

Effect of Broadcast Policy & Regulations on Timely Implementation of the Analogue to Digital Migration in Kenya

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Abstract

This study examined the effect of broadcast policy & regulations on the digital migration process in Kenya. Research has shown that a review of the existing broadcast policies and regulations is critical to the successful implementation of digital migration in any given country, however, no study had been done to establish the linkage of broadcast policy & regulation and timely digital migration. Digital migration was intended to offer both technical and commercial benefits to the ICT sector globally – ranging from better television reception, efficient utilization of broadcasting frequencies and potential for investment in the sector by utilizing the spare frequencies released by the migration. Kenya's target to have fully completed the migration by July 2012, ahead of the 2015 international deadline, was unmet. This study employed a cross-sectional survey research design. Using hierarchical and moderated multiple regression (MMR) analyses, the theoretical models and study objectives were tested based on empirical data collected from key technical personnel involved in the digital migration process. The study samples were drawn from the regulator, broadcast signal distributor, equipment vendors, broadcasters, media owners and consumer protection agencies. The data collected was analyzed qualitatively and quantitatively and a model that can be used to guide the digital migration process developed. The results of this study revealed a strong positive correlation between broadcast policy & regulations and timely digital migration and the moderating effect of awareness and campaign on the relationship. This study recommends some of the key aspects of broadcast policy and regulations that require review for sustainable digital migration as well as contributing to the body of knowledge on the aspects of ICT Policy and Regulations.

Keywords: Analogue Broadcasting, Digital Broadcasting, Digital Migration, Set-Top-Boxes, Broadcast Policy, Regulation.

1. Introduction

The digital age has heralded a new competition for consumer services and emerging entrepreneurial opportunities (Yoffie, 1996). Broadcasting has a significant impact on the social and political class of a society. The broadcast industry has evolved from being a miniscule industry to a key contributor to national and global economies (Golding & Murdock, 2000) and investment in the technology employed in

broadcasting and communications sector has a way to better the lives of the citizens (Castells, 2011; Hernández and Acevedo-Ruiz, 2007).

In the United States of America (USA), The Federal Communications Commission of the USA recognized that the migration of television broadcasting to the digital platform is part of social and economic development (Cianci, 2007). The Republic of Kenya underpins science, technology and innovation as one of the foundations for socio-economic transformation of Kenya into a globally competitive and prosperous nation by the year 2030 (RoK, 2007).

The evolution of television broadcasting from the traditional analogue broadcasting to the modern type digital broadcasting entails coding and decoding of digital signals from the broadcasting station to the consumer of broadcast services (Starks, 2013). Trends in digital broadcasting technologies, the ever increasing demand for better broadcasting services and the push to implement modern principles of frequency spectrum management necessitate the switchover from analogue to the digital platform for broadcasting services (ITU, 2006) which set the year 2015 as the final cut-off deadline for member organizations in which Kenya falls.

Digital migration was initiated in 2006 when the I.T.U., through its council regulation 1185 during the I.T.U. Regional Radio Conference (RRC-04/06). At the conference, the 101 member states drawn from Europe, Africa and Middle East signed a treaty committing to the transition from analogue to digital broadcasting by the year 2015 (Beutler, 2008). Kenya, being one of the member states, set a target to commence digital broadcasting in the year 2007 by having dual illumination/simulcast where both the analogue and digital signals would be broadcasted until final switch off in July 2012 (RoK, 2007) ahead of final international deadline of 2015 line with the guidelines for the transition from analogue to digital broadcasting (I.T.U., 2010). This plan necessitated the formation of the national taskforce on migration from analogue to digital broadcasting in Kenya.

Digital migration which will result in spectral efficiency (better utilization) of the scarce frequency spectrum (I.T.U, 2010; DigiTAG, 2008; Analysys, 2009). The minimum utilization of spectrum within the Ultra High Frequency (UHF) band is envisaged to result in “spare” frequencies being freed up – what has been christened the digital dividend. This available spectrum can be used for community broadcasting, wireless broadband to the last mile users and mobile communications (4G and LTE), and in effect, serve the remote poor populations in an economically viable manner (Prahalad and Hammond, 2002; I.T.U., 2006).

The digital migration has the potential to bridge the digital divide by availing broadband access to households, arguably, because of the bundled services of broadcasting and broadband access (Dutton, Gillett, McKnight and Peltu, 2004; European Commission, 2001). The digital migration will result in improved quality of broadcasting services amongst the consumers of broadcast services in most households (Kristensen and Tadayoni, 1998; I.T.U., 2006) that is likely to improve their social and economic livelihoods arising from the access to information.

