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Building the “Southern +” Mobile Publishing Platform and Accelerating Deep Convergence Development of the Media Group’ s Post-print Business

Authors: Fan Yuping, Yang Wenbiao, Luo Xiaolong, Zhang Zhongkai

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Abstract

The central authorities attach great importance to media convergence, proposing that we should adhere to a mobile-first strategy, construct mobile communication platforms effectively, and enable mainstream media to firmly occupy the commanding heights of public opinion guidance through mobile communication. This paper takes the construction practice of the “Nanfang +” mobile publishing platform as an example, shares the design concepts and considerations regarding the technical platform construction of “Nanfang +”, introduces the main achievements and application status of the construction, reviews the key technical innovations, and discusses how to leverage the “Nanfang +” mobile publishing platform as a leading force to drive the deep convergence and innovative development of media.

Full Text

Preamble

Authors: Fan Yuping, Yang Wenbiao, Luo Xiaolong, Zhang Zhongkai

Affiliation: Southern Media Group, Guangzhou, Guangdong 510601

Abstract: The central authorities have attached great importance to media convergence, emphasizing the need to adhere to a mobile-first strategy, build robust mobile communication platforms, and enable mainstream media to firmly occupy the commanding heights of public opinion guidance through mobile dissemination. This paper uses the construction practice of the “Southern Plus” mobile publishing platform as a case study to share the design philosophy and key considerations behind the “Southern Plus” technical platform. It introduces the main achievements and application status, outlines the primary technical

innovations, and explores how the “Southern Plus” mobile publishing platform can serve as a driver for deep media convergence and innovative development.

Keywords: Intelligent Media; Southern Plus; Media Convergence; New Mainstream Media; Party Media Algorithm

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1. Construction Background

In recent years, the central authorities have placed great emphasis on media convergence, requiring the strengthening of internet thinking and the promotion of complementary advantages and integrated development between traditional and emerging media. This involves deep integration across content, channels, platforms, operations, and management to build a batch of new mainstream media with strong influence and competitiveness, forming a resource-efficient, rationally structured, differentially developed, and synergistically efficient all-media communication system. General Secretary Xi Jinping has pointed out that media intelligence has entered a stage of rapid development, and we must enhance our sense of urgency and mission to drive breakthroughs in core technologies, explore the application of artificial intelligence in news gathering, production, distribution, reception, and feedback, steer “algorithms” with mainstream value orientation, and comprehensively improve our ability to guide public opinion.

As a major economic, media, and internet province, as well as a key region in the Guangdong-Hong Kong-Macao Greater Bay Area, Guangdong stands at the forefront of reform, opening-up, and public opinion struggles. There is an urgent need to build such a new mainstream media. To implement central directives and seize the mobile internet public opinion battlefield, Southern Media Group timely proposed a “mobile-first, data-first, user-first” strategy and an intelligent media development strategy. In 2015, the Group mobilized all its resources to build the “Southern Plus” mobile publishing platform. From its launch, “Southern Plus” was entrusted with the critical mission of becoming “Guangdong Provincial Party Committee and Provincial Government’s First Authoritative Mobile Publishing Platform” –a positioning that has been continuously strengthened throughout nearly five years of construction practice.

2. Technical Platform Construction Philosophy

During the deep media convergence process, Southern Media Group conducted thorough reflection and exploration on development goals and pathways, proposing an implementation strategy of “integrated content production, integrated technical support, and integrated business operations” along with a concrete implementation path of “mobilization, platformization, visualization, and intel-

ligentization.” The construction of the “Southern Plus” technical platform was specifically carried out according to the Group’s “integrated technical support” philosophy and the “mobilization, platformization, visualization, intelligentization” approach.

2.1 Mobilization: All Products Designed and Developed for Mobile

“Southern Plus” is first and foremost a “mobile” publishing platform, with its technical architecture built entirely around mobile. All products, functions, and services are oriented toward mobile terminals. We have not only developed the “Southern Plus” client but also web mobile sites, WeChat mini-programs, and other product forms. Functions such as video live streaming, citizen journalism reporting, solicitation and voting, and various activity services are all designed and developed for mobile, supporting mobile-native production, dissemination, and user participation throughout the entire process. The Group has gradually streamlined newspaper layouts while continuously shifting traditional advantageous resources toward the “Southern Plus” client.

