

ICT4D: Facing the Challenges Head-on in Tanzania

Jim Yonazi

The Institute of Finance Management

July 2009



Country Research Partner:

Jim Yonazi

The Institute of Finance Management

Tel: +255 75 456 6766 / E-mail: yonazijim@gmail.com

Project Coordination:

David Barnard

Southern African NGO Network (SANGONeT)

Tel: +27 11 403 4935 / E-mail: dbarnard@sangonet.org.za

Editing and Research Coordination:

Tina James

icteum consulting

Tel: +27 12 346 8264 / E-mail: tjames@intekom.co.za

This report forms part of the Theta - Regional ICT Discussion Forum Project

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The project is funded by the Open Society Initiative for Southern Africa (OSISA) and the Embassy of Finland (South Africa)

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FOREWORD

The Government of Tanzania recognises that Information and Communications Technologies (ICTs) are a key facilitator for development leapfrogging. The government is therefore determined to integrate ICT in all aspects of social-economic activities. Various national and sectoral visions and strategies bank on the powers and opportunities that ICT is capable of unleashing for achievements. The government is determined to facilitate and ensure that ICT is developed and fully exploited for development for the benefit of all Tanzanians.

Implementing ICT for development has never been easy and automatic. Various challenges need to be understood and tackled carefully. The findings of this research contribute important insights to our understanding on issues influencing the development of ICT in Tanzania. It is my hope that these findings will be used to enlighten, strengthen, hasten and extend the powers of ICT in all dimensions of socio-economic development in Tanzania.

The findings, recommendations, and insights included in this report are intended to inform a wide range of stakeholders. They include decision makers, planners, learners, and researchers. All will benefit from the results and the drawn recommendations. At the Ministry of Communications, Science and Technology (MCST) we welcome this report. We are looking forward to utilise its findings to further and refine our daily activities.

The government has a central responsibility in advancing ICT in the country. However, as highlighted in this report, joint and deliberate efforts by various stakeholders are imperative. The MCST emphasises this call. We observe that such collaborative efforts will help Tanzania to excel and achieve its development vision in a coordinated and sustainable manner.

Eng. Dr. Zaipuna O. Yonah

Director of ICT - Ministry of Communications, Science and Technology
United Republic of Tanzania

July 2009

ACKNOWLEDGEMENTS

The completion of this study was facilitated by many people. All of them were ready to volunteer and provide useful information to help us understand and finally compile this report. We would like to thank all of them. We value and appreciate every bit of support we received from them even when they were on tight schedules. Although we wish to thank each and every individual who participated in this study, we understand that we also limited by space and time. However, we would like to mention the following people for their support.

We thank Dr. Zaipuna Yonah, the Director of ICT at the Ministry of Communication, Science, and Technology. His support, insights, and encouragement evolved from that of a respondent into a participant. From Dr. Yonah, we learned much on Government plans and commitment on ICT. We thank him very much.

We thank the senior officers at COSTECH. We are grateful to the support we obtained from Mr. Theophilus Mlaki, Hamisi Nguli, Enock Mpenzwa, John Mahegere, and Amos Nungu. These people welcomed, informed, and were ready to advise us every time we sought for clarification of various issues. Their experience and commitment was fundamental to this work. We are confident that many researchers will benefit from the wealthy information and experience that these professionals possess.

We would like to thank Mr. Charles Senkondo, the director of the Tanzania Global Development Learning Centre (TGDLC). Mr. Senkondo and his management team, provided us with not only information, but also hosted our workshops and discussions. In this research, we were provided with access to state of the art facilities including fully internet connected computing facilities. We are very much grateful for that.

Mr. David Sawe, deserves special thanks. He was very supportive, responsive, and was always ready to help in searching for information even when he was on his tight schedule. David's experience in ICT activities in Tanzania provided us with clarity of various issues even those which were difficult to understand. David, Thank you.

Finally, we are grateful to all of our respondents, workshop participants, and facilitators. Without them, this report would have not been possible.

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ACRONYMS AND ABBREVIATIONS

COSTECH	Commission for Science and Technology
DAWASCO	Dar es Salaam Water and Sewage Corporation
FGD	Focus Group Discussion
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
IFM	Institute of Finance Management, Tanzania
ITU	International Telecommunication Union
MCST	Ministry of Communications, science and Technology
MDG	Millennium Development Goals
MKUKUTA	Mkakati wa Kukuza Uchuni na Kupunguza Umasikini Tanzania
MKURABIT A	Mpango wa Kurasimisha Rasimali na Biashara za Wanyonge Tanzania
NGO	Non-Governmental Organisation
NMB	National Microfinance Bank
NSGRP	National Strategy for Growth and Poverty Reduction
SMEs	Small and Medium Enterprises
SWOPNET	Sharing With Other People Network
TANESCO	Tanzania Electric Supply Company Limited
TCRA	Tanzania Communications Regulatory Authority
TGDLC	Tanzania Global Development Learning Centre
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
URT	United Republic of Tanzania
UCSAF	Universal Communications Services Access Fund

EXECUTIVE SUMMARY

Background

This initiative forms part of a five-country study in Botswana, Mozambique, Tanzania, Zambia and Zimbabwe to provide opportunities for dialogue among Southern African key players in ICT for Development. The discussions will focus on national challenges and opportunities in ICT4D over the next five to ten years and will aim to develop a comprehensive understanding of national ICT4D issues through in-country research processes, stakeholder consultations, and discussions of these findings on a country level through fora (called *Theta* Fora).

Each of the five participating countries has undertaken preparatory research, led by a team of local researchers. This report is the result of that effort in Tanzania and was undertaken during the months of January to July 2009.

The *Theta* project has been ongoing since 2003, when the Southern African NGO Network (SANGONeT) undertook a series of *Thetas* in South Africa. This was followed by a second phase in 2005-2007 which included five Southern African countries (Angola, Botswana, Lesotho, Namibia and Swaziland). The *Theta* project now continues with funding from the Open Society Initiative for Southern Africa (OSISA) and the Embassy of Finland (South Africa). The ongoing regional roll-out of the *Theta* project provides an important opportunity for a broad range of ICT stakeholders, including government, private sector, academic and CSO representatives, to engage with the ICT challenges and opportunities relevant to the future development of the Southern African region.

Introduction and Methodology

This report presents a situational analysis of ICT4D in Tanzania and aims to:

- Establish key priority areas for ICT4D in Tanzania;
- Identify various issues determining the success or failure of ICT4D in Tanzania; and
- Recommend possible measures to be taken to facilitate the progress of ICT4D for the next ten years.

With respect to the above objectives, an inductive-interpretive approach was adopted to inform the study. Information was purposefully gathered from a broad range of informants from government, the private sector, NGOs and international organisations. Qualitative analysis was used to identify the issues and priorities, and to build the concepts and recommendations.

Key findings

Priority areas

The analysis shows that, at a high level, the Government of Tanzania has established key priority areas, some of which coincide with priority areas identified by citizens. The government priority areas are defined in strategies such as the Tanzania Vision 2025, the National Growth and Poverty Reduction Strategy, the National ICT policy, and the Universal Communication Services Access Fund. However, a composite of the two perspectives reflects the shared view that it is of paramount importance to streamline ICT into the areas of:

- Production and service provision;
- Government;
- Health;
- Education;
- Business; and the
- Growth of SMEs.

Facilitators of ICT4D

Three categories of success factors have contributed to facilitating ICT4D in Tanzania:

1. The affordability, availability, and adoption of ICTs

Tax relief, introduced through concerted efforts by government, has facilitated the spread and availability of computers in the country. This has been observed to facilitate the diffusion and uptake of computer-related equipment by organisations and individuals.

2. Supportive social infrastructure (levels of literacy and Kiswahili as the national language)

The increased provision of content in Kiswahili, together with the rise in literacy in the current population, were also identified as social infrastructures facilitating ICT4D in Tanzania. This is especially important when communicating to reach a wider community.

3. Presence of government will

The establishment of policies and dedicated regulatory bodies such as the Ministry of Communications, Science and Technology, and the Tanzania Telecommunications Regulatory Authority have contributed to an increased emphasis on ICT within government.

ICT4D Challenges

Four categories of issues were identified to challenge the successful uptake of ICT4D in Tanzania:

1. An unsupportive ICT connectivity and supporting infrastructure

ICT connectivity and supporting infrastructure such as roads and electricity are still underdeveloped. This challenges the accessibility and spread of ICT4D, particularly in rural regions.

2. Inadequate quality of ICT content

The quality of the currently provided ICT-based content is still inadequate. The limited services and information available are not easy to use and do not meet user expectations.

3. Unsupportive organisational issues

The government and other organisations still face various organisational challenges which include policies, laws, established systems and procedures, and organisational inertia.

4. People-related challenges

Several people-related issues challenge ICT4D and include inadequate ICT skills, mindset, and limited awareness about the benefits of ICTs.

Recommendations

Several recommendations could be drawn from exploiting existing opportunities and tackling the observed challenges. The recommendations are drawn in view of achieving Tanzania's key strategic visions. Hence, they are not aimed at the government only, but to a broader range of stakeholders involved or interested in ICT4D in Tanzania. By drawing in more stakeholders more benefit can be derived for ICT4D and development in general in the next ten years.

1. Exploit the existing facilitators

Stakeholders should exploit the currently available facilitators of ICT:

- Develop the ICT industry

The utilisation of ICT4D in Tanzania is increasing. However, the production of ICTs is still underdeveloped. The recommendation is to develop strategies focussed on investing in the production of ICTs locally, particularly software and applications.

- Extend national support of ICT to the organisational and community level

There is significant government support at a national level. We recommend that efforts should be made to make this support known and available at organisational and local community levels.

- Integrate ICT into other development projects

Various major projects may be underway or planned countrywide. Such projects may provide opportunities for spreading ICTs to local communities. They therefore need to be

coordinated to integrate ICT4D. Infrastructural projects in water, roads and electricity can be integrated with ICT connectivity deployment countrywide.

- Promote affordability, availability and adoption of ICTS

Tax relief on computers has proved to be instrumental in improving the affordability, availability and adoption of ICTs. Such incentives need to be extended to boost the entire ICT sector. In addition, people need to be made aware of the existence of such incentives so that they can be better used.

- Exploit contextual opportunities

Contextual issues such as language homogeneity (Swahili) and the existing levels of literacy were identified as useful. Identification and exploitation of these and other similar elements need to be emphasised and harnessed to stimulate ICT diffusion and the successful application of ICT4D.

