Exploring Facilitators and Challenges Facing ICT4D in Tanzania

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Abstract

Successful implementation of Information and Communication Technology for development requires a sound understanding of the implementation-context. Interestingly, limited knowledge is available regarding issues potential to facilitate or challenge ICT4D implementation in developing countries. This study aims at establishing such issues in a framework of a developing country like Tanzania. A grounded approach was used for this study. The researcher establishes that, in the Tanzanian context, issues that facilitate ICT4D include affordability, availability of domesticable technologies, supportive social infrastructure and government commitment to ICT initiatives. The key challenges of ICT4D in the country include inadequate connectivity, inadequate content quality, unsupportive organisational issues and people-related issues. Accordingly, the researcher proposes a new view that shows challenges and facilitators are not static. The researcher argues that successful implementation of ICT4D in Tanzania is possible if issues established in this study are influenced in a continuum of adequacy from low to high. Thus, efforts need to be made to address the identified challenges, exploit and advancing facilitators and maintain them on the high-side of the continuum of adequacy.

Keywords: ICT, ICT4D, e-Government, Tanzania, Africa.

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Introduction

Information and Communication Technology (ICT) for development (ICT4D) relates to the use of ICT in various social and economic activities (Kramer, Jenkins & Kats, 2007). Currently, ICT is embedded in products and services we use and consume in our daily lives. As a result, it 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 the utilisation of ICT in the development of the human race (Yusof & Lim, 2003).

The role of ICT in social and economic development can have direct or indirect contributions. Direct contribution occurs when ICT is traded as a commodity. In this way, investments and profits-gains contribute directly to the economy. For instance, economic gains can be obtained when a country produces and trades ICT knowledge or products. This generates direct revenue to the economy of the country. Indirect contribution, on the other hand, arises when ICT is used to facilitate other social and economic development activities. Typical examples include the utilisation of ICT in health services, agriculture, education, governance and commerce sectors. According to Kramer, Jenkins and Kats (2007), ICT facilitates such activities by providing various advantages. Consider for instance when ICT results into reduction of transaction costs and thereby improves productivity or the case when ICT contributes to the provision

of immediate and low cost connectivity for digital multimedia. Further, the use of ICT can result in improving efficiency, transparency and accuracy, increasing choice in the market place and providing access to otherwise unavailable goods and services. The often advantageous use of ICT is when it results in widening the geographical scope of potential markets, and allowing knowledge and information sharing to the global community.

Although the application of ICT4D promises benefits towards achieving human development, it may also cause some negative aspects. For instance, Yusoff & Lim (2003) posit that the application of ICT4D may accentuate social-economic inequalities amongst peoples and nations around the world. The United Nations reports (UN 2008, 2005) show that most of the Western countries have made significant progress in harnessing the benefits of ICT in their development. 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. However, leapfrogging opportunities still exist if developing countries will intelligently exploit ICT for development (Ensley, 2005).

Successful implementation of ICT4D requires a sound understanding of the implementation context. Heeks (2005) argues that lack of adequate understanding of the context may result into design-reality gap. Such a situation may limit the realisation of the expected benefits of deploying ICT4D. This may have severe consequences such as loss of money, time, trust and reputation. Accordingly, it is imperative to identify, understand and address issues that may influence successful implementation of ICT4D. Otherwise, little developmental benefits will be gained from ICT.

The literature presents various issues potential to influence successful implementation of ICT4D. These include inadequate human capital, inadequate technical infrastructure, literacy and financial capability, among others (Ensley, 2005; Hamelink, 1997, ITU, 2007, UN,

2008). The UN (2008) for instance, observes that such issues may include infrastructure, policies, capacity development, ICT applications, knowledge management and customer care practices, which determine any success in government ICT initiatives. The International Telecommunication Union (ITU) (2007) emphasises that access to ICT, high tariff costs, and the slow growth of an ICT industry have negatively influenced the implementation of ICT4D.

The issues presented in the literature have differing magnitude and importance in different contexts (Yonazi, 2010). Accordingly, successful implementation of ICT4D requires an informed decision making in the processes of designing, developing and deploying relevant initiatives in a particular context. This can be achieved by identifying contextual issues influencing the implementation process. Unfortunately, in the Tanzanian context, limited knowledge is available regarding contextual issues related to ICT4D implementation in the country. Accordingly, the purpose of this study is to contribute towards bridging this knowledge gap. This paper aims to establish issues that may facilitate or challenge successful implementation of ICT4D in the country. The researchers further provides a new view on such issues and recommend possible measures relevant for advancing ICT4D in Tanzania.

