# An Assessment of Open Source Promotion in addressing ICT Acceptance Challenges in Tanzania

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**Abstract:** Information and Communication Technology (ICT) is regarded as an enabler of social and economic development. Due to various challenges, ICT has not been accepted and used effectively to assist with the socio-economic development in Tanzania. Worldwide Open Source (OS) is regarded as a technology that could foster and support ICT development, due to various factors such as cost of adoption. Several OS communities have been formed to create awareness of OS and the potential OS has to address ICT challenges. This study is an assessment of such OS promotion efforts in addressing ICT acceptance challenges in Tanzania specifically. The research design includes case studies done on four OS communities using document analysis, a questionnaire, interviews and participant observation during online discussions. In addition, interviews were conducted with OS end users and practitioners to evaluate the success of the OS promotion efforts. As contribution this study provides insight into the current situation in Tanzania with regards to ICT, as well as identify specific ICT acceptance challenges in Tanzania. Furthermore, the study assessed whether OS promotion efforts address the identified ICT acceptance challenges. The findings should be of interest to managers, researchers and practitioners interested in the current state of ICT acceptance in Tanzania, ICT acceptance challenges, as well as the current OC communities and whether OS could be used as an ICT mechanism to enable socio-economic development in Tanzania.

**Keywords:** ICT for socio-economic development, ICT acceptance challenge, OS, OS promotion

## 1. Introduction

Information and Communication Technology (ICT) is regarded as an enabler of social and economic development. The social and economic climate in developing countries results in challenges with regards to ICT acceptance because ICT is associated with cost and demand while the characteristics of developing countries, for instance, constrain cost and demand [4]. Therefore, due to various such challenges, ICT has not been accepted and used effectively to assist with the socio-economic development in Tanzania.

The following ICT challenges for Tanzania as a developing country in Africa as listed by Mushi [13] concur with the challenges listed in the current Tanzanian ICT policy document [24]. The challenges include the following:

1) Outside donor dependence whereby
   a. There is a low level of local manufacturing in ICT.
   b. Existing private sectors depend on ICT foreign dealers.
   c. Research institutions, including ICT research largely depend on donors from outside the country and the continent at large.
2) Lack of ICT experts - this is characterized by few ICT institutions and limited number of ICT trainers with necessary skills.

3) Language **-** Available ICT facilities are English tailored. Since the most popular language is the local Swahili language, a significant proportion of the population cannot follow instructions in English.
4) Low income wages by the local people make it difficult to purchase and use the existing ICT facilities.
5) Poor infrastructure **-** according to [13], only 14% of the country has electricity.

Against this background of ICT challenges the purpose of the study reported on in this paper is to identify relevant ICT acceptance challenges, as well as assess whether the Open Source (OS) promotion activities succeeds as a strategy in addressing ICT acceptance challenges in Tanzania. For the purpose of this paper, ICT acceptance challenges have a narrower focus than ICT challenges as the latter also comprises technological, infrastructural and cultural issues not dealt with here. The rationale is that OS acceptance could support and enhance ICT acceptance [18; 25] with the broader aim of harnessing ICT in addressing the social and economic development challenges in Tanzania.

Within this study OS is defined as any ICT program or software that is open to the public without any interference from the developer of the program or software such that the program or software is transferable and open to modification to suit different demands. ICT acceptance challenges in this context are viewed as factors that negatively affect the willingness of a user or user group to employ ICT as a tool for the tasks and problems it could solve. ICT (Information and communication technology) is the use of hardware, software, services and supporting infrastructure to capture, process, store, manage and disseminate information [18].

Greenberg [8] categorizes ICT into three ways depending on how long they have been in use:

- new ICTs based on digital communications (computers, satellites, mobile phones, the Internet, e-mails and multimedia devices),
- old ICTs(radio, television, land-line telephones and telegraph),
- really Old ICTs (Newspaper, books and libraries).

ICT's categorized as new ICTs are facilitated by technical terms known as software and hardware, software is defined as written programs, procedures, rules and instructions that are executed by a computer to accomplish a specific task. These software instructions run on physical devices known as hardware.

Given this background, the paper reports the findings of the study on the assessment of OS promotion activities in Tanzania in addressing ICT acceptance challenges. The paper is organised as follows: Section 2 provides background specifically with regards to OS, OS characteristics and OS acceptance in developing countries. In Section 3 the research objectives are explicated while the research design and methodology are discussed in Section 4. The data analysis and findings are discussed in Section 5 and the conclusion is presented in Section 6.

