

Impact of ChatGPT Technology on Sports Industry

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Abstract: With the rapid development of the Internet, the era of smart media is an unstoppable trend in the evolution of the communications industry. Voice technology represented by ChatGPT constitutes a pivotal element in the production of intelligent news, with voice-based news serving as a prime application domain for ChatGPT's voice technology in the media sector, particularly excelling in sports journalism. This paper is based on an interdisciplinary theoretical foundation that encompasses sports journalism and communication studies, psychology, linguistics, and phonetics. Starting from the current application status of ChatGPT voice news in the sports industry, it proceeds through an analysis of dissemination effects and inherent flaws. It investigates the research status, practical application, impact, data analysis, and relevant strategies of ChatGPT in the realm of sports journalism. Additionally, it conducts an in-depth analysis of the myriad issues accompanying the smart transformation of sports news production driven by artificial intelligence. These issues entail the technological risks inherent in ChatGPT itself, as well as the professional challenges posed to journalists by the expansion of this technology. Building upon meticulous analysis, the research endeavors to propose feasible countermeasures, aiming to illuminate the path for future intelligent news production in media outlets. It aspires to offer insightful reflections and practical guidance, thereby assessing the potential impact of ChatGPT technology on the future landscape of the sports industry.

Keywords: ChatGPT; Sports News; Artificial Intelligence; AI; Technological Advances

1. Introduction

The information and content contained within sports news can have an impact on investment decisions made by investors and corporate management, ultimately leading to fluctuations in stock returns. Prior to the advent of ChatGPT, there often lacked efficient tools for processing vast amounts of text, rendering it difficult in many studies on the relationship between sports news and the stock market to quantitatively analyze unstructured textual data. ChatGPT, an AI-powered natural language processing technology, exerts its influence on the sports industry in several key ways:

(1) Sports News Reporting: ChatGPT can analyze a vast volume of sports news articles, extracting crucial information and generating contextually coherent, naturally flowing reports. This enhances the quality and speed of sports journalism, delivering more timely, accurate, and comprehensive information to readers.

(2) Data Analysis and Prediction: Capable of handling large datasets related to sports, ChatGPT utilizes its models to conduct in-depth data analysis and forecasting. This aids in improving the performance of athletes and teams, boosting their chances of winning matches, while also furnishing fans with more precise event analysis and predictions.

(3) Advertising and Marketing: By analyzing users' interests and behaviors, ChatGPT can generate targeted advertising and marketing content tailored to individual preferences and needs. This increases the efficiency and precision of ad campaigns, opening up new commercial opportunities for the sports industry.

(4) Event Broadcasting and Interactivity: Leveraging its natural language processing capabilities, ChatGPT provides viewers with a more engaging and immersive live event experience, as well as enhanced interactive

features. This fosters greater audience engagement and loyalty, simultaneously diversifying revenue streams for the sports sector.

In summary, ChatGPT's impact on the sports industry is multifaceted. Its presence not only significantly enhances the quality and speed of sports news reporting but also equips fans with more accurate event analysis and match outcome predictions. Concurrently, it unlocks a wealth of new business opportunities and revenue streams for the sports sector.

2. Research on Factors Influencing the Development of the Sports Industry

2.1 Western Countries' Research Status Quo

Research on the application of artificial intelligence (AI) in news production in Western countries predates that in China. The formal establishment of the discipline of AI was marked in 1956 at the Dartmouth Conference, where participating scholars collectively adopted the term "artificial intelligence." Scoble & Israel [1] introduced the concept of "scenes," distinct from those in the traditional media era, arguing that the mobile internet age has greatly accentuated the significance of scenes because mobile communication is a service based on scenes—perception of the environment and provision of contextually appropriate information.

Diakopoulos [2], in his paper 'Towards a Design Orientation on Algorithms and Automation in News Production', posits that news research should adopt a design-centric approach toward news technologies and strive to establish rigorous evaluation criteria and metrics to propel both academia and practice forward. Guzman [3], in 'Prioritizing the Audience's View of Automation in Journalism', advocates for researchers to give greater attention to audiences and their perceptions of automation technology. Stray [4], in 'Making Artificial Intelligence Work for Investigative Journalism', surveys AI's achievements in investigative journalism, discusses why more advanced methods are difficult to implement, and outlines which investigative news problems AI can address in the near future.

