Building "Smart Broadcasting" and Innovating Broadcasting Development Postprint

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Abstract

At the present stage, the construction of "Smart Broadcasting" constitutes a historical mission bestowed upon the broadcasting industry by the era and the state, while concurrently representing a pivotal measure for actualizing the new development philosophy and high-quality development strategy. In order to accentuate the position and function of radio and television within the overarching framework of the national digital economy strategy, it is imperative to advance the intelligent transformation of broadcasting, thus facilitating breakthrough development for "Smart Broadcasting" .

Full Text

Preamble

Title: Building "Smart Broadcasting" to Innovate Broadcasting Development

Abstract: At the current stage, building "Smart Broadcasting" represents a historic responsibility entrusted to the broadcasting industry by the era and the nation, as well as a critical measure for implementing new development concepts and high-quality development strategies. To highlight the status and role of radio and television within the national digital economy strategy, it is essential to advance the intelligent development of broadcasting, thereby enabling breakthrough progress for "Smart Broadcasting."

Keywords: Smart Broadcasting; Intelligent Integration; Cloud Platform; Broadcasting Network; Development

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Traditional broadcasting operating under conventional models has faced continuous erosion from new media such as the internet, leading to a persistent decline in cable television network subscribers and placing the industry at a critical juncture. This necessitates active integration between broadcasting and new-generation information technologies. The emergence of "Smart Broadcasting" provides a novel development approach for traditional radio and television. Therefore, building upon the agreement signed by the Academy of Broadcasting Science of the National Radio and Television Administration, iFLYTEK Co., Ltd., and Zhejiang Huashu, Zhejiang Radio and Television Group must leverage its own advantages, implement the strengths of smart broadcasting and media convergence, and thereby promote the intelligent development of radio and television.

1. Importance of Smart Broadcasting Construction

In the new era, Smart Broadcasting requires its managers to leverage the advantages of network information technology and advanced science and technology to provide specialized, multi-faceted, and personalized film and television program services. Simultaneously, it must deliver effective, real-time multi-domain information services for the people, thereby creating convenient conditions for their work and daily lives.

First, with the continuous development of the times, constructing Smart Broadcasting has become an inevitable outcome. The ongoing advancement of social science and technology has placed corresponding demands on the current development of the broadcasting industry. To meet the needs of social development, the broadcasting industry must undertake the construction of Smart Broadcasting to satisfy its own transformation requirements. This involves, initially, providing more high-quality services to gain broader support, and subsequently, comprehensively enhancing the strength of the broadcasting industry to ensure it firmly secures its position in social development.[1]

Second, constructing Smart Broadcasting also requires meeting the demand for improved public service levels and corresponding quality. The broadcasting industry exists primarily to provide comprehensive information to the people, helping them broaden their knowledge and horizons. In the process of building Smart Broadcasting, it is also necessary to rationally utilize network information technology to create a convenient public information dissemination method for the people, thereby enhancing actual management levels and ultimately meeting the requirements for social stability and sustainable development.

2. Smart Broadcasting Architecture and Current Application Status

This is specifically manifested as follows: First, the network layer comprises communication networks, the Internet of Things, and broadcasting networks, serving as crucial channels for data transmission. Second, the platform layer

is reasonably constructed on cloud platforms, enabling data aggregation, storage, and subsequent analysis and mining processes. The effective utilization of software and hardware resources constitutes the foundation for implementing corresponding controls and achieving business support. Third, the application service layer primarily integrates various application services, relying on the support of capabilities from the platform layer, network layer, and terminal layer to provide diverse effective services. Fourth, the terminal layer, based on the effective use of software and hardware devices, serves as the presentation terminal for broadcasting and can also function as an interaction terminal.[2]

Figure 1 [Figure 1: see original paper] Smart Broadcasting Technical Architecture

Regarding the overall architecture of Smart Broadcasting, it must be reasonably divided according to the standard systems of computer or communication systems. The overall architecture of Smart Broadcasting mainly comprises four components, as specifically shown in Figure 1. Based on the technical approach of broadcasting, the overall architecture of Smart Broadcasting mainly includes four parts: cloud, network, terminal, and management, as specifically shown in Figure 2 [Figure 2: see original paper]. This architecture represents the best interpretation of media convergence and theoretical research, while also serving as an effective means to achieve supply-side structural reform. It constitutes an opportunity for ecological environment construction and represents the necessary path for comprehensively enhancing broadcasting service capabilities.

