Exploring the Impact of Big Data Technology on the Field of News Communication: Postprint

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Abstract

With socioeconomic development and scientific-technological advancement, information technology has been extensively applied across various domains, among which big data technology exerts the most profound and particularly significant influence on news communication in China, confronting news media with unprecedented challenges. Therefore, news media should, based on the key characteristics of big data dissemination in the data era, analyze the impact of big data technology on in-depth news communication, and consequently enhance the efficiency of news information dissemination.

Full Text

Big Data Technology' s Impact on the Field of News Communication

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Abstract: With the development of socioeconomic achievements and advances in science and technology, information technology has been widely applied across various fields. Among these, big data technology has exerted the most profound and particularly significant influence on news communication in China, presenting news media with unprecedented challenges. Therefore, news media should analyze the impact of big data technology on in-depth news communication based on the key characteristics of big data dissemination in the data era, and thereby enhance the efficiency of news information dissemination.

Keywords: big data technology; news communication; media convergence; news information; information technology

1. Introduction

In the era of big data, both the collection and distribution of news information, as well as its content and presentation, have been fundamentally affected. Under these circumstances, the field of news communication faces tremendous challenges and opportunities. Media convergence has become an inevitable trend for future media development. In the big data era, media must adapt to new and diversified communication methods while steadfastly maintaining the objectivity and credibility of reporting.

Current information forms are no longer limited to single text or images. Instead, through "data," text, images, audio, and video are seamlessly integrated to present audiences with richer, more concrete, and more powerful news information [2]. This makes media communication more effective and popular.

2. Characteristics of Big Data Technology

Big data technology is a technique for extracting and analyzing effective information from massive datasets. It encompasses not only large volumes of data content but also all elements of data aggregation. Information technology has become an important tool for monitoring network information dissemination processes across various fields.

The use and analysis of big data technology originate from the internet. The vast amount of data and information presents unprecedented challenges for search companies. The development of big data technology has also given rise to new media platforms such as WeChat, Weibo, and Zhihu—self-media social platforms whose growth has propelled the advancement of news communication [1]. Today, news and information dissemination relies heavily on big data processing technology, which has opened a new pathway for news communication.

In the big data era, information is characterized as "massive, diverse, persistent, and effective." Technological progress has significantly impacted media. The primary objective of news communication is to pursue "objectivity, authenticity, and quality in journalism." On this foundation, the emergence and development of big data technology can help media acquire more information, effectively analyze user data, and utilize data results to meet user needs. By filtering vast amounts of data and performing other related functions, media can accurately define target audiences for the most valuable information content and improve service levels.

To provide higher-quality news services to audiences, the news industry has reformed its traditional communication philosophy, placing service at the forefront. For example, by collecting data on user likes, favorites, and forwarding counts from internet platforms such as Kuaishou and Xiaohongshu, and analyzing this collected data through big data technology, media can calculate audience preferences and subsequently push targeted content to users, thereby offering better service [3].

3. Impact on News Communication

3.1 Visual News as the Primary Communication Method Due to continuous progress in China' s economic, social, and scientific development, large-scale data processing technology has been widely applied across various fields. In the media industry, big data technology has discovered a new method for information collection and dissemination—visual news—in response to audience demands for information sources. "Visual news" refers to news current affairs based on media data, disseminated through short videos and other means. In the information dissemination era, visual news leverages substantial information technology and has gradually demonstrated its uniqueness and enormous development potential, becoming the primary form of information communication [2].

3.2 Transformation of Dissemination Modes 3.2.1 Shift in Communication Philosophy: The transition from content-centered to service-centered dissemination. In the big data era, the primary philosophy and purpose of news communication is to pursue "objectivity, authenticity, and quality in journalism." The emergence and development of big data technology can help media acquire more information, effectively analyze user data, and utilize data results to meet user needs.

