advanced and developing countries, increases the premium on skills and substitutes for relatively low-skill inputs” (Jaumotte, Lall *et al.* 2007).

While neoliberal economists increasingly acknowledge the geographically uneven impact of technological development and diffusion, in some cases this assumes almost farcical proportions, with William Easterly claiming that “seventy-five percent of Africa’s current income lag relative to Europe can be statistically explained by the technology lag in 1500” (Easterly 2007 quoted in Clarke 2008, p. 52). This technological determinism is also evidenced in studies of mobile phone usage in Africa. For example, one study argues that “for the average country, with a mobile penetration rate of 7.84 phones per 100 population in 2002, the coefficient of 0.075 on the transformed mobile penetration variable implies that a doubling of mobile penetration would lead to a 10 percent rise in output, *holding all else constant*” (emphasis in original) (Waverman, Meschi *et al.* 2005, p. 16). However, all else cannot be held constant as the information revolution is only one dimension of increasing “time-space compression” associated with globalization (Harvey, 1982).

Conclusion: Globalization, Mobiles and African Society: M-perialism?

As altruistic as the benefits are for mobile telephony, the ancillary benefits for corporations and stakeholders to developing rural regions of sub-Saharan Africa are to place conduit devices in the hands of as many potential customers as possible. Does this seem ethical? (Raiti 2006, p. 4).

According to Kransberg's first law technology is neither inherently good or bad, it depends on the uses to which it is put. For example, in the war in Somalia in the early 1990s clansmen used cellphones that the American military were unable to tap (Kaldor 1999). One group which routinely abducts child soldiers, The Lord's Resistance Army, which has been fighting a guerrilla war in Uganda used a recent ceasefire to reorganize itself and purchased 150 satellite phones with money meant to aid communication during the peace talks (Crilly 2008).

For exponents of the ICT revolution poor places can "catch-up" with richer ones through the adoption of these technologies; that is to close the digital divide. In this schema a spatial difference is presented as a temporal one as globalization and increased interconnectedness will allow for catch up (Cox 1998; Massey 2005 cited in Graham 2008). However, how equal are the terms of digital integration and to what extent is the digital merely a reflection of other more deep-seated economic divides? According to neoliberal theorists if we can all achieve copresence in the same marketplaces, where real or virtual, the result is a positive sum game. ICTs then in the "borderless world" help eliminate market failures and erase uneven economic geographies. However, this negates the many other factors which contribute to uneven development; particularly political pressures for asymmetric integration, and cumulative economic advantages.

New fibre optic cables such as Africa One and SAT3 reduce costs of bandwidth for external internet and phone connection these are for the most part owned by European and American companies. In 2002 it was estimated that African internet service providers were paying US \$1 billion a year for connectivity to these bandwidth providers. Indeed the discourse around these fibre optic cables draws on a colonial imaginary. The South Atlantic 3 (SAT3)ⁱ website (www.safe-sat3.co.za) notes that:

History tells us that in the space of twelve years, three Portuguese sailors unlocked the secret routes of Africa by finding a sea passage to the East via the Cape of Good Hope. On the third attempt, Vasco de Gama, finally reached India from Lisbon in 1498 after a voyage lasting almost a year. He succeeded because of a chance meeting with an Arab pilot named Ibn Majib. Majib guided De Gama from the East Coast of Africa to West Coast of India, giving the Portuguese an alternative spice route and a monopoly on east trade.

Today, in the space of just over ten years, submarine fibre optic cables have become the modern vessels for trade and communications between international markets and the African continent... Now, five hundred years after De Gama's trail-blazing journey, a new submarine cable system has been established which closely follows the navigators route from Portugal, down the West Coast of Africa, around the Fairest Cape and finally landing in the East at India and Malaysia.

SAT 3 was launched in Senegal in 2002, but even with this new fibre optic cable the total available fiber bandwidth for the whole country is less than 1.2 gigabits a second; one tenth that of a university such as Harvard or Chicago in the United States (Juma and Moyer 2008).

The question remains about whether this represents a more favourable integration of Africa into the global economy or whether it is merely reinscribing the continent's dependent insertion into the global division of labor. This is important because this

project is “expected to access 90% of Africa’s existing sub-Saharan telephone market in which 72% of the sub-Saharan population lives” (Malcolm nd).

What Watts (1997) terms “appropriationism” is highly evident in relation to mobile phones in titles of reports such as “The Next Four Billion” by the World Resources Institute and the International Finance Corporation of the World Bank (2007 cited in Bhavnani, Chiu *et al.* 2008). Phone companies such as Nokia even hire anthropologists to study how people use their mobile phones in the developing world (Corbett 2008). This is perhaps not surprising, given the relative market saturation in the developed world. By 2006 68% of mobile phone subscribers were already in the developing world.

According to Ya'u (2005, p. 100) “globalisation is not only enabled by ICTs but that the level of connectivity of a country determines to a large degree the possibility of its benefiting from the globalisation process”. For him in Africa this development represents a new form of imperialism represented by knowledge dependence. This knowledge dependence takes many forms.

As Clare Mercer (2005, p. 254) argues that “the idea that the Internet [or mobile phones] should be used as a developmental tool across Africa is only plausible if it is taken as axiomatic that Africa is devoid of the information and knowledge necessary for development”. For example, according to World Bank researchers mobile phones can also help the rural poor overcome “ignorance of income-earning or market opportunities”

and may help in establishing new small businesses in sectors such as prostitution!
(Bhavnani, Chiu *et al.* 2008).

Africa's integration into the global information economy is characterised by a missing top and middle. The continent provides raw materials, associated with conflict, and consumes mobile phone and engages in some limited low-tech assembly operations. The high-value added activities in the chain take place elsewhere. These activities and the use of mobile phone then represent a form of "thintegration" into the global economy. It is not that Africa is excluded from the process of globalization; indeed it is integral to it as a supplier of raw materials (Moseley and Gray, 2008). Use of mobile phones, by itself does not change this context.

Are there then pro-poor modes of technical integration into the global economy? (James 2002). Can, as the former Secretary General of the UN put it, digital bridges be built? Perhaps they can, but the key question is where they are developed and built, what kind of traffic crosses them and what direction the flow is. This is structured by previous social relations and rounds of economic incorporation and marginalization in Africa.

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ⁱ The full acronym of this cable is SAT3/WASC/SAFE. It has 36 member countries in addition to telecommunications operators and other international investors.

