Construction and Technical Exploration of the 'Central Kitchen' in the Newspaper Industry (Postprint)

Authors: Xu Zikai

Date: 2023-10-08T00:00:00+00:00

Abstract

This paper analyzes the new media technologies adopted during the construction of the "central kitchen" model in the context of media convergence transformation across newspaper groups nationwide, and introduces the experimental "central kitchen" construction initiatives and achievements of the News Press under Shanghai Newspaper Group through the utilization of new technologies.

Full Text

Research, Integration and Development: The Construction and Technical Exploration of the "Central Kitchen" Model in the Newspaper Industry

Abstract: This paper analyzes the new media technologies employed in the construction of "Central Kitchen" systems across China's newspaper groups amid the broader context of media convergence and transformation. It introduces the implementation and achievements of the "Central Kitchen" initiative at Xinwen Newspaper, a subsidiary of Shanghai United Media Group, which leverages these emerging technologies.

Keywords: newspaper industry media convergence transformation; Central Kitchen; all-media editorial; multi-channel publishing

Classification Code: G202
Document Code: A
Article ID: 1671-0134(2017)05-032-02
DOI: 10.19483/j.cnki.11-4653/n.2017.05.002

Author: Xu Zikai (Shanghai United Media Group)

1. Background of "Central Kitchen" Construction in the Newspaper Industry

The rapid rise of new media platforms such as the internet and mobile devices has delivered a tremendous shock to traditional media, with the newspaper industry bearing the brunt of this impact. Recent social surveys indicate that the internet, particularly major web portals, has already attracted a considerable portion of the audience away from traditional media, and this attraction will inevitably strengthen as technology continues to advance. The revolutionary changes in information dissemination methods and modes have led to the emergence of diverse media forms like online media and mobile media. Under this assault, the world's newspaper industry has seen its revenue growth plummet, and China's newspaper industry faces the same predicament.

Transformation is imperative for newspapers, and regardless of the approach—whether integrating upstream and downstream operations across the entire industry chain, exploring cross-regional, cross-industry, and cross-media ventures, or pursuing deeper capital convergence—the core lies in breaking down boundaries. With new media forms proliferating, the integration of existing resources has become an essential consideration. Consequently, the concept of "all-media" has gained increasing traction. By the end of 2009, China had established 54 newspaper groups, nearly all of which had proposed all-media concepts encompassing teams, departments, products, system platforms, office workflows, and collaboration models. Over the past two years, further exploration based on this all-media construction approach has yielded new results, most notably the "Central Kitchen" model pioneered and successfully implemented by media organizations such as People's Daily.

2. Definition and Technical Platform of the "Central Kitchen"

The "Central Kitchen" functions as both a hardware foundation and technical platform, as well as the "brain and nerve center" of operations, and should provide basic functions including centralized command, editorial coordination, efficient collaboration, and information communication. In essence, it represents a novel editorial mechanism where newspaper media organizations adjust their organizational structures and workflows after launching all-media editorial platforms, using technical means to strengthen information collection and processing, coordinate personnel, and ultimately produce news products efficiently for both traditional and new media while tracking and supervising published content.

Structurally, the "Central Kitchen" represents a complete integration of business and technical platforms. While the technical platform serves as the foundation, the more critical business platform comprises the new editorial workflow mechanism, specifically employing various methods to stimulate and enhance the professional capabilities of editorial staff. The foundational technical platform

is essentially the long-developed "all-media editorial system," which should enable unified collection, processing, and editing of all-media information; support cross-media integrated layout and multi-person collaborative editing; achieve "create once, publish many times" across multiple media channels and platforms; and provide supervision and analysis of publication effects.

3. Technical Research on the "Central Kitchen" Media Platform

To meet business platform requirements and implement specific functions, "Central Kitchen" technical platforms typically employ several new media technologies.

