

Citizens' Readiness for Remote Electronic Voting in Tanzania

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Abstract

Remote electronic voting through Internet or mobile phones can potentially increase citizens' electoral participation in countries with low voter turnout such as those in Sub-Saharan Africa. This paper measures citizen's readiness for remote electronic voting in Tanzania. Factors influencing citizens' readiness were identified. These factors were further analyzed using SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. Primary data were collected from eligible voters using questionnaires. Using descriptive statistics and Chi-square, we determined socio-demographic and technical factors impacting voters' perception of remote electronic voting versus the current paper ballot system. The results indicate that the majority of Tanzanians prefer remote electronic voting as an alternative to the existing voting system. However, they have concerns related to security, privacy and reliability of this new technology. We conclude that remote electronic voting entails a promising opportunity to increase voter participation in Tanzania; however the "right" enabling environment should be created to ensure its successful implementation and sustainability.

Keywords: Remote Electronic Voting, Electronic Government, Voter Turnout, Voter Participation, Security, Reliability, Enabling Environment, Information and Communication Technology, SWOT Analysis

1. Introduction

1.1 Background and Rationale for the Research

Electronic Government commonly abbreviated as "e-Government" is the use of ICT to enhance work efficiency and improve service delivery in order to meet the needs of the public in a responsive and transparent manner [15]. The Tanzanian government adopted e-Government strategy in 2009 and since then has implemented a number of collaborative projects in order to foster e-Government in the country. These projects include (1) expansion of the national ICT backbone infrastructure, and (2) implementation of national identity system. The national identity project has already started delivering, among other things, unique biometric identity cards to Tanzanians [21]. The government has also established a semi-autonomous e-Government agency responsible for overseeing smooth implementation of e-

government projects in the country [20]. Today the availability and use of ICT increases in many areas. According to the figures from the Tanzania Communication Regulatory Authority (TCRA), in 2013 there were about 26.5 million mobile phone subscribers and these figures seem to be increasing exponentially [19]. Moreover, a significant number of people in Tanzania have already made it a matter of routine to pay their domestic bills and make purchases over the Internet and mobile phones. This is perceived as an enabling factor and opportunity for implementation of unsupervised remote electronic voting in Tanzania. The purpose of e-Government is to bring government closer to citizens. From this point of view, the next step is to offer citizens an opportunity of active participation in democratic processes through ICT. One of the most challenging topics in the area of electronic participation is unsupervised remote electronic voting. Remote electronic voting can be considered as being the supreme discipline of all e-Government applications due to its conflicting priorities of unique identification and perfect anonymity [16]. Despite the challenges caused by its nature, remote electronic voting in general is of interest and currently being discussed in Tanzania.

Remote electronic voting has been introduced to national elections in many countries worldwide with the aim of improving voter participation. These countries include Brazil, Canada, Estonia, France, Germany, India, Ireland Italy Netherlands, Nigeria, Norway, South Africa Switzerland United Kingdom (UK), and United States of America (USA). Literature shows that electronic voting has been successfully implemented in some countries such as Estonia while others, including USA, have decided to abandon these projects due to security concerns [2].

Tanzania, being one of the developing countries, is also planning to move from the current controlled paper-based voting system to the Controlled e-Voting System (CVS) in 2015 national elections [3]. It is also expected that the country will embark on remote electronic voting in the future elections in order to increase voter participation. The need for remote electronic voting in Tanzania is driven by many factors. One of these factors is that citizens living abroad are in need of remote voting opportunities, since voting from abroad has proved to be

difficult, depending on the country in which the citizen resides [9]. There are only few people who are capable of returning to their home country to vote on Election Day. They are, therefore, in need of a platform that will enable them to exercise their constitutional right to vote while abroad, considering their notable contribution into country economy. The introduction of remote electronic voting will not only be an improvement for voters living abroad, but also for voters residing in Tanzania.

Therefore, as Tanzania is planning to adopt remote electronic voting system, it should be noted that the remote electronic voting systems implemented in developed countries cannot be adopted as they are as each country has different requirements and local specifics [6]. Also the existing models were implemented without considering security issues in a holistic way. Security issues are usually overlooked and perceived from a pure technical dimension [22]. As such it is prudent to firmly start addressing the existing issues and challenges of remote electronic voting systems including security issues prior to its adoption and use in the country. This will enable the country to mitigate the risks and not to face problems that other countries have experienced with this new technology.

