

AN ASSESSMENT OF ANALOGUE TELEVISION SWITCH-OFF IN KENYA:

A CASE STUDY OF KIKUYU DISTRICT

BY

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DECLARATION

I declare that this is my original work and has not been presented in any other University or College for Examination or Academic purposes.

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ABSTRACT

Kenya is one of the few countries in Africa to embark on digital television migration, having set 2012 as the deadline for the analogue television switch-off. The International Telecommunication Union Regional Radio communications Conference (RRC-06) set 2015 as the global deadline. The migration to digital television broadcasting is scheduled to take place in three phases. The first phase is the digital switch-on. The European Commission defines 'switch-off' as "terminating the terrestrial transmission of analogue television", and 'switchover' as "the transition from analogue to digital broadcasting of all types of broadcasting" (EC, 2005; Iosifidis, 2006). This digital switchover is seen as a logic consequence of the technological evolution, generating several advantages for citizens and broadcast companies. The main objective of the study was to study the human aspects that influenced the adoption of analogue switch-off in Kenya. The study used a survey design and utilized purposive random sampling to select the respondents and chose a sample size of 120 respondents. Data was collected from primary source through the use of interview guides. The data was analyzed using content analysis technique. It was determined that the top most factors that will motivate the acquisition and the installation of the Set Top Boxes were the clear picture/ high resolution and the quality sound system. Majority of the respondent indicated that the people would not take up the DTV voluntarily or willingly the moment it would take effect, all the households that had the TVs would be forced to purchase the Set Top Boxes in order to receive any signals in their TVs. The Major challenges that the respondents anticipated when adopting the analogue switch off was that the initial cost of the purchase of the set top boxes would be high. The respondents also indicated that they were anticipating government support for the acquisition of the set top boxes

that facilitates the analog TVs to receive the digital signals. The Government as well as other media stakeholders should educate the public on the Analog Switch Off or the DTV so that they are aware of the services offered as well as the benefits of installing the Set Top Box.

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LIST OF ABBREVIATIONS

AM Amplitude Modulation

BTH Broadcasting to Hand

CLF Converged Licensing Framework

DAB Digital Audio Broadcasting

DSTV Digital Satellite Television

DTT Digital Terrestrial Television

DTV Digital Television

DVB Digital Video Broadcasting

DVB-H Digital Video Broadcasting Handheld

DVB-S Digital Video Broadcasting Satellite

DVB-T Digital Video Broadcasting Terrestrial

FM Frequency Modulation

HDTV High Definition Television

ITU International Telecommunication Union

MF Medium Frequency

MHz Megahertz

NFL Network Facilities Licence

NTSC National Television Systems Committee

SDTV Standard Definition Television

SMS Subscriber Management System

STL Studio to Transmitter Link

T-DAB Terrestrial Digital Audio Broadcasting

T-DMB Terrestrial Digital Multimedia Broadcast

TV Television

UHF Ultra High Frequency

UK United Kingdom

USA United States of America

UTC Universal Time Co-ordinated

CHAPTER ONE

INTRODUCTION

1.1: Background of the study

The Regional Radiocommunications Conference of 2006 (RRC-06) was held in Geneva, Switzerland, in mid-2006 under the aegis of the International Telecommunication Union (ITU). The Conference, among other things, set 17th June 2015 as the cutover date for the transition from analogue to digital television broadcasting. It is, therefore, mandatory for countries in the planning area (comprising of Africa, Europe, Russia and Iran) to migrate to digital terrestrial television broadcasting technologies.

Spectrum Planning Areas



Kenya participated in RRC-06 and embarked on preparation to ensure that the country abides by the resolutions arrived at the conference. The Kenyan government in 2007 set up a task force to recommend digital migration strategies this included but were not limited to setting up of Digital Terrestrial Committee (DTC) and the Development of the migration plan to guide the process including the deadline for June 2012. The digital television broadcasting became a reality in December 9th 2009 when the Digital signal was inauguration by H.E., Hon. Mwai Kibaki, President of the Republic of Kenya and Commander in Chief of the Armed Forces. The launch marked the beginning of the transition from analogue to digital TV broadcasting in Kenya.

Kenya is one of the few countries in Africa to embark on migration, having set 2012 as the deadline for the analogue television switch-off. The migration to digital television broadcasting is scheduled to take place in three phases. The first phase is the digital switch-on. The digital signal was initially to be transmitted on a pilot phase in Nairobi and its environs including Kajjado, Machakos, Naivasha and Murang'a and subsequently to the rest of the country. The next phase was going to be the dual-illumination or simulcast period before the eventual switch-off of the analogue signal. The transition process is propelled by the Digital Television Committee, under the guidance of the Ministry of Information and Communications. The initiative operates under the banner of Digital Kenya, whose secretariat is housed at Communications Commission of Kenya (CCK), Waiyaki Way, Nairobi KENYA.

The introduction of satellite television and terrestrial television has turned the market upside-down starting from the beginning of 21st century and it started mainly in European countries. People nowadays have the opportunity to choose between different delivery platforms, which lead to growing competition. When talking about delivery platforms, three different broadcast

technologies for television signal transmission are traditionally distinguished: terrestrial, cable and satellite (De Marez *et al* 2008)

The concepts ‘analogue switch-off’ and ‘digital switchover’ are currently high on the agenda all over the world. The European Commission defines ‘switch-off’ as “terminating the terrestrial transmission of analogue television”, and ‘switchover’ as “the transition from analogue to digital broadcasting of all types of broadcasting” (EC, 2005; Iosifidis, 2006). This digital switchover is seen as a logic consequence of the technological evolution, generating several advantages for citizens and broadcast companies: First, more choice and quality for viewers (more channels, high-definition television, clear image, etc.); Secondly, lower distribution costs and the possibility of transmitting more channels or services at the same cost; Thirdly, greater efficiency in spectrum use (the creation of new services because more data can be transmitted through the same bandwidth); And finally the ability to send data that allows interactivity, personalization, etc. (d’Haenens & Bink: 2001; Iosifidis, 2007). The increased efficiency in spectrum use is the most evident implication for the broadcasting sector. The so-called digital dividend (Fontaine & Girieud, 2007) urges them to explore new business opportunities (mobile broadband, mobile television, etc.) and forces policy makers to adjust the legislative framework of the ‘digitized’ television landscape.

Because radio waves do not respect national borders, consultation over frequency assignments emerged more than a century ago as an early form of global cooperation. Today this activity is overseen by the International Telecommunication Union (ITU), a United Nations agency based in Geneva, Switzerland. Delegates to the Regional Radio Conference (RRC) meeting from 104 countries in Europe, Africa, and the Middle East met there to craft a grand plan for the switchover to digital broadcasting in their respective parts of the world without creating havoc on the airwaves. This Agreement served as a stimulus for adopting national policies in the switch-over to digital broadcasting. The GE-06 Agreement sets 17 June 2015 as the date when

all countries (comprising of Africa, Europe, Russia and Iran) would no longer need to protect the analogue services of neighboring states and can freely begin using the frequencies assigned to them for their digital services. This date is not a guarantee that analogue switch-off will take place throughout a given country. But because analogue services will no longer be possible along its borders, it could serve as an impetus to switching off analogue services completely (ITU, 2006).

1.1.1 Human Aspect of Analog Switch Off

The core, or primary group of stakeholders, who have an ultimate interest in this process, are consumers, whether as individuals or community entities, such as in schools, hospitals and prisons, and users with special needs. Secondary stakeholders include Government, service providers, equipment retailers and manufacturers, equipment suppliers and installers, content providers and legal and regulatory bodies.

From the primary stakeholder's perspective, the main issue concerns take-up of DTV. The literature on the uptake and acceptance of new interactive technologies suggests that there are four key factors which underpin the voluntary adoption of DTV: perceived ease of use, perceived usefulness, perceived entertainment value, and perceived attractiveness (van der Heijden, 2000, after Davis, 1989). In the case of DTV, it could be argued that the last of these, attractiveness, is actually a product of public perceptions of the preceding factors. Two further and fundamental prerequisites need to be added to this list - information and access.

Consumers and users need information about the switchover process, digital television equipment and services, and potential costs and benefits, in order to make informed choices. Equipment and services need to be available, affordable and easy to use in order to be accessible.

An analysis of those who are in a position to influence the factors that would determine primary stakeholders' perceptions and attitudes to digital television, and therefore influence the success

of the switchover, helps to identify the principal secondary stakeholders. Thus the study was focus only on human aspect of analog switch off due to it significance on analogue switch off.

1.1.2 The Analogue Switch-Off In Kenya

Current technical plans for the introduction of digital terrestrial broadcasting in Kenya are based on international accords and first and foremost the Regional Agreement GE-06 (Geneva 2006) which is a binding international treaty signed by national administrations and registered with the United Nations. The East African Community (EAC) member countries have agreed on December 2012 as the regional analogue TV switch-off date so as to have sufficient time to deal with any teething problems that may arise before the expiry of the internationally set deadline.

In Kenya, the migration is expected to take a minimum of three (3) years. During the migration period, viewers are able to receive the current analogue TV broadcasts and new content from the digital platform. However, viewers without digital set-top boxes or integrated digital TVs (iDTVs) will be unable to receive any new digital channels or services broadcasted on the digital platform. The process of switching off the analogue signal in Kenya is scheduled to be completed by June 2012. After that, viewers would need to have DTT set-top boxes or iDTVs to receive free-to-air terrestrial television services. Kenya Broadcasting Corporation (KBC) is conducting a trial, which began in October 2009, to test the new DTT services and technology.

1.2: Problem statement

There is a global push towards digital transmission of TV signals for reasons of efficient spectrum usage, lower transmission cost and better service offerings for users. But throughout the world, this “migration” from traditional analogue transmission of TV to newer digital transmission systems is proving to be a highly complex proposition. Even in wealthy nations with a mass of well-off consumers able to pay for new services and equipment, getting the

“digital business case” right – particularly the economics of the “switchover” period has been fraught with difficulty.