With years of development, the basic architecture of Smart Broadcasting has gradually become clear. However, relying solely on its own strength cannot meet the requirements for comprehensive development. Based on extensive practice and corresponding case analyses, Zhejiang Huashu, after breaking free from conceptual constraints, genuinely proposed the concept of "Smart Broadcasting +."

The proposal of this concept is based on the reconstruction of corporate strategy, business models, and operational management, ultimately changing the characteristics of information products. Only in this way can the curtain be truly opened for transformation, and with the drive of competition, policy, internal factors, and technology, the sustainable development of broadcasting networks can be achieved while also realizing continuous growth.

Regarding "Smart Broadcasting," after proposing "Smart Broadcasting +," its meaning becomes richer. Whether in cross-disciplinary, cross-industry, or cross-regional contexts, the addition of a "+" further expands the possibilities for broadcasting development. Based on effective analysis of construction content, Smart Broadcasting + includes: First, catering to intelligent and smart processing to truly meet the requirements of various aspects such as internal production, analysis, and transmission, with the fundamental goal set on converged media intelligent dissemination. This can enhance customer experience perception and focuses on building key areas such as smart gateways, media operations, and

TVOS. Second, striving to extend business scope, based on the intelligence of broadcasting networks as its foundation, combined with advanced technologies and facilities such as artificial intelligence, cloud computing, and big data, and driven primarily by smart cities and the digital economy. It emphasizes effective integration with multiple industries including education, healthcare, and people' s livelihood to promote development.

3.1 Analysis of Approaches Based on "Smart Broadcasting +"

In the Zhejiang region, Zhejiang Radio and Television Group, combining the basic concepts proposed by various parties and through its advanced development philosophy and unique regional advantages, has broken industrial boundaries and reasonably applied the concept of "Smart Broadcasting +." The specific implementation pathways are as follows.

3.1.1 Policy Support Brings New Opportunities The mutual integration of the broadcasting and film sector with the internet, along with the emergence of "Smart Broadcasting," can enable intelligent and digital development of broadcasting and film. Smart Broadcasting sets its fundamental purpose on basic information facilities, relying on collaborative support by multiple networks such as cable, wireless, and internet, with support placed on big data, IPv6, and other aspects. Based on the effective integration of intelligent media dissemination, this can comprehensively enhance the management, business, networks, and corresponding services of the broadcasting system.

In 2015, the term "Smart Broadcasting" was officially adopted, and the goal of broadcasting and film was clarified, dedicating transformation and upgrading efforts to the construction of Smart Broadcasting. In 2018, at the national Smart Broadcasting construction site meeting, it was directly established as the core strategic choice for innovative development of radio and television in the new era, requiring increased practical promotion efforts. In the current broadcasting industry, Smart Broadcasting construction has become an effective pathway for fully practicing "innovation, coordination, green development, openness, and sharing." [4]

For radio and television, "Smart Broadcasting" represents a strategic positioning. The advantages of broadcasting enterprises in the current stage include: First, network coverage. Achieving coverage of natural villages and administrative villages possesses incomparable advantages. Second, service capability. Based on the support of local maintenance and operation teams, this enables the inclusion of corresponding service hotlines and relevant senior technical teams. Third, customer resources. The broadcasting industry has always possessed vast customer resources including government-enterprise customers and public customers, whose driving effect is also very significant. Fourth, video content. With rich operational experience, this can satisfy video convergence needs based on the actual advantages of terminal household access, ultimately generating corresponding businesses. Fifth, government trust. Considering the background

of broadcasting itself, coupled with its role as a traditional mainstream media outlet and the government' s mouthpiece, it has thus gained government trust in public service domains and propaganda aspects.

As broadcasting enterprises, they must understand how to utilize advantages in various aspects to achieve innovation in information technology, satisfy integration with social life, and ultimately implement a series of constructions such as smart communities and smart households, finally becoming a significant force in serving social life.

