

Analysis of Advantages and Discussion on Development of Network Digital Broadcasting and Television Technology (Postprint)

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Abstract

In the field of radio and television broadcasting, digital technology has been gradually promoted with continuous technological breakthroughs. Due to the advantages of digital broadcasting technology, it has gained widespread application, and the broadcasting industry has also shown new development trends. Relying on high-end digital technology and with the Internet as its foundation, the broadcasting industry is advancing towards a more modern and sophisticated direction. Based on relevant materials, the author takes the development and evolution of digital broadcasting technology as the entry point for analysis and discussion, and briefly discusses its development prospects.

Full Text

Advantage Analysis and Development Prospects of Network Digital Broadcasting Television Technology

Abstract: With continuous technological breakthroughs in the broadcasting and television industry, digital technology has gradually gained widespread promotion during its development. Due to its inherent advantages, digital broadcasting technology has found extensive application, giving rise to new development trends in the broadcasting sector. Relying on advanced digital technology and built upon the foundation of the Internet, the broadcasting industry is advancing toward greater modernization and sophistication. Based on relevant materials, this paper takes the development and evolution of digital broadcasting technology as its starting point for analysis and discussion, while offering insights into its future prospects.

Keywords: network digital technology; broadcasting television technology; advantage analysis; development

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We live in an era of development, technology, and information. Continuous technological breakthroughs have transformed production methods and lifestyles. Digital technology has matured considerably and, due to its numerous advantages, has been widely applied across various fields, including the broadcasting and television industry. To adapt to today's fast-paced development, the operational efficiency of the broadcasting industry must be enhanced. The emergence of network digital technology has made departmental work more efficient, leveraging automation and other techniques to fundamentally transform work modes and methods, replacing traditional approaches with faster, more efficient, and higher-quality models. Furthermore, network digital technology demonstrates absolute advantages in information dissemination, integration, and coverage, which holds significant importance for the development of broadcasting and television.

1. Development Status and History of Network Digital Broadcasting Television Technology

1.1 Development Status

The popularization of digital technology has led to the rapid expansion of Internet television, posing substantial challenges to traditional broadcasting. Examining the current state of broadcasting development, the industry has begun promoting 4K high-definition modes. However, as early as the beginning of 2000, digital transmission was severely limited by technological constraints, with extremely limited coverage. It was not until around 2010 that high-definition digital television gradually gained promotion. Today, the promotion of 4K high-definition mode makes us aware of digital technology's progress and its crucial role in driving the development of the broadcasting industry. Currently, relevant authorities have begun establishing institutional systems to promote standardized and regulated development of the broadcasting industry, combining network information with television media for integrated development and deep integration to build a unified standard system [1].

1.2 Development History

In the initial stages of television broadcasting development, technology was extremely limited, particularly in information transmission and conversion, which remained at a relatively low level. Programs were broadcast using time-axis sampling patterns for signal simulation to complete image and audio transmission. Due to these technological limitations, video images and audio transmission

were susceptible to external interference, resulting in low transmission quality and issues such as image instability, noise, and color distortion, which compromised overall broadcasting effectiveness. However, with the promotion of digital technology and its application in the broadcasting industry, the system now directly employs digital signals instead of traditional analog signals, significantly improving signal stability. The physical quantities representing information manifest the characteristics of digital signals in the form of data sets, with the most prominent feature being their discrete nature, marking the formal arrival of the network digital era [2].

2. Characteristics of Network Digital Broadcasting Television Technology

Broadcasting television technology is a comprehensive field involving extensive technical domains, including electronic technology, acoustics, optics, and computer technology. Supported by the integrated application of these multiple technologies, broadcasting television, through its unique dissemination methods, maintains a broad audience base. First, broadcasting television transmits information to viewers through images accompanied by audio narration on television screens. This approach is not only rich in content but also vivid and realistic, making it a popular medium among audiences [3]. Its most distinctive feature compared to other media is that it is not constrained by age or education level. Second, it enables timely dissemination. As audiences increasingly demand information timeliness, network digital broadcasting television technology has achieved real-time information transmission, allowing audiences to gain authentic and complete understanding of information immediately, particularly through live broadcasting, which highlights the timeliness of broadcasting television. Additionally, it offers broad dissemination coverage. Due to the extensive coverage of television signals, messages can spread far and wide once broadcast. Moreover, audiences enjoy greater freedom in control and selection. Unlike traditional broadcasting's one-way transmission where the initiative rested with television stations, network digital technology has substantially changed this situation, better satisfying audience demands [4].

