

On the Relationship Between Television Station Technical System Architecture and All-Media Business: Postprint

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Abstract

This paper first describes the specific content of all-media business, analyzes the requirements for TV station technical system architecture, and finally synthesizes the above two points to explore in detail the construction of TV station technical system architecture in the new era, hoping to provide some reference for the development of the broadcasting and television industry.

Full Text

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On the Relationship Between TV Station Technical System Architecture and All-Media Business

Abstract: This paper first describes the specific content of all-media business and analyzes the requirements for TV station technical system architecture. Finally, based on the above two aspects, it explores in detail the construction of TV station technical system architecture in the new era, hoping to provide some reference for the development of radio and television industry.

Keywords: TV station; technical system architecture; all-media business

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With the continuous advancement of triple network convergence, the traditional operational management and control model of radio and television media can no longer meet the requirements of new media development. To adapt to this

trend, it is necessary to update concepts, improve technology, and strengthen management to promote the integrated development of traditional and emerging media, thereby laying a solid foundation for the strategic transformation of TV stations toward all-media.

1.6 Mobile TV

Mobile TV refers to using mobile phones as terminal devices to receive TV station signals, thereby enabling real-time or time-shifted viewing of TV programs. In recent years, as mobile phone prices have decreased, their popularity in China has continuously increased, making mobile users a potential group for new media development. Currently, mobile TV is mainly implemented through two methods: terrestrial digital broadcasting and mobile communication networks.

1.1 Digital TV

Digital TV offers excellent advantages in interactivity, emphasizing the subjective role of audiences in the television media field and fully meeting users' personalized needs. Compared with traditional TV media, digital TV has undergone tremendous changes in form, content, and service modes, adding various interactive viewing functions such as video-on-demand and time-shifting, making it a typical representative of new media models.

1.2 IPTV

IPTV is a form of Internet TV, whose advantage lies in its strong interactivity. It can provide various network audio-visual services, such as live broadcasting, video-on-demand, e-commerce, and distance education, to TV terminals through fixed communication networks. This combination of network media and TV media not only effectively enriches TV service types but also improves transmission efficiency.

1.3 Internet TV

Internet TV is a service that delivers IP video and Internet applications to television sets through the public Internet. Based on traditional TV functions, it applies Internet technology to enable online viewing and downloading of Internet movies, TV series, and entertainment programs.

1.4 Online Video

With the continuous development of the Internet, it has gradually become the main channel for people to watch videos. As times progress, radio and television users' demands for video resource richness are constantly increasing, promoting the diversification of online video types. At present, most online video content

is produced by professional production institutions, and entertainment value is gradually being enhanced to meet people's spiritual needs.

1.5 Internet TV Station

An Internet TV station is a novel form of video website. According to relevant Chinese regulations, traditional radio and TV stations must obtain a national operating license before they can carry out related editorial work, which represents the main difference from conventional video websites. In addition, credibility and organizational operation modes also differ.

1.7 Communication-Based Mobile TV

Communication-based mobile TV mainly uses mobile Internet to provide video live or on-demand services for mobile users, involving streaming media technology that downloads video data before delivering it to users. To enjoy this service, users must install corresponding playback software on their mobile devices.

2.1 Business Systems Supporting All-Media Operation Processes

In the new media era, the sources of TV station data content are becoming increasingly complex and diversified. Therefore, TV station technical systems must be able to support content from multiple sources. Simultaneously, to meet various user needs, TV stations must build diversified content distribution channels and conduct integrated operations for multiple services. Additionally, traditional business processes need appropriate adjustments to meet the requirements of new business operations.

2.2 Operation Support Systems for Converged Media New Business

In the new media era, the types of operations for converged media new business are becoming increasingly complex, requiring a business platform that provides integrated services including unified content support, technical services, data analysis, and payment. Meanwhile, the technical system setup for converged media new business must adapt to business operations, integrating final technical products and business models into a unified operation platform for end-user operation.

2.3 Service-Oriented Technical Systems

First, meet the technical capabilities required by new business. Second, instantaneously support business scale changes. Third, instantaneously implement "borderless" deployment of business. Fourth, instantaneously provide business data analysis.