## 2. Background

### 2.1   Open Source (OS)

To evaluate OS promotion efforts, an understanding of OS features is required. [20] defines OS as software for which users have access to the source code that distinguishes it from most commercially published software that allow users only access to the object code(proprietary software). Free OS Software (FOSS) copyright licenses allow everyone to read, modify, and redistribute the source code, so programmers can improve and adapt the software, and fix bugs. And the software can be shared with others, so users can give it to their colleagues and friends [1]. *OS* is typically developed through public collaboration, it is

available to anyone (usually at little or no cost), it does not require proprietary license fees and it may be freely re-distributed [1].

OS can be viewed as software itself or as an approach to software implementation. As software, the product created is accessible and can be modified, distributed, sold without putting any patent to it. On the other hand, OS can be viewed as an approach to create free software in a collaborative, visible but controlled environment to ensure better end product. For the purpose of this study, OS is viewed in both the two ways and the adopted definition of OS is any ICT program or software created in a collaborative way such that the software is open to the public without any interference from the developer of the program, and the developed program is transferable and open to modification to suit different demands. Since OS circulation is not essentially controlled, modalities of circulation, including costs are solely determined by transacting individuals.

OS has very specific licensing requirements that pertain to the distribution and source code. OS allows for free software distribution, redistribution and modification of source code and free license distribution universally without discrimination [14]. The source code may be distributed but there are specifications protecting the integrity of the author's source code. In Section 1.2 OS characteristics are described in more detail and in section 1.3 the use of OS in developing countries are discussed.

## 2.2 *Characteristics of Open Source*

OS has features that facilitate a more favourable environment for ICT acceptance than proprietary software. Table 1 depicts the characteristics of OS that form the basis for promoting OS as an option in addressing ICT acceptance challenges in developing communities. Note that the aspects of cost, skills improvement and cooperative development directly address the first, second and fourth ICT challenges listed in section1.

*Table 1: Characteristics of OS*

| Characteristics | Description |
|---|---|
| Security and Quality | There are many developers working on a project and because source code is provided, inspection is done by many. Because of multiple inspection, quality is also assured (Ford 2007; O'Reilly 1999) |
| Cooperative development | The internet and online fora have lead to the formations of various communities of developers that work together and contribute code to OS projects (O'Reilly 1999; Rota et al. 2007) |
| Improving skills and innovation | Knowledge is being transferred and shared amongst developers and thus increases development skills. Problem solving tendency by OS brings innovation (O'Reilly 1999; Schroder et al. 2006; Johnson 2006; Kogut et al. 2001) |
| Cost effective | The software is free of charge for download and because it has a large group of developers working on it, it may reduce transactions cost (Johnson 2006; Chonia 2003; Bruggink 2003) |

## 2.3 Acceptance of Open Source in Developing Countries

The use of OS in developing countries is inspired by OS success in developed countries. Various studies have been done on how OS can be utilized in various areas [25; 11]. For example, [11] claims that a giant software company like Oracle uses 60% of OS web servers like Apache. Similarly, [25] states that nearly 40% of large American companies and 65% of Japanese corporations use Linux in some form. He also claims that the EU survey found out that 43.7% of German companies and 31.5% of British companies use OS. A special report by the Government Technology maganize [7] learns that 50% of the top websites in the US run on OS servers, and that out of 50 states in the United States, 47 states are already running OS while also 50% of government agencies use OS.

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Based on evidence of OS success in developed countries we consider the possibility that OS can also be successful in developing countries particularly by focusing on the factors that favour OS in developed countries. Although ICT has been viewed as a driving force behind development in developing countries in general and Africa in particular [21], ICT acceptance challenges have not been addressed. Moreover, the use of OS as one of the alternatives to ICT challenges has not been well recorded in developing countries, including Tanzania. ICT acceptance in developing country shows positive development [26]. This means that OS could add to successes in ICT acceptance, if OS promotion efforts can be strategically planned and implemented effectively. The next section describes the research design on investigating the success of OS promotion efforts where OS promotion is a strategy towards promoting ICT acceptance.