ICT4D in Tanzania: An Overview

Cognizant of the role of ICT in development, Tanzania has embarked on various ICT4D initiatives in the country. Typical examples include the implementation of various ICT initiatives in sectors such as the government, business, health and education (IICD, 2008; Sawe, 2007). Progress in ICT infrastructure improvement and local contents development has also been reported (Yonah, 2005). The government plans to streamline and implement more ICT4D initiates across the country (URT, 2003). The aim is to facilitate development activities in the country and boost social-economic growth (ibid).

Although Tanzania is continuing to invest in ICT4D, the country is slow in making significant progress in ICT initiatives (UN, 2008). The UN reports that the country experiences inadequate application of ICT in its development priorities as stipulated in the National ICT Policy (UTR, 2003). This situation hampers the pace and direction of social and economic development in the country. Interestingly, few studies (e.g. Mutagayhwa, Kinyeki and Ulanga, 2007) have been conducted to assess the situation and provide relevant recommendations relevant to advance ICT4D implementation in Tanzania. The researcher has not come across a study which has dealt with facilitators and challenges of ICT4D in the country. This indicates that ICT4D practitioners in Tanzania are inadequately informed on how they can successfully implement ICT4D. Left unaddressed, this situation may lead to failure of ICT4D initiative in the country (Heeks, 2005). Accordingly, in this study the researcher aims at establishing key issues, potential to facilitate or challenge successful implementation of ICT4D in the country.

In this attempt, the researcher defines the facilitators as issues which currently provide a favourable environment for the successful application of ICT4D in a particular context. Understanding such issues informs ICT4D practitioners on factors that can be exploited or influenced when planning or evaluating ICT4D-related initiatives. The researcher termed such issue as *facilitators of ICT4D.* On the other hand, challenges refer to issues that need to be addressed; otherwise, they can potentially hinder successful implementation of ICT4D in Tanzania. The researcher termed such issue as c*hallenges of ICT4D.*

Methodology

Several reasons were considered and influenced the researcher's choice on the fitting approach for this study. First, it is observed that the ICT4D concept is still new in Tanzania. Therefore, the actual meaning of what respondents and other data sources inferred needed to be interpreted rather than predetermined. Second, the researcher anticipated encountering data availability challenges especially from the government organizations. Third, the study was intended to identify issues typical to Tanzania. Accordingly, the researcher observed that the Grounded Theory Approach (GTA) was a fitting strategy for this study - GTA (Strauss and Corbin, 1990). In GTA, a researcher is facilitated to inductively derive meanings from data by systematically utilizing a set of procedures (Strauss and Corbin, 1990, p.24). In this study, this was achieved through open, focused, axial and selective coding of the data (ibid). This approach helped to explore the context and identify and interpret possible categories. This process was useful in highlighting relevant insights emerging from the data.

The researcher collected data from various sources. These include ICT practitioners, non-ICT practitioners and ordinary ICT users. The researcher also collected data through observation and analysed various documents. ICT practitioners provided this paper with insights of how ICT is being currently applied in development initiatives. They also informed on possible facilitators and challenges on implementing ICT initiatives in the country. Other sources provided the researcher with referential information concerning ICT4D in Tanzania.

Interviews, workshops and focus group discussions (FGDs) were used to collect opinions and experiences from both experts and users. Observations were made during researcher's site visits to Mwanza Municipal Council, Internet cafes in Dar es Salaam, Morogoro, and Zanzibar. The researcher also participated in a high level government meeting held at Utumishi office on 3rd March, 2009. Literature-based sources such as policies, reports and other recorded evidences were analysed at the beginning of the study and at the end of data collection. Interviews were useful for capturing personal accounts of the respondents, while FGDs were instrumental in revealing and discussing new issues and clarifying doubts. Literature- based sources were consulted to serve us with recorded and historical evidences.

