

Research on the Influence of Wireless Transmission Technology on the Development of Digital Broadcasting and Television in the 5G Era

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Keywords: 5G; Wireless transmission technology; Digital broadcasting; Television development

Abstract: At present, the research and development of China's 5G technology has completed the first and second stages of experiments, and entered the stage of innovation and commercial deployment, which is expected to realize industrial production and application. The application of 5G mobile communication means that the transmission speed of network information will be greatly improved as a whole, and the audio and video content will also be greatly increased, which will inevitably bring a huge impact on the traditional radio and television industry. 5G technology can realize a large number of audio and video programs to be watched anytime and anywhere. If it is applied to traditional radio and television, then radio and television will also achieve high speed, strong timeliness and no geographical restrictions. Therefore, news from a local perspective in the 5G era will still have a full audience. With the support of wireless transmission technology in the 5G era, this paper can load and spread a large number of audio resources and video resources, and establish an information network communication architecture. In the process of development, other high-tech frontier technologies are continuously integrated, which makes the wireless transmission technology usher in a brand-new development opportunity and lays a technical foundation for faster and more efficient development in the later period.

1. Introduction

With the continuous development of science and technology, 5G technology has emerged and gradually popularized and improved is a popular trend. At present, China's technology development ranks first among the countries that develop 5G technology. Some developed countries, such as the United States, also lag behind in the development of 5G technology. At present, the research and development of 5G technology in China has completed the first and second stages of experiments, entered the stage of innovation and commercial deployment, and is expected to achieve industrial production application [1]. The application of 5G mobile communication means that the network information transmission speed will be greatly improved, and the audio and video content will also be greatly increased, which will inevitably bring a huge impact on the traditional radio and television industry.

The research and development of 5G technology helps to improve the penetration rate of mobile network equipment and improve the mobile information transmission rate. It is customer-centered and builds a diversified technology system, especially the user perception optimization system, which can meet the actual needs of users; It has changed the way of social production and life, and strengthened the sense of experience of modern science and technology; It has promoted the deepening reform of the network system and effectively acted in other industries. With low cost and wide coverage, this technology has become the core technology in basic radio and television services. In the digital era, the development of information technology has accelerated, and new edge technologies have begun to form, involving information technology, multimedia communication technology and software technology. The application of 5G technology has added wings to radio and television and new media transmission, shortening the time and distance, but the regional differences in content cannot be eliminated, and local people still like to watch local news programs. And 5G technology can realize a large number of audio and video programs to be

watched anytime and anywhere. If it is applied to traditional radio and television, radio and television will also achieve fast speed, strong timeliness, and no geographical restrictions [2-3]. Therefore, the news from the local perspective in the 5G era will still have sufficient audiences.

In the new situation, we must deeply understand the characteristics of 5G technology and integrate it with radio and television networks to build a new system. In the process of development, 5G technology builds a network system and reduces network experience delay. 5G technology has strong content novelty, both in terms of transmission speed and connectivity. The wireless transmission technology has the quality characteristics, which can endow the radio and television transmitter with automatic detection function, and can independently statistics information data, thus realizing the automatic control of the switch machine [4]. Through the intelligent transmitter to monitor the working state of the TV, the hidden trouble can be found in time and effective measures can be taken to deal with it. In the process of development, other new and cutting-edge technologies are constantly integrated, which ushers in new development opportunities for wireless transmission technology and lays a technical foundation for faster and more efficient development in the later period [5].

2. The influence of wireless transmission technology on digital radio and television in the 5G era

There is a special system network in radio and television wireless transmission technology, which can provide users with corresponding data according to their access rights. At the same time, the system can also backup and restore data, further ensuring the security of the radio and television system. With the support of new technologies, the mobile communication network speed is improved, which can load and transmit a large number of audio resources and video resources, and establish an information network transmission architecture. With the support of technology, it has impacted the radio and television industry, and the integrated development of 5G technology and radio and television can drive and improve the development speed of the radio and television industry.

According to the analysis of the industry prospect, expanding the application scope of 5G technology can lay the foundation for the development of new media business and radio and television, and expand the development field of radio and television. At present, although the main mode of broadcasting and television has changed a lot, it is mainly in the mode of television broadcast and radio listening, so the broadcast time, form and content will be greatly limited [6]. After entering the digital era, radio and television users are also developing in a diversified direction, which makes the demand for frequency resources of the television system more tense. And high-quality digital signal coverage can ensure the stability and security of the television system, so as to avoid the suspension of broadcasting. The input of digital signals is also relatively low, creating good conditions for mining users.

