
An Assessment of Consumer Awareness and Coverage of Digital Television Services in Uganda

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ABSTRACT: *The research examined the relationship between consumer awareness and coverage of digital TV services in Uganda. The study utilised an appropriate study design help gather data. survey tools and interviews guides helped gather information from people who owned television sets. Analysis of data involved describing, correlations and regressions. Research findings concludes consumer awareness predicts Coverage of Digital TV Services. It is recommended that there is need for revision of the current policy objective 4 a) so that it can cater for new media like social media to promote consumer awareness. The means of disseminating consumer awareness need to be diversified. Government should compel all content providers to create space in their programming for consumer awareness.*

KEY WORDS: digital migration, consumer awareness, coverage of digital tv services, Uganda.

INTRODUCTION

The paper examines how digital migration principally consumer awareness influences coverage of digital TV services in Uganda considering information access is a basic right that is included in the Uganda National Development Plan as it is viewed as an important cog in the wheel of economic development and social transformation (Freiderici, Wahome & Graham, 2018). Consumer awareness of digital migration involves initiating nation-wide communication campaigns to raise public cognizance of the migration from analog amid users of television. This process must be guided by precision and easily explainable terminology to guarantee general comprehension of the migration

procedures by TV consumers. Awareness campaigns should be conducted via free and accessible media, (Ahmad & Ribarsky, 2018). In this study consumer awareness was operationalized as understanding of the equipment needed and digital literacy. conversely, coverage of digital TV services was broken down into countrywide sites; how much distance the respective sites cover; how many viable users of subscriber television; obtainability of Set Top Boxes and content quantity and quality on air.

The Government of Uganda set about building structures to carry the digital signals, investing in sensitization of Ugandans on how the conversion to digital would improve their lives as well as trying to enter into partnerships with private capital to help boost digital content, (Bukht & Heeks, 2018). Regrettably, the process has not unfolded as planned as is reflected in a multiplicity of challenges cited in official government reports from the relevant ministries and authorities. Television owners have not received the promised help and guidance as the migration process proceeded. Two years after 2010, the Ugandan Authorities took steps to boost coverage of by kicking off the movement process involving moving from analogue to digital broadcasting. This process focused on raising consumer awareness among other strategies. Incorporation of digital was supposed to culminate in better spectrum utility sharper sounds and pictures as well as stronger signals. Nevertheless, reports from the government departments concerned with the digital migration process point to a slowdown in improvement in access to digital services. This is further compounded with the information that only Phase I and II of the migration process was completed. The migration process encountered some pitfalls as just eighteen (18) out of one hundred and thirty-five (135) districts received the expected digital coverage by 2017. Consequently, less than 15% of Uganda receives the anticipated digital signals. In addition, seventeen (17) hard to reach areas have the requisite infrastructure that permits signal reach of twenty (20) to forty (40) km incumbent on landscape and the weather on the day. As a consequence, just over 85% does not receive the complete digital signal. Much as there could be many responsible factors, consumer awareness may be playing a major role. Therefore, the research to establish how coverage of digital television in the country is influenced by consumer awareness.

LITERATURE REVIEW

Ugandan Digital Migration Policy

It sets boundaries governing how analogue switch off to complete digitalization happens in the country. As part of NDP II and III digital migration is important in many processes in the country's development path (MOICT, 2012).It was intended to inform consumers on segmentation of the digital process and how the migration would impact their lives in lasting ways, (MOICT Policy Statement, financial year 2021/22).Additionally, the instrument planned to inform consumers about equal accessibility to superior television picture and sound for consumers today and in years to come, (MOICT Policy Statement, financial year 2021/22).The instrument planned to inform consumers about best spectrum utility of radio signals. The shift to digital signal planned to free up space on the spectrum by condensing the radio frequency that is possible using digital technologies. Consumers need to be aware of the additional opportunities that would emerge like 5G technologies and related services, (MOICT Policy Statement, financial year 2021/22).

The instrument also planned to inform consumers about inequitable tendencies by some entities in the duration of the migration process and after. For purposes of delivering on this target, the authorities made informing the public about digital technology best practices and their rights as

consumers of the product. The government planned to ensure cost effective availability of decoders and other receivers as migration process was underway. The authorities defined the minimum standard of receivers and decoders allowed in the country, (MOICT Policy Statement, financial year 2021/22).

The Ugandan Authorities using the instrument planned to ensure consumer awareness about their responsibility regarding the environment safety when disposing of their old television sets and antennas. Additionally, the instrument informs consumers about extending the shelf life of their existing analogue equipment and gadgets by adopting them to the emerging technologies, all the while being environmentally conscious, (MOICT Policy Statement, financial year 2021/22).

The policy instrument targeted making sure consumers are aware of the necessity of locally creating content through skilling and self-improving to match demands of the digital era going forward. The policy instrument additionally aimed at forming a unit tasked with informing consumers about assorted types of local content development through more funding and advisory services, (MOICT Policy Statement, financial year 2021/22).

Theoretical Review

The Information society theory anchors this study. Fritz Machlup is credited for laying the groundwork for originating and developing the theory in 1962. Webster (2015) contends that expounding and critiquing the theory is now the main course of members of the academic community interested in ICT. Ponzanesi & Leurs (2014) hold the view that the theory provokes inquiry and curiosity regarding societal exchange of information on subjects like digital migration and how is intertwined in the fabric of coverage of digital TV services. Calhoun (2014) argues that this theory is central in elucidating the phenomenon known as digital migration and how data packets are diffused and translating into information manifested in coverage of digital TV services.