This paper therefore measures the readiness of Tanzanian citizens to participate in the initiative of implementing remote electronic voting in Tanzania by identifying strengths, opportunities, weakness and threats that can have impact on accelerating or slowing down the adoption process. The paper is a part of an ongoing research which aims at developing a holistic model for secure unsupervised remote electronic voting system for future general and parliamentary elections in Tanzania.

1.2 General Objectives

The main objective of this survey was to measure the readiness of Tanzanian citizens to participate in the initiative of implementing remote electronic voting in Tanzania by identifying strengths, weaknesses, opportunities and threats that have impact on accelerating or slowing down the adoption process

1.3 Specific Objectives

The specific objectives of this survey were

- i. To identify strengths and weaknesses of Tanzanian society impacting readiness and ability of citizens to participate in the initiative of remote electronic voting
- ii. To identify opportunities associated with remote electronic voting in Tanzania
- iii. To identify potential threats to remote electronic voting from the point of view of the public
- iv. To recommend strategies for improving citizen readiness for remote electronic voting in Tanzania.

2. Methodology

We used the collected survey data to measure the degree to which citizens are prepared to use remote electronic voting services. This was done through identification and analysis of citizen specific factors influencing the readiness for remote electronic voting. The analysis of these factors was done with the aid of SWOT analysis technique. Both soft copy and hardcopy questionnaires were prepared and distributed to the eligible voters. We also utilized part of the remote electronic voting classification model adopted from Sussha and Kripp [18] to develop the questionnaires. The model is based on systemic holistic model [22].

2.1 Population and Sampling Method.

The population of all citizens above 18 years old (eligible voters) was considered appropriate. According to the census report of 2012, a total number of Tanzanians above 18 years old was 22,424,397, which is 50 percent of the total population [13]. The sample size was computed by the following formula [7]:

$$n = \frac{Z^2 \times p \times q \times N}{e^2 (N - 1) + Z^2 \times p \times q} \dots \dots \dots (1)$$

N = size of population, n = size of sample = acceptable margin error (the precision = 0.05), Z= the value of the standard variate at 95 percent confidence level, p = sample proportion, q = 1 – p; where q= 0.5

In order to have a fair representation of a sample, the population was stratified into five regions, namely Mwanza, Mtwara, Dar es Salaam, Kigoma, Zanzibar and Dodoma. These regions were selected based on the size of area and geographical location. The sample size of the entire population was estimated at 400. We distributed more than 500 questionnaires and received responses from 413 respondents.

2.2 Profiles of the Respondents

All the respondents were 18 years old and above. The majority of the respondents (59.8 percent) included individuals with age from 18 to 45 years old and 40.2 percent were aged 46 years and above. Among them, 60.2 percent were male and 39.8 percent were female as presented below in Fig 1.

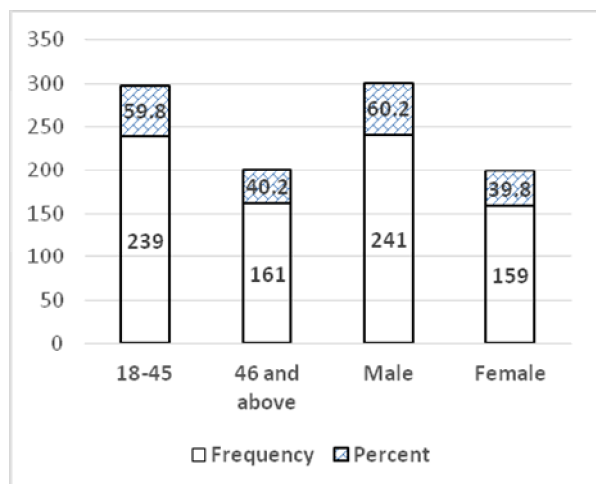


Fig. 1: Profiles of the respondents in terms of age and gender

With regards to educational level, a number of the respondents with university and college education was larger than the number of the respondents with other educational levels including primary, secondary school both Ordinary Level (O-Level) and Advanced Level (A-Level). The majority of the respondents (37.5 percent) and 25.8 percent of the respondents had at least university and college education qualification respectively, whereas 18.8 percent and 10.5 percent had secondary qualification of both A-level and O-level respectively and 7.5 percent of the respondents had only primary qualification. Fig. 2 represents educational levels of the respondents.

