THE EFFECT OF DIGITAL BROADCASTING MIGRATION ON TELEVISION VIEWERSHIP

JANE MERCY MUTHONI KAMUNYI
Lecturer, Department of Journalism and Mass Communication, Ndejje University, Uganda
jmuthoni@ndejjeuniversity.ac.ug.

African Humanities Conference - College of Humanities, University of Dar es Salaam.

Abstract
The effect of digital broadcasting migration on television viewership study was done in Rubaga Division. The objectives were to assess the levels of knowledge about digital broadcasting migration and evaluate the digital broadcasting migration process in Uganda. A cross-sectional research design was used on a sample of 347 household and 10 key informants. The study showed that levels of knowledge about digital broadcasting migration was only 1.7%. The transition staggered from 2015 to 2018 with, 28.1%, 43%, 18.5% and 3.5% migrating in 2015, 2016, 2017 and 2018 respectively. The study concluded that delays in erecting required structures strained the transition with television viewers sensitization inadequately done. The standardization and importation were hampered causing last minute stampede and escalating transition costs. The study recommends the following be carried out: a) sensitization about use and benefits of digital broadcasting for consumers; b) a review to harmonize and standardize subscription fees; and c) a study review on the digital migration status for appropriate adjustments.
Key words: Analogue switch-off, Digital switch over, Broadcasting migration, Transition, Digital Terrestrial Television.

Introduction

Digital broadcasting is now a globally established phenomenon, following the agreement by member states at the culmination of Regional Radio-communication (RRC) meeting held in Geneva from 15 May to 16 June 2006 (O'Leary et al, 2006). This heralded the development of 'all-digital' terrestrial broadcast services for sound and television (ITU RRC-06). Digital migration is premised on the global increased demand for radio frequency spectrum, especially from developed economies experiencing exponential expansions in mobile communications both terrestrial and satellite and in sound and television broadcasting (Clarke, 2014). The motivation for governments commitment to switch over was to achieve digital dividend which would be realized only when the migration process was completed (IRIS plus, 2010. Furthermore, spectrum efficiency would result in consumer benefits of more choice in television channels and services and industry benefit from new revenue streams and business models (ITU, Guidelines, 2010,2012,2013).

There is no empirical study in Uganda on how television viewers were prepared for the digital broadcasting migration. The only literature available, highlight the need for consumer sensitization about the new technology to ensure smooth transition. There is also no information on whether this activity was carried out. Experiences around the world showed that Analogue switch-off (ASO) needed to be carefully planned with a comprehensive publicity campaign involving broadcasters, network operators, governments, manufactures and retailers; aiming at enabling consumers to have

adequate understanding of what ASO meant to them and what they needed to do to migrate to digital broadcasting (Laven, 2014). Additionally, Pule, (2009), in her speech on digital migration made a clarion call for a people-driven, people-centered, inclusive digital broadcasting migration. Where people were to be the determinant and beneficiaries of digital broadcasting migration venture both socially and economically. In agreement, Berger (2010) pointed out that unless the end-users were made aware of the need to adapt to receive digital signals, the entire process was destined to fail.

Although, ITU provided guidelines for digital migration, in Uganda, the process was delayed, muddled and the regulator, Uganda Communication Commission (UCC) was embroiled in a number of lawsuits further delaying the process (Lugalambi, 2010). Analogue switch-off elicited a backlash from consumers, television broadcasters, human rights groups and politicians with some people protesting by carrying television sets to UCC on ASO (Parliament Watch 2015). There was also a reduction of viewership from 3.5 million to 1 million with 60% around Kampala (UBC Review Committee Report, 2016). Television viewers had a protracted transition period portraying a gap in the perception and reception of the new technology. These reactions implied that there were underlying challenges in the digital migration process hence the need for the study.

METHODS

Study design

The study used a cross-sectional design with mixed methods where by the qualitative information elaborated on the quantitative results. The study used a closed and open-ended questionnaire for the household and an interview guide for key informants.

The Study population

The study population was drawn from ten organizations directly responsible for digital migration (key informants KI) and the household respondents were drawn from Rubaga division which had a population of 383,216 (NHPC- KCCA, 2017).