2. Tackling the challenge

- Enhance connectivity

Adequate connectivity is important for allowing the majority of Tanzanians to access ICT services. We therefore recommend the following:

- Improve ICT and other supporting infrastructures such as the availability of electricity, and means of transport such as roads.
 - Exploit the potential of widely locally available ICTs such as mobile phones, TV and radio.
- Improve the quality of content and localisation

To improve the quality of the content offered to the Tanzanian public:

- Improve the quality and quantity of content to ensure that it meets and exceeds the needs and expectations of local users; and
 - Prioritise the use of Kiswahili in developing local content.
- Foster leadership and overcome organisational inertia

Organisations need to overcome their inertia in streamlining ICT into their business activities. We therefore recommend:

- Foster supportive leadership at both national, organisational, and community levels;
 - Reform and build supportive organisational machineries such as laws, policies, systems, procedures and processes.
- Develop strategies to mainstream ICTs

ICT mainstreaming is a crosscutting issue. It requires careful and strategic planning that involves many stakeholders. We therefore recommend multi-stakeholder involvement when developing ICT projects. This will not only contribute during the development phase of ICT plans, but will also promote participation in implementing the resulting plans.

- Develop ICT skills, raise ICT awareness and change mindsets

People need to be empowered and prepared to use ICTs for their own development. We therefore recommend:

- Observe simplicity when developing and implementing ICT initiatives and services. Easy-to-use online systems and content should be emphasised. For example, websites should be easy to navigate and search, and should be written in Kiswahili to allow more people to benefit;
 - Plan for enhancing citizens' ICT skills;
 - Integrate ICT training and coaching in educational curricula; and
 - Market ICT initiatives and services for awareness raising.
- Create a culture of innovation

A stronger emphasis is needed on research and innovation. This will facilitate a better understanding to develop the most relevant solutions that will bring value to the community.

Conclusion

In this study we aimed at exploring the ICT4D situation in Tanzania. Specifically, we intended to understand the current priorities and potential factors which influence the success of ICT4D in the country. We observe that the objectives of the study have been delivered. Specifically, *Chapters 2 and 4* present the delivery of the first objective of the study. The second and third objectives are addressed in *Chapters 4 and 5*.

Various areas were identified as requiring further studies. These include development and applicability of policy to facilitate the documentation and archiving of information concerning ICT and related projects. Others are identification of possible services to be delivered through mobile phones. The transferability of successful ICT implementation modes from one local community to another also needs further investigation.

1. INTRODUCTION TO ICT4D

This chapter provides a short overview of what is meant by ICT for Development (ICT4D), the benefits and challenges, and the research questions which guided the Tanzania research study.

1.1 ICT and ICT4D: A Primer

This study focused on the enabling role of ICT for development. Accordingly, it is important to establish the meaning of the main theme, ICT, as applied in this study, in addition to an exploration of the central theme of this study - ICT4D.

Various contributors have attempted to synthesise explanations of ICT. Yonah (2005) defines ICT as any technique or knowledge used to create, store, manage and disseminate information. Hamelink (1997) says that ICTs *'encompass all those technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic systems, and among electronic systems'*. We agree with these contributors. However, flexible definitions should be developed to allow a broader understanding of the ICT concept (Harris, 2004). We emphasise that ICTs can include electronic and non-electronic technologies, and may also involve 'hard' as well as 'soft' techniques. The hard techniques include the tangible and technical parts of ICT such as computers and telecommunications equipment. The 'soft' side relates to techniques, methods and approaches used in the field of ICT.

As in the case of ICT, the development concept may have different meanings to different people. Development may mean positive change in aspects such as social and economic growth, quality of life, environment and innovations. However, as observed by Soubbotina (2004) human development is the *end*, and all other necessary changes are *means*. Soubbotina emphasises that human development may differ from one context to another depending on localised priorities. Accordingly, in this study ICT4D is considered as the *application of ICT for the purpose of achieving human development*. ICT can demonstrate developmental influence when applied to defined priorities intended to bring about human development in a particular context. The priorities can be health and longevity, education, governance, democracy, innovation, to mention a few.

The role of ICT4D can be viewed in two ways. First, ICT4D promises and indeed brings about a positive change towards achieving human development. However, on the other side it accentuates social-economic inequalities amongst human beings (Yusoff & Lim, 2003). The UN (2008, 2005) has found evidence that most of the developed countries have made significant progress towards harnessing the benefits of ICT. In contrast, most of the

developing countries, particularly in Africa, still lag behind. As a result the countries and the people therein experience social exclusion and dwindled human development. Some of the main reasons for such a situation include lack of resources, unsupportive policies, inadequate technical and human infrastructure, high ICT costs and poverty and illiteracy (Ensley, 2005; ESRF, 2008, Hamelink, 1997, ITU, 2007, UN, 2008). However, leapfrogging opportunities still exist if developing countries, including Tanzania, intelligently exploit ICT for development (Ensley, 2005).

In the past twenty years the ICT4D concept has gained a remarkable appreciation. The main root for this impetus comes from the importance of ICT in achieving the Millennium Development Goals (MDG) (Batchelor, *et al*, 2003). A specific thrust was exerted during the World Summit on the Information Society (WSIS) whereby world leaders and governments agreed to build

“a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights” (in ITU, 2007).

As a result, governments and other stakeholders have been attempting to use ICTs in their various development initiatives and priorities (Batchelor, *et al*, 2003, UN, 2008, 2005) hoping to fulfil this ambition through the potential of ICT (Kramer, Jenkins, & Kats, 2007).

1.2 ICT4D: Benefits and Challenges

In the past twenty years, we have witnessed an increasing appreciation of the role of Information and Communication Technology (ICT) for development. ICT has become pervasive in our social and economic activities (Kramer, Jenkins, & Kats, 2007). As a commodity and a facilitator, ICT is embedded in products and services that we need and consume in our daily lives. As a result ICT influences all aspects of development including social and industrial development (Cole & Roman, 2003). Currently, various stakeholders including governments, international organisations, practitioners and civil societies appreciate and engage in advocating for the utilisation of ICT in the development of the human race (Yusof & Lim, 2003).

ICT can potentially contribute to social and economic development directly and indirectly. The direct contribution happens when ICT is traded as a commodity and profits and gains contribute directly to the economy. For instance, economic gains can be obtained when a country produces and trades ICT knowledge or products. On the other hand, ICTs can indirectly contribute to development when used to facilitate other social and economic activities. Typical examples include the utilisation of ICT in health services, agriculture, education, governance and commerce.

From the facilitation perspective, ICTs promises many advantages (Kramer, Jenkins, and Kats, 2007) as they:

- reduce transaction costs and thereby improve productivity;
- offer immediate connectivity – voice, data, visual – improving efficiency, transparency and accuracy;
- substitute for other, more expensive means of communicating and transacting, such as physical travel;
- increase choice in the market place and provide access to otherwise unavailable goods and services;
- widen the geographical scope of potential markets; and
- channel knowledge and information of all kinds to a far broader range of players and stakeholders.

<u>Box 1: ICT Benefits and Challenges</u>	
Benefits	Challenges
Reduce transaction costs	Inadequate infrastructure
Improve connectivity	Policies
Increase access to market places	Lack of adequate skills
Widens reach to geographical scope	Cost of Equipment
Channels knowledge and information	Slow growth of ICT industry

A range of issues have been identified which could influence the success (or failure) of ICT for development initiatives. These include inadequate human capital, inadequate technical infrastructure, literacy and financial capability, among others. For instance, in the case of electronic government, the United Nations (2008) observes that a combined effect of related challenges has an impact on ICT for development. Specifically the UN identifies that issues as infrastructure, appropriate policies, capacity development, ICT applications, knowledge management and customer care practices determine any success in government ICT initiatives. The International Telecommunication Union (ITU) (2007) emphasises that access to ICTs, high costs (tariffs), usage and the slow growth of an ICT industry have negatively influenced the application of ICTs in Africa.

1.3 Objectives of Study

Like many of the countries in this region, Tanzania has recognised the importance of ICT4D. It also encounters various challenges, including the limited number of empirical studies which have assessed the ICT4D situation and provided relevant recommendations relevant to the country. Accordingly, the objective of this study was *to explore the current ICT4D priorities in Tanzania; related success or failure factors, and the provision of relevant recommendations on the progress of ICT4D in the country*. In this regard, we derived the following specific research questions:

- What are the key priority areas of ICT4D in Tanzania?
- What are the potential issues, in Tanzania, that may determine the success or failure of ICT4D?
- What are the possible recommendations that can be made to facilitate the progress of ICT4D in Tanzania for the next ten years?

The results of this study contribute to the understanding of the current ICT4D status and issues in Tanzania. Additionally, the results contribute to developing a better perspective on ICT4D specifically from a Sub-Saharan African country perspective. This not only enhances our understanding of the issues around ICT4D in the region, but synthesises recommendations that may benefit Tanzania, Sub-Saharan Africa, and beyond. This will advance the knowledge of ICT practitioners, governments, international organisations, donors and other practitioners on how ICT4D can be approached and promoted. As a result, the general fruitful application of ICT4D can be realised through improved and informed decision making, planning, implementation and evaluation.

2. THE NATIONAL CONTEXT FOR ICT4D IN TANZANIA

This chapter summarises Tanzania's political and socio-economic context and the state of access to new and old information and communication technologies for development (ICT4D).

2.1 Country Profile

Tanzania, officially known as the United Republic of Tanzania (URT), is one of the five East African countries (Tanzania, Kenya, Uganda, Rwanda and Burundi), has a surface area of 945,087 km², and an estimated population of about 40,123,160 as at July 2008 (CIA, 2009).

Table 1 below summarises the main social-economic facts about Tanzania.

Table 1. Tanzania - Basic Data as at 2008

Category	Fact
Population	40,123,160
Population growth	2.072%
Religions:	Muslim - 30%, Traditional beliefs - 35%, Christian - 35%
Literacy	69.4% of the population (Male: 77.5%; Female: 62.2%)
GDP (Purchasing power Parity)	\$56.22 billion
GDP - Per Capita (PPP)	\$1,400
Labour force	20.8 Million
GDP (Composition by sector)	Agriculture (27%), Industry (22.7%), Service (50.3%)

Source: CIA (2009)

Tanzania was formed after the union between Tanganyika and Zanzibar in 1964. While Tanganyika was completely merged in to the resulting Union, Zanzibar retained its semi-autonomous status. Dar es Salaam is the largest commercial city, and Dodoma is the capital city and the seat of the government. In Tanzania English is the official language while Kiswahili is the national language. Tanzania is bordered by Kenya, Uganda, Burundi, Rwanda, Democratic Republic of Congo, Zambia, Malawi, Mozambique, and the Indian Ocean in the east.