Thurman [5] and his colleagues, approaching the topic from the perspective of professional journalists, employed a qualitative method of

interviews to identify ethical issues surrounding the application of algorithmic news, including how journalists acquire, verify, and utilize digital data in news production, the potential for bias within algorithmic news, whether algorithms can "reason" to appropriate conclusions in all circumstances, and the transparency of code and data. Creech and Mendelson [6] posit that the development of AI leaves journalists feeling that digitization and automation complicate news production, making adherence to ethical standards more challenging.

Bucher [7], drawing upon interviews with senior managers, editors, and developers at Scandinavian news organizations and adopting a journalist's viewpoint, elucidates the challenges inherent in algorithmic news. She argues that the greatest value of a newspaper lies in the news it carries, which is produced by humans with particular worldviews, possessing an ability to assess news value that is universally human and central to the journalistic craft, dependent on an instinctive "nose" for news and corresponding expertise. Algorithmic news, as a product of machines, exhibits clear limitations, particularly when compared to human-generated reporting. Waddell[8] employing the "Model-Agency-Interactivity-Navigability (MAIN)" framework in an experimental setting, concludes that news produced by human authors is perceived as more credible than that generated by machines in the eyes of the public.

2.2 China's Research Status Quo

In China, with the infiltration and application of ChatGPT technology in the field of news production, research on issues concerning the development of artificial intelligence (AI) and journalism is increasingly emerging. In his work, Yu[9] delves specifically into the topic of "machine news writing," arguing that in the composition of dynamic information such as disaster reporting and sports events, machine news writing can achieve precise and swift generation and dissemination, as well as realizing intelligent tagging, clustering, and matching among vast amounts of content production. Wang and Zhi [10], taking the example of "Kuai Bi Xiao Xin" from the Sports Channel of Guangdong Television, maintain that robot-assisted writing can rapidly report professional news, showcasing the

advantages of data journalism. To a great extent, it substitutes for human efforts, becoming a significant auxiliary to human news gathering and writing, and thus bringing about a liberation of productive forces within the journalism industry.

Kuang [11] presents a differing perspective on the question of whether artificial intelligence (AI) will replace journalists, asserting in his paper "The Path of Media Industry Transformation: Embracing Artificial Intelligence" that AI is a partner rather than an adversary. Journalists, he argues, should fully utilize rather than shun AI; only by doing so can they cultivate a more open and inclusive creativity. Wu [12] advances the study of the relationship between humans and technology further. Drawing from a relationalism perspective in his work "Exploring the 'Symbiotic Growth' Mechanism between News Professionals and Artificial Intelligence: A Relationalism Perspective," he explicates how news professionals can establish a lasting relationship of "symbiotic growth" with AI. News practitioners, he posits, need to adopt AI as a viewpoint or method, thereby transforming our understanding of the relationship between humans and technology and driving the application of AI in multiple aspects of news work. Wang Dapeng [13], from the perspective of technology for good, mentioned in his piece "Unlocking the 'Black Box' of Artificial Intelligence: Starting with the Rise of ChatGPT" that AI should aspire to a higher goal of doing good. On one hand, it is essential to prevent the application of AI from causing detrimental consequences to humanity. On the other hand, attention must be paid to the shocks and challenges that the digitally advancing society, a byproduct of technological progress, imposes on public life. Furthermore, there is a critical need to address issues of equity and inclusiveness, bridging the technological divide and digital divide, ensuring that the benefits of these advancements are shared fairly and reach all segments of society.

Lin Zhuming [14] analyzes the impact of artificial intelligence (AI) technology applications on the roles of news professionals, proposing that news workers must break free from the "reverse domestication" constraints imposed by AI in order to coexist harmoniously with it. Wang and Gu [15]

contend that in the era of smart media, to better address the challenges brought about by AI technology for journalists, news professionals in the process of career transformation should exhibit a trend of transitioning from traditional "gatekeeper" and "gatekeeping" roles to that of "curator." Liu and Jiang [16], taking a systemic perspective, in their paper "Examining the Impact of Artificial Intelligence on News Professional Roles from an Institutional Perspective," trace and review the relationship between technological development and change and news professionals. Focusing primarily on algorithms as an emerging technological tool, they explore the changes in the roles of news professionals within the context of the new media environment. The emergence of these fresh perspectives has concurrently led to further investigation into the realm of AI news anchors.

