AN ANALYSIS OF THE BROADCASTING MIGRATION PROCESS FROM ANALOGUE TO DIGITAL FORMAT: A COMPARISON OF BOTSWANA TELEVISION AND NAMIBIAN BROADCASTING CORPORATION

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1. Abstract

The paper is based on an empirical study that explored the digital migration process at the Botswana Television Services (BTV) and Namibian Broadcasting Corporation (NBC) to understand the challenges posed by the migration process. The study was guided by the diffusion of innovation theory. A mixed design methodology was used. Purposive sampling was used to target 21 key informants. Semi-structured face-to face interviews were conducted with the management of the digital migration project at BTV and NBC, while questionnaires were distributed to the other staff working on the digital migration project. The study also revealed a correlation between the literature consulted and the findings of the study with regard to the digital migration process. The findings revealed that digital migration brings a lot of benefits to both the broadcasters and television viewers. The study also revealed challenges that include: lack of skills, shortage of staff, lack of funds to upgrade from analogue to digital, and a general lack of awareness about the digital migration process. It was also evident that Botswana was more than Namibia in meeting the set deadline of 2015. The major recommendation from the study was that the governments of Botswana and Namibia should be more supportive to the concerned national television broadcasters in their efforts to migrate media from analogue to digital.

2. Introduction

The global digital switchover from analogue towards digital broadcasting poses a challenge to developing countries. Digital broadcasting may place a burden on consumers, as they upgrade TVs and radios in countries where TV and radio penetration is low. Since the opening of airwaves in some countries in Southern Africa (Botswana and Namibia included), there were concerns about access to various forms of communication, and to broadcasting in particular.[118] However, conversation to digital broadcasting may be inevitable when the production of analogue equipment stops. Television stations are upgrading from the old analogue to digital broadcasting, which will bring many advantages for the broadcasters as well as the consumers. The digital migration process is taking place at BTV and NBC.

3. Background to NBC

The Namibian Broadcasting Corporation (NBC) is Namibia's national television broadcaster. It was established in 1990 and has a factual monopoly on the national free to-air television. NBC was established in line with the Namibian Broadcasting Act, Act 9 of 1991. The migration process in Namibia was set in motion in the year 2000 by the International Telecommunication Union (ITU) and an international deadline of June 2015 was agreed on.[119]

4. Background to BTV

Botswana's national television broadcaster went live on air in July 2000. The station has a mandate to air 65% local content and 35% international programming. The vision of BTV is to broadcast for every citizen. BTV broadcasts government and public information to citizens through informative and entertaining television programmes. A Reference Group was established in February 2008 to kick start the digital switchover/migration process.[120] Botswana's transition to digital broadcasting started in earnest in 2008 with the appointment of a digital

118 Fardon, R & Furniss, G. *African Broadcast Cultures Radio: In Transition*. James Currey Publications, 2002.
119 Namibia Broadcast Corporation. *Digital Migration*. 2012. Retrieved from http://www.nbc.na/co_aboutus.
120 Go digital. What is digital migration? 2008. Retrieved from http://www.godigital.org.bw/godigital.htm.

migration task force led by the Chairperson of the National Broadcasting Board (NBB).[121] In February 2010, the task force addressed critical policy issues that covered standards to adopt for set top boxes, signal distribution, licensing, budget, and the exact timeline for each stage and activity.[122]

5. Statement of the problem

A treaty agreement was signed on the 16th of June 2006 at the conclusion of the International Telecommunication Union (ITU's) Regional Radio Communication Conference (RRC-06) in Geneva that marked the beginning of the end of analogue broadcasting. The agreement stipulates that the transition period from analogue to digital broadcasting should end on 17 June 2015.[123] Although the digital migration process is taking place in Botswana and Namibia, the digital switchover poses major infrastructural problems to the national broadcasting stations.

6. Study objectives

This study sought to:

1. Determine the status of television broadcast in Botswana and Namibia.
2. Determine the strategies the broadcasters are using.
3. Identify the benefits of digital migration for Namibia and Botswana.
4. Determine the challenges the broadcasters in Namibia and Botswana are facing.
5. Find out what NBC and BTV are doing to inform their audience about the digital migration.
6. Determine the conditions under which audiovisual media materials are stored.

7. Significance of the study

The study adds to the existing knowledge in the area of digital broadcasting. It will be used by academicians and researchers to fill a gap in knowledge. The recommendations from this study can be used to guide national broadcasters in their attempts to manage the switchover from analog to digital broadcasting more effectively. It will benefit other broadcasters in Africa, and other parts of the world, who are in the process of digital migration.