Study sample size

A sample size of 384 households from a population of 383,216 was selected using Krejcie and Morgan's (1970) sample size determination table. To ensure equal representation of the population, a list of zones was obtained from the Rubaga division offices. Rubaga division is divided into North and South constituencies comprising 11 and 10 zones respectively. Two zones from each constituency, three villages from each zone and 32 household were selected. Respondents were randomly selected and non-response was replaced by a respondent from another household. One respondent from the ten key informants was interviewed. These were Uganda Communication Commission, Uganda Broadcasting Corporation, Signet, Digital Satellite Television (DSTV) , GoTV, StarTimes Uganda, Azam Uganda, Zuku Uganda, NTV, and NBS.

Data collection and analysis

A closed and open-ended questionnaire for household was pre-tested in Kasubi and Lubiri zones of Rubaga North and South respectively. These were not part of the sampled zones for data collection. A pre-test report informed necessary adjustments to the questionnaire in terms of clarity and ease of understanding of the question by the respondents to elicit quality data. Data from key informants was collected using

face to face interviews using a semi-structured interview guide. Four research assistants experienced in quantitative research data collection were deployed in the zones. The face-to-face interviews were collected by the lead author. Tape-recording and note taking were used to ensure all information was captured during the interview.

The Quantitative data was coded, cleaned and entered into excel sheets and later exported into Statistical Package for Social Scientist (SPSS version 16) for analysis. Frequency distribution including percentages were generated and presented in tables and figures. Qualitative data was first transcribed according to the respondents' categories. During transcription the tapes were replayed to collaborate the notes and actual interviews. The data was analyzed according to the study theme manually. Data was triangulated at presentation and discussion of findings. Verbatim quotations were used in presenting findings.

Study limitation and ethical considerations

The study had some limitations. First, the results had more female than male respondents thus, the levels of knowledge probably could have been different if the male respondents were more. This is because males are more curious and have high levels of technology adoption than females. Secondly, the study could have experienced recall bias since it was done three years after the analogue switch-off; probably, if the study was done earlier, it would have yielded different results.

The study adhered to a number of ethical considerations which included; a research committee from the College of Humanities and Social Sciences (CHUSS) Makerere University approved the study. The department of journalism and mass communication provided an introductory letter to Rubaga division. Rubaga division provided an introductory letter to the sampled zones local council (LC2). Zonal leadership (LC2) provided letters of permission to the parish leadership (LCI). Parish leaders provided the letter to permit the researcher to interact with the respondents and also guided through the household interactions ensuring acceptability in the communities. Before data collection each participant signed the consent form. For those unable to read and write, the consent form was read and interpreted to them and after accepting to participate they put a thumb print. All participants were assured of confidentiality of their personal information in the study report.

RESULTS

The findings were on the levels of knowledge by television viewers about the digital broadcasting migration and the digital broadcasting migration process. Under the levels of knowledge about the digital broadcasting, the study assessed the; knowledge about the digital broadcasting migration, on the digital broadcasting migration equipment and on the use of digital broadcasting equipment. Under the digital migration process, the assessment was based on the television viewers migration status; the year of migration, the reasons for the delays in migration, the motivation for migration, the initial costs incurred in the migration process and the specific items money for initial cost was spent on.

Demographic characteristics

Table 1, shows 56.5% household respondents were female, 43% were aged 25-34, 54% were single and 34.6% had a minimum secondary level of education. Business was the main income activity by 63% with 32% earning between Ugshs.100,000 –

300,000. All the key informants were male 40% aged 35-40. Fifty percent were at managerial level and 60% percent had worked between 5-10 years.

Table 1: Demographic characteristics of household respondents
N=347

Gender of Respondents		**Frequency**	**Percent**
	Male	151	43.5
	Female	196	56.5
	Total	347	100.0
Age of Respondents		**Frequency**	**Percent**
	18-24	85	24.5
	25-34	148	42.7
	35-44	74	21.3
	45-54	35	10.1
	above 54	5	1.4
Marital Status of Respondents		**Frequency**	**Percent**
	Single	187	53.9
	Married	129	37.2
	Co-habiting	17	4.9
	Divorced	9	2.6
	Widower	2	.6
	Widow	3	.9
Highest Level of Education		Frequency	Percent
	Secondary Level	120	34.6
	Diploma Holder	81	23.3
	Bachelor Degree	66	19.0
	Primary Level	63	18.2
	Master Degree	9	2.6
	No Formal Education	7	2.0
	Certificate	1	.3
Occupation of Respondents		Frequency	Percent
	Business	218	62.8
	Private Organization Employee	69	19.9
	Civil Servant	21	6.1
	Farmer	17	4.9
	Not employed	14	4.0
	Casual worker	2	.6
	Self Employed	3	.9
	Builder	1	.3
	Nurse	1	.3
	Tailor	1	.3
Monthly Income of Respondents		Frequency	Percent
	Below 100,000	74	21.3
	100,001 - 300,000	112	32.3
	300,001 - 500,000	89	25.6
	500,001 - 700,000	35	10.1
	700,001 - 900,000	15	4.3
	900,001 - 1,000,000	11	3.2