## 3. Research Objectives

The purpose of this research is to assess the promotion of Open Source in relation to ICT acceptance challenges in Tanzania where OS promotion is a strategy towards promoting ICT acceptance. This is guided the following research questions:

First main question: What are the perceived ICT acceptance challenges in Tanzania?

Second main question: How is OS promotion in Tanzania perceived? This question is delineated into the following sub-questions:
- How aware are people of the OS movement in Tanzania.
- How much support does OS receive from the Government and other major ICT stakeholders?
- What are the perceived advantages and disadvantages of OS in Tanzania?

## 4.  Research Design and Methodology

The research approach for this study includes both qualitative and quantitative approaches. The research strategies involved case studies on four OS communities that exist in Tanzania. Data capturing involved three methods namely participant observation, interviews document analysis and a survey.  Questionnaires were distributed via email groups to each of the OS member teams. The interviews and questionnaire were expected to provide answers to the two main questions and the sub questions on OS promotion as listed in section 3.  The OS community profiles are presented in Section 4.1 and the data capturing methods, namely questionnaires and interviews in Section 4.2.

### 4.1.    OS Community Profiles

Four OS communities were selected as case studies since community members would be most likely to provide an informed assessment of the OS promotion efforts. In the following subsections these communities are described in terms of their principal activities and operations.

| Table 2: OS community profiles | | |
|---|---|---|
| Name | Emblem | Description |
| *TAFOSSA* |  | TAFOSSA, short for 'Tanzania Free and Open Source Software Association' is an organization that aims to create awareness about OS movement in the country, build local capacity and coordinate development of free and OS software while ensuring integrity and conformity to the wider national ICT agenda. |
| *TLUG* |  | TLUG stands for 'Tanzania Linux User Group'. The main objective of TLUG is to provide a forum through which Tanzanians can meet and share their experiences in the development and usage of OS tools and technologies |
| *KILINU* |  | Kilinux is an open Kiswahili localization Project. Kiswahili is a Tanzanian official local language while English is the second. The main activity of Kilinux is, therefore, to make sure that any technical knowledge available in foreign languages is made available in Kiswahili. Distribute OS software freely and advocate for use of OS. |
| UBUNTU | | UBUNTU is one of various Linux operating system free distributors across the world. The Tanzania UBUNTU association team focuses on creating UBUNTU awareness in the country. |

The four OS communities have one common goal, namely to promote the use of OS in various areas of ICT application but the following differences in focus have been identified:

- TAFOSSA focuses mainly on creating OS awareness by coordinating various OS local initiatives
- Kilinux mainly strives to localize foreign knowledge through OS. For example, by having the knowledge translated into a local language.
- UBUNTU aims mainly at forming a community of UBUNTU users and so their scope is relatively limited in that very little consideration is given to the local situation.
- TLUG strives to create a large community of Linux users across the country

Given this background on what the four selected OS communities comprise, the next section presents the data analysis of the questionnaires completed by members of these communities.

*4.2. Questionnaires and Interviews*

To allow observation, the researcher joined in as an active member in each of the OS communities (TAFOSSA, TLUG, KILINUX and the TANZANIA UBUNTU

ASSOCIATION). As member it was possible to join the discussion fora, attend the seminars and the general meetings about OS matters arranged by the communities. Observation was used to note the member daily contributions via the communication tools. The communication tools provided room for developers to meet and share code and ideas on how to go about the projects. After gaining their trust, the researcher used a questionnaire and sent it to 40 of the four OS community members for completions. All the members responded by filling in the questionnaire and sending it back.

To determine the practical applicability of OS in the industry, another 10 respondents were interviewed using a researcher-administered questionnaire. The interview process involved the selection of 10 people that deal with ICT matters in the workforce, these included IT managers and end users. The findings from the interviews are triangulated with the findings from the survey and used to extend and explain the findings of the survey as the interviews allowed more in-depth data capturing. Table 3 shows the contribution of each of the OS communities to the survey and the interviews respectively.

| Table 3 The distribution of respondents from survey and interview | | | |
|---|---|---|---|
| **Facility** | **Members** | **Members surveyed** | **Members interviewed** | **Total Respondents** |
| TAFOSSA | 28 | 8 | 3 | 11 |
| TLUG | 23 | 7 | 2 | 9 |
| KILINUX | 30 | 8 | 3 | 11 |
| UBUNTU | 21 | 7 | 2 | 9 |
| **Total** | **102** | **30** | **10** | **40** |

## 5. Results and Findings

The findings are presented in the order of the research questions, therefore Section 5.1 present the findings relating to the ICT acceptance challenges in Tanzania and Section 5.2 presents the findings relating to the perception of OS promotion in Tanzania.

