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AN EXPLORATION OF THE BENEFITS OF MIGRATION TO DIGITAL BROADCASTING

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ABSTRACT: *The paper was an exploration of the various benefits derivable from the migration to digital broadcasting. Using the critical review approach, the paper argued that the migration to digital broadcasting comes with numerous benefits. The benefits as noted by Plum and others include an increase in the capacity of broadcast transmission networks by improving spectrum efficiency (i.e. more data can be transmitted per unit bandwidth), provision of better signal quality which increases robustness to interference and picture degradation, the support of HD services and interactivity, potential reduction in transmission network energy usage, the implementation of single frequency networks (SFNs) instead of the independent parallel networks which are common in analogue broadcasting, the take-up of digital TV is likely to boost sales of TV sets and digital video recorders. More so, digital TV could lead to positive upstream benefits in terms of increased time spent watching TV and greater demand for digital contents in a competitive multi-channel, multi-platform environment, DTT provides opportunities for terrestrial broadcasters to address the challenges posed by pay TV operators and the Internet. Based on these benefits, it was recommended that governments at all levels in various nations and other relevant agencies and organisations should intensify their awareness and compliance campaigns to properly enlighten the public and herald comp*

KEYWORDS: Digital Broadcasting, TV, HD, Digital Contents, Digital Video, SFNs,

INTRODUCTION

The broadcast media industry is currently undergoing a revolution. It is about the ongoing transition from analogue to digital broadcasting. Digitization is a technological innovation that is changing the scope of radio and television broadcasting. In line with the transition process, the International Telecommunication Union, ITU, in the Regional Radiocommunications Conference, RRC '06, held in 2006, set a deadline for a total switchover of all broadcast channels from analogue to digital. The body set June 17, 2015 for all UHF channels to have gone digital. It also set the digitization of all VHF channels for 2020 (Aihe 2008) cited in (Ihechu and Uche, 2012).

As earlier stated, digital migration came out of the Regional Radiocommunication Conference of 2006 (RRC06) and the subsequent Geneva 2006 Agreement (GE06) of the International Telecommunication Union (ITU) recommendation which states that all countries signatory to the agreement must migrate from analogue to digital broadcasting services. This process commonly referred to as Digital Migration involves converting the radio and television broadcast signals from analogue to digital technology. The process of migration to digital broadcasting technologies begins with the **'switch-on'** of digital broadcasting transmission signals and ends with the **'switch-off'** of the analogue ones. Until analogue switch-off occurs, there is a period of **'double illumination';** a period during which both analogue and digital

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broadcasting television services are simultaneously offered (Ministry of Information and Communications Technology, Uganda, 2011).

Digital broadcasting is the use of the digital technology in the transmission and reception of broadcasting services. The term 'digital' implies using digits or numbers in the representation of the information (again sound and pictures in broadcasting). The two technologies (analogue and digital) are essentially the same in terms of information acquisition in that both convert the acquired information (sound, pictures) into electrical signals. However, instead of using the electrical signal directly, the digital technology takes representative samples of the original signal and converts these samples to digits, into what becomes a digital representation of the information. This digital information is then used in the application at hand. Migration from analogue to digital broadcasting means the introduction of the digital broadcasting technology in the provision of broadcasting services and moving away from the use of the analogue broadcasting technology in broadcasting. This migration is driven by the benefits that are associated with the digital broadcasting technology, which have seen most countries, the world over, embarking on the process to move over to the digital broadcasting technology (BAZ, 2012).

Digital broadcasting technology is superior to the Analogue broadcasting technology with the latter slowly being phased out worldwide. The advent in digital technologies is facilitating increased convergence between the traditionally separate businesses of broadcasting, telecommunications and the internet. In contrast to analogue, digitalization has made it possible for different types of content (audio, video, text) to be stored in the same format and delivered through a wide variety of technologies (computers, mobile phones, televisions, etc). The global trend of migrating from analogue broadcasting technologies to digital broadcasting technologies will mean that both broadcasting and telecommunications infrastructures will be used to achieve country wide coverage for broadcasting services. The main purpose of the migration process is to ensure that all broadcasting services that are delivered through analogue network/technologies are fully replicated on the digital broadcasting network/technologies with the aim of switching off the analogue broadcasting services at a specific point in time (Ministry of Information and Communications Technology, Uganda, 2011).

A Discourse on the Benefits of Digital Broadcasting

Broadcasting moved to a new and higher level on June 16, 2006 when the representatives of 104 countries adopted and signed in Geneva, Switzerland, a treaty at an international conference organized by the International Telecommunications Union (ITU). The agreement was for a switchover of television from analogue to digital broadcasting. It also put in place a time table: start date for transition from analogue to digital television broadcasting was 17th June, 2006 while the deadline was 17th June, 2015 (Balarabe, 2013). This agreement was sequel to the numerous benefits derivable from such migrations.

Obviously, digital broadcasting has many advantages over the analogue. Programme presentation would be well improved by the time analogue is completely phased out. These are true in terms of clarity and quality of signals and spectrum efficiency. Since technology has opened a world of possibilities for broadcasting, a huge spectrum will be available for radio and television broadcast in the country. As a result, more frequencies or wavelengths will be available for television stations in the country. It will also afford the industry opportunities for interactive broadcasting as the television sets would now do much more than receive signals (Ocholi, 2009; Ihechu and Uche, 2012).