	Above 1,000,000	11	3.2

Source: Primary Data, 2018

Levels of knowledge about digital broadcasting migration

Table 2. Television viewers' levels of knowledge about digital broadcasting migration

	Respondents' knowledge about digital migration	Frequency	Percent
	It is about Television	254	73.2
	I do not know	35	10.1
	It is from Government	30	8.6
	It is from Foreigners	19	5.5
	Everything about television changed	1	0.3
	It is moving from analog frequency to digital network	6	1.7
	It is about social media	1	0.3
	It is an introduction of a new technology in a country	1	0.3
	Total	**347**	**100.0**

Source: Primary Data, 2018

Table 2, shows only 1.7% of the respondents were knowledgeable about digital broadcasting migration. The respondents knew that digital broadcasting migration is about television by 73.2%. one respondent informed the study that, she did not bother much about was happening especially regarding the advertisements, she was interested in news bulletin of the day. This information was collaborated by key informants.

"The television viewers were supposed to be sensitized about the digital broadcasting migration. However, a number of challenges in planning and actual execution circumvented this arrangement" (KI 1).

"The messages about digital broadcasting migration were relayed on television but lack of actual human interaction made this futile, because after the analogue switch-off there were some mild demonstrations from consumers" (KI 2).

"It was unfortunate that the government thought that advertisements could suffice as convincing to a novel technology like digital broadcasting. But this was proven wrong with the challenges that followed after ASO" (KI 8).

"The government tried so much, but a number obstacles stood on the way, negating the very important plans for the smooth transition. The disagreements even within the bodies mandated to work on the transition proved detrimental to consumer sensitization programs. The parliament also delayed to discuss and have the budget for the migration released on time" (KI 1).

"There were no meetings, only scattered information out there in the public. No explanations or answers that consumers were asking, so most of the population were caught off guard on ASO" (KI 7).

Knowledge of the equipment required for digital broadcasting migration

The study found that 87% did not know the equipment required for digital broadcasting migration. This lack of knowledge on equipment affected the television viewers planning in terms of money allocation for purchase of equipment. According to household respondents, the government did not plan properly to ensure that the new equipment required were in the shops. Some of the respondents did not watch television for three months after analogue switch-off. The Set-Top-Boxes (STB) were not available to television viewers prior to analogue switch-off and even sometime

later. This information was further collaborated by key informants and they had this to say:

"The delay in determining the standards for Set-Top-Boxes (STB) affected the process of importation of STB and other equipment for digital broadcasting migration" (KI 2).

"The technology was new and not only television viewers were challenged everybody in the industry was getting acquainted with new equipment, the process was slow and the negative impact was more on consumers" (KI 9).

"Television viewers, did not know what to do, their knowledge of what was required was limited, some were even cheated by the middle men in the market, others bought equipment that were faulty" (KI 10).

Knowledge on the use of equipment for digital broadcasting

Knowledge on the use of digital broadcasting equipment was limited as reflected in the navigation of different gadgets; 29% had problems with the use of a remote control, 28% had challenges with connecting the new television set, 22% had difficulties in mounting the antenna and 21% could not connect the television set to the decoder. One household respondent said that, the old television set did not need a remote to operate. Other respondents agreed that most of their remote controls got spoilt and/or were misplaced sometime back. Most of the respondents were changing channels using buttons besides channels were few and, in most cases, only one channel was being watched. Similarly, another household with challenges in mounting antennas, informed the study that the family would wait for the father to get back from work and he stays outside turning the antenna while the wife and children would be observing for a clear signal. Some days the signal would fail and they would end up not watching television. Equally, key informants observed that:

"Television viewers were not conversant with the use of digital broadcasting equipment; they had problems interpreting the manuals provided and required physical person's help in every step in the set up" (KI 6).

