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Application of Big Data Analysis Based on Artificial Intelligence in Accurate Communication of New Media

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Abstract: In the era of vigorous development of new media, the pattern of information dissemination has undergone profound changes, and accurate communication has become the core appeal of the development of new media. This article focuses on the application of big data analysis based on AI (Artificial intelligence) in the accurate dissemination of new media. This article deeply analyzes the relevant theoretical basis, and explores the mechanism of AI and big data analysis to help new media spread accurately, including accurate audience positioning, personalized content recommendation and communication channel optimization. It is found that although the application has the advantages of improving communication effect, enhancing user experience and improving marketing efficiency, it also faces challenges such as data security and privacy protection, algorithm bias and fairness, and high technology application cost. Based on this, this article puts forward some strategies, such as improving data management, optimizing the application of algorithms and technologies, and strengthening personnel training and cooperation, in order to promote the effective application of big data analysis based on AI in the accurate dissemination of new media and promote the sustainable development of new media industry.

1. Introduction

With the rapid development of information technology, new media has become an important force in information dissemination [1]. New media communication has the characteristics of immediacy, interactivity and mass, which has changed the traditional communication pattern [2]. However, the emergence of massive information also makes information communication face many challenges, and accurate communication has become the key appeal of the development of new media.

As a strategic technology leading a new round of scientific and technological revolution and industrial transformation, AI is being widely used in various fields [3]. It shows great ability in big data analysis, and can efficiently process and deeply mine massive and complex data [4]. Big data analysis makes it possible to accurately understand audience needs and behavior patterns. Through the collection, collation and analysis of a large number of data, we can reveal the laws and trends hidden behind the data.

It is of great significance to apply AI-based big data analysis to the accurate dissemination of

new media [5]. On the one hand, it can significantly enhance the pertinence and effectiveness of new media communication. By accurately grasping the characteristics and needs of the audience, pushing the content that meets their interests, avoiding information redundancy and interference, improving the efficiency and quality of information transmission, thus enhancing users' satisfaction and loyalty to the new media platform [6]. On the other hand, it helps new media to achieve more efficient marketing. Enterprises can formulate marketing strategies based on accurate audience insight, rationally allocate resources, improve marketing effects and maximize business value.

Although AI-based big data analysis has broad application prospects in the accurate dissemination of new media, it also faces a series of challenges [7]. Such as data security and privacy issues, algorithm bias, etc., need to be further studied and solved. Therefore, it is of great theoretical and practical significance to deeply explore the application of AI-based big data analysis in the accurate communication of new media, analyze its application mechanism, advantages and challenges, and put forward practical application strategies to promote the healthy and sustainable development of new media industry.

2. Related theoretical basis

AI aims to make machines simulate, extend and expand human intelligence and realize intelligent behaviors such as reasoning, learning and planning. Its development has gone through many stages, from simple symbolic reasoning in the early days to complex models driven by deep learning [8]. As the core of AI, machine learning enables computers to automatically improve performance based on data. For example, supervised learning learns prediction models from existing labeled data, while unsupervised learning discovers patterns from unlabeled data. As a branch of machine learning, deep learning processes complex data with the help of deep neural networks.

Big data has the characteristics of mass, high speed, diversity, low value density and authenticity. Big data analysis covers data collection, storage, management, analysis and visualization processes. Data collection obtains data from multiple sources, and storage needs to meet large-scale and high concurrent requirements [9]. Data analysis methods include descriptive analysis to summarize data characteristics, diagnostic analysis to explore the causes of events, predictive analysis to predict future trends based on historical data, and normative analysis to provide action suggestions. Through big data analysis, valuable information can be extracted from complicated data to provide a basis for decision-making.

The accurate communication of new media relies on digital technology, and accurately pushes the right information to the target audience at the right time and through the right channels according to the characteristics and behaviors of the audience. It is based on the theory of audience segmentation, which holds that there are differences in the needs, interests and behaviors of the audience, and the audience groups can be subdivided accordingly. In the new media environment, accurate communication by technical means can improve communication efficiency and enhance user experience.

3. The mechanism of AI and big data analysis to help new media spread accurately

3.1. Accurate audience positioning mechanism

Accurate audience positioning is the cornerstone of accurate communication of new media. With the help of AI and big data analysis technology, audience characteristics can be mined from multiple dimensions. The first is the basic demographic characteristics, such as age, gender, region, etc., which are relatively easy to obtain and can initially outline the audience [10]. Secondly,

behavioral characteristics, including users' browsing, searching, likes and comments on the new media platform. Furthermore, psychological characteristics, such as values and lifestyles, are difficult to obtain directly, but through the deep semantic analysis of users' speeches and shared content, AI algorithm can infer users' psychological tendencies.