2.2 ICT4D in Tanzania: An Overview

Like many other countries around the globe, Tanzania has also boarded the ICT4D wagon as evidenced in how the country recognises the importance of ICT in achieving the UN MDGs. Tanzania developed its own MDGs, which include:

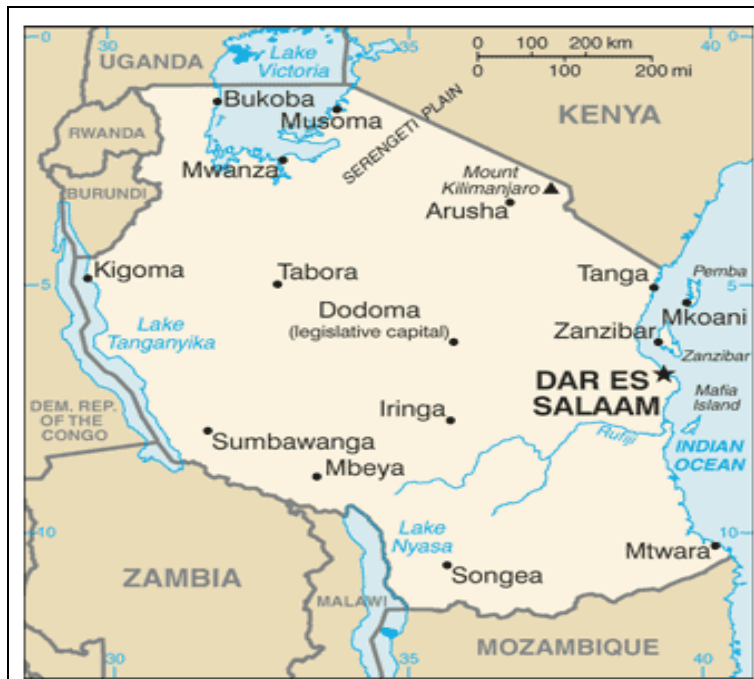


Figure 1. Map of Tanzania

- 1) Extreme poverty - halve the proportion of people living below the national poverty line by 2015.¹
- 2) HIV/AIDS - Halt and reverse the spread by 2015.
- 3) Hunger - Halve the proportion of underweight, under-five year olds by 2015.
- 4) Basic amenities - Halve the proportion of people without access to safe drinking water by 2015.
- 5) Primary education - Achieve universal primary education by 2015.
- 6) Gender equity - Achieve equal access for boys and girls to primary and secondary schooling by 2015.
- 7) Reproductive health - Reduce maternal mortality ratio by three-quarters by 2015.
- 8) Under-five mortality - Reduce under-five mortality by two-thirds by 2015.
- 9) Environmental sustainability - Reverse loss of environmental resources by 2015.

¹ In 2007 the national poverty line was TShs. 13,998 or approximately TShs. 500 per day (about USD 10.60/ 0.38 per day) (Policy Forum, 2008)

Cognizant of the role of ICT in achieving the UN and the national MDGs, the Government of Tanzania and other stakeholders have embarked on various initiatives that aim at increasing the facilitation role of ICT4D activities. These range from policy, regulatory and educational initiatives, to infrastructure and content development. For instance, in 2003 the government developed and approved the National ICT policy (United Republic of Tanzania, 2003). The policy articulates the national areas of focus on ICT. These include ICT Strategic Leadership, ICT Infrastructure, ICT Industry, Human Capital, Legal and Regulatory Framework, Production Sector, Service Sectors, Public Service, Local Content Development and Universal Access. One of the benefits of the policy is the formation of the ICT sector regulatory body, the Tanzania Telecommunications Regulatory Authority (TCRA). TCRA has facilitated the growth of the communications sector in Tanzania. The body has managed to create a supportive licensing environment through a technology- and services- neutral strategy.

Table 2. Tanzania national ICT focus areas

Focus area	Description
Strategic leadership	To create a focused ownership and visionary leadership in favor of ICT
ICT infrastructure	To foster for supportive and interoperable ICT infrastructure
ICT industry	To build and promote, and regulate a conducive ICT environment
Human capital	To bolster the human capital in favour and exploitation of ICT potentials
Legal & regulatory framework	To create an ICT enabling legal, legislative and regulatory framework
Productive Sectors	To encourage and support the utilization of ICT in all productive sectors
Service Sectors	To promote and encourage effective and efficient ICT application in service sectors
Public service	To support and become a role model in utilising ICT in the public service
Local content	To allow, encourage, and promote the development of indigenous knowledge and traditional cultures
Universal access	To addresses digital divide for better and affordable universal access

Source: United Republic of Tanzania (2003)

ICT Infrastructure

Tanzania has also made progress on improving ICT access to all. This has been done through promotion of the spread and reach of various channels that facilitate access to information and services. For instance the government has been committed to the integration and development of the national optical fibre backbone. Together with construction of new linkages, the government is working on consolidating fragmented fibre networks nationwide (Maimu, 2003). The intention is to spread fibre-based access to every district in Tanzania. Engagements in regional initiatives such as the Eastern Africa Submarine Cable (EaSSY) and SEACOM projects are other envisioned projects to improve the access infrastructure in Tanzania.

The ICT Industry

Although significant progress has been observed in the telecommunications sector, ICT production is still low. Apparently, there is no any locally manufactured ICT equipment. Tanzania imports almost all of its ICT equipment through private businesses and representatives of international manufacturers. There are a limited number of local software

and website development and customization houses. The main users of ICT in Tanzania include the government, private sector, parastatal organizations, banks, and educational institutions (Miller Esselaar and Associates, 2004, pp. 24-30).

The Tanzanian ICT market has also been growing. Various services are now provided by private operators such as Tigo, Zantel, Telecoms, Vodacom, Zain and TTCL.

Table 3. Overview of Telecommunications Operators in Tanzania (2000 – 2008)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Voice Telecom Operators	5	6	6	5	5	5	6	6	6
Application Services (Internet & Other Data)	11	17	20	22	23	23	25	34	60
Radio stations	14	19	24	26	32	41	47	-	-
Television Stations	10	10	13	13	15	25	29	-	-
Postal/courier service operators	13	16	15	16	32	38	41	-	-

Source: TCRA (2009)

Since 2000, the operators have contributed to the increase of mobile phone subscribers from 110,518 in 2000 to 13,006,793 in July 2009. In the same period, the number of fixed line subscribers decreased from 173, 591 to 123,809 (**Table 4**). The Government and other stakeholders have been fostering the establishment of access communication networks such as the establishment of telecentres in rural areas (Mahegere, 2008). The increase in the number of Internet service providers, data operators, TV and radio operators' country wide is another notable development (TCRA, 2009).

Local Content Development

Progress on developing local content has also been noticed. Although not on a large scale, the Government and other organisations are attempting to develop and provide citizen-focused content and services. These range from service provision through web-portals and other ICTs. For instance, recently the Dar Es Salaam Water and Sewage Corporation (DAWASCO) have started providing water bill information to its clients.

Table 4. Voice Telecommunication Subscribers (2000 - 2008)

Year	BENSON	CELTEL	TIGO	TTCL Fixed	TTCL MOBILE	VODACO M	ZANTEL MOBILE	ZANTEL FIXED	TOTAL
2000	-	-	56,511	173,591	-	50,000	4,007	-	284,109
2001	-	-	89,056	177,802	-	180,000	6,501	-	453,359
2002	-	120,089	160,000	161,590	-	300,000	26,770	-	768,449
2003	-	320,000	210,000	147,006	-	700,000	68,000	-	1,445,006
2004	-	504,000	303,000	148,360	-	1,050,000	85,000	-	2,090,360
2005	-	882,693	422,500	154,420	-	1,562,435	96,109	-	3,118,157
2006	-	1,516,832	760,874	150,897	6,390	2,975,580	355,246	747	5,766,566
2007	3,300	2,505,546	1,191,678	157,816	72,729	3,870,843	678,761	5,453	8,486,126
2008	3,000	3,862,371	2,569,527	116,265	105,804	5,408,439	1,057,652	7,544	13,130,602

Source: TCRA (as at 10 July, 2009)

Box 2. DAWASCO goes Mobile: Water bills on your hands

The Dar es Salaam Water and Sanitation Corporation (DAWASCO) faces challenges relating to the handling of water bills, extending from the reading of water meters to the issuing and timely delivery of water bills to their customers. DAWASCO customers have been dissatisfied with the level of service offered in the past, with specific complaints about inconsistency, inaccuracy, and late arrival of water bills. DAWASCO has therefore introduced the use of mobile phones to distribute water bills to their customers. Customers are also allowed to request outstanding water bills.

DAWASCO sees that this SMS-based system as a way of delivering timely and accurate water bills while increasing their revenue and enhancing the image of the organisation. With increased revenue, the corporation can invest more to improve water and sanitation services; while its customers can save time and money previously spent on long queues, follow-ups and delays in receiving bills.



Kiula Kingu, Database administrator – DAWASCO, February, 2009

Similarly, the National Microfinance Bank (NMB), in partnership with the Tanzania National Electrical Corporation (TANESCO) and mobile phone operators, has enabled its customers to pay their electricity bills by mobile phone. Similar examples include the use of mobile phone to transfer money across the country (M-Pesa, Mobipower).

Box 3. Sending Money through Mobile phone – M-Pesa

M-Pesa (Pesa meaning *money*) is a new service provided by VODACOM Tanzania. With M-PESA, Vodacom customers can convert cash into electronic money (i. e: M-pesa) at an authorised M-PESA agent. An M-PESA customer enjoy the following services:

- Deposit money
- Withdraw money
- Send money to any mobile customer in Tanzania
- Buy Vodacom prepaid airtime
- Manage M-PESA account



Source: <http://www.vodacom.co.tz/docs/docredir.asp?docid=3493>

An interesting information-sharing attitude has also been growing. This has been demonstrated by the rise in the use of online fora, groups and blogs in sharing information. For instance the EthinkTankTZ is an exemplary and powerful online group of ICT professionals who share and push ICT related issues in Tanzania. The group has been influential in various issues including ICT related policy advocacy and changes. According to David Sawe (*pers. comm.*, July 3rd, 2009), EthinTankTZ was one of the key driving forces behind the ICT policy process and removal of VAT on computers in 2001. The use of blogs has attracted many people. For instance up to July 10th, a blog managed by Muhidin Issa Michuzi (e.g. www.issamichuzi.blogspot.com) had recorded more than 6 Million hits. Jamiiforums (<http://www.jamiiforums.com/>), an online forum, provides a diverse range of local and international content. Websites are being used by political parties,² and in the entertainment industry, specifically music and film production.

² See: <http://www.chadema.net/>
<http://www.cms.ccmtz.org/>
<http://www.nccrmageuzi.or.tz/>

Box 4. ICT in Music industry

In previous years, music production in Tanzania was mainly done in radio stations and specialised music recording studios. Artists were required to organise large groups of instrumentalists to perform accompaniments for them. These may include guitarists, keyboardists, and many more. Currently, the trend has changed.



The music industry has taken ICT as a key enabler of its value chain. Many music recording studios use computers and specialised applications to create, synthesise and produce music. A musician needs only to worry about ground work or writing a song. Other issues including melody creation, background music and accompaniment can be produced using computers in multimedia studios. The resulting music can also be promoted and sold online. This trend allows fast and high quality music to reach the intended customers in a shortened time.

The photo above shows a musician being assisted by a sound engineer to produce a piece of music at Johnson Music lab. The information concerning this activity was posted on *Jiachie* blog. The blog is one of the popular blogs providing local news and information from and about Tanzania.