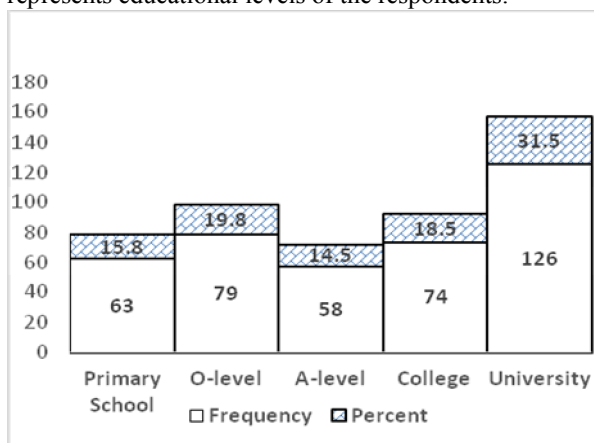


Fig. 2: Educational profile of the respondents

2.3 Data Collection

Primary data were collected using both soft and hard copy questionnaires. The questionnaires were prepared according to the remote electronic voting classification model adopted from Susha and Kripp [18]. In order to ensure validity of the questionnaires, a pilot study was conducted prior to distributing them to respondents. The pilot study was conducted via email communication. The

questionnaires were delivered to 63 respondents. Responses from 15 respondents were received, and necessary improvements to the questionnaires were made. The improved versions of the questionnaires were distributed manually and via Internet to the members of general public.

2.4 Reliability and Goodness of Fit Measurement.

Reliability test was conducted by using Statistical Package for Social Sciences (SPSS) to analyze the internal consistence of the questions; the calculated Cronbach's alpha was 0.998 and alpha was most suitable. Furthermore, a Chi-square test was conducted to assess goodness of fit for all research questions. The results show statistical significance

2.5 Data Processing and Analysis

The content analysis technique was used for processing and analyzing descriptive data. We also used SPSS and Excel to analyze data. Various analysis techniques included descriptive statistics, especially frequency and a Chi-square test which was used to measure both goodness of fit and relationship between variables. The results were presented using charts.

3 Results and Discussions

3.1 Citizens' Readiness for Remote Electronic Voting

We measured the degree to which citizens are prepared to use remote electronic voting services. This was done through identification and analysis of citizen specific factors influencing the readiness for remote electronic voting. The identified readiness factors were, as follows: (1) citizens' regular usage of mobile phone or Internet to conduct business transactions; (2) trust and confidence in electoral process; (3) level of ICT and electronic voting literacy; (4) security, privacy, reliability; (5) system implementation cost; (6) democratic liturgy; and (7) existence of legal framework to support remote electronic voting. These factors were analyzed using SWOT analysis technique. We modified a conceptual framework adopted from Abdelghaffar. I. A [1] to guide us in measuring citizen's readiness for remote electronic voting. The framework assumes the existence of low level of citizens' readiness for remote electronic voting. We expect that following readiness assessment and once the gaps are identified and improved the citizens will be shifted from being non electronic ready (Non-e-ready) and be able to use remote electronic voting services in future. Fig 3 shows the modified conceptual framework for measuring citizens' for remote electronic voting in Tanzania

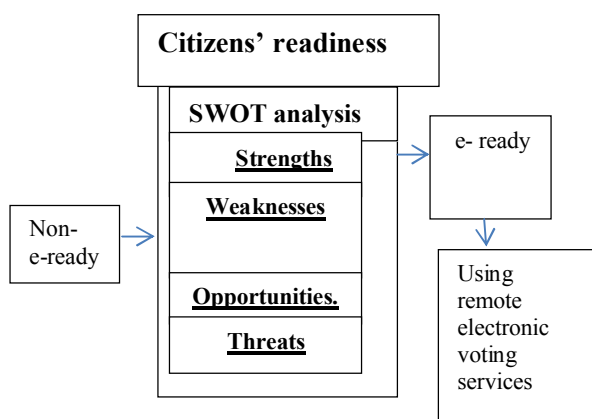


Fig. 3: Conceptual framework for measuring citizens' readiness for remote electronic voting

3.1.1 Strengths

3.1.1.1 Citizens' Trust and Confidence in Electoral Process

The analysis of the collected data shows that 78 percent of Tanzanian citizens have confidence in election processes and National Electoral Commission of Tanzania (NEC). This high level of confidence would be an advantage for the introduction of remote electronic voting in the country. Trust in remote electronic voting can be viewed in the context of general trust in public institutions. There is a relationship between trust in different public institutions such that people with a high level of trust in one institution also tend to trust the other institutions, while distrust in one is related to distrust in others [4]. Thus we can conclude that the observed high level of trust in NEC and overall administration of election in the country may have influence on the level of trust in remote electronic voting in Tanzania. However, those few citizens who exhibited disbelief in the freeness of NEC and administration of the election in general may pose a challenge when it comes to the adoption of remote electronic voting systems in the country. Therefore, the reputation and legitimacy of NEC and the overall quality of election administration is a fundamental prerequisite for the successful implementation of electronic voting in the country. Fig. 4 represents confidence of the respondents in electoral process.

