ASSESSMENT OF DIGITAL MIGRATION SWITCH-OVER PREPAREDNESS AMONG SELECT BROADCAST STATIONS IN BENIN CITY

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ABSTRACT
The researchers assessed the digital migration switch-over preparedness among select broadcast stations in Benin City. The rationale of the study was to ascertain the state of digital switch-over programme among broadcast stations in Benin City and how prepared select broadcast stations are in the switch over policy. Anchored on the Technological Determinism Theory, the researcher employed the survey research method and questionnaire as data collection instrument. The population of the study covers broadcasters from select broadcast stations in Benin City and the purposive sampling technique was used in administering 186 copies of questionnaire on the sample size that was arrived at using Roger Wimmer sample size determiner. Findings of the study revealed, among others, were that the level of preparedness and extent of adoption of DMSO was low and there are factors militating the full migration to digital broadcasting. The researchers recommended, among others, that broadcasting stations, especially smaller ones, would benefit from financial support or incentives provided by regulatory authorities or industry associations to aid in the acquisition of digital broadcasting equipment and infrastructure upgrades.

Introduction

The global shift towards digital technologies has significantly impacted the broadcasting industry, leading to the transition from analogue to digital broadcasting. This transformation, commonly referred to as digital migration switch-over (DMSO) or digital switch-over (DSO), has brought about numerous changes and challenges for broadcast media and broadcasters.

The notion of DSMO was birthed at the International Telecommunications Union's (ITU) Regional Radio-communication Conference (RRC-06) in Geneva, Switzerland in June 2006, when nations around the world agreed to a treaty to migrate from analogue to digital

broadcasting on or before 17th June, 2015 (Olagoke, 2015; Olalere, Oyeyinka, Lateef, Olakunle, Kenneth, Rauf and Nancy, 2013; Berger, 2012). As explained by Akinreti, Ojo, Odegbenle, Owolabi et al. (2013, p.90) the clarion call for the transition to digital broadcasting by the ITU is hinged on the following objectives:

> *The International Telecommunication Union, in its agreement, stated that the transition from analogue to digital broadcasting is set to improve coverage of digital television transmission, ensure that the bandwidths are available for wireless broadcasting services, enhance sound and picture, in particular, High-Definition Television (HDTV), enable more channels (additional content) and give unfettered access to digital radio transmission.*

The ITU's project of digitizing broadcast media globally is to revamp and proffer solutions to the lapses of analogue broadcasting which include defects in sound and picture quality, limited channels and no internet access. Berger (2012) explains that 30 of Africa's 54 states are actually given up till 2020 in the same treaty – that is, nearly two-thirds of the continent. Though Nigeria is part of thirty African countries given an extra five-year grace period to migrate to digital broadcasting (Olalere et al, 2013), the country commenced her digitisation process as early as 2007 by setting 17th June, 2012 as deadline for a complete switch-over of all broadcast channels from analogue to digital (Ihechu & Uche, 2012). Therefore, on 22nd December, 2016, Nigeria made a huge leap in her digital migration process following the launch of the Abuja phase of the Digital Switch-over (DSO) by the then President Muhammadu Buhari, signalling the commencement of the full roll-out of digital broadcasting across country (Onyianyi & Okwumba, 2019).

From inception, television broadcasting in Nigeria has been accomplished by analogue transmission which uses complete waves to transmit pictures and sound. Over the years, the transmission process has improved incrementally. It moved from monochrome (black and white) to colour transmission, and recently it has begun the transition into the digital format (Omale, Ekhaerafo, & Essien, 2016). Digital broadcasting is superior to the analogue format because of some advantages such as improved signal quality, versatility, efficiency and interoperability with other electronic media. Ihechu & Uche (2012) notes that digital signals have as an additional advantage, the capability of generating no noise and are more resistant to signal interference This new technology allows audio, video and data to be transmitted over airwaves like a computer. Due to the dynamic nature of technology and the fact that the analogue system currently in use may be unable to support future developments in the industry, there is a dire need to make this change so that the country can keep up with other nations and meet the demands of the age (Adeyeye & Nwaoboli, 2023).

