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## Postprint: Reflections on the Integration of Data and Business in the Context of Media Convergence

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### Abstract

With the rapid development of the Internet, big data technology has been extensively applied across various industries. This paper primarily presents an analysis of big data applications in public security media operations and the role of big data analytics in this field, aiming to enable public security media operations to fully leverage the value advantages of their own resources, further enhance the operational and management capabilities of new public security media, facilitate grassroots police officers in accurately and promptly handling incidents, and improve the combat effectiveness and service level of frontline police officers.

### Full Text

## Reflections on Data-Business Integration in the Context of Media Convergence

**Abstract:** With the rapid development of the Internet, big data technology has been widely applied across various industries. This paper primarily introduces the application analysis of big data in public security media operations, as well as the role of big data analytics in this domain. It aims to enable public security media operations to fully leverage the value advantages of their own resources, further enhance the operational and management levels of new public security media, facilitate frontline police officers in handling incidents accurately and promptly, and improve the combat effectiveness and service quality of frontline officers.

**Keywords:** Big Data; Public Security Media; Application

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### 1.1 Internet Data Collection

Utilizing mature Internet information collection tools and data centers, we implement real-time monitoring and content acquisition from target websites, promptly retrieving the latest web pages locally for content analysis and filtering operations [3]. The output of these collection tools forms a holographic information set of new web pages, with detailed information for each page completely recorded, including page name, size, date, title, text content, images, tables, and more. While achieving automated collection and aggregation of entire-network data, we provide a lightweight one-click acquisition tool for designated content. When media personnel browse content on the Internet that may be relevant to the Public Security Newspaper or related to writing directions, they can directly push the content to the converged media big data cloud support system through this one-click tool. The system will automatically complete intelligent processing stages such as intelligent filtering of page content and structured data cleaning. This “manual + intelligent” resource acquisition approach comprehensively and precisely locks onto Internet data sources.

### 1.2 Internal Data Resource Integration

Public Security Newspaper big data organically integrates, stores, and manages the newspaper’s historical resources, production resources from various business systems, Internet data, and user data, providing a shared resource pool for editorial staff to conduct news material acquisition, editing, service operations, and other business tasks [1]. The integration of internal data resources primarily involves extracting, processing, and storing data from various system data sources. Internal resources include historical media assets, newly produced resources from multiple channels, and third-party resources, mainly encompassing text, images, charts, audio, video, digital newspapers, and new media-related formats. The integrated data supports common data sources such as local files, shared files, FTP files, and HTTP files, and can be extended to new data sources according to specific requirements [4]. Through the organization and analysis of internal data sources, it facilitates the locking and analysis of internal data resources.

Utilizing a resource center with clear categorical navigation to capture text manuscript libraries, image libraries, Xinhua News Agency wire copies, finished manuscripts, WeChat, Weibo, and other channel resources, the system enables one-click acquisition of internal and external manuscript resources for the Public Security Newspaper, monitors the status of each manuscript, and enhances the newspaper’s data analysis and storage capabilities. The intelligent analysis function is based on mature big data analytics, employing artificial intelligence

technology for deep learning to process and analyze multi-source, multi-modal data. It provides data analysis support for business activities such as planning, acquisition, editing, distribution, influence evaluation, media and legal knowledge services, as well as for the operation and content management of new public security media. It also provides public security organs with Internet data summary analysis, editorial data, and tool support, facilitating use by frontline police officers, improving the dissemination power of public security news, and enhancing the combat effectiveness and service level of frontline officers [2].

## **2. Public Security Newspaper Big Data Management**

Public Security Newspaper big data encompasses four layers: big data collection, big data management, big data analysis, and big data application. The storage and retrieval of the big data management system support the business needs of converged media content production, information services, and operation platforms [5]. Due to the special nature of public security data, the management of Public Security Newspaper big data requires a highly reliable architectural design, necessitating a fully distributed, multi-replica, peer-to-peer, non-shared big data management system. Each newly added node can simultaneously increase system performance and storage capacity, enabling flexible storage and management of incremental data for the Public Security Newspaper.

## **3. Public Security Newspaper Big Data Intelligent Analysis**

Public Security Newspaper big data intelligent analysis represents the fusion of semantic content-oriented intelligent technologies with big data analysis systems, achieving a comprehensive intelligent support system for data services. The big data intelligent analysis system fully leverages cutting-edge technologies such as big data and cloud computing, combined with natural language processing and data mining techniques. It integrates the latest research findings in Chinese information processing, artificial intelligence, and information retrieval. Based on fundamental analytical techniques of text mining tools such as automatic classification and automatic clustering, it constructs and integrates management big data deep analysis models and police-specific data analysis models. The system receives calls for tools and models from upper-layer applications, providing technical support for various applications. Big data intelligent analysis maximizes the value of Public Security Newspaper resources and Internet resources [6]. By forming a big data center based on the public security industry, it collects, aggregates, organizes, analyzes, and utilizes content big data and user big data in the public security field, improving the effectiveness and satisfaction of news propaganda, promoting media transformation and convergence, enhancing public opinion guidance capabilities, and laying a solid data foundation for finding new service models.

