



DO SUBSCRIPTION PAYMENTS IMPROVE COVERAGE OF DIGITAL TELEVISION SERVICES IN DIGITAL MIGRATION PROCESS?

Muhereza, B.R.M¹, Excellence, F.², Makumbi, R.B.³, Buwule, H.M.⁴

¹(Ph.D) Ndejje University

²(Ph.D), Kyambogo University

⁴(Ph.D), Ndejje University

ABSTRACT: The study actively sought to assess how subscription payments contributed towards improvement of coverage of digital TV services in Uganda. A cross-sectional-correlational study design was implemented to gather data. Tools primarily used to gather data from sampled TV owners were semi-structured questionnaires; complemented by interview guides. The collected data was subject to descriptive and inferential analyses. The principle study finding was that subscription payments predicted Coverage of Digital TV Services. It is recommended that Pay-Tv Providers need to be involved in the process of improving the old Digital Migration Policy for TV Broadcasting in Uganda; Government should fully incorporate public private partnerships in the digital migration process to help enhance coverage of digital TV and Government of Uganda needs to eradicate all barriers of entry into the market to prospective pay TV providers, this is because Pay TV providers have contributed the most to expansion of digital TV coverage.

KEY WORDS: Digital migration, Subscription Payments, Coverage of digital TV services, Uganda.

INTRODUCTION

The study is about subscription payments and coverage of digital TV services to guarantee quantity and quality digital content commensurate with Global Standards. Digital broadcasting has a key role to play in the social, economic and cultural development of a country (Freiderici, Wahome & Graham, 2018). Subscription television services are provided by a broadcaster for a fee. For the most subscription television services are usually paid for through monthly subscription fees paid by customers. As a consequence of this, subscription television service providers supply or offer content that can rationalize the cost of the service which helps to attract additional customers, and retain existing subscribers, (Quinones, Heeks & Nicholson, 2017). The majority of pay television services rely almost solely on monthly subscription fees paid by individual consumers. As a result, pay television outlets are most concerned with offering content that can justify the cost of the service which helps to attract new subscribers, and retain existing subscribers, (Quinones, Heeks & Nicholson, 2017). As matter of fact, by the end of the quarter of 2018, Uganda had 2,188,233 Pay-Tv subscriptions. However according to the Ministry of Information and Communications Technology, MoICT (2019), many of these subscription accounts are not active and many TV consumers are multiple subscribers meaning that in actual sense coverage of digital TV services in the country is still very limited. In this study subscription payment was operationalized as fees paid to Pay TV providers to gain access to digital television. On the other hand coverage of digital TV services was operationalized in terms of number of sites in the country; radius of coverage of each site; active number of pay TV subscribers; availability of Set Top Boxes and type of digital content being broadcasted.

A decision was taken in 2012 by the Ugandan Government to embark on the systematic expansion of coverage of digital TV services by kick starting digital migration involving shifting from analogue to digital broadcasting. This process revolved around partnering with private Pay TV providers as one of the initiatives. Digital broadcasting was expected to ensure improved picture and sound quality, quantity of signals and spectrum efficiency. However, the MoICT annual reports (2017, 2018), Internal Auditors Annual Report (2017) and Auditor General's Annual Reports (2017, 2018) 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 process, however, did not progress as smoothly as expected since only eighteen (18) out of one hundred and thirty five (135) districts have reached completion by 2017. This, in effect, means that only 13.3 % of the country receives complete digital TV services. In addition, eleven (11) remote sites have antennas whose configuration and alignment only allow coverage of a radius of twenty (20) to forty (40) km depending on terrain and weather conditions. This results in a situation where 86.3% of Uganda remains in “partial darkness” or is not effectively receiving digital TV services. Much as there could be many responsible factors, subscription payments may be playing a major role. Therefore the objective of the study was to assess the effect of subscription payments on coverage of digital TV services in Uganda. The null hypothesis tested in line with this objective was that subscription payments is not significantly related to coverage of digital TV services in Uganda.

LITERATURE REVIEW

2.1 Digital migration policy in Uganda

The Digital migration Policy sets the boundaries governing the migration from analogue to digital broadcasting in Uganda. As part of NDP II and III digital migration is important in many processes in the development plan (MOICT, 2012).

The policy was established through a consultative procedure. It is grounded on the conclusions and crucial recommendations made by the Digital Migration Working Group (DMWG) established by the Minister of Information and Communications Technology in 2008, the private broadcasters as well as inputs received from stakeholders through public dialogues and consultations, (MoICT, 2012).

The migration policy expressly aimed to generate and separate the market segment into manageable infrastructure services provision and Content services provision to ensure equitable growth while partnering with Pay TV providers (Ministerial Policy Statement- Ministry of ICT & National Guidance, 2021/22).

The policy further aimed to guarantee equitable access to quality broadcasting services to current and future stakeholders including Pay TV providers sustainably extending into the current and conceivable future. Further improvements would be feasible (Ministerial Policy Statement- Ministry of ICT & National Guidance, 2021/22). The migration policy distinctly aimed to ensure effectual use of radio spectrum by all stakeholders including Pay TV providers. The fact that radio frequency spectrum happens to be a scarce resource was a detail the Ministry was eager to press on Pay TV providers. Digital migration aimed at freeing up the radio frequency spectrum by using advanced compression and multiplexing technologies afforded by a digital platform; this benefits Pay TV providers. This would create an opportunity to provide extra services and applications such as mobile telephony, wireless broadband and e-services which Pay TV providers could take advantage of (MoICT, 2012).

The policy additionally aimed at protecting the general public against unfair practices by Pay TV providers during the transition and beyond. In order to operationalize this policy objective, Government gave Pay TV providers stringent terms and conditions that enabled them to acquire licenses; and in so doing guarded against consumer exploitation through excessive subscription fees. The authorities aimed at ensuring accessibility of affordable digital receivers and set-top-boxes through fiscal policy measures during the transition period. Government in collaboration with UNBS, aimed at defining minimum standards and specifications for the set-top-boxes to be used in Uganda, (Ministerial Policy Statement- Ministry of ICT & National Guidance, 2021/22). The digital migration policy aimed at promoting local content development by giving Pay TV providers strict thresholds to include at least 70% of local programming in their broadcasts. The policy further aimed at putting in place appropriate policies on the production, access, use and distribution of content in the diverse digital services environment in a bid to address copyright issues. The migration policy further planned to establish a body entrusted with the responsibility of promoting diverse content development by providing financial and other support to the local content development industry, (Ministerial Policy Statement- Ministry of ICT & National Guidance, 2021/22).

2.2 Theoretical Review

This study is grounded on the Information society theory. Much of the pioneering work was done by Fritz Machlup in 1962. The insightful, intense and focused analysis plus critique of Information Society Theory has been moved from the periphery and moved very much to the centre by scholars of Information and communication technology (Webster, 2015). The Information Society Theory raises questions which are unavoidable for anyone who wishes to understand the relationship between the structures and processes of social communication such as digital migration and social structure and processes that are made possible by coverage of digital TV services. The theory helps expound the role played by information and information technology in society (Ponzanesi & Leurs, 2014). The Information Society Theory took centre stage to throw light on the shift from analogue into digital technologies also known as digital migration and helps explain dispersion of information through coverage of digital TV services (Calhoun, 2014).

In recent years, World powers are grappling to bend the evolution of the information society preferably in their direction. US-companies such as Microsoft and Oracle Corporation have down the years succeeded in creating huge markets for new services and technologies such as digital TV technologies (Mansell & Steinmuller, 2000). There is real fear that Europe and other regions, could in the long run, be kicked out by being leveraged out by the strategy employed by US-companies (Van Audenhove, Burgelman, Nulens & Cammaerts, 2014).