In the contemporary world, superpowers want the information society to evolve to favour them culturally and economically. Mansell & Steinmuller (2000) observed that global giants like Samsung and Apple have carved a niche for themselves basing on digital TV technologies. Van Audenhove, Burgelman, Nulens & Cammaerts (2014) harbor legitimate fears that the EU and Latin America are being edged out by their aforementioned giant corporations that are currently the market leaders. The theory elucidates several points regarding technological advancements that include digital technologies have molded modern society. But the study notes that many aspects of the phenomenon remain unexplained and need further investigation; something this study hopes to do. A point of contention would be the degree the country must advance technologically before qualification to belong to the information society. Does this evolution manifest quantitatively or qualitatively? The situation when all households in the country have digital TVs may or not warrant full coverage. Contemporary academicians such as Dertouzos (1997); Negroponte (1995); Kranich (2004); whose work posits the modern technologies like digital evolution rotate around the Information Society Theory. Notably however, many questions remain that need viable answers to; the current research plans to add value here. Theories like Information society theory in isolation may not expound on contemporary challenges, but notably, they are growing in importance and must therefore anchor empirical research.

Conceptual Review

Consumer awareness

Consumer awareness encompasses commencing communication promotions across the country to promote cognizance of the digital migration amongst television viewers in Uganda. Consumer awareness campaigns if they are to succeed must be steered in a clear and easily understood manner to guarantee countrywide comprehension of the phases involved in digital migration process by TV consumers in Uganda. The process additionally must encompass transparency to guarantee that there is conspicuousness and dialogue about all the events which will engender assurance from all stakeholders most especially the TV consumers. The process must make use of a multiplicity of methods to inform with the aim of guaranteeing availability to TV consumers notwithstanding their level of their academic background or age bracket, (Ahmad & Ribarsky, 2018).

Consumer awareness and coverage of Digital TV services

Worldwide, there were concerted and deliberate steps taken to ensure consumer awareness of digital migration by formulating communication strategies, (Einstein, 2015). Through a number of initiatives that included organizing marketing strategies and massive advertising campaign on different media platforms, setting up call centers and websites to inform the public, (Alexander & Cunningham, 2014). The study noted that while Einstein (2015) and Alexander & Cunningham (2014) discussed steps taken, communication strategies and initiatives, the relative importance of the said factors with specific context was not provided. That study used stakeholder involvement, communication to the public and information availability as predictor variables. This limited the examination outlook creating several conceptual and contextual gaps. These gaps have remained largely unfilled to date.

The United States of America ensured consumer awareness at various levels. The federal government in 2007 deliberately reached out to television consumers using terrestrial televisions exclusively. Special outreach programmes to help senior citizens, low income consumers and those with disabilities. The Federal Communication Commission formed public-private partnerships with firms to setup help call in centres and dish connecting services, (Galperin, 2014). Printed material on flyers and leaflets with information, questions, and answers about using STBs and similar devices, troubleshooting pointers, dish connection repair and maintenance in all major languages, (FCC, 2016). The study was anchored on exploratory design. On coverage in United States of America the study by Galperin (2014) omits to give details beyond the broad categorization of consumers. This is a temporal and methodological gap this study plugged.

Sieber (2016) in his research findings strongly argues the case of consumer awareness boosting coverage of digital TV services. This study indicated how the Bulgarian government invested large sums in running awareness campaigns in the period previously preceding digital migration. However, the study findings point out the fact that consumer awareness on its own cannot boost desired physical reach of the digital signals. Exercise employed documentary review as the principle data sources and was grounded in the communications theory. The resultant gaps in the methodology want addressing. Furthermore, the study was done in the former Eastern Europe which has a different economic setting from the East African setting that Uganda is located in. Kruger and Guerrero (2017) conducted a study of how the awareness campaign in the Netherlands was used to boost the distance covered by digital signals. Dutch authorities provided most funding. However, the exact numbers are absent in

the report. knowledge deficits resulted. Besides, the report is based in the Low Countries in Europe may have few lessons for a similar study to be done in my country of research. geographical and situational gaps ensued. All gaps were addressed by thesis findings and recommendations of the report.

Oiarzabal and Alonso (2016) study findings revealed how consumer awareness can result in substantial increment in coverage of digital TV services when well crafted. The report acknowledges the astronomical costs a successful campaign attracts. The report was based purely on a series of interviews and no quantitative angle involved. This creates a methodological gap that needs filling in order to update the published literature. The theory was grounded in the technological acceptance model which only explains digital migration but not reach of the signal geographically. Theoretical gaps emerged needing bridging to update the latest published literature. Madianou and Miller (2018), study findings are only in partial agreement by study findings by Oiarzabal and Alonso (2016) in that they base all the prediction of coverage of digital TV services on consumer awareness. They identify this factor as the most important predictor. However, the study does not explain any other determining physical reach of digital signals. This created a knowledge deficit. Current research also pegged their consumer awareness promotion strategy on the audio vision industry and ignored all other modes. This created a conceptual gap as clearly more determinants are involved in boosting physical reach of digital signals. Research done outside East Africa created both geographical and contextual gaps. The cited gaps are addressed later in the thesis in form of practical policy suggestions and recommendations.