The researcher collected data from four regions in Tanzania; namely, Dar es Salaam, Morogoro, Mwanza and Zanzibar. Dar es Salaam was selected because it is the main business city of Tanzania. Morogoro and Mwanza were relevant sources to represent other regions in Tanzania with less business activities compared to Dar es Salaam. Zanzibar gave us information from the other side of the Union of the United Republic of Tanzania (URT).

The selection of potential respondents was done by first contacting professionals from the President's Office Public Services Management, Tanzania Global Development Learning Centre and Sharing Ith other People Network. . The professionals were interviewed and requested to suggest other potential respondents. This method helped to reduce researcher's bias in selecting respondents because the researcher had no control of who will be invited; hence minimising biasness.

Data Capturing Procedures

In this study, ICT experts as well as ordinary users were interviewed. The respondents were from the government, private sector, Tanzanians in Diaspora, Non-Governmental Organizations (NGOs) and the United Nations (UN) office in Dar es Salaam (Table 1). Interviews were arranged to take place at respondents' most convenient locations, while those in distant places (e.g. in the diasporas) were contacted by various ICT means (e.g. phone or skype). The paper used semi-structured interview guides to facilitate the flow of the interviews. All interviews were recorded except when respondents felt uncomfortable. The researcher conducted 29 interviews, and each had an average duration of 80 minutes.

Table 1: Interview Respondent Profile

Category	Number
Government	13
Private Sector	6
Diaspora	5
NGOs	3
UN	2
Total	**29**

Three main workshops were conducted with participants from the government, private sector, academia, United Nations and NGOs (Table 2). Additionally, there was organised one focus group discussion with respondents from the Tanzania Commission for Science and Technology (COSTECH). At the beginning of each workshop and discussion session, the researcher provided an introductory presentation to familiarise the participants with the research topic, aims and the information they were expected to contribute. The participants were divided into smaller discussion groups, and given them 40 to 60 minutes for discussion. Each group was given a guide to facilitate the discussion. Later, a joint group discussion was convened whereby groups presented their findings. This approach proved useful because it facilitated active participation, probing and clarification of unclear concepts.

Table 2: Workshop Participants Profile

Category	Number
Government	9
Private Sector	14
Academia	10
UN	3
NGOs	4
Total	40

Data Analysis and Presentation

This paper has followed the Straus and Corbin's (1990) framework of data analysis. 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.

The results are linked to data through codes, quotes, and/or field notes. Appendix I and II presents the codes and selected quotes respectively. The researcher makes reference to codes where F and C letters denote facilitator and challenge respectively. Reference is made to quotes, but the confidentiality of the interview respondents is maintained. Therefore, the respondent is denoted in each quote as R.Y where R stands for respondent and Y for the number assigned to a particular respondent (e.g. R.5 represents respondent number 5). Likewise, quotes are denoted as QX where Q means quote and X is quote number.

Findings

In this study, the researcher was able to identify various issues potential to facilitate and challenge successful implementation of ICT4D in Tanzania as detailed below.

Facilitators of ICT4D

This paper identifies four issues with a potential to facilitate the implementation of ICT4D in Tanzania. They are (1) affordability of ICTs; (2) availability and adoption of technologies; (3) supportive social infrastructure (levels of literacy and Kiswahili as a homogenous national language); and (4) presence of government commitment.

Affordability of ICTs

The researcher deduced that the current level of affordability of ICT equipment is one of the key facilitators of ICT4D in Tanzania (Table 3). This issue was prompted by the fact that the government removed the Value Added Tax (VAT) on computers in July 2000 (Miller *et al.,* 2004). VAT on other ICTs was 20% until July 2009 when the government reduced it to 18% (UTR, 2009). As a result, the cost of computers decreased, which facilitated the uptake of ICT in the country. This is especially evident in urban areas where the number of internet access points (e.g. cybercafés) and the ownership of personal computers have increased significantly. Second-hand computers can be bought with a price of TSh.[1] 150,000 (about USD 150). 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. Such prices allow middle-income people, particularly in urban areas, to own a computer at home and a mobile phone. However, it is still expensive for the poor based in rural areas, and low-income people in the urban areas.

