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M-voting in developing countries: Findings from Uganda

Emmanuel Eilu, Rehema Baguma and John Sören Pettersson

In the last two decades, competitive elections have become the standard in a number of African countries. Free and fair elections have not only helped consolidate emerging democratic institutions, but also improved projection for greater economic and political development. In other cases, such as Liberia and Sierra Leone, plausible elections have shaped the route for national reconciliation and a return to democratic rule after years of armed conflict and civil war (CAE, 2009). However, there has been a decline in voter turnout in many developing countries. The African continent has the lowest voter turnout in the world with an average of 65 per cent (Vergne, 2009). The 2005 referendum in Uganda had a voter turnout of only 47 per cent (Petersen, 2006), while, in the 2011 presidential elections in Uganda, more than 40 per cent of the registered 13.5 million voters did not turn up to vote (Oola, 2011; Young, 2005). The reasons for low voter turnout in developing countries range from violence, intimidation and rigging, to voter apathy and election delays (Pande, 2011). Vergne (2009) suggests that this is problematic as low voter turnout creates very weak incentives for politicians to adopt or implement policies in the public interest.

There is therefore a need to find ways of improving voter turnout in developing countries. The joint EU-UNDP Task Force on Electoral Assistance calls for new and innovative ways of integrating attractive and acceptable mobile technologies into sensitive processes like national voting. In this article, we report results from a survey based on strategies for persuasive design and technology acceptance analysis that can influence perceptions, views and attitudes towards using mobile phones as devices for national voting.

Despite all the opportunities mobile phones provide as a voting tool over other information and communications technologies (ICTs), they have failed to gain much acceptance as an electronic-voting tool in developing countries. For instance, surveys carried out in Uganda and Malaysia revealed that close to 60 and 50 per cent of survey participants, respectively, did not agree to use their mobile phones for voting (Eilu and Baguma, 2013; Sin et al., 2008). The major concern is about keeping the ballot secure over the GSM operator. According to the evidence presented by Kailasam (2010), these technical issues may in fact be relatively simple to overcome, although overcoming voters' negative perceptions and attitudes towards using mobile phones as a voting tool is thought to be more problematic.

Technology acceptance design is an adoption of the theory of reasoned action (TRA) originally proposed by D. F. Davies (1989) and persuasive technology design proposed by Fogg (2004) that is specifically tailored for modelling user acceptance of information systems/technology.

In 2013, two and a half years after Uganda's last general elections, we carried out a study in Uganda to assess citizen perceptions and interests towards using their mobile phones to vote. Our results revealed that close to 60 per cent of those who owned mobile phones were not willing to use them to vote, with participants citing a number of political, technological, social and cultural reasons for this (Eilu and Baguma, 2013).

Methodology

Technology acceptance principles and persuasive technology design principles were used to design the questionnaire. The respondents in the survey were eligible voters of different demographic attributes in urban, peri-urban and rural areas of three districts in Uganda. The three districts were Soroti, Serere and Kumi in Eastern Uganda. Each of these districts was chosen because the urban, peri-urban and rural settings were clearly defined and the respondents were of different political affiliations. In addition, they could easily be accessed by the investigators with minimal financial resources. The study used a quantitative approach where 900 questionnaires were given to respondents of different age groups (from 18 and above), genders, literacy levels, income levels, occupations and types of mobile phone owned. Out of 900 questionnaires, 786 were fully filled out and returned for analysis, making an 86.9 per cent response rate. The completion of these questionnaires was entirely voluntary and responses were anonymous. Descriptive statistics were used to present general results on the extent to which persuasive and acceptance design principles could contribute to increased acceptance and usage of mobile phones in voting. Cross tabulation was used to determine the percentage of respondents who did not agree to use their mobile phones for voting but would be encouraged to do so if particular design factors were met.