Regarding the renewed pressure AI anchors bring to journalists, Yu [17] in the paper "Disembodied and Embodied Cognition in Communication: Cognitive Interaction of Artificial Intelligence News Anchors" introduces cutting-edge ideas from the fields of cognitive science and AI, such as disembodied cognition, embodied cognition, and cognitive interaction. She argues that while humans give birth to AI, we also bear the responsibility to educate robots. The shift from an "human-machine battle" to an "human-machine symbiosis" reflects scholars' profound contemplation on human-machine relationships and their in-depth exploration into the state of AI technology applied to news production. Wu [18], in "An Analysis of the Originality Issue in Artificial Intelligence News Production," examines the originality problem in AI-generated news. He asserts that given the absence of an effective news copyright protection system under current Chinese copyright law, to ensure AI-produced news receives copyright protection, the standard for assessing its originality should be lowered. Fu [19], in "Legal Regulation of Content Production on Blockchain News Platforms," holds that although blockchain technology confers new roles on the news industry, due to its immaturity, issues it exposes in various aspects of news production are becoming increasingly prominent. There is an urgent need for Chinese law to regulate platforms from two angles: platform tokens

and network operators. Wei[20], in the article "The Application of Artificial Intelligence Technology in Journalism and Its Impact," states that "while applying AI technology in journalism, the industry needs to balance technological innovation with journalistic ethics, ensuring the healthy development of AI technology."

3 The Impact of ChatGPT on Sports News Reporting

3.1 Data Collection

In the process of collecting sports news data, considerations must extend beyond data sources and data quality to encompass data diversity and breadth. Data diversity: ChatGPT necessitates the acquisition of sports news data of various types, themes, and origins, with the aim of training models or generating sports news reports that embody both diversity and richness. For instance, coverage should span different sports disciplines, diverse nations and regions, and multiple languages and cultural contexts within the realm of sports news. Data breadth entails ChatGPT's need to compile sports news data over an extended time frame, thereby enabling analysis and forecasting of trends and evolutions in sports news. This would involve gathering sports news data from past years or even decades, allowing for the examination of sports development trends and historical transformations. Moreover, due diligence must be exercised in protecting user privacy and respecting copyright, upholding the legal rights and interests of data owners. When dealing with data containing personal information, de-identification measures must be implemented to safeguard individual privacy. In the case of copyrighted data, the appropriate authorization must be obtained or relevant regulations adhered to, preventing any infringement upon copyright.

In summary, the process of ChatGPT collecting sports news data involves utilizing web crawlers to extract sports news data from major sports news websites, forums, blogs, and other such channels. Subsequently, this data undergoes cleaning and processing, ultimately serving as the basis for either model training or the generation of sports news reports.

3.2 Model Training

Through training on a vast corpus of collected

sports news data, ChatGPT develops a profound understanding of sports news reporting. The journey towards a ChatGPT model capable of producing high-quality sports news entails several stages: data collection and dataset preparation, training environment configuration, pre-training the model, model training itself, and model evaluation. By following these steps, a ChatGPT model is honed that can adeptly generate top-notch sports news content. The concerted effort of ChatGPT in amassing and training on copious sports news data holds significant implications at multiple levels. This model training serves as a powerful enabler for automation within the sports domain, finding applications in automated sports news generation, event coverage, athlete evaluations, among others. Therefore, ChatGPT's systematic gathering and training on large-scale sports news data plays a pivotal role in enhancing the quality of generated sports texts, bolstering model generalization capabilities, broadening application scenarios, and driving forward the automation of the sports sector.

3.3 Input Event

In the specific process of generating a sports news report, the ChatGPT model can undertake the following analyses and interpretations:

(1)Entity Recognition and Relationship Extraction: ChatGPT adeptly identifies entities within input text, such as individuals (e.g., athletes), events, and locations, and automatically uncovers the relationships between them. For instance, given the sports news snippet "Yao Ming attended a CBA game in Beijing," ChatGPT would recognize "Yao Ming," "Beijing," and "CBA game" as distinct entities and establish the relationship between "Yao Ming" and "CBA game" as "attendance." This ability allows the model to structure information precisely and contextually.