Much as the Information Society Theory explains many aspects of how digital migration and other ICT advancements have shaped society, a number of questions remain that this study hopes to address. For example, how much advance in terms of ICT advancement like migration should happen for Uganda to qualify for information society status? Is this advancement in ICT is required in order to identify an information society qualitative, quantitative or both? Will coverage of digital TV services happen when all Ugandans own a digital television? Currently scholars like Dertouzos (1997); Negroponte (1995); Kranich (2004); who champion the notion that technology such as digital migration is central to Information Society Theory are not able to furnish us with anything approaching the answers we seek. The study hopes to bridge these gaps. Theoretical knowledge may not be a new way to try to explain research problems, but it is arguable that its significance has accelerated in recent times and therefore we base this study on the Information society theory.

2.3 Conceptual Review

2.3.1 Subscription payments

Subscription television services are provided by a broadcaster for a fee. For the most subscription television services are usually paid for through monthly subscription fees paid by customers. As a consequence of this, subscription television service providers supply or offer content that can rationalize the cost of the service which helps to attract additional customers, and retain existing subscribers, (Quinones, Heeks & Nicholson, 2017). Subscription Payments are operationalised as content broadcasted and viewership, and affordability.

2.3.1 Coverage of Digital TV Services

This refers to both geographical coverage of various broadcasters (areas where their digital signal covers) and the hardware that is able to receive their signal, (Richer et al, 2019). Coverage of digital TV services operationalized as number of sites in the country, radius of coverage of each site, availability of STBs or other free-to-air digital receivers, active number of Pay-TV subscribers and type of digital content being broadcast.

2.4 Subscription payments and coverage of digital TV services

The world over, pay television, sometimes termed as subscription television are subscription-based television services, usually provided by multichannel television providers, (Raven, Hoehn, Lancefield & Robinson, 2014). Subscription television began in the multi-channel transition and transitioned into the post-network era. This format helped to spread the coverage of digital TV services but in varying degree largely down to the economic strengths of the respective countries (Quinones, Heeks & Nicholson, 2017). The study put to use a correlational research design and collected data using mainly key informant interviews. The examination found the above

research findings rich in definitions and technical details but lack the specificity and contextual relevance relating subscription payments and coverage of digital TV services in developing countries like Uganda. This is one area the research threw more light on.

United States of America and the United Kingdom found increasing coverage of digital TV services through subscription TV easier as they didn't face outstanding technological constraints like developing countries did and pay television easily enhanced coverage of digital TV services in those countries, (Galperin, 2014). According to Levy, et al. (2013), pay television revenue from advertising has grown at a faster rate than those of terrestrial TV even before digital migration took place as so pay television from the onset helped boost coverage of digital TV services. The digital terrestrial TV was introduced in the United Kingdom as early as 1998, when around 27% of households had a TV service subscription. The United Kingdom already had the required infrastructure to comply with ASO in 2012, (Goodwin, 2015). The above studies by Galperin (2014) and Levy, et al. (2013) prove that Pay-TV subscriptions have helped expand coverage of digital TV services in United States and the United Kingdom. The study relied on availability of free-to-air decoders, subscription costs of Pay-TV and means of payment for service as independent variables. However, few practical lessons were borrowed and applied in the Ugandan setting. This created several temporal and contextual gaps. The study established which avenues can be employed to ensure subscription payments increase coverage of digital TV services in Uganda.

Wajcman (2017) conducted a study centered on how subscription payments influence on coverage of digital TV services in Poland. The study findings were mixed and largely inconclusive regarding the exact contribution of subscription payments to determine the magnitude of coverage of digital TV services. The study is grounded in the communication theory of justice. This created a theoretical gap that the study planned to fill. The report used reports from the information ministry as the data source of the study. This created a methodological gap that the study wants to address by employing primary data. That study also took place in Poland which created a geographical and contextual gap. Banaji et al (2018) conducted a survey in Pakistan and concluded that subscription payments were positively correlated with coverage of digital TV coverage in the country. The examination slightly differs from the study by Wajcman (2017). A clear conclusion was reached by the study. However, the report was unclear whether there were other contributors to digital migration on top of subscription payments. This created knowledge and conceptual gaps in the published literature which need filling. That study employed a longitudinal research design that created a methodological gap as a cross-sectional design is more suited to this type of study. The gaps cited in the above paragraph were addressed and results presented as policy alterations and improvements.

Toyama (2014) carried out a study that concluded that subscription payments positively contributed to coverage of digital TV service in Singapore. The factor by far contributed significantly to expansion in coverage. The study, however, used a rapid assessment method creating a methodological gap. The research also concluded that moderating variables like new technologies may affect the influence subscription payments has on coverage of digital TV service creating conceptual gaps in the published literature. The research is also several years old creating a temporal gap. In addition, the work was based in Singapore. This created a contextual gap. Coyer (2013), on the hand, argues that subscription payments in Western countries tended to contribute to coverage of digital TV services compared to the same in developing or middle-income countries. However, further details were not provided. This created a gap in the published literature. The study used a very small sample mainly from urban centres. This created a further methodological gap. Furthermore, the research took place nearly eight years ago and the information may no longer bear much relevance and requires updating. The gaps discussed in the above paragraph have been filled and the details of the same are among the recommendations put forward by the report.

Raboy et al. (2018) conducted a survey investigating the contribution made by subscription payments towards digital migration in the Great Lakes region of North America. The survey makes a very strong case for Pay-TV

provider's contribution to the success of digital migration in North America. The research used secondary data to draw up most of the conclusions in the research findings. This created a methodological gap. The study did not use any qualitative data in the process of analysis creating a further methodological gap. The examination is essentially grounded in mass communication theories. This created a theoretical gap. Girard (2017) did not agree with the preceding arguments. This new examination called for a multi-faceted approach to digital migration that would incorporate other predictors of coverage of digital TV coverage. However, the report stops short of identifying these predictors creating a conceptual gap. The survey was conducted in Europe and yet it compared its findings to the report by Raboy et al (2018) that was based in the United States. This created a contextual and geographical gap. This and other gaps were addressed by the study and presented in the policy recommendations of the study.

Mansell (2017) study findings make a case of subscription payments contributing substantially to coverage of digital TV services. He, however, concedes that contribution of subscription payments is unequal and is largely incumbent upon the economic situation that differs country by country. The distinction remains vague at this point and raises as many questions as it answers creating a conceptual gap the study hopes to address. The learning uses lot quality sampling technique that arrives at small clusters of nineteen. This created methodological gaps that need to be filled. King (2017) did not entirely concur with earlier study findings by Mansell (2017). He contends that subscription payments are supposed to supplement government efforts in funding the digital migration process and cannot solely make a telling contribution to coverage of digital TV services in the digital migration policy. The research only covered a three year period which probably does not cover enough time to pass judgment on contribution made by subscription payments towards boosting coverage of digital TV services. This creates a temporal and methodological gap that needs to be addressed. These gaps are later filled in by research findings as indicated in the conclusions and recommendation section.

In the East African region, Pay-Tv contributed very little to coverage of digital TV services. This was attributed to the high cost of decoders and a rushed process has affected digital TV signal uptake in Tanzania, (Gathara, 2015). At the time of ASO Tanzania had about 500,000 decoders available to cater for the estimated three million TV sets owned by households at the time, (Kisero, 2015). However, private players quickly saw this gap and slashed decoder prices and in recent years the role played by Pay-TV in helping coverage of digital TV services is growing, (Wangalwa, 2015). This study employed the cross sectional research design and collected data using self-administered survey tools. Study findings by Gathara, (2015) and Kisero, (2015) do not fully reveal how the subscription payments increase coverage of digital TV services in creating a conceptual as well as methodological gap in the published literature the study addressed.