3.1.2 Identifying Roles and Leveraging Strengths to Shape New Development Momentum The construction of "Smart Broadcasting +" itself belongs to the auxiliary system. In the current ecosystem, broadcasting institutions serve as a series of roles including builders and investors. For instance, as investors, they must rationally and effectively utilize relevant government policies, and under the premise of controllable risks, integrate BOT models directly into information projects through PPP models. As builders, they should understand how to leverage practical Smart Broadcasting construction experience to help governments align with the construction goals of smart cities. As operators, they need to manifest the operational advantages of broadcasting networks based on content and network models, which can also be reflected in the application aspects of smart cities. When serving as networks and platforms, based on their own upgrades and transformations, they must also rationally and effectively establish new-generation infrastructure such as the Internet of Things and cloud computing to participate more directly in smart city construction. As customer service providers, they need to maintain effective differentiated advantages to achieve comprehensive mastery of actual business processes, clearly analyze and gain insights into real demands, and ultimately enhance actual customer value.[5]

Figure 2 Schematic Diagram of "Cloud-Network-Terminal-Management" Technical Architecture

Based on overall architecture analysis, the Smart Broadcasting standard system construction mainly includes the content layer, business layer, network layer, user layer, and control layer, thereby implementing various technical standards.[3]

Conducting in-depth analysis of the involved technologies, combined with the end-to-end overall approach of broadcasting, allows for reasonable division of specific technologies, as detailed in Figure 3 [Figure 3: see original paper].

Figure 3 Smart Broadcasting End-to-End Technology Division

3.1.3 Building the "Smart Broadcasting +" Technology Platform The emergence of Smart Broadcasting itself represents an innovation in communication technology. Based on the integration and application of various technologies, it replaces certain labor, enhances quality of life and happiness, and thus

brings about a series of transformations in multiple domains of social life. Where transformation occurs, challenges emerge; where transformation occurs, opportunities arise. Therefore, through the construction of the "Smart Broadcasting +" platform, we can adapt to the demands of the era' s development.

3.2 Smart Broadcasting Application Examples

Regarding the practical application of Smart Broadcasting cloud, this section conducts specific analysis using the "cloud" component of the "cloud-network-terminal-management" framework as a representative example.

3.2.1 Smart Broadcasting Converged Media Cloud Platform Based on the mutual integration of media cloud platforms and Smart Broadcasting, its architecture mainly includes three aspects: First, public cloud. Serving as the foundation for construction, operation, and maintenance, it can provide public computing resources and directly face the general public. The public cloud platform includes all-media material aggregation, big data mining and analysis, and new media production and distribution. Second, private cloud. This refers to self-construction, building corresponding service clouds for internal users. In contrast, private cloud deployment leans toward enterprise content, enabling autonomous control over system availability and data security. For example, television program broadcasting and post-production can all be implemented on private cloud platforms. Third, exclusive cloud. This belongs to basic vendor facilities, constructed based on business and corresponding system clouds. The emergence of exclusive cloud combines the advantages of the former two, ultimately satisfying basic control requirements.

Regarding platform applications of the Smart Broadcasting converged media cloud, its main scenarios include a series of foundational applications such as converged production services, converged news services, and converged broadcasting and distribution services.

3.2.2 Smart Broadcasting Voice Cloud After integrating intelligent speech interaction technology, it can satisfy the comprehensive enhancement of actual usage frequency, improve user experience, ultimately maximize operational value, and simultaneously meet corresponding value-added requirements.[6] In terms of intelligent speech technology, it encompasses recognition, synthesis, understanding, and corresponding encoding. Its primary voice cloud includes core capability platforms, intelligent content production platforms, intelligent content monitoring platforms, etc. Within the core platform, it mainly includes corresponding functions such as voiceprint recognition, intelligent recommendation, and machine translation.

In actual production, its services tend toward automatic generation of intelligent subtitles, voice-overs for manuscripts, etc. In monitoring actual content, it considers multiple service contents such as intelligent analysis, content acquisition, and release processing.

Figure 4 [Figure 4: see original paper] Smart Broadcasting Voice Cloud Architecture

Build Smart Broadcasting voice cloud to achieve mutual integration with each other.

Conclusion

In summary, following the analysis of Huashu' s practices in the Smart Broadcasting industry, Zhejiang Radio and Television Group has implemented further Smart Broadcasting initiatives, thereby constructing a mutually beneficial, win-win industrial ecological chain and community of shared interests in future development. Therefore, Smart Broadcasting, as an intelligent, multi-level, and full-system upgrade and transformation, is user-centered and provides full-service operational capabilities. This represents the current trend in broadcasting and film technology development and constitutes the necessary path for the transformation and upgrading of the current broadcasting industry. The emergence of Smart Broadcasting has placed new demands on the development of the broadcasting industry. This is key to improving the total factor productivity of the broadcasting industry and serves as a driver for achieving quality, power, and efficiency transformations in the broadcasting industry based on Smart Broadcasting as the foundation, ultimately enabling leapfrog development and breakthroughs in the broadcasting sector.

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