Photo source: <http://michuzijr.blogspot.com/2008/12/studio-ya-jml-na-makamuzi-mapya.html>

ICT in Education

Noticeable progress has been realised in the use of ICTs in education in Tanzania. For example, various public³ and private⁴ institutions offer education on ICT. These range from introductory courses, and professional⁵ and higher degrees⁶ in ICT. Various academic programmes include ICT modules as part of their curriculum. ICTs have also been applied to facilitate learning. The Tanzania Global Development Learning Centre (TGDLC) (See **Box 5** below) provides a typical example. However, the government is yet to institutionalise ICT as a mandatory element in the education sector. As a result, ICT subjects are often taken as an optional choice.

³ e.g. The institute of Finance Management (www.ifm.ac.tz)

⁴ e.g. Institute of Information Technology IIT (<http://www.iit-tz.com/>)

⁵ e.g. CISCO Training at University Computing Centre (www.ucc.co.tz)

⁶ e.g. University of Dar Es Salaam (www.udsm.ac.tz)

Box 5. ICT in education: TGDLC paves the way

The Tanzania Global Development Learning Centre (TGDLC) is a not-for-profit public organisation aimed at facilitating learning and knowledge sharing. TGDLC was established in 2000 and is a member of the Global Development Learning Network (GDLN) with over 120 networked development communication hubs around the world. TGDLC houses state-of-the-art learning facilities which enable distance as well as conventional in-class learning.



TGDLC Services include but are not limited to video-conference facilities for both local and international delegates, and net-conferencing and internet facilities using a wideband satellite system. TGDLC also organise market-led fully interactive training through tele-seminars, workshops, discussion groups and courses for decision-makers and professionals in the public and private sector. The centre enables links to over 120 similar GDLN centres globally, and provides access to a multi-partner Tanzania Development Information Centre (TDIC - www.tdic.or.tz).

TGDLC has enabled government, businesses, as well as individuals to save time and money instead of travelling. In this way the centre has facilitated meetings, dialogues and discussions, allowing people to meet at a reasonable cost.

Charles Senkondo, Executive Director, TGDLC (February 2009)

ICT in Business

Various entities have taken advantage of ICT in their business. As mentioned above business organisations are utilising ICT to reach their customers, enhance the quality of their products and services, while optimising the chances of getting premium profits. The banking financial industry has been abreast of this movement. For instance almost all banks have internal ICT networking. They also provide networked Automatic Teller Machines (ATM) for their customers. Their websites provide information useful to a wide range of stakeholders. A recent development is the integration of financial services in the mobile industry. M-Pesa is a typical innovation in this category. It allows people to send money around the country by using their mobile phone.

ICT in Health

Although there has been limited documentation, the health sector has also experienced the powers of ICT (Kimaro, 2006). Various efforts at modernising the health sector have been initiated, one being the implementation of a Health Management Information System (HMIS) in hospitals of the Evangelical Lutheran Church Tanzania (ELCT) (IICD, 2006). HMIS facilitates the capturing, storing and analysis of patient information. Similar efforts are underway at the Muhimbili National Hospital. However, policy and coordination of ICT and related efforts are yet to be completed and as a result, the efforts and initiatives are

fragmented and duplicated. This causes loss of resources and may also result in the lack of standardisation in the future.

Box 6. Telemedicine brings hope to the poor

A telemedicine project under the Evangelical Lutheran Church of Tanzania (ELCT) is bringing hope to people with limited access to health specialists. The project started in 2008 and is managed by the Christian Social Services Commission. IICD and NORDAID from Holland are funding the project.

In the ELECT telemedicine initiatives, doctors in Tanzania get access to health specialists, discussions, and archives around the globe. When doctors in remote health facilities encounter cases that need consultation, they log onto the system to seek advice. This allows poor people in remote areas to gain access to an international network of specialised doctors without travelling.

Currently 13 hospitals in Tanzania are using this system. These include Kuaranga, St. Elizabeth, and Saliani in Arusha; Makungu and Saliani in Singida; Hysom, Manyara, Mgoyani, Marangu, Machame, and KCMC in Kilimanjaro, and Bumbuli and St. Raphael in Tanga region.

Source: <http://www.youtube.com/watch?v=sE7Gug6sT84>

ICT in Government

The application of ICT in the public sector (e-government) received its impetus from the Public Sector Reform programs (PSRP) and the Local Government Reform Programme (LGRF). However, due to lack of e-government strategy and coordination, initiatives have been fragmented. This situation has caused the president's office to embark on developing an e-government strategy. An e-government agency will also be established to coordinate related activities.

Regardless, various initiatives have been taken. For instance, at the local government level, initiatives include the Planning and Reporting Database (PlanRep), Local Government Monitoring Database (LGMD), and District Roads Maintenance System (DROMAS)⁷. At a central government level, most of the Government Ministries have established their websites. In addition, various systems have been implemented in most of the government Ministries and employees have been trained. These include an Integrated Financial Management System (IFMS) and a Human Resource Management System (IHRM) (Sawe, 2007). The government has also established a portal through which citizens can channel complaints and receive feedback from the government.

⁷ See: <http://www.pmoralg.go.tz/mis/index.php>

Box 7. Wananchi Portal connects Wananchi⁸ with their government

Wananchi portal in an initiative that allow Tanzanian citizens to contact their government. The portal allows Tanzanian citizens to submit, track, and obtain feedback from the government.

Principally, the portal was designed:

1. To help improve citizen awareness and satisfaction about the services they receive or believe they

should be receive by enabling fast and efficient resolutions of relevant citizen submissions

2. To collect data that will assist the Government of Tanzania to identify opportunities for improvement and change, to optimize service and minimize complaint in the future.

The portal is managed by the Ministry of Information, Culture and Sports, and is accessible through <http://www.wananchi.go.tz/>



⁸ Wananchi means citizens

3. RESEARCH METHODOLOGY

This chapter outlines the research approach which was adopted in gathering information regarding ICT4D in Tanzania. Data was collected through site visits, analysis of existing documentation, interviews, workshops and focus group discussions. The Atlas.ti software was used for qualitative data analysis.

3.1 Research Approach

This research adopted an inductive-interpretive approach (Walsham, 1993). In this approach a researcher inductively derives meanings from data interpretation to identify important insights as they describe a particular phenomenon. Several reasons were considered to influence this choice. First the ICT4D concept is still relatively new to Tanzania. Therefore, the actual meaning of what respondents and other data sources inferred needed to be *interpreted* rather than predetermined. Secondly, we anticipated data availability challenges especially from the government organizations. Thirdly, the study is explorative in nature; it does not focus its contribution on specific theoretical debates, but rather on existing practice.

Various sources contributed data to this study:

- Literature-based sources such as policies, reports and other recorded evidence were consulted to provide recorded and historical evidence, which were then analysed.
- Data was collected through observation during researcher's site⁹ visits and participation in a government meeting¹⁰.
- Interviews, workshops and focus group discussions (FGDs) were used to collect opinions and experiences from ICT practitioners, non-ICT practitioners and ordinary ICT users concerning the use of ICT for development. Interviews were useful for capturing personal accounts of the respondents, while FGDs were instrumental in revealing new issues, allowing discussions and clarifying doubts.

Data were collected from four regions in Tanzania: Dar es Salaam, Morogoro, Mwanza and Zanzibar. Dar es Salaam was selected because it is the main business city of Tanzania, while Morogoro and Mwanza were relevant sources to represent other regions in Tanzania with

⁹ Site visits to TGDLC, Mwanza Municipal Council, Internet cafes in Dar es Salaam, Morogoro and Zanzibar

¹⁰ E-government Meeting held at Utumishi on 3rd March, 2009

fewer business activities as compared to Dar es Salaam. Zanzibar provided information from the other side of the Union of the United Republic of Tanzania (URT)¹¹.

The selection of potential respondents was done by first contacting professionals from the President's Office Public Services Management, the Tanzania Global Development Learning Centre, and SWOPNET.¹² The professionals were interviewed and requested to suggest other potential respondents. This method helped to reduce researcher bias in respondent selection.

3.2 Data Capturing Procedures

Interview handling

Interviews were conducted with ICT experts and ordinary users at locations convenient for the respondents, while those in distant places (e.g. the Diaspora) were contacted by phone, email or Skype. Semi-structured interview guides were used to facilitate the flow of the interviews. Initially interviews were recorded but respondents were uncomfortable with this approach and this was therefore terminated. Instead, notes were taken and transcripts were prepared for analysis and respondent verification. The average interview duration was 80 minutes.

Table 5. Interview Respondent Profile

Category	Number
Government	13
Private Sector	6
Diaspora	5
NGOs	3
International organisations	2
Total	29

Workshops, Focus Group Discussion and Observation Protocol

Three workshops were conducted as well as an FGD with the Commission of Science and Technology (COSTECH). At the beginning of each workshop and FGD, an introductory presentation was done to familiarise the participants with the research topic, aim, and the information they were expected to contribute. Participants were then divided into smaller discussion groups, and given between 40 and 60 minutes for discussion. Each group was given an FGD guide (**Appendix V**) to facilitate the discussion. Later, a joint group discussion was convened, whereby groups presented their findings. This approach was useful because it facilitated active participation, probing, and clarification of concepts. During site visits and meeting participation, an observation form was used to record emerging issues relevant to

¹¹ Tanganyika and Zanzibar united in 1961 and formed URT

¹² Sharing With Other People Network (<http://www.swopnet.or.tz/>)

this research. This form was also useful during document analysis. An example of the completed document analysis is attached (**Appendix IV**).

Table 6. Workshop Participants profile

Category	Number
Government	9
Private Sector	14
Academia	10
UN ¹³	3
Civil Service Organisations	4
Total	40

3.3 Data Analysis

Primarily, the Straus and Corbin’s (1990) framework of data analysis was used. In this process open, axial, and focused coding was performed. The process was facilitated by means of qualitative data analysis software, *Atlas.ti*. The software was used to manage data, code, analyse, and relate the emerging themes. However, some other applications such as MS Excel and MS Word were used to provide a more flexible analysis environment. **Figure 2** below shows an example on how the category *challenges* were arrived at.

