

Sharing Lessons for the Review of ICT4D Concepts in Developing Countries of Africa

Tibuhinda T. Ngonzi

UCT, Tanzania

Abstract

This paper is an attempt to contribute some insights in the understanding of ICT4D in the socio-economic-political context of African developing countries. It proposes an upgraded understanding of 'social innovation' SI as innovation wired in the behaviour and practices of social agents which is necessary for the propagation of technology locally. It is argued in the text that focusing artefacts on the tackling of social needs is not enough to qualify them as social innovations since they still bear the identities of their origins. Along with, the paper calls for acknowledgement of the behavioural aspect of development, and the means to bring influences in that dimension for social development.

Keywords

Social innovation, Artefacts, Capacity for ICTs, SI4SD, Economic base.

Introduction

The operationalization of the social aspect in ICTs and artefacts is a persistent phenomenon in the dialogue on the relationships between technology⁷ and development especially in the African context. As a consequence, the productivity of technological initiatives in Africa is unfavourably undermined. For instance, it is not fully understood at the moment on how to operationalize technology: whether as a tool, a factor input for development, a medium of development, or otherwise, to bring about desired social transformations in the developing countries in general, and Africa (South of the Sahara as the developing Africa is normally differentiated from the developed parts of the continent) to be specific. Complaints on the lack of theoretical guidelines in the field (Edquist and Hommen 1999; Heeks 2010) evidently support the claim. Analytically, the discourse on ICT for development has projected a variety of perceptual chapters across countries. Recall that, some scholars argue from the benefits point of view – 'Provide technology to enhance access to information' as a way for the realization of knowledge economies (ITU 2005). What information and from where remains to be an open question. Others advocate for the 'skills to use computers' as the source of power to harness the benefits of technology (Alampay 2006; Langmia 2006). Yet others think that technology has to be designed

⁷ Where not otherwise stated, the term 'technology' in this text is used as a short form for 'Information and Communication Technologies'

in a way that will be able to promote the use and hence drive to development (Reijswoud 2009). Distinct threads point in the policy dimension (Heeks 2008) and strategic focuses (Thompson and Walsham N.A).

In general terms, ICTs, as they drive knowledge economies, have impacted greatly on the social development of the peoples globally. The acknowledgement of the impact potentials of ICTs to humankind and livelihood has pressed stakeholders in the field to indulge in the brainstorming on how to, at least, involve as many societies on the globe as possible, in the reaping of these potentials. Hence the inception of ICT for Development (ICT4D) (ITU 2005). To a greater extent, the concerns of the stakeholders on board are on how to make the 'under-developed world' become 'developed' through the use of ICTs. Benchmarking from the decade of massive withdrawal of Colonial Masters from Africa, the 1960s, persistent poverty in Africa south of the Sahara remains to be a pressing problem. Tremendous literature exists in other disciplines on the cause-effect relationships of investments, savings, capital, labour, technology (in generic terms), income distribution, and economic development as a dependent variable. From the scholarship of 'political economy of underdevelopment', poverty in the same mentioned place has acted unfavourably against the drivers for several reasons which are beyond the scope of this paper to discuss (Todaro 1981).

The ushering in of ICTs has been seen as a viable discovery which could break some isolating barriers like geographical locations, lack of communication links, shortage or lack of knowledge and others which aggravate poverty in the under-developed Africa. Subsequently ICTs could drive development in the South (WSI 2003). The concerns in this paper dwell on the lack of appropriate strategies to deploy technology in the development processes of the African people.

A background to the problem in discussion, some basic concepts in ICT4D and what the paper assumes to be important contributions follow after the above brief introduction.

Background

Analytically, the dialogue on the deployment of ICTs for development in the discipline of Information Systems (IS) has evolved through several significant circles. It begun with the dichotomies: digitized and non-digitized worlds (digital divide), the haves and have not, connected and none connected, skilled and unskilled to use computers etc (DiMaggio and Hargittai 2001; Sonaike 2004). To solve the problem, the universal access policy was coined (WSI 2003; ITU 2005). Unsatisfactory results of the policy plied the attention to ICT4D (Heeks and Molla 2008). Technology has been conceived as something that in order to develop, no place of the world can afford to live without (International Perspectives 1993). With technology, developing countries will be able to "modernize" (Mercer 2006), develop by leapfrogging some stages of development, and so on arguments proceed.

