

## Postprint on Cable Television Technology Applications in Triple-Network Convergence Environments

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### Abstract

With the development of technology and the continuous advancement of triple network convergence, positive impacts have been brought to various aspects of people's lives. Following triple network convergence, the traditional cable television model can no longer adapt to current development needs and requires further reform. Based on this, this paper investigates the application of cable television technology in the triple network convergence environment, employing literature review and analysis methods. It begins by analyzing the connotation of triple network convergence, then examines the challenges faced by cable television technology during the convergence process. Finally, by integrating personal perspectives and insights, it elaborates in detail on the application of cable television technology in the triple network convergence environment, providing assistance for its development, which holds significant practical importance for enhancing the quality of life of citizens in our country.

### Full Text

#### Preamble

**Abstract:** With the continuous advancement of technology and triple network convergence, people's lives have been positively impacted in various aspects. Following triple network convergence, the traditional cable television model can no longer adapt to current developments and requires further reform. Based on this, this paper investigates the application of cable television technology in the triple network convergence environment using literature review and analysis methods. Beginning with the connotation of triple network convergence, it analyzes the problems faced by cable television technology in this process. Finally, combining personal perspectives and understanding, it elaborates in detail on the application of cable television technology in the triple network

convergence environment, providing certain assistance for its development and holding important practical significance for improving the quality of life for Chinese citizens.

**Keywords:** Triple network convergence; Cable television technology; Communication technology; Application

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Currently, cable television serves as an important carrier of information media in China. With the development of digital information technology in our country, triple network convergence has transformed the traditional cable television model, possessing incomparable advantages. It enables the sharing of multiple services through a single terminal, allowing users to enjoy the functions of triple network convergence through one network. This not only greatly ensures network service security but also reduces network construction costs. Triple network convergence aligns with future trends in communication technology development and is a product of modern technological advancement, playing a significant role in improving people's overall quality of life [1]. Therefore, research on the application of cable television technology in the triple network convergence environment requires our attention.

## 1. Connotation of Triple Network Convergence

The so-called triple network convergence primarily refers to the organic integration of broadcasting television networks, telecommunications networks, and the Internet. Through service terminals with computer core applications, it can complete information and data processing in a relatively short time, strengthening connections with users [1]. Essentially, it represents the convergence of three main components of China's information network. Regarding broadcasting television networks, they represent traditional information dissemination methods, and the digital development of cable television can enable broadcasting television networks to fully exert their utility, providing better services for our lives. For telecommunications networks, mobile communication services are indispensable in daily life in China and represent primary functions. For the Internet, it is characterized by short development time, rapid growth, and wide influence, mainly because the Internet, supported by electronic computers, has achieved massive information transport and processing, and has long been closely integrated with our lives and learning. Overall, broadcasting television networks

demonstrate high compatibility in the triple network convergence process and constitute the main component.

## **2. Technical Foundation of Cable TV Technology in Triple Network Convergence Environment**

Currently, triple network convergence aligns with the development of social information networks and represents a major research topic. From a development perspective, communication technology, information industry transformation, and high-tech achievements have created conditions for triple network convergence [2]. Cable television is related to fiber optic communication and cable transmission, and the goal of developing this technology is to enable regions without wireless signal coverage to enjoy corresponding television services. Alongside the development of telecommunications and Internet technology, cable technology can leverage its advantages to enhance the speed of television coverage. Moreover, triple network convergence can not only expand the coverage scope of cable television services but also enlarge the service scale, laying a foundation for the development of cable television technology.

## **3. Problems Faced by Cable TV Technology in Triple Network Convergence Process**

At present, although triple network convergence technology continues to innovate and develop along with information technology, from a practical perspective, cable television technology faces many problems in the triple network convergence process. These are mainly manifested in operational system issues, market environment impacts, and the need for technological improvement, with specific details as follows.

### **3.1 Operational System Issues**

Triple network convergence involves extensive knowledge, encompassing not only the Internet but also broadcasting television networks and information networks. Due to the different operational models of these three networks, contradictions emerge in their operational modes during the convergence process, making it difficult to form a unified operational system. This will cause certain difficulties in the operation of cable television technology within triple network convergence in future development.

### **3.2 Market Environment Impact**

In the application process of cable television technology, continuing to use development models from before triple network convergence and relying on old content to attract users will lack appeal. This is because public users are the main service targets, and related business quality and technical levels require customer evaluation, which is also true for triple network convergence market

services [3]. With the development of the times, people's demands for diversified content and the goal of enriching and improving Internet content will have a significant impact on the future development of the entire television industry. Therefore, it is necessary to break free from current triple network convergence market constraints and expand cable television business.