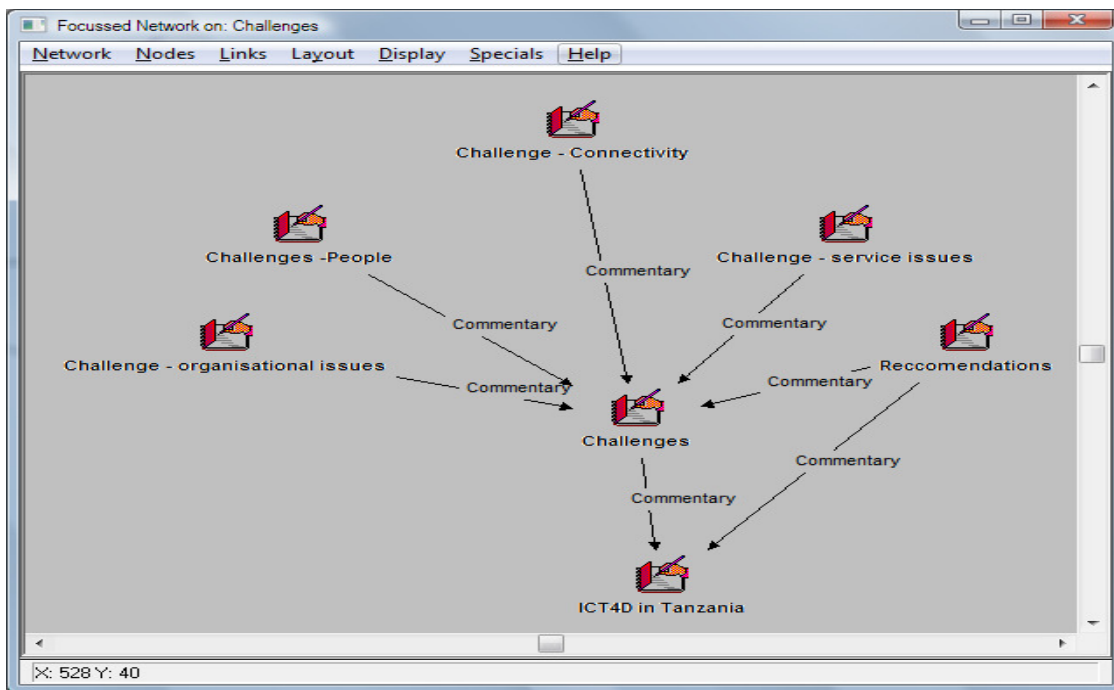


Figure 2. Example of coding in Atlas.ti

¹³ Participants were from UNDP and UNHCR

4. RESULTS

The research results are presented in this chapter. Several facilitators were identified, all of which support the uptake of ICTs for Development – the presence of government will; efforts to reduce the cost of ICT;, and the existence of supportive social infrastructures such as existing literacy levels and Kiswahili as a homogenous national language. Specific challenges were identified to be 1) the lack of adequate connectivity; 2) insufficient availability of relevant local content; 3) lack of leadership, organisational inertia, inadequate planning and unsupportive processes; and 4) people-related challenges which include the lack of ICT skills, existing mindsets relating to ICT4D and the lack of awareness of the benefits of ICT4D.

4.1 Priority Areas for ICT4D in Tanzania

In determining the priority areas in which ICT is intended to be a key facilitator, several strategic government documents were reviewed including national and sectoral strategies and policies. These were compared with findings from the field data. Findings reveal that the Government of Tanzania has intentionally and repeatedly appreciated the role of ICT as

Box 8. ICT Priority Areas in Tanzania

- Production and service sectors
- Government
- Business
- Health
- Education

a key enabler for development in Tanzania (Kobb, 2007; Miller, 2007; United Republic of Tanzania, 1998, 2003; 2005; 2008). However, it is the National Strategy for Growth and Reduction of Poverty (NSGRP) (URT, 2005) which clearly articulates the priority areas for ICT application. These include the use of ICT in production and service sectors, government, business, health, education,

and SME development. These observations correspond to the areas highlighted by the research respondents in this study, although their feedback provides a broader view of where the priorities should be placed (**Appendix VII**).

4.2 Facilitators of ICT4D in Tanzania

In this study facilitators are defined as factors in a particular context which provide a favourable environment for the successful application of ICT4D. Understanding such factors informs ICT4D practitioners on issues that are available to them to exploit or influence when planning or evaluating ICT4D related initiatives. Identified categories of the factors are summarised as:

- The affordability, availability, and adoption of ICTs;
- Supportive social infrastructure (levels of literacy and Kiswahili as a homogenous national language); and
- Presence of government will.

4.2.1 Affordability, Availability and Adoption of ICTs

Tax Relief

The government removed the Value Added Tax (VAT) on computers and peripherals in July 2000 (Miller *et al*, 2004). VAT was 20% until July 2009 when the government reduced it to 18% (United Republic of Tanzania, 2009). As a result the cost of computers decreased and allowed the improved uptake of ICTs in the country, especially in the urban areas as seen through the increased number of internet access points e.g. cybercafés, and the ownership of personal computers. Second-hand computers can be bought for as little as TSh. 150,000 (about USD 150). This is affordable to ordinary people, particularly in urban areas. However, it is still too expensive for the poor in rural regions. The availability of low cost mobile phones, with a basic model from as little as TSh. 20,000 (about USD 20) has also resulted in widespread penetration.

“I recall there were hardly any cybercafés back in June 2000 which is when the tax on computers was lifted. It was an ethinkTankTZ initiative during our first year of existence. We sent a small delegation to meet the Minister of Finance around April or so that year. We prepared a paper describing the advantages of increasing the penetration of IT as opposed to targeting IT for Taxation. The boom of cybercafés is one of the advantages of the VAT relief on computers.”

David Sawe, 3rd July 2009

4.2.2 Availability and Adoption of Technologies

Technologies with high domestication potential are those which ordinary households can acquire and own. Currently, technologies such as TVs, radio and mobile phones are widely available in Tanzania (TCRA, 2009). Many citizens have demonstrated that they are willing to adopt new technologies as seen in the sharp increase of mobile phones between 2000 and 2008 (see **Table 2**). In addition, while visiting a remote area in the Morogoro region, the researcher observed that some members of the local community had installed satellite dishes for TV reception. Most of the houses had at least one mobile phone and a radio. The availability of such technologies, and the willingness to use them, allows more citizens to access information. They also facilitate users to advance their lifestyle and economic activities. This plays an important role in development as evidenced below.

“Advancement in technologies is a facilitating factor. People have been fast in adopting technologies. For instance, currently we have more than 10 million mobile phone subscribers. Many people including secondary school pupils have and use mobile phones”

Enock Mpenzwa, March, 2009

"An impressive example concerns the CD/DVD movie sellers in the Oysterbay neighbourhood. They are always willing to give you a phone number so that you can order any movie you desire. But one who got my respect also used his phone to record each of his sales, right there up in front of his client."

David Sawe, 3rd July, 2009

4.2.3 Supportive Social Infrastructure: Literacy and Language

Although illiteracy is still a challenge to Tanzania, 64% of the adult population can read and write (CIA, 2009) and most can read, speak, and write Kiswahili. The existence of one national language has contributed to political and economical stability (Mukuthuria, 2006). If adequately exploited, the use of ICTs and content development and advocacy in Kiswahili could reach a wider audience who could benefit from the utilization of ICT in their social activities.

"Tanzania uses one language, it is easy to communicate, advocate and develop contents in a language that everyone understands. A typical example is the AIDS awareness campaign. They mainly use Kiswahili. This makes it possible to reach people even in remote areas. I think it is time that we have to shift from using English in ICT to localisation through Kiswahili."

Elias Otaigo, 12th March, 2009

4.2.4 Presence of Government Will and Support

Several aspects which indicate the presence of government will were observed. These include high-level policies and support, and establishment of coordination and implementation government organs. At policy level, several policies were observed to provide emphasis and opportunities for ICT as a key enabler of development (**Appendix VIII**). These include the Tanzania Vision 2025, the Strategy for Growth and Reduction of Poverty (NSGRP), and the Property and Business Formalisation Programme (PBFP). Others are the National ICT policy and other sectoral policies such as the ICT policy for basic education (United republic of Tanzania, 2007). Additionally, H.E. Jakaya Mrisho Kikwete, the President of Tanzania, and the Chairman of Microsoft, Mr. Bill gates, signed a memorandum of understanding (MoU), in 2006. The MoU commits the government and Microsoft to further the role of ICT in the areas of e-government, tourism and education.

The government have also established and charged various organs to coordinate, regulate and implement ICT in the country. For instance, in 2008, the Ministry of Communications, Science, and Technology (MCST) was established. MCST is responsible for spearheading the coordination of ICT in Tanzania. MCST is still new; however, it is envisioned that it will facilitate integration, coordination and direction of existing (though fragmented) and new ICT initiatives in the country. Other government bodies which deal with ICT include TCRA and the Commission of Science and Technology (COSTECH). TCRA have contributed much in regulating the communication industry in Tanzania, while COSTECH have researched, coordinated and piloted various ICT related initiatives in the country (Mutagahywa, Casmir & Make, 2006).

The Government has envisioned the Universal Communications Services Access Fund (United Republic of Tanzania, 2006); another indicator of its commitment. The fund is yet to be functional. However, upon its operationalisation it will facilitate investments and initiatives to disadvantaged communities in Tanzania. The purpose is to facilitate investors in reaching areas which otherwise they would have not considered. Specific objectives of the fund are outlined in **Appendix VIII**.

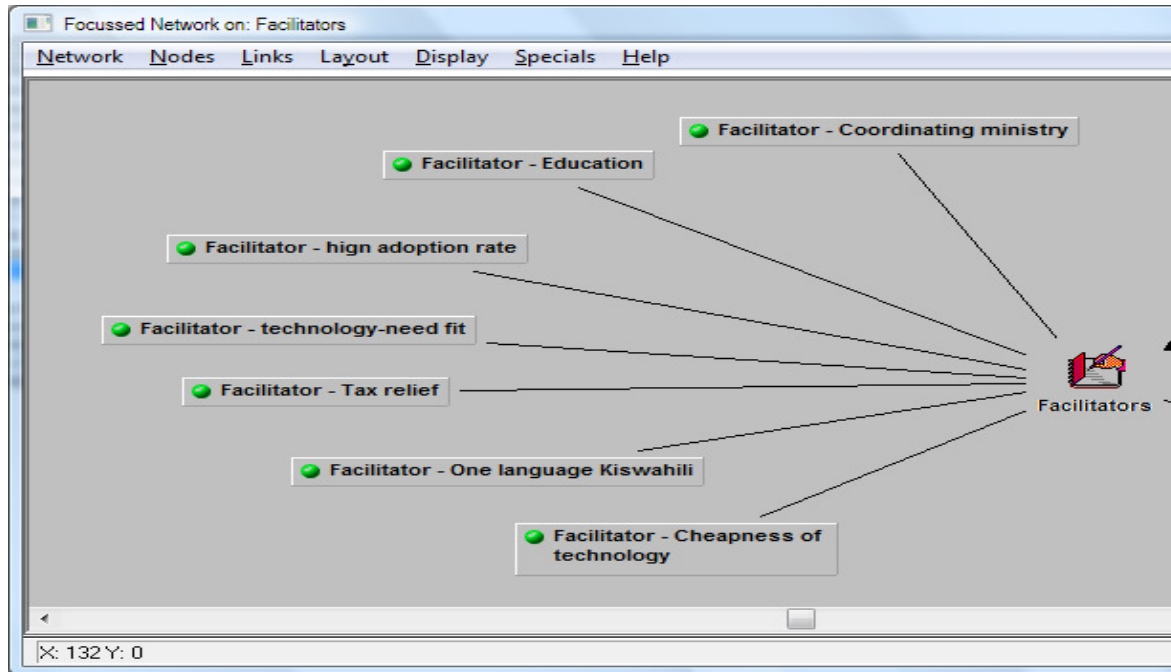


Figure 3. ICT4D Facilitators screenshot from Atlas.ti

4.3 ICT4D Challenges in Tanzania

Four categories of issues were identified through research carried out for this study. These include connectivity, content (service) issues, organisational, and people related challenges.

