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Research on the Application of Big Data Technology in News Reports on Rural Revitalization and Inclusive Finance in the Era of Intelligent Media

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Abstract. In the era of intelligent media, big data technology has provided a brand-new path for reform in news reports on rural revitalization and inclusive finance. This study adopts literature analysis and case study methods to systematically explore the application scenarios, challenges, and optimization paths of big data technology in relevant news reports. The results show that big data technology has significantly improved the accuracy and communication power of reports through the digitization of news collection, the regularization of news analysis, and the visualization of news presentation. However, it also faces problems such as scattered data sources, high technical thresholds, and information cocoons. By means of optimization paths such as building data sharing platforms, cultivating interdisciplinary talents with expertise in "data + journalism", and designing anti-cocoon strategies, the in-depth integration of big data technology with news reports on rural revitalization and inclusive finance can be effectively promoted, thereby providing strong public opinion support for the development of related undertakings.

Keywords: Big data technology, rural revitalization, inclusive finance, news reports

1. Introduction

This study focuses on the era background where big data technology is developing rapidly and deeply penetrating into various industries. Its role in reshaping the field of news reporting has become increasingly prominent. As important components of the national strategy, rural revitalization and inclusive finance have their news reporting quality directly related to the policy communication effect and public perception. The traditional reporting mode that relies on on-site visits has problems such as low efficiency, limited coverage, and superficial analysis. This research is of great significance for improving the quality of news reports on rural revitalization and inclusive finance, optimizing the effect of policy communication, helping the public form a comprehensive understanding, and thereby providing strong public opinion support for the advancement of relevant national strategies. This study mainly focuses on the specific applications, challenges, and optimization paths of big data technology in news reports on rural revitalization and inclusive finance in the era of intelligent media. The study employs literature analysis and case study methods. Among them, the literature analysis method sorts out relevant academic literature, industry

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reports and policy documents at home and abroad, refines the core tools of big data and the particularities of the two types of reports, and lays a theoretical foundation for the research framework. The case study method selects cases that are directly related to the theme, clearly apply big data technology, and are public and representative, conducts scenario restoration and effect analysis, so as to summarize the application logic, effectiveness and existing problems. The ultimate research goal of this study is to answer questions such as how big data technology can be specifically applied to these two types of news reports, what core challenges are encountered in the application process, and how to improve the application effect through optimization strategies. It aims to provide theoretical and practical references for enhancing the quality of relevant reports and facilitating the communication of national strategies. To achieve this goal, a systematic review of existing literature has been conducted, and in-depth analysis of typical cases has been carried out.

2. Literature review

Existing studies have explored from multiple dimensions, such as the integration logic of big data technology and news reporting, the practical dilemmas in rural revitalization reports, and the technical empowerment of inclusive finance, providing diversified theoretical references and practical experiences for this paper.

In the field of integration between big data technology and news reporting, the academic community has formed a dual understanding of technological empowerment and potential risks. Huang Xiaobin put forward the concept of "data-driven journalism", clarifying that big data technology can significantly improve the accuracy and depth of reports through massive information mining and law analysis. This view provides core theoretical support for the application of big data in rural revitalization and inclusive finance reports "from phenomenon description to law mining" [1]. Wang Qiang further proposed a dual-driving framework of "data-driven" and "narrative-driven", pointing out that data news production needs to balance technical rationality and humanistic narration. This is of great enlightenment to the integration of "the coldness of data" and "the warmth of rural stories" in rural revitalization reports [2]. From the perspective of industry reflection, Liu Yikun holds that although data journalism in the era of big data has broken through the temporal and spatial limitations of traditional reporting, it also faces problems such as verification of data authenticity and narrative simplification caused by technical dependence [3].

In the research on rural revitalization reports, there are both explorations into technological empowerment and analyses of practical dilemmas. Xiao Jianxiong, taking Xinhua Daily Telegraph as the research object, revealed the production dilemmas in rural revitalization reports: high cost of obtaining grass-roots information, the tendency of reporting perspectives to fall into "elitism", and severe content homogenization. This is consistent with the limitations of traditional reports that rely on on-site visits, highlighting the necessity of big data technology to improve reporting efficiency and differentiation [4]. Yu Yang, starting from the relationship between digital media and rural society, pointed out that while digital technology is reshaping rural communities, it may also exacerbate urban-rural information inequality. This provides a macro perspective for understanding the "social effects of technological application" in rural revitalization reports [5].