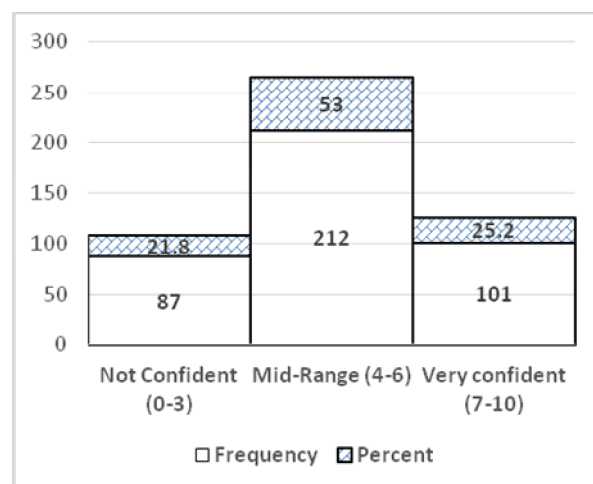


Fig. 4: Confidence in electoral process

3.1.1.2 Access to Financial Services Through Mobile Phones and Internet

A significant number of people in Tanzania have already made it a matter of routine to pay their domestic bills, make money transfer and make purchases over the Internet and mobile phones. The findings show that more than 55 percent of mobile phone users use their mobile phones to conduct financial transaction frequently while 18 percent use it rarely. This is an indication that they are likely to be able to vote through their mobile phones as it follows a similar process, except that in this case they will be selecting their preferred political candidate instead of choosing a service or product from the catalog. We perceive this development as an opportunity for implementation of remote electronic voting in Tanzania. Fig. 5 shows frequency of use of Internet and mobile phones for financial transactions.

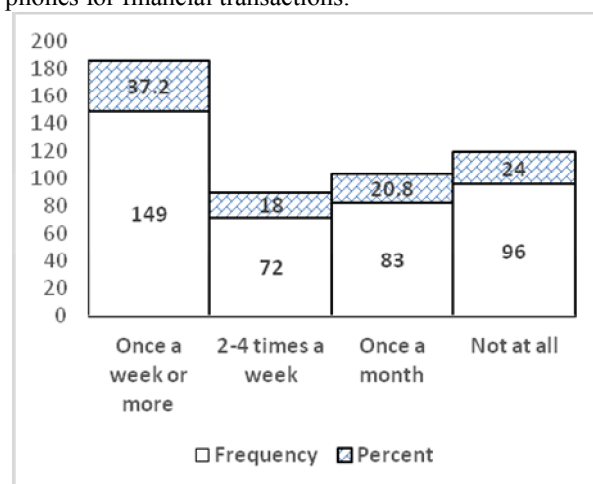


Fig. 5: Frequency of use of Internet/mobile phone for online purchasing and payment

3.1.2 Weaknesses

3.1.2.1 Low Level of ICT Literacy and Unawareness of Remote Electronic Voting

Despite the government efforts to promote ICT education in the country, Tanzania still has a low level of ICT and electronic voting literacy. We noted that 52 percent of the respondents were ICT illiterate whereas 21 percent had some ICT knowledge, and 19 percent had average ICT knowledge. A small group of respondents (nine percent) considered themselves as experts in ICT. Fig. 6 below indicates the level of ICT literacy among respondents.