Digital migration creates entrepreneurial opportunities. Digital migration is a key motivator for economic revolution as stipulated by the Schumpeterian theory of technological innovation (Schumpeter, 1934). This

economic revolution creates new business opportunities for enhancing radical innovation, closed innovation, cultural diversity and ethnic cohesion (Castells, 2011; RoK, 2007, 2010; Analysys, 2009).

The critical milestones for a smooth migration as proposed by the digital migration taskforce for Kenya and corroborated by the I.T.U. guidelines are: (a) Planning phase – where the state engages the stakeholders in defining the digital migration policy, technical and business readiness, the licensing and regulation regime to be adopted and the analogue switch-off method to employ. (b) Implementation phase where the various parties (the broadcasters, network operators and government) engage in deployment of the digital broadcast including license administration, sites preparation and signal roll out and (c) Analogue switch-off after a successful migration of the analogue signal (RoK, 2007; I.T.U., 2006).

1.1. Problem Statement

Broadcasting significantly accounts for the global and national economies and as such timely migration significantly accounts for the increase in pooled taxed base for Kenya (Wangusi, 2011). On the other hand, research shows that countries that have either not done the digital migration or delayed in the migration process have had a negative impact on the ICT sectors within those nations (Starks, 2013; Deloitte and Touché, 2012).

Different countries adopted unique migration plans depending on the policy, technical and institutional changes that needed to be in place for the successful digital migration (Adomi, 2010). In Europe, seven nations were able to complete the migration by the target 2009 time frame (Van den Broeck and Pierson, 2008; Iosifidis, 2006). In East Africa, Tanzania and Rwanda were able to migrate by 2012 and 2014 respectively (Kisaka, 2015; Mutabazi, 2015). Kenya was not able to meet the implementation time frame of June 2012 to have the country migrated to digital television broadcasting despite having an existing broadcast policy and regulations framework (Murungi, 2007).

Despite the efforts by the government to license signal distributors and equipment vendors, zero rate cost of Set Top Boxes in a bid to encourage the uptake of the digital broadcasting and carrying out a consumer awareness campaign (Agona and Otim, 2011; Wangusi, 2012) the target date remained unmet. Likewise, the sector players, mostly equipment vendors, have made attempts to increase uptake of digital broadcast services by reducing cost of with minimal impact. The migration dates constantly changed – ostensibly brought about by protracted court battles by aggrieved stakeholders (Starks, 2007), who feel their interests in the migration have not been addressed.

On the local scene, Ericsson Kenya Ltd (2007) has done a study on migration from analogue to digital television in Kenya, while Murungi (2007) studied regulatory and policy reforms in the broadcasting industry in Kenya. All these studies have aimed at unpacking the critical success factors for digital migration. Limited attention has been paid to the study of the effect of the existing broadcast policy and regulations regime and the digital migration in Kenya. Therefore, further research was needed which would include current status of digital migration in Kenya. This study sought to fill in on this existing knowledge gap.

1.2. Objective of the Study

The objective of this study was to empirically determine the effect of Broadcast Policy & Regulations on the timely implementation of the Analogue to Digital Migration in Kenya.

2. Literature Review

The existing policy, legal and regulatory framework in the countries that are undergoing the digital migration is a key imperative to successful migration process. As such, country regulators have a responsibility to review their regimes against the digital migration guidelines to ensure readiness and smooth transition (I.T.U., 2006). A policy approach in integrating new digital broadcasting rules is therefore essential to protect the digital migration plan. An old broadcast regulatory regime cannot favor a seamless digital migration (Armstrong & Collins, 2004).

In the Kenyan context, the current legislation around the regulation of broadcast services where frequencies are issued by the sector regulator and licenses are issued by the ministry needs to be reviewed and harmonized to ensure independence of the industry (Murungi, 2007). This broadcast regulatory structure could be an impediment to the digital migration process and Murungi goes further to argue that structural amendments of the regulator would give it the latitude to effectively run its mandate considering the convergence in the ICT sector with broadcasting, internet and telecommunications converging in the manner of licensing and service delivery.

A study by Deloitte & Touché (2012) on Kenya's broadcast sector observed that there were gaps in the licensing of the digital migration landscape. The existing licensing of having a national (and public) broadcaster being a broadcast signal distributor was a potential hindrance on the digital broadcast market structure. Deloitte & Touché recommended a review of the structure of the national broadcaster by explicitly defining a public wing (with mandate to provide public broadcast services) and a private commercial entity that competes with the rest of the other players in the digital broadcast industry.