The study used 'agreement continua' to determine the response of participants on a variety of persuasive and acceptance design questions and statements. Agreement continua are questions that require the respondent to agree or disagree (depending on the scale) with given statements. For this study, the questionnaires were designed based on a seven-item Likert scale (strongly agree, agree, somewhat agree, neutral, somewhat disagree, disagree, strongly disagree). In order to simplify the presentation of results, the study computed results in the form of agree, neutral and

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Figure 1: Place of interview

Area	*Frequency (%)*
Rural	260 (33.3)
Peri-urban	250 (31.2)
Urban	276 (35.5)

Figure 2: Gender of respondents

Gender	*Frequency (%)*
Male	442 (56.6)
Female	344 (43.4)

Figure 3: Age of respondents

Age (years)	*Frequency (%)*
18–30	408 (52.1)
31–40	183 (23.3)
41–50	106 (13.6)
51–60	48 (6)
60+	39 (5)

Figure 4: Mobile phone owned

Mobile phone type	*Frequency (%)*
Basic phone	709 (91)
High end	77 (9)
Total	786 (100)

Figure 5: Education attained

Education level	*Frequency (%)*
None	61 (7.4)
Primary	172 (22.1)
O-Level/secondary	181 (23.2)
A-Level/advanced	133 (16.8)
Diploma and above	236 (30.5)

Figure 6: Income level of respondents

Income level (USh)	*Frequency (%)*
0–99,999	423 (55.3)
100,000–299,999	177 (22.7)
300,000–599,999	112 (14.2)
600,000–1.29 million	51 (6)
1.3 million–1.79 million	12 (0.9)
1.8 million+	11 (0.9)

disagree. However, neutral figures were not reflected because the percentages were insignificant.

Results

General data

As shown in Figures 1, 2 and 3, respondents were evenly distributed between urban, peri-urban and rural; the majority of the respondents were male; and the majority of the respondents were aged between 18 and 30 years.

As shown in Figures 4, 5 and 6, the majority of respondents had basic phones and earned below USh100,000 per annum (US$1 = USh2,650). Many of the respondents were educated to diploma level or above.

Encouraging mobile phone use

This section presents results on the extent to which use of persuasion and acceptance design principles in m-voting would influence voters' desire to use their mobile phones to vote. All results shown here are for respondents who initially said they would not be happy to participate in m-voting.

The survey explored whether respondents could be encouraged to use their mobile phones to vote if rewards, such as air time or free SMS services, were offered. The results found that just 22 per cent of the respondents who were not in favour of using their mobile phones for voting said that they would be encouraged to do so if offered some kind of incentive.

The study also explored whether the respondents would be encouraged to use their mobile phones for voting based on previous use of other mobile phone services, such as mobile banking and games. A relatively significant percentage (30 per cent) of the respondents who did not agree to use their mobile phones for voting said that would be encouraged to do so had they been previously successful in using other mobile phone services.

The study explored whether the respondents would be encouraged to use their mobile phones to vote if the process was tailored to their needs, interests, language, personality, usage context and other personal factors particular to the respondent. The results found that 26 per cent of the respondents who were not in favour of using their mobile phones to vote agreed that they would be encouraged to do so if the voting process was customised.

Statement Four of our questionnaire explored the principle of social and political learning, that is, whether the respondents would be encouraged to m-vote if they knew that their chosen party leader, friends or party members were also voting using their mobile phones. Some 32 per cent of the respondents indicated that they would be encouraged to vote if there was an indication that such influential figures in their lives were voting using their mobile phones as well.

The study also explored the effect of voting reminders on m-voting habits, looking specifically at whether the respondents would be encouraged to use their mobile phones for voting if they were politely reminded to do so at certain times. Twenty per cent of respondents indicated that they would be encouraged to use their mobile phones for voting if such a service was provided.

Respondents were also asked whether they would be encouraged to use their mobile phones for voting if guided through a step by step process in mobile phone voting before and during the voting process. The results were positive, with 35 per cent of respondents answering that they would be encouraged to vote using their mobile phones if a user-friendly, step-by-step m-voting system was available.