By integrating these multi-source data, an accurate audience portrait is constructed. Table 1 shows the dimensions of the audience portrait of a new media platform, and depicts the audience from different dimensions, providing a basis for subsequent accurate communication.

Table 1 Dimensions of audience portrait of a new media platform

Portrait dimension	Specific content
Demographic characteristics	Age: 18-25; Gender: male; Region: First-tier cities
Behavior characteristics	The daily browsing time is 2-3 hours, mainly browsing sports events and fitness information, and often participating in comments and interactions.
Psychic characteristic	Advocate a healthy and energetic lifestyle and pursue self-improvement.

3.2. Personalized content recommendation mechanism

On the basis of accurate audience positioning, personalized content recommendation mechanism plays a role. This mechanism depends on AI algorithm, and the common ones are content-based recommendation algorithm and collaborative filtering algorithm. Content-based recommendation algorithm makes recommendations according to the matching degree between audience portraits and content characteristics. Collaborative filtering algorithm recommends content by analyzing the behavior of similar users. For example, when it is found that many users with similar interests are concerned about a new band, the system will recommend the relevant information of the band to other users with similar interests. In addition, deep learning algorithm has also emerged in personalized recommendation, which can deal with more complicated user-content relationship and further improve the accuracy of recommendation. The new media platform comprehensively uses these algorithms to analyze user behavior and feedback in real time and dynamically adjust the recommended content to meet the changing needs of users.

3.3. Communication channel optimization mechanism

AI and big data analysis help new media optimize communication channels. Different new media platforms have different user groups and communication characteristics. By monitoring and analyzing the data of communication effect of each platform, such as exposure, clicks, conversion rate and other indicators, the advantages and disadvantages of each channel are evaluated. According to the analysis results, the communication resources are allocated reasonably. If it is found that a certain platform has a high conversion rate in a specific audience group, the content delivery and promotion on this platform should be appropriately increased. At the same time, the AI algorithm can also predict the communication trends of different channels in the future, and make the layout in advance, so that the new media communication will always remain in an efficient channel and maximize the communication effect.

4. Advantages and challenges of big data analysis based on AI in accurate communication of new media

4.1. Advantage analysis

AI-based big data analysis has brought many significant advantages to the accurate dissemination of new media. First of all, the communication effect is significantly improved. Through accurate audience positioning and personalized content recommendation, the content is highly compatible with the audience's needs, which greatly improves the probability of information being concerned and accepted. For example, e-commerce new media platforms use this technology to accurately push product information to potential consumers, which can effectively promote purchasing behavior and increase sales. Second, enhance the user experience. Users are no longer bothered by a large amount of irrelevant information, but get content that meets their own interests, which saves information screening time and makes the use of new media more convenient and comfortable, thus improving users' goodwill and loyalty to the platform. Furthermore, improve marketing efficiency. Advertisers can accurately reach the target customer groups, avoid ineffective delivery, reduce marketing costs and improve the input-output ratio.

4.2. Challenge analysis

This technology also faces a series of challenges in the application of accurate communication of new media. Data security and privacy protection bear the brunt. In the process of data collection, storage and use, once the data is leaked, it will seriously infringe on users' privacy and trigger a crisis of trust. The problem of algorithm bias and fairness can not be ignored. AI algorithm is trained based on historical data. If the data is biased, the algorithm will amplify this bias, which will lead to unfair treatment of specific groups. For example, in the employment information recommendation algorithm, if there is gender discrimination in historical data, the algorithm may reduce the recommendation of high-quality jobs for female job seekers. In addition, building and maintaining the AI-based big data analysis system requires a lot of capital investment, including the purchase of hardware facilities, software development and update, and the employment of professionals. For some small and medium-sized new media enterprises, it is difficult to bear such a high cost, which limits the wide application of this technology. The rapid development of technology also requires enterprises to continue to invest to maintain the advanced technology, which further increases the cost pressure.

5. Strategies to promote the application of AI-based big data analysis in the accurate dissemination of new media

5.1. Improve the data management strategy

Data is the core resource to achieve accurate communication, and it is very important to improve the data management strategy. First of all, it is necessary to establish a strict and standardized data collection process, clarify the legitimacy and compliance of data sources, and ensure that the collected data does not infringe on user privacy. At the same time, we should pay attention to data quality, clean and preprocess the collected data, and remove duplicate, wrong or incomplete data to improve the accuracy and usability of the data. Second, strengthen data security and privacy protection. Advanced data encryption technology is adopted to encrypt the data in storage and transmission to prevent data leakage. In addition, build a perfect data access authority management system and strictly limit the access level of different personnel to data. As shown in Figure 1 below,

the data access scope of personnel in different positions is clearly defined, which effectively reduces data security risks.