(2)Sentiment Analysis and Attitude Tendency: ChatGPT automatically assesses the emotional tone and attitude expressed in the input text toward teams, players, coaches, or other relevant entities. This information enriches the generated sports news with appropriate context and emotional shading, making it more relatable to readers. Whether the sentiment conveyed is admiration for an individual's

performance, disappointment in a team's strategy, or anticipation for an upcoming match, the model captures and reflects these nuances accurately.

(3) Semantic Matching and Inference: ChatGPT performs semantic matching and inference to grasp the semantic relationships within the input text. Taking the example, "James scored 40+ points in consecutive games, becoming the fifth player in NBA history to achieve this feat," the model comprehends the connection between "scoring 40+ points" and "becoming the fifth player to do so," and, based on contextual cues, can accurately discern whether "fifth player" refers specifically to NBA history or encompasses global basketball history. This advanced capability not only accelerates and enhances the accuracy of sports news reporting but also widens its applicability, paving the way for intelligent news-generating bots, automated sports news production lines, and other innovative use cases.

In summary, by analyzing and comprehending new sports events, extracting crucial information and contextual nuances, ChatGPT is capable of autonomously producing sports news reports that adhere to both grammatical and semantic norms. This process significantly enhances the speed and precision of sports journalism while broadening the scope of applications for sports news coverage, encompassing innovations such as AI-driven news bots and automated production systems.

3.4 News Generation

ChatGPT harnesses input event data, leveraging an existing corpus of sports news articles and advanced natural language generation models, to synthesize a cohesive, articulate report replete with pertinent details, appropriate tonality, and adherence to established conventions and formatting standards in sports journalism. Upon receipt of event information, it employs natural language processing techniques to parse and comprehend this input, extracting core facts and contextual subtleties. Subsequently, drawing on its repository of sports-related prose and sophisticated NLG architecture, ChatGPT crafts a seamlessly coherent narrative that mirrors the stylistic tenets and structural requisites characteristic of the genre.

3.5 Optimize Output

To ensure that generated sports news reports better align with actual circumstances and readers' expectations, ChatGPT can further enhance the quality of generated content through optimization and fine-tuning of its output. For instance, ChatGPT can incorporate additional details and descriptions within its output to bolster the vividness and authenticity of the news reporting. The Figure 1 is how ChatGPT worked.



Figure 1. Chat GTP workflow diagram

4 The Application Scope of Chatgpt and Sports Events

4.1 Data Analysis and Prediction of ChatGPT and Sports Events

ChatGPT is capable of processing vast amounts of sports data, utilizing its own models for in-depth analysis and forecasting. This not only contributes to enhancing athlete and team performance, increasing win rates in competitions, but also furnishes fans with more precise event analysis and predictions. There are several ways in which ChatGPT can optimize and refine its output to elevate the quality of generated sports news reports. Here are some common approaches:

(1) Fine-tuning: Fine-tuning involves further training an already trained ChatGPT model with the specific aim of improving its performance on a particular task or dataset. In the context of generating sports news reports, this would involve retraining the model using a substantial corpus of sports news articles. By exposing ChatGPT to this specialized content, it learns the unique language patterns, terminologies, and narrative structures characteristic of sports journalism, thereby enhancing its ability to generate accurate, contextually appropriate, and engaging sports news pieces.

(2) Length and Fluency Control: Ensuring the quality of generated sports news reports necessitates regulating their length and fluency. A maximum text length can be set to prevent

overly lengthy or truncated outputs, striking a balance between comprehensive coverage and reader engagement. Techniques like beam search can be employed to identify the most optimal sequence of words, effectively navigating the vast space of possible outputs and converging on the most coherent and contextually relevant narrative. Additionally, perplexity, a measure of how well a probability model predicts a given sequence of words, can be used to assess the linguistic smoothness of generated samples.

(3) **Incorporation of Prior Knowledge and Constraints:** ChatGPT can be optimized and tailored to generate sports news reports by integrating prior knowledge and imposing relevant constraints. For instance, the theme or topic of a sports news report can be explicitly provided as prior knowledge, guiding the model to generate content that remains focused and pertinent to that specific subject matter. Furthermore, employing a vocabulary list and grammar rules as constraints helps to enforce linguistic correctness and coherence, ensuring that the generated text adheres to standard grammatical structures and uses appropriate terminology specific to the sports domain. This results in reports that are not only factually sound but also linguistically polished and easily comprehensible for readers.