### 5.1. ICT Acceptance Challenges

The participants of the survey were asked to list ICT challenges facing the society of Tanzania. The results from the survey were categorized and the number of times each category was mentioned was tallied and depicted in column 2 of Table 4. It is evident from Table 4 that resource constraints (which referred to cost) is regarded as the most important ICT acceptance challenge, followed closely by lack of policy implementation and lack of knowledge and skills. The findings from the interviews administered to 10 respondents in relation to the five ICT acceptance challenges are also depicted in Table 4, again the results were categorized and the number of times each category was mentioned was tallied.

| Table 4: Interview results on selected ICT acceptance challenges | | |
|---|---|---|
| **Challenge** | **Importance based on frequency in surveys (%)** | **Importance based on frequency in interviews (%)** |
| Resource constraints | 93.3 | 80 |
| Context | 50 | 60 |
| Lack of knowledge | 66.7 | 100 |
| Policy | 73.3 | 70 |
| Language | 23.3 | 20 |

Considering the results from the interviews and the results from the survey it is observed that the same themes arise but the order of importance is different. For example,

resource constraints which are the most important determinants of ICT acceptance challenges as per survey results appear as the second important challenges in the interview results. The interviewees therefore consider lack of knowledge as the most important ICT acceptance challenge in Tanzania. This difference in outlook be explained by the fact that most of those involved in the interview were professionals in different fields including ICT and, therefore, for them education in the use of ICT was more important than resource constraints. Furthermore the issue of cost could be seen as less prominent by this group due to the circulation of OS products which were perceived as relatively affordable. Language was not frequently listed; this can possibly be attributed to the selection of respondents. The aim of these questions were to capture ICT acceptance challenges and not to prioritise them therefore the focus should be on the factors listed and not the rating.

## 5.2. OS promotion in Tanzania

As noted, the question on how OS promotion is perceived in Tanzania has been deconstructed onto three sub questions and each of these will now be considered.

### 5.2.1. How aware are the people on the OS movement in Tanzania?

The awareness was judged by considering the results to three questions. Each question together with the response is now presented.

- How many other external partners does the open source community you belong to have? The survey results showed that 13% of the participants selected less than 5 external practitioners as partners, 7% selected between 5 and ten and the rest (80%) selected more than 10 external practitioners as partners.

- How many events (seminars, workshops or meetings) have your open source community conducted annually? Participants reported that there were a few seminars per year; all selected the option for between 1 and 5 which means that five is the maximum.

- What was the success of the events? The survey results showed that 8% judged the success as very low, 55% of the respondents judged the success of the seminars as low, 33% as moderate and 4% as high.

In conclusion it can be said that there is an awareness of the OS communities as evidenced in the fact that most OS communities has more than 10 external partners, they hold annual events but the success of these events are perceived mostly as low to moderately successful.

