

ICT as an enabler of Socio Economic Development
Prof Darelle van Greunen
School of ICT

Abstract

Today's is a world of many divides, one of the most typical being the Digital Divide, which in itself has given birth to or is worsening other economic and social divides. In this world, more suffer and less are able to benefit from technology. This paper aims to promote the importance of and need for inter-disciplinary cooperation for the use and promotion of Information and Communication Technologies (ICT) as a bridge for the Digital Divide within disciplines. Information and communication technologies (ICTs) include any communication device—radio, television, cellular phones, computer and network hardware and software, satellite systems, the services and applications associated with them, such as the Internet, geographic positioning systems (GPS), banking, e-health, e-learning and electronic government services. The paper will touch on tangible examples of inter-disciplinary cooperation and the use of ICT in different community interventions.

Introduction

A formal definition of Information Technology (IT) terms it as a broad subject concerned with technology as well as with other aspects of managing and processing information. IT also deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and retrieve information (Christenssen, 2005). The term Information and Communication Technologies (ICT) was coined to reflect the seamless convergence of digital processing and telecommunications. Contrary to common perception, it is not limited to modern hi-tech gadgets or networks. In fact, ICTs have since long been in use as communication mediums to transmit information, even to very remote places. Examples include postal and radio services. For ease of use, we can divide these technologies into old and new ICTs wherein the former one includes Radio, Television, Telephone, Fax, Telegram, etc., while the latter comprises data networks, e-mail, World Wide Web (or Internet) and cutting-edge wireless and wire line technologies.

The uneven diffusion of technology and the inequality in access to technologies with significant social,



economic and political consequences defines the term Digital Divide. This may exist between rich and poor countries, rural and urban areas, men and women, skilled and unskilled citizens and large and small enterprises. There are many reasons for the creation of these divides but this is certain that, if these are not taken care of immediately, the situation for some will keep on worsening until the associated economies collapse.

Digital Opportunity initiatives are those efforts aimed at bridging the digital divide. This paper primarily focuses on the importance of inter-disciplinary cooperation in ICT to bridge these digital divides at country, regional and global level. This cooperation is essential for an overall sustainable socio-economic development process. The topic is very broad, and the complete picture requires many aspects to be considered. I will focus only on ICT for Development within the boundaries of South Africa, and then specifically within the Eastern Cape.

ICT for Development

Hargittai (1999) and other studies have shown that the rate of IT diffusion is correlated to the general level of socio-economic development. A most recent finding is that ICT plays a vital role in advancing economic growth and reducing poverty (Fourie, 2008). A survey of firms carried out in 56 developing countries finds that firms that use ICT grow faster, invest more, and are more productive and profitable than those that do not (Fourie, 2008).

Dabla (2004) has made comprehensive literature references enticing the relationship between ICTs and Socio-Economic Development. Similarly, Jeremy Grace *et al* (2004) have deliberated the characteristics and forces in ICTs which can play a pivotal role in the economic growth of a country.

It can therefore be inferred that ICTs can be used to directly influence the productivity, cost effectiveness and competitiveness of industries, which is the advantage upon which developing countries can build their economies. The opportunity to catch up on developed economies in terms of the application of technology and its resulting economic benefits has never been greater. On

the other hand, the implication of not being able to adopt ICTs can be disastrous.

ICT as a tool

ICT can be used as a means, but is not an end. People do not need word processing to survive, but they may need efficient ways of sharing information about livelihoods and employment. ICTs for human development are not about technology, but about people using the technology to meet some basic need. Understanding human requirements takes time and effort. User needs assessments are essential in planning the introduction of ICTs to communities, no matter what their status.

The advantages of previous decades, i.e. abundant natural resources or cheap labour, are no longer the advantages in the newly emerging “Information Society” or “Knowledge Economy”. Developing countries can no longer expect to base their development on their labour advantage. The application of knowledge has now become the critical competitive advantage.



Potential of ICT to address socio-economic development

The Eastern Cape is widely regarded as having the potential to contribute more towards the national GDP (Fourie, 2008).

In the Eastern Cape, there is a lack of awareness from management level as well as from rural communities in understanding the potential impacts that ICT can have in the province. People are set in their ways, and it will require a paradigm shift to move away from an industrial- to an information technology thinking pattern. Opportunities such as road shows, the implementation of

information systems or the development of educational platforms are important to enlighten people on how ICT can be used to boost the local economy.

During 2003, the South African Department of Trade and Industry designed a 5-year e-strategy to promote socio-economic development. The strategy focused on e-government, software development, e-education, Internet development and e-health. Some initiatives supporting this strategy have been implemented, but with limited success.