2.2 Platformization: Building a Powerful Technical Platform to Pool Internal and External Resources

Platformization is the core of media technology construction. Even with a professional content production team of several thousand people, traditional media groups remain minuscule compared to internet commercial platforms with millions or even hundreds of millions of content creators. Moreover, the technical strength of traditional media is even weaker relative to editorial operations. The only solution is to concentrate limited technical resources where they matter most by making technology construction platform-based, enabling everyone in editorial, business, and operations departments to demonstrate their capabilities on the platform. This involves building content production and dissemination platforms, business innovation service platforms, operations and promotion management platforms, and party-government service platforms. Once established, these platforms empower business personnel through continuous iteration and long-term commitment rather than one-time construction.

2.3 Visualization: Emphasizing Visual Capabilities Such as Video, Live Streaming, and AR/VR

Visualization is a crucial characteristic of modern communication, allowing mainstream media to disseminate party and government voices through popular and accessible means. Video, charts, and data visualization are key components. In an era of fragmented reading, visualization technology is intuitive and impactful, quickly capturing user attention and enhancing communication effectiveness. Throughout the construction of the “Southern Plus” technical platform, all product lines have consistently incorporated visual elements and concepts, such as building short video platforms, live streaming platforms, AR news viewing, VR exhibitions, H5 creative products, and data visualization

tools. Particularly with the arrival of the 5G era, audio and video will usher in a new round of major development.

2.4 Intelligentization: “Big Data + AI” Empowerment Throughout the Entire Business Chain

“Big Data + AI” technological capabilities are empowered throughout all stages of the business process—from planning, gathering, editing, reviewing, and distribution to evaluation and feedback—launching a series of intelligent products, functions, and services to comprehensively improve production efficiency and communication effectiveness. Internally, this deepens intelligent empowerment to liberate editorial productivity, transforming previously manual and inefficient tasks into smarter production lines, allowing editorial staff to focus on higher-end creative and review work. This facilitates high-quality new media data product mass production, such as intelligent writing, intelligent proofreading, intelligent review, and intelligent layout. Externally, it achieves more intelligent dissemination based on communication scenarios, user characteristics, and geographic location to enhance user stickiness and attract more users, such as content recommendations based on user interests, Southern Account recommendations, and regional push notifications.

2.5 Integration: Comprehensively Collecting Requirements from All Business Departments to Build a Powerful, Unified, and Efficient Technical System

To implement the Group’s integrated technical support strategy, the “Southern Plus” technical platform was planned and constructed with a holistic, systematic, and internet-oriented perspective. By focusing resources on key breakthroughs, the Group has made “Southern Plus” bigger and stronger, using it as a driver to integrate and converge high-quality content and resources across the Group. This creates synergy through collaborative consultation, joint construction, and shared benefits, building a powerful, unified, and efficient technical system that maximizes cost reduction and leverages technology to empower communication, thereby enhancing external competitive advantages. Therefore, during platform development, requirements were comprehensively collected from all business departments, including resources from local city correspondent stations and post-launch operations team deployment.

3. Main Achievements and Application Status

3.1 Constructing a Southern Media Group Characteristic All-Media Three-Dimensional Communication System

Leveraging big data, cloud computing, artificial intelligence, AR/VR, and other new technologies, we have developed dozens of systems and hundreds of services, building a mobile product matrix centered on the “Southern Plus” client that integrates App, mobile sites, mini-programs, digital newspapers, large and

small screens, and Weibo/WeChat. This achieves “one-time gathering, multiple generation, multi-terminal publishing, and multi-channel dissemination.” The “Southern Plus” client has reached 70 million downloads, with over 7,000 institutional accounts on the Southern Plus platform and annual revenue exceeding 260 million RMB. It has become Guangdong’s largest mobile media information publishing platform and government new media aggregation platform, essentially establishing an autonomous, controllable, open, and shared new media platform with strong communication power. It serves as a benchmark for provincial mainstream media clients nationwide and has received full recognition from the Central Propaganda Department and the State Council Information Office. Together with *Southern Daily*, *Southern Magazine*, and *Southern News Network*, “Southern Plus” has constructed Guangdong’s mainstream party media three-dimensional communication pattern of “one newspaper, one magazine, one website, one client.”