In the analysis by Avgerou (2008), ICTs innovations are either based on technology transfer from developed to under-developed economies, contextualization of the innovations to account for local social and organizational conditions or creating possibilities for leveraging large scale and deep socio-economic change in a transformative way (Avgerou 2008). Pro-poor considerations in design (Heeks 2008),

Human face in technology (Sewchurran 2010) are other areas not earmarked by Avgerou. Not adequately covered however is how does people in the receivership end create demand for ICTs, as a basic economic condition for their further propagation.

Indeed the enthusiasm on ICTs has gone through high tides, in some instances regarding them as a direct solution to poverty alleviation/development (G8 2000, ITU 2003).

The low returns on investment in universal access strategies have led to the propagation of investigations in the key success factors, as lessons from a few temporarily successful initiatives across countries. Needs orientation of technology, technology relevance, cultivation for user participated implementation appropriate technology are the emanating confluences (see examples: 'The E-Barrio Project' (Bala, R. W. Harris, and Songan 2004), 'The Siyakhula Living Lab' (Khane et al. 2010), etc).

Once again, the below expectations outcomes, especially on sustainability and social transformation (Heeks 2010) have further broadened the dialogue on ICT4D to include considerations for people and contexts. Projects of the 'Digital Doorways' type (Gush et al. 2010) emerged with "addressing real needs in natural setting", framed on "design – based research" (Gush et al 2010; Heeks 2008) to mean researching for design in order to be able to develop contextually relevant artefacts (or 'pro-poor' in the words of Heeks (2008)) as the principal approach. What is labelled as achievements in these type of projects read as "locals were able to make calls to their relatives in towns", "establishment of internet kiosks around the facilities" etc.

Social transformation and development have not happened as theorized in literature (Reijswoud 2009). Currently, the voices on the consideration of sociological sphere in the technological initiatives for development firmly stand the ground (see Heeks 2008; Sewchurran 2010) as an aspect of social implications and relevance in technological processes. In this more recent paradigm, hypotheses have been put forward for contextual engagements. For instance, Reijswoud (2009) advocates "appropriate technology (AT)" as being capable of orienting ICTs to local conditions. According to the scholar, AT at the levels of hardware, software and implementation is suitable for the environmental, cultural and economic conditions (p3). The focus of the author's discussion is on the designs that are capable to withstand local environmental conditions (heat, dust etc), and avail the "ordinary man" access to information and connect with the knowledge society out there.

It is currently a consensus among the scholars of ICT4D that the design, deployment and use of ICTs should emphasize social aspects. The social aspect of ICTs is interpreted as a focus on the relations of technology and people for the solution of social needs (Sewchurran 2010; Heeks 2008). Furthermore, referring to literature in the field of Information Systems, technological innovations that address social needs are broadly understood as social innovation (Baldrige and Burnham 1975; Mulgan 2006). To limit the concentration of the discussion at hand to the earlier underlined concern, this paper looks specifically at the social innovation processes in the deployment of technology for development in the context of the African people,

beginning with an overview on the perspectives of ICTs for development.

Theoretical Perspectives of ICT for Development

Information is critical to all forms of economic activity at the foundation of economic development. In the current information economy, meaningful information for decision making that is timely and relevant is becoming almost impossible to get at without ICTs. ICTs are at the helm of productive participation in the global economy through globalization (ITU 2005). In general terms, expressions at the WSI (2003 and 2005) indicate that the member governments are united on the desire to realize an all-inclusive global information society (see ITU 2005). Since the first World Summit on Information Society (WSI) in 2003, considerable initiatives have taken place to address the 'digital divide' scenario around the globe and Africa in particular (Benner 2003; Ng'ambi 2006). However, despite huge investments in ICTs and emphasis on ICTs for development, the achievements on the economic and social development front through access to ICTs as formerly envisaged are not as anticipated.

Amidst huge investments in ICT4D, infant mortality rate, illiteracy level, life expectancy, per capital income, and other human development index figures have not shown significant improvements. Evidences are lacking to suggest appreciable return on investment in ICTs in developing countries of Africa (DCoA). In fact, findings from studies around indicate that the use of internet for example has not grown in considerable proportions with the growth in access (a favourite of WSI 2005). For instance, according to ITU (2008), internet usage in 1998 was 1 out of every 100 inhabitants in Africa. Ten years later, 2008, the usage had grown to just 15 in every 100 (ITU 2010). In essence, there is a need to rethink both, the understanding on the developmental impact of ICTs on African societies, and the strategies for the activation of ICTs for development in African societies.