Although, the transition from analogue to digital broadcasting offers potential benefits such as improved signal quality, efficient spectrum utilization, enhanced interactivity, and the possibility of delivering diverse multimedia content. However, this transition is not without challenges, including infrastructure upgrades, equipment costs, regulatory compliance, and audience adaptation (Ihechu & Uche, 2012). Therefore, the motivation behind this study stems from the need to understand the current state of digital migration among select broadcast stations in Benin City.

Statement of the Problem

In a country that intends to phase out analogue transmission and attain full digital switchover in broadcast stations of thirty-six states in less than two years, it is instructive to provide empirical evidence and contribute to the ongoing conversation on the broadcast stations' awareness of, and readiness for, digital migration process. Existing studies in Nigeria that investigated the state of preparedness and awareness of broadcast media professionals to the digitization of broadcasting observed that broadcasters were aware of digital migration and willing to broadcast digitally but they lacked the financial prowess to acquire the new digital technologies (Alalibo, 2009; Okon & Eleba, 2013; Alalibo, 2017; Obot & Inwang, 2017). However, without robust empirical evidence as to the situation among broadcast stations and broadcasters in Benin City, which is the host of one of first private broadcast stations in Nigeria (the Independent television and radio), the existing findings may be deficient in representing the situation in Nigeria. In other words, it is imperative to understand the perspectives held by broadcasters in select broadcast stations from

Benin regarding the implications of digital switch-over. It is, therefore, essential to fill this knowledge gap by focusing on Benin City, Edo State, in our attempt to establish the extent to which broadcast stations from the zone are aware of, and prepared for, and challenges militating against the digitization of broadcasting in Nigeria.

Research Objectives

The objectives of the study were to:

1. Find out the level of preparedness of select broadcast stations in Benin City for the digital migration switch-over.
2. Determine the extent to which select broadcast stations in Benin City have adopted digital technologies in their broadcast operations.
3. Ascertain the challenges faced by these broadcast stations in the digital migration and/or full digital switchover.

Theoretical Framework

Technological Determinism theory

This study is anchored on the technological determinism theory. Technological determinism is a theory that suggests that technological developments drive and shape the course of societal change, often having profound effects on various aspects of human life, including culture, communication, and economy (Asemah, Nwammuo & Nkwam-Uwaoma, 2022). Within the context of media, technological determinism theory examines how technological advancements influence the evolution of media forms, content, and their impact on society (Arijeniwa, Nwaoboli, Ajimokunola & Uwuoruya, 2022). The theory proposes that each technological innovation comes with its own inherent qualities, capabilities, and limitations, which can influence how it is used and its effects on society and considers how changes in media technology, such as the printing press, telegraph, radio, television, and the internet, have transformed how information is communicated, distributed, and consumed (Asemah et al., 2022). The theory argues further that significant technological shifts can lead to societal transformation, altering social norms, cultural practices, and economic structures and highlights that the adoption of new media technologies can have unintended consequences, both positive and negative, on various aspects of society (Arijeniwa et al., 2022). This means that media technologies can influence perceptions of reality and shape how people understand and interpret the world.

Given the overall objectives of this study, employing the technological determinism theory as the framework is relevant. This is because the Technological Determinism Theory provides an vantage standpoint in understanding how digital switch-over, as new media technology would shape the thinking, feelings, and operations of the broadcast stations and broadcasters as Nigeria moves from analogue broadcasting to digital broadcasting.