### 3.3 Technology Needs Improvement

Triple network convergence represents the future development direction and aligns with the trends of the times. However, current communication technology levels in China are limited, and after triple network convergence, they cannot meet business demands. This is also the "bottleneck" in the development of cable television technology application, which greatly restricts the development of broadcasting enterprises after triple network convergence [4]. This is mainly manifested in three aspects: First, the emergence of new businesses. Although triple network convergence has added new businesses, due to limitations in current network broadband development, it cannot meet the network broadband demands of new cable television businesses. Second, work lag. This is because there is no unified standard for implementing triple network convergence, and the implementation time has been short. Third, influence from traditional business models. After triple network convergence, continuing to use traditional business methods leads to poor service quality, requiring higher standards for new business service quality.

## 4. Specific Applications of Cable TV Technology in Triple Network Convergence Environment

Based on the development of triple network convergence, China's communication technology and information industry have undergone transformation. This transformation has expanded the coverage scale of cable television business, improved service levels and quality, and enabled better development of cable television technology. Regarding its specific applications in cable television technology, these are mainly manifested in cable television industry chain application, strengthening network security control, upgrading network broadband, and expanding cable television business, with specific details as follows.

### 4.1 Cable TV Industry Chain Application

Currently, the organic integration of broadcasting television networks, telecommunications networks, and the Internet has formed relatively complete industry chains through long-term development, with each demonstrating distinct characteristics in related business scopes, such as terminal service models, industry core technologies, and communication standards. After triple network convergence, broadcasting television networks have achieved systematic integrated operations while also realizing the provision, dissemination, processing, and operation of cable television business [5]. Compared with traditional cable

television industry chains, the post-convergence cable television industry chain, on the one hand, takes business providers as the core of the industry chain, and on the other hand, separates network from content. Among these, business suppliers in actual development can not only exist independently but also combine and develop with network operators.

#### **4.2 Strengthening Network Security Control**

In the triple network convergence environment, while the Internet provides convenience for people's lives, it also brings certain security risks. This is because China's current network environment is not secure and lacks a sound legal foundation, which impacts network security control [6]. Examples include current network fraud and false information in society. To solve these problems and enable the application of cable television technology in the triple network convergence environment, Chinese government departments have adopted measures such as firewall technology, information encryption, and identity verification to enhance network security control and ensure network security. Additionally, by improving network-related laws and regulations through relevant legislative departments, the security and quality of the Internet environment are enhanced, thereby achieving strengthened network security control.

#### **4.3 Upgrading Network Broadband**

Under the influence of scientific and technological development, the definition clarity of cable television in China has improved, and capacity has increased, posing brand-new requirements for network broadband access. Regarding network broadband access, relevant national departments can upgrade network broadband and optimize home networks [7]. Additionally, by conducting traditional broadband free upgrade activities to promote the development of telecommunications networks, user demands for broadband access can be met, which is one of the important pathways for triple network convergence. Furthermore, as the application of digital television in China began relatively late, by combining with digital technology and using third-party devices to complete network signal conversion, the application of digital technology can be increased to improve cable television broadcasting effectiveness. For example, set-top boxes have gained widespread application in social and family life currently, promoting the development of cable television.

#### **4.4 Cable TV Business Expansion**

With the organic integration of broadcasting television networks, telecommunications networks, and the Internet, it has broken the constraints of traditional broadcasting television networks and improved the traditional business scale of cable television, increasing telecommunications users and Internet users, substantially expanding the audience scope, and increasing the attention rate and click-through rate of television business. The application of cable television technology in the triple network convergence environment has broken the reality of

television program viewing and, through the creation of one-to-many and many-to-many models, satisfied users' real-time viewing demands, achieving a revolutionary transformation of cable television business [8]. From the perspective of business expansion, the increase in telecommunications business and Internet content has extended mobile communication terminal functions and Internet terminal functions, increasing business crossovers between mobile phones and television networks, thereby generating mobile interactive messaging, Internet television stations, etc. Additionally, the expansion of cable television industry scope has broken through time and space limitations, improving television program viewing quality and user experience, and satisfying people's diversified demands.

In summary, this paper has studied the application of cable television technology in the triple network convergence environment, understanding the content of triple network convergence and the technical foundation of cable television technology within this environment. It analyzed how the application of cable television technology in the triple network convergence environment is affected by operational system issues, market environment, and technology. From a development perspective, it elaborated on the specific applications of cable television technology in the triple network convergence environment, namely cable television industry chain application, strengthening network security control, upgrading network broadband, and expanding cable television business. This provides certain assistance for the development of cable digital television technology under triple network convergence and holds important practical significance for improving the quality of life for Chinese citizens.

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

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