(4) **Multimodal Information Fusion:** Recognizing that text alone may not always fully capture the essence of sports events, ChatGPT can be enhanced to integrate multiple modalities of information, such as images, videos, and audio, to create richer and more diverse sports news experiences. For example, when describing a game's action, accompanying photographs or video clips can supplement the textual description, providing visual evidence of key moments, player reactions, or tactical maneuvers.

In summary, ChatGPT can optimize and adjust its output results to improve the quality of generated sports news reports through methods such as fine-tuning, controlling the length and fluency of generated samples, incorporating prior knowledge and constraints, and integrating multimodal information.

4.2 GPT Assists Sports Advertising and Marketing

ChatGPT is capable of analyzing users'

interests and behaviors in order to generate tailored advertising and marketing content based on their needs and preferences. By examining data such as users' hobbies, past actions, and other relevant information, ChatGPT can create targeted ads that more closely align with users' specific requirements and interests. This personalized approach not only enhances ad effectiveness but also improves user experience, thereby more effectively promoting the advertiser's products and brand. Specifically for sports-related products, ChatGPT can analyze users' interest in sports by scrutinizing their search history, browsing records, social media interactions, and various other behavioral data. This allows it to generate sports product advertisements specifically tailored to those interests. For instance, if a user frequently searches for information related to basketball games, ChatGPT can infer that the individual has a keen interest in basketball matches and subsequently generate corresponding sports product ads accordingly. A concrete example would be a scenario where a sports drink company aims to promote its new product to users particularly interested in basketball games. The company could utilize ChatGPT to generate targeted ad copy and imagery designed to captivate the attention of the intended audience. In this case, ChatGPT might draw from the user's search history and browsing patterns to craft an ad like the following:

Title: "Boost Your Game Performance with Our New Sports Drink!"

Body: "Are you passionate about basketball games? Our new sports drink delivers the energy and hydration you need to excel on the court. Buy today and enjoy an exclusive offer!"

Accompanying visuals could include images of basketball players hydrating during a game with the advertised sports drink, or close-ups of the product bottle itself, among other possibilities.

Through this method, ChatGPT enables advertisers to pinpoint their target audience with greater precision and generate ad content that is highly attuned to users' interests and needs, ultimately boosting ad efficacy and conversion rates.

4.3 GPT Enhances the Experience of Live

Streaming and Interaction in Sports Events

ChatGPT harnesses its natural language processing capabilities to provide viewers with a more vivid and engaging live sports broadcasting and interactive experience, thereby increasing viewer engagement and loyalty while opening up additional revenue streams for the sports industry. It can generate real-time text-based live coverage and post-game recaps, effectively chronicling match proceedings and outcomes for audience reference.

These reports delve into every nuance and highlight of the event, enhancing spectators' understanding of the game while augmenting the readability and interactivity of the broadcast. Traditionally, text-based live reporting relied on manual input from on-site journalists or analysts, consuming considerable time and effort. However, leveraging ChatGPT for live text reporting offers a real-time, automated solution that significantly enhances the viewing experience.

As an example, the NBA could employ ChatGPT to produce live text commentary accessible via their official website or social media platforms, enabling fans to stay abreast of game developments and outcomes in real-time. As a game commences, ChatGPT, through analyzing game data and unfolding events, autonomously generates live commentary, continually updating it as the action unfolds. When a player scores or commits a foul, for instance, ChatGPT instantly incorporates this information into the live report, ensuring spectators have immediate access to the latest updates.

Moreover, ChatGPT can leverage existing sports news corpora and natural language generation models to produce comprehensive game recap reports. Following a contest's conclusion, it analyzes the game data and context, generating a detailed post-game analysis peppered with expert insights and interpretations, allowing viewers to delve deeper into not just the final result but also the stories behind it.