Conceptual/Literature Review

Digital Migration Switch-Over and Digital Broadcasting

Digital migration in broadcasting refers to the process of transitioning from analogue to digital transmission technologies and standards for the delivery of audio and video content over the airwaves. According to Hart (2010), digital migration switch-over in broadcasting refers to the process of transitioning from analogue to digital broadcasting technologies, involving the upgrading of broadcasting infrastructure, transmission systems, and content delivery mechanisms. This definition emphasises the comprehensive nature of the switch-over process, encompassing technological advancements in both hardware and software components of broadcasting systems. It involves replacing traditional analogue broadcasting methods with modern digital technologies. The switch aims to improve the efficiency, quality, and diversity of broadcasting services.

However, Orlu-Orlu (2017) opined that digital means the application of digits or numbers in the representation of information. In this regard, digital broadcasting is a means of ensuring capacity in broadcast transmission networks by improving spectrum efficiency (Plum, 2014). By implication, digital broadcast content is considered superior in quality compared to analogue broadcast. In addition, digital broadcasting offers multiple programme options, and minimised energy usage among others, thus creating an unavoidable avenue for a shift of attention from analogue to digital.

Some requisite equipment needed to foster digital broadcast operations is a studio mixing board, microphones, headphones, digital cameras, broadcast media server for television automation, capture cards for ingesting live material, scheduler, hardware encoder, studio transmitter link, streaming receiver, digital TV transmitter, digital mixer, digital monitors, virtual studio equipment, satellite technology, capture card, streaming digital receiver (Inaba & Kolia, 2016).

In addition, digital television offers interference-free, quality sound and multiplexing of up to 6 channels under one bandwidth. Okhakhu (2015) cited in Benike (2022) on his part described digitalisation as the cutting-edge technology that enables the broadcast industry to do away with the obsolete method of transmission. He further noted that digitalisation is about making broadcast transmission to be digitally compliant; by implication, television means nothing but quality of broadcast transmission that requires improvement. This is in agreement with the position of Jayson (2014) that digital transmission (also called digital switch-over or analogue-switch off) which analogue television is converted to and replaced by digital television. Therefore, digital migration switch-over in broadcasting represents the strategic overhaul of broadcasting infrastructures, involving the transition from analogue to digital technologies for content delivery, transmission, and reception.

Challenges to Digital Broadcasting in Nigeria

Digital broadcasting has fundamentally transformed the landscape of content production, transmission, and consumption, introducing both exciting prospects and significant challenges. One of the primary challenges lies in technological infrastructure and associated costs. Upgrading existing broadcasting systems to support digital transmission necessitates substantial financial investment. This includes acquiring new equipment, establishing digital transmitters, and ensuring widespread signal coverage. For smaller broadcasters or those with limited financial resources, making this transition can be particularly daunting, potentially leaving them at a disadvantage in an increasingly competitive market (Omale et al., 2016).

Another critical challenge is the audience's transition from analogue to digital broadcasting. This shift requires viewers to adapt to new technologies, such as acquiring digital television sets or set-top boxes. In regions with lower technological penetration or limited consumer affordability, this can pose a significant barrier. Consequently, the audience may experience a lag in the adoption of digital broadcasting, which could impact viewership and engagement levels (Hassan, 2015).

Spectrum scarcity further complicates the digital broadcasting landscape. As digital broadcasting relies on efficient spectrum allocation and management, the limited availability of broadcast frequencies can lead to heightened competition among various stakeholders (Ayeni and Nwaoboli, 2023). This scarcity not only affects broadcasters but also raises concerns about the equitable distribution of spectrum resources, which is essential for the successful implementation of digital services.

While digital broadcasting offers the potential for high-definition and interactive content, the challenges of content creation and quality cannot be overlooked. Producing high-quality digital content often demands higher production costs and specialized technical expertise. Smaller broadcasters, in particular, may struggle to maintain the required level of quality and diversity in their programming, which can hinder their ability to compete with larger, more resource-rich organizations.

Additionally, the regulatory and policy frameworks surrounding digital broadcasting play a crucial role in facilitating a smooth transition. Effective regulations and policies are essential for guiding the shift to digital broadcasting; however, inadequate regulatory frameworks or delays in policy formulation can create significant uncertainties for stakeholders. Such uncertainties may impede progress and deter investment in digital broadcasting initiatives, ultimately affecting the sector's overall growth (Dyikuk & Chinda, 2017).