3.2 Empowering Comprehensive Business Services in Content, Operations, and Business

Under this three-dimensional communication system, new technologies continuously empower content, operations, business, and other application scenarios. In terms of content, creative planning through the New Media Laboratory and new technology displays have produced frequent viral new media products with billions of clicks across the network. The Southern Citizen Journalism Reporting Platform and Cloud Solicitation Platform have expanded UGC content production. The 5G+4K+VR live streaming platform supports over 3,000 live events annually. The precision push platform with multi-channel high reach can instantly push messages to tens of millions of users, with 99.8% of messages delivered within milliseconds. Intelligent recommendation based on the Southern Party Media Algorithm strengthens positive energy public opinion guidance while fully considering user interests. In operations, various characteristic activities such as junior journalist programs, primary school poetry festivals, and college entrance examination consultations have driven downloads and enhanced brand influence. The high-concurrency, high-availability voting platform has cumulatively supported over one billion votes. In business, the Group’s revenue-generating capabilities have been innovated through all-media advertising, smart party building, and live streaming e-commerce. The mobile media advertising platform supports mass production of dozens of new media ad formats.

3.3 Promoting Institutional Innovation and Driving Overall Group Transformation

Against the backdrop of mobilizing all Group resources to build “Southern Plus,” the Group established the Newspaper-Network-Client Integrated Operations Committee to promote “integrated content production, integrated technical support, and integrated business operations” and drive overall Group

transformation. To further advance deep convergence, after achieving certain results in “Southern Plus” mobile publishing platform construction, the Group successively established the Newspaper-Network-Client Product R&D Center, Newspaper-Network-Client Audio-Video Department, Newspaper-Network-Client Copyright Department, Newspaper-Network-Client Theory and Commentary Department, and the “Southern Plus” Editorial Committee under the Integrated Operations Committee to strengthen R&D and editorial work for “Southern Plus.” Currently, “Southern Plus” fully leverages Southern Media Group’ s content production advantages and resource integration capabilities, internally accommodating content publishing from almost all media under the Group, including high-quality content from *Southern Daily*, *Southern Magazine*, *Southern News Network*, *Southern Rural Daily*, *Southern Weekly*, and *Southern Metropolitan Daily*.

4. Main Technical Innovation Points

4.1 Developed “Southern Party Media Algorithm” Intelligent Recommendation Technology to Strengthen Mainstream Value Guidance

To enhance the client’ s public opinion guidance capability, “Southern Plus” developed an intelligent recommendation technology that integrates multiple algorithms and strengthens positive mainstream value guidance. Algorithm rules aligned with socialist core values were established, including media scoring rules, editorial selection rules, high-quality content recommendation rules, and sensitive word filtering rules. (1) In the “data preparation stage,” big data and AI technologies are fully utilized to create precise profiles of content data and user behavior, deeply mining potential correlations between content and users to construct a media industry knowledge graph. (2) An “intelligent recommendation engine” that strengthens positive mainstream value guidance was developed, consisting of four components: a rule engine, algorithm engine, scenario engine, and display engine. This deeply integrates the business characteristics, rules, and editorial experience of party media to form a media intelligent recommendation engine with multi-algorithm fusion and positive mainstream value guidance. (3) In “business applications,” rapid analysis and mining of returned data continuously enhance the media knowledge graph capabilities.

[Figure 1: see original paper] Schematic Diagram of Intelligent Recommendation Technology Processing

4.2 Developed High-Precision Intelligent News Topic Hierarchical Extraction Technology for More Refined Content Management