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Digital broadcasting carries many benefits over the analogue system. The digital revolution presents broadcasters and broadcasting with vast opportunities to do so many interesting and valuable things they have always wanted to do but constrained by technological, financial and other resources. Among the dividends of broadcasting digitization are the efficient use of available spectrum which will allow more channels to be carried across fewer airwaves, thus bringing more choice to the viewer. Digitization permits the broadcasting of four to six more television channels from only one in the current analogue system. This means that a substantial part of the broadcast spectrum will be freed up for other uses. Higher quality audio (sound) and video (images), including the possible deployment of High Definition Television (HDTV). Digital television signals can carry extra information such as electronic programme guides that can provide additional programme and schedule information, interactive programming (two-way data exchanges) and mobile reception of video, internet and multimedia data (Balaraba, 2013).

In fact digital television signals in particular are clearer and stronger in their audio and video output. It is worthy of note that television sets would perform the tasks of computers and telephone handsets, under digital technology. This implies that, TV sets would be able to provide access to the internet. It would also be able to store data from received audio and visual signals. In essence, the ephemeral nature of the broadcast media would have been reduced, if not eradicated. The broadcast media would begin to have catalogue value. On the side of broadcasters, digital broadcasting equipment will enable the simultaneous transmission of a minimum of four programmes and four channels from the same station that used to transmit only one programme or channel in the analogue transmission. Moreover, digital television offers variety of added services such as multimedia, banking, home shopping and faster rates of data transmission (casting) (Ocholi, 2009; Ihechu and Uche, 2012).

Digital broadcasting delivers an attractive, low cost multi-channel service offering to a wide audience. In many countries it is or will be the primary means of distributing broadcast video content and it can be developed as part of a multi-platform digital broadcasting strategy. Through the use of interactive standards, digital broadcasting enhances broadcasting functionality and enables interactive features for viewers. Interactivity provides access to data and other services that utilise the digital transmission capability of the DTT multiplex. In this one way mode it can be used for a variety of data distribution services. Where a return path is available via a fixed or mobile broadband connection a richer set of interactive services can potentially be provided. DTT allows introduction of High Definition and full-High Definition services. In future, if there is adequate bandwidth available it may also support the introduction of ultra-High Definition services (Plum, 2014).

Since the information is in digit format, the information can be processed using computers, and be conveyed using digital transmission techniques. Digital information does not degrade easily and where it becomes degraded, particularly during transmission, it can be corrected and be restored to its original state. This enables the original quality of the information to be restored or maintained at the receiving end. The digital technology also introduces the concept of signal compression whereby only the amount of information necessary to reproduce the original signal at the receiver is transmitted. This concept, in digital broadcasting, enables a lot more programmes to be transmitted simultaneously on a single frequency using the same transmitter. The analogue technology could transmit only one programme on a single frequency, on the one transmitter. A separate frequency and transmitter would be required for any additional analogue services (BAZ, 2012).

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Another technical benefit of DTT is the better signal quality which increases rejection of noise and interference. Interference with digital transmissions does not create the same type of visual distortion often experienced by analogue transmission (e.g. ghosting). However, once DTT signals drop below a defined power level the receiver will not decode the signal. This can lead to a reduction of the service area. More so, Digital broadcasting standards increase the capacity of transmission networks by improving spectrum efficiency (i.e. more data can be transmitted per unit bandwidth). In an equivalent frequency channel used for one analogue TV service, DTT typically allows between 4 and 18 services to be accommodated. Replacing the analogue terrestrial transmission network with a DTT network often results in a reduction in energy usage. Overall power savings will depend on network configuration and possible requirement to build new transmission or re-broadcast sites to fill-in coverage gaps. The increasing obsolescence of analogue broadcast equipment will lead to rising maintenance and support costs for analogue broadcasting. By migrating to DTT broadcasters also benefit from lower maintenance costs of digital systems and better support from vendors, further contributing to reduction of operational costs (Plum, 2014).

According to the Uganda's Ministry of Information and Communications Technology (2011) migration to digital broadcasting will bring with it many benefits including and not limited to:

a) Efficient use of the frequency spectrum, a public and scarce resource;

b) More channels and, therefore, more diverse content delivered to the public;

c) Better picture quality; and,

d) Potential for special interactive services to cater for people with visual and hearing impairments such as audio description and subtitling, and e-government delivery.

Digital technology supports picture resolutions much higher than those of its analogue counterpart. This, coupled with what is called progressive scanning, results in much better picture definition and, therefore, picture quality. High Definition and Three Dimension Television (3D TV) are supported by this platform. Work has already started on standardizing even higher picture definition formats (Ultra High Definition) such as 4K and 8K, which provide even better picture resolution through the digital platform. Excellent sound quality, surround sound and the use of multiple languages on a programme are all possible features of the digital broadcasting technology. The service capacity generated by the digital broadcasting technology creates an opportunity for new broadcasting business models to be realized. Whereas the analogue broadcasting technology was mainly associated with free-to-air broadcasting services, the capacity generated by the digital technology allows for the packaging of services (channels) which can be accessed on a subscription basis. A subscription based service is a reality with the terrestrial digital technology, in the same way that such services have, hitherto, been provided via satellite transmission (BAZ, 2012).

CONCLUSION

Based on the discourse above, it is therefore appropriate to assert that digital broadcasting is will enhance the gratifications currently provided by analogue broadcasting. As already noted, digital broadcasting among others provides enhanced the quality of audio and visual signals, increased the number of channels as well as effective utilization of available spectrum.

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RECOMMENDATIONS

In line with the revelations of made, it is recommended that governments and other relevant agencies and organisations should intensify their awareness and compliance campaigns to properly enlighten the public and herald compliance.

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