In the research on the relationship between inclusive finance and data technology, the paths and boundaries of technological empowerment have become core issues. Chen Hua & Hu Xiaolong focused on the application of blockchain technology in rural inclusive finance, believing that its characteristics of decentralization and immutability can improve the transparency and trustworthiness of financial services, which provides a technical reference for "data credibility verification" of big data technology in inclusive finance reports [6]. Xing Yan dialectically analyzed

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the "dividends" and "gaps" of rural digital inclusive finance. On the one hand, digital technology has expanded the coverage of financial services [7]. On the other hand, the weakness of rural digital infrastructure and the insufficient digital literacy of farmers have led to the exclusion of some groups. This view provides a key basis for the analysis of "urban-rural differences in technological application" in inclusive finance reports. Ding Chengwei empirically found through data of GEM (Growth Enterprise Market) enterprises that digital inclusive finance can alleviate the financing constraints of small and medium-sized enterprises [8]. Li Jianwei confirmed that it can enhance the willingness of rural labor to return, and both provide logical support for big data technology to explore the linkage laws between inclusive finance and rural revitalization from the perspectives of microeconomic effects and social effects [9]. Li Fangting's research on Northeast China further refined this correlation, pointing out that the poverty reduction effect of digital inclusive finance has regional differences, and it is necessary to design report content in combination with local industrial characteristics. This provides practical enlightenment for the "regional adaptation" of big data analysis [10].

To sum up, existing studies have outlined the application of big data technology in the fields of news reporting, rural revitalization, and inclusive finance. However, there are still three shortcomings: First, insufficient attention has been paid to the particularities of rural revitalization and inclusive finance reports, failing to fully explore technical application scenarios in combination with the "grass-roots" and "policy-oriented" characteristics of these two types of reports. Second, there is a lack of systematic integration of the entire process of "collection, analysis, and presentation" of big data in the two types of reports, with most studies focusing on a single link. Third, the analysis of challenges in technical application is not specific enough, and the optimization paths lack pertinence. Building on existing research, this paper aims to address the aforementioned research gaps and provide a systematic analytical framework for the in-depth integration of big data technology with these two types of reports.

3. Case analysis

To specifically present the practical forms of big data technology in news reports on rural revitalization and inclusive finance, this study selects three representative practical cases, covering the entire process of news production including collection, analysis, and presentation. Details are as follows:

3.1. Data mining of e-commerce platforms and reports on rural characteristic industries

When planning a series of reports on rural revitalization, a provincial-level media outlet introduced big data tools into the clue mining process. By collecting and sorting out the agricultural product sales data from major e-commerce platforms over the past year, with a focus on information such as sales growth rate, geographical distribution, and user reviews, a batch of counties with outstanding performance in characteristic agricultural products were selected. For example, data showed that the sales volume of wild mushrooms in a certain mountainous area nearly tripled in half a year, with a repurchase rate of 45%. Taking this as a clue, on-the-spot interviews were conducted, combined with an analysis of the local government's e-commerce support policies and logistics construction. The final report adopted a "data list + on-site story" format, which not only used charts to show the growth of characteristic industries in different counties, but also reflected the effect of policy implementation through the real experiences of farmers.

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In this case, big data technology played a key role in the early stage of clue screening, helping journalists quickly identify valuable reporting targets from massive amounts of market information. Compared with the traditional "carpet-style" visits, the interview efficiency was significantly improved. After the report was released, it also boosted the attention to related products, indirectly promoting the development of local industries.

3.2. Visualized reports on the coverage of inclusive finance

To demonstrate the current progress of inclusive finance in rural areas, a financial media outlet integrated various data including the distribution of financial institution outlets, the usage rate of mobile banking among rural users, and the volume of microcredit issuance, covering county-level regions in more than 30 provinces across the country. Through data collation and analysis, it was found that there are significant differences in the availability of financial services across different regions. For instance, the mobile banking coverage rate in county-level areas of a certain eastern province exceeds 60%, while in some county-level areas in the western region, it is less than 20%.

In terms of report presentation, a dynamic map was adopted, with different shades of color marking the coverage level of inclusive finance in various regions, allowing readers to intuitively see the regional gaps. Meanwhile, specific cases were incorporated, such as the practice of a county in the western region to improve credit coverage through the "bank + cooperative" model, which made the data more persuasive. This presentation method made the originally complex financial data easy to understand. The report was reprinted by multiple government platforms and became a reference for understanding the advancement of inclusive finance in rural areas.

3.3. Practice of precision push for rural revitalization content

A news client attempted to apply big data to analyze user preferences in the content distribution of its rural revitalization section. By counting information such as users' reading history and click behaviors, labels like "concerned about rural tourism", "caring about agricultural loans" and "paying attention to rural education" are attached to different users, so as to push corresponding content.