"Television viewers were scared of tampering with the antenna incase the signal was weak. Even when they were being guided through the customer care help line, they would hang up before all instructions are fully provided. "(KI 4).

Uganda digital broadcasting migration process

Digital broadcasting migration policy 2011

The study found that there was delay in the development of the Digital Migration Policy 2011, the main document for digital broadcasting migration. This affected activities that would have led to a smooth transition such as infrastructure, standardization, sensitization programs among others. This late policy development made Uganda to opt for a two-phased process; switch off analogue in Kampala and its surrounding and digitalize the rest of the country. The study also found that even this arrangement was not properly implemented with a sizeable number of people unable to watch television for a period of time. Most of the household respondents were oblivious of the analogue switch off, despite the limited advertisement indicating the looming switch-off. They assumed that these were usual government programs which either delay or are never implemented. The key informants provided their views:

"A number of television viewers were not keen on the process of analogue switch-off. This was a new thing in the country and globally and with the very limited

consumer sensitization programs, it was likely that the confusion experienced was going to be there" (KI 4).

"The consumer programs were supposed to be rolled out in the whole country starting with the capital city, but the budgeting process took too long, the discussion in parliament dragged on and when the money was released, there was either no much time or it was not enough to carry out the activities" (KI 1).

"The implementors were not speaking the same language and there was some kind of disorganization with the organizations mandated to carry out the digital migration. There were accusations, counter accusations and court cases. All these compromised the quality of the process" (KI 3).

"Of course as in any titanic battle, the grass suffers, therefore the customers suffered more, although there was some discomfort within the industry, it was able to pick up faster than the ordinary television viewer" (KI 2).

Digital broadcasting migration status

The results showed that 93.1% had migrated by 2018. However, the respondents did not migrate at the analogue switch-off. The migration progression was 28.1%, 43%, 18.5% and 3.5% in 2015, 2016, 2017 and 2018 respectively. The study further found that most household by 2018 were on and off television. The study also found that there was misconception about digital broadcasting with some households attributed the transition as a government ploy to collect taxes. Other respondents opted to listen to radio and allow the children to watch television at the neighbors. The information from key informants was divergent depending on whether one was in government or the industry.

"Customers (television viewers) are on and off because they are not loyal to one service provider. They have decoders from almost all service providers in the country and activate decoders depending on particular needs and interests. For example, some pay for DSTV services during football season especially world cup. Almost all service providers will record high and regular subscriptions during school vacations and festive season especially Christmas time" (KI 4).

"We record low subscriptions during school season, because many television viewers opt for low-cost bouquets or keep with free to air broadcasting" (KI 5).

"The government has provided the free to air decoders where television viewers after the initial purchase will continue enjoying their favorite television programs without any further subscriptions. So, it is their choice to either pay for extra channels or stick to the free to air" (KI 2).

Reasons for the delay in migrating to digital broadcasting

Respondents delay in migrating to digital broadcasting was attributed to digital migration costs 59.3%. Many household respondents complained that things required for migration were very expensive and they did not have enough money for a new television set. Many decried that they had to pay school fees for their children so they opted to stay off television until funds were available.

The study also found that 25.9% delayed to migrate because they did not have a compatible television. Some respondents claimed that they had old model television sets which were not able to work with the new technology. Other respondents had special attachments with their television sets as gifts from children or friends and were not comfortable discarding them or believing that they were not working. They

thought the television had mechanical problems since it stopped working suddenly. The key informants had this to say:

"Digital technology is a change that has come after many years and the people had not seen anything like this previously. Moreover, they were not adequately prepared to adopt to the new technology. So, there was apathy and resistance to change" (KI 1).

"Ugandans do not react very fast to new things. Well, there might have been some challenges in passing information about the new technology but we cannot do much about it now, people will come around slowly" (KI 2).

The 14.8% delayed because they were not interested in migrating. Some respondents indicated that they were comfortable with how the television was and were not willing to change. Others were apprehensive and did not like the idea of a new way of watching television. Yet others were annoyed that they were not informed about the whole change in television viewership. One respondent said that when it comes to things of government and "whites", he does not rush, he always takes his time to understand the change very well before joining. He bought a Set-Top-Box in 2016. The key informants attributed this to human nature to resist change at the beginning but embrace the change with time.