Nazareno (2012) carried out a study that established that consumer awareness through making local TV content and movies. This, in his considered view, can result in better and faster coverage of digital TV services in a more cost effective manner. In his view, this can be put in effect by having the correct regulation regime embedded in the legislative framework. The study focused on the UK, France and Brazil. The study used a three-step method of analysis. This created a methodological gap as such a wide study required adoption of a structural equation model and logistical regression methods. The study fails to avail a viable regulatory framework that may work outside the three countries of the UK, France and Brazil. Contextual as well as knowledge gaps worth addressing emerged. All three counties utilised different consumer awareness strategies and the study fails to suggest a triangulation of the three approaches of consumer awareness. Deficits in knowledge resulted and require attending to. In addition, this report took place more than a decade ago and the information requires updating. Temporal gaps resulted requiring filling. Gaps cited up in preceding paragraph were addressed in the research findings and as recommendations.

Seabright & Weeds (2015) conducted a study that assessed how consumer awareness mediated between aspects concerning migration of digital and physical reach of digital signals. The study uncovered a positive mediation between predictor variables (digital migration) and outcome variable (physical reach of digital signals). Knowledge and methodological gaps resulted which the present research hopes to address by considering using consumer awareness as one of the key predictor variables. The scrutiny employed a number of data gathering techniques including participant observation. This created a further methodological gap as this method may not suited to Uganda's case where digital migration is not yet complete even after more than 10 years. An alternative data collection method will have to be adopted. Puppis, D'Haenens and Saeys (2017), on the other hand, established a positive correlation between the study's predictor variable and physical reach of digital

signals which used consumer awareness as a principle predictor variable and disagreed that it qualifies as a mediating variable. This created a conceptual gap. However, the study employed a rapid assessment data collection methodology. This created a methodological gap as the current research utilised survey tools as well as interviews to gather information as they were considered more efficient techniques of gathering data. The study was based outside sub-Saharan Africa creating a contextual gap. The gaps in the published literature in the preceding paragraph were addressed in the recommendation section in form of policy change suggestions and recommendations.

Waisbord (2015) conducted a study that investigated how consumer awareness in South America leads to better coverage of digital TV services. The awareness campaign was somewhat hampered by intermittent funding of the campaigns and this was invariably impacted the pace of physical reach of digital signals. However, this research does not disaggregate any components of consumer awareness to inform future studies. This created a conceptual gap the current study hoped to address. The study employed a correlational analysis that the study felt would be better addressed by a cross-sectional study design. This created methodological gap that needs attention. The study also used secondary data to compile the findings. Secondary data is not always regarded as the most reliable. This created a further methodological gap. This research was anchored by agency theory that this research opines that it has a limited explanatory powers regarding consumer awareness and physical reach of digital signals. Theoretical gaps resulted. Singh and Raja (2017) conducted a study that assessed how consumer awareness contributed to physical reach of digital signals in the Indian subcontinent. Findings slightly differed from earlier studies by Nazareno (2012) and Waisbord (2015) that show that while coverage in different countries within the Indian sub-continent was not uniform, the time difference was very small unlike the case of the UK, France and Brazil as earlier discussed by Nazareno (2012) that had uniform growth of coverage in the UK and France but at a slower pace in Brazil. This creates Knowledge and empirical gaps which need to be researched. This research utilised a comparative study design this invited more inquiry. Gaps identified were addressed and reported the findings of the thesis.

In Botswana information infrastructures were still under development by time for ASO. In order to expediate digital migration, incorporation of the leadership in all regions was essential to get consumers awareness to reach an acceptable threshold before the completion of digital migration in the stipulated period, (Bekker 2012). With integrated approach, confusion caused by wrong information was averted in the country, Once the viewers were informed and raised their level of awareness as consumers, they were now in position to consume the digital services made available by DTTB unambiguously, (Armstrong & Collins, 2011). Studies by Bekker (2012) and Ngcaba (2012) affirm that an integrated approach was used by the Botswana authorities to avert the dangers of confusion caused by wrong information. Yet, it remains unclear through what mechanisms within the integrated approach succeeded the most. The study put to use the dissemination of information, statutory regulation of the changes and availability of information as independent variables. Notably, the predictors were not properly conceptualized which limits the report's generalizability. The research identified the areas that needed interventions and filled the knowledge gaps in the process. In the East African region, Tanzania was the first to "go digital". Many critics and skeptics felt that the migration process was hurriedly done and in fact took place prematurely. A number of NGOs and broadcasters in the country requested return to the pre-digital migration era so that "ordinary wanaichi" can learn to make adjustments to the new technologies, (Skinner, 2018). A survey conducted by a leading Tanzanian newspaper in December 2012, estimated that half of possessors of

televisions were unable to connect to the digital signals as they did not possess the requisite gadgets. The blame was pushed to the Tanzanian consumers who alleged to have got no nous concerning the freshly introduced technologies and how to acquire cost effective devices, (UNCTD, 2017). In recognizing the possible deficit in consumer awareness, authorities in Tanzania gave in to public pressure and put on hold the ensuing stage in the migration process to gauge how previous phases in the migration fared, (Obonyo, 2016). This research could adopt a multi-faceted approach to offset many short comings. Furthermore, study findings by UNCTAD (2017) relied on a study conducted by an independent body and results were inconclusive regarding consumer cognizance gaps especially regarding the countryside. The discrepancies cited were addressed in the thesis.