Governments should embrace the commercialization of the digital migration and offer competitive services away from state run, state funded public broadcasters (Iosifidis, 2005; Adda and Ottaviani, 2005). This commercialization however would require appropriate policy and regulatory reforms. The commercialization can be in the form of infrastructure setup, digital broadcast equipment acquisition or spectrum management.

The linkage between awareness & campaign on the existing broadcast policies & regulations and impact on digital migration. The regulator and the digital transition committee are responsible to create awareness to the digital broadcasting value chain on the rights, obligations and responsibilities of every stakeholder (Berger, 2010; Adomi, 2010). Broadcasting being a medium of access to information implies the right of citizens and as such, the digital migration policy must embed in itself social objectives associated with free and fair public broadcasting that does not discriminate any citizen the right to access broadcast services based on their ability to have the mechanism to access these services (Candel, 2007).

2.1. Conceptual Model

The conceptual model is based on Broadcast Policy & Regulations (independent variable), Timely Digital Migration (dependent variable) and Awareness & Campaign being the moderating variable as shown in figure 1.

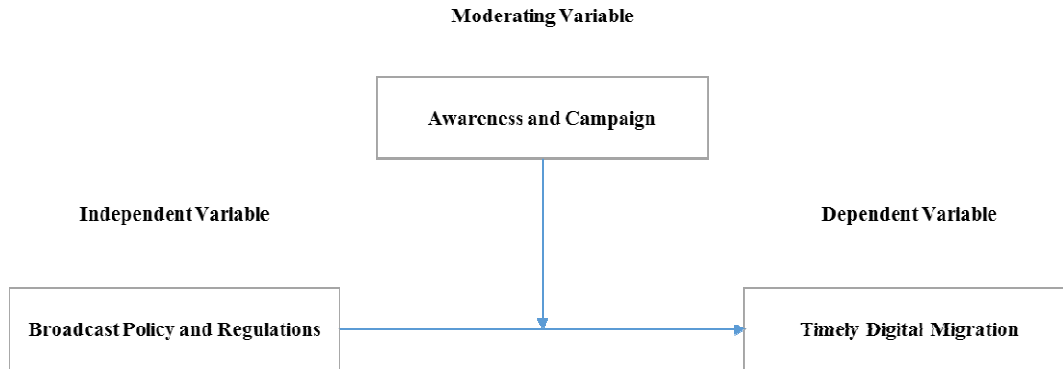


Fig. 1 Conceptual Model

3. Methodology

Cross-sectional survey research design was used in this study. Cross sectional studies take a snapshot of the respondent group within the target population and analyze the behavior of the respondents with reference to the study topic (Abbott & McKinney, 2012). The target population of study was the key stakeholder organizations in the migration process as defined by the Communications Authority of Kenya and informed by the digital migration taskforce. The respondents were the technical personnel responsible for digital migration from their respective institutions. The study employed purposive random sampling to get to appropriate responses from a sample of 140 respondents.

Data was collected using semi-structured interview guides and a questionnaire with both open ended questions and a 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). A Likert Scale can be evaluated easily through standard techniques like, factor analysis and logistic regression analysis (Montgomery, Peck & Vining, 2001). Data collection was done using a hybrid of data collection procedures to maximize the reach of the respondents that is using both self-administration of the questionnaire and using Survey Monkey online platform. Online surveys afford the study greater geographic reach at the least cost enabling a high response rate quickly and cheaply (Reynolds, Woods, & Baker, 2006).

A pilot study was done on 10% of the sample population to test the reliability and validity of the questionnaire (Mugenda & Mugenda, 2003). This sample was representative of the target study population - large enough to provide useful information about the aspects that were being studied (van Teijlingen & Hundley, 2001). A resulting Cronbach's alpha coefficient of 0.739 qualified the instrument as reliable and consistent (Nachmias and Nachmias, 1996; Sijtsma, 2009).

The study used the Statistical Package for the Social Sciences (SPSS) version 21 for Windows to assist in analyzing quantitative data. Qualitative data was analyzed by categorization and summarization of key

thematic areas based on the responses (Keegan, 2009). This study employed descriptive statistics to analyze quantitative data. Correlation analysis was carried out on the study variables to determine the strength of the relationships between the study variables. The moderating effect of Awareness and Campaign was tested using Moderate Multiple Regression (MMR) analysis. MMR models allow the simple relationship between the dependent variable and an independent variable to depend on the level of another independent variable (Irwin & McClelland, 2001).

4. Results

The study established that majority (65.4%) of the respondents had migrated to the digital platform, while a few (34.6%) had not compared with official estimates by the Communications Authority of Kenya (CAK) of May 31st, 2016 which indicated that television penetration had increased from 57.0% during analogue broadcasting to 64.0% of the population with digital broadcasting.