### 5.2.2. How aware are the people on the OS movement in Tanzania?

The findings show that not more than five government institutions partnered with the OS community in OS movements while more than ten private institutions partnered with the OS community in the movements. Fig 1 below depicts the number of Government and Private Institutions supporting the OS communities in Tanzania.
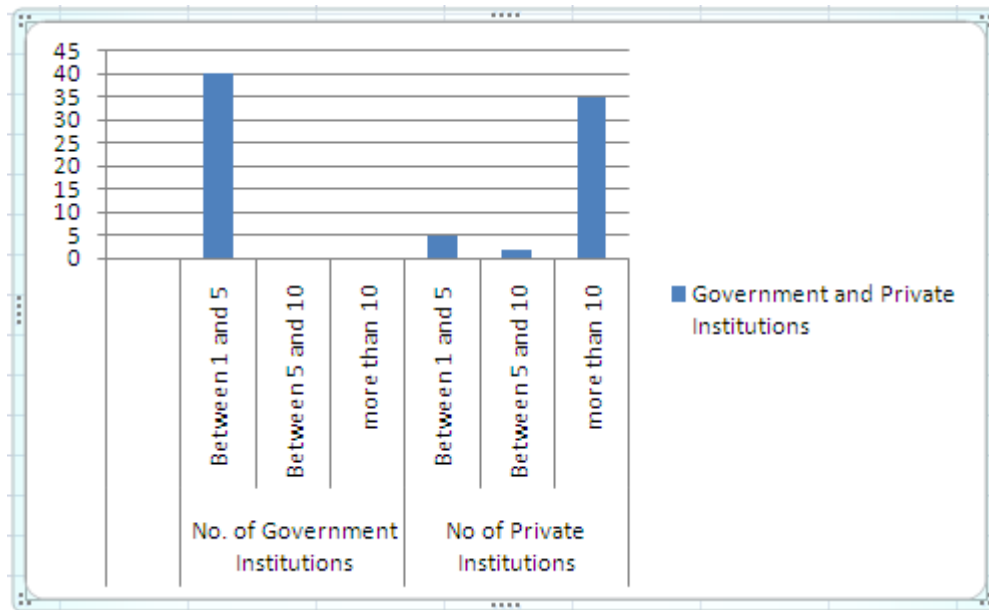
*Fig 1. Government and Private Institutions supporting OS communities*

Based on these findings it is reasonable to conclude that both government and the private sector are involved in the promotion of OS in the country. However, there were differences in the manner the two agencies impinged on the promotion. For the government the main activity was to formulate policies and regulations that could set favourable conditions for growth, adoption and sustainability of OS. For instance, the Tanzania government ICT policy document [24] recognized OS as an important aspect of ICT penetration among the population. Despite the policy formulation, the government did not explain the practical application of the policy through establishment of institutions that could both inspire and promote the spread. This implies that the government has stopped at the level of propaganda instead of mentoring promotion on the ground. Consequently, there was no single government producer or distributor of ICT software in general and OS in particular. As seen earlier in the literature, [4] identifies the lack of government commitment to enforce ICT policies and regulations as an obstacle to ICT growth within a nation. Hansen, Kohntopp and Pfitzmann [9] argue for the importance of government involvement claiming that government engagements in OS movements reduces system acquirements cost as well as enhancing security issues. This means that if the government stands on the fence with regard to OS production, circulation and promotion the industry is also adversely affected.

### 5.2.3.  What are the perceived advantages and disadvantages of OS in Tanzania?

This was done by examining what the respondents knew about OS and what they do with OS and also the way they compared OS and the proprietary software. Through the interview (question 7 and 8) and the survey (questions 7a-7b) information was sought on how the respondents perceived of OS in terms of features associated with it.  Figure 2 shows the positive features of OS in the view of the respondents based on their experiences with OS as per survey.
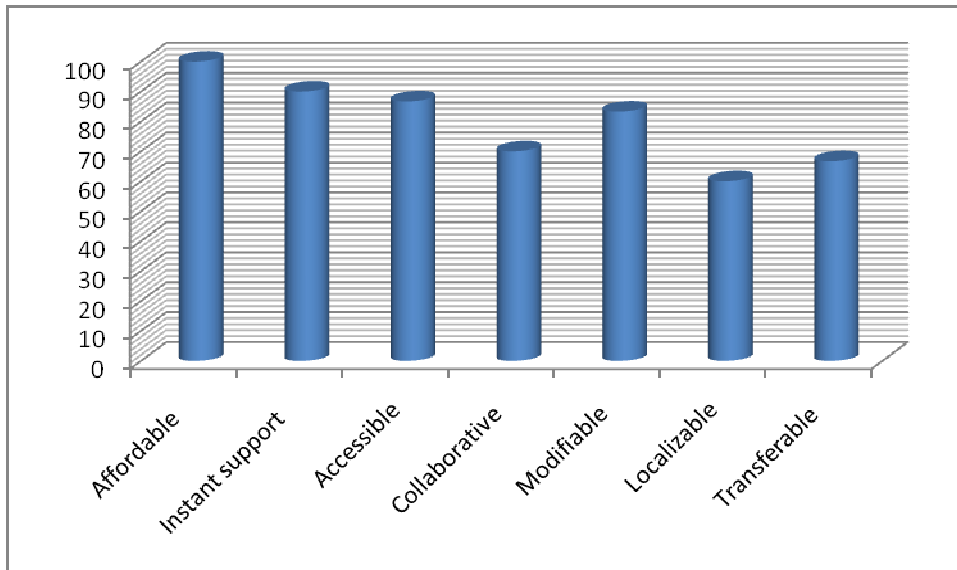
*Figure 2: OS perceived positive features in percentage as per survey (Field data)*