Within the circulation and dissemination of news products, for instance, the AI anchor on Guangdong Television's Sports Channel appears not only in specific reports and special programs but primarily functions as a long-running short-form video news segment within the client application. This study takes March

and June 2021 as examples, the former being the month with the highest number of news releases and the latter the month with the fewest. It compiles statistics on the 291 short-form video news items published by the AI anchor program on the Guangdong TV Sports Channel between March 1st and March 31st, 2021, and June 1st and June 30th, 2021. The main focus is on seven elements: the publication date, daily release count, news themes, video duration, view count, comment count, and content keywords. By combining descriptive statistical methods, the study aims to outline the current dissemination situation of the segment. The Figure 2 is the quantity of March and the Figure 3 is the quantity of June.

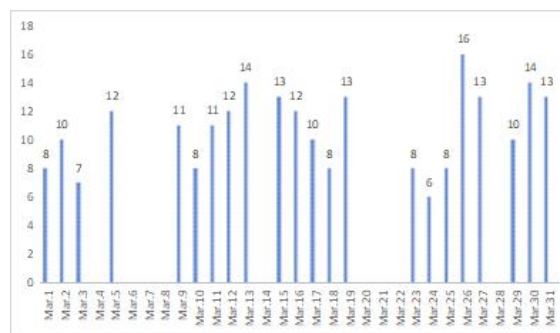


Figure 2. Release date and quantity chart of AI anchor program on Guangdong TV Sports Channel (March 2021)

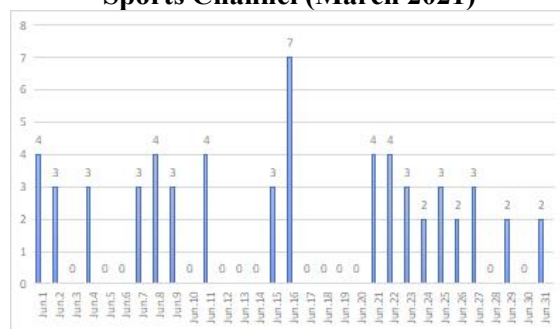


Figure 3. Release date and quantity chart of AI anchor program on Guangdong TV Sports Channel (June 2021)

From the perspective of publication dates, the AI anchor segment on Guangdong Television Sports Channel does not adhere to a fixed release cycle or quantity. Within the selected two-month interval, the highest daily release count was 16 videos, while the lowest was 0. In March 2021, the total number of releases was 237, averaging 14.81 videos per day, with content not published on 9 separate days. In June 2021, the total release count was 54, averaging 3.48 videos per day, with no content

released on 14 days. These figures demonstrate that, currently, the AI anchor segment not only lacks regularity in daily release volumes but also exhibits significant variation in the number of releases between different months. Regarding the content and video durations of the news releases, over the period from March to June 2021 (N = 291), social news constituted the largest proportion of content in the AI anchor segment on Guangdong Television Sports Channel (N = 242). A small minority of the videos covered topics in nature, science & technology, and finance. News items related to politics, military affairs, and international affairs were either very scarce or entirely absent. Through keyword frequency analysis of the news content, it becomes evident that the AI anchor's news segment particularly emphasizes topics closely tied to people's lives, with the news content directly relevant to the everyday experiences of the general public. In terms of video length, the average duration of a single short-form news video was 19.67 seconds, with the longest being 49 seconds and the shortest clocking in at just 8 seconds.

5 Conclusion

ChatGPT is a potent natural language processing technology that autonomously learns and comprehends large volumes of textual data, subsequently generating novel content in a natural language fashion. This technology has seen extensive adoption across diverse domains, with the sports industry being among them. Within this sector, ChatGPT aids in:

1. The production of high-quality sports reporting and commentary for media outlets.
2. Enhancing advertiser targeting of their intended audience for sports-related brands.
3. Enabling spectators to gain deeper insights into game scenarios and athlete actions.

The technology harnesses vast datasets of sports news for training, thereby enabling the automatic generation of articulate and journalistically valuable sports reports. It facilitates the creation of personalized, custom-tailored advertising content for sports brands and targeted advertisements catering to distinct user interests. Furthermore, ChatGPT generates real-time text-based event coverage and voiceovers, incorporates viewer feedback and data to deliver live recommendations,

enhancing the streaming and interactive experience. Lastly, it creates virtual personas and environments to augment spectator comprehension of game situations and player maneuvers, ultimately enriching the viewing experience.

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