Television transmission has clearly entered the digital era, entailing both new opportunities as well as pitfalls. The exponentially increased competition and range of services, applications and channels reflect the diversity of opportunities (d’Haenens, 2001). At the same time, in this newly digitized and competitive television arena there are ‘downsides’ or pitfalls at several levels. The public needs to be aware of the changes and benefits of these changes. They also need to be motivated to change; Individual users need the competence and confidence to operate the technology; and Individual users need to feel confident that they ~~was~~ ~~be~~ are supported at all stages through the switchover.

In spite of these promising social and economic advantages, however, the digital switchover seems not welcomed by every citizen. Klein et al (2004) demonstrate that a substantial fraction of the citizens show a rather negative attitude towards the digital revolution. It is against this backdrop the study seeks to understand the human aspects of adoption of analogue switch-off in Kenya. According to the researcher knowledge, no similar study has been done before on the influence of human aspects of adoption of analogue switch-off, more so in a Kenyan set up. Thus by undertaking this study the researcher is to fill the research gap on influence of human aspects of adoption of analogue switch-off.

1.3: Objectives of the study

The study was guided by the following objectives

1.3.1: General objective

To study the human aspects that influences the adoption of analogue switch-off in Kenya

1.3.2: Specific objectives

- i. To study the motivating factors that can influence people to change from analog to digital television in Kenya
- ii. To examine the factors that contribute toward resistance to change to digital television in Kenya
- iii. To analyze the challenges that people face when adopting the analogue switch-off in Kenya
- iv. To explore possible intervention mechanisms towards adoption of the analogue switch-off in Kenya

1.4: Research questions

The study was guided by the following research questions

- i. What are the motivating factors that that can influence people to change from analog to digital television in Kenya
- ii. What are the factors that contribute toward resistance to change to digital television in Kenya?
- iii. What are the challenges that people face when adopting the analogue switch-off in Kenya?
- iv. What are the possible intervention mechanisms towards adoption of the analogue switch-off in Kenya?

1.5: Justification of the study

The document will offer guidance to program managers and policy-makers on analogue switch-off in Kenya. Furthermore, the results will help organization policy makers to understand more about the human aspects that influence the adoption of analogue switch-off in Kenya. Finally the study will assist future researcher in communication, as it will act as a reference material.

1.6: Scope and the Limitation of the study

The study examined the human aspects that influence the adoption of analogue switch-off in Kenya. Thus it did not cover any other region apart from Kikuyu District and focused on human aspects that influence the adoption of analogue switch-off in Kenya. Kikuyu District has been selected because it cuts across all social, cultural and economic factors. Kikuyu District is an administrative district in the Central Province of Kenya. The district is adjacent to the northern border of Nairobi and has a population of 1,673,785 with an urban population of 1,017,476. Due to its proximity to the city plays host to both the poorest and the richest masses.

1.7: Limitation of the study

The time limit available for this type of study was not adequate but all efforts were made to come up with a comprehensive study. Financial resources will be a limiting factor as it will have been prudent to employ a number of assistants in collecting data. The study may further be limited by the theoretical and conceptual frame work that the researcher used.

1.8: Assumptions of the study

The research assumed that the respondents would provide truthful and honest responses to all the items in the interview guide. The research would be useful to various stakeholders and the recommendations made in the research would be incorporated in the development and review of policies of analogue switch-off in Kenya.

1.9: Operational Definition of Terms

Television: Television is primarily a public broadcasting medium, using point-to-multipoint technology that is broadcast to any user within range of the transmitter.

Analogue: Telegraphs, telephones, radio, and television all work by modifying electronic signals, making the signals imitate, or reproduce, the original message. This form of transmission is known as analogue transmission.

Digital: Digital technologies convert a message into an electronic or optical form first by measuring different qualities of the message, such as the pitch and volume of a voice, many times. These measurements are then encoded into multiple series of binary numbers, or 1s and 0s. Finally, digital technologies create and send impulses that correspond to the series of 1s and 0s.

Television: Television, system of sending and receiving pictures and sound by means of electronic signals transmitted through wires and optical fibres or by electromagnetic radiation.

Digital Television transition: The digital television transition is a process in which analogue television broadcasting is converted to and replaced by digital television.

Broadcasting: is a process of disseminating information through electromagnetic waves to a large proportion of users (audience).

Digital Dividend: The amount of spectrum made available by the transition of terrestrial television broadcasting from analogue to digital.

CHAPTER TWO

LITERATURE REVIEW

2.1: Introduction

This chapter reviewed literature of theoretical frame work. It also reviewed literature on human aspects that influenced the adoption of analogue switch-off.

According to a study done by DigiTaG (2008), countries around the world have launched their digital terrestrial television (DTT) services and begun planning to switch off their analogue networks. A few pioneer countries in Europe have already completed the process. Ending the transmission of analogue services can have dire consequences should viewers not be adequately prepared and significant numbers lose access to television programmes. Governments do not want to risk disenfranchising viewers and they (Governments) want to ensure that proper safeguards are taken. But doing so, would require careful planning and the involvement of the entire broadcast industry.

DitiTaG (2008) also noted that the process of analogue switch-off was different in countries depending upon the market configuration. Countries with many households relying on the terrestrial platform will need to take different measures than countries with few terrestrially dependent households.

2.2 Period the digital broadcasting in the developed countries

The following table indicates the countries in the world where DTT has been implemented and the respective years the analog switch off was done.

Country	Start of DTT	ASO	No. of years
United Kingdom	1998	2012	14
Sweden	1999	2007	8
Spain	2000	2010	10
Finland	2001	2007	6
Switzerland	2001	2007	6
Germany	2002	2008	6
Belgium	2002	2010	8
The Netherlands	2003	2006	3
Italy	2003	2012	9
France	2005	2011	6
Denmark	2006	2009	3
Austria	2006	2010	4
Greece	2006	2012	6
Norway	2007	2009	2
Portugal	2008	2012	4
Ireland	?	?	?

Source:

2.3 Governmental perspective benefits of migration from analogue to digital terrestrial broadcasting

The migration from analogue to digital broadcasting is bound to bring a number of benefits to Government, the business community and consumers. Some of the anticipated benefits include:

- Greater spectrum efficiency of digital technology with some free frequencies otherwise known as the digital dividend which shall be used to provide other non-broadcast services such as mobile broadband.
- Licensing of such services will in turn generate revenue for government through licensing fees or taxes on the offered services.

- Increased demand for content will spur new businesses in the content production industry and content provision hence increase creation of more employment for creative artists.
- Increased business opportunities in form of retail outlets for digital receiving devices/ set top boxes hence more revenue for the Government in form of taxes.
- Other benefits would include: new and additional services possible: Consumers will have a wider choice of enhanced broadcasting applications, multimedia data and related services, licensing of more broadcast content service providers, new category of licensees (signal distributor) hence more revenue and employment creation and conservation of environment (less infrastructure required)

2.4. Factors affecting switchover strategies

There are factors that impact which approach chosen for digital switchover in the various countries which are planning the Analog Switch Off (ASO). These factors include the size of the terrestrial platform, the availability of spectrum, DTT penetration and coverage as well as compliance with international obligations (The Digital Terrestrial Television Action Group, 2008)

2.3.1 Size of the terrestrial platform

Countries with very few households relying on the terrestrial television platform are able to switch-off their analogue platform quickly and with little risk of causing viewers to lose television services. This has been demonstrated in highly cabled countries, such Luxembourg, the Netherlands and Switzerland which completed analogue switch-off quickly. In calculating the size of different television reception platforms in a given country, only the reception mode used for the primary television set is determinant.

2.3.2. Spectrum availability

The word spectrum refers to “broadcast spectrum”. Broadcast spectrum refers to a portion of the full electromagnetic spectrum that is ideal for telecommunication, with frequencies much lower than infrared or visible light. The availability of spectrum was determine whether a given market can simultaneously offer analogue and digital terrestrial services. In some countries, the launch of DTT services is contingent upon switching off analogue services. In Switzerland, partial analogue switch-off took place before DTT services could be launched. In Germany, the simulcast period has been short, ranging from a period of 3-9 months. In most countries, near-universal DTT coverage is generally not possible without first completing analogue switch-off.

2.3.3 DTT penetration and coverage

As increasing numbers of terrestrially-dependent households convert from analogue to digital television services, it becomes feasible to switch-off the analogue platform. Yet the take up of DTT services is directly linked to the availability of services (coverage), the appeal of the service offering (content) and the cost of the service (price of receiver). In an open market, viewers ultimately determine the speed of DTT penetration.

Coverage, on the other hand, will be determined by the availability of frequencies and the man-hours needed to provide transmitting stations with digital equipment.

2.3.4 International obligations

International obligations determine how countries use and share frequencies. The Geneva 2006 Agreement determined the date when countries in Europe, Africa and parts of Asia are no longer obligated to protect the analogue services of neighboring countries from interference. The World Radiocommunications Conference, held every four years, determines which type of services can be provided in different frequency bands. Both of these international treaties make up international law and must be respected by the signatories.

2.3: Challenges of digital switch over

The literature on the Technology of innovations suggests that DTV was taken up voluntarily over a period of time by a significant proportion of the population, as shown in target date. It is important to identify potential barriers to this process and seek to overcome them. This will assist in accelerating the rate of voluntary uptake and enable attention to be focused on addressing the obstacles perceived by those who will not voluntarily make the switch. There is a significant amount of research evidence already available which identifies the perceived barriers to the uptake of DTV. These are as follows:

2.3.1: The cost of the service

Consumers, generally speaking, are expected to pay something towards the transition, and not only via their taxes. Especially in the case of TV, they are required to make some investment in a set-top box, even in cases of partial government subsidy. Here, the cost of the boxes is an economic issue of relevance, and this depends on issues of import duties and local industrial manufacturing policy. Kenya, for example, has said it will consider tax relief on importing boxes so as to ensure they are affordable. It was part of the proposed Kenya Government Budget for the Financial Year 2012/2013.

