

Architecture Design Postprint for a DaaS-Based Full-Process Hierarchical Supervision Service Platform for Territorial Converged Media

Authors: Li Hongbo

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Abstract

With the rapid development of technology, data is becoming increasingly important for media convergence. Media resources constitute data assets, while data servitization can provide more diversified data services, thereby unleashing greater value from big data. Propaganda management departments within their jurisdictions bear supervisory responsibilities over various media entities, particularly necessitating effective oversight of the entire media production and publishing workflow as well as content security review. Through the introduction of data services based on Internet big data DaaS and intelligent semantic analysis and aggregation, coverage can be achieved for scenarios including propaganda management, content production, and monitoring services within the jurisdiction. Leveraging DaaS' s advantages of low cost and high efficiency, the value and utility of data can be realized to provide guidance for management and business operations, thereby achieving intensification and standardization of hierarchical regulatory services for the full converged media workflow across media units within the jurisdiction. This enables more effective connection with netizens, correct guidance of public opinion orientation, and ultimately enhances media dissemination power, influence, guiding power, and credibility.

Full Text

Architecture of a DaaS-Based Integrated Media Local Full-Process Tiered Supervision Service Platform

Abstract: With the rapid development of technology, data has become increasingly important for media convergence. Media resources are not only data assets but can also provide more diversified data services through data servitization, unlocking greater value from big data. Local publicity management departments have supervisory responsibilities over various media within their

jurisdiction, particularly requiring effective oversight of the entire media production and distribution process as well as content security review. By introducing DaaS (Data-as-a-Service) based on internet big data, intelligent semantic analysis, and aggregation, this platform covers scenarios including local publicity management, content production, and monitoring services. Leveraging the low-cost and high-efficiency advantages of DaaS, it maximizes data value and utility to guide management and operations, achieving intensive and standardized full-process tiered supervision services for integrated media units within the jurisdiction. This more effectively connects with netizens, correctly guides public opinion, and enhances media dissemination power, influence, guidance, and credibility.

Keywords: integrated media; localized tiered management; DaaS; SaaS; full-process management; public sentiment

Author: Li Hongbo

1. Big Data and Media Convergence Development

Within a region, media can be categorized by their attributes into institutional media, government affairs media, and self-media. Beyond their media characteristics, the vast majority possess regional, industry-specific, or professional attributes, as well as service attributes. Such media exist in large quantities and wield strong dissemination power and influence within their localities or industries, reaching considerable audiences and generating substantial communication volume. To harness the collective effect of all these media within the jurisdiction, it is essential to construct an intensive platform for integrated media content management and production convergence.

In December 2018, the China Internet Network Information Center (CNNIC) released the *Statistical Report on Internet Development in China* in Beijing, showing that by December 30, 2018, China's netizen population had reached 829 million, with mobile netizens totaling 817 million, accounting for 98.6% of internet access via mobile phones. The rapid development of mobile internet has generated massive amounts of data related to people, devices, locations, behaviors, and more, further driving the creation and application of big data.

The explosive development of mobile internet has accelerated the rapid accumulation of media big data and hastened the media convergence process, propelling it into a stage of deep integration. Institutional media, government affairs media, and self-media have achieved unprecedented amplification on mobile social network platforms. Institutional media have actively deployed on mobile internet, opened social media accounts, and gradually established mobile-first development strategies, forming new-era new media communication matrices that promote media convergence development within their scope, consolidate ideological and cultural positions, and strengthen mainstream public opinion to better serve and guide the masses. Government affairs new media has been established as a crucial channel for the Party and government to connect with,

serve, and mobilize the people in the mobile internet era, an important position for guiding online public opinion and building a clear cyberspace, and a key pathway for exploring new social governance models and improving social governance capabilities. Self-media has developed exceptionally rapidly, directly facing all netizens through various social network platforms.

Therefore, leveraging mobile internet and big data for media content production and dissemination monitoring enables full-process supervision of media content production and distribution within the jurisdiction, realizes localized tiered management and distribution monitoring, more effectively connects with netizens, correctly guides public opinion orientation, and achieves the goal of enhancing media dissemination power, influence, guidance, and credibility.