3. Research on Technical System Architecture for All-Media Business

In the process of all-media transformation, the integration between traditional and new media is key. New media differs from traditional media in many aspects, including communication mode, content form, and transmission medium, while also featuring new characteristics such as massive volume, aggregation, and interactivity. Therefore, in terms of technical systems, appropriate innovation, supplementation, and improvement should be made on the original basis.

3.1 Content Production

Content production involves multiple stages including pre-production shooting, studios, OB vans, post-production, and content management. Under all-media convergence business, TV program production has been enriched functionally to adapt to new media needs, in addition to traditional functions.

First, in the pre-production shooting stage, there is no significant change between new media and traditional media. The main difference is that recording media have shifted from traditional tapes to semiconductor and optical storage. The new recording media can directly connect to editing equipment and networks, making a significant contribution to improving editing efficiency.

Second, studios. Based on the traditional studio recording and live broadcasting model, new media has developed a network-based workflow specifically for new media business, gradually shifting from video recorder recording to video server recording. During program recording, content can be transmitted to the production network simultaneously, saving material upload time and promoting efficiency improvement.

Third, OB vans. For large-scale event live broadcasting, relay broadcasting, and news live broadcasting, compared with traditional media, new media introduces wireless communication networks. Its advantages include smaller size, portability, and lower cost, enabling rapid arrival at breaking news event sites within a short time.

Fourth, post-production. To better adapt to the characteristics of new media such as massive volume, aggregation, and fragmentation, TV program post-production must achieve the following: first, support the aggregation of multi-channel resources; second, support rapid clip-cutting functions; third, conduct rapid cataloging, description, classification, and packaging of clipped programs; fourth, possess multi-service version management and release functions. Currently, the post-broadcast sharing function is widely applied, achieving interconnection between traditional and new media. Programs with low timeliness requirements adopt finished product or post-broadcast sharing methods, while those with high timeliness requirements adopt material or semi-finished product sharing methods, integrating production processes and establishing an all-media production architecture.

Finally, content storage. The traditional TV media model of using tape library systems for program material management seriously hinders resource sharing, development, and utilization. In the new era, TV station content management advocates media asset management systems that unify the storage, management, and utilization of the entire TV station's content resources, laying a foundation for resource sharing.

3.2 Broadcasting and Distribution

First, synchronize the broadcast of existing channels in new media. This only requires encoding the program signals received by existing satellite receivers, optical terminal equipment, etc., and then transmitting them to the network platform.

Second, establish new channels for broadcasting. Utilize new media transmission channels to broadcast new TV channels, such as public transportation mobile TV and Internet TV stations. The main methods include two types: SDI and IP. The SDI system mainly consists of transmission systems, broadcast control systems, hard disk broadcast systems, and broadcast content management systems. It involves processes such as scheduling and transmission of external and broadcast signals and decoding and broadcasting of audio and video files. The IP method is based on program playlists and ordinary PC servers for broadcasting.

Third, virtual channel broadcasting. TV stations will play all content with similar themes sequentially according to pre-compiled broadcast playlists. To facilitate the development of on-demand and live broadcasting services, content should be classified by theme, and specialized virtual channels should be set up for content with the same theme. Since virtual channels adopt ordinary PC servers and use corresponding software for stream encapsulation, there are certain differences in file formats and broadcast signals for different media, requiring support for multi-service data processing and multi-format and multi-protocol stream output.

3.3 Transmission and Distribution

New media business mainly includes three transmission methods: first, radio and television networks after digital and two-way transformation; second, dedicated transmission networks of telecom operators; third, the open Internet. Currently, the transmission technologies for video distribution through the Internet mainly include two types: CDN and P2P. The former adds a new network architecture based on the existing Internet, publishing website content to the network "edge" closest to users, enabling them to obtain required content nearby. Its advantages include high efficiency and fast response speed. The latter connects computers of different users for file sharing and exchange. The advantages of this technology include strong stability, high smoothness, and support for large-scale user access.

3.4 Terminal Reception

With the continuous advancement of triple network convergence, any transmission network supports most terminals, achieving cross-coverage of TVs, computers, and mobile phones. Not only can video networks support multiple terminals such as TV sets, mobile phones, and computers, but digital TV can also cover terminals like mobile phones and PCs.

In summary, the development of all-media business has placed higher demands on TV station technical systems. Only by updating technical equipment on the original basis and developing all-media-oriented technical systems can TV stations lay a solid foundation for all-media operation and promote their sustainable development.

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