In some cases, the inadequate guidance of ICT initiatives have led to unintended outcomes like urban – rural digital divide where the growth of users become significant in urban areas but not so for the counterparts (Conradie, Morris, and Jacobs 2003). Disrupted employment opportunities to the majority of low skill levels rendering them redundant from jobs and therefore poorer, is another observation by Benner (2003). On the other hand, Alampay (2006) stresses that the application of ICTs in absence of development strategies that make their use effective will inevitably lead to sub-optimal utilization outcomes. The same observation is held by Thompson and Walsham (N.A) who from a policy perspective, voice on the need to implement strategic developmental focus in ICTs.

In recognition of the matter, the Tunis WSI (2005) has embraced the vision of 'Inclusive Information Society' that considers factors of human development, gender and age together with access and connectivity in the ICT initiative frameworks.

How researchers analyze and understand developmental impacts of technology depends very much on the way they understand development itself: What it is and how it is to be achieved. According to Martinussen (1997), "development was originally conceptualized as a fairly linear, straightforward technical intervention to push nations along a linear path from "less developed" to "more developed," as also observed by Sewchurran (2010), with a primary focus on macroeconomic indicators such as the gross national product (GDP), per capita income, standard of living etc.

(Ngwenyama et al. 2006; Maswana 2007; Martinussen 1997). But experience and field reflections have led most development theorists to reject this view as flawed and overly simplistic (Ngwenyama et al. 2006). Macroeconomic indicators do neither show how wealth is distributed, nor the influence of political, economic conditions, and social factors that all contribute to quality of life thence social development. In addition, the traditional accounts do not hint on the behavioral dimension of development which this paper advocates as potentially important for development in Africa.

The Technological Aspect of ICT4D in the African Context

One dimension the discourse on ICT4D has not adequately addressed is the power of indigenous innovativeness towards the realization of the desired global information society through ICTs. Much speculation in literature is on using ICT to bring about social transformations. However, the social behaviour across communities on earth has significantly unveiled a different conceptual domain in technology. The emergences of 'virtual socialization' where people of the world are increasingly being networked by shared interests or 'identity' (Flores 1998) have ushered in new values in the understanding of innovation and the use of technology. Social action and political action feature more conspicuously in the essence of peoples own innovations for themselves. Marriages, political organizations of people's power that have resulted in pro-democratic political changes are a case in point. From the design point of view, these are not according to the pre-planned artefact design of internet for instance. To a greater extent, they are outcomes of "innovation by the people, for the people".

Accordingly, the positioning of artefacts in ICT4D as they have been known to emerge and work has to change. In essence, ICT4D has viewed artefacts as agents that should be operationalized for social change. They are to be trained into "bringing about desired changes" in communities of relevance as Andrade (2010) in "Does IT help or not: Computers for development in the Andes" would suggest. The argument at hand however is that, it is not likely enough **to design development in artefacts**. Neither does ICTs decisively lead to economic growth (Corea 2000) as a factor of production. It is on the way people themselves deploy them. This paper prefers to claim here that, artefacts are likely to work better in social development where they are designed as servants of social innovation. That is at the micro level. From the school of thought where social innovation is perceived as a 'social phenomenon' according to Sewchurran (2010), Mulgan (2006) and others, social innovation happen through the people where developments in the innovation dictate on the required adjustments in technology to make it work better.

Artefacts taken to communities out of speculation stand narrow chances to be effective. Rather, an artefact created in one community bears the identity of that community and its people (see Flores 1998 p352 and Reijswoud 2009 p1). Since the designers are people with certain backgrounds, it is imperative that during the design, the designer will inevitably inscribe into the artefact the identity of that individual's virtual world as it is thought to exist. To work in another community, it has to be peeled off of the former human identity before any meaningful replication can take place. The difficulty of this is that there is no part of the work that is 'neutral' as people and technology cannot be separated (on the argument that no technology has

ever emerged and existed on its own) except looking for similarities. And where they lack, the whole piece will be useless. Training/learning, called upon in some literature on diffusion of innovation (Chigona and Licker 2008) will help where similarities exist as well.

Artefacts emergent from communities out of their social innovation processes on the other hand stand higher chances to succeed. Why so? Within the social innovation domain, adjustments to ideas are done by the people themselves. For instance, people will dismantle technology to re-create innovation in their own way, more meaningful to them. Even in the case of the so called 'technology transfer'(Rai, Van Belle, and Pedersen N/A), the scholars conflate that "technology integration will be most successful when the level of interaction between the source of the technology and the recipient of the technology is appropriately matched to, or fit, the characteristics of the technology to be integrated" (Rai, Van Belle, and Pedersen N/A).

