

**HARNESSING INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) TO ADDRESS
URBAN POVERTY**

POLICY LESSONS FROM EMERGING CASE STUDIES

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ABSTRACT

Urban poverty is a complex socio-economic problem. The expected doubling of the urban population relative to rural areas by 2050 without a corresponding economic and infrastructure growth will worsen the problem especially in emerging economies. Poor urban residents face rising unemployment and underemployment, constrained access to financial services, market exploitation, poor housing, crime, unsatisfactory health services and scant education opportunities. Several players have attempted to address these problems through Information and Communication Technology (ICT). This paper isolated a few of these to determine critical success factors on the economic empowerment front.

Keywords: Mobile Phones; ICT; Information and Communication Technology; Urban Poverty; Slums; Developing World

1.0 Introduction

Almost one billion people currently live in urban slums¹. By 2050, for every 1 rural resident, there will be 3 urban dwellers (See Fig. 1). Almost exclusively, this growth is projected in Asia and Africa (World Urbanization Prospects, 2007).

Urban problems can be categorized into economic (rising unemployment and underemployment, constrained access to financial services, market exploitation) and social (poor housing, crime, unsatisfactory health services and scant education opportunities).

While these problems present intractable challenges in emerging economy cities, these cities growing global economic importance has also been underlined. Over the next 15 years, they will constitute 60 percent of global GDP growth up from 10 percent currently (Dobbs et al, 2011). This exponential growth offers opportunities for tackling their slum poverty.

(Figure 1)

2.0. Limitations and Scope of this Paper

The scope of this paper is limited to representative ICT initiatives that address job creation, financial inclusion, skill development and social capital enhancement. To qualify, the initiatives must have been established at least 5 years ago and must be currently operating successfully.

3.0 Methodology and Organization

To inform this paper, the author has reviewed various publications, web sites and case studies. The literature review focuses on ICT characteristics that make them amenable for urban slum poverty reduction and their associated key building blocks.

¹ See <http://ww2.unhabitat.org/programmes/guo/statistics.asp> for the UN-HABITAT definition of “slum”

A conceptual framework follows the literature review section followed by selected initiatives. A brief discussion precedes the conclusion.

4.0 Literature Review

ICTs can be an engine for economic growth (World Economic Forum, 2009). ICTs often lead to job creation. ICTs can also provide opportunities for skills development and address market failures (Rahman, 2006). ICTs also enhance individual's social capital by enabling individuals to keep in touch with their personal networks (Woolcock and Narayan, 2000). In addition, affordable technologies represent the most promise for meaningful poverty reduction (Lefebvre and Bouffard, 2008). These key ingredients are especially critical for successful job creation in urban slums (Yonah and Salim, 2006).

4.1 ICT Characteristics in context

Slums have been part of the ever growing global ICT ecosystem. The mobile phone especially can and has exposed slum residents to expanded competitive global markets, low-cost access to financial services and jobs (Rangaswamy and Nair, 2010).

Moreover, the ever shrinking mobile phone costs has the potential and has been used for uplifting the urban poor from poverty (Raha and Cohn-Sfetcu, 2009).

Taken together, modern ICTs provide new possibilities for creating wealth through niche markets. ICTs can open up the value of local skills by marketing human capital locally and globally, for example through outsourced jobs and offshore opportunities (Proenza, 2002 and Yonah, 1999).

ICTs can also enhance social capital in urban slums (Sharma, n.d. and Spence, 2003). ICTs increase transparencies within societies fostering empowerment and accountability. ICTs can also facilitate profitable access to the global knowledge economy (Spencer, 2010).

Through their constant availability, ICTs can be used to facilitate 24 x 7 business transactions. This characteristic can be especially useful for urban slum dwellers who are highly socially dependent on one another for survival (Vedeld and Siddham, 2002).

Furthermore, access to modern ICT networks is essential for sustainable economic development (Gates, 1999 and Kao, 1996). In this context, ICTs can enhance for the urban slum dweller access to intermediate economic products and services, content in human and social capital formation activities and knowledge of high productivity skills.

On the other hand, adequate skills development, social capital accumulation and adequate infrastructure capacity have been identified as among the key building blocks for sustainable economic development (Kuriyan, Ray and Kammen, 2008). New sectors of the economy, especially the services industry, require advanced skills. Relevant skills development can help the urban poor address impediments to new and better opportunities. Accordingly, the urban poor needs to be information literate beyond computer literacy i.e. have the ability to access, evaluate and use profitably information from multiple formats. (Anderson and Bikson, 1998 and UN Commission on Science and Technology for Development, 2007).