In terms of effectiveness, this approach has increased users' click-through rates and dwell time on the content. However, some phenomena have emerged. For instance, users who have long been receiving rural tourism content show a significant decrease in clicks on reports in other fields such as rural medical care and education, which to a certain extent restricts the comprehensive acquisition of information.

3.4. Characteristics of technical applications in the cases

Although the above three cases have different themes, they all reflect the supplement of big data technology to the traditional reporting mode: in the information collection stage, it breaks through the time and space limitations of traditional interviews, and obtains information from multiple channels such as markets and financial institutions with the help of data tools. In the analysis phase, through sorting out the correlations among multi-dimensional data, potential connections between different factors are identified, such as the correlation between policy support and industrial development. In the presentation and dissemination phase, methods like visualization and personalized push are adopted to make the reports more acceptable to the audience.

At the same time, these cases also reveal some practical problems. For example, data from different sources have inconsistent formats, which makes sorting them out quite time-consuming.

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Some journalists are not proficient enough in data processing and visualization production, which hinders the exertion of data value. Although personalized push has improved communication efficiency, it may lead users to only focus on content they are interested in and ignore other important information. These situations provide a practical basis for subsequent analysis of the challenges and optimization directions in the application of technologies.

4. Results and analysis

Through the systematic review of literature and in-depth analysis of typical cases, the application of big data technology in news reports on rural revitalization and inclusive finance has shown multi-dimensional innovative characteristics, while also exposing multiple challenges at the practical level. The specific analysis can be carried out from the following aspects:

First of all, big data technology has injected new momentum of precision and depth into the reports on rural revitalization and inclusive finance by reconstructing the news production process. In the news collection stage, the traditional model that relies on on-site visits is gradually transforming into a "data scanning" approach. Technologies such as web crawlers can quickly capture massive amounts of information, including policy documents from the Ministry of Agriculture and Rural Affairs, agricultural product sales data from e-commerce platforms, and microloan records of financial institutions, helping journalists break through time and space constraints to locate key clues. For example, by capturing data from e-commerce platforms, media outlets discover a surge in sales and a concentration of positive reviews for regional specialty fruits, and based on this, the on-site interviews they conduct accurately present the local industrial development experience. An analysis of the growth data of rural road investment in a certain province intuitively reveals the driving effect of infrastructure construction on the rural economy. In the news analysis phase, big data technology promotes reports to shift from phenomenon description to law mining. By integrating multi-year and multi-dimensional data, it can identify in-depth patterns such as "the income growth of loan-taking farmers engaged in characteristic breeding and cultivation is significantly higher than that of other farmers" and "the ecological protection and rural tourism model features income stability". These findings provide a more insightful perspective for reports on rural revitalization and inclusive finance. In the news presentation stage, data visualization tools transform complex data into intuitive forms such as bar charts and dynamic maps, while interactive designs further enhance the readability and sense of participation of the reports. For instance, the "National Inclusive Finance Coverage Map" presents regional gaps through color differences, and the interactive charts in a county's rural industry report allow readers to adjust the time range to view industrial changes. Such innovations have increased the reading volume of the reports by more than 30%, fully confirming the positive empowerment of technology on communication effects.

Secondly, big data technology still faces three core challenges in the application process, which restrict its in-depth penetration in the reports on rural revitalization and inclusive finance.

First, the issues of data sources and availability are prominent. Data related to rural revitalization and inclusive finance involves multiple entities such as governments, financial institutions, and enterprises. Not only are the formats inconsistent and standards chaotic, but there are also information barriers. Some government data is not made public due to confidentiality, and customer data of financial institutions is restricted by privacy protection, making it difficult for journalists to obtain. Even if the data is obtained, problems such as false reports and omissions in rural statistical data, as well as conflicts between data from different sources, require a lot of time to verify, which seriously affects the efficiency of reporting. Second, the technical threshold has become a bottleneck

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in application. Operating big data tools such as Python and Tableau requires professional skills, yet most journalists lack systematic training. Although some media outlets have carried out relevant training, it mostly stays at the level of basic concepts, resulting in superficial application of technology. For example, due to journalists' unskilled operation, the chart designs in media's visualized reports are rough, failing to give full play to the value of data.

Third, the risk of "information cocoon" caused by algorithmic recommendation cannot be ignored. Although algorithms push content based on user preferences, which improves communication efficiency, they may lead to one-sided cognition. Readers who pay attention to rural tourism, for example, receive similar content for a long time, easily ignoring important information such as inclusive finance and rural education. Data from a certain platform shows that algorithmic recommendation of rural revitalization content has reduced users' clicks on content in "non-interest fields" by 40%. This trend not only limits the public's comprehensive understanding of rural revitalization and inclusive finance, but also may provide a hotbed for the spread of false information.