At the time of Analogue Switch Off few Ugandan TV viewers had more than a passing knowledge of digital migration and many never took the deadline seriously. As a result, many were hit hard when Analogue Switch Off took effect, (Oluka, 2011). A number of researcher findings blamed the UCC's ineffective communication and sensitization work plan and expressed little surprise that consumer awareness was far below the expected threshold by the time ASO materialized, (Imaka, 2011). UCC was blamed for being out of touch with facts on the ground by insisting on using websites, newspapers, and fliers to raise consumer awareness due to the fact that these messages are in English and few people outside major urban centers had access to the internet. People in remote areas of Uganda were subsequently left out of the digital TV coverage. Such information gaps have also given Pay-Tv firms an unprecedented business opportunity to take advantage of the Ugandan public, (Obonyo, 2016).

The knowledge gaps to be addressed by the research are predicated by consumer awareness strategies not ably enhancing physical reach of digital signals in Uganda. Studies via Oluka (2011) and Imaka (2011) utilised professed usability of the new televisions, multiplicity of available content, consultation with stakeholders, acquisition of PCs that utilised these new signals plus availability of relevant information as independent variables and conclusively demonstrated that collectively using websites, newspapers, and fliers to raise consumer awareness is ineffective. However, research on the impact of individual media needs addressing. The resultant knowledge gaps must be addressed, and this study offers many answers; albeit not all answers in the conclusion section.

Summary of Literature

From the above one easily acknowledges the body of knowledge regarding consumer awareness and physical reach of digital signals have been undertaken. Some pieces of literature considered particular attributes regarding consumer awareness in a limited manner. A lot of the noted deficits in the body of knowledge were temporal, methodological, contextual, theoretical and conceptual.

METHODOLOGY

Research Design

This research employed a cross sectional- correlational design. The study needed to correlate consumer awareness with coverage of digital television services. The research happened within a period of a few weeks and gathered data across one point in time. No further follow up surveys came after the initial data was collected. It is a cost-effective approach (Kothari, 2004). Cooper & Schindler (2003) asserts that survey designs enable gathering data from large swathes of a chosen population. It is a method of choice as the study planned to draw conclusions from a subset of the population of

the country. Amin (2005) argues that this approach is ideal for rapid assessments that have finite resources and time. Kothari (2004) advises that collecting cross-sectional data is advisable in studies that gathering data from a multiplicity of districts in a country. Amin (2005) observes that at the design stage, the researcher needs to have in mind the approaches that fit their study. In this regard, the study opted for qualitative and quantitative approaches at the analysis levels.

Study area and population

The focus of the study revolved around determining the extent to which the digital signals covered the country. To achieve this, the study sought to determine how coverage of digital TV services was influenced by consumer awareness. The people that formed the population under study were TV set owners and their household. 3,770,000 TVs are currently in use (Uganda National Household Survey, 2016/17). These constituted the study population.

Study sample

Saunders, Lewis & Thornhill (2012) advised that when faced with a huge population, the researcher might consider sampling to make it manageable. The researcher opted for this given that the population is excess of 3 million. 95% accuracy was assumed for the sampling. 1.96 was the z score that was in tandem. 5% was estimated to constitute the minimum error. The research assumed completed survey tools would be around 60% with the remaining 40% of the survey tools incomplete and unusable in the study. Substituting the population of TV owners in the country into the formula propagated by de Vaus, 1991, Saunders, Lewis & Thornhill, 2012), estimating 95% to be the confidence level, the minimum sample size was determined thus.

Minimum sample size was calculated by:

1. Worked out the sample size for inestimable universal set.
2. Accustomed the sample size to the essential population.

$$S = Z_2 * P * (1-P) / M_2$$

S = Sample size for infinite population

Z = Z score

P = population proportion (presumed to be 60% = 0.6)

M = margin of error

Z score was calculated based on confidence level.

Confidence level: The probability that the value of the parameter falls within predetermined boundaries

95% level of confidence means 1.96 is automatically z score.

5% was the study's choice of error of margin.

$$M = 0.05$$

$$Z\text{- Score} = 1.96$$

$$P = 0.6$$

$$M = 0.05$$

$$S = (Z\text{-Score})^2 * P * (1-P) / (\text{Margin of error})^2$$

$$S = (1.96)^2 * 0.6 * (1 - 0.6) / (0.05)^2$$

$$S = 3.8416 * 0.24 / 0.0025$$

$$S = 368.7936$$

So, sample size for inestimable population is 368.7936.

Study made adjustments to the sample size to the needed population; therefore, 390 TV set owners in the country.

Calculating the proportionate sample for every grouping of the population by region countrywide. This research used Kothari (2004)'s method to sample allocation proportionately:

$$n_i = \frac{n * n_i}{N}$$

n_i = Sample Size of each category within the study area

n = Desired Sample size computed above

n_j = Number of population in each category

N = Total number of respondents in the study area

Ankole = $\frac{396,199 * 369}{3,770,000} = 38.77916$ approx. (39)

The formula was applied to all regions in Uganda to get proportions per region.

Sampling Design for Heads of Households

Selected TV owners were arrived at using the simple random sampling approach. This was done for each cluster. This approach was utilised as the best unbiased sampling method available.