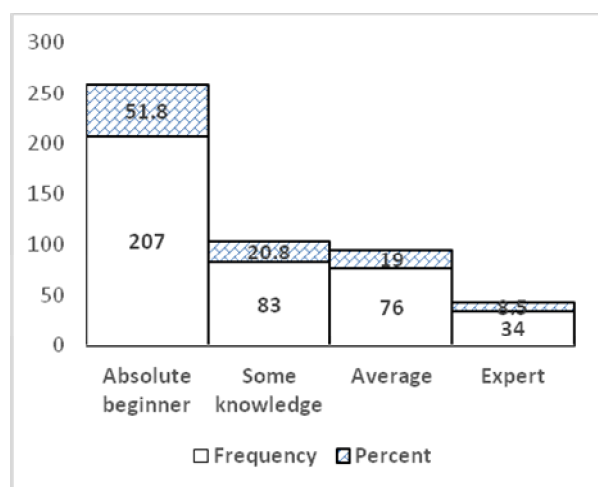


Fig. 6: Level of ICT literacy among respondents

We also collected and analyzed the data on awareness of Tanzanians towards remote electronic voting system. The majority of respondents (67.2 percent) were unaware of it. The government recognizes the potential of ICT as a tool for improving education delivery as evidenced through the national strategies and policies. The Tanzania Vision 2025 identifies the potential of ICT to address most of the development challenges including those presented by education [14]. The National ICT Policy of 2003 recognizes that ICT can enhance education opportunities and advocates for the introduction of an e-education system [11]. The national ICT policy for basic education of 2006 also recognizes the need to integrate ICT in pre-primary, primary, secondary and teacher education, as well as non-formal and adult education [10]. However, these policies are not comprehensive enough to address electronic voting issues and their implementation faces a number of challenges. Such challenges include lack of adequate infrastructure (equipment, electricity, facilities and connectivity) especially in rural areas [14]. If ICT and electronic voting literacy level will not be improved, a significant number of eligible voters will not be able to use remote electronic voting system securely and

effectively. Thus high level of ICT and electronic voting literacy is among prerequisites for the introduction of remote electronic voting in the country

3.1.2.2 Fear of Lack of Democratic Liturgy among Citizens

When asked whether casting the vote in a private setting (from home, work etc) is feared to diminish the symbolic value of the voting process (democratic liturgy), the majority of respondents (41 percent) strongly supported the statement. This indicates that some voters would still like to vote at polling stations as the action of casting a vote is perceived as part of a democratic socialization process. In other words voters would like to feel as part of political community.

3.1.3 Opportunities

If well implemented, remote electronic voting entails opportunities to citizens as well as government. Remote electronic voting will increase accessibility, improve processing of the results and make voting more convenient for citizens [5]. This means that remote electronic voting will encourage more voters to cast their vote remotely and increases the likelihood of higher voter turnout. Eligible voters will be able cast their vote in an electoral district other than the one where they are registered. More than 61 percent of the respondents commented that remote electronic voting will improve voters' participation in elections. On other hand, election administration cost will be reduced in long run and hence reduce cost burden on the citizens.

3.1.4 Threats

Respondents expressed a number of concerns regarding potential threats in connection with the implementation of remote electronic voting in Tanzania. These threats relate to the issues of security, reliability and privacy and implementation cost. Whilst a significant number of respondents (55 percent) conducted financial transactions via Internet and mobile phones, they were only willing to do it through well-established websites and reputable mobile operators that their family members and friends had used safely and recommended them. Of the participants who do not conduct online financial transactions, the largest number (46.5 percent) indicated security and privacy concerns as the reason which prevented them from doing it and 27.2 percent of respondents preferred personal interaction (again due to privacy considerations). Limited access to either Internet or mobile networks was another factor mentioned by 11.8 percent of respondents as a reason for not conducting financial transactions through Internet/ mobile phones

whereas 9.5 percent indicated that they did not need it and five percent did not indicate any reasons.

3.1.4.1 Security Threats

One of the most significant threats to the citizen participation in remote electronic voting is perceived inability of authorities to ensure security and secrecy of electronic ballots. Respondents were concerned that there might be a fraudulent behavior that would lead to legitimate voters being cheated. There is a possibility for political groups to commit a wide-scale fraud in order to safeguard their political interests. Respondents were also of the view that the system could also be sabotaged with the aim to disrupt the entire electoral process. The threat of sabotage was connected to political terrorism. If these threats materialize, there would be a possibility for the political violence or even civil war to happen. One of the respondents (a voter and ICT expert) has written:

"I totally agree with an idea of introducing remote electronic voting in Tanzania but prior to that we need to have a good preparation such as having the most reliable central database for citizens that will be used to identify all eligible ones who are supposed to exercise their voting rights. ICT security should be well designed and implemented to insure proper verification of all those who are going to be involved in the voting process".

