

Exploring DVB+OTT for Broadcasting Network Internet Television: Postprint

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Abstract

OTT services have exerted tremendous impact on traditional digital television businesses, prompting the emergence of DVB+OTT discussions. This concept seeks a convergence point between traditional DVB and OTT services to establish a well-functioning operational environment and enhance competitive capabilities by leveraging inherent advantages. This paper elaborates on the dilemmas and opportunities confronting DVB+OTT, as well as strategies for breaking through current predicaments to forge a future development path, thereby offering recommendations for the development of the DVB+OTT model in broadcasting networks.

Full Text

Preamble

As living standards improve and television users demand richer spiritual and cultural experiences, traditional digital television can no longer satisfy user expectations for abundant, high-definition television resources [1]. OTT (Over-The-Top) services represent an inevitable product of technological development. The massive volume of free content has made broadcast television networks truly appreciate the power of free services in the internet era, and OTT's ability to bypass operators and serve users directly has positioned it as broadcast networks' most significant competitor. Consequently, it has become imperative for broadcast television networks to explore new development directions through the integration of DVB+OTT models.

1. Dilemmas Facing DVB+OTT

Although the DVB+OTT model represents the general trend, it still faces considerable challenges in practice.

1.1 Line Transmission Issues

Current traditional digital television systems rely on coaxial cables, many of which are aging and poorly laid out. Line loss is difficult to control and modify. Under conditions of extremely high picture quality requirements and enhanced user interaction capabilities, these systems cannot guarantee sufficient bandwidth. Given these objective constraints, ensuring smooth, large-bandwidth transmission would require prohibitively high investment costs [2].

1.2 Inadequacy of Set-Top Boxes

Traditional digital television employs unidirectional set-top boxes that cannot support bidirectional services, video-on-demand, time-shifted viewing, and other advanced functionalities. To achieve new business growth and establish smart terminals for digital home environments, comprehensive software and hardware upgrades are essential.

1.3 License Provider Constraints

The National Radio and Television Administration's Document No. 181, "Operational Management Requirements for Institutions Holding Internet Television Licenses," mandates that all internet content must receive broadcast authority approval and certification. Only license providers recognized by the administration can offer television services, which constrains the development of the DVB+OTT model.

1.4 Funding Issues for New Model Development

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3.2 Establishing Intelligent Pipelines to Enhance Business Competitiveness

Broadcast television networks must efficiently and securely share valuable information from their channels with partners to jointly establish intelligent pipelines. This enables precision marketing that directly addresses consumer pain points and drives business growth. Through intelligent pipeline technology, broadcasters can develop other services and perform dynamic optimization. When other internet operators cannot deliver quality services due to objective constraints, broadcasters possess natural advantages, allowing them to enhance the priority and stability guarantees of their broadband services, thereby delivering superior user experiences.

3.3 Further Developing Paid Services

Broadcast television has long explored paid services. However, with the rapid development of OTT, the competitiveness of broadcast paid services has declined.

Internet companies attract users with free content and then convert user volume into profit; once a user base is established, launching paid services becomes a natural next step. Leveraging its accumulated large user base from traditional digital television, broadcast television must maximize the utility of this user volume in the DVB+OTT development trend, positioning itself as an entry point like Baidu or Tencent and unlocking the true value of its accumulated big data. Big data represents an untapped goldmine, and developing value-added paid services based on big data is the future direction. This requires multi-party integration to create truly suitable paid services for broadcast television.

4. A Standard Implementation Scheme for DVB+OTT

When designing DVB+OTT implementation schemes, broadcast television must fully utilize existing system resources and HFC line resources to minimize investment. The focus of upgrades should be primarily on the terminal side, with new or upgraded DVB+OTT users adopting DVB+OTT set-top boxes. These boxes feature traditional RF inputs and newly added network interfaces, simultaneously connecting to both broadcast television systems and internet video systems. In addition to traditional DVB modules, DVB+OTT set-top boxes integrate new IP network processing modules and new decoding units.

The system architecture comprises several key functional modules:

Media Asset Library: Content from providers is acquired by cable television network operators through remote networks (such as satellite broadcast or IP backbone). The acquired content undergoes review and processing to generate media asset packages (including metadata and media files).

Media Asset Operation System: This system receives metadata files generated by the media asset library to perform service package definition and management, program metadata orchestration (including program-to-column binding and program-to-content-package binding), service package synchronization, EPG template management, program lifecycle management (program launch, update, and removal), service package lifecycle management (launch, update, and removal), content publishing control, real-time stream injection control, and metadata publishing functions.

Content Distribution System: Comprising central and edge content distribution nodes, this system implements content file reception and distribution, transmitting content files from the cable television network operator's head-end media library to edge devices closest to users (edge content distribution nodes or streaming servers).

Streaming Service System: This system implements streaming service functions, pushing user-selected programs to terminals.

Portal System: This system implements terminal authentication and business navigation functions, providing terminals with on-demand control parameters

and connection parameters (including session management function module access addresses).

Session Management Function Module: This module completes session mechanisms between terminals and the server, implementing request processing and session maintenance for various interactive on-demand services, including user authentication requests, resource requests, streaming service requests, session state control, and resource release.

In this architecture, OTT content injection is controlled by broadcasters through internal CDN servers, while OTT license providers offer rich content and broadcast control platforms. In the primary user terminal interface, OTT exists only as an application that can connect to OTT applications from different license providers. Both live and on-demand streams are transmitted over the HFC IP backbone in MPEG2 TS format before entering the IPQAM. Whether existing DVB live streams or newly added on-demand content, all can be integrated into the DVB+OTT system through the media asset library. Both existing DVB live streams and newly added VoD content can be efficiently distributed by the CDN.

Conclusion

The DVB+OTT model represents an inevitable trend for future development; those who do not proactively transform themselves will be transformed by external forces. Diversified demands mean users require diversified services, which traditional digital television can no longer satisfy. The emergence and development of OTT have brought new opportunities and growth to the entire video industry. Although the DVB+OTT model has not yet received universal industry recognition, it can be foreseen that this model will undoubtedly become a leader and guide in the television industry, continuously bringing new surprises. Broadcast television should actively participate as a player in the OTT ecosystem, break free from conventional thinking, vigorously promote DVB+OTT business development, and forge its own new path.

References

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