"I think some customers had no money to buy Set-Top-Boxes (STB) whose cost were high at the beginning so they opted to stay put" (KI 9).

Motivation for migrating to digital terrestrial television

The motivation to migrate to digital by 25.2% was to enjoy clear pictures, and 23% to view variety of channels however, 51.8% of the respondent did not have a choice but to migrate. Some respondents indicated that they were disappointed with the government introduction of a new way of watching television. Some decried that they wished to remain in the "old" television. Other respondents blamed the government for imposing charges to watch television and forcing them to watch programs, some of which they felt were in conflict with their cultural norms. Another respondent projected that digital broadcasting migration like other government programs and projects would soon collapse. Another respondent attributed the digital migration to a government gimmick to solicit money for elections through subscriptions. One respondent lamented that the government had taken away the only free thing she was enjoying, the television. She wondered how one can sustain paying to watch television. It took her two years to acquire a Set-Top-Box bought by her son. The key informants attributed these to a number of factors.

"Television viewers did not feel well prepared for the change that is why probably some felt that the government pushed them off their comfort zones" (KI 7).

"Although there is free to air broadcasting, some customers complain about poor signal and few channels" (KI 3).

Initial cost of migrating to digital broadcasting

The study found that initial costs constituted the greatest constraint to digital migration. 48% spent between Ugshs. 100,000 – 300,000, 41% spent Ugshs. 100,000 and below and only 8% spent above Ugshs. 300,000. Some respondents felt that the cost of a Set-Top-Box was too expensive at Ugshs. 180,000 and above and therefore chose to stay off the digital broadcasting until finances were available. One respondent had to get a quick loan of Ugshs. 300,000 from a money lender to acquire

a new television set. He said that this money was a challenge to pay back because shortly after acquiring the loan, his motor bike and only source of income was stolen. He had to go to the village and sell a small piece of land to repay the loan. The key informants attributed the cost to a number of factors.

"The government delays in standardization of Set-Top-Boxes (STB), pushed the procurement process to a level of crisis and the importation was very costly, hence the high costs at the sale to customers" (KI 6).

"The government made the promise to subsidize the costs of Set-Top-Boxes (STB) but this promise was not realized hence pushing all the costs to the final consumer" (KI 8).

"When business men are faced with a situation that looks like crisis, they actually create a bigger crisis and inflate the prices, which happened shortly prior and after analogue switch-off. This was a hyped situation and government could not do much and the customers suffered high prices in the migration process" (KI 1).

"We tried to help the customers in having free to air decoders in stock with a standard price of Ugshs. 150,000. However, there was a challenge of middle men who could extort money from clients in the name of facilitating the process of procurement for them" (KI 2).

"Ugandans are last minute people. So, many television viewers did not want to invest any money on digital broadcasting because they did not understand how the technology was to operate. So, when they were told that the Set-Top-Boxes (STB) were to be bought, most of them resisted until the actual analogue switch-off" (KI 3).

Specific items the initial cost of migration money was spent on.

The study found that 75% spent money buying decoders, 20% buying new television sets, 4% connectivity fee while only 1% spent money on antenna. According to a household respondent, it took two months after analogue switch-off to acquire a decoder because they were not available and those available were unaffordable. So, they waited until the prices came down. Another household respondent had to use his savings to buy a new television for his family because the children kept crying that they wanted to watch television. The key informants informed the study that:

"One of the baggage that the digital migration came with was an added cost to television viewership. The government had promised to subsidize the cost of Set-Top-Boxes (STB) but the delays experienced in the process negated this promise. So, television viewers had to incur high costs of acquiring the STB at the last-minute costing a minimum of Ugshs. 200,000" (KI 9).

Discussions

Levels of knowledge

The study assessed knowledge levels at three echelons; about digital broadcasting migration; about digital broadcasting equipment and knowledge on the use of digital broadcasting migration equipment. The study findings agree with experiences in other places including the pioneering countries (Brown & Pacard, (2004)). A study by Atkin, et.al., 2003 in the USA found that 62% of respondents knew nothing about DTV. A separate study three years later by Chan-Olmsted & Chang (2006), investigating the levels of consumer awareness and knowledge of digital television (DTV) in the USA found that, consumer knowledge about DTV appeared to be minimal, with almost half of the respondents indicating that they were not familiar at all with the differences between digital and analog TV, most Americans were not

aware of the conversion to DTV, 40% had never heard about the DTV transition and another 43% were only 'somewhat aware' of the transition.