## 4.1 Topic Planning

Topic planning needs to capture the temporal depth, spatial span, connotative depth, and dissemination breadth of selected topics [7]. Based on a big data cloud platform, the Public Security Newspaper conducts data collection, mining, and analysis, intelligently processing entire-network news information to construct functions for news clue discovery and analysis, news hotspot discovery and analysis, and in-depth event analysis, providing internal business personnel with topic clues and directional guidance [8].

**4.1.1 Clue Discovery and Analysis** Clue discovery and analysis utilizes algorithms such as clue detection clustering, correlation analysis, and importance analysis to achieve functions including entire-network real-time clue focusing, netizen attention clue focusing, and Weibo exposure [9]. It covers dimensions such as clue discovery, clue aggregation, clue monitoring, clue analysis, and clue calendar, helping business personnel quickly obtain entire-network news clues and providing support for reporting topic planning. For hotspot events in various vertical sub-domains of the public security industry, thematic analysis can be conducted. Thematic analysis represents the integrated utilization of big data intelligent analysis tools and analysis models from the People's Public Security Newspaper's police-related public opinion real-time monitoring and analysis system and the public security police big data cloud support system. It can automatically aggregate resources and information related to the theme according to set conditions, performing necessary statistical analysis and visualization. For example, conducting thematic analysis on the topic of "child trafficking" can produce the following forms of presentation: aggregating news reports on child trafficking in recent years, analyses of major solved cases, and public opinion focus across different channels; forming visual geographical analysis of regions where child trafficking occurs; creating trend analysis of child trafficking case numbers along temporal dimensions; and associatively displaying relevant laws, regulations, and clauses related to child trafficking, such as the Law on the Protection of Minors and the Adoption Law.

**4.1.3 Hotspot Discovery and Analysis** Hotspot discovery and analysis employs technologies such as hot word mining, hotspot news evaluation, and hotspot blog evaluation to conduct entire-network hotspot discovery, regional hotspot discovery, Weibo hotspot discovery, front-page headline clustering, ranking list analysis, and more, providing data support for topic planning.

**4.1.4 In-Depth Hotspot Event Analysis** By employing analytical methods such as focus restoration, viewpoint analysis, trend analysis, and sentiment analysis, we conduct multi-dimensional analysis of hotspot events, making the deep-level information surrounding these hotspot events more simple and intuitive.

## 4.2 Public Security News Communication Influence

The Public Security Newspaper utilizes the converged media big data cloud support system to obtain original manuscript information and conduct global statistical analysis [10]. By constructing influence analysis models and massive Internet indicator data, it implements hierarchical management of national media and obtains dissemination power indices, forming multi-dimensional influence analysis covering “region,” “field,” “channel,” “author,” “department,” “column,” and “time.” This promotes the overall improvement of dissemination power, influence, and credibility of public security news.

**4.2.1 Global Manuscript Dissemination Analysis** Based on the full volume of Public Security Newspaper manuscript data and Internet dissemination data, it statistically analyzes the publication volume, reprint volume, and discussion index of relevant manuscripts for global analysis. For hotspot manuscripts, visual tracking of quantity and change trends can be conducted on a daily basis.

**4.2.2 Manuscript Influence** Manuscript influence analysis specifically includes influence contribution analysis, media adoption influence analysis, manuscript influence channel coverage, manuscript influence regional analysis, and manuscript influence path analysis. Manuscripts within a specified time range in the Public Security Newspaper’s influence manuscript database can be sorted according to influence indices. Interpretation can be conducted across multiple dimensions including manuscript title, author, publication date, department, category, influence index, and influence indices across various channels.

## 4.3 Public Security Media and Legal Knowledge

The construction and management of knowledge systems form the foundation of public security media and legal knowledge services. Utilizing knowledge deep processing techniques and methods, it forms a unique knowledge service platform for the People’s Public Security Newspaper, including legal knowledge databases and typical case analyses, achieving deep processing of knowledge resources such as policies, regulations, and security prevention, and providing important references for public security media information dissemination and response.

**4.3.1 Public Security Media Analysis** Based on the business characteristics of public security media, we construct a multi-dimensional classification system for public security media information services. Grounded in the information resources of the Public Security Newspaper’s converged media and guided by this classification system, we analyze relevant events, particularly the latest policies issued by the state regarding political and legal affairs, providing interpretations of these new policies.