UCC estimated that by 2010 about 300,000 used Pay-Tv stations. This means 95% are watching free-to-air channels; only 5% are watching pay-per-view stations in Uganda and accounted for very little for coverage of digital TV services in the country, (Bourgault, 2015). The reason for this is the Digital TV signal covers a radius of 60 km from Kololo, and covered greater Kampala, Luwero, Mityana, Lugazi, Entebbe and Mpigi among few other areas, (Oluka, 2011). Technically only residents within a 60-kilometer radius of Kampala could use a free-to-air decoder. This created an avenue for Pay-Tv to leverage its way into the rest of Uganda not catered for by Digital TV signal, (Tilson, Lyytinen & Sørensen, 2015). The study findings were based on a blend of quantitative and qualitative data. The research used availability of switching among subscriptions, subscription discounts on Pay-Tv and availability of free-to-air decoders as predictor variables. The researcher feels a more diverse choice of variables could have been made. This created a major conceptual gap the study filled.

The study gap of this study was that the objective is premised under the question why the subscription fees strategies were not able to enhance the access digital TV services in Uganda. Although some providers tried to fill this vacuum by cutting prices of decoders, the initial prices and monthly subscription remained too high for most Ugandans outside the capital. Clearly Pay-Tv has not greatly contributed to coverage of digital TV services, (Ndemo & Weiss, 2017). The decoders being sold by Pay-Tv firms in Uganda only allow viewers who

have paid subscription fees to access television channels. None of these Pay-Tv decoders have the entire local free-to-air TV channels locking out potential subscribers' further digitally disenfranchising TV viewers (Imaka, 2011). Study findings by Ndemo & Weiss (2017), Bourgault (2015) and Oluka (2011), used a correlational and case study design in their study. Data was collected using administered questionnaires. Study findings clearly indicate Pay-Tv has not greatly contributed to coverage of digital TV services, however the reasons why Pay-Tv has accounted considerably less to coverage of digital TV services compared to many other African countries remain unanswered. This created a major contextual gap. This necessitated a deeper inquiry which this study accomplished.

2.5 Summary of Literature

From the above review it can be observed that scanty studies have been conducted on subscription payments and coverage of digital TV services. The majority of the reviewed published literature examined some aspects of subscription payments but not in the totality of the predictor. A number of gaps were identified as few studies in the literature reviewed indicate that subscription payments affects coverage of digital TV services. Temporal gaps were identified where a number of studies were several years out of date and the study hopes to close that gap. Conceptual gaps were noted in the published literature with most studies not including all the sub variables in subscription payments. Most of the theories that moored preceding studies were incompatible with the study besides the Information Society Theory creating a theoretical gap. Methodological gaps were noted in a number of studies with some studies adopting research designs not entirely suited to the subject matter. Contextual gaps were identified as many of the previous studies were centered in developed countries, outside Africa and few publications on Uganda.

METHODOLOGY

3.1 Research Design

The study utilized a correlational cross-sectional survey design. A correlational design was selected so as to test the effect the independent variable (Subscription Payments) had on the dependent variable (Coverage of Digital TV Services). The study was cross-sectional because it was conducted across participants at a point in time and picked only some representative sample elements of the cross section population. It did not compel the researcher to make follow up on the participants. It was utilised on account of its rapid turnaround in data collection as Amin (2005) advises.

A survey design enabled the collection of data from a large number of respondents. It was a preferable method of choice because the researcher intended to generalize from the sample used extracted from the whole target population in Uganda (Cooper & Schindler, 2003). Surveys are particularly invaluable when it comes to rapid informational analysis and were comparatively easy to administer and manage (Kothari, 2004). Generally, data was collected using a cross sectional design because respondents were selected from different regions (Cooper & Schindler, 2003). The above quantitative designs were used in order to describe the current conditions and investigate the relationship, including cause and effect relationships (Amin, 2005). The study in addition employed both quantitative and qualitative approaches of data collection and analysis. The qualitative approaches helped in collection of data using views, comments and judgment of selected respondents on the various themes the study brought up. In addition the quantitative approaches were employed because it was based on testing theories which consist of variables to be measured with numbers and analysed with informational procedures to determine whether the predictive generalisation of the theories held true (Cooper & Schindler, 2003).

3.2 Study area and population

The study was in coverage of digital TV services in Uganda. For this study revolving around subscription payments and coverage of digital TV services, the targeted populations were households that own television sets. According to Uganda National Household Survey 2016/17 Commissioned by the national bureau of

information, about 3,770,000 television sets are owned by Ugandan households. The population of the study was 3,770,000 television owners.

3.3 Study sample

The total population of television owners is 3,770,000. This is too big a population to be involved in the research. For that matter a minimum sample size was determined. In advanced research like the current one, it is recommended (Saunders, Lewis & Thornhill, 2012, Sekaran & Bougie, 2010) that the minimum sample be calculated specifically for the study. So the "estimate" was 95% accurate. This corresponded to a z score of 1.96. The minimum margin of error was therefore 5%. In this study, the z score was used to estimate the proportions of accuracy and minimum margin of error as far as responses were concerned.

It was presumed that at least 60% of the selected respondents will answer fully the items on the questionnaire and suggested that 40% may not be able to. Using the formula popularized by de Vaus, 1991, Saunders, Lewis & Thornhill, 2012). The minimum sample size was computed using confidence level of 95% as follows.

Sample size was determined in two steps:

1. Calculated the sample size for infinite population.
2. Adjusted the sample size to the required population.

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

S = Sample size for infinite population

Z = Z score

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

M = margin of error

Z score was determined based on confidence level.

Confidence level: The probability that the value of the parameter falls within a specified range of values

Confidence Level	Z- Value
90%	1.645
95%	1.960
99%	2.576

The study took 95% confidence level then Z score as 1.96.

Margin of error was a small amount that is allowed for in case of miscalculation or change of circumstances.

Generally we took margin of error as 5%

$$M = 0.05$$

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

$$P = 0.6$$

$$M = 0.05$$

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

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

$$S = 3.8416 * 0.24 / 0.0025$$

$$S = 368.7936$$

So, sample size for infinite population is 368.7936.

Now, we adjusted the sample size to the required population. In this instance, the study adjusted the sample size to 369 television owners in Uganda.

The study put to use the following formula for adjusted sample size as recommended by Saunders et al (2012);

$$\text{Adjusted sample size} = (S) / 1 + [(S - 1) / \text{Population}]$$

$$\text{Adjusted } S = 368.7936 / 1 + [(368.7936 - 1) / 3,770,000]$$

$$\text{Adjusted } S = 368.7936 / 1.000102$$

$$\text{Adjusted } S = 368.756 \text{ approximately } 369$$

The sample size therefore for 3,770,000 is 369

So the desired sample size used to complete the main research instrument, that is, the questionnaire was 369.

To compute the proportionate sample per category of the population by region, the study used the regions categorized in the Uganda National Household Survey 2016/2017. The study employed the proportionate allocation sampling by Kothari (2004) based on a target population of 369 using the formula below:

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

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

$$\text{Kampala} = \frac{1,654,047}{3,770,000} * 369 = 161.8948 \text{ approx. (162)}$$

$$\text{Busoga} = \frac{465,789}{3,770,000} * 369 = 45.59049 \text{ approx. (46)}$$

$$\text{Bukedi} = \frac{116,178}{3,770,000} * 369 = 11.37127 \text{ approx. (11)}$$

$$\text{Elgon} = \frac{119,963}{3,770,000} * 369 = 11.77356 \text{ approx. (12)}$$

$$\text{Teso} = \frac{117,147}{3,770,000} * 369 = 11.74174 \text{ approx. (12)}$$

$$\text{Karamoja} = \frac{87,146}{3,770,000} * 369 = 8.529675 \text{ approx. (9)}$$

$$\text{Lango} = \frac{104,783}{3,770,000} * 369 = 10.25595 \text{ approx. (10)}$$

$$\text{Acholi} = \frac{107,265}{3,770,000} * 369 = 10.49888 \text{ approx. (10)}$$

$$\text{West Nile} = \frac{102,584}{3,770,000} * 369 = 10.04072 \text{ approx. (10)}$$

$$\text{Bunyoro} = \frac{100,348}{3,770,000} * 369 = 9.82186 \text{ approx. (10)}$$

$$\text{Tooro} = \frac{209,473}{3,770,000} * 369 = 20.50279 \text{ approx. (20)}$$

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

$$\text{Kigezi} = \frac{189,078}{3,770,000} * 369 = 18.50657 \text{ approx. (18)}$$

3,770,000

Sampling Design for Heads of Households

Simple random sampling design was used in this investigation to select samples of heads of households. The systematic sampling will then be applied to select respondents from the various strata. This design is chosen for this study because it gives each element in the population an equal chance of being included in the sample.