Relatedly, Odufwa, (2011), found that majority of Nigerians were completely oblivious to the impending digital transition while the Open Society Foundation (2013) indicated that Kenyans were unaware of the provisions of digital broadcasting. Uganda, could have avoided being part of the statistics by following ITU guidelines that advised Africa to adopt realistic time schedules, noting that in Europe the period between Digital Terrestrial Television Broadcasting (DTTB) launch and completion of analogue TV switch-off ranged from 3 to 14 years (ITU Guidelines, 2010). While European Union member states committed to finalize the switchover by 2012 (Nyman-Metcalf & Richter, 2010), Russia indicated a period from 2014-2017 (Haeberlé (2014).

The limited knowledge on the use of digital broadcasting equipment was also collaborated by Okon, 2011 in a study carried out in River's State Nigeria, concerning the use of set top boxes, where 44% of the respondents upheld a complete lack of knowledge while 37% did not seem to be sure of the utility value of STB. Thus, when respondents were not aware of digital television, they did not know how to relate its functionality to similar technologies (Atkin et al, 2003)

Digital broadcasting process

Uganda was off to a late start with the digital broadcasting migration coming in 2011 just four years before the official analogue switch-off (UBC Review Committee report, 2016). The delay in formulating the policy which was fundamental for guiding the process, meant that the activities supposed to be carried out within a ten-year transition period were to be done in under four years. Besides the late digital migration policy development, Uganda Communications Commission (UCC) the regulator was embroiled in a number of law suits including 19 with digital migration solutions 4 Africa (Pty) in November, 2012 (PPDA, 2012). These took off a considerable amount of already limited time for the transition implementation. Similarly, European situation described by Brown and Picard, (2004), indicates that Europe major difficulty in the transition to DTV had been the tension between the jurisdiction and powers of the European Commission (EC) and those of the national governments and regulatory authorities. However, the European countries adopted realistic time schedules, noting that in Europe the period between Digital Terrestrial Television Broadcasting (DTTB) launch and completion of analogue TV switch-off ranged from 3 to 14 years (ITU Guidelines, 2010).

Uganda's two- phased analogue switch-off on 17th June, 2015 within the 60km radius was received with repulsion by a cross-section of Ugandans (Parliament Watch 2015). Television viewership reduced from 3.5million to 1 million, 60% from around Kampala (UBC Review Committee Report, 2016). This scenario was also experienced in Tanzania the first country in Sub-Saharan Africa to switch-off analogue on 31st December, 2012 (Berger, 2012). Where some viewers lost access to television after ASO – estimates ranged from 20% to 50% in Dar es Salaam (Mason and Schuman, 2013).

The initial costs of migration were high for the television viewers and although, the Uganda government had promised to subsidize the digital Set-Top-Boxes (STB), Githinji, (2014, there was no information on whether this promise was fulfilled.

Relatedly, according to Berger, 2010, the government of south Africa promised to subsidize 70 percentage of the cost of a Set-Top-Box (STB) for an estimated five million households (out of nine million viewing households), who would otherwise not be able to afford the device (estimated retail cost $60 - $100 for a basic box). A government gazette no. 35014 provided a subsidy scheme (Parliament Monitoring Group, 2012).

Conclusion /Implication/Recommendation.

Television is still the most significant source of information and entertainment (Raycheva, 2008) and each new advancement in communication technology disturbs a status quo (De Sola Pool, 1983) that require deliberate diffusion to the consumers (Rogers, 1962). The rate at which the benefits of the digital terrestrial television will be realized might be slower in Uganda than other countries which have invested in consumer knowledge and support.

The study found that television viewers' knowledge levels about digital migration was low, which implied that the uptake of the terrestrial television was also low. Thus, there was a likelihood that the benefits of television in terms of infotainment and edutainment would not be realized. This would consequently, affect the industry growth and its contribution to global development.

There is therefore need for a clear diffusion of information in regards to any new innovation so that the consumers (television viewers) appreciate, invest in the technology and continuously support its growth and development. It is therefore imperative that the government invest in consumers' awareness for ease of technology uptake and reduce on consumer apathy of government projects. Appropriate reviews should be carried out to establish the status of television viewers all over the country. There is also need for harmonization and standardization of subscription fees to reduce on disparities and the gap of haves and have nots.