8. Theoretical framework

In modern and postmodern society, there is a constant flow of new products, ideas, solutions to problems, new interpretations, and other kinds of innovations. Diffusion of innovation theory applies to mass media communication in two ways: the innovation of new media products and the role media plays in spreading innovation. With each development in media technology, new forms of communication must be adopted by people. It is the broadcaster's responsibility to bring the audience media technology and make them aware of them since there is a constant change in the media. The diffusion of innovation theory is therefore relevant to the study. The researchers used the diffusion of innovation theory because digital migration is an innovation to the broadcasting world. It transmits TV pictures and sound as computerized bits of information.[124]

121 Gaotlhobogwe, M. *Now Botswana go for Japan-Brazil digital std*. Gaborone: The Monitor. 2013.
122 Schuman R., and Mogobe, T.T. Botswana Switches to ISDB-T for Digital TV. 2013. Retrieved from http://www.com/AboutUs/News/Newsletter/Botswana-switches-to-ISDB-T-for-digital-TV.
123 Stork, C. and Kanyangela R. Digital TV Switchover Economic Impact Assessment. 2010. Retrieved from http://www.nbc.na/resources/final%200n%20the%20Digital%Switchover%Economic%Impact%20Assesment pdf.
124 Potter, W. J. *Media Literacy*. California: Sage Publications. 2005.

9. Digital transition

International developments show that analogue TV services are being phased out. Places like India, the Netherlands, Europe, and the United Kingdom completed the analogue switchover before the end of 2007. Digitisation and Broadcasting was the theme of the 7th Biennial Conference of Africa Broadcasters, AFRICAST, held in Abuja, Nigeria, October 2008. At the conference Africa resolved that digitization of broadcasting is not only necessary but also imperative in Africa. This is because it has the potential for revolutionizing the media and communication activities within the continent, creating better business opportunities and redefining national values. African countries, therefore, must strive towards meeting the ITU deadline of June 17, 2015 for broadcasting to transit from analogue to digital, otherwise, they stand the risk of being isolated from the world's broadcasting community.[125] Digitization has far-reaching implications and daunting challenges for governments, broadcasters, regulators, and the people. The success of the transition will depend, on the co-operation of these parties.[126]

10. Media development

In terms of media development, broadcasters are currently witnessing progressive migration from analogue to digital production, digital television encourages an increase in the number of programmes available, improves quality and accessibility, and creates new media services. However, the move to digital broadcasting brings with it other crucial challenges regarding regulation planning, pluralism of information, media development and access for all new digital equipment, and increasing dependency beyond national borders in the sector.[127] The move to a digital world offers opportunities for Television broadcasters to engage in data casting, as well as multicasting of standard digital (SDTV) signals with a digital channel or several SDTV channels.[128]

11. Benefits of digital migration

The transition from analogue to digital TV can bring a number of benefits that include: better quality television service; potentially better TV coverage even with the same number of broadcast locations; less transmit power; more spectrum efficient, which therefore enables the distribution of many more TV channels in the same spectrum; lower protection ratio, and therefore less sensitive for interference and enables more indoor and mobile reception of TV signals; no signal loss or degradation of the signal through the transmission or storage medium[129] and higher picture definition, because a digital signal can be compressed far more than an analogue signal.[130]

12. Challenges

Whereas the bulk of Americans rely on cable and satellite television services, Africa is very dependent on terrestrial broadcasting. African countries should realize that, no matter what effort they make to achieve total digitization, some of the challenges associated with the transition would still remain due to the peculiarities of the African environment, e.g., high temperature and high/low relative humidity).

125 APC. The transition to digital broadcasting in Africa. 2011. Retrieved from http://digmig.apc.org/en/why-does-digital-broadcast.matters-to-africa.
126 Akintaro, S. Bumpy Road for Africa. 2013. Retrieved from http://www.ittelecomdigest.com/cover12-feb.htm.
127 Berger, G. *Challenges and Perspectives of Digital Migration for African Media*. Dakar: Danika Marquis. 2010.
128 Albarran, A.B. *Management of Electronic Media*. (3rd Ed). Belmont Thompson Learning. 2006.
129 Craft, J.E, Frederic A.L & Godfrey D.G. *Electronic Media*. Wadsworth: Thompson Learning. 2001.
130 Cringely, R.X. *Analog to Digital Advantages*. Retrieved from *http://electronics.howstuffworks.com/digital-convertor-box2.htm*.