In addition to the findings from the survey depicted in Figure 2, data was also captured from the interview (items 7 and 8) to establish what the respondents take to be positive attributes of OS. Results are as shown in Figure 3
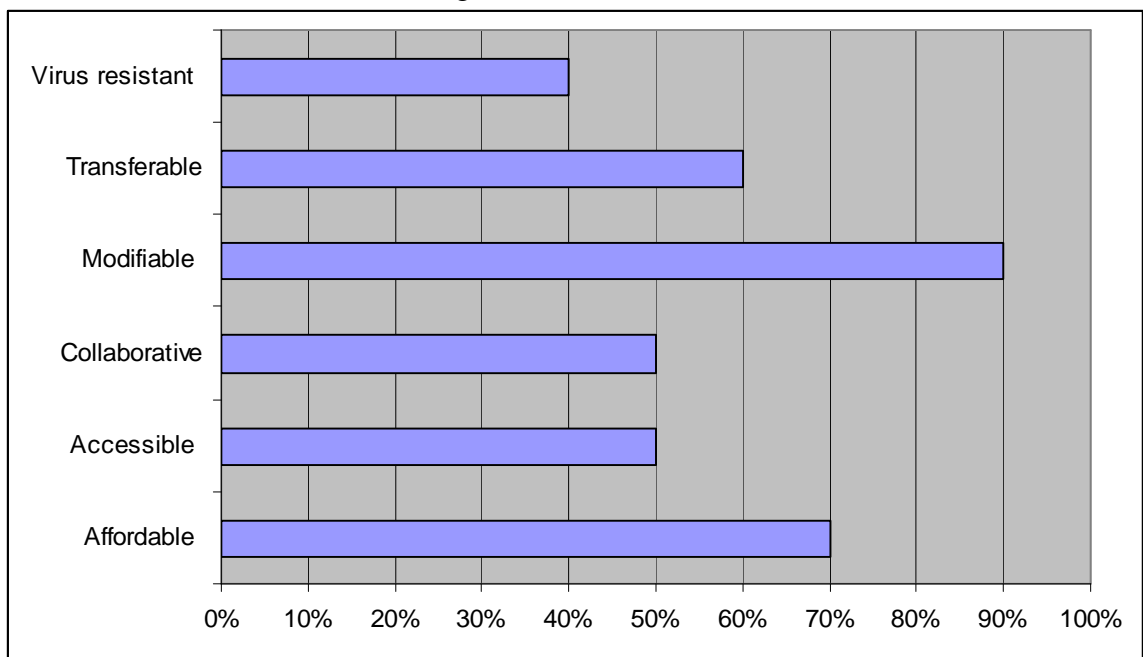


*Figure 3: OS perceived positive features in percentage as per interview (Field data)*

Based on the findings from survey and interview, respondents indicated that they have experience in some features of OS, which shows that the respondents used OS, though in varying degrees. The goals and methods of surveys and interviews are too different to directly compare the data but it is interesting to observe the most salient feature of OS is affordability as per survey by over 90% whereas modifiability is more significant among the interviewees by 90%. Again this inclination could be attributed to the fact that the interviewed group were more technical as they were professionals in different ICT related projects while most of those involved in the survey only participated in OS online communication and so cost was an important factor as well.

## 6. Discussion

This paper reports on the results and findings of a study that had as objective the assessment of open source promotion in addressing ICT acceptance challenges in Tanzania. Based on an analysis of the responses to a survey and interviews with members of four OS communities in Tanzania the following was concluded. The perceived ICT acceptance challenges in Tanzania were indentified as:

- Resource constraints,
- Lack of knowledge,
- Lack of policy; and
- Lack of context and language.

Resource constraints (including cost) and lack of knowledge were indicated to be the most important with government policy as a new factor in ICT acceptance challenges that may also influence the broader ICT challenges. Regarding OS promotion in Tanzania, it was found that the members of the OS movement were aware of OS promotion efforts but there was mixed results on the success of these efforts. There was evidence of involvement from both the Government and other major ICT stakeholders in OS.