4.3.1 Inadequate Connectivity

Connectivity challenges refer to the difficulties that organisations or individuals encounter when deploying or accessing ICT enabled initiatives. This is mainly due to the fact that ICT networks and other supporting infrastructures are still inadequate, unreliable, and have not covered a wide area (**Table 7**). Typical examples are the lack of availability and the spread of broadband, the lack of electricity, and even the limited coverage of mobile phone networks. ICT equipment and especially computers are still not widely available, particularly in the rural areas. This hinders the possibility of stimulating demand and deployment of ICT4D.

Table 7. Tanzania Infrastructure Index, 2008

Element	Value
Internet per 100 users	1.00
PC per 100 users	0.93
Cellular subscribers per 100 users	14.78
Main telephone lines per 100	0.40
Users broadband per 100 users	...
E-readiness index	0.2929
Regional average e-readiness index ¹⁴	0.2879
World average e-readiness index	0.4514
World leader e-readiness index ¹⁵	0.9157

Source: Source: UN, 2008

4.3.2 Content Quality

Although the government and other development stakeholders have tried to provide ICT enabled services, they are still inadequate. The quality and quality is yet to meet user expectations. For instance much of the content is infrequently updated and also is not local. Out of the 41 websites visited (*Appendix II*), only the news websites and blogs are updated frequently. Specific examples include the obsolescence of links and tender information on government websites. These elements are often left unattended even when they are no longer functional. Users therefore show reluctance in consulting websites as their first choice when wanting to contact organisations.

Other possible content quality issues include insufficiency and fragmentation of the provided services or information. Together, they contribute to user dissatisfaction of the quality of available content.

Surprisingly most of the websites, including government websites, are written in English. While English is the official language, most ordinary Tanzanians speak Kiswahili. As a result, the available content is not perceived to be local. Other service related issues include lack of responsiveness, incompleteness, lack reliability and dependability.

4.3.3 Organisational Challenges

Organisational challenges refer to the characteristics or issues which determine the aggressiveness and progress of an organisation towards ICT initiatives. Several issues were

¹⁴ East Africa

¹⁵ Sweden

identified in this category – lack of leadership, organisational inertia, inadequate planning, and unsupportive processes. There was evidence of success of ICT projects where responsible leadership with strong conviction and commitment were available, e.g. the Sengerema community centre project (**Box 9**). Other projects stagnated when committed leadership ceased e.g. the Kilosa community centre project, where inadequate councillor support can be identified as the cause for project failure. This situation is evidenced below:

“Leadership is another important challenge. I will also give you an example. The District Executive Director for Kilosa went to Sengerema and wanted a similar project in her area. That was done successfully. However, after she was transferred to another area support problems started. People started calling even the local radio by her name. Madiwani¹⁶ were divided such that diwanis from distant areas where the community radio cannot be heard did not want to contribute to the sustainability of the radio”

John Mahegere - Telecentre Managers, COSTECH, February 2009

Box 9. Sengerema Multipurpose Community Telecentre: Empowering Local Community

The Sengerema Multipurpose Community Telecentre (SMTC) is located in Sengerema town in the Mwanza region. SMCT was established in 2001. Connectivity is provided by an optic fibre cable owned by the Tanzania National Electricity Services Corporation. The main services offered by the centre include access to the internet and email, computer training, secretarial services, IT consultancy, content development, and local radio.



The key aims of establishing the SMTC were to demonstrate the positive impact of ICTs on rural development and livelihoods, the integration of rural communities into the global information community, testing the usefulness of local content, providing a model for future multipurpose telecentres, and influencing ICT policies and strategies.

John Mahegere says that the centre has contributed to improving the lives of the local community. As example, the then Misenyi District Commissioner, Elias Maalugu, obtained his master's degree through distance learning by using the facilities at SMTC. He also explains that before the advent of SMTC only 50% of children were taken for vaccination. Currently, the rate has reached 100% due to enhanced awareness facilitated by the centre.

John Mahegere - Manager for Telecenters, COSTECH (February 2009)

¹⁶ Madiwani means local councillors

Equally, inadequate planning; unsupportive policies, practices and processes; and organisational inertia affect the application of ICT in development activities. These issues have also been observed by other researchers (e.g. Mutagahywa, Kinyeki & Ulanga, 2007). For instance, inadequate planning in Tanzania has negatively impacted the rate of progress in ICT4D. For example; the National ICT Policy (NIP) was produced and approved in 2003, but without an implementation strategy. As a result, no guidance and responsibility was assigned to any government body. This has caused the NIP to remain a legacy document with minimal interpretation and implementation. The situation is similar at sectoral levels with exception of the education sector where the Ministry of Education and Vocational Training has developed its own sectoral ICT policy (URT, 2007). However at the time of writing, no sectoral strategy was available on how the policy will be implemented. One of our respondents cites this issue:

“I think many people are yet to be knowledgeable about ICT [projects]. For this reason they do not know even how to write good ICT policies. The unsupportive ICT policies that we have are results of such poor skills.”

Amos Nungu, ICT4RD Coordinator, 17th February, 2009

4.3.4 People-Related Issues

Three people-related issues were identified to be important for the application of ICT4D-adequacy of ICT skills, ICT awareness, and mindset. Although various initiatives are being deployed in Tanzania, many Tanzanians, especially in the rural areas, do not have adequate skills and awareness to operate ICT equipment, especially computers. Equally, organisations including the government do not have sufficient skilled people to drive the application of ICT in development initiatives.

The third issue, is that of unsupportive mindsets, is a particular issue among the older generation who are presently in decision-making positions. This may have a historical reason as the Government of Tanzania banned the use and importation of ICTs (e.g. TVs, computers) in the early 1970s. As a result, the ownership and use of these technologies was seen to be illegal, and a luxury. The long term effect has been that some/many decision makers lack the power to conceptualise and exploit the potential of ICT in development. This culminates in a limited number of ICT initiatives, limited utilisation of ICTs in development initiatives, and inadequate support, prioritisation and advocacy of ICT from the policy, implementation, and use levels.

“The perception of people as well as the general public has to change. Tanzania is yet to grasp the importance of ICT. It is mostly regarded as a luxury rather than an important developmental tool. Many leaders are not aware of ICT potentials. This makes it difficult for them to put ICT as one of the priority issues in their activities. As a result ICT initiatives face some difficult bureaucracies. This is one of the major problems.”

Muhidin Issa Michuzi, Tanzania Standard Newspaper, 16th February, 2009

Box 10: ICT Challenges in Tanzania

- Connectivity inadequacy
- Unavailability, unreliability of access infrastructure (networks, equipment, supporting infrastructure e.g. electricity) challenges ICT
- Quality of content
- Inadequate content quality discouraged acceptance of ICT based services. Specific issues may include service/information and links obsolesce
- Organizational issues
- Unsupportive laws, policies, processes, practices huddles ICT success
- People related issues
- Unsupportive mindset, poor ICT skills, and awareness of people choke ICT progress

5. RECOMMENDATIONS

Tanzania's Vision 2015 has the country's overarching development ambition for about 10 to 15 years. The vision is intended to be delivered through country's MDGs, MKUKUTA, MKURABITA, national and sectoral policies, e-government strategies and the Universal Communications Services Access Fund. Based on the findings of this study, recommendations have been synthesised to facilitate these efforts. The recommendations take cognisance of the existing ICT facilitators, and the need to overcome the highlighted challenges. The government has the sole responsibility for harnessing ICT4D. However, the government alone cannot achieve this goal. Joint and committed efforts and collaborations from a wide range of stakeholders are necessary. Hence, these recommendations are relevant to the government, others currently involved as well as future development partners.

5.1 Exploiting Existing Opportunities

Develop the ICT industry

Tanzania can benefit from the production and utilisation of ICT4D. While utilisation of ICT in various sectors has been increasing, production of ICT is still underdeveloped. We therefore recommend that the government should strategise and encourage the local production of ICTs. Although hardware production is time and investment intensive, software and applications development can be prioritised. Experiences in attracting investors in other sectors (e.g. tourism) can be used to benefit the ICT sector.

Extend national ICT support to implementation levels

At a national level the government has demonstrated its intent and willingness towards ICTs through the establishment of policies, strategies and coordination structures. These efforts need to be propagated more widely, and awareness raised at the community, organisational and local government levels where implementation has to take place. This will facilitate the incorporation of ICTs into their developmental initiatives.

Integrate ICT into other development projects

Various development projects are being deployed country wide although ICT deployment is limited. The government can take the advantage of the existing coordination and regulatory structures to influence the integration of ICT into development initiatives. For instance, by collaborating with other ministries, departments, agencies and others, the MCST can foster the integration of ICTs into other large-scale projects such as road construction, water

supply and buildings. A road project may also include the laying down of fibre cable to expand connectivity. Possible synergies and the development of collaborative strategies for implementation such as shared infrastructure and shared ICT skills training could also be considered.

Promote affordability, availability and adoption of ICTS

The VAT relief on computers has contributed to increased availability of ICTs and related services in Tanzania. The possibility of extending such measures to other areas of ICT should be considered, particularly those with high domestication potential. This will facilitate the spread, availability and adoption of ICT in many other development activities.

In addition, awareness should be raised about the VAT relief presently available, so that the advantage of the reduced costs of computers can be used to stimulate the use of ICT4D.

Exploit contextual opportunities

Existing educational levels and Swahili homogeneity were specific contextual facilitators identified during the research. These can not be the only factors. Other similar facilitators need to be identified and exploited.

Box 11: Exploiting the Existing Opportunities

DEVELOP THE ICT INDUSTRY

Invest and develop possible ICT production

EXTEND NATIONAL SUPPORT ICT TO ORGANISATIONAL AND COMMUNITY LEVEL

Further the availability and awareness of national support and coordination to implementation and community levels

INTEGRATING ICT IN OTHER DEVELOPMENT PROJECTS

ICT needs to be seen as a key enabler of all development projects. Regulatory authorities and sector-specific ministries need to ensure that it is integrated in all development projects

PROMOTE AFFORDABILITY, AVAILABILITY AND ADOPTION OF ICTS

Provide opportunities that will promote affordability, availability, and adoption of ICTs
Raise the awareness of existing incentive opportunities such as VAT relief on computers

EXPLOITING CONTEXTUAL OPPORTUNITIES

Strategise to identify and use locally available opportunities such as social infrastructure, widely available ICTs, and language (Kiswahili)

5.2 Tackling the Challenges

Enhance connectivity

The government has the responsibility for constructing reliable and adequate ICT access for the country. This relates to ICT networks and supporting infrastructure such as electricity and roads. However, because such initiatives may take a long time and resources are scarce, we recommend that ICT4D stakeholders should start integrating existing infrastructure for channelling services and advance the reach of ICT4D to a larger population. Specific emphasis should be put on the use of widely available technologies such as mobile phones, TV and radio. In addition, the use of alternative sources of energy, e.g. solar energy, should be considered.