There are many problems in the development of 5G technology, and the audio business, video business and picture business are developing rapidly, showing a traffic growth. At present, the 5G R&D achievements have been able to basically meet these needs. Due to the relatively large growth value of traffic, the mobile communication network services are intensified, and the existing problems cannot be solved by increasing bandwidth [7]. Most people believe that only by focusing on the development of broadcasting business can we solve the internal problems. It can achieve large-scale filling and increase audio, image, video, etc., and the increase of ports enables the flow of traffic in large quantities at the same time, to avoid stagnation when watching video, and improve people's sense of viewing experience.

3. Innovative development approach of wireless transmission technology to radio and television wireless transmission technology in the 5G era

3.1. Innovation and development foundation of radio and television wireless transmission technology in 5 G era

When 5G technology is integrated with radio and television networks, the traditional execution architecture is relatively simple, and it is only aimed at the execution of a single target. In the face of multi-target tasks and work, the work efficiency will decrease, and even some errors will occur, which will affect the business processing results. This paper constructs a new system, which can meet the actual business needs of radio and television stations, such as realizing the coverage of local and regional signals, opening public broadcasting services, and supporting local and regional broadcasting at the same time [8]. In China, this is the first attempt of 4K transmission in 5G network, and it is also a significant progress in the integration of 5G network into new media industry.

China Mobile Company provided a dual-frequency test site for this attempt. The test site transmitted the 4K ultra-clear signal to the computer room of the Central Radio and Television General Station, and at the same time, the ultra-high definition 4K signal of the Central Radio and Television General Station was transmitted to the Shenzhen branch venue. The relay vehicle at the branch venue could receive the signal in real time. The difference between the converged architecture and the traditional architecture is that its top-level design takes multi-objectives as the core, so its extension direction is relatively more flexible and more targeted. Compared with the traditional single architecture, it can improve the effect and speed of application processing in the face of complex situations and maintain data balance. The initial architecture of multi-objective radio and television convergence is shown in Figure 1.

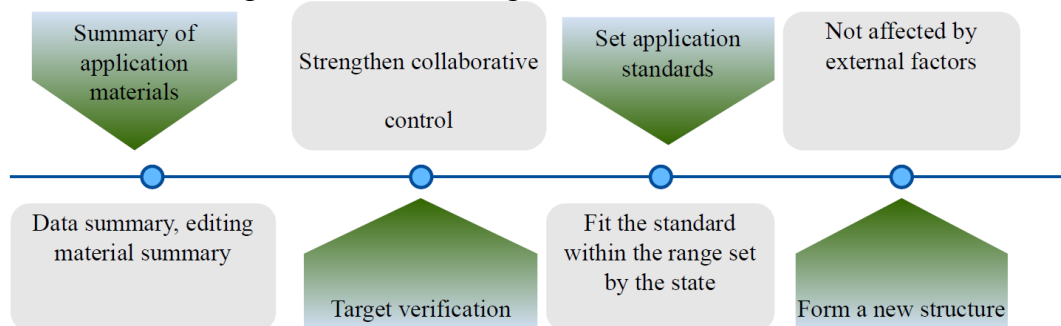


Figure 1 Initial architecture of 5G technology radio and television wireless transmission technology integration

In addition, the signal transmitting and receiving equipment used by 5G technology is highly integrated, easy to install, small in size, easy to transport, high in quality, long in service life, and rarely in failure. According to the results of actual market research, the mean time between failures of 5G technology equipment is much longer than that of other types of communication equipment [9]. The future radio and television network must rely on the transmission advantages of 5G mobile communication technology, coordinate and mobilize content, network and terminal resources according to the needs of users, and conduct intelligent analysis, mining and prediction of user behavior. At the same time, the fusion architecture also needs to set corresponding functional modules such as resource scheduling, login authentication, user management, etc.

3.2. Mobile communication network and one-way broadcasting

5G belongs to wireless signal communication, which includes one-way broadcast and two-way communication. Through improving and optimizing the two communication methods, colleges and universities use wireless networks, combining indoor and outdoor coverage, local and regional coverage, and high-speed mobility will also become the mobility characteristics of 5G networks. At the same time, the terminal can be divided into linear video broadcasting, content interaction, video-on-demand, high-definition and personalized content according to the flow of data and interaction

ability [10]. According to the data information in Table 1, the logical unit transmission structure can be set. After completion, the corresponding data information obtained by programming is imported into the static storage unit, and each module is connected with the logical unit to realize resource sharing. At the same time, 5G technology is used for video data transmission, so as to improve the data transmission speed.