Even without the costs variable, the question that still generally arises is why should consumers fork out any money for a box unless absolutely necessary? While the threat of turning off the analogue TV signals constitutes a serious “stick” a transitional period cannot rely on a rush at the last minute to buy the boxes. The logistics of disseminating boxes and phasing in the transition require that there are also “carrots” for the audience. In general, this requires that digital TV should offer highly desirable benefits that go far beyond what is obtainable through the existing analogue services. In short, for consumers to spend money on receiving devices, someone has to spend money on the sourcing and delivery of content that is extra (or enriched - eg. by subtitles) to the existing mix.

Migration from analogue to digital broadcasting has affected both the developed and developing countries in similar ways. In order to ensure that their citizenry are not plunged into information blackout, the central governments of several developed countries adopted specific strategies to provide relief to their people. Internationally, Governments are the drivers of digital migration. For example the following countries have provided some form of financial aid to their citizens to enable them migrate to the digital broadcasting platforms: USA, Australia, United Kingdom, Sweden and Germany.

According to the Kenyan Government budget for the Financial Year 2012/2013, majority of consumers in Kenya currently possess analogue TV sets which will automatically become obsolete once the country switches off analogue TV broadcasting and they will be forced to acquire the set top boxes of whose tax was announced in the financial budget of 2012/2013. The tax relief is expected to bring the costs between Kshs 4,500 and Kshs 6,000 range down from the current rates of Sh10, 000 and Sh6, 000.

This was cited as the main disadvantage to taking-up digital television services, even though consumers often over-estimate the cost of digital services (MORI, 2001). Furthermore, an advisory report to the Government states that the cost of open standard iDTVs is prohibitively high for most customers, as well as a lack of availability of low priced set-top boxes designed to deliver the free-to-air services and unawareness or inability on the part of viewers to pay for television services (Joint ITC, Oftel and OFT advice, May 2000). New research shows that 25 per cent of respondents are not prepared to pay anything to switch to DTV. Forty per cent of those over 65 are not wishing to pay anything for DTV and a further 40 per cent were not really sure about the costs involved (Taylor, Nelson, Sofres, 2001).

2.3.2: Lack of awareness

A survey of almost 2000 people found that 51 per cent of non-adopters and 44 percent of those who have adopted digital television are unaware of the Government's plan to switch off the

analogue signal (Consumers Association, 2001). Lack of clear messages about free-to-air services without subscription – in the consumer survey reported above, only three out of ten respondents were aware that the existing public service channels will remain free-to-air after switchover to digital broadcasting (Consumers Association, 2001). Lack of awareness of what DTV has to offer. Over half (56 per cent) of those not adopting DTV have reported that they feel that they do not have enough knowledge about what digital television is currently offering; 25 per cent of adopters of DTV also feel this way (Consumers Association, 2001). Apart from the option of receiving different types of channels, extra channels in general and better picture quality; consumers had difficulty identifying other benefits of DTV over analogue TV. Furthermore 20 per cent of non-adopters did not know what the benefits were of choosing DTV (Consumers Association, 2001). Having fewer social contacts this reduces the opportunity to find out about DTV. In a survey conducted on behalf of the Department of Culture, Media and Sport (DCMS), 30 per cent of ‘possible’ digital viewers cited talking to family and friends for further information about DTV (MORI, 2001).

2.4: Theoretical Framework

2.4.1: Communication Theory/Diffusion of Innovations

According to Rogers (1996), diffusion refers to “the process by which an innovation is communicated through certain channels over time among the members of a social system. An Innovation is an idea, practice or object perceived as new by an individual or other unit of adoption. The diffusion of innovations involves both mass media and interpersonal communication channels”. That is, by sharing communication channels such as interpersonal communication or mass communication people can get information of an innovation and perceive its innovation as useful. Most innovations have an S-shaped rate of adoption. Diffusion research has attempted to explain the variables that influence how and why users and audience

adopt a new information medium, such as the Internet. According to evolution of media technology, interpersonal influences are important even though in the past the individual is usually the unit of analysis. Also, critical mass becomes an important factor in adopting new media because new media are interactive tools and thus are required by many users to gain efficiency. That is, the more people use, the more people get benefits. In this sense, diffusion theory not only can apply to practical things, but also can be related to digital divide.

2.4.2 The Innovator Theory

The innovator theory relates to the spread of innovation and was put forward by Rogers (1962) in his book "Diffusion of Innovations". Rogers (1962) classifies consumer attitudes towards purchasing products into five categories according to how quick consumers are to purchase new products;

1. Innovators (2.5%),
2. Opinion leaders or early adapters (13.5%),
3. Early majority (34%),
4. Late majority (34%), and
5. Laggards or late adapters (16%).

The percentages occupied by these five types are shown by the bell-shaped curve in the graph below. Rogers compared this curve to the S-shaped curve formed by cumulative frequency distribution of product diffusion and, based on the fact that the 16% line that marks the cut-off point between innovators and opinion leaders and other consumers roughly coincides with the point where the S-curve starts to increase dramatically, discovered that the key to product diffusion is diffusion amongst opinion leaders. Thus Rogers put forward the 16% diffusion rate theory.

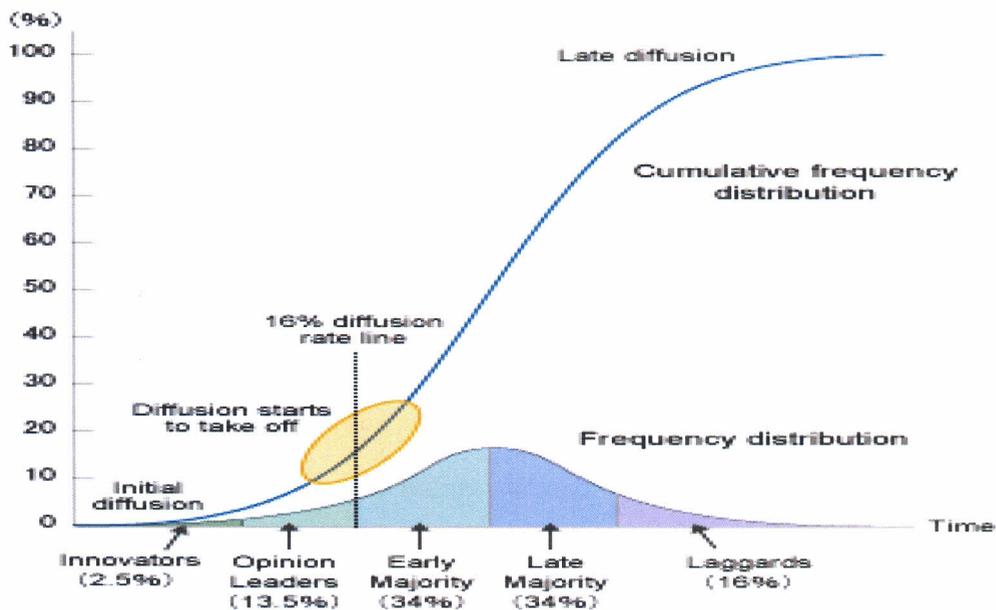


Figure 2.1: Technology adoption

According to Rogers' innovator theory, in general, diffusion amongst opinion leaders holds the key to product diffusion as a whole. Although it is innovators who purchase products at the earliest stages soon after their release, they tend to focus on products' novelty value rather than their essential benefits that might appeal to the majority of consumers. On the other hand, opinion leaders, who are next off the mark after innovators, tend to focus not on mere novelty value but on newly available benefits that differ from products in the past. The sooner a product is adopted, the more its actual uses differ from the uses and usage scenarios that the developers originally had in mind. Consequently, you could say that it is the role of opinion leaders to actually come up with uses for products. Effectively, it is not until opinion leaders come up with actual ways of using a product that it starts to find its place in the market. In addition to this, opinion leaders are generally thought to have a great deal of influence over other consumers. When word-of-mouth networks are formed based around opinion leaders, it really paves the way for product diffusion. That is why opinion leaders are said to hold the key to product diffusion. Although innovators and opinion leaders combined account for no more

than the 16% of the overall market, whether or not a company can get opinion leaders on board at the early stages of the market determines whether or not product diffusion will spread to the early and late majorities

2.4.3 Technology adoption theory

Rogers (1986) noted that the Technology side of the theory talks about the using of communication to transfer technological innovation from development agencies to their clients so as to create an appetite for change through raising a climate for modernization among members of the public. Denis (2005) says any history of communication technologies testifies to the accelerated pace of innovation and of material potential as an outcome, and some theorists are inclined to identify distinct phases. Rogers (1986), for instance locates turning points at the invention of writing, the beginning of printing in the fifteenth century, the mid-nineteen century start to the telecommunication era, and the age of interactive communication beginning in 1946 with the inventions of mainframe computer. Schement and Curtis (1995) provide us with a detailed timeline of communication technology inventions, which they classify according to their being either conceptual/ institutional or devices for acquisition and storage or being related to processing and distribution. According to this theory, communication is used to transfer technological innovations from development agencies to their clients so as to create an appetite for change through raising a climate for modernization among members of the public.

2.4.4: Max Weber's Modernization Theory

Max Weber's Modernization Theory holds that modernity process through the institutionalization of rationality results in social specialization, and bureaucratization. The modernization theory treats progress as a process that will take place naturalistically. According

to Daniel (2004) notes that, for economic and social institutions to change, change is required in individual knowledge, attitudes and aspiration. This means that change is very necessary for development as well as modernization. Modernization in this light is that television broadcasting has been a process and the process is still on, however, there has been a lot of progress in Kenya and other parts of the world.

Factors That Have Influenced the New Technology Digital Migration

Aneato et al (2008) explains that, there are critical roles for technology in the employment of mass communication for development. The technology in mass communication serves a dual role in Technology. They are channels for messages, as well as messages of innovation. Another technological deterministic approach sees technology as a value-free and politically neutral asset that can be used in every social and historical context.