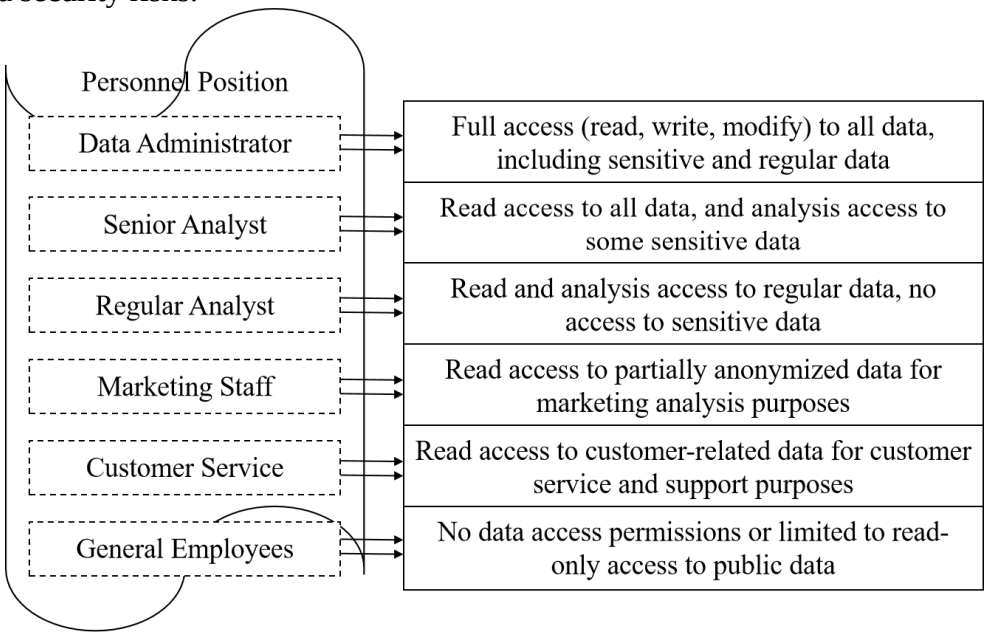

Figure 1 Data access rights of different personnel

5.2. Optimization algorithm and technology application strategy

In order to improve the application effect of AI-based big data analysis in the accurate dissemination of new media, it is necessary to continuously optimize the algorithm and technology application. On the one hand, increase investment in algorithm research and development, encourage innovation, and improve the accuracy and adaptability of the algorithm. On the other hand, keep up with the forefront of technological development and introduce new technologies and methods in time. For example, reinforcement learning technology can make the algorithm dynamically adjust the recommendation strategy according to the real-time feedback of users, and further improve the effect of personalized recommendation. At the same time, we should pay attention to the interpretability of the algorithm, so that users and operators can understand the logic of algorithm recommendation and enhance their trust in the algorithm.

5.3. Strengthen personnel training and cooperation strategies

Talent is the key factor to promote the application of technology. The new media industry needs compound talents who understand the laws of new media communication and are familiar with AI and big data analysis technology. Universities and vocational colleges should optimize related majors, strengthen the construction of interdisciplinary course, and train professionals to meet the needs of industry development. In addition, enterprises should strengthen cooperation with universities and scientific research institutions and establish cooperation mechanism in Industry-University-Research. Through cooperative projects, enterprises can obtain the latest research results and technical support, while universities and scientific research institutions can provide practical platforms for students and improve their practical ability. At the same time, enterprises can also organize internal training regularly to improve the technical level and business ability of existing employees, and provide a solid talent guarantee for the application of AI-based big data analysis in the accurate dissemination of new media.

6. Conclusions

In this article, the application of AI-based big data analysis in the accurate dissemination of new media is comprehensively studied. It is clear that AI and big data analysis are of great value in the accurate communication of new media. The precise audience positioning, personalized content recommendation and communication channel optimization mechanisms built by AI provide strong support for the accurate communication of new media, effectively improve the communication effect and marketing efficiency, and enhance the user experience. However, it cannot be ignored that this application has encountered many obstacles in practice, such as data security and privacy issues threatening users' rights and interests, algorithm bias affecting the fairness of communication, and high technology application costs limiting technology popularization.

In order to meet these challenges, we need to make concerted efforts from data management, algorithm technology optimization and talent training. Improve the data management strategy and strictly observe the bottom line of data security and privacy; Continuously optimize the application of algorithms and technologies to improve accuracy and fairness; Strengthen personnel training and cooperation to inject impetus into technology application. Through the implementation of these strategies, it is expected to give full play to the potential of AI-based big data analysis in the accurate dissemination of new media and push the new media industry towards a healthier and sustainable development track. In the future, with the continuous progress of technology, related research still needs to be deepened to meet the changing development needs of new media.

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