2. Requirements and Scenarios for Media Local, Tiered, and Full-Process Supervision

Within a region, media can be categorized by their attributes into institutional media, government affairs media, and self-media. Beyond their media characteristics, the vast majority possess regional, industry-specific, or professional attributes, as well as service attributes. Such media exist in large quantities and wield strong dissemination power and influence within their localities or industries, reaching considerable audiences and generating substantial communication volume. To harness the collective effect of all these media within the jurisdiction, it is essential to construct an intensive platform for integrated media content management and production convergence.

At the end of 2018, the General Office of the State Council issued the *Opinions on Promoting the Healthy and Orderly Development of Government Affairs New Media*, and the Cyberspace Administration of China explicitly proposed requirements for localized, tiered, and classified management of self-media. In early 2019, it issued the *Government Websites and Government Affairs New Media Inspection Indicators and Annual Supervision Assessment Indicators*. These documents all pointed to the need to follow the laws of mobile internet development, innovate work concepts, methods, and institutional mechanisms, and actively utilize new technologies and applications such as big data, cloud computing, and artificial intelligence to enhance the intelligence level of government affairs new media.

Within a region, to better leverage the collective advantages of various media, improve public opinion dissemination power, guidance, influence, and credibility, and better serve and guide the masses, it is necessary to utilize cloud computing, big data, and mobile internet technologies to build a DaaS-based integrated media local full-process tiered supervision service platform. This platform enables effective resource sharing and monitoring management of various media units at different levels within the jurisdiction.

Through the platform, resource integration and process reengineering within the jurisdiction can be achieved, realizing horizontal content sharing and fu-

sion as well as vertical communication interaction to form three-dimensional convergence. On one hand, it enables intensive management and services while helping to standardize media distribution processes during media convergence and achieve effective supervision. On the other hand, it can collect various types of information from the bottom up within the jurisdiction, aggregate and analyze it through intelligent semantics to form internal offline public opinion monitoring, enabling early detection and early prevention to eliminate risks and problems in their infancy. This further promotes integrated media development within the jurisdiction, enables full-process tracking, and better serves and guides the masses.

The convergence scenario is shown in Figure 1 [Figure 1: see original paper] below.

Figure 1 Three-Dimensional Convergence Scenario for Local Full-Process Tiered Supervision

Data quality is highly guaranteed because there is only one data update point, ensuring consistency across all parties. The system is highly flexible, enabling more agile satisfaction of any change requirements.

This planning proposal introduces internet big data through DaaS service models, applying it to processes and scenarios such as content production, publicity supervision, and performance assessment. It achieves local full-process tiered supervision services in a low-cost, rapid, and efficient manner.

2.1 Advantages of DaaS

DaaS (Data-as-a-Service) refers to any data-related services being centralized in one location, where data undergoes aggregation, quality management, cleansing, and other processes before being provided to different systems and users. Users no longer need to consider which data sources the data comes from, or even the intermediate cleansing and matching processes—they can simply use the required data on demand. DaaS offers the following advantages:

Rapid Deployability. Through DaaS data services, loose coupling between systems can be achieved, enabling faster deployment and migration of applications without considering underlying data source issues. If different data structures or data from specific locations and attributes are needed, DaaS can satisfy these requirements very quickly with minimal changes.

Low Service Cost. Data itself is objective, and the data used has high reusability. Large amounts of data, after one-time acquisition, cleansing, indexing, and other operations, can be provided to numerous users and application scenarios through DaaS, greatly reducing data acquisition, storage, and processing costs.

High Data Quality. Through services to control data access, data quality is highly guaranteed because there is only one data update point, ensuring

consistency across all parties. The system is highly flexible, enabling more agile satisfaction of any change requirements.

The platform utilizes big data, cloud services, LBS, and intelligent semantic analysis technologies to achieve localized, tiered, and full-process supervision and services for media within the jurisdiction. It covers institutional media, government affairs media, and self-media, integrates media content resource sharing and exchange, standardizes the collection, editing, and distribution processes, and simultaneously completes the aggregation and analysis of offline public opinion within the jurisdiction. It builds a three-dimensional convergence technology platform with horizontal content sharing and vertical communication interaction, meeting the needs of multi-level (province, city, county) integrated media, government affairs new media, and self-media supervision and effectiveness assessment. It provides an operational platform, data, and technical service support for deep media convergence within the jurisdiction, effectively enhancing media dissemination power, influence, guidance, and credibility.