This theory states that technology can transform any environment, and in a communication sense, media technology can be both a channel and a message at the same time. Since technological innovations can imbibe development through the Technology of the messages it carries, then one can say that digital broadcasting would no doubt break the barriers associated with analog broadcasting.

2.4.5 Diffusion of Innovation Theory

In 1962, Everett Rogers outlined four elements in the diffusion of innovations: the innovation itself, communication channels, time, and the social system. He defined diffusion as “the process by which an innovation is communicated through certain channels over time among the members of a social system” and described diffusion as a special form of communication with the message of a new idea in order to bring about social change, a process by which changes occur within the structure and function of a social system. The innovation represents a potential

efficacy in solving a perceived need or problem. Individuals with intrinsic curiosity and comfort with technological innovations experiment with a new innovational product or process. If the experiment shows promise, influential individuals excitedly share the new approach with a group of “early adopters” who, in turn, attempt the new innovation. Once enough individuals join in utilizing an innovative process, the group reaches a “tipping point,” where adoption of the innovation evolves rapidly. Innovations with clear advantages diffuse rapidly; for example, the telephone, fax machine, e-mail, Internet, Google search engine, and Apple iPod. When an innovation is compatible with existing values, past experiences, and needs of potential adopters, appears to make things “faster, cheaper and better,” and requires little skill or training, it will be quickly diffused and assimilated. However, when one or more of these elements are experienced as problematic, diffusion will be much slower and may, ultimately, fail.

2.4.5.1 Assessment and Enhancing Readiness for Change

Successful change requires both individuals at all levels and organizations to change. The more complicated the innovations, the more the “rank and file” must be involved in change processes. Complicated processes may seem wonderful to leadership, but can be perceived as burdensome, overly complicated, and ineffective by those in middle management and on the front-lines. Unless each level perceives the intended changes to be in their own interests, they may not cooperate with implementation. When objections to innovation are not adequately addressed or assessed, those affected may refuse to participate or, in subtler fashion, may engage in passive-aggressive behavior, such as delay, which sabotages the implementation plan. All sorts of unintended consequences may occur.

Assessing how ready to change a group of individuals and organizations may be is complex. Readiness is associated with people’s perceptions of whether they have financial support, a well-defined mission, leadership structure, a cohesive work team, the technical skills needed to adopt an innovation, and the extent to which they see their own needs for safety, security, and

autonomy protected. Armenakis et al (2008) defined a model for enhancing change readiness in organizations, which involves

1. Assessing,
2. Contextualizing, and
3. Enhancing readiness.

In this model, assessment includes the use of survey instruments, focus groups, clinical interviews, site visits, and community profiles. Strategic planning for such assessment of change requires first identifying types of information about the individuals and institutions involved, providing a framework for planning the campaign and understanding how it works and what it may achieve, and providing a framework for integrating related theoretical constructs. Contextualizing readiness involves helping individuals to develop attitudes and beliefs that provide the “big picture,” to understand the larger context in which the new innovation will be implemented. The personal attributes of the “change agent,” the person implementing the plan, such as perceived credibility, trustworthiness, sincerity, and expertise, also affect the development of readiness to change. Internal change agents who are mid-range authority figures are often the most successful in assessing and developing readiness.

Individual differences, social differences (in role, status, power, and authority), and social relationships all have important implications for increasing organizational readiness for change and implementing change programs. Most importantly, active participation by individuals at all levels, particularly those who enjoy positions of influence with their peers, subordinates, and superiors, enhances readiness because people trust what they learn through their own experiences and from those they respect.

2.5: Resistance to Change

Research conducted in Europe over several decades has generated remarkably consistent findings regarding the human response to change (e.g. Bennis et al., 1985; Kanter et al., 1992; Dawson, 1996) and has identified the barriers and facilitators to adoption of new technology (e.g. Damodaran and Olphert, 2000).

Managerial psychology literature has defined resistance to change as “the forces against change in work organizations” (Mullins 1999, p. 824). The first theoretical conceptualizations of resistance to change by managerial psychology research started more than half a century ago. Researchers at this time identify in people a natural tendency to prefer keeping to what is well-known and familiar rather than to accept innovations, and thus the unknown (Coch and French 1948; Tichy 1983). Kurt Lewin (1947) was one of the first researchers, who used the term resistance to change. His pioneering studies on force-field analysis are the starting point of organizational change and the corresponding employees’ resistance to change research. Since these early works, research in managerial psychology has investigated the phenomenon of resistance to change in different settings and developed a more precisely understanding of how and why people resist organizational change. For example, Piderit (2000) propose a multidimensional view of attitudes towards organizational change, Oreg (2003) discusses resistance to change as a personality trait, and Ford et al. (2008) describe different perspectives of resistance to change research, highlighting that research should distinguish between change agent and change recipients, and especially their relationship. All these organizational change research approaches have in common that they have extended the early understanding of resistance to change as provided by (Lewin 1947; Coch and French 1948).

Rogers (1983) proposes that adoption of new technologies at the individual level can be seen as a five-stage process. This begins with establishing awareness of the innovation in potential adopters; proceeds through persuasion or arousal of interest, mental evaluation of the

innovation, trial; and then adoption. This clearly indicates that in order to achieve 'user pull', consumers must be able to see real advantages and benefits to themselves through Internet usage, and in particular through the medium of DTV. Kenya television viewers are confronted with an increased offer of platforms of pay television in the last few decades. The traditional television landscape in many countries came under pressure due to the combination of increasing competition, new distribution channels and the digitization process (Dahlgren, 2000), making them evolve from often monopolistic structured television markets to highly competitive television markets

The extent to which people are more or less resistant, indifferent or likely to lend support to change is affected by how they perceive the change affecting them. The reasons individuals cite for resisting change include the following: perceived loss of control; too much uncertainty; surprise; confusion; loss of face; concerns about competence in new context; increased effort required; change fatigue; perceived costs-benefits ratio; past resentments; and real threats (Kanter et al., 1992; Dawson, 1996 – from Iles and Sutherland, 2001)

Stages of resistance to organizational change, likened to Kubler-Ross's stages of grief in "On Death and Dying," have been characterized as follows: An outside organizational consultant who facilitates workers' grief processes may help. Such consultants may provide a safe, non-punitive environment a transitional space in which employees may safely explore the implications of the imposed changes. The consultants may explore how anxieties and uncertainty, the introduction of additional complications in the form of new procedures, red tape, regulations, and other factors appear to take precedence over problem-solving, provision of services, and addressing worker concerns.

Leadership

Leadership is crucial in the implementation of change. Continuous, committed, and active leadership that sets direction and develops vision and strategies is required for organizational change to succeed. Effective change leaders employ the following behaviors:

Most importantly, leadership can set into motion the processes to determine if the intended changes really make sense to those closest to implementing them and to those who are going to be affected by them. Several approaches, such as those of Deming and of Nadler et al., describe detailed tactics for working through problems and change in large organizations that are likely to spot problems and unintended consequences before they occur and increase the likelihood that innovations that make sense will be implemented successfully.

Kotter (2006) highlighted eight essential factors for transformation efforts. Transformation takes time, and a renewal effort will lose momentum if there are no short-term goals to meet and celebrate. Without visible reward, such as recognition, promotion, or bonus, many people will give up or join the resisting group. These performance improvements must be planned and actively created and achieved. This tenet is important when major change takes a long time, as urgency levels can drop. Thus short-term wins keep the urgency level up and force detailed analytical thinking to clarify or revise the vision. Implementing change is hard work, and there is a temptation to celebrate wins early. "Celebrating a win is fine; declaring the war won is catastrophic." New changes are fragile and subject to regression, so until they sink deeply into the culture, which can take 5 to 10 years, the effort must continue. A premature victory celebration kills momentum and allows the force of tradition and complacency to take over. Leaders of successful change efforts should use the credibility of short-term wins to tackle new and bigger problems. They should change systems, structures, and policies that do not fit the vision, continue to hire, promote, and develop employees who can continue the vision, and reinvigorate the process with new themes, ideas, projects, and change agents.

Finally, the sign of acceptance of change is when it becomes the established process. Implementations rooted in social norms and shared values will succeed if they clearly and continuously make things better for those responsible for implementing them on a day-to-day basis, and when leadership, including opinion-leaders at all levels, back these changes in deed as well as in word.

2.5.1: Perceived reward-cost ratio

As individuals we assess, inevitably, the need or desirability of change in our lives from our own perspectives. This means that a change that comes about as result of an individual making a decision for him or herself is a very different experience from having change imposed by others. As human beings we weigh up the 'pros and cons' of changes required of us. How we respond is to be determined by the range of factors listed above. In particular, we are mostly likely to 'buy in' to the proposed change if: we are dissatisfied with our current situation; can envision real advantages to ourselves of the anticipated new order; have the knowledge and capability to migrate to that new order; and perceive that making the shift is not too costly or painful.

Applying Gleicher's formula (Gleicher, cited in Buchanan & Huczynski, 1997) to the present circumstances, a major obstacle to consumer 'buy in' to the planned conversion to digital broadcasting is that there is minimal dissatisfaction with the status quo. On the contrary, surveys show very high levels of satisfaction with existing free-to-air channels. This, combined with the widespread belief that, like decimalization in the past and the introduction of the Euro at the present, DTV will bring additional, perhaps hidden, costs for ordinary householders to meet, lack of knowledge about practical steps to take and disinterest/cynicism about the future vision makes clear the scale of the challenge to be met through the transition programme.