Lastly, interoperability and standardization present another layer of complexity in the digital broadcasting ecosystem. Ensuring compatibility between different digital broadcasting technologies and standards can be a challenging task (Nwaoboli, 20223). The lack of standardization may lead to fragmentation within the industry, complicating the efforts of broadcasters and manufacturers to provide

seamless and user-friendly services. Addressing these challenges is vital for realizing the full potential of digital broadcasting and ensuring that it serves the diverse needs of audiences and stakeholders alike.

Prospects of Digital Broadcasting in Nigeria

Digital broadcasting presents numerous prospects that can significantly enhance the media landscape. One of the most notable advantages is the improved signal quality and efficient spectrum usage. Digital broadcasting offers superior audio and video quality compared to analogue, which enhances the overall viewing experience for audiences (Okhakhu, 2015 cited in Benike, 2022). Additionally, digital broadcasting utilizes spectrum more efficiently than its analogue counterpart, allowing for more channels to be accommodated within the same frequency bandwidth. This efficient spectrum use not only reduces energy consumption but also leads to potential cost savings, contributing to the sustainability of broadcasting operations.

Another significant prospect of digital broadcasting is the enhancement of interactive content. Digital platforms enable features such as program guides, digital text, and multimedia services, which provide viewers with more engaging and personalized experiences (Adaramola, 2017; Kawu, 2017). This interactivity fosters a deeper connection between broadcasters and their audiences, allowing for a more tailored viewing experience that can adapt to individual preferences.

Moreover, digital broadcasting facilitates multi-channel and multicast services, allowing for the transmission of multiple channels within a single frequency. This capability enables broadcasters to offer diverse content options and niche programming, catering to a wider range of audience interests (Benike, 2022). Beyond traditional broadcasting, digital platforms can also support data services, including emergency alerts, weather updates, and educational content, thereby enhancing the value of the broadcasting service.

The convergence of digital broadcasting with internet technologies is another promising prospect. This integration allows for hybrid models that combine linear broadcasting with on-demand and interactive features, creating a more versatile media consumption experience (Plum, 2014). Such convergence not only broadens the scope of content delivery but also aligns with the evolving preferences of modern audiences who increasingly seek flexibility in how they consume media.

Finally, digital broadcasting opens up opportunities for new revenue streams. It enables targeted advertising, pay-per-view services, and value-added content offerings, which can significantly enhance the financial viability of broadcasting operations (Dyikuk & Chinda, 2017; Aginam, 2017). By leveraging data analytics and audience insights, broadcasters can create more effective advertising strategies and develop content that resonates with specific viewer demographics, ultimately driving revenue growth.

Overall, the transition to digital broadcasting presents both challenges and prospects for the industry. While overcoming technological, regulatory, and financial hurdles is essential, the benefits of improved quality, interactivity, and efficiency make digital broadcasting a promising avenue for the future of media delivery. Effective policy frameworks, collaboration among stakeholders, and strategic investments can help maximize the prospects while mitigating the challenges of digital broadcasting

Empirical Review

Obot & Inwang (2017) investigated the awareness of and preparedness for digital broadcasting among communication practitioners and educators in Uyo, Akwa Ibom State. Anchored on the Diffusion of Innovation and the Technological Determinism theories, the survey method was adopted for this study. The research instrument (questionnaire) was administered directly to the respondents by the researchers. Based on the findings of the study, it was found that communication educators in Uyo are aware of the digitization process in the broadcast industry and are already teaching the subject of digitization in tertiary institutions in Uyo, Nigeria. The researchers recommended that there is a need to carry out timely information and communication activities for the communication practitioners and educators, and even to the general public to raise awareness and understanding of digital broadcasting.