The common aspects which featured in the survey and interview pertained to

- Limited number of discussions in the forums (survey 73%).
- Members are not frequent visitors/not very active (interview 70%).
- Limited number of workshops (interview 80%).

Policy and regulatory issues featured in the interview only, whereby six interviewees (60%) showed that there were problems regarding policy and regulation of OS promotion and general use of ICT. Specifically, there was a lack of policy reinforcement and guidance pertaining to the use of OS in marginalized sectors like agriculture and small businesses. Moreover, through participation in and observation of the activities of the OS communities researcher could note that

- Most of the communities have no specific hierarchy of leadership.
- There were no really specific teams responsible for certain task.
- The only discussion was on initiated projects.
- Some members did not reside in the country

The perceived advantages of OS in Tanzania were found to be the cost effectiveness feature of OS, seen as key to development facilitated by ICT within the country. Furthermore the accessibility of source code to influence local software development for modification and customization and facilitate software skills development. Finally, OS prohibits vendor lock in, i.e. no single choice of vendor as found in proprietary software

The disadvantages include a negative perception of unreliability found upon usage of OS software within some organizations in Tanzania. The unreliability is caused by the absence of an official and consistent enterprise support system that ensures maintenance, upgrades and management of developed OS software. Other disadvantages include difficulties in obtaining reliable documentation and the requirement of a specific set of skills which is rare and can actually be expensive.

## 7. Conclusion

This study investigated OS promotion efforts in addressing ICT acceptance challenges in Tanzania. The first objective pertained to the identification of perceived ICT acceptance challenges in Tanzania. Analysis of the responses to a survey and interviews identified ICT acceptance challenges as resource constraints, lack of knowledge, lack of policy and lack of context and language as the challenges. Identified OS advantages in Tanzania namely free

distribution and transferability were listed as factors that could positively influence ICT acceptance in Tanzania. Free distribution addresses the resource constraint challenge that is mostly indentified as cost to ICT access. The challenge of context and language is addressed by the customization (modification) feature of OS within a local society.

The second objective was to determine how OS promotion is perceived in Tanzania and whether it addresses ICT acceptance challenges. ICT acceptance challenges are viewed to be addressed on a theoretical level by what is being stated as strategies by the Government policies and OS community constitutions. However, the strategies employed seem to lack proper execution. Therefore, the major concern is whether the strategies employed address what they are meant to address. With regard to open source communities for instance, there seems to be a gap between what is articulated in the constitutions and other relevant documents and what happens in practice. To conclude on the aspect of strategies employed in promoting open source in Tanzania, it could be said that the strategies can address the challenges associated with ICT acceptance in the country but certain conditions have to be met to make the strategies successful.

The contribution of this study is firstly to identify relevant ICT acceptance challenges in Tanzania, secondly, investigate the current OS promotion communities and their activities, and lastly, to identify the gaps in OS promotion in Tanzania in relation to ICT acceptance challenges. Furthermore, some recommendations are presented as to how OS promotion could be a more effective tool in alleviating ICT acceptance challenges in Tanzania.

The main gap identified is that OS communities do not address the perception users have that OS is complex. Data collected from observation methods and interviews has shown that OS in Tanzania is viewed as technology that lacks proper enterprise support by IT experts. Only users familiar with OS technology found it user friendly and end users of ICT in Tanzania perceive OS to be a bit complex without proper support. However, if OS could be used frequently and if proper support is available, usage experience and functionality will facilitate ICT usage and acceptance in Tanzania. All this tells us that promotion activities should be preceded by situational and needs analysis of different professions and sectors of the economy to make the promotion both meaningful and comprehensive. The scope of the research was limited to four OS communities in Tanzania. Future research should entail a larger sample that includes respondents outside the OS community. It should also be useful to consider specific ICT acceptance challenges investigate how the execution of OS impacts the listed challenges.