In order to receive digital television transmission/signals the consumer need either to replace the analogue TV set with a set equipped with a digital tuner; or adapt the current analogue TV set by using of an external Set Top Box that will convert digital signal to analogue.[131]

The end of analogue broadcasting and the production of the new equipment are likely to give rise to serious problems in Africa such as problems of maintaining infrastructures that remain analogue. Digital broadcasting brings other crucial challenges regarding regulation planning, pluralism of information, media development, and access for all the new digital equipment and increasing dependency beyond national borders in the sector.[132]

NBC's greatest challenge is transforming the broadcast into a digital multi-channel. However, the absence of policy creates tension between stakeholders due to the uncertainties in the regulatory environment. NBC is behind schedule due to funding shortage.[133] In the case of Botswana, more frequencies for analogue TV broadcasting are a challenge. The costs are still a matter of concern to the broadcasters. They should be weighed against benefits.[134]

Another challenge is that the analogue signal cannot be credibly switched off until almost all viewers have migrated to digital due to universality of access to television. Before switchover in any country, only part of the country's population can be reached with the digital signal.

Those who are reached need to spend more to upgrade their reception equipment because the capacity to increase the power of the digital signal will be made available only then.[135]

The transition requires broadcasters to invest in new transition plants and that viewers buy reception equipment to decode the digital signal. The incentives for viewers to switch to digital television depends on the cost of this equipment and the availability of digital services with valuable content.

13. Methodology

This study applied a mixed method approach using a combination of qualitative and quantitative research designs. Data was gathered using self-administered questionnaires and semi-structured interviews. The population was the national television broadcasters of BTV and NBC. Snowball sampling was also used to identify subjects who in turn identified others in the population. Purposive sampling was used to identify key informants of the technical team of NBC and key informants of the engineering department of BTV who were in a better position to provide the required information. The data was collected during June and July of 2013. Quantitative data was analyzed using Microsoft EXCEL, while qualitative data was analyzed thematically using content analysis.

131 ICT Consultants. Summary report on the digital migration process. Gaborone. 2010.
132 Berger, G. *Challenges and Perspectives of Digital Migration for African Media*. Dakar: Danika Marquis. 2010.
133 Dreyer, A. *Namibia's progress with digital migration*. Windhoek: CTO. (n.d.)
134 Gaotlhobogwe, M. *Now Botswana goes for Japan-Brazil digital std*. Gaborone: The Monitor. 2013.
135 Adda J, Ottaviani M. *The transition to digital television 1-2*. 2004 Retrieved From http://papers.ssrn.com/sol3/papers.cfm?Abstract_id660649.

14. Findings

14.1 The status of the television broadcasters

Before 2015, the analogue terrestrial TV transmission stations that are registered with ITU will be protected but after 2015, there would be no protection for analogue TV transmission broadcasting. This implies that if Botswana does not implement digital migration, the country may suffer external interferences with the signal. Nonetheless, ICT Consultants advise that in order to receive digital television transmission/signals the consumer will need either to replace the analogue TV set with a set equipped with a digital tuner; or adapt the current analogue TV set by means of an external Set Top Box which will convert digital signal to analogue.[136]

The digital migration process is bound to bring a lot of benefits for Botswana and Namibia. The audience is said to enjoy brighter pictures, clearer sound with a wider variety of what they can watch. Digital migration could also benefit those that are unemployed since it creates job opportunities. The set top boxes will have radio stations on them, providing even more options for the audience. However, challenges faced by broadcasters differ from country to country. The main challenge is funding. Digital migration is a big project and it requires a lot of money for it to run smoothly. The challenges depend on the level of development of a given country. Thus, the findings show that Namibia faced more challenges than Botswana.

Different deadlines were set by different countries but the international deadline for all SADC countries is June 2015. It seems that most countries had to postpone their set target dates because things had not worked out as they had planned so the project was delayed a bit. Although things did not go as planned, the countries are determined to do what is possible to meet the deadline.

The findings also indicate that Namibia and Botswana are not using the same standard of migration for various reasons. Both broadcasters have their own strategies on how they run their project and the findings show they are each working at their own pace.

14.2 Broadcasting strategies used

Unlike some countries such as the Unites States of America, which rely on cable and satellite, Africa is very dependent on terrestrial broadcasting.[137] The results from this study revealed that NBC uses the European standard because it is flexible and the cost of equipment is relatively low. On the other hand, BTV opted for the Japanese standard because it is the most robust digital TV standard in operation in the world and it can also provide three modes of transmission from the same transmitter at the same time, i.e., fixed, mobile, and portable. It can therefore be argued that there is no particular strategy that is right or wrong. Each country chooses a standard that suits their needs.