3.2.2 Diversification of Communication Methods: The shift from "single communication method" to "multiple communication methods." Big data optimizes news presentation and promotes media convergence. Traditional news reports typically relied on simple text and images. Under big data technology, news reporting can explore and develop various new dissemination forms while using traditional methods, such as combinations of text and graphics, audio and video integration, to increase audience interest. The news industry needs to strengthen integration with the internet, utilize big data processing technology more extensively to promote industrial development and media convergence, and enable more diversified dissemination.

3.2.3 Enhancement of Communication Efficiency: The shift from real-time to full-time communication. The emergence and development of big data technology have promoted media convergence and initiated a transitional period where news moves from real-time reporting to "full-time" communication. Compared with real-time reporting, full-time communication has been continuously strengthened. It is no longer limited to the temporal dimension but transcends both space and time. The news reporting process unfolds comprehensively 24 hours a day to ensure quality content that meets diverse audience needs.

3.3 Transformation of the Receiver-Disseminator Relationship The emergence and development of big data technology have had a non-negligible impact on China' s media industry, and the development of media has further transformed the relationship between receivers and disseminators. With the development of digital technology, receivers and disseminators in the big data

era often exhibit "decentralized" characteristics, and the boundaries between them have become increasingly blurred. Receivers are no longer passive recipients but can actively disseminate information. This transformation has greatly increased audience participation in news communication, expanded information dissemination methods and channels, and promoted the continuous, healthy development of news in a more equitable, free, and open direction.

4. Impact on Specific Aspects of News Communication

4.1 Impact on News Communication Efficiency The most important and critical issue in news reporting is the updating and timely dissemination of current events. Currently, big data technology is frequently used in news communication through the internet. This not only provides more reporting types based on each audience member' s preferences but also reports news in real time, greatly improving news communication efficiency [4]. Additionally, based on current experience, different types of journalists can extract and filter valuable information from large datasets. Meanwhile, this data is carefully studied and collected, then edited to enhance news efficiency and maximize information quality.

4.2 Impact on News Communication Channels With the development of big data technology, increasing amounts of information are related to people' s lives. Data information currently shows a trend of diversification and fragmentation, most of which is typically unstructured. In this context, the information layer utilizes large-scale information technology to expand news channels and advance the news release process through multiple channels. Furthermore, technology has increased the speed and number of channels for news communication, thereby improving communication efficiency to a certain extent.

4.3 Impact on News Communication Methods As big data information technology continues to update and develop across various media, high-speed interactive networks are forming. During news release, journalists use big data technology to mine, analyze, classify, and disseminate various news information, which has had a certain impact on the internet. This impact is reflected in audiences' free commentary and creating hot topics through online comments to amplify news dissemination.

5. Coping Strategies for News Communication in the Big Data Era

5.1 Optimizing Dissemination Methods In the big data technology environment, news dissemination primarily depends on changes in personnel philosophy. Therefore, only by forming correct communication ideas can big data be effectively utilized for news dissemination.

First, data must be the fundamental concept. In today' s world where big data is widely used and data services are ubiquitous, the media industry needs

to use big data to process and utilize information. Big data mining technology begins with data collection, integration, protocols, conversion, and cleaning. Data analysis is conducted based on information provided by stored data, using fundamental data processing methods such as genetic algorithms, neural networks, fuzzy groups, rule processing, decision trees, and case-based reasoning [5]. Consequently, journalists can discover large amounts of hidden information and apply it to news articles, significantly improving their work efficiency. High-quality journalism is achieved through correct data concepts.

Second, optimize communication methods through cross-boundary integration and convergence. In the past, news communication methods primarily involved journalists investigating local news events and writing related articles—a work model constrained by various factors such as space and time. Today, journalists need to optimize news communication methods. In the big data environment, big data technology will push the journalism industry toward a more successful stage, and information-media convergence is an inevitable trend. Against this backdrop, to achieve effective, healthy, and sustainable development of news communication, media practitioners must actively reform existing production channels, introduce service concepts and innovative awareness, and maintain sensitivity to industry development to accurately grasp industry trends. Taking information retrieval as an example, mobile terminals such as smartphones and cameras are widely used to improve the efficiency of information production and reception.