ICTs can also enhance the employability of urban slum dwellers through social capital consolidation. This calls for collective approaches of networked communities linking markets and slum residents in a participatory manner. The development of a searchable database with a brief description of community members' personal and business interests and skills could be useful in creating fruitful networks (Pigg and Crank, 2004).

Ultimately, however, connectivity depends on a robust infrastructure. The recent proliferation of affordable mobile telephone services offer opportunities to urban slum dwellers to increase their earnings.

On another level, mobile telephones offer low cost solutions relative to conventional fixed lines. World Summit on the Information Society (WSIS) and other international ICT players recognize the promise of these technologies in rolling out infrastructure to more people more rapidly, at lower costs (UN Commission on Science and Technology for Development, 2007).

More importantly, mobile telephones are increasingly driving the digital opportunity. From 2000 to 2005, Africa's mobile market was the fastest growing, registering a 50 percent annual average growth rate compared to the global average of 24 percent (International Telecommunications Union (ITU), 2007). By these estimates, for every 1 fixed telephone in Africa, there are almost 5 mobile phones and the number is growing. By the end of 2005, the continent had some 137.2 million mobile subscribers. By the end of 2008, this number had nearly doubled to 259 million (World Bank, 2010). This has translated to 9 out of 10 subscribers of mobile phones in sub-Saharan Africa. In addition, third generation (3G) mobile broadband services are now widespread in many emerging economies and possibilities of adopting 4G with even faster speeds remain high. Connectivity costs are also expected to keep dropping as are the costs of smart phones (Kimura, Omole and Williams, 2010). This suggests an imminent widespread future adoption of mobile phones for Internet connectivity.

Virtualization technologies that use low cost low power computers costing as little as \$70 each in a Local Area Network (LAN) (Dukker, 2007) or a cloud computing model² remain viable options. These models are cheap. They can also be made more secure, more easily maintainable, and feature a dramatically reduced energy footprint.³ However, this paper has not been wholly focused on these models.

5.0 Conceptual Framework

Below is a conceptual framework for the application of the convergence of ICTs for urban slum poverty reduction. It will be used to analyze the ICT case studies covered. The table

² For more on cloud computing, see <http://www.infoworld.com/d/cloud-computing/what-cloud-computing-really-means-031>

³ N-Computing for example touts these as possibilities. See <http://www.ncomputing.com/Default.aspx>

has been developed by looking at the functional capabilities of the mobile phone, the Internet and virtualization computing in the context of socio-economic empowerment.

(Table 1)

6.0 Case Studies

The five case studies covered follow. Highlighted are specific problems they target, their operational schema, technologies applied and their impacts.

6.1 Mobile for Good (M4G)⁴

M4G uses mobile phones to connect people to jobs information. . Job seekers subscribe to a Short Messaging (SMS) job referral service, 'Kazi560' for about US \$0.1 to receive SMS announcements of job openings and to enquire about job openings in their specialties.

Franchisees require a PC to connect to the M4G platform which allows them to add new services, manage existing subscribers, generate reports and maintain a database of communications. The M4G platform connects to mobile operators over Hypertext Transfer Protocol (HTTP) using a Simple Network Management Protocol (SNMP). According to OneWorld UK, the first project started in 2003 in Kibera in Nairobi. At launch, it had helped more than 100 people find jobs every week. Within one year, with nearly 100,000 users and 80,000 unique subscribers, over 60, 000 people had secured jobs through the service. The service advertises 150-200 job openings weekly. 60-70 percent of these are filled by SMS recipients of the information. As of 2006, the service had broken even with US\$100,000 yearly revenues (Balancing Act, 2011).

Building on the success from Kenya, OneWorld UK, together with Accenture Corporate Citizenship Council started looking into scaling up the project across Africa and other developing countries.

⁴ Mobile for Good Ltd. (2003). Kazi560. Retrieved November 14, 2010 from <http://www.kazi560.co.ke/>

6.2 Babajob⁵

Babajob is a job site started in 2005 in Bangalore India. It is owned by Babajob Service Private Limited (BSPL). By March 2011, it had expanded to 6 other Indian cities (Delhi, Mumbai, Hyderabad, Thane, Jaipur and Chennai). It currently has 16 employees, more than 60,000 customers and sending out in excess of 1 million job alerts monthly.