3.1.4.2 Lack of Reliability

As it is for security, reliability is among the key requirements for any voting system. Lack of a reliable system may lead to harming of democratic principles which in turn may lead to dissatisfaction of election stakeholders. The issue of reliability was linked to the issue of lack of reliable ICT infrastructure and a stable power supply in the country. According to the statistics of 2013, only 18.4 percent of the total population was connected to the national power grid with only two percent of these being in the rural areas [12]. Unstable and reliable power may prevent from the introduction of a wide scale remote electronic voting system.

3.1.4.3 Threats to Privacy

Vote privacy is probably the most important requirement for democratic election and became mandatory for public elections in most countries as a way to prevent coercion and bribery [17]. The majority of the respondents (46.5 percent) expressed their worries that casting their votes through the Internet or mobile phones might allow someone to trace whether they had voted and how exactly. This is also against fundamental voting principle and election law which require a secret ballot.

3.1.4.4 Implementation Cost

Normally the cost of implementing electronic voting system is high while the prospective short term returns are uncertain. The majority of the respondents (49.70 percent) agreed that the initial system implementation cost is very high. In this regard respondents were concerned about how much it would cost them as individuals or taxpayers to vote electronically. Since voting is a constitutional right, it was strongly argued that there should be no any fee associated with this service. The major concern here is how the implementation of such a system would be funded and how to provide for its financial sustainability. Respondents' responses on the implication of high system implementation costs are shown in Fig 7

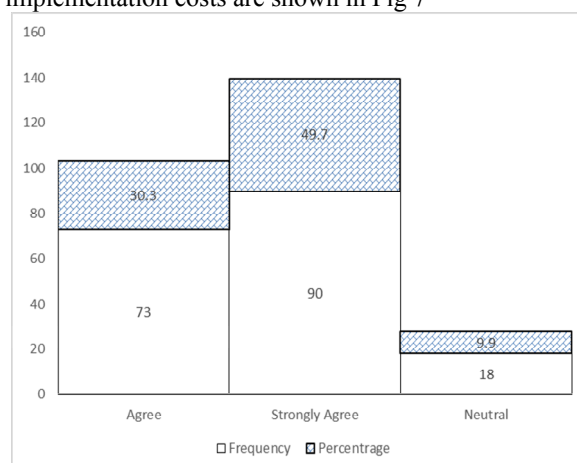


Fig. 7: Respondents' responses on the implication of high system implementation cost

3.1.4.5 Lack of Legal Framework

Respondents also expressed their concern on the legal issue. Lack of the necessary legal framework can seriously affect implementation of remote electronic voting as the making of amendments is a lengthy process. According to the current Tanzanian legislation, remote electronic voting is not permitted. The National Elections Act Chapter 343 [23] and its provisions are based on traditional voting procedures by which the voters insert a paper ballot in the ballot box at polling stations. If the remote electronic voting is introduced as an option, the jurisdiction pertaining to elections should be amended. Until such amendments have been made, however, opportunity should be given to run pilot projects regulated by provisional legislation.

3.2 Respondents' Preference on the Suitable Way of Voting and Their Acceptance of Remote Electronic Voting

Although a number of threats to the use mobile phones and Internet to vote during parliamentary and presidential

elections were identified, remote electronic voting was found acceptable by the majority of the respondents. We asked the respondents to choose among four voting options which included (1) website, (2) touch-screen, (3) mobile phone, and (4) other voting options. In the latter case the respondents were asked to specify what exactly option they would prefer. The majority of respondents (37 percent) preferred mobile phone to be used in casting the vote followed by website with 23 percent respondents. Voting at an Internet kiosk as another voting channel was suggested by 22 percent of respondents suggested while 18 percent proposed a touch-screen.

We were also interested to know whether citizens perception on their acceptance of the idea of implementing remote electronic voting in the country. We asked the respondents to choose among four options which included (1) "definitely (absolutely sure)", (2) "probably (considerable certain)", (3) "unlikely" and (4) "I do not know". The majority of the respondents (66 percent obtained after adding "definitely" and "probably" responses) supported the idea of introducing remote electronic voting in the country. Despite the fact that the majority of the respondents approved the use of the system, yet 23.5 percent were against it mainly due to security and reliability concerns. This gives us an indication that citizens are willing to accept remote electronic voting if the security issues are addressed properly.

Public responses on the acceptance of remote electronic voting are shown in Fig. 8.