A majority (77.0%) agreed to the need of the regulator to review spectrum regulation and pricing policy to attract investors to fund the migration in exchange for spectrum assignment, 10.0% were neutral while a few (13.0%) disagreed. Majority (62.0%) of the respondents polled disagreed that the licensing of the 2nd broadcast signal distributor (BSD), the Pan-Africa Network Group (Kenya) Co. Ltd, had been done in a free and fair manner, 19.0% were neutral while a few (19.0%) agreed.

Correlational Analysis for Broadcast Policy & Regulations and Timely Digital Migration indicated a strong positive linear correlation between Broadcast Policy & Regulations and Timely Digital Migration ($r=0.742$, $p<0.05$) as shown in table 1.

Table 2 shows the moderating effect of Awareness & Campaign on the relationship between Broadcast Policy & Regulations and Timely Digital Migration. Broadcast Policy & Regulations was a strong predictor of Timely Digital Migration. From table 2, Model 1 shows that $R=.772$, $R^2=.596$ and $[F(5, 79) = 23.278, p=0.05]$. The values of R^2 indicates that 59.6% of the variance in Timely Digital Migration can be accounted for by broadcast policy and regulations. Model 2 shows results after the interaction variable (Broadcast Policy & Regulations*Awareness and Campaign) was added into the model. From table 3, the moderating effect of Awareness and Campaign gained 4.3 % variance in Timely Digital Migration, over and above the variance of Broadcast Policy & Regulations and Awareness and Campaign. The amount of change in R^2 is a measure of change in the predictive power of a given dependent variable or variables with introduction of the dependent variable or variables in the model (Aguinis, 1995). From the aforementioned, Awareness and Campaign was found to moderate the relationship between Broadcast Policy & Regulations and Timely Digital Migration.

In table 3, Model 1 indicates that Broadcast Policy & Regulations (BPR) was statistically significant ($p < 0.05$; Beta value = 0.469); Awareness and Campaign (AWC) was also statistically significant ($p < 0.05$). Equation 1 shows that for a 1-unit increase in review of Broadcast Policy and Regulations, Timely Digital Migration is predicted to have a difference by 0.251, given that the Awareness and Campaign is held constant. The regression coefficient associated with Awareness and Campaign means that the difference in Timely Digital Migration characterized by an aggressive Awareness and Campaign and that with a very limited Awareness

and Campaign drive is 0.090, given that Broadcast Policy & Regulations is held constant. Substituting these values in the OLS regression model ($Y = \beta_0 + \beta_1 X + \beta_2 Z + \varepsilon$), the following equation is obtained:

$$\text{Timely Digital Migration} = 5.12 + 0.251 \text{ BPR} + 0.090 \text{ AWC} \dots\dots\dots$$

Equation (1)

Model 2 shows the details of inclusion of the interactive variable in the model. Broadcast Policy & Regulations was found to be significant ($p=.006 < 0.05$, Beta value =.407), Awareness and Campaign was found to be statistically insignificant ($p=0.326 > 0.010$, Beta value =.126) and Broadcast Policy & Regulations*Awareness and Campaign was found to be significant ($p= 0.010 < 0.05$, Beta value =.471). From equation (1), if we substitute these values in the OLS regression model ($Y = \beta_0 + \beta_1 X + \beta_2 Z + \varepsilon$) we obtain:

$$\text{Timely Digital Migration} = 7.99 + .218 \text{ BPR} + .076 \text{ AWC} + .252 \text{ BPR*AWC} \dots\dots\dots$$

Equation (2)

5. Discussion and Conclusion

This study found a positive relationship between Broadcast Policy & Regulations and Timely Digital Migration in Kenya as supported by the literature review. Lie (2004) of the I.T.U. in his study on technology focused and market based reforms in spectrum management found out that regulatory regimes that favour best assignment of spectrum within constraints of the market conditions spur technology migration. Similar findings were made by Deloitte & Touché (2011) in their study on the broadcasting industry in Kenya who observed that the digital migration in Kenya would be as successful if the existing broadcast regulatory framework was reviewed.

The licensing of the players involved in the digital migration process is a key determinant to the successful and timely digital migration process. This opinion is consistent with observations by Iosifidis (2006) in his study on the Digital switch over in Europe that political and broadcast regulatory issues relating to licensing of players directly impacts the digital migration process. In the Kenyan digital migration process, there was perceived unfairness in allocation of the 2nd BSD license to the Pan African Network Group (PANG). This unfairness triggered protracted court battles that prompted the decision by the CAK to allocate a provisional 3rd BSD license (temporal authorization) to the African Digital Network (ADN) consortium as a result of the prayers of the complainant being granted by the Supreme Court of Kenya in 2015. The ADN consortium consists of 3 media houses - The Standard Group, Royal Media Services and The Nation Group.