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

Probability based sampling employed the simple random sampling technique. The researcher opts for the use of simple random sampling techniques for purposes of having all categories in television owners involved in the study. The names of the 369 heads of households will be listed and assigned numbers from 1 to 369 and each number will be written on a different piece of paper, folded and put in a box. The box will then be shaken carefully and a piece of paper picked randomly without replacement. The procedure was repeated until the entire listed household heads (369 in number) were got. The names of household heads randomly picked from the box will listed as respondents to be given questionnaires.

Sampling Design for Key informants through Focused Group Discussions

Census and purposive sampling design was used in this research to select samples of key informants. For purposive sampling, carefully chosen respondents from various regions will be chosen. This design is chosen for this study because key informants possess rich knowledge on the subject matter and have been identified beforehand.

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

Non Probability based sampling employed census and purposive sampling techniques. The researcher opts for the use of census and purposive sampling techniques for purposes of having all qualified and experienced key informants to be interviewed.

3.4 Data collection

Questionnaires

Self-administered and self-designed questionnaires were administered to 369 respondents for the express purpose of getting primary data. Questionnaires were a tool of choice as they made it possible to ask specific questions that focused on the subject matter with no danger of being diverted outside the area of study. Previous studies found questionnaires quite popular because the respondents were usually able to fill them in at their own convenience and further still this tool was appropriate for a sample of this size. Questionnaires in addition provided the respondents with privacy to freely express their feelings on the subject matter because basically, respondents were not required to append their names on the tools.

Interview guide

The study used a semi-structured interview guide to conduct interviews with the following stakeholders in the broadcast industry: 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 were interviewed. Interviews as a tool were chosen because they made it easy to fully understand an interviewee's points of view or unique perspectives, or learn more about their answers as compared to questionnaires. According to Mugenda & Mugenda (2003), interviews are good in that unlike questionnaires, they provide more detailed information.

Documentary review check list.

The researcher developed a list of secondary sources of information that were reviewed. Several documents reviewed about the study included Ministry of ICT minutes of meetings, journals on digital migration and coverage of digital TV services, digital migration text books, dissertations on digital migration, abstracts, coverage of digital TV services consultants' reports and other related digital migration and coverage of digital TV services documents. Burns (2016) asserted that primary data alone cannot provide a comprehensive construct of the study problem, as it should be supplemented by secondary sources of data.

3.5 Data processing and Analysis

After collection, data was compiled, sorted, reviewed, edited and coded. The editing was meant to remove any corrupted or erroneous data provided by the different respondents and the coding helped in quickening the process of data input.

Data Analysis and Presentation

Quantitative Data Analysis

Collected quantitative data was coded, entered into IBM SPSS© 26 program and analyzed, based on the research objectives. IBM SPSS© 26 program was used to generate demographic and descriptive characteristics of the sample to be studied. In addition, Pearson's correlation coefficient analysis and linear regression to establish the relationship between variables and the regression analysis was done to establish the variations that the independent variable (subscription payments) accounted for in the dependent variable (coverage of digital TV services).

Qualitative Data Analysis

All the qualitative data that was collected through interviews and scrutiny of documents were categorized, organized and analyzed along the themes of the major variables. This was done to triangulate and marry the findings obtained through quantitative analysis.

3.6 Ethical Considerations

Ethics is the basis for conducting effective and significant studies and as such ethical concerns will be addressed by the study. The following ethical issues were prioritised as suggested by Saunders, Lewis & Thornhill (2012): Guarantees and honesty were key; whereby the purpose of the study and anything to be gained from it was clearly explained to respondents; confidentiality which requires that confidentiality and anonymity will be unreservedly and profusely guaranteed; identity of respondents as well as information obtained during the study was kept confidential unless otherwise agreed upon with the respondents; informed consent whereby all aspects and intentions of the study were clearly explained to the respondents to protect their welfare and dignity; and protection of respondents from any physical or mental harm arising out of the study. As suggested by Ghauri & Grønhaug (2005), respondents were not exposed to risks greater than, or additional to those encountered in their ordinary lives.

FINDINGS AND DISCUSSION

The study's findings are organized and presented according to the study objective and hypothesis tested. Descriptive analysis, correlation and regression results are presented.

4.1 Descriptive analysis

Both subscription payments and coverage of digital TV services were described. Respondents rated themselves on the different measures of the variables in question on a 5 point Linkert Scale (1 = strongly disagree; 2 = disagree; 3 = not sure; 4 = Agree and 5 = strongly agree). Results were categorized according to their means, standard deviations and t-values. For the means to be significant, the t-values should be equal to or greater than the conventional significance levels of 10%, 5% and 1%. Table 4.1, shows the summary descriptive statistics of both subscription payments and coverage of digital TV services.

Table 4.1 Summary Descriptive statistics of Coverage of Digital TV services.

	Aspect/Variable	Mean	Standard deviation	t-value
1	Subscription Payments	3.55	1.215	3.01
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	3.54	1.131	3.26

services			
----------	--	--	--

Subscription Payments was operationalized as payments made monthly to gain access to content from various broadcasting stations. Coverage of digital TV services was operationalized as: number of sites in the country; radius of coverage of each site; active number of pay TV subscribers; availability of STBs and types of digital content being broadcasted.

According to summary results in table 4.1, respondents rated themselves high on a scale of 5 on all features of Subscription Payments according to the overall mean (mean = 3.55; std = 1.215 and t-value = 3.01). Further, results in Table 4.1 indicate that overall, respondents also rated themselves high on all aspects of coverage of digital TV services as shown by the overall mean (mean 3.54; std = 1.131; t-value = 3.26). All the overall means of both Subscription Payments and coverage of digital TV services were significant at 1% or 0.01.

4.2 Testing of the hypothesis

The study sought to test the following hypothesis that, Subscription Payments is not significantly related to coverage of digital TV services in Uganda.

Correlation results

In conformity with the research design utilized in this study, an effort was made to establish whether there was an associative relationship between Subscription Payments and coverage of digital TV services in Uganda.

A bivariate analysis was conducted using Pearson's correlation methods. The correlation coefficients are between (-1) and (+1). Positive correlation means both the independent and dependent variables move in the same direction, while negative correlation, the two variables move in opposite directions. The strengths of the correlation were interpreted on the following basis: 1.00 means perfect relationships; 0.90 – 0.99 very high; 0.70 – 0.89 high; 0.50 – 0.69 moderate; 0.30 – 0.49, low; 0.01 – 0.29 very low and 0.00 translates to a non-existent relationship. Correlation results are presented in Table 4.2.