Develop reliable local content

Service delivery needs to be adapted to meet the needs of local communities in an appropriate manner. Simplicity is required in terms of language and ease of use, usefulness and comprehensiveness. Responsiveness and reliability should also be promoted. The quality of content needs to be improved with content localisation, specifically in the use of Kiswahili.

Existing content provision is limited and fragmentary - efforts should be made to increase the quantity of ICT based services. This will contribute to the completeness, sufficiency, and usefulness of the provided services, mainstreaming ICTs into citizen's social-economic activities.

Develop leadership and overcome organisational inertia

ICT4D initiatives require strong, persuasive, and committed leadership. However, it may not be easy to achieve such leadership in every project. Mentoring and incentive schemes should be used to promote innovation in ICT4D. Mentoring combines training and coaching of stakeholders to understand and practise ICT4D. Incentive schemes can be used to coerce or attract stakeholders to adopt ICT4D activities. Schemes can take the form of sanctions or rewards towards ICT utilisation and innovation. This will attract and encourage leaders to engage and adopt ICT in development initiatives, and reduce organisational inertia.

Other issues which may cause organisational inertia need to be identified. Issues such as unsupportive policies, regulations and procedures need to be identified and reformed. Models used in other crosscutting issues such as gender advocacy and reforms can also be studied and used to highlight and fast track such reforms.

Improve Planning

As ICT4D is a crosscutting issue, more emphasis should be placed on intra- and inter-organisational collaborative planning involving a broad range of stakeholders. This will allow the identification of needs and priorities, as well as available opportunities for collaboration

(e.g. standards, services, and infrastructure development). Multi-stakeholder models applied in other successful sectoral projects can be used where appropriate.

Enhance skills, awareness, and mindset

Addressing these issues will require a combination of approaches. In the short term, ease of use should be prioritised. This may involve designing simplified and ease to use services which people can use to build their skills and encourage adoption. However in the longer term, the government needs to integrate ICT training into the country's education system and workforce training. This will enhance citizens' ICT skills, and ensure availability of skilled ICT labour to facilitate ICT4D.

The government needs to establish a sustained ICT awareness campaign for mindset change, as has been done in other sectors such as health in fighting HIV/AIDS. People need to be reminded, convinced, and continually persuaded about the benefits of ICTs. Spontaneous and periodic campaigns will not produce expected results.

Cultivate innovation

More innovative research is required to understand and develop the most relevant solutions for communities. The establishment of centres of excellence in ICT is recommended as one possible approach. Such centres can be useful for providing advice and practical solutions concerning ICT4D.

Box 12: Recommendations

IMPROVE CONNECTIVITY

Improve infrastructure and use widely available ICTs e.g. mobile phones, TV, and Radio

DEVELOP RELIABLE CONTENT

Deliver content that meets or exceeds expectations and provides needed services

FOSTER SUPPORTIVE LEADERSHIP

Introduce mentoring and incentive schemes to develop supportive leadership
Identify, review, and implement supportive organizational processing machinery
Improve planning
Emphasis strategic collaborative planning involving key stakeholders

ENHANCE ICT SKILLS, AWARENESS AND MINDSET

Observe simplicity define simplicity when developing ICT initiatives and services.
Develop strategies to enhance citizen ICT skills. Integrate ICT training into educational curricula and workforce training.
Undertake ICT awareness raising initiatives and services.

INNOVATION

Establish centers of excellence to undertake innovative research to develop the most relevant solutions that will bring value to communities

6. CONCLUSIONS

This study explored the ICT4D situation in Tanzania, including current priorities and potential factors which influence the success of ICT4D in the country. Using an inductive approach, various potential issues were identified - organisational, people, connectivity and service factors are the major determinants of success for ICT4D in Tanzania. These are facilitated through factors such as social infrastructure (e.g. education and language) and technical facilitators (e.g. availability of ICTs and the existing of functioning and effective regulatory bodies). Exploiting these factors and adopting the recommendations included in this report will facilitate the successful integration and deployment of ICT4D by a wide range of stakeholders. This may eventually help Tanzania to leapfrog towards the attainment of its own national priorities and the Millennium Development Goals.

Several findings emerged during the research study which require further study:

- Mobile telephony is widely adopted in Tanzania, however no studies are available on the types of specific services which should be delivered, nor are any studies available on how they this technology could be used, for example, in education or libraries.. The current services are trial-and-error efforts of individual entities, whereas more informed guidelines are needed.
- Various initiatives are underway in Tanzania. However, these initiatives are inadequately documented and communicated. Many factors may contribute to this situation, one being the lack of an overarching policy on documentation and dissemination of ICT information. This area needs further investigation if adequate measures are to be adopted.
- Successful projects such as the Sengerema Multipurpose Community Telecentre are externally funded. Because sustainability is important, it may be useful to study how those projects can be sustained after the external partnership expires. In addition, the possible replication of such initiatives also requires further research.

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APPENDIX I: LIST OF INTERVIEW RESPONDENTS

S/N	Interviewee	Organization
1	Charles Senkondo	Tanzania Global Development Learning Center
2	David Sawe	Independent consultant
3	Elvida Max	Presidents Office Public Service Management
4	John Mahegere	Tanzania Commission of Science and Technology
5	Daniel Mhina	Zain Tanzania
6	Enock Mpenzwa	Tanzania Commission of Science and Technology
7	Agape Nchimbi	Tanzanian in the Diaspora
8	Lazaro Luhusa	Tanzanian in the Diaspora
9	Magdalena Hall	Tanzanian in the Diaspora
10	Issa Michuzi	Tanzania News Standard
11	Amos Nungu	Sengerema ICT4RD Coordinator
12	George Kivaria	Vodacom Tanzania
13	Happy Kavishe	Presidents Office Public Service Management
14	Adolf Kinyero	National Electoral Commission
15	Abibu Ntahigiye	tzNIC
16	Anna Lyimo	United Nations High Commissioner for Refugees (UNHCR)
17	Enock Yonazi	African Development Bank
18	Elaine Backer	University Computing Center
19	Mugisha Bisanda	Ericson
20	Isack Mota	Technoserve/Tanzania
21	Dr. Ombeni Mbwambo	Tanzania Ports Authority
22	Sebastian Malando	IBS
23	Rainer Mwashu	Mbeya Institute of Technology
24	Margareth Nzuki	ESRF spell out
25	Elias Otaigo	The Institute of Finance Management
26	Kwame Polisy	TCAA spell out
27	Annete Nara	Tanzanian in the Diaspora
28	Issa Haji	Zanzibar Revenue Board
29	Mariam Kiravu	Tanzanian in the Diaspora

The Institute of Finance Management			
Computing and Information Technology Department			
Attendance List for ICT4D Participants			
Date; 19th, February, 2009			
S/N	Name	Organization	Area of Expertise
1	Col. Rueshwa J. Katakweba	P2D Converters	Document Management Systems
2	Madeline Kimei	Private	E-Commerce Law
3	Martin Kimario	Movenpick	Assistant Systems Manager
4	Isack Mota	Technoserve/Tanzania	consultant (IT)
5	Light Chobya	Technology Transfer Center	Civil Engineering (Transportation)
6	Adam Mambi	TCRA	ICT Law and IP Law
7	Elaine Baker	University Computing Center	Systems Analyst
8	David Sawe	Consultant	e-Government facilitation
9	Anthony Karokola	IIT	Systems Analyst
10	Moiz Selamwella	IIT	Networking
11	Syslvia Ndekana	TGDLC	Systems administrator
12	Abibu R. Ntahigiye	tzNIC	.tz Management
13	Sosthenes Lugome	Immigration HQ	Systems Analyst
14	Caritas H. MKate	Ministry of Finance & Economic Affairs	Database
15	Kwame Polisy	TCAA	Systems Administration
16	Sendoro Juma	TCC	IT Governance
17	Didas Wambura	Bunge	Networking
18	Robert Madaki	Zain	Project Management
19	Kabenga Kaisi	CECIT.NET	Business Analyst
20	Michael M. Andendekisye	IFM	Business Management
21	Jim Yonazi	IFM	e-Government

APPENDIX II: LIST OF WORKSHOP PARTICIPANTS

The Institute of Finance Management			
Computing and Information Technology Department			
Attendance List for ICT4D Participants			
Date; 20th, February, 2009			
S/N	Name	Organization	Area of Expertise
1	Elias Otaigo	IFM	Information Systems
2	R.J. Katakweba	P2D	EDMS
3	Adam Mambi	TCRA	ICT Law/Cyber Law
4	Brigita Ndete	UN	Administration
5	Thomas Maqway	TAFY	Administration
6	Hamisi Nguli	COSTECH	ICT4D
7	Adam Jackson	TCRS	Management and Evaluation
8	Didas Wambura	Bunge	ICT
9	Sendoro Juma	TCC	IT
10	Dr. Faraja T Igira	IFM	ICT & Information systems
11	Jim Yonazi	IFM	ICT & Information systems
12	Frank Philip	University of Dar es Salaam	
13	Edwin Kwesigabo	IFM	ICT and Information systems

The Institute of Finance Management			
Computing and Information Technology Department			
Attendance List for ICT4D Participants			
Date; 27th, February, 2009			
S/N	Name	Organization	Area of Expertise
1	Rainer Mwashu	MIST	ICT
2	Kamala James Lutatinisibwa	EDIT	ICT
3	Adam Mambi	TCRA	ICT Law/Cyber Law
4	Anna Lyimo	UNHCR	Administration
5	Thomas Maqway	TAFY	Administration
6	Sebastian Marondo	IBS	ICT
7	Julius Macha	IFM	Banking
8	Bajuna Saleh	IFM	ICT
9	Raphael Julius	IFM	ICT
10	David Sawe	POPSM	e-Government Consultant
11	Nassoro Hussein	IFM	ICT Economics
12	Kiula Kingu	Dawasco	Data administration
13	Jim Yonazi	IFM	E-Government