To cite one phenomenon, there is a need to adopt a more positive view of the delay or rejection of new technologies in local places. The perception of 'resistance' to technology adoption as it has always been referred to in literature (see for instance Dalvet et al. (2007) needs to be clarified. It is good to understand that all people are rational. That being the case, they should not be taken as resisting to adopt technology. There are complex mental calculations and processes that they go through before they make choices, and important for research is to look for variables (what they can change) and parameters (what they cannot change) in the tacitly composed equations as a prerequisite for their actions. In a more tactical way, Flores (1998) posits it as "human beings do not normally act in the world by simply transferring, disassembling, and reassembling basic things but do that by also changing the status of things within the community". To confine the argument to technology, such changes will be directed in ways that make sense to them and that is their rational choice and not mere Kim & Kankanhallis' (2009) 'resistance'.

The Behavioural Dimension of Development

Development in the broad sense of the term does not get designed in material objects or systems, the like of artefacts (Telecenter, Information Communication Systems, Computer or Computer networks) in the discipline of Information Systems (IS). Rather, development is a behavioural concept as suggested by Corea (2000) as well, which gives forth material objects. It is a result of deliberate and 'rightfully directed' application of efforts. Such efforts could be applied towards the promotion of technology, learning and so on, or even discouragement of anti-development behaviour like laziness, corruption, or dirtiness, etc. We table this as a scenario of behavioural variables. Under this thread of knowledge, development is enshrined in behaviour as poverty is. This is why, there are poor people, co-existing with the rich in materially rich places. For instance, one does not need ICTs to keep his/her home surroundings clean in order to fend off diseases and save on resources used for medication. It is not a question of ICTs to adopt good farming practices for environmental conservation or sustainable ecosystem where these are known.

Within this line of argument, development is considered to be a process, grounded in **behaviour** (Corea 2000), **technology** (in general) and **ideology**. Motivation,

aspirations, and role playing drive the behaviour of individual actors as development agents. Innovations on the other hand, drive technology (in its generic meaning) to devise tools (tangible and intangible tools like institutions) for both, social and economic activities. Ideology begets policies and strategies to guide the process of development. For instance, the path the West has taken to develop is not the same China has gone through. Thus, if ICTs are to be activated for the realization of the millennium development goals (MDGs), it is for the governments in developing countries to have definite ideologies which target them in the first place. The extant paper views development as a result of increments of favourable tangible and intangible qualities. In the long-run, such increments accumulate to significantly notable differences along the time spectrum, time before and time after any chosen reference point. This is then noted as a change or a desired transformation. The things people invent, use and adjust over time to help them on the trajectory as they take on different forms of life are regarded as tools. The contribution the extant text is making is that for development, the promoters of ICT4D should focus in the technological, behavioural and ideological dimension tripartite simultaneously.

In the evaluation of ICT4D initiatives, it is in the views of this author that there is a vital work ahead in the field for research to search for themes that are capable of accommodating more dimensions of behaviour, technology and ideology in the development processes. Aligned to the devised conceptualization of social innovation, SI is upheld as a mechanism through which societies can restructure themselves, to adapt their existence to externally or internally emergent innovation impacts, thus proposing social innovation for development SI4D as a vehicle in place of ICT4D.

Technology, Innovations and Social Innovations

In literature, 'Social Innovation' has been used to present different characteristics. From the business organizations point of view, McElroy (2001) and Andrew & Ciborra (1998) has used the term to refer to innovations focused on people in organizations, in recognition of their agency and capability to innovate and carry on innovations there (McElroy 2001). In the social settings, SI refer to social context functional innovations like 'educational innovations, community action innovations, health delivery innovations, new technology in industry and the like (Baldrige and Burnham 1975); while Mulgan (2006) conceptualize SI as the "innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organizations whose primary purposes are social". Phills (2009) however, is not interested in the diffusion process of Mulgan. According to the latter, a SI is "any novel and useful solution to a social need or problem, that is better than existing approaches, and for which the value created (benefits) accrues primarily to society as a whole rather than private individuals" (Phills 2009).