2.5.2: Change management

Change management is a systematic approach to dealing with change, both from the perspective of an organization and on the individual level. A somewhat ambiguous term, change management has at least three different aspects, including: adapting to change, controlling change, and effecting change. A proactive approach to dealing with change is at the core of all three aspects

Successful adaptation to change is as crucial within an organization as it is in the natural world. Just like plants and animals, organizations and the individuals in them inevitably encounter changing conditions that they are powerless to control. The more effectively you deal with change, the more likely you are to thrive. Adaptation might involve establishing a structured methodology for responding to changes in the business environment (such as a fluctuation in the economy, or a threat from a competitor) or establishing coping mechanisms for responding to changes in the workplace (such as new policies, or technologies).

The world is in a constant state of change characterized by increase in global socioeconomic integration, technological advancement and the scramble for resources. An evolution of ICTs from traditional location fixed computing through to mobile and pervasive ICTs is an example of such change which have fuelled subsequent change in organisations, societies and individuals. The inception of ICT is forcing organisations and societies to change the way people interact and how businesses operate (Oakland and Tanner, 2007).

It is evident that the implementation of ICTs transforms the livelihoods, experiences and socio-economic aspects of people (Trim and Sheng 2008). The change involves a transformation and replacement of the old and familiar system with an unfamiliar system characterised by uncertainty, fear and a threat to the security of the people (Vahs et al 2010). It therefore follows that the change should promote a positive user experience. For user experience to be positive it

has to be managed in a manner which satisfies the needs and requirements of the people. Thus the technique for managing user experience must be centered on the target users for the ICTs to be accepted and utilized to the full potential benefits.

Various authors have defined change management and proposed models for the implementation and guiding success in managing change (Kotter and Cohen 2002; Jick 2003; Garvin 2000; Mento et al. 2002; Price and Chahal 2006; Hiatt 2006). In this paper we adopt a change managed definition put forward by and defined by Hiatt and Creasey (2003) as “the process, tools and techniques to manage the people-side of change to achieve the required business outcome.”

Critique of the existing models can be summarized thus. Hiatt’s (2006) ADKAR model lacks in assessing the environment for change and evaluating the outcome and impact of change. Price and Chahal’s (2006) model focuses much on managing change from the organization’s point of view and neglects the needs and requirements of the people. Kotter and Cohen’s [2002] eight steps change management model is aimed at strategic level activities to transform the organisation. In their model they do not consider managing change in human experiences. Mento et al (2002) focus on the role of strong leadership in implementing change in organisations. Jick’s (2003) model aims at tactical implementation of major change.

2.5.3 Resistance to technology adoption

According to Desmet and Parente (2011) in Mokyr (2005), the factor that most clearly demarcates the Malthusian era of stagnant living standards from the modern growth era is the intensity of resistance to the introduction of new technologies and goods by subgroups of society. The failure to adopt new technologies may derive from various sources. According to Canton et al (1999) the first and historically very relevant obstacle to the adoption of new technology is violence and effort to get political acclaim for the request to stick to the status quo in production technology. Obstacles to the adoption of new technologies may be unions that, by

acting in favor of their members, resist labour saving projects. A third, currently most pressing, source of the failures to adopt best-practice technologies derives from regulations and laws that formally prevent technological improvements.

Fisher (2005) noted that the capacity or willingness of individuals to use these new technologies will affect all segments of society. Businesses and governmental agencies are under continuous pressure to use technology regardless of whether individuals want to or are able to do so. Consequently, individuals who cannot use the technologies are at risk of being left out economically and socially. Companies whose market success depends on technology adoption by individuals or other organizations may see their growth rates reduced or eliminated. Organizations whose success depends on the ability of their own staff to use technology will need to ensure that their entire staff is capable of using the latest generation of technology. Finally, the cost of maintaining multi-channel interfaces to support both the technologically capable and technologically resistant segments of the population will increase due to the need to upgrade each of the interfaces as the technology itself evolves.

A recent book by Weil and Rosen divides technology users into three groups based on their psychological response to new technology. The three groups differ in their response to the use of new technology and the amount of support they require to adopt a new technology. Moore defines technology adopters in a very similar way from a marketing perspective. Early adopters (estimated to be 10% to 15% of the population) are wishing to teach themselves how to use new technologies. Members of this group will accept the frustrations of trying to make the technology work as part of the challenge and joy of working with technology. This group corresponds to the innovators and early adopters defined in marketing terms.

Hesitant users (estimated to be 50% to 60% of the population) are willing to use technology, but only if given some degree of support in learning and/or using the products and systems. This

group corresponds to the early majority pragmatists and some of the late majority conservatives defined in marketing terms.

Technology resisters (estimated to be 30% to 40% of the population) are highly resistant to technology. Members of this group are not risk takers and interpret problems with technology as a reflection on their own abilities (or lack thereof). This group corresponds to the laggards defined in marketing terms. It is very difficult to migrate them to a new technology.

2.6: Factors Influencing Analogue Switch-Off

In addition to identifying causes of resistance to change, research evidence also indicates that the uptake of new technologies is generally slow, not primarily because it is actively resisted, but far more often because of factors such as the need to adapt to new ways of working/operating; poor support for learning; inadequate communication both about the technology and reasons for change; and failure to create a culture conducive to technology acceptance (Damodaran and Olphert, 2000).

The barriers identified commonly arise where change is imposed on individuals. In this situation individuals frequently do not perceive the need or desirability for the proposed change. This means that they have little or no motivation to invest in learning the required new skills or to change their established ways of operating. In such circumstances the change is unlikely to generate the positive benefits sought by those driving the changes - unless or until at least some of those who are affected are in favour of the change.

2.7: Intervention Mechanisms

There is extensive evidence in the academic and business literature to show that for a planned change to be successful it is crucial that those who will be affected by it are engaged in the planning of that change (Bennis, Benne and Chin, 1985). Identification of the stakeholders is clearly a pre-requisite for their engagement. It is only through involving stakeholders effectively

from an early stage that their needs can be identified and met in the design and planning process. There are significant benefits to be gained from stakeholder participation. Through investing time and effort in the change process, stakeholders begin to identify with and to develop personal goals for the planned change. The engagement process also gives early warning of potential difficulties, which often enables solutions to be found before significant adverse impact occurs.

According to Rawolle (2000), there are two components to achieving social inclusion. One relates to designing for inclusion and the other to formulation of strategy and policy. The transition strategy has the most significant role to play in promoting the widespread application of human-centered design principles in all spheres of life, especially in business, education, and healthcare. There are major rewards for the economy and for society in enabling the vast proportion of the population to enjoy the benefits of the information society through the medium of DTV. One of the challenges for the strategy is to transform the perception of 'social inclusion' as burdensome and perhaps tedious to one of excitement in recognition that 'Design for All' is the key to innovation and commercial success on an unprecedented scale (Roto 2011). Through the medium of DTV, diverse products and services including many novel ones, yet to be conceived was be made accessible to large populations whose needs are not met by existing delivery mechanisms.

Shulzycki (2003) stated that knowledge sharing is vital for bridging the knowledge/skills gap that exists between different populations and groups, between generations, and between different sections of the same population. There is need to begin the education and awareness process at the earliest possible time through engaging with primary stakeholders and promoting dialogue between primary and secondary stakeholders for mutual benefit.

Government has many declared objectives to promote public access to information, providing on-line access to information on health care, benefits, employment and education Bane (1997). The explicit goal of enhanced social inclusion has also featured in a number of white papers. To achieve these ambitious and visionary goals requires government departments to work together to exploit the unprecedented opportunities that could be offered to the citizens, either through the medium of DTV or through the introduction of new integrated technologies Rawolle (2000). It is clear that the success of the transition was not achieved simply through the attractions of more TV channels and interactive TV for entertainment purposes. For a considerable proportion of citizens, the switchover will only become a desirable objective when it offers some positive enhancement to their perceived quality of life. Such enhancements are likely to come from improved services delivered in to the home, meeting needs for easier job search, supporting education and learning, applying for social security benefits, supporting rehabilitation programmes, coordinating care in the community etc.

User experience can be positive or negative (Roto 2007). Negative user experience is when users find a product to be boring, difficult to interact with it or not fit for the intended use. A positive user experience is developed when the user finds the product to be usable with pleasure and satisfaction (Sharp, Roger and Preece, 2007). A positive user experience and perceived usability of a product is of paramount importance for its acceptance and full usage (Davis 1989; Webb et al, 2003; Roto, 2007). User experience development is not a once off thing, but rather a process that evolves over time (Roto 2011). The main difference between individuals is the amount of time they spend in developing user experience. Thus it is important to manage the change in user experience of ICT users for the ICTs to be accepted and utilised to their potential benefits.

2.8: Switch-Off Plans and Strategies in Different Countries

The e-Europe 2005 action plan (followed by i2010) stresses the role of digital television in the information society (European Commission, 2000; European Commission, 2005b). Therefore, the national and European regulators have put this issue high on the agenda. In this context, Member States of the European Union were urged to reveal their national plans concerning the analogue switch-off (date, strategy, commissions, etc.) (Iosifidis, 2007: 8). The Member States could choose their strategy freely, but Europe aims for the end of analogue terrestrial television by 2012.

The plans and timing vary greatly. In some countries (Luxembourg: September 1st, 2006; The Netherlands: December 11th, 2006; Finland: August 31st, 2007; Andorra: September 25th, 2007 and Sweden: October 15th, 2007 – DigiTAG, 2008) the analogue switch-off has already been accomplished, other countries fixed their dates. (UK: 2008-2012; France: 2011; Germany: 2008; Italy: 2012; Spain: April 2010), while others have not yet decided (Ireland, Portugal). The switch-off dates vary from one country to another depending on the particular characteristics of each national television landscape (Iosifidis, 2007: 8),

We roughly distinguish three types of countries in Europe (Blumler, 1992: 25; d'Haenens & Bink: 135; BIPE, 2002): First, *'cable countries'*: where more than 90% of households watch cable television (Belgium, The Netherlands, Luxemburg); Second, *'terrestrial countries'*: terrestrial transmission is the dominant delivery platform (UK, France, Italy, Spain, Portugal); And finally *'hybrid countries'*: cable and satellite together serve more than half the households (Germany, Ireland, Sweden, Finland, Denmark).