APPENDIX III: LIST OF LOCAL WEBSITES VISITED

Organisation	Website
Prime Minister's Office	www.pmo.go.tz
Prime Minister's Office Regional Administration and Local Government	www.pmoralg.go.tz
President's Office, Public Service Management Department	www.estabs.go.tz
Ministry of Finance	www.mof.go.tz/
Ministry of Agriculture, Food, and Cooperative	www.agriculture.go.tz
Ministry of Health and Social Welfare	www.moh.go.tz
Ministry of Infrastructure Development	www.moct.go.tz
Ministry of Community Development, Gender and Children	www.mcdgc.go.tz
Ministry of Natural Resources and Tourism	www.tourismtanzania.go.tz
Ministry of Education and Vocational Training	www.moe.go.tz
Ministry of Higher Education, Science and Technology	www.msthe.go.tz
Ministry of Information, Culture and Sports	www.hum.go.tz
Ministry of East African Cooperation	www.meac.go.tz
Ministry of Home affairs	www.moha.go.tz
Tanzania Parliament	www.parliament.go.tz
National Electoral Commission	www.nec.go.tz
Bank of Tanzania	www.bot-tz.org
Tanzania Revenue Authority	www.tra.go.tz
Tanzania Communications Regulatory Authority	www.tcra.go.tz
Tanzania Investment Centre	www.tic.co.tz
Tanzania Bureau of Standards	www.tbs-tz.org
Dar es Salaam Stock Exchange	www.darstockexchange.com
Tanzania Tourism Board	www.tanzaniatouristboard.com
Tanzania Social Action Fund	www.tasaf.org
National Social Security Fund	www.nssf.or.tz
Public Service Pension Fund	www.pspf-tz.org
Parastatal Pension Fund	www.ppftz.org
National Examinations Council	www.necta.go.tz/
Tanzania Communications Regulatory Authority	www.tcra.go.tz
Public Procurement Regulatory Authority	www.ppra.go.tz
Unit Trust of Tanzania	www.utt-tz.org/index1.php
Tanzania Online Gateway	www.tzonline.org
Tanzania Development Gateway	www.tanzaniagateway.org
ICT for Rural Development (ICT4RD)	http://www.ict4rd.ne.tz/
IPP Media	www.ippmedia.com
University of Dar Es Salaam	http://www.law.udsm.ac.tz/
The Institute of Finance Management	www.udsm.ac.tz
University of Dodoma	www.udom.ac.tz
Mwananchi News Paper	www.mwananchi.co.tz
Issa Michuzi Blog	www.issamichuzi.blogspot.com
Majid Mjengwa Blog	www.mjengwa.blogspot.com

APPENDIX IV: DOCUMENT AND OBSERVATION SUMMARY FORM- EXAMPLE

Document type: Government Report, 2007	Date received:	
Site: POPSM	Today's Date	8 th Jan, 2009
Restrictions: No restrictions	Written by:	Mutagahywa, B., Kinyeki, C., Ulanga, J. 2007
Contact Person:	Priscuss Kiwango	
<p>1. Name and description of the Document: A REVIEW OF E-GOVERNMENT RELATED INTERVENTIONS IN PSRP PHASE I AND ADVISE ON A STRATEGY FRAMEWORK TOWARDS PSRP PHASE II. The document provides a detailed evaluation of current e-government initiatives in Tanzania. it also suggests some solutions to the identified factors that hinder the progress of e-government in Tanzania</p>		
<p>2. Significance of the document: This document is a government report. It provides current information on e-government initiatives. A detailed picture and clues on the possible issues that may also influence citizens' adoption of e-government initiatives. The document sees that lack of adequate ICT awareness to government officials as well as the citizens can potentially influence the usage of e-government. It clarifies our discoveries from interviews and observations</p>		
<p>3. Summary of the contents: Several issues emerged from the document:</p> <p>The government intends to implement e-government as a way of improving its effectiveness, efficiency and responsiveness</p> <p>The existing infrastructure has been highlighted as one of the factors that affect e-government. Frequent references and suggestions have been made (p.1, 19, 31-33) to highlight this concern. To this report we can suggest that inadequate infrastructure negatively affect citizens adoption of e-government initiatives in Tanzania</p> <p>Inadequate coordination has also been identified (p. 1, 19, 27, 31, 35, 45). The effect of this problem is emergence of disjointed initiatives. The disjointed situation results in to poor quality of e-government services, image, and eventually trust</p> <p>Inadequate ICT skills and awareness to both government officials and the general public was identified. Our data support this as well (p.21, 25, 34)</p> <p>Government processes need a change for accommodating e-working (p.24)</p>		

<p>The legal environment is not supporting e-working (p.2, 18, 29, 35)</p> <p>The quality of e-government services/systems is questionable (p.28, 29, 34)</p> <p>Inadequate availability of funds not only suggest that the government can not retain competent skilled resources, but also it can not ensure project continuity (p.25)</p>
<p>4. Any other things</p> <p>The level of e-government in Tanzania is at presence level (p. 29)</p>
<p>5. Issues to focus at in the next document analysis or document to search for:</p> <p>Mutagahywa, B. and Ngalinda, I.: Towards an African e-Index; ICT access and Usage 2005. www.researchictafrica.net</p>

APPENDIX V: FOCUS GROUP DISCUSSION FORM

The Institute of Finance Management - IFM

Computing and Information Technology Department

Information Communication Technology for Development (ICT4D)

Researcher: Jim Yonazi Focus Discussion Form, Date:

1. Areas where ICT is visibly used for development:

.....
.....

2. Development activities/sectors where we think ICT has not been used as expected are:

.....
.....

3. The currently common ICTs used for development in Tanzania are:

.....
.....

4. The main issues which influence effective utilization of ICT for development are:

.....
.....

5. In order to enhance the utilization of ICT for development the following issues need to be addressed:

.....
.....

APPENDIX VI: INTERVIEW GUIDE - ICT PROFESSIONALS

The Institute of Finance Management - IFM

Computing and Information Technology Department

Information Communication Technology for Development (ICT4D)

Research Interview guide – ICT professionals

Researcher Jim Yonazi

Date: Interviewee: Organization:

Introduction

For the researcher and the respondent

Purpose of this research

The purpose of our research is to understand issues around Information communication Technology as applied to development in Tanzania. Specifically, the researcher intends to understand how ICT is used, where, challenges, and how it can be furthered to deliver the most expected developments to the people of Tanzania.

Reason of selecting the interviewee

You have been selected to take part in this session because you have been involved in planning, managing, advocating, and/or supervising the implementation of ICTs in your organization. I am much interested in your contributions because I believe that, you can enlighten me on what you have observed, experienced, encountered, and decided in the course of implementing e-government initiatives.

Rules

Please feel free to speak-up your ideas. There are no right or wrong answers. I would also like to assure you that high confidentiality standards will be observed. If you feel that you would not like your name to be mentioned in the reports resulting from the results of this study, please feel free to inform.

I thank you in advance.

The Institute of Finance Management - IFM

Computing and Information Technology Department

Information Communication Technology for Development (ICT4D)

Research Interview guide – ICT professionals

Researcher Jim Yonazi

Date: Interviewee:Organization:

A. Respondent information:

1. Please tell me about yourself including your position in your organization and your current responsibilities

B. How ICT is used for Development?

2. Please tell me how ICT is currently used for development activities in Tanzania

Probe: What are the development areas where ICT is used intensively?

Probe: What are the areas that utilize ICT less than expected?

Probe: Please tell me if there is any specific technologies that you think are the mostly used in Tanzania

Probe: What could be the reason for that?

Probe: Are there specific ICTs that you think are most relevant for Tanzania?

C. ICT4D Challenges

3. In your experience, what are the typical challenges that face the utilization of ICT for Development in Tanzania?

D. Recommendations

4. What measures will you recommend to be taken to facilitate the utilization of ICT of development in Tanzania?

E. Other:

5. Are there any other issues that you think may be relevant to understand concerning the utilization of ICT for development in Tanzania?

APPENDIX VII: OPEN CODING LIST FROM ATLAS.TI

Administrative inertia challenge	Facilitator - Cheapness of technology
Appropriate technologies	Facilitator - Coordinating ministry
Challenge - Appropriate Financial Allocation	Facilitator - Education
Challenge - Awareness	Facilitator - high adoption rate
Challenge - Connectivity	Facilitator - One language Kiswahili
Challenge - Corruption	Facilitator - Tax relief
Challenge - Equipment	Facilitator - technology-need fit
Challenge - Expertise	ICT applications
Challenge - Financial	Information Management
Challenge - ICT literacy	Key responsibility
Challenge - Illiteracy	Less use in agriculture
Challenge - Leadership	Less use in education
Challenge - Local content	Less use in financial services
Challenge - Mindset	Less use in Government
Challenge - Organizational inertia	Less use in health
Challenge - Planning	Less use in ICT application
Challenge - Policy	Less use in manufacturing
Challenge - Political will	Less use in private sector
Challenge - Procurement process	Less use in rural development activities
Challenge - Resistance to change	Less use in specialized social services
Challenge - Updating	Less utilization
Challenge - Viruses	Less utilization in SME
Current ICTs	Most relevant technologies
Facilitating access	Purpose of ICT
	Recommending - ICT R & D

Recommending Access Fund	Recommending tax rate cut
Recommending adoption factors	Recommending top leadership buy in
Recommending Benchmarking	Respondent information
Recommending Business Process Outsourcing (BPO)	Unable to own ICT
Recommending coordination	Use in Agriculture
Recommending government commitment	Use in business transaction
Recommending human capacity development	Use in commerce
Recommending ICT Curriculum	Use in Communication
Recommending ICT education and training	Use in development
Recommending ICT supportive policy	Use in education
Recommending implementation plan (planning)	Use in Entertainment
Recommending incentives	Use in financial services
Recommending infrastructure improvement	Use in governance
Recommending leadership commitment	Use in health
Recommending Local content	Use in information management
Recommending Mindset change	Use in infrastructure development
Recommending on advocacy style	Use in job creation
Recommending Open Source	Use in land management
Recommending prioritization of ICT communication	Use in Marketing
Recommending relevant application	Use in Media
Recommending sharing of infrastructure	Use in Mining
Recommending simple initiatives	Use in office productivity
Recommending stakeholder involvement	Use in security and safety
	Use in Social life
	Use in travel and tourism

APPENDIX VIII: POLICIES AND OBJECTIVES

Policy	Key Objectives/Achievements
Development vision 2025	<ol style="list-style-type: none"> 1. High quality livelihood 2. Peace, stability and unity 3. Good governance 4. A well-educated and learning society 5. A competitive economy capable of producing sustainable growth and shared benefits
National strategy for Growth and Reduction of Poverty (MKUKUTA)	<ol style="list-style-type: none"> 6. Growth and reduction of income poverty 7. Improved quality of life and wellbeing 8. Good governance and accountability
Property and Business Formalisation Programme (MKURABITA)	<ol style="list-style-type: none"> 9. Improved business environment 10. Increase legal ownership of property and access to capital for property owners 11. Expansion of the legal economic sector
Universal Communications Services Access Fund	<ol style="list-style-type: none"> 12. To ensure the availability of communication services in rural and urban underserved areas 13. To promote the participation of the public and private sector in the provision of universal services in the rural and urban underserved areas 14. To promote social-economic development of rural and urban underserved areas 15. To create a framework for open and efficient access to, and use of communication networks and services in production and availability of competitive markets 16. To promote widespread provision of quality services at affordable rates and ensure that rural and urban underserved areas have access to communications and information services at reasonable and affordable prices. 17. Ensure availability of universal services by enhancing communications services access through private sector participation