3.1 Distributed Cloud Crawling and Semantic Analysis Technologies

The primary requirement in building a "Central Kitchen" is the real-time aggregation of data from various news websites and the identification of trending topics. However, with internet information growing exponentially daily, traditional centralized data search and crawling methods are inadequate for handling such massive data acquisition and processing. Currently, "Central Kitchen" systems generally employ distributed cloud crawling engines focused on collecting multimedia resources to provide users with an industry-specific massive data warehouse. These engines use flexible, easy-to-write Python scripts to intelligently analyze and extract various resources, distribute storage loads across multiple servers, collect data through cloud crawling patterns, and automatically aggregate it into central data servers to establish a vast news database for user access and selection.

The initially collected data comprises multiple media formats including text, audio, and video, with such large volumes that manual classification, retrieval, and publication become impractical. Therefore, "Central Kitchen" systems typically integrate semantic analysis technology that combines natural language processing, image recognition, video analysis, and cross-media data mining. By leveraging structured analysis, low-level feature extraction, high-level semantic analysis, and cloud computing frameworks, these systems achieve high-precision, high-speed news processing. Semantic analysis technology ultimately enables index modeling and management of massive news data aggregated by the "Central Kitchen," facilitating early warning and discovery of news hotspots while providing a data foundation for subsequent news product tracking and copyright protection.

3.2 Mass Data Storage and Mining Technologies

Due to its aggregation of media resource data across the entire network, the "Central Kitchen" faces endless capacity growth demands in data storage, requiring continuous expansion of storage space. Consequently, the technical platform must integrate advanced storage management technologies for unified

data administration, implementing several key functions: (1) managing new media resource data storage through a unified control interface; (2) enabling rapid data mirroring, backup, recovery, and cleanup; (3) implementing tiered storage that processes different data according to priority levels; and (4) optimizing storage technology by automatically eliminating duplicate data to free up space, objectively increasing capacity while expanding system performance.

The massive data mining engine focuses on editorial staff search intentions, employing advanced techniques such as pattern recognition and text mining to extract text, images, audio, video, and programs from web pages. It processes data through attribute labeling, feature abstraction, and category classification, reorganizing resources into new collections that enable extensive mining across sources and categories. At the business level, this technology accelerates news resource discovery and utilization for editorial staff while providing unexpected yet relevant search recommendations during writing to broaden perspectives and enhance work efficiency.

3.3 All-Media Production and Publishing Technologies

Currently, media editors must handle multimedia news production tasks, simultaneously processing various news materials in different formats including text, images, and audio-video, and publishing finished products across multiple channels such as newspapers, Weibo, WeChat, and mobile clients. To simplify editorial work, the "Central Kitchen" must employ a completely new set of news production and publishing technologies.

The "Central Kitchen" editorial platform typically includes a built-in editor meeting new media editorial requirements, featuring image processing, audio-video integration, mixed text-image layout, word counting, version tracking, and version query functions that enable editorial staff to complete news gathering and editing quickly while enabling version traceability and responsibility attribution afterward. The platform's underlying architecture stores multimedia news data in XML format files compliant with newspaper industry information language standards. This standardized XML approach allows rapid format conversion and transfer between internal systems and associated platforms, flexibly meeting publication requirements. Furthermore, the platform integrates multiple publishing platform interfaces—including newspaper layout software, WeChat, Weibo, and news clients—into a unified, centrally managed system that ultimately enables one-time editing and one-click publishing of multimedia news content products.

3.4 Editorial Staff Organization and Coordination Technology Based on WeChat Enterprise Account

WeChat currently ranks as China's most popular instant messaging software. The WeChat Enterprise Account, a mobile service provided by WeChat for corporate clients, offers a convenient entry point for "Central Kitchen" mobile

applications. Developing "Central Kitchen" mobile applications based on the WeChat Enterprise Account offers several significant advantages.

Development Simplicity. WeChat Enterprise Account application development evolves from web application development, which proves highly advantageous for migrating the overall "Central Kitchen" technical platform—originally built on a B/S architecture—to WeChat Enterprise Account mobile applications. Through simple page adjustments, approximately 70% of the platform's basic functions can be implemented on WeChat Enterprise Account, including core functions such as information browsing, news gathering and editing, material uploading, multi-channel issuance, and finished product browsing.