Table 1 Logical unit transmission function standard

Logical unit indicators	Static transmission standard	Dynamic transmission standard	Mean value standard
Storage unit ratio	7.1	5	6
Transmission speed	1.87	1.54	1.62
Cohesion value	65.23	68.49	70.12
Fitting coefficient	0.0047	0.0034	0.0012

In broadcast convergence, multiple technologies are transmitted to realize network conversion. At the same time, it can provide audiences with high-quality audio-visual enjoyment and ensure the quality of online experience services. In fact, it is a complex information processing technology, which is mostly used for the processing of huge data of radio and television. It can incorporate the originally complex and huge data information into the broadcast and two-way communication timeslot into the layered multiplexing technology, expand the uplink communication channel, improve the signal quality received by the user, and promote the development of radio and television network convergence. According to its own operating system, the corresponding integration and summary can be completed in a very short time, so that the editing and processing of TV programs in the later stage can be carried out smoothly. By updating and upgrading the equipment at the receiving end to meet certain conditions, the signal can be separated at the receiving end to receive multiple high-quality signals.

Reasonably apply 5G technology, use multiple data links to send program information to the production and broadcast platform, and use the platform mechanism to transmit content to users to fully meet user needs. With the support of 5G technology, improve the quality of radio and television programs, improve video resolution, and obtain high-quality playback effects. 5G technology provides faster transmission speed of wireless transmission technology, improves signal strength and reduces signal interference. The transmission of wireless signals in 5G network not only supports two-way, but also supports multiple, high-definition and ultra-high-definition. Optimize the traffic so that the wireless transmission signal can realize the free switching between one-way and two-way communication. Therefore, the audio-visual signal received by the client is clearer, and users can enjoy a more pleasant audio-visual experience, and can support services such as ultra-high-definition television and virtual reality, and generate user portraits, so as to formulate broadcast plans for different customer groups.

3.3. Application Scenarios of Integration of 5 G and Radio and Television Technology

The biggest advantage of mobile communication network is that it can realize two-way communication. Based on this, it can promote the rapid development of one-way broadcasting and enable communication resources to switch flexibly between one-way broadcasting and two-way communication modes, thus completing the deep integration and innovation of mobile broadcasting. With the development and commercialization of 5G technology, a better information transmission structure has been gradually formed. Due to the continuous popularization of 5G transmission technology, the existing error can reach millisecond level, and the delay speed has also changed. While keeping the overall style consistent, users can adjust it by themselves and choose the interface according to their own aesthetic concepts, which has a very wide choice space to meet their needs. According to Table 2, when the test data transmission peak reaches 25 Gbps, the data processing speed of broadcast TV without 5G technology is 1.18s, and that of broadcast TV with 5G technology is 0.87s. In different peak data transmission environments, compared with the data processing speed of radio and television without 5G technology, the data processing speed of the test group after application is relatively fast.

Table 2 Analysis of the results of the application of wireless transmission technology to digital radio and television in the 5G era

Test the peak environment of data transmission	Data processing speed of radio and television without using 5G technology	Processing speed of radio and television data using 5G technology
25 Gbps	1.18	0.87
35 Gbps	1.23	0.98
45 Gbps	1.36	1.07
65 Gbps	1.42	1.18

Through the wireless transmission technology in the 5G era, high integration can be achieved, and with the help of computer equipment and augmented reality broadcasting technology, real scenes can be built to ensure users get a quality experience. In the application of wireless transmission technology in the 5G era, the audience is equipped with relevant equipment to obtain different broadcast information content. To integrate 5 G technology into radio and television media, it is necessary to support mobile reception, realize personalized requirements, and cover a wider range. The design of architecture scheme must be based on broadcast network and mobile communication network, and at the same time, we must pay attention to strengths and weaknesses.

4. Conclusions

At present, in the era of information technology, mobile communication technology is gradually mature. Under this background, the traditional development model of radio and television can no longer meet the needs of social development, and needs to be innovated. 5G technology has developed rapidly, focusing on the integration of technology and radio and television technology, and expanding the application space of radio and television system. In the process of 5G technology development, radio and television, through exploration and practice, contribute to the integration of 5G technology and broadcast media. In fact, it is a complex information processing technology, which is mostly used for the processing of huge data of radio and television. It can incorporate the originally complex and huge data information into the broadcast and two-way communication timeslot into the layered multiplexing technology, expand the uplink communication channel, improve the signal quality received by the user, and promote the development of radio and television network convergence. The emergence and development of 5G technology can just make up for the corresponding defects, further optimize and improve the entire industry structure, achieve higher quality effects, and provide a certain guarantee for the transformation and expansion of media communication. This paper provides wireless transmission technology with faster transmission speed through 5G technology, improves signal strength, and reduces signal interference. The transmission of wireless signal in 5G network not only supports two-way, but also supports multiple, high-definition, and ultra-high-definition. In the new era, the radio and television industry must attach great importance to the integration and creation of 5G technology and radio and television technology.

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