In 2002, The Netherlands installed a 'Switch-off Commission', to investigate how the transition from analogue to digital terrestrial television might take place. The commission concluded that the transition will be relatively easy compared to other countries given the limited number of households dependent on analogue terrestrial transmission. The research bureau GfK Intomart

was consulted to map out the number of households that still make use of analogue terrestrial television.

GfK Intomart concluded that the number of such households was decreasing swiftly in the period preceding the analogue switch-off. In the beginning of 2005, 222,000 households were watching television by means of analogue terrestrial television (519,000 in 2002). More than half the households did so at home, while a substantial group watched analogue terrestrial television outside the 'home boundaries' (caravan, holiday home). 51% mentioned that connection to the cable was not possible; while 20% stated that for them cable or satellite television was too expensive as an alternative (GfK, 2006).

2.9: Analog switch off and media pluralism

The emergence of new media, particularly the Internet, has profoundly changed the way people communicate and share and receive information. Digital terrestrial broadcasting and new media also have changed the traditional conception of "information boundaries" (Whirtz 1999).

New media have not just helped develop a globalized world, but they also provide us with "globalized" news, accessible often in real time and any time by one-third of the world's population. In this regard, the Internet and new media bring people closer to each other, while at the same time increasing transparency and generating a new understanding of what is the public sphere. New media also present challenges to national jurisdiction over media outlets and content. With a server located in one country, content being produced in a second and read or downloaded in a third, the questions of the origins of news or other media content and their target audience arise. This can have an impact on media pluralism domestically and in the trans-national context (Galperin 2004).

Numerous governments are aimed at ensuring freedom of expression, of information and of the media. Many governments have rightfully recognized that independent media and freedom of expression are cornerstones for stable and peaceful societies.¹ Freedom of the media is the

collective embodiment of freedom of expression. Pluralism in the media is, therefore, a prerequisite for the expression of different opinions and a guarantee of individuals' abilities to express their opinions without interference. With media in the hands of society, and not the custody of the state, pluralism is a safeguard for the marketplace of ideas (Mayer 2001).

2.10: Advantages of Digital Migration

There are a myriad of advantages of the adoption of the DTV among the various stakeholders such as the broadcasters, telecommunications providers and television viewers. The following are the advantages.

First advantage of the DTV is that it can typically carry up to five standard definition programmes on a single transmitter depending on quality and the specific technology and other factors. Alternatively, it can carry a mix of high definition and standard definition services in a flexible configuration.

The digital terrestrial television system also allows additional information to be carried with the programmes in the form of data services but this capability has not yet been fully exploited by receiver manufacturers or broadcasters. Greater spectrum efficiency of digital technology will free some frequencies otherwise known as the digital dividend which shall be used to provide other non-broadcast services such as mobile broadband Licensing of such services which will in turn generate revenue for government through licensing fees or taxes on the offered services, Increased demand for content will spur new businesses in the content production industry and content provision hence increase creation of more employment for creative artists. Another benefit of the digital dividend is the increased business opportunities in form of retail outlets for digital receiving devices/ set top boxes hence more revenue for the Government in form of taxes.

A second benefit of DTV is the Conservation of environment as fewer infrastructures would be required. The most recognizable characteristic and benefit is the much improved reception

capability, including the elimination of ghosting and other transmission errors as well as the high quality audio. DTV has the multichannel programs capability as well as Radio programs. Other benefits of the DTV will include the program enhancements on separate channels to the primary program, e.g., additional camera angles on a sports match, statistics about a player, or additional information about a segment in a lifestyle or magazine program .Broadcasters will be allowed to broadcast more than one channel when certain events, such as sporting matches, extend beyond time due to circumstances beyond the broadcasters' control, and overlap a regularly scheduled news program. This will allow viewers the option of continuing to watch the end of the event or the news bulletin and lastly over time, interactive television services and data casting services, including selected Internet services, home shopping, computer games, etc will be provided by broadcasters and data casters

2.11: Challenges /Obstacles of the Universal Access Digital Television

There are two sets of direct costs associated with the transition: one by the broadcasters, and the other by the television users themselves. Broadcasters pay the cost of production and equipment needed to operate digitally, whereas the users must cover the cost of television set-top boxes or a new television set (Brown-Kenion, 2000)

Because Africa's government broadcasters are primarily paid for by public funds (and advertising), governments are likely to fund a large part of the transitions. However research carried out by APC has shown with the African telecommunications reform, state-owned incumbents are not necessarily efficient in delivering national telecommunications infrastructure (Galperin, 2004).

The risk is that the new infrastructure mirrors the existing coverage pattern – meaning that the government broadcaster will only have a slightly larger transmission coverage area nationally, and that the private sector will continue to focus on the urban areas. Competitive signal carriers

(rather than the single national carrier) could present an alternative to this, but this will imply that these areas already have access to electricity. Southwood (2008) suggests that “it may be worth considering making universal access to television and to electricity dual objectives of any policy for the digital transition.”

While the process will be costly for governments, the heaviest cost burden will be felt by consumers of television, who will need to purchase either a digital set top box or a digitally-enabled television. Since higher quality hardware comes at a higher price, those countries that have begun the migration process, have typically chosen the lower-cost top boxes, dropping the price from about \$45–55 USD to about \$30–35\$ for users that cannot afford to finance the top boxes on their own (Berchtold, 2002).

2.12 Implications of Migration to Digital Broadcasting

It will be necessary to replace all analogue TV transmitters with digital transmitters. Currently in Kenya there are over 110 TV channels and 264 FM stations that were licensed by Communications Commission of Kenya, by December, 2009. Kenya became the second country to migrate to digital television after South Africa. Kenya set the date for analog switch off as December, 2012. Kenya’s digital migration strategy has been accelerated by government participation such as subsidizing set top boxes which will need replacement.

The huge installed base of analogue receivers will need upgrading by introducing Set-Top Boxes (STBs) or acquisition of digital receivers and probably to re-align receiving antennas or to acquire new ones. The migration to digital broadcasting will affect all segments in the broadcasting value chain, namely content production, signal distribution, transmission and reception. Availability of affordable set-top-boxes and digital receivers is required for smooth take-off. Content Service Providers could be faced with increased costs to change formats of content during purchase and selling of content to and from suppliers from countries with

digital broadcasting. Similarly, depending on whether production suites upgrade to digital systems in order to reduce multiple content conversion, the actual cost of content production could increase.

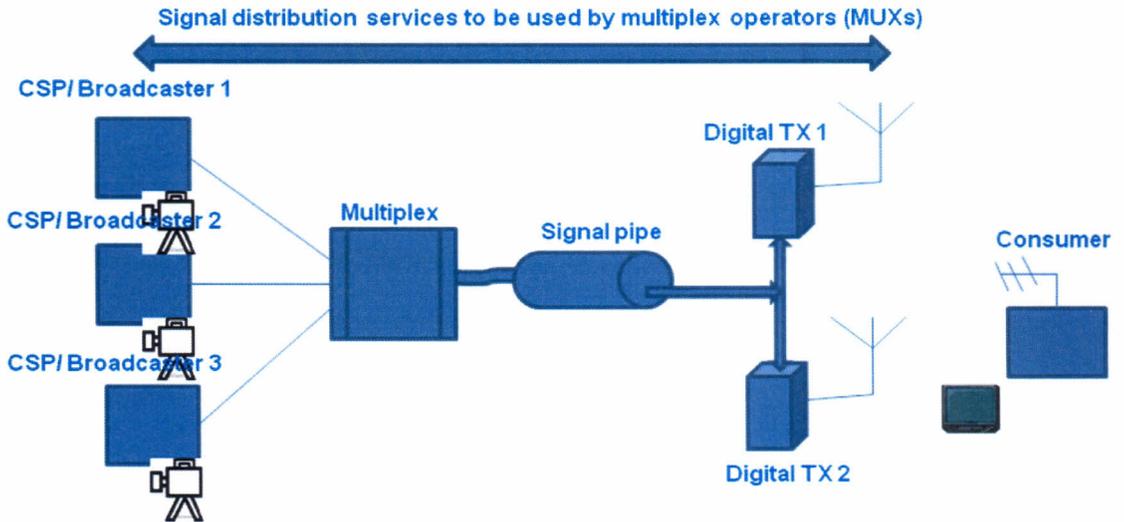


Figure 2.2: Digital Value Chain

Key :

CSP: Content Service Provider.

Digital TX : Digital Transmission site .

The current broadcasting scenario is that all broadcasters construct here own infrastructure .The infrastructure includes Masts, transmission equipment, generators, buildings and studios.

The digital scenario is best captured by the value chain. A broadcaster burden is now limited to provision of content that is presented to the Multiplex operator, who then transmits the signal. The burden of transmission is handed to him.

In Kenya we have 2 multiplexes, KBC’s SIGNET and PANG- Pan African Network Group limited.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter discusses the methods used to carry out the research. Research is the process of arriving at effective solutions to problems through systematic collection, analysis and interpretation of the data. Methodology is the systematic way of sourcing the research problem. This chapter is concerned with research design, target population, location of the study sample and sampling techniques, data collection instruments and data analysis procedures adopted to attain acceptable relevancy and reliability of the research tools are also explained.

3.2 Research design

The study used a survey design. A survey research design is used to obtain pertinent and precise information concerning the current status of phenomena and whenever possible to draw valid general conclusion from the facts discovered. Also the survey aims at obtaining information which can be analyzed, patterns extracted and comparisons made. According to Khan (1984) this approach is considered appropriate because subject events or conditions already exist. This idea prompted the researcher to choose the design and from this research questions will be answered.