Babajob is built on the premise that job seekers secure jobs through their extended networks. Employers on their part hire people with credible references. To achieve these twin connectivity goals, Babajob leverages the existing high mobile penetration.

Babalife.com, available in local Indian languages, acts as the social intermediary. It interfaces seamlessly with an SMS service and combines blogging with photo and video-sharing.

Babajob in turn is the interface between employers and employees mainly in the informal sector.⁶ Anyone who provides leads that help others get jobs through the network receives mobile phone credits or a check payment.⁷ Mentors⁸ who earn about 100 Rupees whenever someone is hired through their efforts are incorporated into the system to manage accounts for illiterate people and those without access to PCs or mobile phones.

Babajob's innovative job creation solutions have received wide attention including in internationally circles. See for instance Giridharadas (2007).

6.3 Esoko (formerly TradeNet)⁹

Esoko is a private software company started in Accra, Ghana in 2004. It has expanded to 7 other countries (Burkina Faso, Ivory Coast, Madagascar, Malawi, Mali, Nigeria and Sudan). It

⁵ Babajob Services Private Limited. Retrieved September 14, 2010, from <http://www.babajob.com/>

⁶ On its website Babajob jobs lists jobs such as IT Professionals, Customer Representatives, Nurse-maids, Drivers, Housekeepers, Cooks, Child Caretakers, Gardeners, Security Guards, Construction Workers, Garment Workers, Office Helpers, Delivery Helpers, Receptionists, Cashiers/Retail Clerks.

⁷ According to Babajob, a check is provided when monthly earnings exceed 300R (~\$7).

⁸ A mentor can either be a friend, relative, NGO or a cyber-café operator.

⁹ Esoko. Retrieved November 11, 2010, from <http://www.esoko.com/>

enables farmers and traders to share market information for agricultural products worldwide through a simplified form of eBay over mobile phones and the Web. Listing of offers and receiving of text messages is free. Buyers and sellers post information on their business interests and contact details. This information is circulated to 'matched' subscribers using SMS text messages in several local languages. Interested parties contact each other directly for business.

Esoko earns revenue by putting advertisements in messages and by collecting economic data which it sells to advertisers subject to privacy regulations. Among the recent success stories is a sale of organic fertilizer facilitated by TradeNet between a person in Yemen and another in Nigeria at rates far more competitive than the seller would have otherwise received (Economist, 2007).

Six years after its launch, Esoko has 40 full-time employees and about 9,000 users with a revenue base of US\$1.4 million and US\$0.5 million in profits. It has also led to a 6.4 percent fall in grain price market dispersion and a 3.5 percent decline in mean prices. Transactions costs for farmers and traders have fallen by \$2–\$150 per transaction. By reducing the role of middlemen or cutting them out altogether through SMS advertising and procurement, Esoko has also cut transaction times by as much as 50 percent. Additionally, Esoko has increased the utility of mobile phones transforming them into valuable market bulletins (Bartlett, 2010).

According to the ITU, similar projects are underway in other parts of the world. Trade at Hand in Burkina Faso and Mali funded by United Nations Conference on Trade and Development (UNCTAD), provides daily fruit and vegetable exports price information. Manobi,¹⁰ a Senegalese telecoms firm, provides real-time agricultural and fish prices. Manobi has also expanded to South Africa with considerable success (ICTUpdate, 2010). According to UNIDO, others such as the Uganda Business Information Network (UBIN) in Kampala act as a

¹⁰ Manobi South Africa. Retrieved February 22, 2011 from <http://www.manobi.sn/sites/za/>

one stop “infomediary” that provide information services, ICT support and commercial Internet solutions to SMEs.

6.4 WIZZIT Payments Pty¹¹

WIZZIT is a mobile payment system launched in 2005 to offer secure, affordable and efficient banking for the financially excluded in South Africa. It uses cell phones and SIM cards compatible across all national telecom networks to provide person to person/utility bill payments, transfers/pre-paid purchases, Internet Banking, ATM service and formal retail. It also uses local languages.

Account opening is available 24/7. Low transaction fees with no minimum balance requirements and no paid media advertising ensure lower costs. A monthly fee currently set at R19.99 (approximately US\$3) includes funeral cover for subscribers which, enhances the utility of the service.

