On the Application of Micro-probe Network Technology in Converged Media Broadcasting Engineering Technology - Postprint

Authors: Yin Qingdong, Chen Tianlin

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Abstract

The vigorous development of new media has brought severe impacts on traditional broadcasting media, manifested through diversified information dissemination channels and accelerated transmission speeds that have substantially enriched media information. To promote stable development of the media industry, actively driving the integrated development of traditional and new media represents an inevitable choice. In this context, broadcasting engineering should align with the developmental trends of the converged media era and flexibly apply network technology in practical implementation, thereby further expanding the audience market, enhancing media activity, satisfying audience needs, while simultaneously promoting the enhancement of competitive advantages and development of broadcasting media. This paper analyzes the practical application of network technology in converged media broadcasting engineering, elucidating its role and impact while seeking rational recommendations to facilitate its practical application.

Full Text

Preamble

Title: A Preliminary Study on the Application of Network Technology in Converged Media Broadcasting Engineering Technology

Authors: Yin Qingdong, Chen Tianlin
(Laizhou Converged Media Center, Laizhou, Shandong 261400, China)

Abstract: The vigorous development of new media has brought severe impact to traditional broadcasting and television media, manifested in diversified information dissemination channels and faster transmission speeds, which have greatly enriched media content. To promote stable development of the media

industry, actively facilitating the integration of traditional and new media has become an inevitable choice. In this environment, broadcasting and television engineering should adapt to the development trends of the converged media era by flexibly applying network technology in practice. This can further expand the audience market, enhance media activity, meet audience needs, and promote the enhancement of competitive advantages for broadcasting and television media. This article analyzes the practical application of network technology in converged media broadcasting engineering technology, clarifies its functions and impacts, and seeks rational recommendations to promote the practical application of network technology.

Keywords: Broadcasting Engineering; Converged Media; Network Technology; Network Technology; Data Processing

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1. The Role of Network Technology in Converged Media Broadcasting Engineering Technology

Network information technology' s pervasive application in human social production and life has greatly facilitated information dissemination and sharing, bringing tremendous convenience to information acquisition. However, the gradual increase in network data transmission volume has brought severe impact to traditional broadcasting and television engineering technology, creating an urgent need for further optimization and improvement to promote high-level transformation of data transmission methods. The converged media trend provides new ideas for the innovative development of broadcasting and television engineering technology. Actively integrating network technology can not only enrich the amount of information and dissemination channels but also strengthen interaction with audiences, feedback their opinions and views, timely improve deficiencies, better meet media needs, and hold profound significance for the high-level development of broadcasting and television engineering.

1.1 Automatic Television Program Playback

Flexible application of network technology in converged media broadcasting engineering technology offers a typical advantage: the automatic playback of television programs. Specialized equipment enables sequential program broadcasting. Leveraging network technology to achieve operations such as broad-

casting program recording, replay, and pause breaks through the limitations of traditional television viewing formats. Users only need to watch on mobile intelligent terminals with internet access to obtain more humanized and convenient services [1]. This approach can better satisfy user viewing needs, not only reducing human, material, and financial resource consumption but also greatly improving broadcasting and television work efficiency. Additionally, the application of network technology in converged media broadcasting technology can improve upon traditional technology deficiencies while promoting diversification and standardization of broadcasting television programs, arranging program schedules according to actual requirements to provide audiences with higher-quality viewing services.

1.2 Improving Program Recording Efficiency

In the converged media era, broadcasting and television media, as traditional established media, embracing network technology in line with development trends represents both an impact on and transformation of traditional media, enriching information volume while providing solid guarantees for program quality improvement. Meanwhile, the practical application of network technology allows staff to remotely edit broadcasting television programs, enabling remote review and control without entering the site, thereby enhancing program recording efficiency, guaranteeing program quality, and effectively reducing human, material, and financial resource consumption [2].

1.3 Achieving Large-Scale Program Resource Sharing

The practical application of network technology, compared to traditional media technology, offers more prominent advantages and facilitates large-scale transmission and sharing of program resources. Traditional broadcasting and television media work environments lacked network technology support and could only disseminate media resources one-to-one, whereas network technology application facilitates maximizing broadcasting television program resource sharing capabilities [3]. For example, multiple stations can broadcast excellent broadcasting television programs, expanding audience viewing scope, while also achieving optimal allocation and utilization of quality program resources, positively impacting program rating improvements.

1.4 Accelerating Information Interaction

Network technology can effectively enhance converged media broadcasting engineering technology levels, break through time and space limitations, enable more free broadcasting of converged media programs, and allow rational arrangement of program broadcasting schedules. Under traditional broadcasting formats, users could only passively receive information with limited autonomous selection [4]. The application of converged media broadcasting engineering technology establishes network exchange platforms where users can select program content according to individual needs, achieving information interaction among

multiple users. Through this approach, information interaction can be accelerated, promoting high-level development of broadcasting and television.