To address the issues of traditional topic extraction algorithms—where sequential relationships and weak correlations among Dirichlet distribution random vector components lead to low overall topic prediction accuracy— “Southern Plus” developed a high-precision intelligent news topic hierarchical extraction technology. To overcome LDA model weaknesses, a semantic similarity acti-

vation layer based on the Word2Vec neural network model was constructed to replace the original probability distribution activation layer, performing Embedding on topic words after topic clustering. Drawing on “Southern Plus”’s rich media domain experience, similarity thresholds between topic words and news title feature vectors after Embedding were optimized to screen globally optimal topic words and news articles. A Transformer model with an encoder-decoder structure formed by attention mechanisms was built for topic extraction based on this high-quality data, solving the problem of low topic extraction accuracy caused by loss of critical information features during dimensionality reduction in topic models. This enables more refined, orderly, and standardized content management, providing users with more precise and detailed news information services. The news topic extraction rate has been improved to over 90% and has been widely applied in intelligent news gathering, classification, clustering, content profiling, media industry knowledge graph construction, keyword extraction, popular content analysis, timeliness analysis, hot topic ranking, and intelligent recommendation.

4.3 Built a High-Concurrency Microservices Architecture with Multi-Level Caching, Asynchronous Processing, and Rapid Elastic Scaling

The platform architecture employs distributed clustering, automated deployment, elastic scaling, multi-level caching, and asynchronous queuing technologies to achieve mutual isolation and dynamic service management of microservices operating environments. For different scenarios, flexible technologies such as database/table sharding, asynchronous read/write, data partitioning, and multi-threading + asynchronous I/O processing are selected to greatly improve back-end service processing efficiency. Taking caching technology as an example, memory caching and distributed caching technologies are used to cache hot data, reducing time costs for hot data retrieval. Based on NIO (Nonblocking I/O), single connection instances are implemented for concurrent access across multiple threads while ensuring thread safety, with elastic scalability to add instances on demand when cache connection instances are insufficient. The cache uses a data structure combining ordered sets and hashes to actively cache business data, preventing cache penetration and breakdown and reducing back-end service pressure from large-scale data access. This architecture establishes multi-level caching, asynchronous processing, and rapid elastic scaling capabilities through comprehensive multi-dimensional and multi-level considerations, significantly improving instantaneous concurrent processing capacity. It has supported various large-scale content dissemination and online activities for mobile media, playing important roles during the Dongguan International Marathon live broadcast and COVID-19 pandemic periods.

4.4 Adopted 5G+4K+VR Video Streaming Cloud Distribution Technology to Create an Integrated “Cloud, Management, End” 5G Mobile Media Live Platform

Utilizing 5G ultra-low latency transmission and 4K ultra-high bitrates, an integrated “cloud, management, end” 5G mobile media live platform was built through H5 encapsulation, GPU decoding, and VR immersive technologies. Software functions are deployed in lightweight form on mobile phones and other portable devices, enabling editorial teams to simply and conveniently conduct live news gathering, rapid editing, directing, delayed broadcasting, and distribution at news scenes. In addition to fully leveraging 5G’s high bandwidth and low latency characteristics, the platform also utilizes 5G network slicing and edge cloud technologies to apply for different network slices based on data types and complete some business processing at edge computing nodes. Edge cloud technology allows data to be distributed directly to users’ mobile terminals without uploading to main servers, reducing transmission costs and time. To better utilize edge cloud technology and reduce the frequency of manual intervention requiring data to be transmitted back to main servers, AI technology is employed at edge nodes for automatic processing of news and videos to enable live streaming and on-demand playback of ultra-high-definition video, VR, and other bandwidth-intensive content.

[Figure 2: see original paper] Schematic Diagram of Edge Cloud Usage

4.5 “Spherical Latitude-Longitude Precise Positioning and Distance Calculation + Data Visualization Display” Creates Real-Time Case Trajectory Maps to Empower Epidemic Prevention and Control

During the COVID-19 pandemic, “Southern Plus” independently developed Guangdong Province’s real-time dynamic COVID-19 epidemic map query system, enabling dynamic real-time display of confirmed case trajectories to help the public promptly grasp information about confirmed patients’ activity routes, playing an important role in promoting epidemic prevention and control. The system automatically locates users’ geographic positions, calculates the nearest case trajectories based on spherical latitude-longitude distance computation, and marks and displays them on maps. Different colors render case distribution in different areas on maps, with dynamic gradients over time to show real-time distribution and changes. The epidemic data is comprehensively visualized through maps, line charts, trend graphs, video animations, and other forms to intuitively display epidemic dynamics and guide public safe travel. Due to the adoption of 24/7 cloud R&D methods, the epidemic map became the first provincial-level anti-epidemic map product in China. This development was produced by the “Southern Plus” client, led and executed by the “Southern Plus” Product R&D Center, with data and content support from the “Southern Plus” Content Operations Center, Southern Daily Local News Department, and Southern Daily Pearl River Delta News Department—representing a typical new media product born from deep integration of technology and content.