Table 4.2: Correlation between Subscription Payments and Coverage of Digital TV services in Uganda
Correlations

		Subscription Payments	Coverage of Digital TV Service
Subscription Payments	Pearson Correlation	1	.738**
	Sig. (2-tailed)		.000
	N	307	307
Coverage of Digital TV Service	Pearson Correlation	.738**	1
	Sig. (2-tailed)	.000	
	N	307	307

** Correlation is significant at the 0.01 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Correlation results in Table 4.2, indicate that there is a high and positive association between subscription payments and coverage of digital TV services in Uganda whereby Pearson's r coefficient was [$r(307) = .738$, $p < 0.01$] and it was significant $p < 0.01$ ($0.000 < 0.01$). This means that coverage of digital TV services in Uganda is positively and highly associated with subscription payments and this association is significant. However, there was need to run simple regression analysis to confirm whether the relationship was predictive or not as illustrated below;

Simple linear regression results of subscription payments and coverage of digital TV Services in Uganda

The null hypothesis stating, “subscription payments is not significantly related to coverage of digital TV services in Uganda” was also subjected to a simple linear regression test.

Table 4.3 Model Summary

Table 4.3: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.738 ^a	.545	.543	.41651

a. Predictors: (Constant), Subscription Payments

Source: Primary Data 2021

Table 4.3 portrays the model summary that summarises the value of R, R Square, Adjusted R Square and Std. Error of the Estimate is the standard deviation of the error term, and is the square root of the Mean Square Residual. R value represents the correlation between the two variables stands at 0.738. The Adjusted R square value of 0.543 accounts for the variations noted in coverage of digital TV services in Uganda by 54.3% (at 100% test level). The remaining variations (45.7%) in coverage of digital TV services in Uganda are accounted for by other factors. Adjusted R Square is the method used to adjust the R Square to cater for the sample size and number of independent variables contained in the model and stands at 0.543.

Table 4.4: Analysis of variance
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.278	1	63.278	364.756	.000 ^a
	Residual	52.911	305	.173		
	Total	116.189	306			

a. Predictors: (Constant), Subscription Payments

b. Dependent Variable: Coverage of Digital TV Service

Source: Primary Data 2021

Table 4.4, indicate that all the factors considered for subscription payments are collectively explanatory variables of coverage of digital TV services in Uganda. The contribution of 54.3% of subscription payments to variations in coverage of digital TV services is also supported by the regression value of 63.278 compared to the residual value of 52.911 meaning other factors that affect coverage of digital TV services are relatively less than subscription payments.

Moreover, Table 4.4 above contains the sum of squares, degrees of freedom, mean square, the f information and its level of significance. The sum of squares in information gauges the nonconformity of data points as one travels away from the mean value. A total of sum of squares stands at 116.189 indicates that the data does not vary greatly from the mean value. A moderate residual sum of squares of 52.911 (given that regression sum of squares stands at a sizeable 63.278) suggests the model fits the data substantially. Degrees of freedom (df) which are values that have the freedom to vary in the data sample stand at (1,305) suggest a significant result. The Regression Mean Squared value that measures how close a fitted line is to data points stands at 63.278 is on the high side. The p-value associated with this F value is very small (0.0000) which is typically ($P < .05$) which signifies that the R Square value is significantly different from zero.

4.3 Discussion of findings

This segment delivers a detailed discussion showing a connection between the findings and the literature that was reviewed, the Digital Migration Policy for Television Broadcasting in Uganda as well as the Information Society Theory which underpinned the study.

In this study, subscription payments were analyzed along the following dimensions: awareness of availability of subscription payments, affordability of subscription payments, television content available, and flexibility of payment options and value for money of the decoders available on the market.

Study results indicated by a mean score of 4.18 largely agree that consumers are fully aware of the availability of subscriptions payment television. The study findings are supported by a substantial quantity of publications. Cases in point include Goodwin (2015) who holds the view that the initial success in the United Kingdom by ITV and London Weekend Television was purely down to public awareness of the excellent and superior services on offer due to an aggressive public awareness campaign. Kumabe (2010) argued that preparations for Digital Switchover in Japan, included a protracted awareness campaign by Pay-TV providers who were able to take on eager subscribers when analogue switch off happened. Ngcaba (2012), while conducting a study on building a Digital Life for All South Africans, noted that Pay-TV market leaders like STEMSAT were able to have a growth market purely because of public awareness of the existence. The broadcasters that provide service after subscription payments is covered under digital migration policy for television broadcasting in Uganda are seen as providing a complementary service to support existing Government initiatives. The study finding can be grounded by pillars of the Information Society Theory that stress the role played by private participants in communication to complement the public sector.

The study established that the monthly or daily TV access subscription payment plans are quite affordable; supported by a mean score of 3.39. This is largely in agreement with published literature. For instance, study findings by Quinones, Heeks and Nicholson (2017), while examining Digital start-ups in the global South, specifically Latin America assert, that for most countries including Colombia, Bolivia and Uruguay, Pay-TV has low and flexible payment plans that just about all can afford. Bajon and Villaret (2014) divulge the unique role played by the emergence of High-Definition TV that is both cost effective and affordable thus enabling technological transition and creating new markets as cheaper Pay-TV is now feasible. Alexander and Cunningham (2014), whose study discussed diversity in broadcast television, revealed that in many parts of the world, particularly in developing countries, cheaper Pay-TV was becoming fairly ubiquitous. Considering the Digital Migration Policy for Television Broadcasting in Uganda, government through UCC has placed a price ceiling on subscription payments for Pay-TV. This finding is in conformity with the Information Society Theory that promotes the notion that the information industry is the fastest growing economic sector in the world with enormous potential in terms of growth and foreign export and this is reflected by affordable Pay-TV payment plans.

The study established that the majority of consumers able to pay their monthly or daily TV subscriptions without much difficulty. This is supported by a mean score of 3.55. This finding is in line with Einstein (2015) whose study about broadcast network television spanning the era 1955-2015, argues that development of cheaper microchips and wireless reception technology has ensured availability of cost effective Pay-TV. Griffin (2012) envisaged a period over the next decade when good quality digital television would be within reach of the average European and over a further decade much of the low developed countries. Kapteina (2017), while discussing how organizations manage innovation and examined digital technologies and trends 2017, concluded that cheaper technologies coming on the market meant that decoders sold by Pay-TV providers could charge lower and lower fees making it affordable to most prospective subscribers. Considering the Digital Migration Policy for Television Broadcasting in Uganda, government has carefully vetted prospective Pay-TV providers and placed price ceilings on their products which made them much more affordable. This finding is backed by the Information Society Theory: that is to say the information industry forms the basis of the information

society, as it is this sector that produces the products and services which are going to be used throughout society. It will also lead to new forms of use, communication and interaction. This is only possible when the products are affordable to most consumers.

The findings of the study indicated by a mean score of 3.68 support the notion that the content from the Pay-TV providers that consumers are currently viewing is appealing and relevant to me and my family. This conclusion is similar to that arrived at by Ndemo and Weiss (2017) who argue that, in Kenya, where television was already a popular, pastime in the terrestrial television days, it was important that the Pay-TV providers would use continuity to inherit much of that market by ensuring that the content they offered continued to be appealing and relevant. Kapteina (2017), when discussing how broadcasters manage innovation, underscores the importance of having several choices that have the look and appeal as well as depth of content on offer. Bhat (2012) cited falling costs in running Television stations in India and saw this as the reason Pay-TV rates would gradually start declining and due to competition have more appealing and relevant programming. Considering the Digital Migration Policy for Television Broadcasting in Uganda, UCC makes hosting of programmes that have relevance and appeal to masses, usually in local languages. This finding is backed by the Information Society Theory that advocates the idea that the information industry as well as the applications and services resulting from it create the basis of the evolution towards the information society. This is in keeping with having content that is both appealing and relevant.