2. Analysis of Current Development Status of Converged Media Broadcasting Engineering Technology

Against the backdrop of the converged media era, broadcasting and television engineering technology has integrated many cutting-edge technologies, greatly enhancing converged media broadcasting technology levels. However, significant deficiencies and shortcomings remain. Specific manifestations include the following aspects.

2.1 Challenges in Network Technology Integration

The rapid development of network technology has spurred the vigorous rise of the new media industry, enabling fast data transmission and sharing, breaking through time-space limitations, and deepening information interaction [5]. After long-term development, the new media industry structure has gradually become more complete. Compared to traditional technology, it can effectively improve upon traditional media technology deficiencies and promote diversified development of the media market. How to better meet challenges has become one of the primary issues awaiting solution for broadcasting and television media. China' s information technology level is already relatively mature, ranking among the international forefront, especially with rapid development in recent years. However, its application in the broadcasting and television engineering field remains insufficient, failing to achieve deep integration and application of network technology. Combined with limitations from traditional business models, this has constrained the steady development of the broadcasting and television industry to a certain extent [6]. The existence of various factors has constrained the high-level development of broadcasting and television engineering technology to varying degrees.

2.2 Monotonous Broadcasting Technology

Under the converged media background, traditional and new media have begun deep integration. Traditional broadcasting and television media have expanded their audience scope by leveraging new media advantages, but they still inevitably expose the problem of monotonous broadcasting engineering technology [7]. The essential attributes of broadcasting and television programs have caused enormous impact on traditional broadcasting and television media from new media. Along with innovative development of network technology, the public' s acceptance of new technology continues to increase, leading to network broadcasting and television gaining popular support and appreciation. Compared to traditional broadcasting programs, network broadcasting programs can break through space and time limitations, allowing users to freely select content of interest according to their preferences, pause and replay as needed,

and provide feedback on their views and opinions for positive interaction with program producers. This flexible user experience breaks the monotony of traditional broadcasting program formats, upgrades operational models, and steadily increases user numbers. As network broadcasting program audiences grow, traditional broadcasting program audiences decline in reverse. How to achieve innovative development of traditional broadcasting and television programs urgently requires integration of network technology to promote optimization and improvement of program formats and content [8].

2.3 Limitations on Television Program Broadcasting Time and Location

The Internet has been widely popularized and penetrated into people' s daily study, life, and work. Most areas have achieved cable television coverage with stable user growth, but the corresponding effective television viewing period has substantially shortened, intensifying competition among television stations [9]. Due to their program characteristics, television stations can only broadcast at fixed locations and times during long-term development. This broadcasting format imposes significant limitations. Currently, people' s fast-paced lifestyles leave them without time to watch fixed television programs, leading them to prefer watching programs on mobile devices such as smartphones and tablets. This has brought tremendous impact to the stable development of the broadcasting and television industry.

2.4 Slow Development Pace

Broadcasting and television engineering has experienced slow development over many years due to limitations from traditional technology models. Additionally, as new media has occupied portions of the market share, overall revenue levels have substantially declined. Advertising constitutes the primary revenue source for the broadcasting and television industry. As audience group size and viewing time gradually decrease, advertisers have massively shifted to new media platforms, leveraging convenient platform advantages to attract audiences [10]. Faced with such circumstances, the broadcasting and television industry should correctly recognize its own disadvantages and shortcomings, actively integrate network technology, promote innovation in program formats and content, and thereby seek sustainable development.

3. Application of Network Technology in Converged Media Broadcasting Engineering Technology

As a cutting-edge technology, the application of network technology in converged media broadcasting engineering technology helps improve upon traditional technology deficiencies, promotes technological optimization and innovation, clarifies future development directions, and points the way forward for high-level development of the broadcasting and television industry.

3.1 Establishing Terminal Service Platforms

Rapid technological development has substantially elevated network technology levels. Mobile intelligent terminals have achieved favorable development, with smartphones and tablets becoming widely popularized in people' s lives. Many users now prefer downloading software for watching broadcasting and television programs on smartphone terminals or tablets, enabling more free information acquisition. Examples include apps such as Youku Video, iQiyi, Tencent Video, Ximalaya, and Lychee FM, which offer convenient operations and better satisfy users' diversified information acquisition needs [11]. For instance, the CCTV client allows users to watch programs anytime and anywhere on mobile intelligent terminals, including documentaries on the Korean War and CCTV news. Another example is Mango TV launched by Hunan Satellite TV, where users who subscribe to Mango VIP can watch program outtakes and behind-the-scenes interviews. Based on terminal platforms, data information sources are expanded, user needs are fed back through big data analysis, and real-time interaction promotes converged media broadcasting engineering development. Additionally, users can also obtain program information through new media channels such as WeChat and Weibo to promote and publicize broadcasting and television program information, greatly enhancing program resource acquisition and sharing. Therefore, establishing terminal service platforms facilitates organic integration of traditional broadcasting and television media with network technology, enriching information dissemination channels while attracting more young users, enabling online interaction, occupying larger market shares, and playing a positive role in promoting high-level development of broadcasting and television engineering technology [12].