Akinola-Badmus & Ojebuyi (2021) examined broadcast journalists' perception of challenges

and benefits of digitization of broadcasting in Oyo State, Nigeria. Driven by the Technological Determinism and Diffusion of Innovation theories as the framework, the study employed survey and in-depth interviews as the research methods to examine broadcast journalists' levels of awareness, readiness for, and perception of, the challenges and benefits of digital switchover.

Findings showed that most broadcasters were aware of the digital switchover. However, majority of the broadcasters confirmed that they were not adequately prepared for digital transition. Further findings confirmed that, apart from skills, costs of content creation and procurement of digital technologies required by digital broadcast were the major impediments to digital switchover while they identified job creation, more revenue generation, richer contents, stronger bandwidths, and enhanced patronage as the benefits of digital broadcast. The researchers concluded that relevant government agencies in charge of digital switchover in Nigeria should, through training and equipment procurement, motivate and empower broadcasters and broadcast stations to prepare them for a successful digital switchover.

Oyedokun, Molindo & Ajayi (2022) examined the progress, challenges, and benefits of the analogue-digital switchover in the Nigerian broadcast industry. The technological determinism theory serves as the theoretical backbone upon which this study is anchored. The study employed the library research approach. Findings revealed that digital television provides crisper pictures and sound, the signals are less prone to distortion and the audience will be provided with numerous channels to choose from. Furthermore, it was found that the digitisation process is faced with some challenges such as inadequate funding, scarcity of qualified manpower, inadequate power supply, citizens' unawareness, and inadequate digital equipment. The researchers concluded that until these issues and other relevant issues are solved, a successful analogue to digital migration may be unachievable on time in Nigeria. The researchers, therefore, then recommended that government should provide enough financial resources to fund the switchover. Also, the concerned agencies should embark on rigorous publicity as many Nigerians are still not aware of the initiative.

Benike (2022) investigates migration from analogue to digital broadcasting in selected government and private media stations in Delta State. The objectives include examination of availability of digital equipment, the patterns of equipment use, and the investigation of the impact of digital broadcast equipment in government and private media stations. The study was anchored on the technological determinism theory and used a cross-sectional research design on a sample of 186. The study found that digital equipment are available in both private and government owned stations but are employed more by private TV stations and that the marked disparity gives private stations greater impact. The researcher, therefore, recommended that government should encourage the training of media personnel to enable them to handle digital equipment to ensure better service to consumers.

Methodology

The study adopted Cross-sectional research design. This design aids the collection of data through survey approach. It allows a researcher to make inferences about a population under investigation (universe) at one point in time while trying to measure their perception of the subject-matter (Asemah, Gujbawu, Ekhareafo & Okpanachi, 2017). The population of the study is three hundred and sixty (360) constituting all the broadcast staff of ITV-Radio, EBS (radio and TV), NTA, Silverbird TV, Channels TV, Bronze 101.5FM, Rhythm 93.7FM and KU 92.7F.M all in Benin-City. The category of staff comprised technical and non-technical staff such as engineers, technologies, cameramen as technical and reporters, and presenters as non-technical staff. The purposive sampling technique was used for this study. One hundred and eighty-six (186) respondents were drawn from the select broadcast stations as the sample size using RogerWimmer sample size determiner and purposive sampling technique was used in administering copies of questionnaire on the respondents. According to Oguonu & Anugwom (2014), the purposive sampling technique allows the investigator to select members to be included using his individual judgment as regards their suitability to the research. A structured questionnaire was used to generate data for the study and the data obtained were analysed using descriptive statistics of mean and frequency count.

Data Presentation and Analysis

Table 1: Level of preparedness of select broadcast stations in Benin City for the digital migration switch-over

Variables	Frequency	Percentage
Fully prepared	33	17.7
Moderate prepared	68	36.6
Not Prepared	85	45.7
Total	**186**	**100**

Data presented above shows that majority of the respondents are of the view that the broadcast stations in Benin are not prepared for the DMSO.