WIZZIT gives priority for employment to disadvantaged and chronically unemployed youth (Wizzkids) who help in account opening and activation. To qualify, a Wizzkid must be a WIZZIT customer, have an email address, a camera-enabled cell phone and R100 (approximately US\$15) for initial business operation. For good performance and sustainability, WIZZIT places emphasis on training and development.

Within 2 years of operation, WIZZIT had employed more than 2000 Wizzkids and by 2010, had processed nearly 3 million transactions and opened over 250,000 accounts with over 12,500 monthly new additions (Bassiri, 2007).

WIZZIT has enhanced affordability, usability and the existing social capital by allowing meaningful financial interaction between the previously unbanked arguably also enhancing their psychological well-being through a feeling of inclusion. 8 in 10 subscribers had never

¹¹ WIZZIT Payments Pty. Retrieved November 14, 2010 from <http://www.wizzit.co.za/>

owned a bank account and had never used an ATM (Mola, 2006). Over two-thirds of users find it convenient and safe. 70 percent of users view it as cheap (as much as one third cheaper than comparators in the big retail banks). 70 percent of users also find it fast. WIZZIT has also enhanced shareholder wealth by eliminating risks associated with carrying cash (Ivatury and Pickens, 2006).

6.5 Project ABC

ABC was launched in 2009 by the Niger Food Security and Nutrition Program and the Catholic Relief Service (CRS) to improve adult literacy in Niger. ABC uses multimedia mobile phones programmed with a digital curriculum in the local languages of Hausa and Zarma. It also incorporates a literacy component. Local facilitators teach the two component program.

By 2010, ABC had established 140 CRS intervention villages with 56 operational literacy centers and 1,400 learners.

Nearly 1 and half years after ABC's launch, Aker, Ksoll and Lybbert (2010) found substantial improvements in literacy and numeracy test scores. Adults' math test scores increased by .32 points during the first year and 1 out of 4 students attained a higher level of numeracy. Students transitioned from an inability to recognize any numbers to successfully completing simple addition and subtraction problems. According to this study, both literacy and numeracy effects are stronger and statistically significant for younger populations. Results from the first year of the program also suggest that ABC increases students' test scores better than the traditional literacy curriculum. This effect continued even 8 months after the program, the learners having been tested without any prior knowledge that they would be.

Anecdotally, farmers and traders are also having higher incomes through increased productivity and by getting better prices for their products by by-passing potentially

exploitative middle men. They are also having a wider market reach for their products facilitated by SMS marketing.¹²

7.0 Discussion

(Table 2)

According to **Table 2**, mobile phones and the Internet hold the most promise for ICTs for poverty reduction in urban slums. This is consistent with their perception as predictors of success in most available literature. The case studies in this paper make exclusive use of these technologies. On the other hand, virtualization computing, as represented by local area networks and cloud computing, while not currently in use in these projects, might present tremendous opportunities for cost savings. They remain possible candidates for adoption going by the evidence provided in the literature review. This suggests that ICT projects with a poverty reduction mission could possibly benefit from their use but these technologies may not necessarily be a requirement for the projects' success. Future application and research in specific similar projects may yet determine their necessity.

The Internet enhances the utility of these technologies. It connects them to useful sources of information and makes them amenable to widespread use and adoption. Each of these initiatives has arguably succeeded because they have the Internet as a fundamental component. For that reason, policy makers need to pursue options that encourage widespread adoption of Internet-capable smart phones and affordable Internet access. One way of doing this is to create a competitive telecom business environment. From an economist's standpoint, competition ensures the right pricing and as complete access to services as possible within a given business context. The other could be to foster public private partnerships (PPPs) that safeguard the public interest while fostering private sector investment as is the case with Esoko

¹² For details on ABC, see Jaschke (2010) and Aker (n.d.).

and Project ABC.¹³ But these may not be the only policy prescriptions. They are only representative of a wide array of other possibilities.

With regard to the functionality framework, all the case studies seem to be having all the poverty reduction ingredients as outlined in the conceptual framework with the exception of Esoko and ABC but even they lead to desirable positive spillover effects. Esoko for example, had created 40 full time jobs six years after its launch (Bartlett, 2010). This should give confidence to policy makers that ICT projects that seek to increase incomes, build skills and embellish networking are more likely to succeed in providing sustainable livelihoods to the poor.

(Table 3)

Table 3 gives a summary of the common emerging threads derived from the case studies. It maps each of the case studies for every occurrence of the success factor.