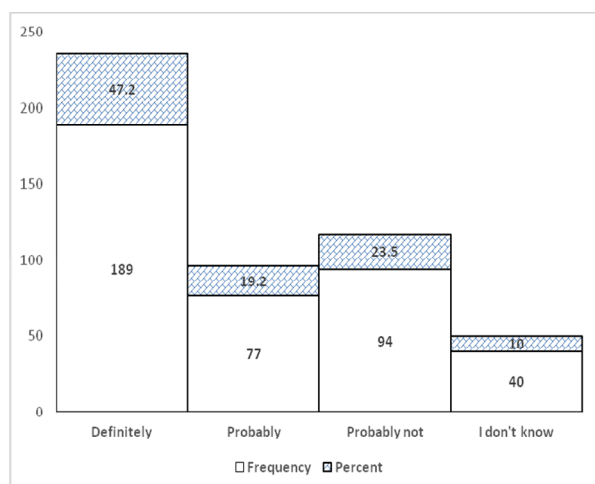


Fig. 8: Public response on the acceptance of the idea of implementing remote electronic voting in Tanzania

3.3 Correlation between Variables and Chi-Square Tests

We assessed whether there was a significance relationship between (1) respondent's educational level, (2) age, (3)

frequency of use of mobile phones for conducting financial transaction and citizen's acceptance of remote electronic voting system in Tanzania. Chi-square tests were carried out in order to assess if there was a significant relationship between the variables. The Chi-square test was used because the given variables were qualitative and categorical in nature [8]. Before interpretation of the Chi-square tests; we ensured that all the assumptions were fulfilled. These assumptions were as follows: (1) variables should be qualitative or categorical, (2) the categories are mutually exclusive, and (3) the minimum expected count is not less than five. In the case where any assumption was violated, we used exact p-value (*values associated with significance test i.e. a test where all assumptions, upon which the derivation of the distribution of the test statistic is based, are met*) to interpret the results rather than an asymptotic method. The minimum count for the relationship between the given pair of variables was above five. Hence the assumption was not violated. We selected five percent level of significance, the calculated p-values for all pairs of variables were less than five percent indicating that there is a significant relationship between the given set of variables.

3.3.1 Correlation between Level of Education and the Citizens 'Acceptance of Remote Electronic Voting

Educational level variable had five categories, including (1) primary school, (2) O-level, (3) A-level, (4) college and (5) university. The acceptance of electronic voting system expressed by respondents had four categories: (1) "definitely (absolutely sure)", (2) "(probably considerably certain)", (3) "unlikely" and (4) "I do not know". The null hypothesis in this case was that there is no relationship between the educational level and citizen perception on the acceptance of remote electronic voting system. The alternative hypothesis was that there is relationship between respondents' level of education and their acceptance of remote electronic voting system. The null hypothesis was rejected at five percent level of significance. This means the null hypothesis which suggests that there is no significant relationship between the educational level of the respondents and their acceptance of remote electronic voting system in Tanzania had to be rejected while the alternative hypothesis had to be accepted. Thus individuals who have relatively higher educational levels are more likely to support the implementation of remote electronic voting system than others

3.3.2 Correlation between Respondents' Educational Level and Their Preference of the Most Suitable Way of Voting

Educational level variable had the same categories as described above. Respondents' preference of the most suitable way of voting in Tanzania involved (1) paper-based voting, (2) electronic voting and (3) other ways of voting (as specified by respondents themselves). The null hypothesis in this case was that there is no significance relationship between the level of education and respondents' preference on the most suitable way of voting. The alternative hypothesis was that there is a significance relationship between the level of education and preference on the most suitable way of voting. The findings from the SPSS table show a Chi-square statistic value of 66.128^a with eight degree of freedom while asymptotic p-value is 0.000. This means that there is a significant relationship between the educational level of the respondents and preference of the suitable way of voting system in which electronic voting system was the choice of the majority.

3.3.3 Correlation Between Age of the Respondents and Their Preference of the Suitable Way of Voting

Age was set in two main categories, (1) 18-45 years and (2) 46 years old and above. Preference of the most suitable way of voting has the same categories as described above. The null hypothesis in this case was that there is no significance relationship between the given variables. The alternative hypothesis was that there is a significant relationship between respondents' age and preference on the most suitable way of voting. Null hypothesis was rejected at five percent level of significance. After performing chi-square test by cross tabulation between the variables the results indicates chi-square statistic value of 41.129^a with two degree of freedom and asymptotic significance p value is 0.000. The results suggest that there is a significant relationship between respondents' age and preference on the most suitable way of voting. These results reveal that unlike elderly voters, younger voters are more likely to become early adapters of the remote electronic voting and demonstrate a higher level of trust in the system. The reason could be that younger generation is perceived to put more preference on electronic communication.