**4.3.2 Legal Knowledge** Based on the fundamental classification of the socialist legal system with Chinese characteristics and national policies and regulations, we provide the foundation for the legal knowledge database, organizing and presenting resources to complete the construction of the policy and regulation knowledge base. The legal knowledge database, guided by a comprehensive and scientific knowledge classification, provides internal and external users with hierarchical browsing and query services for legal provisions and policy clauses. While presenting specific legal provisions and policies, the knowledge base can also form visual knowledge associations with related resources, including typical case analyses, policy interpretations, and media reports.

#### 4.4 Typical Case Knowledge Analysis

Establishing a typical case database, we comprehensively depict each case from perspectives including context analysis, comprehensive analysis, and public opinion viewpoint analysis, providing rich knowledge resource information around cases to achieve thorough vertical and horizontal understanding of cases [11].

**4.4.1 Focus Context Analysis** Using time as a clue and taking the case analysis time range and intervals as conditions, while automatically aggregating information that has significant impact on case development along the timeline, combined with some important time nodes and information, we form focus context analysis on the occurrence and development trends of cases.

**4.4.2 Case Comprehensive Analysis** Utilizing text analysis technologies such as knowledge topic indexing and association analysis, combined with existing knowledge resources in the knowledge service platform, we achieve in-depth analysis of cases. Specifically, analysis can be conducted from aspects including media reports, case involvement analysis, expert interpretations, and legal basis.

**4.4.3 Public Opinion Viewpoint Analysis** Conducting in-depth public opinion analysis around cases, we comparatively analyze sub-topics generated by the case across official media versus civilian media, in-house media versus external media, and domestic media versus foreign media. We analyze viewpoints and commentaries on the event published by important domestic and international figures, media outlets, and institutions [12]. For some controversial cases, we provide sentiment analysis of public opinion viewpoints, comparatively analyzing the positive or negative tendencies of various media and the public toward certain sub-topics of the case. To establish connections between police personnel and various platforms, we establish specialized models for analyzing police personnel attribute information, life information, and work information according to the specific needs of local public security organs.

## 4.1 Topic Planning

Based on the business characteristics of public security media, we construct a multi-dimensional classification system for public security media information services. Grounded in the information resources of the Public Security Newspaper's converged media and guided by this classification system, we analyze relevant events, particularly the latest policies issued by the state regarding political and legal affairs, providing interpretations of these new policies.

### 4.1.1 Material Discovery and Analysis

Material discovery and analysis utilizes correlation analysis algorithms to achieve clustering, classification, display, and analysis of information such as policy and regulation news, conference news, natural disaster news, and safety accident news, with options for autonomous subscription. Material discovery and analysis uses relevant information to discover associations, forming topic directions while providing material support for topic selection.

### 4.4.4 Similar Case Recommendation

Utilizing text mining and analysis technologies such as association analysis and clustering analysis, we search the case database of the knowledge service platform to find cases with similar characteristics to the current case for associative recommendation. Similarity analysis can be conducted from multiple angles including domain classification, domain theme, occurrence period, occurrence region, personnel, laws and regulations, and more.

### 4.5.1 Case-Related Personnel Analysis Model

By constructing a case-related personnel analysis model, we focus on case suspects and their related persons. Personnel profile information is imported through the resource database, including household registration, workplace, address, and other information. External collected data can also be imported, such as bank records and call logs. Based on this data, we form association relationship analysis of case-related personnel across temporal, spatial, and other dimensions, thereby providing analytical materials for case investigation [1][2][3][4].

### 4.5.2 Online Activity Trajectory Mining Model

We construct an indicator system and model for mining the online activity trajectories of key personnel, providing a foundation for monitoring and tracking their online activities. Using persons and events as dimensions, we build a hierarchically clear analytical indicator system, forming single-dimension and combined-dimension model construction and visual analysis [5][6][7][8].

#### 4.5.3 Internet Hype Analysis Model

We construct an indicator system and model for Internet hype analysis, providing a foundation for multi-dimensional analysis of Internet hype actors. The indicator system consists of multi-level indicators, including first-level indicators of publisher basic information and second-level indicators of network relationship characteristics, which may include netizens, affiliated media or organizations, blogs, Weibo, Weibo friends, and topic discussion relationships. Based on these, we construct foundational models for publisher characteristic analysis, association analysis, and influence analysis, comprehensively forming an Internet hype analysis model [9][10][11].

#### 4.5.4 Intelligence Warning Model

We construct an intelligence warning indicator system and model to rapidly discover Internet intelligence information. Intelligence warning indicators include abnormal surges in clicks and replies on Internet intelligence, preset keywords, abnormal content from key netizens, abnormal content from key websites, etc. By assigning different weights to various indicators and setting preset thresholds, warning signals are triggered [12][13].

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

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