At least 8 peculiar characteristics emerge. They are technology/network interoperability, local/multiple language use, local content application, relevancy to local context, broad-based wider reach, affordability as measured by ability of several people to own the technology, easy potential for scalability and inclusiveness.

Affordability allows for widespread uptake which can then be used as a platform for greater economic development. All the case studies in this paper started out small and have been gradually expanded. It is notable that those that had a profit making objective at the outset such as Esoko ultimately achieved this goal after initially running in the red which is not unique to ICT projects. Profitable businesses generally evolve from loss making ventures before eventually breaking even at a given tipping point.

¹³ In both cases, respective governments have given specific concessions to telecom companies in exchange for connectivity and service in commercially less competitive areas.

Interoperable networks are just as critical. WIZZIT for instance, has been largely successful because of compatibility with all mobile phone networks as has been M4G with its goal of replication in other geographical areas.

In addition, projects that have an explicit inclusive goal are more likely to succeed than those that may be exclusionary. Several elements contribute to an inclusive project design but among the most important are local languages and relevant local content. Instructively, each of these case studies has varying degrees of these (see **table 3**).

8.0 Conclusion

As the case studies show, the success of ICT projects for poverty reduction in urban slums requires an affordable technology platform that can be widely scaled up and a functional framework that has immediate relevancy to the needs of the locals. Mobile phones and virtual computing meet the technology criteria. In terms of functionality, increasing incomes, skill building and networking consolidation are critical but aligning projects with the local context is just as paramount. This paper has focused only on the economic empowerment front. Future research may yet shed more light on the impact of ICTs on other socio-political aspects of poverty reduction in urban slums.

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Tables

Table 1. Conceptual Framework

Table 2. Summary of Case Studies Using the Conceptual Framework

Table 3. Mapping of Case Studies to Critical Success Factors

Figures

Figure 1. Urban and rural populations, by development group, 1950-2050

Table 1. Conceptual Framework

Technology Platform	Functional Role			
	Employment	Economic Development	Social Capital	Skills Building
Mobile Phone	<ul style="list-style-type: none"> - Job listing - Job subscription - Market information and access - Advertisements - Investment Opportunities - Assisted Search for hire - Community Database - SMS broadcast - SIM Cards - Financial services 	<ul style="list-style-type: none"> - Job listing - Job subscription - Market information and access - Advertisements - Investment Opportunities - Assisted Search for hire - Community Database - SMS broadcast - SIM Cards - Financial services 	<ul style="list-style-type: none"> - Social Networking - Community Database - Investment Opportunities - SMS broadcast - SIM Cards 	<ul style="list-style-type: none"> - Mobile courses - Learning Apps - Investment Opportunities - SMS broadcast - SIM Cards - Course information marketing
Internet	<ul style="list-style-type: none"> - Job listing - Job subscription - Market information and access - Investment Opportunities - Advertisements - Assisted Search for hire - Community Database - Financial services 	<ul style="list-style-type: none"> - Job listing - Job subscription - Market access and information - Investment Opportunities - Advertisements - Assisted Search for hire - Community Database - Financial services 	<ul style="list-style-type: none"> - Social Networking - Community Database - Investment Opportunities 	<ul style="list-style-type: none"> - Distance Learning - Web courses - Course information marketing - Investment Opportunities - Learning Apps
Local Area Network	<ul style="list-style-type: none"> - Virtual PCs - Servers 	<ul style="list-style-type: none"> - Virtual PCs - Servers 	<ul style="list-style-type: none"> - Virtual PCs - Servers 	<ul style="list-style-type: none"> - Virtual PCs - Servers
Cloud Computing	<ul style="list-style-type: none"> - Business Apps 	<ul style="list-style-type: none"> - Business Apps 	<ul style="list-style-type: none"> - Social Networking Apps 	<ul style="list-style-type: none"> - Learning Apps