Study findings illustrated by a mean score of 2.71 fairly disagreed that consumers have been forced to subscribe to more than one Pay-TV provider because no provider has content for the whole family. This finding is not completely in line with Tilson, Lyytinen and Sørensen (2015) who while studying digital migration considered the need to ensure polarized TV content provision is avoided as much as possible. Goodwin (2015) conducted a study that considered digital terrestrial television growth and development in Europe in general and the United Kingdom in particular. He credited the extraordinary progress achieved to provision of balanced content by Pay-TV providers that kept most family members content. Considering the Digital Migration Policy for Television Broadcasting in Uganda, the government through UCC vets all programming by all digital TV broadcasters including Pay-TV. One of the initial requirements is balanced programming suitable for family viewing. Linking the findings to the society theory is that the incumbent strategy is one group of actors (Government of Uganda) strives for control over ownership of or key positions in the information industry. An obvious key position is the control over the telecommunications network, as it forms the underlying infrastructure for the new information industry. In this field, dominant players like line Ministries try to exert control, either over local networks or over large parts of international traffic. Another strategic position insisted on by bodies like UCC is the determination of the provision of content and services.

Study findings shown by a mean score of 3.78 established that existing Pay-TV providers allows flexible payments options. This conclusion is similar to that arrived at by Adda and Ottaviani (2015) whose study rotated about the changeover to digital television and suggest that taking consumers' tastes and preferences would be the smart way to go as it would meet immediate positive reception. Galperin (2014) while presenting findings on the transition to digital TV in the western countries argues that catering for current needs, as far as flexibility in payments was concerned, were important as well as regular revision of the same to keep up with the market. Kumabe (2012), while discussing findings of adoption of digital television and specifically newer broadcast technologies like DTT, argued that this initiative could only succeed if market conditions were incorporated by Pay-TV providers when setting subscription rates as this would boost numbers and make individual providers competitive. Bearing in mind the Digital Migration Policy for Television Broadcasting in Uganda, the government strongly suggested that more flexibility be exercised by the private broadcasters who included Pay-TV providers. Linkage or lack thereof between this finding and the Information Society Theory is it promotes the insurgent strategy which is geared at the creation of new means and positions that can be controlled by a small number of actors such as Pay-TV provider as the result of a specific action. This action can consist of fast

innovation, the anticipation of specific users' needs not yet addressed like the acceptance of flexible payment plans.

Study findings shown by a mean of 3.29 further revealed that subscription television service providers offer content that rationalizes the cost of the service. This position is in sync to many scholars' publications on this subject. Montero, Peters and Desmet (2013) as part of their study findings pointed out the value for money generally tagged to digital technologies. They emphasize the importance of maintaining the bottom line so that any price increases can be explained away basing on quality programming. Noam (2016) ascribed the popularity of cable television in the American outback to the services hosting popular shows. Increases in fees could be tolerated as long as subscribers were happy with the content on offer. Quinones, Heeks and Nicholson (2017), in their study findings, based on the study conducted in South America about the growth in popularity of Pay-TV due to the rich menu of excellent programming they could offer to their subscribers. Considering the Digital Migration Policy for Television Broadcasting in Uganda, the government tagged increment in subscriber fees on increased spectrum usage as well as growth in content. Linkage between this finding and the Information Society Theory is the emphasis on the virtual community and their love of individualized content and services. Actors like Pay-TV providers that are active within this strategy can be very diverse and usually belong to the private sector. Small companies like Pay-TV companies focus their strategies on niche markets.

Study findings shown by a mean of 3.46 ably established that Pay-TV is affected by high cost of decoders. This conclusion is in line with study findings by Sussan and Acs (2017) who, while discussing the digital entrepreneurial ecosystem, point out the need for private broadcasters who are typically focus on long term strategies like dropping decoder prices but gradually increasing subscriber fees over a long period of time. Gong (2016) emphasized the usefulness of cost effective technologies that can result in eventual reduction in prices of equipment. This would be a win-win situation as this would drive up demand for decoders and other equipment which would benefit Pay-TV providers. In Uganda's case, the main Pay-TV providers have slashed prices of their decoders in recent years creating extra demand for their product. Considering the Digital Migration Policy for Television Broadcasting in Uganda, the government has in support of the digital migration policy cut taxes on imports of decoders and has encouraged Pay-TV providers to assemble decoders locally where possible. In this way Pay-TV providers and the government have realised that Pay-TV providers are adversely hit by high decoder prices. Linking the study finding and the Information Society Theory is the theory is closely aligned with economic sensibilities and thus encompasses the principles of economies of scale. In this way, the theory is in support of reducing prices of decoders so as to realise a bigger demand.

Study findings shown by a mean score of 3.91 demonstrated that the role played by Pay-TV in helping coverage of digital TV service is growing. This finding was largely in sync with a number of publications. For instance, Friederici, Wahome and Graham (2018), while presenting study findings of digital entrepreneurship in Africa pointed out the huge role Pay-TV has played, and will continue playing, in increasing the coverage of the digital signal. Hsu et al. (2013), while studying expansion of digital broadcasting cited the contribution Pay-TV has made in expanding the digital coverage in many countries in Asia, especially in countries with struggling economies like Myanmar and Bangladesh. Considering the Digital Migration Policy for Television Broadcasting in Uganda, the government through ICT Ministry had an elaborate plan to quickly increase coverage of digital television countrywide. However, they recognise the role Pay-TV can provide in extending the service in hard-to reach areas that are not under electrification, for instance, as they utilise alternative power sources. Connection between this finding and the Information Society Theory is the idea that there exist new possibilities in information processing, storage and transmission lead to the spread and use of ICT-applications in almost all corners of the economy and society. More often than not, it is assumed that this process has positive social and economic consequences like in helping coverage of digital TV service by Pay-TV providers.

The study findings shown by a mean score of 3.81 demonstrated the fact that decoders being sold by Pay-TV firms in Uganda only allow viewers who have paid subscription fees to access services from television channels.

This finding is supported by a number of scholars who recommend investors in digital technologies can expect a return on their portfolio and capital outlay. Tsebee (2014), while disclosing findings challenges and prospects for developing digital technologies in Nigeria, pointed out the fact that many Pay-TV providers leave very few free channels available to the subscriber on expiration of the subscription. Afolabi et al. (2018), while discussing study findings which showed that Pay-TV providers tend to support fully subscribed clients held the view that, concerning evolution of wireless networks technologies, pointed out the advanced security features on modern decoders that instantly disconnect any user who is no longer eligible. When considering the Digital Migration Policy for Television Broadcasting in Uganda, the government through ICT Ministry has negotiated with private Pay-TV providers so they can allow the subscribers access to a few channels on expiration of their subscription which include the National broadcaster among other channels, (ICT Ministerial Statements, 2018). Linkage between this finding and the Information Society Theory is the theory's basis to always distinguish between evolutions in specific sectors, at the economic level or at the level of social institutions and structures. This makes a case for decoders with newer and more advanced features that may limit a subscriber's access to the decoder when their subscription expires.

The study findings exemplified by a mean of 3.83 was able to establish the fact that Pay-TV firms in Uganda have led to increased coverage of digital TV services in many area. This finding is supported by a number of scholars whose publications agreed with the main finding. Armstrong and Collins (2011), while discussing digital mayhem for South African TV, still acknowledged the vast contribution made by Pay-TV providers in coverage of digital TV services in many provinces; most especially outside major cities. Ndemo and Weiss (2017), while discussing constraints to digital migration in Kenya, gave due credit to Pay-TV in extending digital TV services in remote areas of Lake Turkana and Garissa towards the border with Somalia in North Western Kenya as well as in Lake Elgon areas that would otherwise have not been catered for. Under the Digital Migration Policy for Television Broadcasting in Uganda, the government ensured the role to be played by Pay-TV was supported by policy. This was because they were acutely aware of their limitations as far as finances and technical abilities was concerned. Linking this finding and the Information Society Theory is it avails us with an analysis of recent evolutions in the information industry and their impact on society which currently include but are not necessarily limited to coverage of digital TV services.