Potential of mobile phones

It is believed that encouraging the uptake of mobile phones is the most effective response to the Digital Divide (Fourie, 2008).

In South Africa, there is 80% mobile phone coverage and, even in rural areas, almost everyone has access to a mobile phone (Peyper, 2013). M-health or the use of mobile computing and communication technologies in health care and public health is a rapidly expanding area of research and practice. Mobile devices have also become common tools for a range of functions from clinical decision support systems and data collection tools for healthcare professionals, to supporting health behaviour change and chronic disease management by patients in the community (WHO, 2012). Mobile phones present an enormous promise for health care and for chronic disease control in low- and middle-income areas. In areas where infrastructure and resources are often lacking, m-health initiatives are beginning to provide a wide range of services, including real-time case notification, interactive health messaging, and performance-based incentives for health workers.

The Digital Divide is not the problem in itself but it is low income, under-development of the socio-economic conditions and the lack of literacy that divides the rich from the poor. Evidence suggests that mobile phones are the technology with the greatest impact on development. Mobile phones support long-term growth rates, and their impact is twice as big in developing

countries (Odendaal *et al.*, 2011). A more sensible approach to promote ICT would therefore be to donate mobile phones instead of computers.

With a mobile phone there is no need for foreign funding. Mobile phones do not rely on a permanent power supply and can be used by people who cannot read or write. Mobile phones are widely shared and rented. Farmers and fisherman use mobile phones to call markets to obtain the best price for their produce. Small firms use their cellphones to shop around for the best prices for their supply. Mobile phones can also be used to make cash payments without the need for a bank account.

Further advantages that mobile subscribers experience in developing countries are:

- Reduction in transaction costs;
- Enlargement of the area in which trade is performed;
- Reduced need for travel (which is a big advantage, especially for the unemployed); and
- Extended reach of public service delivery in under-serviced communities.

Mobile phones are important, but so is education. There are numerous factors that influence economic growth, but mobile phones appears to be the most effective way to close the digital divide (Fourie, 2008).

The next section will provide a snapshot of projects developed and implemented in the Eastern Cape to address issues relating to e-health, access, information sharing and education.

The Case of the Eastern Cape

Basic Facts

The Eastern Cape is South Africa's second largest province, taking up approximately 13.9% of the country's land area and having a population of around 6.5 million people (SA Yearbook, 2012). The province is the hub of

South Africa's motor industry, and has been earmarked as a key area for growth and economic development based on the excellent, efficient range of transport modalities. The province offers economic opportunities for agriculture, fishing and forestry. The Eastern Cape is largely rural and this, coupled with the vastness of the landscape and the paucity of information and telecommunications infrastructure, inhibits the infiltration of ICT (ECPG, 2009).

Challenges

The Eastern Cape Provincial Government (ECPG) (2009) identified several challenges as part of their journey to 2014. Some of the highlighted challenges included (ECPG, 2009):

- Lack of integrated infrastructure to support service delivery;
- Lack of a province-wide governance framework with supporting policies and standards;
- Inadequate ICT connectivity infrastructure, specifically in rural areas;
- Shortage of critical IT skills in the province; and
- Lack of technology-driven service delivery.

A further challenge, not unique to the Eastern Cape but relevant in African countries, is that western models are implemented without modification to suit the needs of the specific country (Heeks, 2002). For example, it is argued that in an African context e-government is essentially an imported concept based on imported design. The e-government concepts and designs originated in the West, which is within an environment that is very different from African realities (Baskaran & Muchie, 2006).