The extant paper wishes to go a bit further in the conceptualization of SI. To begin with, we wish to separate 'socially focussed innovation' from 'social innovation' Socially focussed innovations remain to be socially oriented artefacts but not yet SI. Then we upgrade SI to the level of 'innovations wired in the behaviour and practices of the social agents. Social agents include individuals as community members and institutions (social, economic and political). Social innovation – The society as a unit or its agents carry the idea and operationalize it as its own new idea, or its own new

way of doing things, ready to and has capacity or is aware of the means to modify it. A Social innovation is an innovation 1) rooted in society and 2) socially driven from the society in question. This is the adopted definition for the operationalization of SI in social development.

It means, an innovation that can be traced to an individual, even if it is from within the society, is not yet a social innovation until it is assimilated by the society (here is the essence of “an innovation, no matter how well designed, would be perceived as useless if it is not adopted” (Chigona& Licker 2008).

In the same token, an innovation originating from outside the society, however socially focussed it might be, will become a social innovation only when it is wired in the behaviour and practices of the society of concern. A piece of innovation in ICTs may address social issues or have a ‘social focus’. It will not be a social innovation until when it is socially subscribed to in actions or cognitively. And the same society will propagate it.

-Social innovation is the level above adoption of innovation.

-Adoption of innovation is a level above diffusion of innovation

Therefore, addressing social issues with ICTs is not an end in itself, Social innovation should be the target and capacity for SI must be developed.

Under these circumstances, the paper is of the views that, the potential for innovation in African societies is necessary, it can be aroused via deliberate efforts eg from the political dimension where the private sector is either weak or lacks on that angle of knowledge.

According to Mulgan (2006), SI can be initiated by individuals, movements or institutions like governments, research, academia or others. Individuals bear ideas or even strive to implement them, while movements act out of massive discontent, Mulgan observes. Similarly, Institutions can act out of deliberation for instance where applied research is concerned. The motivation for social innovation is to meet social needs (Mulgan 2006 p146). Contrary to what is observed in business where the impetus for diffusion of technology is said to be built on cost factors, customer services, or strategic advantage over competition; social innovation is the action area for social development where profits is not explicitly the driving force.

Social innovation provides means for ICT to respond to the needs of humanity. A focus on humanity should be the gateway for ICT4D. In the same token, Lyytinen & Damsgaard (1997) emphasize that ‘complex IT solutions should be understood as socially constructed and learning intensive artefacts which can be adopted for varying reasons’ even completely different from what design intended.

The people in the receivership block have got a big role to play as initiators and drivers of their own ideologies if technological innovations are to work for them. Where ideologies lack, it is not a surprise that the supply side will dictate those initiatives in ways that are for its benefits. In this era of globalized economies, the beneficiaries of North-South connectivity are not in the south. Businesses in the north

like internet because they can access the Southern markets, pound on software piracy and the like without exemption.

Unfortunately, the potential of technology to provide access to information is thought in terms of linking the information dry South to the information rich North. [the question of appropriateness and relevance is somehow forgotten]. But on the contrary, technology could be thought along providing means for the maximum utilization of local resources and promotion of intra-regional linkages across Africa for example. It is only ideology which will be able to funnel in such moderations.

The Problem of Africa

From the scholarship of the 'political economy of underdevelopment', any society's 'economic base' is very important for its development. Substantial developments have occurred in many countries through radical changes, adjustments or restructuring in the economic bases to accommodate great innovations.

The economies of developing countries are currently dominated by subsistence production, 'short shelf life period' of produce which are predominantly agricultural, animal or lakes, ponds and river products. These are produced in small quantities due to lack of capital and being labour intensive. Their market is driven by exchange for subsistence. Immediate need of money to buy family needs of the day – low level of saving, constant deficiency etc. There is a significant lack of institutions and a shallow private sector which impinge on the necessary public, private partnership (PPP) for the propagation of technology in development (Harris 2002). This is in sharp contrast to the knowledge and services dominated economies of developed countries.

For the former type of economies, IS4SD theorize that ICT initiatives in developing countries should be supplemented with appropriate information systems. Models to promote intra-regional linkages for accessible resource sharing, policies for maximum resource utilization through ICTs, or policies for capacity creation for technology exploitation among others are just examples. Information systems must be implemented beyond connectivity and get inputs from the societies themselves as a way of including them in the innovation process and inculcating awareness in the society. It does not help much to post them in the top down approach modality. At the moment ICTs are more productive in manufacturing and services sectors (here admitted in advance as a potential area for research to establish certainty). But not so in the characteristic economies of rural Africa where the majority poor, between 75-80% (Salvatore et al. 2005; Songan 2004) live.