3. Advantage Analysis of Network Digital Broadcasting Television Technology

3.1 Stable Transmission Signals and Convenient Remote Editing

The application of network digital technology employs digital signal systems rather than traditional analog technology, making signal transmission more stable and of higher quality than conventional modes. Furthermore, since the technology relies on the Internet platform, relevant images and audio can be uploaded directly and transmitted and edited through relevant nodes, greatly improving transmission efficiency. Additionally, audio-visual production can be conducted directly within the network, avoiding many cumbersome work

procedures, ensuring data timeliness, and enhancing work efficiency [5].

3.2 Resource Sharing and Efficiency Improvement

As previously mentioned, digital technology is built upon computer technology, and network digital technology is founded on the Internet. This determines that relevant materials can be transmitted through network systems, establishing a resource-sharing platform for uploading, transmitting, editing, and downloading data. This allows various departments to select material information according to their needs, fully utilizing resources to achieve sharing. Moreover, television broadcasting production can leverage digital technology for spatial arrangement, expanding information coverage and transmission areas, thereby substantially improving work efficiency.

3.3 Television Picture Quality Guarantee

The application of digital technology in broadcasting television creates a secure and stable environment for data information transmission, enhancing data transmission quality. Utilizing two-dimensional filtering technology to protect transmission can significantly improve picture quality, reduce interference during transmission, and ultimately ensure broadcasting quality.

4. Development Prospects of Broadcasting Television Technology in the Digital Era

4.1 Organic Integration of Internet IP Technology and Broadcasting Television Systems

From the current digital perspective, the development prospects of broadcasting television technology are clear. To further advance television broadcasting technology, network optimization and technological breakthroughs are necessary, particularly in developing IP technology. This provides an opportunity to connect the Internet with broadcasting television, creating a systematic platform for integrated resource consolidation to promote further development. Moreover, from an economic standpoint, current network transmission relies on fiber optic backbone networks. Integrating these with broadcasting television could substantially reduce costs. Therefore, the organic integration of IP technology, Internet technology, and broadcasting television represents an inevitable industry development direction.

4.2 Marketization and Resolution of Information Source Issues

As previously described, integrating IP technology and Internet technology with broadcasting television is an inevitable development direction. The broadcasting television industry is not an isolated sector but exists within societal development and the market. Against the backdrop of deepening digital network technology, related departments can be introduced into market competition.

Therefore, we can integrate the television broadcasting industry, dividing its business into different segments such as value-added services and extended services. By distinguishing different markets, functions, and objectives, segmenting business into different plates can make operations more targeted, enabling television broadcasting to more closely grasp market dynamics and audience needs, thereby using market mechanisms to orderly regulate the broadcasting television industry and promote its development.

4.3 Enhanced Audience Interaction and Introduction of Feedback Mechanisms

In broadcasting television development, the related customer market will be further expanded to better meet audience needs and align with current social culture. In future development, interaction between television broadcasting and audiences can be increased by introducing feedback mechanisms into broadcasting. Feedback links can be embedded in relevant software, allowing the public to voice their opinions and provide feedback to relevant departments. Introducing feedback mechanisms can make broadcasting television more targeted, enabling comprehensive understanding of different age groups and industry sectors. With relevant technical support, a more systematic and three-dimensional feedback mechanism can be established, ultimately improving program quality and promoting industry development.

5. Conclusion

The application of network digital broadcasting television technology has brought substantial development to the entire broadcasting industry, not only making signals more stable and pictures higher quality but also achieving resource sharing to some extent. In future development, deepening digital network technology, introducing feedback mechanisms into broadcasting, and organically integrating IP technology, Internet technology, and broadcasting television represent the inevitable direction of industry development. Due to cognitive limitations, this analysis of network digital broadcasting television technology remains limited, requiring further in-depth research and development by more experts and scholars.

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Note: Figure translations are in progress. See original paper for figures.

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