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# Appendix

## UNIVERSITY OF SOUTH AFRICA

## QUESTIONNARE ON OPEN SOURCE PROMOTION IN TANZANIA

| BACKGROUND: |
|---|

Below are demographic questions of which the appropriate answer is selected by marking an X on the provided box

1. Age:

| 20-30 | | 30-40 | | 40-50 | | Above 50 | |
|---|---|---|---|---|---|---|---|

2. Gender

| Male | | Female | |
|---|---|---|---|

3. Occupation:
_____

4. IT Experience:

| IT professional | |
|---|---|
| System analyst | |
| Computer technician | |
| End User | |
| Other IT related experience | |

5. IT experience (number of years)

_____

| OPEN SOURCE (OS) |
|---|

6. List the perceived ICT acceptance challenges in Tanzania
_____
_____
_____

7a. List the advantages of Open source in Tanzania
_____
_____

7b. List the disadvantages of Open Source in Tanzania
_____
_____

## OPEN SOURCE PROMOTION EFFORTS

The following are used to promote OS. Please indicate how important you find each of the following in promoting the acceptance of OS in Tanzania by making a cross 'X' over the most appropriate answer.

8. Establishment of OS communities

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

9. Implementation of Online discussion forums?

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

10. Free software distribution

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

11. Seminars and workshops on OS

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

12. Campaign for OS policies

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

13. Academic education about OS applications

| Totally unimportant | Unimportant | Neither Important nor Unimportant | Important | Very Important |
|---|---|---|---|---|
|  |  |  |  |  |

What other open source promotion efforts done in Tanzania that you are aware off?

_____

_____


## PROMOTION EFFORTS AND ICT CHALLENGES:

**VENDOR DEPENDENCY**
Vendor dependency in OS communities:
14. Are you a member of an existing open source community in Tanzania?

| YES |  | NO |  |
|---|---|---|---|
|  |  |  |  |

15. How many open source communities in Tanzania are you aware off?

| Between 1 and 10 | | Between 10 and 20 | | More than 20 | |
|---|---|---|---|---|---|

16.  How many active members are there on average per each community?

| Between 1 and 10 | | Between 10 and 20 | | More than 20 | |
|---|---|---|---|---|---|

17. Can an organization rely upon IT solutions that might be offered by the open source community?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

**SKILLS:**
18 How would you rate the average IT skills of each member per community?

| Very Low | | Low | | Moderate | | Higher | | Very High | |
|---|---|---|---|---|---|---|---|---|---|

19. What is the level of online project contribution of the members in the online community public discussions?

| Very Low | | Low | | Moderate | | Higher | | Very High | |
|---|---|---|---|---|---|---|---|---|---|

20. What type of IT skills do you think are mostly addressed under various topics posted by members on open source community online forums? Please prioritize by placing a number on an empty line: 1 being highest value and 5 lowest

| | Level |
|---|---|
| Computer literacy | |
| Computer programming | |
| Computer troubleshooting | |
| Data handling | |
| Basic IT knowledge | |

**ICT AWARENESS**
21. How many other external partners does the open source community you belong to have?

| Between 1 and 5 | | Between 5 and 10 | | More than 10 | |
|---|---|---|---|---|---|

22. How many events (seminars, workshops or meetings) have your open source community conducted annually?

| Between 1 and 5 | | Between 5 and 10 | | More than 10 | |
|---|---|---|---|---|---|

23. How would you rate the level of success of conducted seminars to the public?

| Very Low | | Low | | Moderate | | Higher | | Very High | |
|---|---|---|---|---|---|---|---|---|---|

**COST**

Open Source movements are widely known in their efforts to offer free and downloadable software. Do these efforts address?

24. Product purchase cost?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

25.  Product licensing cost?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

26. Product maintenance cost?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

27. Product distribution cost?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

28. Product training cost?

| Strongly disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|

**GOVERNMENT AND PRIVATE SECTOR SUPPORT**

29. How many private sector companies have partnered in your open source movements?

| Between 1 and 5 | | Between 5 and 10 | | More than 10 | |
|---|---|---|---|---|---|

30. How many government institutions have partnered with your community in its open source movements?

| Between 1 and 5 | | Between 5 and 10 | | More than 10 | |
|---|---|---|---|---|---|

31. What level of assistance is given by the government to the open source community?

| None | |
|---|---|
| Very Limited | |
| Limited | |
| Substantial | |
| Very Substantial | |

32. What level of assistance is provided by private institutions in the open source community?

| None | |
|---|---|

| | |
|---|---|
| Very Limited | |
| Limited | |
| Substantial | |
| Very Substantial | |

33. Besides open source promotion efforts mentioned previously, what other efforts can be used to address common ICT acceptance challenges in Tanzania?

_____

_____

_____

_____

_____