Table 3.1: Sample Size of Respondents and Sampling Techniques

Category of Population(By Region)	Population Size	Sample Size	Sampling Technique
Kampala	1,654,047	162	Simple random sampling
Busoga	465,789	46	Simple random sampling
Bukedi	116,178	11	Simple random sampling
Elgon	119,963	12	Simple random sampling
Teso	117,147	12	Simple random sampling
Karamoja	87,146	9	Simple random sampling
Lango	104,783	10	Simple random sampling
Acholi	107,265	10	Simple random sampling
West Nile	102,584	10	Simple random sampling
Bunyoro	100,348	10	Simple random sampling
Tooro	209,473	20	Simple random sampling
Ankole	396,199	39	Simple random sampling
Kigezi	189,078	18	Simple random sampling
Total	3,770,000	369	

Source: Uganda National Household Survey 2016/17

Sampling Procedure for Heads of Households

Simple random sampling is based on probability. This study chose this approach for its all-embracing nature. The sample arrived at will be used to assign numbers to all TV owners. The listed TV owners were place in an opaque container written on separate pieces of paper. Later, the names were picked at random and listed until 369 were arrived at. These were the study participants.

Sampling Design for Key informants through Focused Group Discussions

Participants in the in-depth interviews were arrived at using purposive and census sampling. Knowledgeable study participants in every region were purposively chosen as they possessed the requisite information to enrich the study.

Table 3.2: Sample Size of Respondents and Sampling Techniques

Category of Population	Population Size	Sample Size	Sampling Technique
CEO SIGNET (U)	1	1	Census sampling
CEO UBC	1	1	Census sampling
CEO Multichoice Uganda	1	1	Census sampling
CEO Startimes Uganda Ltd	1	1	Census sampling
Retired Broadcasting Engineers from each region	13	5	Purposive sampling
Retired Broadcasting journalists from each region	13	5	Purposive sampling
Retired Broadcasting station managers from each region	13	5	Purposive sampling
Selected Members of the UBC Board	10	3	Purposive sampling
Selected Commissioners ICT Ministry	8	3	Purposive sampling
Total	61	25	

Source: Primary data 2021

Sampling Procedure for Key informants

Purposive and census approaches are non-probabilistic approaches. This was deemed necessary if the most qualified respondents for interviews were to be picked.

Data collection**Questionnaires**

Survey tools that were self-designed were given to 369 respondents to complete and avail the study with the required information. Survey tools a convenient tool that is used to collect structured data that is focused on the study parameters. They provide for provisions like confidentiality, anonymity and privacy.

Interview guide

This research, used an interview guide to get information from the CEO SIGNET (U), CEO UBC, CEO Multichoice Uganda, and CEO StarTimes Uganda Ltd. In addition, retired broadcasting engineers, journalists, station managers, select members of the UBC Board and Commissioners ICT Ministry took part in the exercise. The interview guide enables the obtaining of in-depth and detailed information that survey tools are unable to do, (Mugenda & Mugenda ,2003).

Documentary review check list.

This study had several sources of secondary data to review. Minutes of meetings in the information ministry, academic journals on the subject matter, theses, manuals and textbooks were all reviewed. Most experienced researchers recommend the enrichment of study findings based on primary data with reliable secondary data (Burns,2016).

Data processing and Analysis

Coding, sorting, editing, and compiling of data was diligently done. This eradicated typographical and miswritten information that would have increased number of outliers unnecessarily.

Data Analysis and Presentation**Quantitative Data Analysis**

Following the coding of data, it was entered into SPSS. The order of data entry followed the study objectives. The statistical software generated tables containing descriptive and demographic data. Additionally, inferential statistics of multiple regression and correlations between predictors and outcome variables was computed and presented in tabular form.

Qualitative Data Analysis

Results of interviews were systematically transcribed and analyzed along themes and content in line with the study objectives. These were then integrated in the main report to enrich and give more meaning to the results of descriptive and inferential statistics.

Ethical Considerations

All empirical research is governed by a defined body of ethics and the study respected the laid-out research ethics. Issues of openness and clarity were addressed with full disclosure to the respondents what the research entailed. The anonymity and confidentiality of the respondents was respected as advised by Saunders, Lewis & Thornhill (2012). Study participants were not unduly put at risk beyond what they faced in their day to day lives in their natural habitat and settings and environment as advised by Ghauri & Grønhaug (2005).

FINDINGS AND DISCUSSION

The study's findings are organized and presented according to objective guiding this study as well as testing the hypotheses. Analysis of descriptive statistics, correlations and regressions were included.

Descriptive analysis

Both consumer awareness and reach of the digital signals were given. The five-point Likert scale was used to gauge the responses ranging chronologically from strongly agree to strongly disagree (5 to 1). Statistics of standard deviations, means, and t-values were summarized. T-values significance range from 1% to 10%.

Table One Summary Descriptive statistics of Coverage of Digital TV services.

	Aspect/Variable	Mean	Standard deviation	t-value
1	Consumer Awareness	3.14	1.285	2.45
2.	Coverage of digital TV services			
(i)	Number of sites in the country	3.72	1.084	3.45
(ii)	Radius of coverage of each site	3.53	1.091	3.24
(iii)	Active number of pay TV subscribers	3.38	1.096	3.55
(iv)	Availability of STBs	3.48	1.193	2.92
(v)	Type of digital content being broadcast	3.59	1.193	3.13
	Pooled Mean and STD, t-value of Coverage of Digital TV services	3.36	1.131	3.26

Consumer awareness was operationalized as understanding of the equipment needed and digital literacy.

Mean representing consumer awareness and coverage of digital TV services were significant at 1% level.

Testing of the hypothesis

The research hypothesis tested whether Consumer awareness is not significantly related to coverage of digital TV services in Uganda.