5.2 Optimizing News Production Mechanisms In the big data environment, optimizing news production mechanisms is a major challenge for journalists. Only by changing news production methods can contributions be made to the sustainable development of news communication and the improvement of journalists' work quality. News production mechanism optimization should consider the following aspects:

(1) **Searching for news information in media.** In recent years, the use of self-media such as Weibo and WeChat has become increasingly common. The public is no longer merely a group that receives news and information but has become the main body that produces and disseminates news and information. Therefore, journalists should search for relevant information in these media and use it to release current affairs in real time. In the big data environment, journalists searching for news through multiple channels can not only improve news quality but also enhance work efficiency.

(2) **Integrated media platforms.** In the big data environment, for media to disseminate news and better collaborate with each other, they need to start with media platforms, integrate them, and promote more efficient and accurate news communication. For example, China Central Television established CCTV International Co., Ltd., integrating various new media resources and transferring bus mobile TV, IPTV, mobile TV, and internet TV businesses to CCTV [7].

5.3 Transforming Traditional Thinking in the News Industry The news industry has always been responsible for collecting new data, gathering authentic information, and reporting news. However, the emergence of large-scale information technology has significantly impacted traditional thinking modes and news communication methods. In the big data era, the primary task of media is to rapidly change traditional thinking, adapt to modern technology, adapt to different evolving technologies, and provide meaningful responses to various online news events. Journalists need to learn to think from an internet perspective. Only in this context can traditional media and new media develop together, break through constraints, and achieve innovative development for both journalists and the news industry.

6. Conclusion

In the new era, the shortcomings of traditional media are continuously being affected. First, the accelerated pace of life increases demands for news and information timeliness. Traditional media channels are too limited to adapt quickly. Print media such as newspapers and magazines have begun to lose portions of their audience, primarily because their relatively slow speed cannot effectively align with the era' s development. Therefore, in this new context, traditional media must adhere to accurate and rigorous concepts, strengthen data infrastructure, actively update existing ideas, and optimize information production processes.

Second, the service concept must be central. In a big data environment, data sources are highly complex. Whether modern or traditional media, when referencing these sources, they should prioritize the audience. In this situation, the concept of "service first" must be accepted, providing relevant news content according to user needs. For example, Toutiao continuously finds specific "tags" for users over time and sends corresponding news once it identifies a user' s "tags." Additionally, it analyzes user behavior and provides data links. For instance, journalists can use big data technology to connect news with various related information, analyze user behavior across different public accounts, and recommend news and other related information to users after they view specific news.

It is important to note that when establishing a service-centered concept, information cannot be provided blindly. If users receive information that differs from their psychological expectations, satisfaction will change. Therefore, staff should integrate, analyze, and calculate news content early. Only content that meets public demand is truly valuable. For example, the "Yidian Zixun" App is an online client with broad news coverage and high audience satisfaction [6]. At the application' s inception, managers determined its development direction, committed to finding users, integrating marked information, and finally delivering unified data information according to tag classification. Following this concept maximizes satisfaction of the broad masses' needs.

Moreover, based on data analysis, the definition of news service attributes should be adjusted and improved, with additional service content added. For example, official WeChat public accounts primarily promote recruitment content but simultaneously add "job-seeking tips" and "interview skills" alongside job vacancy announcements. This is based on the universal relationship of users' own needs, thus increasing clicks and attention. Many media outlets now provide "site links," which not only fully satisfy user needs but also achieve network resource sharing.

Looking ahead, large-scale data processing technology will become the primary medium. Data analysis is an important skill for journalists. Media must continue to actively adapt to new technologies. Journalists need to rapidly change traditional news perspectives and forms, enrich news communication channels, identify audience preferences and needs, and release targeted content.

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