There are two types of paradigms that exist in research. This includes; “phenomenological” also referred to as qualitative research and “positivist” also referred to as quantitative research. According to Collis and Hussey (2003), Phenomenological (qualitative) is an umbrella term for various types of interpretive modes of inquiry commonly used in the social sciences. Qualitative research is subjective in nature and involves examining and reflection on perceptions in order to gain an understanding of social and human activities. Positivist (quantitative) approach on the other hand is described as objective in nature and focuses on measuring phenomena (Collis &

Hussey 2003). It involves collecting and analyzing numerical data and applying statistical tests. Quantitative research includes designs, techniques and measures that produce discreet numerical or quantifiable data (Mugenda & Mugenda 2003). The fundamental differences between the qualitative and quantitative approaches are the philosophical assumptions within which each mode of inquiry operates. Mugenda and Mugenda (2003) argue that both approaches seek to build a body of knowledge about phenomena. Knowledge, according to Zikmund (2000) is a blend of information, experience, and insights that provide a framework that can be thoughtfully applied when assessing new information or evaluating relevant situations.

Therefore, after careful consideration, this study thus followed both qualitative paradigm approaches so as to analyze the situation under study and provide more insight to issues under investigation. The study gathered primary data from key informants chosen in the five wards in the Kikuyu District.

3.3 Population and Sampling Design

A population is defined as a complete set of individuals, cases or objects with some common observable characteristics (Mugenda & Mugenda, 2003). It is the total collection of elements about which the study wishes to make some inferences (Cooper & Schindler, 2008). The survey target population was the Kikuyu District residents.

The researcher targeted individuals in residing in the Kikuyu District in the course of the study. These groups of respondents were selected by the researcher as they were in a position to provide a lot of information on the research problem. The target population of the study was 265,829 people dwelling in Kikuyu County (Kenya National Bureau of Statistics, 2009) and a total number of 77,045 households. The researcher will define the target population based on available data and statistics at the time of undertaking the study but relied as well on logic. The population was defined in keeping with the objectives of the study.

In this study a research sample is defined as the people who actually participated in the study, (KAPC, 2002). Sample design - a definitive plan for obtaining a sample from a given population targeted by the study (Kothar, 2001). According to Mugenda and Mugenda (1999), random sampling is the process of selecting a number of individuals for a study in such a way that the individuals selected represented the large group from which they were selected. This is done to secure a representative group which will enable the researcher to gain information about a population.

The total population of the entire community living in the Kikuyu District is approximately 265,829 residents and to sample this we use the sample determination formula where the population is the target population for this study is approximately 77,045 households. From this target population a representative sample was drawn. Sampling was done to reduce the time and cost of research survey but the size was large enough that the findings can be used to infer on the population included in the research study. For this study, the sample was obtained by calculating the sample size from the target population by applying a Yamane (1967:886) formula as quoted by Israel (1992).

$$n = \frac{N}{1 + N(e)^2}$$

Where: n= Sample size, N= Population size e= Level of Precision.

At 95% level of confidence and $\rho=5$

$$n=77,045 / (1+77,045 \{0.05\}^2)$$

$$n=397.9$$

$$=398$$

Thus a sample size of 400 respondents will be required. Due to the time and financial constraints the researcher tried to contact 30% of the sample size obtained using the Yamane formula, which translated to 120 respondents.

Stratified random sampling was used to obtain 120 respondents that reside in both urban and rural areas. The population will be divided according to the administrative unit known as wards (strata) through the divisions and the wards found within the Kikuyu District.

3.4 Data Collections Methods

Data was collected from primary source. The collection of primary data was done using an interview guide. Data collection was done systematically and closely monitored. The interviews were conducted at personal level to ensure high return rates. The researcher had briefing meetings with the respondents to inform them about the research, sought their consent to be involved in the study. The researcher took notes during the face to face interview. Other questions outside the interview guide were used to clarify certain important issues.

3.4.1 Validity

There are no statistical tests to measure validity. All assessments of validity were subject to opinions based on the judgment of the researcher. Nevertheless, there were at least two types of validity that were addressed and stated regarding what steps to taken to assess validity. These were:

3.4.2 Face validity

This looked at the likelihood that a question were misunderstood or misinterpreted. Pre-testing of survey instruments was a good way to increase the likelihood of face validity.

3.4.3 Content validity

This looked at whether the instruments used provided adequate coverage of the human aspects that influence the adoption of analogue switch-off in Kenya. It was also do this by use of expert opinions, literature searches, and pretest open-ended questions in order to help establish content validity.

3.4.4 Reliability and Test-Retest

The following three basic methods were used by the researcher to test reliability of the study instruments: A test-retest measure was done by administering the same instrument to the same group of respondents at two different points in time. The degree to which both administrations are in agreement was a measure of the reliability of the instrument.

The third and most popular method of estimating reliability was the use of measures of internal consistency. When an instrument includes a series of questions designed to examine the same construct, the questions were arbitrarily split into two groups. The correlation between the two subsets of questions was the split-half reliability.

3.5 Data Analysis Methods

After the fieldwork, before analysis, all the responses were adequately checked for reliability and verification. The data was analyzed using qualitative techniques as the study collected its primary data using interview guide. Qualitative method involved content analysis and evaluation of text material.

3.6 Ethical Considerations.

Ethical consideration in research should be an integral part of the research planning and implementation process, not viewed as an afterthought or a burden. There should be increased

consciousness of the need for strict ethical guidelines for researchers. Some of the ethical issues touch on deception and invasion of privacy. (Frankel, R. Jack & Norman E. Wallen, 2000).

There are three main ethical principles that were considered:

- a) **Beneficence:** Maximizing good outcomes for science, humanity, and the individual research participants and minimizing or avoiding unnecessary risk, harm, or wrong.
- b) **Respect:** Treating people with respect and courtesy, including those who are not autonomous (e.g., small children, people who have mental retardation or senility)
- c) **Justice:** Ensuring that those who bear the risk in the research are those who benefit from it; ensuring that the procedures are reasonable, non-exploitative, carefully considered and fairly administered.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents analysis and findings of the study as set out in the research methodology. The main objective of the study was to establish the human aspects that influence the adoption of analogue switch-off in Kenya. The results presented were based on the research questions. The data was gathered exclusively from interview guide as the research instrument. An interview guide was designed in line with the objectives of the study. The data was presented in qualitative research form followed by discussions of the data results. The chapter concludes with critical analysis of the findings.

4.2 Demographic Information

4.3.1 Age of the respondents

The study sought to find out the age of the respondents. According to the findings, 40.5% of the respondents were aged 25-40 years, 23.8% were aged 40-55 years, 23.8% were aged above 55 years and 11.9% were aged less than 25 years. This implies that the study interviewed all the age groups from the county and this provided more reliable information pertaining to the digital to analogue switch off.

4.3.2 Level of Education of the respondents

The study established that 33.3 % of the respondents have secondary education as their highest level of education, 21.1% of the respondents have diploma level education as their highest level of education, 28.6 % have diploma level of education, and undergraduates comprised 16.7% of the respondents while those that had primary education as their highest level of education constituted 21.4%.

4.4 If the household owned a TV set

The study sought to inquire if the households owned a television set and it was determined that majority of the respondents (83.3%) indicated that they had television sets in their homesteads while 16.7% indicated that they did not possess a TV set. This implies that most of the households in the district had an access to the TV and they might be familiar with the ongoing digital migration.

4.5 If the respondents were aware of analog switch off

It was established from the study that majority of the respondents (92.9%) were aware of the analog switch off to the digital television. A mere 7.1% of the respondents said that they were not aware of the switch off and this indicated that the CCK had carried out the public education to create the awareness of the impending analog switch off.

4.6 Respondents understanding of analog switch off

It was determined from the study that most of the respondents said that analog switch off was the process by which the old television was be phased out and the improvement of the signal quality transmitted and received by the modern or the digital TV sets. Some of the respondents did not know what the ASO was and were asking what it entailed.

SECTION B: MOTIVATING FACTORS THAT CAN INFLUENCE PEOPLE TO CHANGE FROM ANALOG TO DIGITAL TELEVISION IN KENYA

4.7 Motivating factors that can influence people to change from analog to digital television in Kenya

It was determined from the study that among the top most factors that the respondents said that would motivate them for the acquisition and the installation of the Set Top Boxes was the clear picture/ high resolution that was be achieved by this form of transmission and it was followed by the good sound quality. These two factors topped the expectations of the respondents as the country is looking forward to the ASO or the digital migration.

4.8 If the government has set up program for persuasion or arousal of interest of people to DTV.

It was established from the study that majority of the respondents said that they had scanty information concerning the government's role in setting up programmes for the persuasion of the residents to purchase the set top boxes, rather that the government was broadcasting the requirements for the conversion of the conventional television sets to digital ones through the acquisition of the set up boxes which were expensive as per the ordinary citizens standards.

4.9 Benefits anticipated by the respondents through analog switch off to DTV

The benefits that the respondents anticipated through the analog switch off to DTV were the motivating factors and they included the high resolution/ picture quality coupled with the good sound quality. The number of the television channels was yet another benefit that the respondents anticipated as they would be many compared to the current number of the limited number of the channels.

SECTION C: THE FACTORS THAT CONTRIBUTE TOWARD RESISTANCE TO CHANGE TO DIGITAL TELEVISION IN Kenya

4.10 Respondents' responses if DTV was be taken up voluntarily by people

It was established from the study that majority of the respondent (95.2%) said that they would not take up the DTV voluntarily or willingly as the moment it would take effect, all the households that have the TVs would be forced to purchase the boxes. A mere 4.8% of the respondents said that they would voluntarily take up the DTV.

4.11 If the respondents were ready to incur the cost of set-top boxes so as to have DTV

It was established from the study that majority of the respondents (61.9%) said that they would incur the cost of the set top boxes as this would be the only alternative left for them while the 38.1% of the respondents said that they were not ready to incur the cost of the set top boxes.

4.12 Main disadvantage expected by the respondents as result of analog switch off to DTV

The main disadvantage expected by the respondents was poor reception of the signals in some of the rural areas where interruption was likely to occur as this would translate to lack of signal at all. Most of the respondents indicated that some of the households that have the analog TVs would be locked out if they would not be in a position to purchase the set top boxes.