Correlation results

This research further sought to establish the association between consumer awareness and coverage of digital TV services in Uganda. Pearson's product moment correlation was conducted. The coefficients fall anywhere between positive one (1) and negative one (1). This means the predictor and outcome variable can move in the same general direction (positive) or move in contrary directions (negative). In other words, the two variables could have a perfect association (1.00) or no association whatsoever (0.00).

Table Two: Correlation between Consumer Awareness and Coverage of Digital TV services in Uganda

		Consumer Awareness	Coverage of Digital TV Services
Consumer Awareness	Pearson Correlation	1	.662**
	Sig. (2-tailed)		.000
	N	307	307
Coverage of Digital TV Services	Pearson Correlation	.662**	1
	Sig. (2-tailed)	.000	
	N	307	307

** significance levels of correlation (0.01)

The findings above reveal association between the two variables is moderate, statistically significant, and positive. To move beyond gauging their association, the study regressed the two variables against each other to establish the degree of the predictive powers of the independent variable.

Simple linear regression results of consumer awareness and coverage of digital TV Services in Uganda

This research has "Consumer awareness is not significantly related to coverage of digital TV services in Uganda" as its null hypothesis.

Table three Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.662 ^a	.439	.437	.46237

a. Predictors: (Constant), Consumer Awareness

Source: Primary Data 2021

The diagram above details important information regard statistics that help measure the predictive powers of consumer awareness and variance in the dependent variable it accounts for. R value represents the correlation between the two variables stands at 0.662. Adjusted R square values are adjusted for sample size and number of variables in the model stand at 0.437. this explains the observed 43.7% variance observed in the dependent variable; remaining variance (56.3%) is explained by other predictors other than consumer awareness.

Table 4.4: Analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.985	1	50.985	238.489	.000 ^a
	Residual	65.204	305	.214		
	Total	116.189	306			

a. Predictors: (Constant), Consumer Awareness

b. Dependent Variable: Coverage of Digital TV Service

Source: Primary Data 2021

Table 4.4 reveals that all factors of consumer awareness considered in this study explain as a collective explain coverage of digital TV services ($f=238.489$, Sig. = 0.000). its influence shown by (43.7%) explaining variance in the outcome variable is buttressed regression figure of 50.985 compared to the residual figure of 65.204, representing other predictors linked to reach of the digital signals in Uganda.

Sums of square measure originality of data points as the data departs from the mean value. Sums of squares of 116.189 is statistical proof that the data set is not radically different from the mean. A residual value of 65.204 is further proof of model fit. Degrees of freedom in table are proof of a significant result. Mean Square value of 50.985 is moderately sized. The f-value in this study is significantly different from zero. The null hypothesis was rejected because consumer awareness is not significantly related to coverage of digital TV services in Uganda.

DISCUSSION OF FINDINGS

Detailed discussions gauging how study results relate to previous findings contained in previous publications, policy governing the sector and theory anchoring the study was diligently done. Consumer awareness was analyzed along these following lines: steering consumer awareness, comprehension of consumer awareness, awareness of equipment needed, and methods used to promote consumer awareness and stakeholders used in the awareness campaigns. Study results

generally agree that consumer awareness was steered in a clear and easily understood manner to guarantee countrywide comprehension of the phases involved in digital migration shown by a mean of 3.05. results were not dissimilar to existing body of literature. Examples comprise Kapoor, Mittal and Dhiman (2016), who argue that challenges and likely impact of digital migration in India were averted with a conscious and concerted consumer awareness campaign. Aarreniemi-Jokipielto (2016) proposed a number of ideas on how best to cost effectively reap dividends from a well-orchestrated consumer awareness campaign. Boateng et al (2017), while discussing digital enterprises in Africa, opined that the process generally rolls out better when consumers are made aware of the full benefits of digital migration. The consumer awareness is a key policy initiative underlined within the existing framework governing TV broadcasts in the country. Results were propped by the theoretical anchoring founded in the communication dynamics which are imperative for successful consumer awareness promotions.

The study established with a mean of 3.12 that consumer awareness encompasses transparency to guarantee that there is dialogue about all the events which will engender assurance from all TV consumers. This is largely in agreement with published literature. For instance study findings by Bajon and Villaret (2014) who assert that for successful technological transition to High-Definition TV, a consumer awareness campaign would determine its rate of success or failure. Siwei (2013) revealed digital TV development path taken by the Chinese government used consumer awareness campaign as the backbone of the entire process. Bourgault (2015), whose study centered on digital migration process in the sub Saharan sections of Africa, named out the lagging nations for failing to launch a media campaign to raise digital awareness. within the existing framework governing TV broadcasts in the country, government entities particularly those in the education sector regard digitization as a cornerstone in many implementation phases. This is particularly relevant in the COVID-19 pandemic era where remote learning was a matter of necessity. The result is anchored by the theory grounding the study which emphasizes roles of awareness as a function of effective communication.

The study established with a mean of 3.29 that some consumers are aware of the digital migration equipment needed. Study results in sync with Friederici, Wahome & Graham (2018) which established Digital Entrepreneurship in Africa has not progressed as expected due to limited consumer awareness. Gathara (2015) argued that one of the constraints besides litigation is limited consumer awareness which has constrained digital migration. However, quite a few consumers especially in Nairobi, Kisumu and Embakasi were aware of the digital migration equipment needed. Tsebee (2014), discussed trials and tribulations putting up digital infrastructure in Nigerian, established the relative success in some states is down to some consumer awareness of the equipment needed. within the existing framework governing TV broadcasts in the country, Ministry of ICT was solely in charge of raising awareness of processes of migrating digital processes generally and educating consumers on the operation and functionality of relevant equipment. The results are enamored by the theory anchoring the study which lauds evolutions in specific sectors like ICT. This sector encapsulates the entire concept of digital technologies of which consumer awareness of equipment needed to operationalize it is part and parcel.