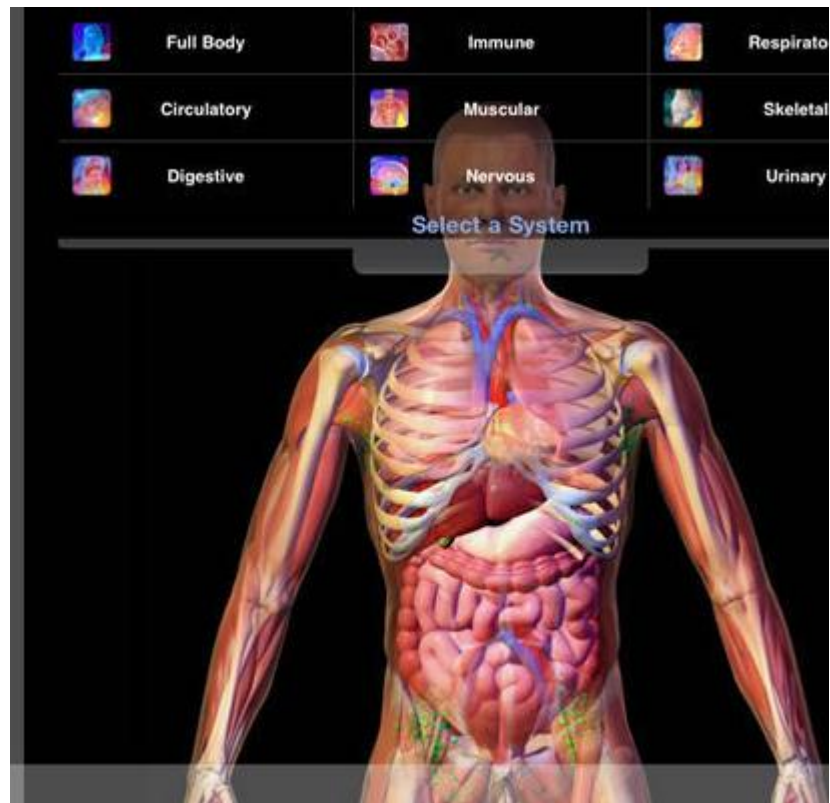
Specific projects

ICTs, from cell phones to computers and networks, are being integrated into a wide range of development projects. Examples of these include the use of ICT in the Nelson Mandela Bay area to monitor and manage home-based care workers who are delivering a critical service to the public in under-served communities. A further example is the use of ICT to combat TB in the region

by using mobile health applications. As the chronic disease burden is very high in the Metro, technology is also used to address mitigating factors such as food security, malnutrition and general wellness education.

E-health for Schools

It is the aim of this project to demonstrate the use of e-health to improve School Healthcare. E-health is defined as “the cost-effective and secure use of Information and Communication Technologies in support of health and health-related fields, including healthcare services, health



surveillance, health literature, and health education, knowledge and research” (WHO, 2012). Applications that make use of mobile technology are developed to address the following critical needs in schools:

- Nutrition, malnutrition and exercise;
- Personal and environmental hygiene;
- Chronic illnesses (including HIV and TB);
- Abuse (sexual, physical and emotional abuse, including bullying and violence);
- Sexual and reproductive health;
- Menstruation;
- Contraception;

- Sexually Transmitted Infections (STIs) including HIV/AIDS;
- Male circumcision including Male Medical Circumcision (MMC);
- Teenage pregnancy, Choice of Termination of Pregnancy (cTOP), PMTCT;
- HIV Counseling and Testing (HCT) and stigma mitigation; and
- Mental health issues including drug and substance abuse, depression and anxiety and suicide.

Building capacity for chronic disease management

Home-based care workers can provide a vital link between the community and the health system (Kash *et al.*, 2007; Patel & Nowalk, 2010). However, the main challenge for care workers lies in engaging both health service personnel and community members. A further challenge is inadequate support and supervision as well as a lack of appropriate training, which has previously been attributed to staff attrition among care workers (Olang'o *et al.*,



2010; Patel & Nowalk, 2010).

While care workers can become important role players in the response to the chronic disease burden, one should consider their needs as well. The SA Medical Research Council illustrated this in an exploratory study, identifying the need of care workers for non-remunerative incentives such as badges, T-shirts and refresher training (Odendaal *et al.*, 2011). With appropriate training, customised to their immediate needs, empowering effects such as motivation, self-esteem, and self-worth can be developed. This in turn can lead to provision of improved quality of health care and higher rates of staff retention (Kash *et al.* 2007; Patel & Nowalk 2010).

This research project seeks to fill a gap in a cost-effective e-health approach by building capacity among care workers and creating community awareness of chronic diseases. while at the same time assessing the efficacy of these interventions in different geographical areas. The e-health approach intends to utilise a convergence of ICTs: audio podcasts, mobile phones and an interactive radio series, broadcast via community radio stations.

Connected Agriculture

The opportunities studied in this project aim to improve the efficiency of the agriculture and food sectors. It aims to raise the farming income of poor farmers in rural areas, as well as the income from family vegetable gardens. Increased efficiency is expected to lead to fewer food losses – an important aspect of meeting the growing demand for adequate and affordable supplies of nutritious food.

The use of mobile services enables companies to access and interact directly with different participants in the value chain, thereby helping to build visibility of issues, optimise capacity and improve quality. This will support company sustainability objectives. In addition, it can particularly enable progress towards the UN Millennium Development Goals by helping to reduce poverty, improve health and increase funding for education. Enabling mobile financial payments and mobile information provision can generate the greatest potential benefits.