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[1] Tanzanian Shillings

Table 3: Affordability of ICTs

Category	Codes	Quote	Observation
Affordability of ICT	F1-8	Q1	Prices of ICTs are falling. This makes it possible for more people to buy and own ICTs particularly Radio, TVs and mobile phones

Availability of Domesticable Technologies

This category relates to technologies with high domestication potential. This is termed as *'Domesticable Technologies'* (Table 4). They are such technologies which ordinary households can acquire and own for domestic use.

Table 4: Affordability of ICTs

Category	Codes	Quote	Observation
Domesticable Technologies	F9-12	Q2	Availability of domesticable technologies provides people with available ICT infrastructure within their reach. Technologies are such as radio, TV and mobile phones. People are able to domesticate such technologies and access information.

Indicators that point to these issues include the availability of 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 (Table 5). Also noticed is the increase of TVs, and radios in rural areas. The researcher observed that the availability of such technologies provide an infrastructure that if used innovatively, can advance the implementation of ICT4D in the country.

Table 5: Voice Telecommunication Subscribers by Providers (2000 - 2009)

YEAR	Provider								
	BENSON	CELTEL	TIGO	TTCL Fixed	TTCL MOBILE	VODACOM	ZANTEL MOBILE	ZANTEL Fixed	TOTAL
2000	-	-	56511	173591	-	50000	4007	-	284109
2001	-	-	89056	177802	-	180000	6501	-	453359
2002	-	120089	160000	161590	-	300000	26770	-	768449
2003	-	320000	210000	147006	-	700000	68000	-	1445006
2004	-	504000	303000	148360	-	1050000	85000	-	2090360
2005	-	882693	422500	154420	-	1562435	96109	-	3118157
2006	-	1516832	760874	150897	6390	2975580	355246	747	5766566
2007	3300	2505546	1191678	157816	72729	3870843	678761	5453	8486126
2008	3000	3862371	2569527	116265	105804	5408439	1057652	7544	13130602
2009	3101	4910359	4178089	157321	115681	6883661	1378595	15601	17642408

Source: TCRA (as at December, 2009)

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 (Table 6). 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. This is particularly so in the development of local electronic services and digital contents.

Table 6: Supportive Social Infrastructure: Literacy and Language

Category	Codes	Quote	Observation
Supportive Social Infrastructure: Literacy and Language	F13-14	Q3	Language and literacy are important social infrastructures relevant for ICT initiatives. They are particularly useful for the development of local content development.

Presence of Government Will

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 (Table 7).

Table 7: Presence of Government Commitment

Category	Codes	Quote	Observation
Presence of government Commitment	F16-24	Q4	The involvement of the president and establishment of various institutions to further ICT in the country are key facilitators of ICT in Tanzania

An important observation is that several actions by the government indicate the presence of political will and support for ICT. Specific aspects identified include the intent highlighted in all key national policies, presence of ICT coordination frameworks and active involvement of the national top leadership in initiation and support of ICT initiatives. Such issues contribute to creating a supportive environment for the success of ICT initiatives in the country.

Challenges Facing ICT4D in Tanzania

The researcher identifies four categories of issues potential to challenge the success of ICT4D in Tanzania. They include (1) inadequate connectivity; (2) content (service) issues; (3) organisational issues; and (4) people-related issues.

Inadequate Connectivity

Connectivity challenges relate to the difficulties that organisations or individuals encounter when deploying or accessing ICT-enabled initiatives. The researcher relates this issue to the inadequacy of the ICT networks and other supporting infrastructure in the country (Table 8).

Table 8: Inadequate Connectivity

Category	Codes	Quote	Observation
Inadequate connectivity	C1-6	Q5	Although there is a significant availability of telecommunication services, radio, TV and phones, rural areas still do not have access to such technologies. Roads, electricity and other supporting infrastructure need to also be improved for better access.

Typical examples of this issue include the inadequate availability and spread of broadband, lack of electricity and even limited coverage of mobile phone networks (Table 9). ICT equipment, especially computers, is still not widely available, particularly in the rural areas. This impedes the possibility of stimulating demand and deployment of ICT4D initiatives across the country.

Table 9: 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[2]	0.2879
World average e-readiness index	0.4514
World leader e-readiness index[3]	0.9157

Source: Source: UN, 2008

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[2] East Africa
[3] Sweden

Content Quality

The quality and quantity of the existing ICT enabled services are yet to meet user expectations (Table 10). For instance, much of the content, except news websites and blogs, is infrequently updated and also is not local. 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 useful.