The findings of the study of a mean of 3.01 are in partial agreement that consumer awareness campaigns make use of a multiplicity of methods to guarantee accessibility for all TV consumers. The finding partly agrees with studies by Richer et al. (2019), who argue that for the digital migration

process to progress at the expected pace, a multipronged approach to raise consumer awareness is advisable. Consumer awareness are central to bringing into action measures of digital economies and giving the whole process direction, (Ahmad and Ribarsky ,2018). Consumer awareness ensures smooth progression in dispersion of newer digital TVs like internet TV and online video rental services and public television, (Crinon et al. ,2019). within the existing framework governing TV broadcasts in the country, Ministry of ICT attempted to accelerate the process by using the existing platforms to raise awareness. This research result supported this said theory is seen to be universal in character and there requires a multifaceted approach to bring out its best and most telling attributes. This helps to explain the identified multiplicity of methods to guarantee accessibility for all TV consumers. The products identified are free-to-air television, internet streaming as well as Pay-Tv. This research results (2.70) mean fairly disagreed with the notion authorities involved all stakeholders in each district in consumer awareness to reach an acceptable threshold before the completion of the process in the stipulated period. The result isn't completely aligned to Kapoor, Mittal and Dhiman (2016) who while studying Indian digital development journal; identified and examined entities central to the process and aspects that may influence the digitization process. Ndemo and Weiss (2017) conducted a study that considered digital migration in Kenya. They recommended targeted interventions that were more cost beneficial given that the involve identification and bringing on board all stakeholders in each province. In this way the community who made up the consumers would own the process, thus, leading to successful implementation. within the existing framework governing TV broadcasts in the country, Ministry of ICT specifically underscore the fact that given the limited timeframe it is crucial to involve all stakeholders for expeditious digital migration to raise the consumer awareness. While building on the Information Society Theory, Van Audenhove (2003) pointed out that linkages to handling data packets, routing nodes that help transmit aspects of ICT in people's everyday lives. All this was only feasible with involvement of all stakeholders in the consumer awareness campaigns.

This research results (2.93) mean established the fact several respondents disagreed with the notion that the integrated approach was used by authorities to avert the dangers of confusion caused by wrong information. The finding was different to Preston (2011) that addressed reshaping of communications, specifically technology, information and social change. He asserted that proper shaping of communication leads to clarity. Sussan and Acs (2017), while presenting findings on the digital entrepreneurial ecosystem pegged its sustained success in perpetuity on proper and clearly coordinated communication using integrated approaches. Berger (2010) discussing findings on obstacles and prospects of developments in the media in Africa, pointed out the variety of benefits accruing from adopting an integrated approach to raising consumer awareness. within the existing framework governing TV broadcasts in the country, Ministry of ICT made commitments to undertake an integrated approach to consumer awareness. Unfortunately, the implementation did not match the expectations and that explains the dismal findings of the study. An audit targeting this specific aspect needs to be conducted. The result was contrary to theory anchoring this study supports idea that rise and effects of ICTs using integrated approaches form the foundation on which the information society theory is based.

Results represented as (3.01) mean score were not conclusive that consumer awareness is always made in local languages. This position is not in complete tandem to many scholars on this subject. Xing, Hanhui and Chong (2009) while examining China's transition to digital TV with a theoretical and empirical perspective; specifically the Telecommunications Policy pointed out the faster progress

that was attained once Mandarin and Cantonese were used in rural China to raise consumer awareness. Tilson, Lyytinen and Sørensen (2015) credited the rapid progress realised in central European nations down to the use of many languages to raise consumer awareness particularly in Metropolitan areas. Ndavula and Lidubwi (2016), fault unhurried awareness by consumers in Western Kenya on the insistence on employment of English language to raise consumer awareness yet most Kenyans in that part of the country are more comfortable using Kiswahili. within the existing framework governing TV broadcasts in the country, Ministry of ICT, undertook to disseminate the key messages in as many languages as possible. However, due to financial constraints, not all languages could be integrated in the program. This explains the considerable uneasiness the question solicited from the respondents. The implementation of the said policy needs to be revisited. While extending the information society theory, Castells, views the contemporary transformations in societal norms as morphing from industrial settings to connected entities using the internet as the backbone. He contends the next step in the evolution is eminent. This in African means effective dissemination of information which implies using commonly used media and languages to raise consumer awareness.