SECTION D: THE CHALLENGES THAT PEOPLE FACE WHEN ADOPTING THE ANALOGUE SWITCH-OFF IN KENYA

4.13 Challenges anticipated by the respondents when adopting the analogue switch-off in Kenya.

From the focused group discussions held, the study established that the major challenge that the respondents anticipated when adopting the analogue switch off would be the initial cost of the purchase of the set top boxes that would be imported in the country. Given the socio-economic

status of the respondents, this would cost them a lot. The cost of acquisition of the new digital television set would be afforded by everyone.

Another challenge that was raised in the discussion groups was the reception of the signal in some of the remote areas that was expected to be poor and thus have some of the citizens residing in the upcountry may not enjoy fully the benefits of the digital TV.

4.14 If the respondents are anticipating poor support for learning about analog switch off to DTV from the government

It was established from the study most of the respondents in the focused groups indicated that they were anticipating government support for the acquisition of the set top boxes that was facilitate the analog TVs to receive the digital signals. The respondents said that the government could do this through lowering further the cost of the boxes to affordable prices.

SECTION E: INTERVENTION MECHANISMS TOWARDS ADOPTION OF THE ANALOGUE SWITCH-OFF IN Kenya

4.15 Intervention mechanisms respondents proposed so as the people could easily adopt analogue switch-off in Kenya.

It was established from the study that the government could liaise together with the distributors that would be mandated by it to sell and distribute the set top boxes at affordable prices rather than leaving the citizens in the hands of the middlemen who would likely move to enrich themselves. The government could also lower the cost of the acquisition of new digital television sets so that the consumers could debate whether to purchase either the set or the set top boxes as this would be flexible enough.

4.16 Respondents' responses if they should be engaged in the planning of that change of analog switch off to DTV.

It was established from the study that the respondents wanted the government to engage them in the planning of the change of analog switch off to DTV. This was proposed just like the way the government does initiate other projects in the country and they hold public rallies to get the opinions from the citizens and through this way, the ministry involved in the implementation of the ASO would get different views from the citizens.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter provides the summary of the findings from chapter four, and it also gives the conclusions and recommendations of the study based on its objectives. The objectives of this is to study the human aspects that influences the adoption of analogue switch-off in Kenya

5.2 Summary of the Findings

It was established from the study that majority of the respondents (92.9%) were aware of the analog switch off to the digital television. A mere 7.1% of the respondents said that they were not aware of the switch off and this indicated that the CCK had carried out the public education to create the awareness of the impending analog switch off. This was in contrary to the study conducted by Consumers Association, (2001) who indicated that majority of the people were not aware of the plans by Government's plan to switch off the analogue signal. Most of the respondents said that analog switch off was the process by which the old television was to be phased out and the improvement of the signal quality transmitted and received by the modern or the digital TV sets. Some of the respondents did not know what the ASO was and were asking what it entailed.

Among the top most factors that the respondents said that will motivate them for the acquisition and the installation of the Set Top Boxes was the clear picture/ high resolution that was be achieved by this form of transmission and it was followed by the good sound quality. These two factors topped the expectations of the respondents as the country is looking forward to the ASO or the digital migration. Majority of the respondents said that they had scanty information concerning the government's role in setting up programmes for the persuasion of the residents

to purchase the set up boxes rather than the government was broadcasting the requirements for the conversion of the conventional television sets to digital ones through the acquisition of the set up boxes which were expensive as per the ordinary citizens and this was postulated in the Innovator Theory by Rogers (1962) who classifies consumer attitudes towards purchasing products into five categories according to how quick consumers are to purchase new products and thus majority of the citizens would be forced to buy the set top boxes for them to receive the digital signals.

The benefits that the respondents anticipated through the analog switch off to DTV were as the motivating factors and they included the high resolution/ picture quality coupled with the good sound quality. The number of the television channels was yet another benefit that the respondents anticipated as they were many compared to the current number of the limited number of the channels.

It was established from the study that majority of the respondent (95.2%) said that the people would not take up the DTV voluntarily or willingly as the moment it was taken effect, all the households that have the TVs were forced to purchase the boxes. A mere 4.8% of the respondents said that they will voluntarily take up the DTV. Majority of the respondents (61.9%) said that they will incur the cost of the set top boxes as this was the only alternative left for them while the 38.1% of the respondents said that they were not ready for incurring the cost of the set top boxes and this corresponds with the study by Fisher (2005) noted that the capacity or willingness of individuals to use these new technologies will affect all segments of society and thus stagnate the adoption process.

From the interviews held, the study established that the major challenge that the respondents anticipated when adopting the analogue switch off was the initial cost of the purchase of the set top boxes that was imported in the country. Given the socio-economic status of the

respondents, this was cost them a lot. The cost of acquisition of the new digital television set is also quite to be afforded by everyone. Another challenge that was raised in the discussion groups was the reception of the signal in some of the remote areas that was expected to be poor and thus have some of the citizens residing in the upcountry may not enjoy fully the benefits of the digital TV.

The respondents indicated that they were anticipating government support for the acquisition of the set top boxes that will facilitate the analog TVs to receive the digital signals. The respondents said that the government could do this through lowering further the cost of the boxes to affordable prices. It was established from the study that the government could liaise together with the distributors that was be mandated by it to sell and distribute the set top boxes at affordable prices rather than leaving the citizens in the hands of the middlemen who was likely move to enrich themselves. The government could also lower the cost of the acquisition of new digital television sets so that the consumers could debate whether to purchase either the set or the set top boxes as this was be flexible enough.

The respondents wanted the government to engage them in the planning of the change of analog switch off to DTV. This was proposed just like the way the government does initiate other projects in the country and they hold public rallies to get the opinions from the citizens and through this way, the ministry involved in the implementation of the ASO was get different views from the citizens.

5.3 Conclusions

Most of the respondents were aware of the analog switch off to the digital television as this has been in the lime light for quite some time now. Most of the respondents said that analog switch off was the process by which the old television was be phased out and the improvement of the signal quality transmitted and received by the modern or the digital TV sets. Top most factors

that will motivate them for the acquisition and the installation of the Set Top Boxes were the clear picture/ high resolution and the quality sound system. Majority of the respondent indicated that the people was not take up the DTV voluntarily or willingly as the moment it was take effect, all the households that have the TVs was be forced to purchase the boxes in order to receive any signals in their TVs.

Major challenges that the respondents anticipated when adopting the analogue switch off was be the initial cost of the purchase of the set top boxes that was be imported. The respondents in the focused groups indicated that they were anticipating government support for the acquisition of the set top boxes that will facilitate the analog TVs to receive the digital signals. The respondents wanted the government to engage them in the planning of the change of analog switch off to DTV so as it can come up with comprehensive policies and strategies to ensure that all households could get access the digital television benefits.

5.4 Recommendations

The government as well other media groups should educate the public what is the ASO or the DTV so that they could be anticipating how the services was look like. They should also educate the public on the benefits they was accrue from the service as this was like bait or incentives for the installation or the purchase of the digital enabled TVs or the set top boxes.

The government should lower the cost of set top boxes so that all households could be I a position to afford them and this was guarantee that almost all households was access the services. It should also come up with strategies and policies that will ensure that all the media groups that are involved in the transmission of TVs signals reach all the parts of the country.

5.5 Suggestions for Further Study

This study the human aspects that influence the adoption of analogue switch-off in Kenya. To this end therefore the same study should be carried out in other districts in the country to find

out if the same results would be obtained. The size of the sample used in the study was 50 and the size should be increased in other subsequent studies that was be conducted on the same topic as this was provide wider information to the human aspects that influence the adoption of analogue switch-off. Switchover has to be handled systematically since it involves many variables and affecting all social groups - consumers, industry and public authorities and broadcasters so as not to be a protracted process.

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APPENDICES

Appendix I: Interview Guide

Section A: Background Information

1: What is your highest academic level?

- a) Primary certificate []
- b) Secondary certificate []
- c) Diploma []
- d) Graduate []
- e) Post Graduate []

2: What is your age?

- a) Less than 25 years []
- b) Between 25-35years []
- c) Between 35-45years []
- d) Between 45-5years []
- e) Above 55 years []

3: Do you own a TV set

- Yes []
- Non []

4: Are you aware of analog switch off?

Yes []

Non []

5: What is analog switch off according to your own knowledge?

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.....

Section B: Motivating factors that can influence people to change from analog to digital television in Kenya

6: What are the motivating factors that can influence people to change from analog to digital television in Kenya?

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7: Have the government set up program for persuasion or arousal of interest of people to DTV?

.....
.....

8: What advantages and benefits do you anticipate to gain through analog switch off to DTV?

.....
.....

Section C: The factors that contribute toward resistance to change to digital television in Kenya

9: What is your opinion was DTV was be taken up voluntarily by people?

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.....
10: Are you ready to incur the cost of set-top boxes so as to have DTV? Kindly explain your answer

.....
.....

11: Are you aware of government's plan to switch off the analogue signal to DTV? Kindly explain your answer

.....
.....

12: What are the main disadvantage do you expect as result of analog switch off to DTV?

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.....

Section D: The challenges that people face when adopting the analogue switch-off in Kenya

13: What challenges are you anticipating when adopting the analogue switch-off in Kenya?

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.....

14: Do you think inadequate communication both about the technology and reasons for change to digital TV was be major challenges that people may face when adopting the analogue switch-off in Kenya?

.....
.....
15: Do you anticipating poor support for learning about analog switch off to DTV from the government?

.....
.....

Section E: Intervention mechanisms towards adoption of the analogue switch-off in Kenya

16: What Intervention mechanisms can you propose so as the people can easily adopt analogue switch-off in Kenya?

.....
.....

17: Do you feel you should be engaged in the planning of that change of analog switch off to DTV?

.....
.....