Table 2: Extent to which select broadcast stations in Benin City have adopted digital technologies in their broadcast operations

Variables	Frequency	Percentage
High extent	21	11.3
Moderate extent	56	30.1
Low extent	109	58.6
Total	**186**	**100**

Data from table 2 shows that the extent of adoption of digital technologies in broadcasting among select broadcast stations in Benin City is very low.

Table 3: Challenges of DMSO among Broadcast Stations in Benin City

Variables	SA	A	N	D	SD
Insufficient budget for equipment upgrades and technology adoption.	97 (52.2%)	78 (41.9%)	11 (5.9%)	-	-
Difficulties in sourcing and procuring digital broadcasting equipment.	103 (55.4%)	83 (44.6%)	-	-	-
Technical compatibility issues between existing infrastructure and new digital technologies.	71 (38.2%)	93 (50%)	22 (11.8%)	-	-
Challenges in optimizing signal quality and coverage for digital transmission.	83 (44.6%)	98 (52.6%)	5 (2.7%)	-	-
Lack of expertise and training for technical staff in managing digital broadcasting systems.	61 (32.8%)	82 (44.1%)	43 (23.1%)	-	-

From table 3 above, it can be seen that there are challenges militating against the adoption of full DMSO among broadcast stations in Benin City.

Discussion of Findings

Findings revealed that majority of the broadcasters in Benin, which constitute the respondents in the study are of the view that most broadcast stations in Benin are not fully prepared for the digital migration switch-over. This is seen in the response rate of 45.7% that answered to that effect. The reason for their inability could be linked to the fact that most of the broadcast stations in Benin are local stations that are not with enormous economic power nor do they serve a broader audience. However, some of the respondents are of the view that there are stations in Benin City that are fully prepared for the DMSO. This finding is in tandem

with the studies of Obot & Inwang (2017) and Akinola-Badmus & Ojebuyi (2021) where they found that majority of the broadcasters confirmed that they were not adequately prepared for digital transition.

In ascertaining the extent of digital technologies in broadcasting, it was found that majority of the broadcasters are of the view that the broadcast stations in Benin have been able to adopt digitalisation in their broadcasting to a moderate extent, as seen in a response rate of 58.6% in table 2. This shows that although their level of preparedness is not significant, the stations have embraced digitalised broadcasting. This is in tandem with the thrust of the technological determinism theory that as information and communication technology evolves, the communication patterns in the society reflect such technological advancements. This also mirrors the finding of Benike (2022) which found that digital equipment are available in both private and government owned broadcast stations.

The findings reveal that while significant strides have been made in upgrading broadcasting infrastructure and adopting digital technologies, there are persistent challenges that need to be addressed to ensure a successful and seamless transition. The switch-over process has brought about improvements in signal quality, content diversity, and interactive features, which have enhanced the overall broadcasting experience. However, it is evident that certain factors, such as financial constraints, regulatory complexities, and audience education, continue to pose obstacles to the full realization of the benefits of digital migration. This supports the study of Oyedokun, Molindo & Ajayi (2022) that digital broadcast is impinged by myriads of challenges and issues.

Conclusion and Recommendations

Based on the findings, it is concluded that the level of preparedness and extent of adoption of digital migration switch-over among select broadcast stations in Benin City is low, hindered by challenges such as insufficient budget, equipment procurement difficulties, technical compatibility issues, signal quality challenges, and lack of expertise, highlighting the need for urgent attention and support.

1. Broadcast stations should implement a phased digital migration plan, prioritizing equipment upgrades and training for technical staff to enhance preparedness and adoption of digital technologies.

2. Broadcast regulatory bodies should collaborate with broadcasters to establish a clear and updated regulatory framework that addresses technical standards, spectrum allocation, licensing procedures, and compliance requirements for a smooth digital migration process.

3. Training programs and workshops should be organised for broadcasting personnel to enhance their technical skills and knowledge in managing digital broadcasting technologies, signal encoding, and content delivery.

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