Table 2. Summary of Case Studies Using the Conceptual Framework

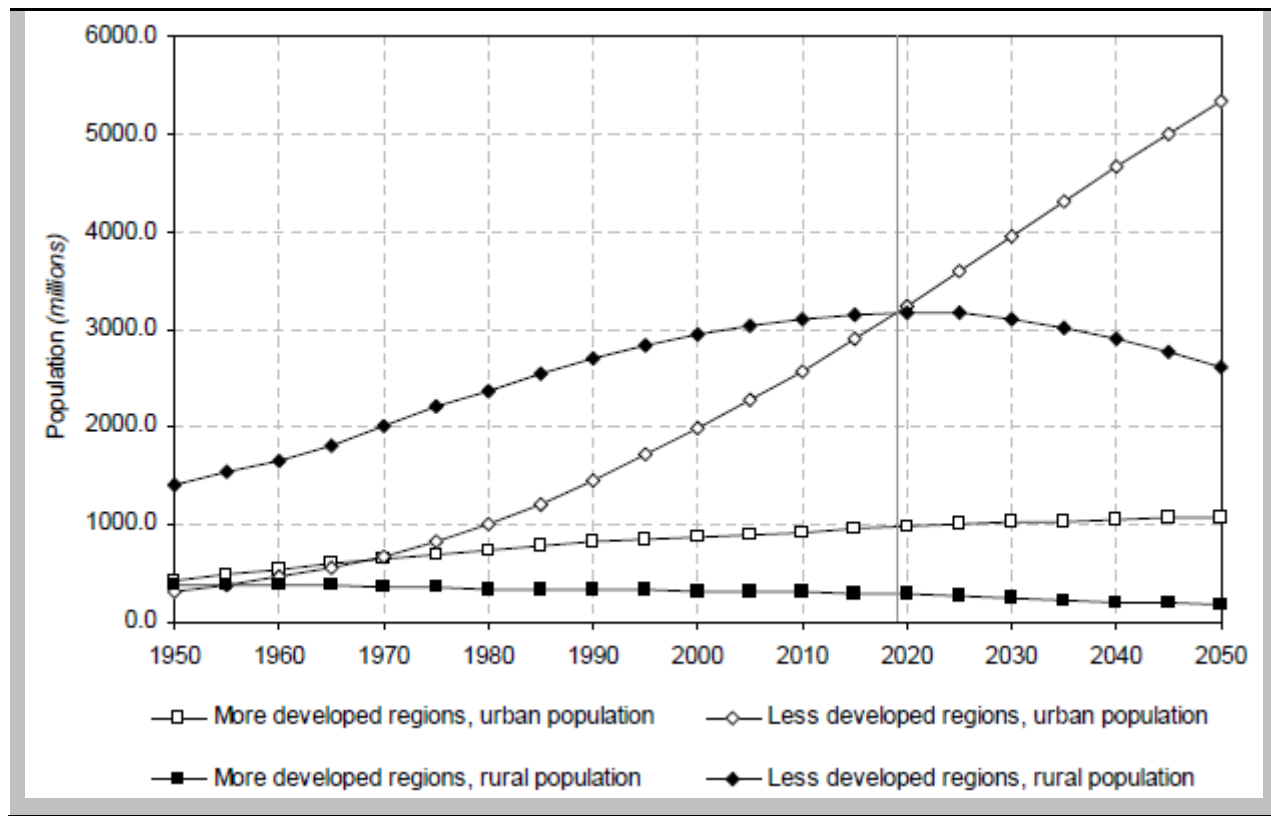
		M4G	Babajob	Esoko	WIZZIT	ABC
Technology Framework	<i>Mobile Phone</i>	X	X	X	X	X
	<i>Internet</i>	X	X	X	X	X
	<i>Local Area Network</i>					
	<i>Cloud Computing</i>					
Functionality Framework	<i>Employment Services</i>	X	X		X	
	<i>Economic Development</i>	X	X	X	X	X
	<i>Social Capital</i>	X	X	X	X	X
	<i>Skills Building</i>	X	X	X	X	X

Note: An X indicates current usage; a blank indicates a technology tool/functionality not currently applied even if the potential exists.

Table 3. Mapping of Case Studies to Critical Success Factors

Interoperability	Local/Multiple Language Use	Local Content	Local Context	Wider Reach	Affordability	Scalability	Inclusiveness
M4G WIZZIT	ABC Babajob Esoko WIZZIT	ABC Babajob Esoko M4G	ABC Babajob Esoko M4G WIZZIT	ABC Babajob Esoko M4G WIZZIT	ABC Babajob Esoko M4G WIZZIT	ABC Babajob Esoko M4G WIZZIT	ABC Babajob Esoko WIZZIT

Figure 1. Urban and rural populations, by development group, 1950-2050



Source: *World Urbanization Prospects, 2007*¹

¹ For details see http://www.un.org/esa/population/publications/wup2007/2007WUP_ExecSum_web.pdf (p. 3).