ICT initiatives in Africa exist intensively in missions but shallowly in visions. The shortcoming in vision makes it difficult for respective governments to implement technologically focussed long term programs. Such programs would provide a platform for those initiatives, making them more effective, efficient and sustainable. Consider the telecenter initiatives (Ncheye 2007; Abbasi n.d.; Yeo et al. 2010), the East Africa Submarine Cable System (EASSy) (Kenduiwo 2005) etc. On the other hand, reliance on wholesale deliberations from international forums like the ITU and the community of 'development partners' find many implementations based on missions without being tailored to custom circumstances. There is lack of local inputs

due to absence of voices from the respective local places. The technologies concerned may be appropriate as called for by scholars (Reijswoud 2009), but in absence of appropriate philosophy and a viable school of thought on social behaviour and development agenda, favourable outcomes are far to come by. Instead of having International agents drive the initiatives for technologization, the states should have ideology based agenda about technology and drive the initiatives. In fact, there is a need to develop local platforms for social innovation to happen in Africa. Governments in developing countries cannot avoid taking lessons from developed countries which have upheld funding basic science research as a seed for innovation. This should be a strategy for building Africa's local capacity.

A wider exploration on the relations between technology and developing economies suggest that there is a need for evolutions in economic models to pave a way for technological enhancements. For example in the current scenario, ICTs are seen to be more productive in services than commodity production (this should not be confused with computer aided or based production). The advanced economies in which services command a significant share of the GDP are more digital dependent than their counterparts. In such economies, connecting and networking are fundamental, with volumes of data exchange. In the latter type of economies the situation is different. Apart from the fairly rich commodity based economies like sugar, coffee, and minerals, the poverty stricken category of commodity producers who are dominant in the so called digitally divided developing countries, produce at the subsistence level. They still make a limited use of information. At the moment they are limited to the enjoyment of the conveniences of mobile ICTs for communicating with relatives in towns and cities for financial assistance and other social welfare.

When providing for behavioural considerations in artefacts, the main agenda has to be working towards triggering innovations locally, as opposed to technology transfer (International Perspectives 1993; Heeks 2008; Rai et al. N/A). In essence, leadership in developing countries should fight and promote the endorsement of open ended artefacts in their countries that allow for peeling, dis-bundling and re-assembly. That is a proposition to promote the acquisition and innovations in core technology.

Any successful development and implementation of a technological solution requires a deep understanding of its immediate social environment. There must be an understanding that it is the people in point who will sustain it and render it effective as an innovation (Wafula, Rodrigues, and Wanjohi 2007).

Many economic problems of poor communities are rooted in the dominant economic base. Base mechanisms significantly impact on the way other things on it function. Therefore, any problem solving measures are compelled to take into consideration some of the base compatibility factors (Andrews 1953 p161). In essence, for effectiveness and sustainability, measures aiming for social transformation or providing solutions to systemic problems need to respect the base influences accordingly.

The innovative trends in mobile technology viz mobile money (m-pesa), mobile banking, m-bill payments are all happening in the locus of peoples' activities. Time convenience, economic convenience, and service convenience, are the factors that

have fuelled the use of mobile technology.

Despite the fervent calls to pay attention to contextual dictates (Avgerou 1998; Reijswoud 2009), social contexts are complex in nature. This makes it difficult to understand every aspect of them essential for addressing in technological mediations. Local digital minds have to be developed and the prime area to start from is strategized education. Some lessons from the business sphere can help here.

In the business domain, learning is categorically earmarked as a pillar for innovation. Through learning, organizations acquire knowledge and embed it in themselves. In the end, such knowledge becomes natural to them (Andreu & Ciborra 1998). Similarly, knowledge has to be embedded in societies. Learning is a tool for technology naturalization. In some literature, innovation is seen as a form of learning (Fiol & Lyles 2007 p807). In others, learning is a factor for adoption of innovation (Mulgan 2006). The important lesson to draw from the organizational scenario is that the potential and effectiveness in social innovation can be more enhanced if the aspect is factored in the social structures and processes.

It is in the belief of this paper that ideas and research are still at high demand in the field of ICT4D in order to harness the potential of ICTs in the economies of subsistence level characteristics.

Conclusions

The paper has presented a proposition for the locally driven, inward looking social innovation process to drive for social development. A deeper understanding of social innovation and its position in the propagation of ICTs in African economies has been broadly discussed. Indeed, it is not enough to concentrate on contextual considerations in ICT4D initiatives without promoting local capacity for technological innovations. Countries in Africa have to have ideologies to drive the technology centred development agenda and understand the weaknesses inherent in foreign initiatives especially in the current globalized world economic order. These mark the contributions made by the article.