To sum up, big data technology has brought all-round innovations to the reports on rural revitalization and inclusive finance. However, its application effects are still restricted by factors such as data quality, technical capabilities, and algorithmic logic. How to break through these bottlenecks has become a key issue in promoting the in-depth integration of technology and reporting.

5. Discussion

The results obtained in this study through literature analysis and case verification not only form a theoretical echo with existing research, but also demonstrate in-depth insights into technological applications in the specific context of reports on rural revitalization and inclusive finance. Moreover, combined with the newly supplemented literature perspectives, the depth and breadth of the discussion can be further expanded.

First, regarding the enabling effect of big data technology on the quality of reports, the results of this study are highly consistent with Huang Xiaobin's view that "data-driven approaches improve the accuracy of news" and Wang Qiang's perspective on "the dual driving forces of data-driven and narrative-driven approaches" [1,2]. Wang Qiang proposed that data journalism needs to balance technical rationality and humanistic narrative, which is particularly crucial in rural revitalization reports. The cases in this study show that although the "data scanning" of web crawlers has broken through the time and space constraints of on-site interviews, it still ultimately requires on-site visits to supplement the details and warmth of rural stories [2]. This echoes the production dilemma revealed by Xiao Jianxiong in the rural revitalization reports of Xinhua Daily Telegraph that "it is necessary to both break through information barriers and avoid an elitist perspective", confirming the necessity of "integrating technical tools with humanistic narrative" [4]. Meanwhile, the risk of "big data potentially leading to narrative simplification" pointed out by Liu Yikun is reflected in this study as some data visualization reports neglect the understanding habits of rural readers due to an excessive focus on technical presentation. This also provides practical evidence for the idea that "interactive visualization needs to balance intuitiveness and locality" [3].

Secondly, regarding the challenges in the application of technology, the findings of this study complement the industry pain points revealed in the new literature. Xing Yan put forward that rural digital inclusive finance has the duality of "dividends" and "gaps", and this view can be extended to the field of news: the "dividend" of big data technology improving reporting efficiency coexists with the "information gap" caused by weak rural data infrastructure and insufficient digital literacy of

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farmers. For example, farmers in some remote areas find it difficult to access interactive visual reports due to the lack of digital devices, which is consistent with Yu Yang's judgment that "while digital media reshape rural communities, they may exacerbate information inequality" [5,7]. Moreover, the characteristics of "decentralization and immutability" of blockchain technology highlighted by Chen Hua & Hu Xiaolong provide a new idea for addressing the "scattered data sources and insufficient credibility" identified in this study: the distributed storage and encryption technology of blockchain may serve as the underlying support for data sharing platforms, which can both protect the privacy of financial data and enhance the reliability of data used in reports [6].

In addition, the incremental value of this study becomes more evident when referenced against new literature. Compared with Xiao Jianxiong, who only focused on the production process dilemmas in rural revitalization reports, this study further combines the particularities of inclusive finance reports to reveal more segmented issues, such as the more prominent conflict between "financial data privacy and the openness of reports" and "higher adaptability requirements for data collection due to regional industrial differences" [4]. Compared with Xing Yan's macro analysis of the "gap" in digital inclusive finance, this study, through case studies, elaborates on the specific manifestations of such "gaps" in the field of news, such as differences in data availability and readers' acceptance of technical presentations among rural areas in the eastern, central and western regions [7]. These findings provide a more precise target for the design of optimization paths.

6. Conclusion

Through literature analysis and case studies, this study systematically explores the application of big data technology in news reports on rural revitalization and inclusive finance. The research shows that big data technology has significantly improved the efficiency, depth, and communication power of reports through "data scanning-based collection", "regularized analysis", and "interactive presentation", providing new tools for the public opinion dissemination of these two themes.

Meanwhile, the research also reveals three core challenges: scattered data sources with low availability, technical thresholds restricting journalists' application, and potential information cocoons caused by algorithmic recommendations. To address these issues, the optimization paths include: establishing a data-sharing platform with multi-stakeholder participation, unifying standards and ensuring security; strengthening journalists' training in "data + news" composite capabilities to lower technical thresholds; and designing anti-cocoon content strategies to balance personalized push and information comprehensiveness. The limitation of this study lies in the narrow scope of case selection, which does not cover differences across various regions. Insufficient discussion has been conducted on the ethical issues concerning the application of big data. Future research can expand the scope of cases, compare the application effects in different regions, and conduct in-depth analysis on the governance paths of data ethics, so as to provide more comprehensive references for the sustainable application of big data technology in reports on rural revitalization and inclusive finance.

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