The convenience of using a mobile phone for voting was also addressed. In this regard, the study explored whether respondents would be encouraged to m-vote given the near proximity of their mobile phones. There is no need to travel to the nearest polling station because the polling station is in the mobile phone. Some 24 per cent of respondents indicated that they would agree to use their mobile phones for voting given that a mobile phone is convenient and portable, meaning that they could vote from home.

The study explored the principle of perceived ease of use, that is, whether the respondents would be encouraged to use their mobile phones for voting if the process was easy to learn and operate. The results found that 28 per cent of the respondents indicated that they would be encouraged to vote using their mobile phones if the process is easy to learn and simple to perform.

Finally, the study looked at how the perceived usefulness of using mobile phones affected respondents' willingness to participate in m-voting. The study explored whether the respondents would be encouraged to use their mobile phones for voting so as to save time, vote for the right candidate, and avoid the violence and intimidation that takes place at the polling station. Some 33 per cent of the respondents suggested that, in light of these factors, they would be encouraged to use their mobile phones for voting.

Conclusions

The persuasive and acceptance strategies discussed in this article alone may not be adequate in achieving a desired raise in the acceptance and usage level of mobile phones for voting. For example, the discussion of rewards was mistaken by respondents for a form of bribery and corruption. It is also worth noting that, whereas the acceptance strategies as a whole had a reasonable influence on respondents who worked in NGOs or the private sector, those who earned more than USh1.8 million per annum and those who owned high-end mobile phones, there was very little influence among the civil servants, those above 60 years of age and those with no education.

Other aspects that need to be worked on to achieve wider acceptance of mobile phones for voting include elimination of election fraud and improving mobile phone network performance. For example, based on previous elections, Eilu and Baguma (2013) observed that some respondents believe that it is much easier to rig elections using this technology than it is with manual voting. Others believed that the existing laws and policies on elections are biased and favour the ruling government. Nevertheless, as shown in the results from this study, persuasive and acceptance design principles have the potential to raise the acceptance and usage level of mobile phones for voting in a developing country like Uganda by close to 20 per cent. Therefore, alongside addressing challenges facing effective voting in developing countries, attempts to use mobile phones as voting facilitators should consider the utilisation of persuasion and acceptance principles.

The use of ICTs in elections

Information and communications technologies (ICTs), such as mark-sense, direct electronics recording (DRE), mechanical lever machine (MLM), punch cards (PC), the internet and mobile phones, have been fronted as one of the possible solutions to improving voter turn-up in developing countries (Caarls, 2010; Ayo et al., 2011). For instance, proponents of e-voting observe that ICTs have the potential to increase participation for disadvantaged communities, such as people with disabilities; serve as an antidote for voter apathy; provide greater voter convenience in terms of voting time and location; and ensure greater accuracy as well as being cost saving (Kailasam, 2010). Many developing countries, especially in Africa, have introduced ICTs either in the initial stages of the election process, or in monitoring and reporting election violence and fraud. The most widely used ICTs in elections in developing countries are biometric systems for voter registration and mobile phones for the monitoring and reporting of election results, violence and fraud cases. Mobile election monitoring through open and bounded crowd sourcing has taken place in a number of Sub-Saharan African countries, including Benin (2011), Burundi (2010), Kenya (2010), Nigeria (2011), Sudan (2010) and Zimbabwe (2008). Biometric voter registration has been utilised in countries including the Democratic Republic of Congo, Togo, Guinea, Uganda, Angola, Nigeria and Mozambique (Caarls, 2010). During the 2012 presidential elections in Uganda, Citizen Election Watch – IT (CEWIT) and DEMGroup found that more than 10,000 text messages were sent reporting on various matters including vote buying, registration hiccups, inappropriate campaign conduct, cases of violence, and general complaints and feedback (Hellström and Karefelt, 2012).

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