Research results (3.61) mean consumers are fully aware that their digital TV also allows them to receive digital radio content. This conclusion is aligned to study findings by Gong (2016) who while discussing cutting edge technologies that are better executed by availability of more bandwidth and spectrum include digital radio content availability. Einstein (2015) underscored the vast benefits that digital migration come with which include but are not limited to tremendous increased digital radio content. within the existing framework governing TV broadcasts in the country, Ministry of ICT availing expanded spectrum that would naturally accommodate digital radio content for local audiences. Connection with the anchoring theory is that currently ICTs is perceived as all pervasive; which now is in tandem with increased spectrum that can now house much more digital radio content. Research results (2.88) proved television owners are not fully aware that their digital TV allows them to stream data packets from internet sites. The result contradicted exiting literature. A case in point, Harji, Woods and Alavi (2010), point out the benefits of new digital technologies that include but are not limited to using TV sets to access the internet, pretty much like PCs enabling accurate and smooth subtitling in a secure envelope. Hsu et al. (2013), observed the correlation between digitization and spread of a nationwide internet framework. Within the existing framework governing TV broadcasts in the country, Ministry of ICT spearheaded the push to expand the reach of the internet within the country, so data streams transmit easily. Unfortunately, much of the work regarding internet proliferation, especially upcountry, remains incomplete. Connection to the anchoring is the theory's ability to enable us better comprehend society's structures that enable exchange of information. Streaming of data packets is possible if properly deployed.

Results indicated (3.59) mean score showing consumers are fully aware that their digital TV set is fully transferable to other geographical areas. The finding is in tandem with previous publications that allude to speed of transmission of new technology. Luftman, Lyytinen and Ben Zvi (2015) on IT Alignment observed that transferable technology was important connecting points which organisations use to reach a delicate balance between the business side and the IT department. Raven et al. (2014), on adverts on TV and their economic benefits said this would make more economic sense once the electronic adverts are portable and easy to diffuse to far corners of the country as well as abroad. Within the existing framework governing TV broadcasts in the country, Ministry of ICT recommended that the TVs imported into this country should be fully digitized and compatible with

existing broadcasting technologies in Uganda. Connection about transferability with the anchoring theory is that most conceptualizations of the theory examine recent developments in sector of information dispersal. It also reflects influence on societal norms and its flexibility as well as transferability. These revolutionised how information sectors operate.

Results indicate that consumers are fully aware that their old analogue TV can be reconfigured to receive digital TV and need not be discarded. The above is reflected by (3.25) as mean. The result is in tandem with several journal articles. Shapiro and Varian (2015), observed the need to minimise downtime of television viewership promoted the idea of convertible technology to help in bridging the two worlds of analogue and digital. Wangalwa (2015) asserted the need for a smooth transition with minimum fuss and hitches by buying compliant devices that can be attached to old TV receivers in the East African country due to the high initial costs in purchasing a digital television. Within the existing framework governing TV broadcasts in the country, Ministry of ICT recognized facts that mass replacement of TV sets would not be cost effective in the short run and planned to subsidize the importation of STBs. Unfortunately, the policy implemented process hit some snags and as a result, many STBs that have been imported remain in shop shelves as the price remains high and consumers are largely unaware of their availability and use. Linkage to the anchoring theory is that historically, the information society held together European and American culture, economies, and education advances, like the switch-from-analogue-to-digital technologies, are seen as enablers on the long and eventful journey to becoming.

Results indicate (3.22) mean, established that consumers are fully aware that their digital TVs allow them to get optional extras search as receiving digital signals without a physical connection. This finding is in tandem with a number of authors. Xing, Hanhui, and Chong (2009) asserted that making the spectrum more accommodative and efficient incorporated wireless technologies on top of what the spectrum was already carrying. Crinon et al. (2019), examined interactive TV and data propagation observed that optional extras like wireless broadcasting could be added as a bonus and improve the customer experience overall as long as they have reliable internet access like broadband and 5G technologies. Within the existing framework governing TV broadcasts in the country, Ministry of ICT, expect all broadcasting houses to reserve more space on the spectrum they got allocated to have a wide array of available services including but not limited to wireless technologies. Linking results to anchoring theory, this theory provides frameworks that explains a wide variety of telecom and ICT matters. These manifest as enablers in the EU and US economic spheres and eventually the whole world.

CONCLUSIONS AND RECOMMENDATIONS

Research was about impact of consumer awareness on coverage of digital TV services in Uganda. It was clarified that consumer awareness though under consideration by Ministry of Information and Communications Technology (ICT), has had some positive effect on coverage of digital TV services in Uganda. The result is partially in support of the existing framework governing TV broadcasts aimed at Prioritizing raising awareness of consumers through skilling and teaching so as to ease access and use of digital technologies and make them aware of their rights as TV consumers. It is recommended that there is need for revision of the current policy objective 4 a) so that it can cater for new media like social media to promote consumer awareness. This can be done by updating the computer equipment to help them support social media platforms. This is because most Ugandans

are below the age of 30 and can be easily accessed using social media and the internet. It is further recommended that the means of disseminating consumer awareness be diversified. This is necessary as increased coverage of digital TV services is only possible with enhanced consumer awareness. Finally, government should compel all content providers to create space in their programming for consumer awareness. This can be done through official communication to the said entities. This is because content providers have a long reach and reach millions of Ugandans on a daily basis.

Although this study adds to our appreciation of consumer awareness that explains the reach within the country the digital signals, it has had a few challenges, and this limits the replicability of this study. The challenges are: The model had a single predictor. Consumer awareness and reach of signals countrywide could be gauged using different predictors on top of variables utilised by this research. The study basically delaminated itself to establishing the relationship between consumer awareness and coverage of digital TV services in a short period of time. The approach limits the generalizability of the findings. Further, the questions in the survey tool were closed-ended; hence important details may not have been captured.

The above gaps open whole new avenues for new researches. Other predictors could be included in future models to test newly formulated hypotheses to gain more knowledge on the how digital signals in the country can be boosted further. Additionally, new research could examine an alternative analysis plan to better elucidate associations governing consumer cognizance and reach of digital signals countrywide.

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