Table 10: Content Quality

Category	Codes	Quote	Observation
Content Quality	C7-2	Q6	The presence of poor quality digital content is a key problem. The majority can't comprehend English but also unavailability of value added services do not encourage people to use the content.

Other possible content quality issues include insufficiency and fragmentation of the provided services or information. Additionally, most of the websites, including government websites, are written in English. While English is the official language, most ordinary Tanzanians speak Kiswahili. Consequently, the available content is not perceived to be local. Other service-related issues include lack of responsiveness, incompleteness, lack reliability and dependability.

Organisational Challenges

Organisational challenges refer to the characteristics or issues which determine the aggressiveness and progress of an organisation towards ICT initiatives. Issues related to this category are the lack of leadership, organisational inertia, inadequate planning and unsupportive processes (Table 11).

Table 11: Content Quality

Category	Codes	Quote	Observation
Organisational Challenges	C13-20	Q7, 8	Internal organisational issues hinder innovation, streamlining and adoption of ICT. Issues such as planning, policies, laws and business processes need to be addressed. However, strong leadership is required to champion the addressing in favour of ICT.

It is observed that projects with strong leadership conviction and commitment were successful (e.g. the Sengerema community centre project). Other projects stagnated when committed leadership ceased (e.g. the Kilosa community centre project). 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 et al., 2007). For example, inadequate planning has led to lack of implementation of the National ICT Policy (URT, 2003). Consequently, no responsibility was assigned to any government body. The policy remains a legacy document with minimal interpretation and implementation. The situation is similar at sectoral levels with exception of the Ministry of Education and Vocational Training (URT, 2007). The researcher could not identify other sectoral strategies available on how the national ICT policy will be implemented.

People-Related Issues

Three people-related issues describes as important for the application of ICT4D; namely, adequacy of ICT skills, ICT awareness and mindset (Table 12). Although various initiatives are being

deployed in Tanzania, many citizens, 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.

Table 12: People-Related Issues

Category	Codes	Quote	Observation
People- related Issues	C21-27	Q9, 10	It is imperative that ICT awareness and skills and mindset are enhanced in Tanzania. Alternatively, ICT Initiatives need to be developed to accommodate the current situation. This will also need to reflect the financial affordance of the people, especially in the rural areas.

The third issue relates to unsupportive mindsets particularly among the older generation presently in decision-making positions. This may have a historical reason as the Government of Tanzania banned the use and importation of ICT (e.g. TVs, computers) in the early 1970s. As a result, the ownership and use of these technologies was perceived to be illegal and a luxury. The long-term effect has been that 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, inadequate support, prioritisation and advocacy of ICT from the policy, implementation and use levels.

Discussion

In this study, the researcher aims at establishing issues potential to facilitate or challenge successful implementation of ICT4D in Tanzania. The paper established that possible facilitators include affordability of ICTs, availability of domesticable technologies, presence of supportive social infrastructure and presence of government will. On the other hand, issues potential to challenge the implementation of ICT4D in Tanzania are inadequacies in connectivity, content quality, organisational issues and people-related issues.

Facilitators of ICT4D

The results of this study are supported by the literature. For instance, various studies have been undertaken on issues related to the importance of affordability of ICTs (e.g. Cawley & Hynes, 2010; UN, 2012); affordability availability of domesticable technologies (NAO, 2002); literacy and language (Fourie, I. Krauss, 2011; Henson, 2005), government will and support (Venkatesh *et al.,* 2003). However, in most cases, they are presented from a challenge perspective. In the present case, it was found that although they may be inadequate, their presence facilitates ICT4D. Further, innovative advancement and exploitation of such factors may contribute to the success of ICT4D. Accordingly, the government and other ICT stakeholders of Tanzania need to embrace this perspective for the advancement and success of ICT initiatives in the country.

Challenges of ICT4D

Issues related to adequacy of connectivity have been widely discussed (e.g. EOCD, 2007; InfoDev, 2002; UN, 2008, 2005). These issues are expected especially in a developing country context. Inadequate access infrastructure is currently challenging the advancement of ICT initiatives for development in Tanzania. It is therefore necessary that access infrastructure is enhanced to facilitate the streaming into development activities. In the Tanzanian context, this can be achieved through innovative use of existing access infrastructure such as mobile phones, TV and radio. In this way, ICT initiatives will extend and reach more people especially in the rural areas.