In this project, mobile applications will be used to connect farmers to markets, and to manage crop diseases, finance and education. It will enable monitoring of resources and tracking of products. This unlocks productivity potential while helping to manage the impacts of increased production, such as increased water use and greenhouse gas emissions.

Conclusion

The examples discussed in this paper touched on how ICT is used to address challenges by strengthening the following key issues:

- **Communication** for quick and easy access, dissemination and sharing of information and knowledge;
- **Productivity** to improve efficiency, competitiveness, and responsiveness of institutions, firms, and markets;
- **Accountability** to increase transparency in private and public institutions and in regulatory and policy processes;
- **Inclusiveness** to increase access to services, information and resources for poor and marginalized groups; and
- **Empowerment** for a greater voice in the public decision-making process.

Mobile network operators have a leading role to play in the successful realisation of the benefits outlined in this paper, but they will need the collective support of key stakeholders. NGOs, private enterprises, universities and governments must also contribute their knowledge and expertise to bring critical elements together.

The use of ICTs can make a direct contribution to poverty reduction, giving producers and small entrepreneurs access to market information, job opportunities, business and technical skills and banking services. These technologies drive innovation, productivity and efficiency gains across industries, contributing to overall economic growth and competitiveness.

The research projects executed in the Eastern Cape are aimed at connecting people to their governments, strengthen service delivery and supporting basic human rights. Finally, through the use of ICTs, development agencies, field workers, local organizations and communities are linked, enabling them to share knowledge and to find common solutions to some of the region's most pressing challenges

References

Baskaran, A. & Muchie, M. (2006). Bridging the digital divide: Innovation systems for ICT in Brazil, China, India, Thailand and Southern Africa. Adonis & Abbey Publishers Ltd.

Christenssen, P. (2005). The Tech Terms Computer Dictionary. Available online at: www.techterms.com/definition/ict [accessed 1 May 2013].

Dabla. A. (2004). The role of IT Policies in promoting social and economic development: The case of the state of Andhra Pradesh, India. *EJISDC* 19(5): 1-21.

Fourie, L (2008). Enhancing the livelihoods of the rural poor through ICT: A knowledge map. Working paper 13, 2008. Available online at: www.infodev.org [accessed 1 May 2013].

Hargittai, E. (1999). Weaving the Western Web: Explaining Differences in Internet Connectivity Among OECD Countries. *Telecommunications Policy* (23): 711 – 718.

Heeks, R. (2002). Information Systems and Developing countries: Failure success and local improvisations. *The information society* (18):101-112.

Jeremy G., Charles K. and Christine Q. (2004). Information and Communication Technologies and Broad-Based Development: A Partial Review of the Evidence. Washington DC: World Bank Working Paper No. 12.

Kash, B. A., M. L. May. (2007). Community health worker training and certification programs in the United States: findings from a national survey. *Health policy* **80**(1): 32-42.

Mhila G., DeRenzi B., Mushi C., Wakabi T., Steele M., Roos D., Dhadialla P., Sims C., Jackson J., Lesh N. (2009). Using Mobile Applications for Community-based Social Support for Chronic Patients. HELINA, April 2009.

Odendaal, A. Mtshizana, Y. Lewin, S. Hausler, H. (2011). A formative evaluation of the integrated community-based treatment and adherence support models for TB and HIV clients, MRC and TB/HIV Care Association, pp. 1-41.

Olang'o, CO., Nyamongo, IK. Agaard-Hansen, J. (2010). Staff attrition among community health workers in home-based care programmes for people living with HIV and AIDS in western Kenya. *Health Policy* (97): 232-237.

Patel, AR., MP. Nowalk (2010). Expanding immunization coverage in rural India: a review of evidence for the role of community health workers. *Vaccine* **28**(3): 604-613.

Pyeper, L (2013) Mobile Phone Usage in SA, Finweek 22 January 2013. Available online at: <http://finweek.com/2013/01/22/mobile-phone-usage-in-sa> [accessed 1 May 2013].

South African Yearbook. 2011/2012.

The Eastern Cape Provincial Government (2009) Eastern Cape ICT Strategy 2009 – 2014, Compiled by Lungi Ngcingwana, Available online at: www.ecpg.gov.za [accessed 1 May 2013].

WHO (2012) Global Tuberculosis Report 2012. Available online at: http://www.who.int/tb/publications/global_report/en/index.html [accessed 2 May 2013].