3.2 Strengthening Data Information Collection

In the converged media era, an important component for supporting sustainable development of broadcasting and television engineering is collecting and integrating data information based on network technology. Supported by network technology, information collection channels can be expanded to obtain multiple types of information through methods such as BBS, email, internet interfaces, and electronic forums. Users can input keywords on platforms to search for required information or browse by classification categories. Simultaneously, information collectors can be established for certain information types based on information collection technology. For example, information collectors can regularly gather target-type information to better satisfy information collection needs. When broadcasting and television stations air programs, to better meet user viewing needs, manual methods and information collectors can be organically integrated to collect netizen evaluation information on platforms such as Weibo, WeChat, and forums, including images, text, audio, and video, thereby enriching television program content while further expanding market share [13]. It should be noted that against the backdrop of continuously expanding network technology coverage, attention should be paid to data information security mon-

itoring, proper data information storage and encryption, and protection of user personal privacy. On this basis, diversified content can be created for users, potential problems can be deeply analyzed, and issues can be addressed promptly.

3.3 Data Analysis and Processing

In the converged media era, information volume is exploding and information sources are increasing. Leveraging network technology enables deep mining and extraction from massive data information. Analyzing data helps identify valuable information and provide personalized services to users. When users utilize platforms such as WeChat and Weibo, they generate large amounts of data that are stored in the background and transmitted to staff. Through data analysis, staff can predict information users like and push it to them, enhancing user experience. Traditional information processing methods required large numbers of personnel, involved heavy workloads, and suffered from information scarcity. In the traditional media era, this model could satisfy information analysis and processing needs. However, against the backdrop of gradually increasing information volume, manual information processing methods have become difficult to meet actual work demands. Based on big data technology and cloud computing, massive amounts of data information can be collected for in-depth analysis and processing, providing support for subsequent broadcasting and television program production and creating more programs that conform to market development trends, thereby playing an important promotional role in high-level development of the broadcasting and television industry. For example, when users log in to Mango TV, their viewing records and search records are directly transmitted and stored in the background to generate user viewing histories. The next time users log in to the app, they can not only watch previous programs but also receive recommendations for similar programs, thereby increasing user click rates and improving program ratings.

3.4 Gradual Expansion of Broadcasting and Television Engineering Service Areas

The integration of network technology into converged media broadcasting and television engineering represents an innovative upgrade to traditional broadcasting and television technology. Based on network technology, program formats can be further enriched and diversified services can be provided to users, such as game promotion, television shopping, and online education. Converged media includes different media content from broadcasting and television, and peripheral products are also launched to facilitate timely discovery by people. While pushing information, user viewing experience is not affected. For example, when airing the TV drama "The Journey of Flower," purchase links for the original work can be placed below the program to stimulate people' s purchasing desire and expand new business areas. Converged media broadcasting and television has strong promotional effects. When airing the TV drama "Love O2O," the production company collaborated with the popular mobile game "Ghost

Story" at the time. While broadcasting the drama, it helped people gain deeper understanding of the "Ghost Story" game gameplay, thereby attracting large numbers of player users to the mobile game. These are all functions achieved by broadcasting and television through integrating network technology, greatly enhancing the competitive advantages of broadcasting and television media.

4. Development Trends in the Integration of Broadcasting and Television Technology and Network Technology

Future network technology will continue to innovate and develop. The continuous integration of new network technologies into converged media broadcasting and television engineering technology can spawn many new products and promote high-level broadcasting and television development. For example, converged media and live streaming integrated development enable simultaneous broadcasting of gala events on television and live streaming of gala content on new media platforms such as Weibo, Douyin, and Kuaishou. Live streaming is a new program transmission method that, when combined with broadcasting and television, produces very considerable effects, attracting large numbers of users who can watch live content anytime and anywhere. Simultaneously, the live streaming format strengthens interactive communication with audiences, expanding program influence while substantially improving program ratings. Additionally, in future development of converged media broadcasting and television engineering technology and network technology, data collection and analysis methods will be further optimized. While pushing programs, schedules can be arranged according to reasonable time periods, and big data analysis can be used to select optimal advertising placement times to obtain the most considerable benefits.

In summary, integrating network technology into broadcasting and television engineering technology can effectively improve upon the limitations and constraints of traditional media development models, actively absorb new media technology advantages, leverage network technology for data collection and analysis, engage in deep interaction with audiences, build converged media terminal platforms, provide quality services to users, and further promote high-level development of broadcasting and television media.

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Author Biographies: Yin Qingdong (1968-), male, from Laizhou, Shandong, Engineer, research direction: television media communication technology; Chen Tianlin (1967-), male, from Laizhou, Shandong, Senior Journalist, research direction: converged media information.

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