Studies that relate to the value of content in ICT initiatives exist (e.g. Kumar et al., 2007; Tan, Benbasat, & Cenfetelli, 2008). It has been argued that poor quality of the content may greatly contribute to failure of ICT-related initiatives. This was also the case in Tanzania. A particular quality aspect is the use of foreign language to present local content. Adoption of bilingual strategy could be useful to address this issue (UN, 2012).

Organisational issues have also received the attention of researchers (e.g. Ho & Ni, 2004; Mgaya, 1999). Organisational issues such as poor championship, unsupportive business processes and legal framework are common in the developing countries context. Possible strategies relevant to addressing such issues may include the integration of monitoring and evaluation, and awareness raising mechanisms in all stages of ICT initiatives (Wagner *et al.,* 2005).

Various authors have provided insights similar to the people-related issues (Diminitrova & Chen, 2006; Ebrahim & Irani, 2005; Gupta et al., 2008; Ho & Ni, 2004; Venkatesh, 2003; Warkentin et al., 2002). It has been suggested that inadequacies in user characteristic particularly the awareness, ability to operate ICT equipment and mindset may impede the implementation of ICT4D. Accordingly, governments and other stakeholders need to devise mechanisms to mitigate or address such issues. Strategies such as education and awareness campaigns may be useful in addressing such issues (Yonazi, 2010).

Suggested View of Facilitators and Challenges of ICT4D in Tanzania

The facilitators and challenges identified in this study offer a new understanding of implementing ICT4D in Tanzania. Consequently, the researcher observes that when a current challenge is adequately addressed, it may turn into a facilitator. Likewise, ignoring the current facilitator may create a future challenge for ICT4D. For instance, addressing the current adequacy of content may turn into a facilitator. Similarly, ignoring the potential of the existing social infrastructure may create a challenge to the accessing and adoption of ICT4D initiatives.

The above view is depicted in Figure 2. The figure shows the current challenges of ICT4D in the low side of the continuum of adequacy and facilitators to the high side. Addressing a challenge may result in moving it towards the high adequacy side, while ignoring a facilitator may shift it towards the low-side of the continuum. Accordingly, efforts should be made to address challenges, exploit and advance facilitators and maintain them on the high side of the continuum of adequacy.
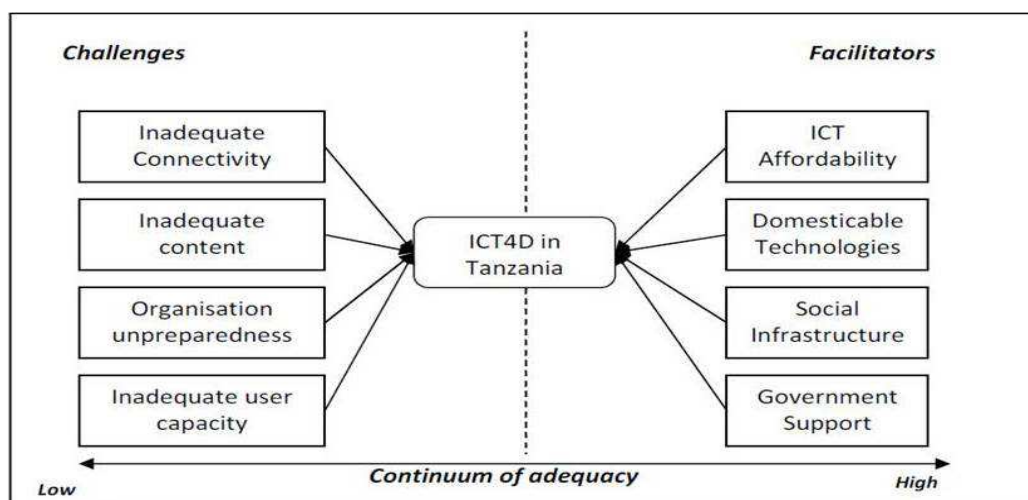

Figure 1: Facilitators and Challenges of ICT4D in Tanzania
(Source: Own Conceptualisation)

Conclusion

In this study, the researcher identifies issues that will likely facilitate and challenge ICT4D in Tanzania. The researcher argues that it is important to understand and exploit the facilitators, while addressing the challenges in favor of ICT4D. The paper therefore introduces a new view regarding the position of challenges and facilitators of ICT4D in Tanzania. It is concluded that it is possible to successfully implement ICT4D in Tanzania through addressing challenges and exploiting facilitators. These results may be useful to ICT4D initiatives in Tanzania. However, they may be applicable in the contexts of other similar developing countries. Accordingly, improvements such as prioritisation of issues and customization need to be considered.