References

Analysis Mason (2013), Case Study of Digital TV Switchover in Tanzania, available at: www.analysysmason.com/About-Us/News/Insight/Case-study-of-digital-TV-switchover-in-Tanzania/ (accessed 29 November 2013).

Atkin, D. J., Neuendorf, K., Jeffres, L. W., & Skalski, P. (2003). Predictors of audience interest in adopting digital television. *The journal of media economics*, *16*(3), 159-173.

Berger, G. (2010). Challenges and perspectives of digital migration for African media.

Berger, G. (2012). Theorising African communications: The bad news signaled by broadcast digital migration policy. *Communication*, *38*(2), 135-146.

Brown, A. & Picard, R.G., (2004). The Long, Hard Road to Digital Television in Europe. 6th World Media Economics Conference Centre d'études sur les médias and Journal of Media Economics HEC Montréal, Montréal, Canada. (1-9).

Clarke, R. N. (2014). Expanding mobile wireless capacity: The challenges presented by technology and economics. *Telecommunications Policy*, *38*(8-9), 693-708.

Chan-Olmsted, S. M., & Chang, B. H. (2006). Audience knowledge, perceptions and factors affecting the adoption intent of terrestrial digital television. *New Media & Society*, *8*(5), 773-800.

De Sola Pool, I. (1983). *Technologies of freedom*. Harvard University Press.

Digital Migration Policy. (2011). Terrestrial Television Broadcasting in Uganda. Kampala. Uganda.

Githinji, K.W., (2014). A critical Analysis of Factors Affecting Digital Migration and its Uptake within Nairobi. Nairobi University.

Haeberlé, L., (2014). Importance and advantages of digital migration. ITU regional forum on digital terrestrial television broadcast services in Arab region. Dubai, United Arab Emirates. LS telecom AG.

IRIS Plus, (2010). Switchover to the Digital Dividend (Susanne Nikoltchev (Ed.). Overview of Digital Television Switchover in Europe. European Audiovisual Observatory, Strasbourg.

ITU, (2013). Guidelines for the Transition from Analogue to Digital Broadcasting and Relevant ITU Activities. Greece.

KCCA, (2017). National Population and Housing Census 2014: Area Specific Profiles. Kampala, Uganda.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, *30*(3), 607-610.

Laven, P. (2014, May). Digital migration worldwide status. In *ITU Regional forum on digital terrestrial television broadcast services in Arab region. Dubai*.

Lugalambi, W. (2010). *Public broadcasting in Africa series: Uganda*. African Books Collective.

Lugalambi, G.W., & Mwesige, P., (2010). Public Broadcasting in African Series – ON AIR – Uganda, A survey by the Africa Governance Monitoring and Advocacy Project (AFRiMAP). Open Society Initiative for East Africa (OSIEA) and Open Society Media Program (OSMP). An Open Society Institute Network Publication.

Nyman-Metcalf, K., & Richter, A. (2010). Guide to the digital switchover. *Vienna: The Office of the OSCE Representative on Freedom of the Media*.

Public Procurement and Disposal of Public Assets Authority (PPDA), (2012). Investigation report into the supply, delivery, installation and commissioning of digital terrestrial television broadcasting system proc ref no: UCC/supls/2011-12/00280. Entity: Uganda communications commission complainant: M/S digital migration solutions 4 Africa (Pty) Ltd.

Pule, D. D., (2009). Statement by Dina Pule; ANC, NEC member and Deputy Minister of Communications on Digital Broadcasting Migration. 14th September, 2009.

Raycheva, L. (2008). "Television: the challenges of pluralism to media regulation. "Central European Journal of communication, 1(01), pp.63-78.

Rogers, E. M., & Williams, D. (1983). Diffusion of Innovations (Glencoe, IL: The Free Press, 1962)

UBC Review Committee, (2016). Securing the future of Public Broadcasting in Uganda. Kampala, Uganda. Uganda Bureau of Statistics, (UBOS) (2014). National Population and Housing Census 2014

Odufwa, F., (2011). Digital Broadcasting migration in West Africa: Nigeria research report. Association for progressive communication and balancing Act.

O'Leary, T., Puigrefagut, E., & Sami, W. GE06-overview of the second session (RRC-06) and, EBU Technical Review, https://tech.ebu.ch/docs/techreview/trev, 1-20.