The platform is based on internet public opinion systems and DaaS for internet big data, implementing systems including media content production, media content management, data visualization command and dispatch, media supervision and control, and public sentiment aggregation. It covers application scenarios such as local content production, content management, publicity supervision, and interactive services, meeting multi-dimensional needs for content production platforms, publicity supervision platforms, communication interaction platforms, and service platforms.

The functional relationship diagram of the system with DaaS as the service bus is shown in Figure 2 [Figure 2: see original paper] below.

Figure 2 System Functional Relationship Diagram

Media Content Production System: Implements standardized tiered management of the full process of planning, collection, editing, review, and distribution for institutional and government affairs media, as well as automatic media recommendation and copyright protection for content.

Media Content Management System: Establishes multi-level material libraries, finished product libraries, and distribution libraries to enable manuscript sharing and transfer among media within the jurisdiction; implements performance assessment for internal personnel and assessment of media units within the jurisdiction.

Media Supervision and Control System: Manages institutional media, government affairs media, and self-media within the jurisdiction, allows custom grouping of new media accounts of interest, enables monitoring and statistics of content published by followed new media accounts, and provides automatic sensitive word early warning prompts; for authorized accounts, it can obtain comment data for aggregation analysis based on semantics; and conducts overall analysis of media users.

Public Sentiment Aggregation and Analysis System: Enables classified collection and reporting of public sentiment information including location data within the jurisdiction; aggregates information and conducts intelligent analysis and disposal to automatically generate offline public opinion reports.

Data Visualization Command and Dispatch System: Associates and graphically displays information such as collection and editing content, processes, distribution data, and locations of media within the jurisdiction; enables information location display based on position; and supports news reporting, public opinion disposal, and multi-video dispatch command.

To facilitate system management, deployment, and integration with external systems, the platform adopts a layered technical architecture overall, specifically including the platform layer, data layer, service layer, application layer, and presentation layer. External data and interactions with external data are aggregated at the service layer through SaaS and DaaS models. The details are shown in Figure 3 [Figure 3: see original paper] below.

Figure 3 System Layered Architecture Diagram

The platform layer, data layer, and service layer constitute the foundation of the system and are recommended to be deployed as a unified intensive platform within the jurisdiction. The application layer and presentation layer can be adaptively configured for different application scenarios to achieve personalized and targeted solutions.

2.3 System Characteristics and Advantages

The platform's planning and design are oriented toward practical application scenarios and requirements, focusing on media content management, content production, and publicity management within the jurisdiction. It can serve as both a content production and distribution platform and a publicity management platform. It can also function as a supervision and assessment platform for higher-level publicity departments over lower-level departments and media units within their jurisdiction.

The system is designed based on PaaS, SaaS, and DaaS service bus architecture, achieving a foundational platform for integrated media construction within the jurisdiction at the lowest cost and in the most efficient manner of integration. It has the following specific characteristics and advantages:

1. **Localized and Tiered Management:** Meets the needs of tiered management and media convergence at provincial, municipal, county, and township/street levels within the jurisdiction.
2. **Full-Process Coverage:** Covers the full process of publicity management and content production operations for media within the jurisdiction.
3. **Wide Application Scenarios:** Can be applied to integrated media at

provincial, municipal, and county levels, as well as to publicity management in universities, vertical industries, and corporate groups.

4. **Easy Integration and Selectable:** Multiple systems can be used independently or in combination, allowing free selection based on actual conditions.
5. **Low-Cost and Efficient DaaS:** Adopts a data service model for acquiring and disseminating big data, reducing operational costs. Simultaneously, through DaaS introduction, it can quickly and efficiently establish a data-centric intensive platform.
6. **Open and Easily Extensible:** Reserved data input and output interfaces facilitate data exchange with other systems.

As big data, cloud computing, and other new technologies continue to develop and media convergence deepens, news data as an important media asset must be fully protected and utilized. By constructing an intensive content production and management platform based on DaaS within the jurisdiction, achieving full-process coverage of media content production and management, we can effectively promote media convergence development and better serve and guide the masses within the region.

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(Author's Affiliation: Tianjin Jinwan Network Information Technology Co., Ltd.)

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

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