Convenient Communication. Developing "Central Kitchen" mobile applications on WeChat Enterprise Account primarily leverages WeChat's convenient communication features, which are crucial for implementing essential business platform functions like task assignment and personnel coordination. Utilizing WeChat's built-in SDK, WeChat Enterprise Account development can quickly implement rapid communication forms including personnel location, mass messaging, group chat, and group video calls. Maintaining timely communication among task members facilitates rapid task advancement and completion.

Easy Deployment. WeChat is an essential smartphone application for editorial staff. Deploying WeChat Enterprise Account requires only adding organizational personnel information in the enterprise account backend and inviting users to scan a QR code for access. The mobile application's usage pattern, similar to WeChat Official Accounts, makes "Central Kitchen" technical platform functions more accessible, significantly reducing deployment and training costs.

4. Application of "Central Kitchen" at Xinwen Newspaper

The Information Technology Center of Shanghai United Media Group began jointly researching all-media editorial technologies with universities and development companies years ago, undertaking multiple national and municipal-level research projects funded by the Ministry of Science and Technology and Shanghai Municipal Science and Technology Commission. This extensive experience has enabled numerous media units within the group to integrate all-media systems into daily news production and management applications.

In 2016, Xinwen Newspaper, a group subsidiary, adopted the "Central Kitchen" concept to attempt media convergence transformation. Xinwen Newspaper represents an influential media organization in Shanghai, publishing *Xinwen Morning News*, a comprehensive metropolitan newspaper that, after nearly two decades of development, has established a distinctive style as Shanghai's highest-circulation morning daily and one of the nation's largest-circulation morning newspapers. The Morning News has developed a relatively complete new media layout: its "Community Morning News" subsidiary covers 38 communities, 600 neighborhood committees, and 3,000 residential compounds across Shanghai; its Sina Weibo official account boasts over 29 million followers, ranking first among

national metropolitan newspapers for 13 consecutive months; and its WeChat official account has 600,000 followers, placing it among the top ten media public accounts nationwide. Additionally, in 2016, the Morning News launched its own news client, *Thoughtful Shanghai*, to better serve mobile internet users with news and information services. With this expanding all-media layout, the newspaper faced significant demands for content production and editorial staff coordination management, making media convergence to enhance productivity an urgent priority.

The newly launched all-media editorial system incorporates the latest all-media editorial technology research from the group and its partners, ultimately achieving the following distinctive features: (1) processing heterogeneous multi-source data from increasingly complex new media including news portals, video sites, forums, blogs, and social media like Weibo through collection, extraction, semantic analysis, and behavioral analysis to provide comprehensive, reliable data and intelligent analysis results more accurately; (2) implementing a real-time collection, management, and analysis integrated platform that acts as a "filter net" for content dissemination, addressing news hotspot discovery, news clue tracking, public opinion monitoring, dissemination analysis, intelligent indexing, and intelligent retrieval; (3) incorporating a built-in story planning function that enables newspaper leaders to quickly screen newsworthy clues, plan topics, and assign tasks to editorial staff; (4) integrating multi-channel publishing technology for deep-level news data processing and application, incorporating various all-media product creation tools to help editors complete diverse, distinctive all-media products and publish them with one click across various media, channels, and terminals; (5) crawling news website data to timely analyze the dissemination effect of proprietary news products, obtain republication statistics, monitor news comment content, and provide data support for news copyright protection; and (6) establishing SSL VPN and deploying WeChat Enterprise Account mobile applications and mobile editorial clients to enable editorial staff to access the platform anytime, anywhere using various terminals for rapid personnel coordination and manuscript editing.

Since the system's implementation at the end of 2016, it has operated stably as Xinwen Newspaper's "Central Kitchen" technical platform. The implementation of this "Central Kitchen" media convergence transformation has helped Xinwen Newspaper effectively consolidate resources, improve the quality of news products on *Xinwen Morning News* and other media platforms, enhance the work efficiency of Morning News editorial staff, and ultimately strengthen the newspaper's core competitiveness.

(Author Affiliation: Shanghai United Media Group)

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