There was a strong positive correlation between reviews of the regulatory framework and the Digital Migration process. This is supported by a study done by Murungi (2007). The study found an empirical relationship between review of the regulatory regime as a pre-cursor to a timely and successful digital migration process. He further established that the Kenyan broadcast landscape that was regulated under the analogue regime was significantly due for review to effectively support the broadcasting industry in the converged digital space.

Moderation results led to the conclusion that there was a moderating effect by Awareness & Campaign on the relationship between Broadcast Policy & Regulation and Timey Digital Migration in Kenya. The regulator has a responsibility to create awareness on the critical nature of consumer education on the importance of the digital migration to the ICT sector, and the economy at large. Equally, the stakeholders in the digital broadcasting value chain have to campaign and advocate for fair play in order that the benefits of the migration are realized by the majority of consumers. Scott (1995), in his study on institutions and organizations makes similar observations that institutions, which include legal, political, regulatory frameworks compel a specific behavior in organizations – in this case, the digital broadcasting ecosystem.

The study established that the licensing regime for infrastructure service providers needed review to ensure fair play, quality of services and availability of ICT services. The infrastructure sharing policy needed to be reviewed, adopted and signed into law to ensure environmental protection and reduction of cost of infrastructure development.

This study fills a significant gap identified in the literature review and provides a model that can be adopted in future undertakings that involve technology migration. The outcomes of this study greatly enriches the academia as much has not been researched in the field of digital broadcasting in Kenya.

6. Recommendations

This study advocates for the need to draft, review, adopt and ratify a digital broadcasting policy (for both radio and television broadcasting) that will inform future licensing for broadcast signal distributors & self-carriers, allocation and assignment of the digital dividend spectrum. This digital broadcasting policy should be part of the National ICT Policy and Communications Act.

Equally important is the need to review, adopt and ratify the draft Infrastructure Sharing Policy that will ensure that there are cost effective ways of building and sharing appropriate ICT infrastructure to support the digital migration. Shared use of passive network infrastructure has a potential impact of reducing the total cost of ownership of the required digital broadcasting infrastructure. In the absence of a National Infrastructure Sharing Policy, there is a risk of having multiple players building their own infrastructure which in the end makes the cost of the services higher while at the same time negatively impacting the environment.

Lastly, this study recommends a review the procurement and licensing strategy that is currently in place to ensure fair play of the Kenyan enterprises in the allocation of rights and licenses for participation in the digital migration process. The current public procurement policy for the scale of the migration project upstages the Kenyan entrepreneur to stiffer competition from the foreign players. It is imperative to review the provisional 3rd BSD license issued to the Africa Digital Network (ADN) through a court order and consider an administrative process in light with best practice within the sector to ensure commitment by the licensees to their licensing obligations.

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Table 1 Correlational Analysis for Broadcast Policy & Regulations and Timely Digital Migration

Variable		Timely Digital Migration	Broadcast Policy and Regulations
Timely Digital Migration	Pearson Correlation	1	0.742
	Sig. (2-tailed)	*	0.000
	N	78	78
Broadcast Policy and Regulations	Pearson Correlation	0.742	1
	Sig. (2-tailed)	0.000	*
	N	78	78

** . Correlation is significant at the 0.05 level (2-tailed).

Table 2 Moderated Multiple Regression Model summary for Broadcast Policy and Regulations

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.772 ^a	.596	.570	4.16976	.596	23.278	5	79	.000
2	.768 ^b	.589	.579	4.12608	.043	58.775	2	82	.070

- a. Predictors: (Constant), Awareness and Campaign, Broadcast Policy and Regulations
- b. Predictors: (Constant), Awareness and Campaign, Broadcast Policy and Regulations, Broadcast Policy and Regulations*Awareness and Campaign

Table 3 Moderated Multiple Regression Model Coefficients for Broadcast Policy and Regulations

Model	Coefficients					
	B	SE	Beta	t	p	
(Constant)	5.12	1.850		-0.277	0.783	
AWC	0.090	0.098	0.149	0.920	0.361	
BPR	0.251	0.097	0.469	2.599	0.011	
(Constant)	7.99	1.534		-.521	.604	
AWC	.076	.077	.126	.989	.326	
BPR	.218	.078	.407	2.798	.006	
AWC*BPR	.252	.096	.471	2.631	.010	