The study established that some consumers opted for subscription payment TV because they fall outside the area Digital TV signal covers, as is supported by a mean score of 3.03. This finding is not completely new as it was identified by a number of authors as a key inhibition to digital migration. Siwei (2013) noted that broadcasting and television digitization strategy in China was initially reluctant to allow private players in the television industry but eventually allowed state-owned Pay-TV providers who are still under state control and have in some areas towards the Tibetan border provided digital TV signal. Richer et al. (2019) noted that in the EU most digitization falls under private providers who charge subscribers for their services. In that sense most TV consumers in their area by default opt for Pay-TV services. Considering the Digital Migration Policy for Television Broadcasting in Uganda, the government was expected to provide a framework for the provision of community television. However, due to, in part, their financial challenges they invited private players in for of Pay-TV to help compliment their efforts. Therefore, Pay-TV covers many areas that are not covered by Digital TV signal. Linkage between this finding and the Information Society Theory is the explosive use of the Internet has, to a considerable degree, contributed to the use of ICTs throughout society which includes digital technologies. The internet and the growth of new technologies and services is the first medium or even better meta-medium that demonstrates the enormous potential of the convergence between informatics, telecommunications and content. Pay-TV has ably covered the resultant deficit in areas not previously covered by Digital TV signal.

CONCLUSIONS AND RECOMMENDATIONS

The study sought to scrutinize the effect of subscription payments on coverage of digital TV services in Uganda. In view of the regression results which revealed the amount of unique variations in coverage of digital TV

services accounted for by subscription payments, it is logical to conclude that subscription payments though under consideration by Ministry Of Information and Communications Technology (ICT), has had some of the expected effect on coverage of digital TV services in Uganda. This result is partly supportive of the digital migration policy for TV broadcasting in Uganda Policy objective 5d) that aimed at instituting a policy on infrastructure sharing such that existing infrastructure owners like Uganda Broadcasting Corporation and new entrants like Multi Choice and Startimes who levy subscription payments can easily integrate their facilities into the distribution network.

In view of the findings the study advanced the following recommendations;

- (i) Government needs to revise the current policy objective 5 in which it gives limited support to the Pay TV providers. This can be implemented by Technocrats in MoICT who are mandated to give guidance on policy matters. This can be done through stakeholder meetings involving Pay TV providers. This is because Pay TV providers have contributed the most to expansion of digital TV coverage.
- (ii) Government should fully incorporate public private partnerships in the digital migration process to help enhance coverage of digital TV. This can be implemented by a joint team from the MoICT and leadership of Uganda Private Broadcasters. This is because the Ugandan government's resource envelope is small and its efforts to increase coverage of digital TV would need to be complemented by the private sector.
- (iii) Government of Uganda needs to eradicate all barriers of entry into the market to prospective pay TV providers. This can be done through the reduction of red tape imposed by UCC on new entrants. This is because pay TV providers like Multichoice and Startimes have contributed greatly to expansion of digital TV services countrywide.

Although this study widens our comprehension on how subscription payments impact coverage of digital TV services in Uganda it has some limitations and therefore not all findings are generalizable. These limitations among others include the following;

There were few variables integrated in the framework. Mutually subscription payments and coverage of digital TV services could have been assessed by many other variables in addition to the ones employed by this research. The study was basically cross-sectional that examined the effect subscription payments had on coverage of digital TV services at one point in time. This limits the replicability of the results. Further, the questions in the questionnaire were closed-ended; hence important details may have been left out.

Considering the above limitations, the study suggests areas for additional research. More variables should be added in the framework grounded on publications and be tested practically to increase our comprehension of coverage of digital TV services in Uganda. Secondly, future studies should consider different analyses to widen our appreciation of how subscription payments impact coverage of digital TV services in Uganda.

REFERENCE

- Adda, J., & Ottaviani, M. (2015). The Transition to Digital Television. *Economic Policy*, 159-209.
- [1] Afolabi, et al. (2018). Evolution of wireless networks technologies, history and emerging technology of 5G wireless network: A review. *Journal of Telecommunications System & Management*, 7(3): 1-5.
 - [2] Alexander, P. J. & Cunningham, B. M. (2014). Diversity in broadcast television: An empirical study of local news. *The international journal on media management*, 6 (3&4), pp. 176-183.
 - [3] Amin E. M. (2005). *Social Science Research, Conception, Methodology and Analysis*, Makerere University Press. Kampala, page, 77-81
 - [4] Armstrong, C & Collins, R. (2011). Digital turmoil for South African TV. *International Journal of Digital Television*. 2(1):7-29
 - [5] Bajon, J. & Villaret, S. (2014). High-Definition TV: Technological transition or new market? IDATE, Montpellier.
 - [6] Banaji, S., Livingstone, S., Nandi, A., & Stoilova, M. (2018). Instrumentalising the digital: adolescents' engagement with ICTs in low- and middle-income countries. *Development in Practice*, 28(3), 432-443. doi:10.1080/09614524.2018.1438366
 - [7] Bhat, R. (2012). Television in India: The starting point for digital switchover. *International Journal of Digital Television*, 73-83.
 - [8] Bourgault, L (2015). *Mass media in sub-Saharan Africa*. Bloomington: Indiana University Press
 - [9] Burns, R. (2016). *Introduction to research methods*: Longman.
 - [10] Cooper, R. & Schindler S. (2003), *Business Research Methods. The McGraw-Hill/Irwin series operations and decision sciences. Ed.8 illustrated Publisher McGraw-Hill School Education Group/*