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Appendix I: Coding of the Key Categories

Code No.	Open coding	Axial Coding	Focused Coding
F1	Cheapness of technology	Tax relief	Affordability of ICTs
F2	Tax relief		
F3	No tax on computers		
F4	Affordable because now		
F5	Chinese phones		
F6	People have phones		
F7	High adoption rate	High adoption rate	
F8	Everyone had a phone (adoption high)		
F9	Televisions are available	Availability of Technologies	Availability of Technologies with High Domestication Potential
F10	Radios are available		
F11	Having a Phone		
F12	Technology-need fit	Domestication	
F13	Know Kiswahili	Language homogeneity	Supportive social infrastructure
F14	One language Kiswahili		
F15	Education and Literacy level at 65%	Literacy level	
F16	Coordinating ministry	Coordination mechanism	Presence of government will
F17	Tanzania Regulatory authority		
F18	Universal Access Fund		
F19	Commission for Science and Technology		
F20	Minister is in this	Top Government support	
F21	National fibre project ongoing		
F22	Mkukuta, ICT Policy, 2003 + Other policies		
F23	Microsoft MoU		
F24	President support, top leadership support		
C1	Farmers can't use	Inadequate connectivity	Poor Connectivity
C2	No service for agriculture	Poor network coverage	
C3	No Network in villages		
C4	VODACOM Is not available here		
C5	Equipment unavailability in the rural	Unavailability of ICTs	
C6	Not everyone has a phone		
C7	There isn't much for me	Service inadequacy	Inadequate Content Quality
C8	Local content		
C9	No Swahili information	Local Information customisation	
C10	No updates		
C11	No information for agriculture	Information coverage	
C12	Updating information		
C13	Organisation inertia	Inadequate processes	Organisational challenges
C14	Procurement processes are hard		
C15	No law for ICT		
C16	No ICT Strategy		
C17	Poor planning		
C18	Resistance to change	Inadequate leadership	
C19	Where is the champion?		
C20	The leader left		
C21	Mindset	Mindset	People-related Issues
C22	Need to see a real person on a computer		
C23	Can't speak English	Need for Kiswahili	
C24	Can't afford a computer	Financial Affordance	
C25	Not my area of expertise	ICT Skills and awareness	
C26	No awareness		
C27	ICT literacy		

Appendix II: Sample Quotes

Quote no	Sample Quote
Q1	"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." R.1.
Q2	"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". R2.
Q3	"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.". R.3.
Q4	The value of ICT in Strategy for Growth and Reduction of Poverty (2005), National ICT policy (2003) and other sectoral policies such as the ICT policy for basic education (URT, 2007). *(Recognition of the value of ICT at the national top priority policies and strategies)* Ministry of Universal Communications Services Access Fund, Ministry of Communications, Science, and Technology, Commission of Science and Technology (COSTECH), and Tanzania Communications Regulatory Authority *(Establishment of ICT coordination and regulatory machinery).* Memorandum of understanding signed by H.E. Jakaya Mrisho Kikwete, the President of Tanzania, and the Chairman of Microsoft, Mr. Bill Gates in 2006 *(Involvement of top level leadership)*
Q5	"When you talk about ICT4D I undertand that you are considering people in towns. My parents in the village can't comprehend your concepts. They only have a radio. They do not have electricity, and even the phone i provided them with they have to charge using a car catter. R.11"
Q6	"Yes, our website is in English. It is not necessary that it remains so, but we are just used to develop websites in English. In the future we will develop a Kiswahili version. But, it is not our fault because even the minister sometimes gives his speeches in English..".R.9.
Q7	"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. Madiwani4 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". R.4.
Q8	"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." R.5.
Q9	"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." R.6.
Q10	"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." R.5.

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[4] Madiwani means local councillors