Bibliography

Abbasi, S. n.d. 'Role of Telecentres in Gender Empowerment: Do telecentres really work'.

Alampay. 2006. 'Beyond access to ICTs: Measuring capabilities in the information society'. *International Journal of Education and Development using ICT* 2(3). Retrieved October 14, 2009 (<http://ijedict.dec.uwi.edu/viewarticle.php?id=196>).

Andrade, A. D. 2010. 'Does IT Help or Not?' *Icts for Global Development and Sustainability: Practice and Applications* 78.

Avgerou, C. 1998. 'How can IT enable economic growth in developing countries?' *Information Technology for Development* 8(1):15–28.

Avgerou, C. 2008. 'Information systems in developing countries: a critical research review'. *Journal of information Technology* 23(3):133–146.

Bala, P., R. W Harris, and P. Songan. 2004. 'E Bario Project1: In Search of'. *Using community informatics to transform regions* 115.

Baldrige, J. Victor, and Robert A. Burnham. 1975. 'Organizational Innovation: Individual, Organizational, and Environmental Impacts'. *Administrative Science Quarterly* 20(June):165–176.

Benner, C. 2003. 'Digital development and disruption in South Africa: Balancing growth and equity in national ICT policies'. *Perspectives on Global Development and Technology* 2(1):1–26.

Chigona, W., and P. Licker. 2008. 'Using diffusion of innovations framework to explain communal computing facilities adoption among the urban poor'. *Information technologies and international development* 4(3):57–73.

Ciborra, Claudio, and Rafael Andreu. 1998. 'Organizational Learning and and Core Capabilities Development: The Role of IT'. Pp. 87–106 in *Information Technology and Organizational Transformation: Innovation for the 21st Century Organization*. Chichester, England: John Wiley & Sons.

Conradie, D. P., C. Morris, and S. J. Jacobs. 2003. 'Using information and communication technologies (ICTs) for deep rural development in South Africa'. *Communicatio* 29(1):199–217.

Corea, Stephen. 2000. 'Cultivating Technological Innovation for Development'. *EJISDC* 2(2):1–15. Retrieved March 12, 2012.

Dalvit, Lorenzo, Hyppolite Musingi, Alfredo Terzoli, and Mamello Thinyane. 2007. 'The Deployment of an E-commerce Platform and Related Projects in a Rural Area in South Africa'. Pp. 27–38 in *Special Topics in Computing and ICT Research: Strengthening the Role of ICT in Development*, vol. III. Kampala: Fountain Publishers Kampala UG.

DiMaggio, Paul, and Eszter Hargittai. 2001. *From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use as Penetration Increases Working Paper #15, Summer 2001*. Center for Arts and Cultural Policy Studies.

Edquist, Charles, and Leif Hommen. 1999. 'Systems of Innovation: Theory and Policy for the Demand Side'. *Technology in Society* (21):63–79.

Flores, Fernando. 1998. 'Information technology and the institution of identity: Reflections since Understanding Computers and Cognition'. *Information Technology & People* 11(4):351–372.

Gush, K., R. de Villiers, R. Smith, and G. Cambridge. 2010. 'Digital Doorways'. *Icts for Global Development and Sustainability: Practice and Applications* 96.

Harris, R. 2002. 'Research partnerships to support rural communities in Malaysia with information and communication technologies'. *Managing IT/community partnerships in the 21st Century* 222–247.

Heeks, R. 2010. 'Policy Arena: Do Information and Communication Technologies (ICTs) Contribute to Development?' *Journal of International Development* (22):625 – 640.

Heeks, R. 2008. 'ICT4D 2.0: The Next Phase of Applying ICT for International Development'. *Computer* 41(6):26 – 33. Retrieved March 4, 2010.

Heeks, R., and A. Molla. 2008. 'Compendium on Impact Assessment of ICT-for-development projects'. *Manchester: IDRC. Retrieved Dec.*

International Perspectives. 1993. 'Sub-Saharan Africa: A Technological Desert'. *Communications of the ACM* 36(2):25–29.

ITU. 2005. 'World Summit on Information Society'. Retrieved (<http://www.itu.int/wsis/outcome/booklet.pdf>).

Kenduiywo, P. 2005. 'African Regional Conference for the WSIS Pre-Conference Activities'.