14.3 Awareness of television viewers

The results show that the NBC audience was not informed about the 2015 deadline, while BTV was playing radio and TV advertisements to inform their viewers about the media developments. Nonetheless, both countries said that they had awareness campaigns in the pipeline.

136 ICT Consultants. Summary report on the digital migration process. Gaborone. 2010.

137 Southwood. R. (2011). *Snapshot of progress of analogue to digital migration in Africa: outcome of ATU survey*. Balancing act Africa

14.4 Challenges faced and steps taken to address them

Berger states that the end of analogue broadcasting and the production of the new equipment are likely to give rise to serious problems in Africa such as problems of maintaining infrastructures which remain analogue. This implies that the broadcasters will face challenges in acquiring the set top boxes that are required after the analogue signal is switched off. In addition, the move to digital broadcasting brings other challenges regarding regulation planning, pluralism of information, media development, access for all to new digital equipment, and increasing dependency beyond national borders in the sector. This is the case at BTV and NBC. This explains why the Chief Technical Officer of NBC stated that Namibia's switch from analogue to digital broadcasting brought a lot of challenges to the broadcasters. The findings indicate that NBC's greatest challenge is how to transform the broadcast into a digital multi-channel. There is still uncertainty on what the television channels will play.
Researchers such as Adda & Ottaviani (2004) argue that before the switchover, only part of the country's population can be reached with the digital signal. This explains why the chief technology officer of NBC stated that there were plans to implement the switching off of the signal phase region by region. In addition he said that those who are reached need to spend more to upgrade their reception equipment instead of switching off because the capacity to increase the power of the digital signal will be made available only then. The absence of policy causes uncertainties in the regulatory environment in Namibia. The findings show that NBC was lagging behind schedule due to funding shortage. Unavailability of skilled people in NBC and shortage of manpower pose a challenge in Namibia.

With respect to the audiovisual media resources (tapes, DVDs, DV Cam), some of the places visited did not seem to have appropriate equipment for controlling relative humidity and temperature. Although storage conditions at the Sound Radio Archives in Namibia appear to be satisfactory, one air conditioner for the whole storage place is inadequate. Moreover, the absence of equipment for controlling humidity, temperature, fire, and water damage means that the audiovisual materials are in danger. However, at the Botswana TV archives, the building seemed to meet standard requirements but the workers were not aware of the appropriate equipment required to control temperature, humidity, and environmental pollutants.

15. Conclusions

The main aim of this study was to explore the challenges faced by the NBC and BTV since it was most likely that they may face difficulties in switching from analogue to digital broadcasting. The study's aim to find out about the digital migration process has been achieved. It cannot be assumed that all the countries that are switching from analogue to digital will face the same digital migration process, although the benefits are similar. However, the study findings suggest that the challenges differ from country to country, as in the case of Botswana and Namibia.

The findings show that government plays a major role in the digital migration process because the government is responsible for the funding the project. It is up to the countries to see the strategies that best suit them; there are not specific guidelines that they need to follow. The findings also indicated that the two countries are doing their best to meet the deadlines.

16. Recommendations

The following recommendations are drawn from the above conclusions and they are directed to broadcasters who are in preparation for their digital migration process. It is recommended that:

1. Regulatory bodies create awareness for innovation.
2. The television broadcasters should educate themselves more on what is to be expected in order to address the challenges.
3. Broadcasters should produce quality local programmes that will allow the audience to enjoy the benefits of the new digital television innovation.
4. Broadcasters in Botswana and Namibia should concern themselves with the quality and the state of broadcast equipment.
5. The governments of the two countries, Botswana and Namibia should empower their citizens so that they can benefit from the benefits of digitization.
6. The governments of the two countries should ensure that the digital set top boxes are affordable and accessible for the audience.
7. BTV and NBC should work jointly and give each other tips and solutions on the digital migration process.
8. The two broadcasting corporations should improve the storage conditions for the AV materials in their custody. They should ensure that appropriate equipment for monitoring temperatures and relative humidly is provided.
9. The broadcasters need to ensure that the set top boxes are readily available for purchase for the digital migration before the switchover.
10. The viewers also play a role in the digital migration process so they should not be excluded in the digital migration process.
11. It is up to the countries to devise the strategies that best suit them; there are not specific guidelines that they need to follow.

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