3.3.4 Correlation between Online Financial Transactions and the Citizen's acceptance of Remote Electronic Voting

Citizens' acceptance of remote electronic voting system in Tanzania variable had four categories including (1) "definitely (absolutely sure)", 2) "probably (considerably

certain)", 3) "unlikely" and 4) "I do not know". The null hypothesis in this case was that there is no relationship between online financial transactions and citizens' acceptance of remote electronic voting. The alternative hypothesis was that there is a significant relationship between the given variables. The results show that there is a significant relationship between online financial transaction and the citizens' acceptance of remote electronic voting system at five percent level of significance. This finding signifies that people who frequently use mobile phones or Internet to conduct financial transactions are more likely to accept remote electronic voting as it employs a similar process, except that in this case they will be selecting their preferred candidate instead of choosing a product or a service.

4 Recommendations

Based on the findings from this survey, we propose strategies to improve citizens' readiness to embrace remote electronic system in the country. These strategies include recommendations aiming to (1) enhance privacy and security posture in the country, (2) increase level of ICT literacy and awareness of electronic voting, (3) reduce initial system implementation cost, and (4) reduce fear of lack of democratic liturgy among citizens.

Unlike other e-government applications, remote electronic voting requires a very high level of security due to conflicting priorities of unique identification and perfect anonymity. The current ICT security posture in the country cannot guarantee secure election via ICT. Possible recommendations to enhance privacy and security posture in the country are the following.

- 1) The digital identify project has to be extended to include complete Public Key Infrastructure (PKI). This is one of the key issues in remote electronic voting is voter authentication. The only workable technical means to ensure such authentication is through use of digital identity with PKI. The government is issuing digital cards, but a complete PKI system is yet to be implemented. To realize a full value from identity card, a complete PKI system must be implemented.
- 2) The government, public and private sectors should actively promote user education and awareness about online privacy and the means of protecting privacy.
- 3) Government, public, non-governmental organizations, as well as a private sector, should collaborate to enhance user confidence, build trust, and protect ICT assets with regard consider to existing and potential threats to remote electronic voting.
- 4) There is a need for development of a clear and comprehensive national ICT security policy which will address the total ICT control spectrum, including adoption good security practices. Within this policy there must be

institutionalized proactive measures including enforceable legal mechanism for protecting ICT assets.

Possible recommendations to enhance ICT and electronic voting literacy are the following.

1) To develop policies ensuring that ICT services apart from electronic voting are fully integrated in education and training at all levels and in support of the concept of sustainable learning.

2) To implement comprehensive voter educational programs at an early stage in the remote electronic voting implementation. special attention should be paid to marginalized, disadvantaged and vulnerable groups.

3) To promote awareness of electronic voting by involving different stakeholders including private and public sectors. Awareness programs should concentrate on the benefits of electronic voting in fostering democratic elections in the country.

4) To provide affordable sustainable shared access to ICT resources such as community telecenters.

Possible recommendation to reduce initial system implementation cost include integrating remote electronic voting system with other e-Government applications such as driving license, national identity, and electronic passport. This integration will also increase system efficiency and effectiveness.

Possible recommendation to reduce fear of lack democratic liturgy among citizens include awareness raising on shift patterns.

5 Conclusion

This study measures citizen's readiness for remote electronic voting in Tanzania. Factors influencing citizens' readiness were identified. These factors were further analyzed using SWOT analysis technique. While internal strengths such as the high level of trust on electoral processes and access to financial services through mobile phones and Internet, give an indication of electronic voting acceptance by citizens, privacy and security threats may hinder the adoption process. It was also noted that in the situation where there is disbelief in the freeness and fairness of elections, the implementation of remote electronic voting systems poses a challenge. Therefore, the reputation and legitimacy of the national electoral commission of Tanzania and the overall quality of election administration is a fundamental prerequisite for the successful implementation of electronic voting in the country. This study also demonstrates significant correlations between different survey variables. The results show that variables such as younger age, frequent use of Internet/mobile phones and higher educational level have positive influence on acceptance of remote electronic voting system by the citizens. Generally the evidence presented in this paper shows that remote electronic voting entails a promising opportunity to

increase voter participation in Tanzania. However an enabling environment is yet to be established to the level that guarantee its successful implementation and sustainability. We conclude that more time is needed to strengthen what Tanzania has and create enabling environment for successful implementation of remote electronic voting in the country.

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