Khane, C. P, I. Siebörger, H. Thinyane, and L. Dalvit. 2010. 'The Siyakhula Living Lab: A Holistic Approach to Rural Development'. *Icts for Global Development and Sustainability: Practice and Applications* 42.

Kim, Sung S. 2009. 'THE INTEGRATIVE FRAMEWORK OF TECHNOLOGY USE: AN EXTENSION AND TEST.' *MIS Quarterly* 33(3):513–537. Retrieved October 14, 2009.

Langmia, K. 2006. 'The role of ICTs in the economic development of Africa: The case of South Africa'. *International Journal of Education and Development using ICT* 2(4).

Lyytinen, Kalle, and Jan Damsgaard. 1997. 'What's Wrong with the diffusion of innovation theory? The case of a complex and networked technology'. Hongkong University and Case Western University Reserve.

Martinussen, J. 1997. 'Society, state and market: A guide to competing theories of development'. *Recherche* 67:02.

Maswana, Jean-Claude. 2007. 'A New Framework for African Economic Development with a Focus on Technological Innovation'. Retrieved (<http://mpira.ub.uni-muenchen.de/5550/>).

McElroy, Mark W. 2001. 'Social Innovation Capital'.

Mercer, C. 2006. 'Telecentres and transformations: Modernizing Tanzania through the internet'. *African Affairs* 105(419):243.

Mulgan, Geoff. 2006. 'The Process of Social Innovation'. *Innovations* (Spring):145–162.

Ncheye, F. B. 2007. 'My Experience with the Sengerema Community Multimedia Centre (CMC)'. *The Journal of Community Informatics* 2(3).

Ng'ambi, D. 2006. 'ICT and Economic Development in Africa: The Role of Higher Education Institutions'. in *Commissioned as a background paper to the University Leaders' Forum by the Partnership for Higher Education in Africa.. UCT, Cape Town.*

Ngwenyama, O., Francis K. Andoh-Baidoo, Felix Bollou, and Olga Morawczynski. 2006. 'Is there a Relationship Between ICT, Health, Education and Development? An Empirical Analysis of Five West African Countries from 1997-2003'. *The Electronic Journal of Information Systems in Developing Countries* 23(5):1–11.

Phills, Jim. 2009. 'Rediscovering Social Innovation'. Retrieved December 25, 2011.

Rai, Sudhanshu, Jean-Paul Van Belle, and Mogaens Kuhn Pedersen. N/A. 'Technology Transfer as a Form of Co-creation for Future Market - Issues, Frames and Concepts'.

Reijswoud, Victor van. 2009. 'Appropriate ICT as a Tool to Increase Effectiveness in ICT4D: Theoretical Considerations and Illustrating Cases'. *EJISDC* 38(9):1–18.

Salvatore, Mirella, Francesca Pozzi, Ergin Ataman, Barbara Huddleston, and Mario Bloise. 2005. 'Mapping global urban and rural population distributions Estimates of future global population distribution to 2015'.

Sewchurran, Kosheek. 2010. 'The use of Internet in Africa for cultural rememering in order to inspire development'. *Proceedings of the 5th IDIA Conference 2010.*

Sonaiké, S. A. 2004. 'The Internet and the dilemma of Africa's development'. *International Communication Gazette* 66(1):41.

Songan, P. 2004. *Community Informatics: Challenges in Bridging the Digital Divide.* Malaysia: Malaysia University, SARAWAK Centre for Applied Learning and Multimedia.

Thompson, Mark, and G. Walsham. N.A. 'ICT Research in Africa: Need for a Strategic Developmental Focus'. Retrieved November 25, 2009 (<http://www.jbs.cam.ac.uk>).

Todaro, M. P. 1981. *Economic development in the Third World.* Longman New York.

Wafula, J.M., Anthony J. Rodrigues, and N.G. Wanjohi. 2007. 'Conceptual ICT tool for Sustainable Development: The Community Development Index (CDI)'. *Strengthening the Role of ICT in Development* 498.

Walsham, G. 1995. 'The emergence of interpretivism in IS research'. *Information systems research* 6(4):376–394.

Winograd, Terry, and Fernando Flores. 1987. *Understanding Computers and Cognition: A new Foundation for Design*. USA: Addison-Wesley Publishing Company, Inc.

Yeo, A.W, F.S Hazis, T Zaman, P. Songan, and K. Ab Hamid. 2010. 'Telecentre Replication Initiative in Borneo Malaysia: The CoERI Experience'. in *The Proceedings of the 4th International Development Informatics Association Conference*. Cape Town: Monash University.