- [11] Coyer, K. (2013). *Community media in a globalized world: The relevance and resilience of local radio*. Cresskill, NJ: Hampton Press.
- [12] Dertouzos, M. L. (1997). *What will be: How the new world of information will change our lives*. Piatkus.
- [13] Einstein, M. (2015). Broadcast network television, 1955-2015: The pursuit of advertising and the decline of diversity. *Journal of Media Economics*, 17 (2), pp. 145-155.
- [14] Friederici, N., Wahome, M., & Graham, M. (2018). *Digital entrepreneurship in Africa*. Available at: https://geonet.ox.ac.uk/blog/digital-entrepreneurship-in-africa-announcing-our-upcoming-book/friederici-et-al_outline_digitalentrep-africa-nov-2018/.
- [15] Galperin, H. (2014). *New television, old politics: the transition to digital TV in the United States and Britain*. Cambridge University Press, Cambridge.
- [16] Gathara, P. (2015, February 26). Kenya: Why the media is losing the digital migration debate. *The Star*. Retrieved February 13, 2020, from <http://www.the-star.co.ke/sections/patrick-gathara>.
- [17] Ghauri, P. & Grønhaug, K. (2005). *Research methods in Business Studies: A practical guide*. 3rd Ed. London: Prentice Hall.
- [18] Girard, B. (2017). *Empowering Radio – Good practices in development and operation of community radio: issues important to its effectiveness*. Report prepared for the Programme on Civil Engagement, Empowerment and Respect for Diversity, World Bank Institute. (WBI). June 2007.
- [19] Gong, W. (2016). *The Internet of Things (IoT): What is the potential of the internet of things (IoT) as a marketing tool?* Retrieved December 12, 2020, from University of Twente: http://essay.utwente.nl/70018/1/Gong_BA_BMS.pdf
- [20] Goodwin, P. (2015). United Kingdom: Never mind the policy, feel the growth. In: A. Brown and R. G. Picard, ed. 2005. *Digital terrestrial television in Europe*. Lawrence Erlbaum Associates Publishers, Mahwah, NJ. pp.151-180.
- [21] Hsu, C.-K., Hwang, G.-J., Chang, Y.-T., & Chang, C.-K. (2013). Effects of video caption modes on English listening comprehension and vocabulary acquisition using handheld devices.
- [22] Imaka, I. (2011). UBC not ready for digital migration, says communications commission. <http://mobile.monitor.co.ug/News/-/691252/1213220/-/format/xhtml/-/j5a8g1/-/index.html>
- [23] Kaptaina, G. (2017). *Digital Technologies and Trends 2017. How Organizations Manage Innovation*. Retrieved December 12, 2020, from <https://gernotkaptaina.com/2017/01/17/digitaltechnologies-and-trends-how-organizations-becomedigital/>
- [24] King, G. (2017). *History of Struggle: The Global Story of Community Broadcasting Practices, or a Brief History of Community Radio*. *Westminster Papers in Communication and Culture*, 12(2), 18. doi:10.16997/wpcc.227
- [25] Kiseru, J. (2015, February 17). Digital migration across Africa is all about dubious deals with Chinese. *Daily Nation*. Retrieved February 13, 2020, from <http://www.nation.co.ke/oped/Opinion/-/440808/2627116/-/3rcbqgz/-/index.html>
- [26] Kothari, C. R. (2004). *Research Methodology, Methods and techniques* (2nd Ed). New Age International (P). New Delhi, India.
- [27] Kranich, N. (2004), 'Libraries: the Information Commons of Civil Society', in Schuler, Doug and Day, Peter (eds), pp. 279–99.
- [28] Kumabe, N. (2012). DTT switchover accomplished in most areas of Japan. *International Journal of Digital Television*, 3 (1), 85-87.
- [29] Kumabe, N. (2010). Preparations for Digital Switchover in Japan: An Update. *International Journal of Digital Television*, 1 (1), 85-87.
- [30] Levy, J., Ford-Livene, M. & Levine, A. (2013). *Broadcast television: Survivor in a sea of competition*. FCC Office of Plans and Policy Working Papers Series, 37. [Internet] FCC, Washington, DC.
- [31] Mansell, R. & Steinmuller, W. E. (2000). *Mobilizing the Information Society. Strategies for Growth and Opportunity*. Oxford: Oxford University Press.
- [32] Mansell, R. (2017). *Inequality and Digitally Mediated Communication: Divides, Contradictions and Consequences*. *Javnost - The Public*, 24(2), 146-161. doi:10.1080/13183222.2017.1287966
- [33] Ministry of Information and Communications Technology (MoICT) (2011a), *Information Management Services Policy: Draft V.8, February*, available at: www.nita.go.ug/uploads/Draft_IMS_Policy.pdf (accessed 7 December 2020)
- [34] Ministry of Information and Communications Technology (MoICT) (2011b), *National Information Security Strategy (NISS), March*, available at: www.nita.go.ug/uploads/NISS.pdf (accessed 7 December 2020)
- [35] Ministry of Information and Communications Technology (MoICT) (2011c), *Institutionalization of Information and Communications Technology (ICT) Function in Ministries, Departments, Agencies/Local Governments (MDAs/LGs): Draft Final Report, March, Kampala*.
- [36] Ministry of Information and Communications Technology (MoICT) annual reports (2017).
- [37] Ministry of Information and Communications Technology (MoICT) annual reports (2018).
- [38] Ministry of Information and Communications Technology (MoICT) (2012), *Draft Telecommunications Policy 2012, August, Kampala*.
- [39] Ministerial Policy Statements Ministry of Information and Communication Technology for FY 2018/2019.
- [40] Montero Pérez, M. M., Peters, E., & Desmet, P. (2013). Is less more? Effectiveness and perceived usefulness of keyword and full captioned video for L2 listening comprehension. *ReCALL*, 26, 21-43.
- [41] Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches*. Nairobi, Kenya: African Centre for Technology Studies (ACTS).

- [42] Ndemo, B. & Weiss, T., eds. (2017). *Digital Kenya: An Entrepreneurial Revolution in the Making*. Palgrave Macmillan, London.
- [43] Negroponte, N. (1995), *Being Digital*. Hodder & Stoughton.
- [44] Ngcaba, A. (2012). "Building a Digital Life For All South Africans – Building an ICT Ecosystem through an Inclusive Consultative Process". Presented at the Department of Communications National Integrated ICT Policy Colloquium.
- [45] Noam, E.M. (2016). The concentration of American media industries. In: TPRC (Telecommunications Policy Research Conference), 34th Research Conference on Communication, Information and Internet Policy. Arlington (VA), United States 29 Sep-01 Oct. TPRC: Farnham (VA).
- [46] Oluka, E. (2011). Uganda moves towards digital TV. Monday, 17 January. http://www.busiweek.com/11/index.php?option=com_content&view=article&id=259:uganda-moves-towards-digital-tv-&catid=72:tv&Itemid=1272
- [47] Ponzanesi, S., & Leurs, K. (2014). On digital crossings in Europe. *Crossings: Journal of Migration and Culture*, 5(1), 3–22.
- [48] Quinones, G., Heeks, R., & Nicholson, B. (2017). *Digital start-ups in the global South: Embeddedness, digitality and peripherality in Latin America*. Development Informatics Working Paper Series No. 67. Centre for Development Informatics, Global Development Institute, University of Manchester, Manchester.
- [49] Raboy, M., Buckley, S., Mendel, T., Price, M. E., Duer, K., & Sióchrú, S. Ó. (2018). *Broadcasting, voice, and accountability: A public interest approach to policy, law, and regulation*. University of Michigan Press.
- [50] Raven, J., Hoehn, T., Lancefield, D. & Robinson, B. (2014). *Economic analysis of the tv advertising market*. [Internet] PriceWaterhouseCoopers.
- [51] Richer, M. S., Reitmeier, G. T., Gurley, G. A., Whitaker, J. & Rast, R. (2019). *The ATSC Digital Television System*, *Proceedings of the IEEE*, vol. 94, pp. 37–43, January 2019.
- [52] Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students* (6 ed.): Pearson.
- [53] Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th Ed.). Chichester, West Sussex: John Wiley & Sons, Inc.
- [54] Siwei, H. (2013). Broadcasting and television digitization strategy in China. *International Journal of Digital Television* , 4 (2), 203-213.
- [55] Sussan, F., & Acs, Z.J. (2017). The digital entrepreneurial ecosystem. *Small Business Economics*, 49(1): 55–73.
- [56] Tilson, D., Lyytinen, K., & Sørensen, C. (2015). Digital infrastructures: The missing IS research agenda – Research commentary. *Information Systems Research*, 21(4): 748–759.
- [57] Toyama, K. (2014). Technology as amplifier in international development. In, 75-82
- [58] Tsebee, A. (2014). *Digital Broadcast Migration: Challenges and Prospects for Developing Nigeria*. In G. B. Okon and O. P. Ohiagu (Eds.). *ICT, Communication and Society: Trends and Issues*. Port Harcourt, Nigeria: Accuracy Prints. pp. 163 – 182
- [59] Van Audenhove, L., Burgelman, J. C., Nulens, G. & Cammaerts, B. (2014). 'Information Society Policy in the Developing World: A critical assessment', *Third World Quarterly*, 20(2), 387-404.
- [60] Wajcman, J. (2017). From women and technology to gendered technoscience. *Information, Community and Society*, 10(3), 287-298.
- [61] Wangalwa, E. (2015). *The Woes in Kenya's Digital Migration Process*. Retrieved February 13, 2020, from <http://www.cnbcfrica.com/news/east-africa/2015/02/16/kenya-digitalmigration/>
- [62] Webster, F. (2015) 'Making Sense of the Information Age in Britain: Sociology and Cultural Studies', *Information, Communication and Society*, 8 (4): 439–58, 477–8.