[Figure 3: see original paper] Guangdong Province Epidemic Map Real-Time Query System

5. Reflections and Considerations

5.1 Establish an Independent Technology R&D and Innovation Team

The new media era, particularly the mobile internet era, features diverse and constantly changing production, creation, dissemination, and display methods. Technology platform construction and product function development can no longer rely on external vendors for one-time solutions as in the traditional media era. An independent R&D innovation team must be established, equipped with product managers, UI designers, front-end App developers (Android, iOS), web developers, and back-end developers to achieve autonomous control of core technologies. Only by firmly grasping technological leadership and enabling rapid iterative updates can we timely and effectively support innovative and exploratory businesses and market changes arising from deep media convergence.

5.2 Closely Align Technology Empowerment with Media Business Development

No matter how good the technology, it equals zero without application scenarios. Technology application must be closely integrated with business. The technology platform is the implementation of business requirements, involving extensive demand integration and communication coordination that requires participation and joint research from all business departments. With new media development, technology has become an important wheel in the “four-wheeled carriage” of newspaper convergence development alongside content, business, and operations. Technology platform construction is not just the technology department’s responsibility; it requires strengthening two-way integration between technology and business departments to cultivate “business-savvy technical personnel” and “technology-savvy editorial personnel.”

5.3 Continuously Strengthen Technology Optimization to Improve Platform Quality

As a mainstream media party client, App user experience is critically important. Continuous technology optimization is needed to achieve optimal product experience. Evaluating a technology platform’s quality involves two dimensions: functional indicators and technical indicators. If functional indicators address the issue of existence, technical indicators address the issue of excellence. Although technical indicators are mostly invisible, they truly test a platform’s quality. Under conditions of massive user access, massive data processing, and weak network environments, differences in technical indicators become prominent. Excellent technical indicators mean good user experience, which helps retain users and improve stickiness.

5.4 Explore Organizational Structures and Technical Implementation Better Aligned with Convergence Transformation Paths

Technology platforms essentially represent “organizational structure + management philosophy + business model” implementation. As Conway’ s Law states: “Organizations which design systems are constrained to produce designs which are copies of the communication structures of these organizations.” In other words, “when enterprises increasingly rely on information technology, whether organizational structure matches information system architecture is key to successful transformation.” Advancing technology convergence means breaking the original relatively independent accounting and assessment methods of various business departments, as technology must continuously adapt to changes in organizational structure, management norms and processes, business models, and new technological developments.

After several years of practice, the “Southern Plus” mobile publishing platform, built with the full strength of Southern Media Group, has achieved mainstream communication reaching millions, tens of millions, and hundreds of millions of users, driving deep media convergence development. As big data, cloud computing, artificial intelligence, virtual reality, IoT, and other new technologies continue to evolve, the “Southern Plus” mobile publishing platform will continue adopting the internet product development model of “small steps, fast running, and continuous iteration,” maintaining a high-paced version update frequency, continuously expanding application scenarios, building intelligent capabilities, and optimizing the platform to ensure high-quality sustainable development. This provides more advanced weapons for the main force to advance into the main battlefield and offers stronger platform support for accelerating the Group’ s deep media convergence development.

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Author Biographies:

Fan Yuping (1981-), male, from Hai’ an, Jiangsu, intermediate engineer, Southern Media Group.

Yang Wenbiao (1978-), male, from Dianbai, Guangdong, junior engineer, Southern Media Group.

Luo Xiaolong (1988-), male, from Shuangfeng County, Hunan, Deputy Technical Director of Southern Plus Product R&D Center, Southern Media Group.

Zhang Zhongkai (1991-), male, from Xiji, Ningxia, Deputy Technical Director of Southern Plus Product R&D Center, Southern Media Group.

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

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