A Preliminary Discussion on Using Blockchain Technology to Avoid Fake News Postprints

Authors: Liu Xiaowan

Date: 2023-10-08T00:00:00+00:00

Abstract

With the rise and development of we-media, the pernicious trend of fake news dissemination in society has become incessant, misleading the public through false and one-sided reports, seriously undermining media credibility and damaging media reputation. Insufficient verification of fake news may also engender serious political, economic, and social issues. This paper elaborates in detail from the perspective of blockchain technology on how to overcome the predicament of rampant fake news in journalism. By leveraging blockchain technology's characteristics of decentralization, transparency, immutability, and traceability, it is possible to reduce the generation and dissemination of fake news from the source, thereby enabling the long-term development of the news media industry. Combined with an analysis of the unique news tracking system of the authoritative Italian news agency ANSA, this paper presents concrete, practical, and feasible cases of blockchain technology in journalism, and provides prospects regarding the impact of technological transformation as well as countermeasures adopted to confront fake news.

Full Text

Preamble

A Preliminary Discussion on How to Avoid Fake News Based on Blockchain Technology

(Xinhua News Agency Editorial Technology Department, Beijing 100803)

Abstract: With the rise and development of self-media, the proliferation of fake news has become a persistent social ill, misleading the public through false or one-sided reporting and severely undermining media credibility and reputation. Inadequate identification of fake news can also lead to serious political, economic, and social problems. This paper elaborates in detail on how to escape the predicament of rampant fake news in journalism from the perspective

of blockchain technology. The decentralized, transparent, immutable, and traceable characteristics of blockchain can reduce the generation and dissemination of fake news from the source, thereby enabling the long-term development of the news media industry. By analyzing the unique news tracking system of the authoritative Italian news agency ANSA, this paper provides a concrete and feasible case of blockchain technology in journalism and offers prospects for the impact of technological transformation and countermeasures against fake news.

Keywords: self-media; fake news; blockchain; decentralization; news tracking system

CLC Number: G2
Document Code: A
Article ID: 1671-0134(2021)08-013-04
DOI: 10.19483/j.cnki.11-4653/n.2021.08.002

Citation Format: Liu Xiaowan. A Preliminary Discussion on How to Avoid Fake News Based on Blockchain Technology [J]. China Media Technology, 2021(08): 13-16.

1. Background and Current Situation

The rise of self-media, lowered barriers to entry for social media, and the development of mobile internet have drastically reduced dissemination costs. The anonymous nature of online communication has led to an overflow of fake news, posing enormous challenges to social development, economic stability, and new media convergence. Consequently, the public has become severely skeptical about the authenticity of any information released by the media. The driving forces behind fake news generation may include profit incentives, pursuit of web traffic, capturing public attention, entertainment demands, inducing public consumption, and continuous innovation in information technology. In addition to strengthening manual review processes to enhance media and platform oversight, leveraging scientific and technological means to filter fake news has become a primary driver for new media development. The decentralized, transparent, immutable, and traceable features of blockchain technology can play a significant role in preventing fake news production. Timely application of blockchain technology in news reporting can provide strong support for verifying authentic content, thereby efficiently ensuring the possibility of eliminating fake news from the source.

2. Blockchain Technology and Its Characteristics

2.1 Introduction to Blockchain Technology

Blockchain is an internet database technology consisting of a series of encrypted data blocks, each containing information about network transactions used to verify its validity and generate the next block. First proposed by the Japanese "geek"Satoshi Nakamoto, blockchain features decentralization, immutability, full

traceability, collective maintenance, and transparency. These characteristics ensure the "honesty"and "transparency"of blockchain, laying a foundation for trust creation and providing an effective technical means for fake news identification that can truly reduce the negative impact of fake news from the source.

2.2 Characteristics of Blockchain Technology

2.2.1 Decentralization The essence of blockchain decentralization is a decentralized distributed ledger database. By storing data on multiple nodes through distributed storage, the difficulty of tampering is increased and data confidentiality is enhanced.

2.2.2 Data Traceability Data traceability means that when publishers release information, all manuscript content and tags are recorded on the blockchain' s distributed storage, enabling easy tracking of messages to their source and ultimately determining information credibility.

2.2.3 Immutability Blockchain also possesses the attribute of immutability. Each block is independently distributed with a unique hash value that distinguishes different blocks. This hash value changes with any modification to the block content, ensuring that any block storing news content cannot be forged or altered.

3. The Impact of Fake News and Blockchain Solutions

3.1 The Impact of Fake News

Fake news created by fabricating facts, forging videos and audio not only disrupts social order but may also smear public figures, eroding public trust and posing significant threats to both social security and content security while causing serious harm in political and economic domains. According to the 2019 CIGI-Ipsos Global Survey on Internet Security and Trust, 44% of respondents admitted that the spread of fake news had significantly reduced their trust in the media. Applying cutting-edge technological methods for automatic detection and identification of fake news would represent a breakthrough in this field.

3.2 Using Blockchain to Combat Fake News

Blockchain technology connects data blocks through timestamps to form an immutable chain-like database. Its information traceability characteristic can comprehensively record the entire process from news production to publication, substantially reducing the frequency of fake news and solving the difficult problem of digital intellectual property traceability.

First, key information from each news report can generate a hash value through smart algorithms, giving it a unique copyright identity and establishing a digital copyright protection mechanism that effectively safeguards authors' rights.

Once a news article is stored in blockchain' s distributed storage space, any content modification will change the hash value. Consequently, the immutability characteristic of hash values ensures that no block storing news content can be forged or altered.

Second, blockchain technology enables real-time tracking of information across all nodes in the dissemination network. Any acts of tampering, plagiarism, or fabrication can be traced, and penalties can be imposed through deduction of security tokens and cryptographic tokens, thereby ensuring authenticity in news dissemination.

Third, the immutability characteristic makes malicious content tampering particularly difficult, effectively preventing external interference.

Finally, the "cryptocurrency token" payment method provides new ideas for incentivizing quality news content creation, opening up a unique pathway and representing an innovative business model. As freelance news creators gradually increase, tokens with certain value may appreciate, enabling the mechanism to become self-adaptive and providing friendly environmental support for healthier and more novel reporting. This approach also allows content creators to achieve profitability through direct transactions with consumers, avoiding the traditional profit-sharing model and building a virtuous cycle content production mechanism.

3.2.1 Advantages of Blockchain In today' s environment of internet information overload, readers urgently need reliable information sources. If multiple media institutions use blockchain technology to verify the authenticity of news sources, it will help readers focus on core and valuable content while strengthening trust between media institutions and readers, thereby further enhancing media reputation. In a society flooded with information, any media unable to automatically identify fake news will undoubtedly fall behind the times and may gradually become obsolete.

3.2.2 Disadvantages of Blockchain The development cycle of blockchain applications is not long, and cases applying this technology to identify fake news in the journalism field are extremely rare. Consequently, system applications, security protection, and business development remain imperfect, with performance and energy consumption issues yet to be effectively resolved. The decentralization characteristic requires blockchain technology to have relatively complex computational capabilities, resulting in high energy consumption that not only consumes substantial electricity but also requires consideration of the scale of machines and occupied space for supporting computational capacity.

Additionally, from the perspective of news organizations, talent for blockchain application is extremely scarce, and the novelty of the technology brings with it a lack of personnel experience. Once technical problems occur in news content production, significant hidden dangers may arise, harming public interests and

reducing trust in news institutions.

4. Case Study: ANSA' s Blockchain News Tracking System

In response to new media development in the internet era and the low-barrier entry characteristics of social platforms, fake news can damage the reputation and high credibility that authoritative news agencies have long established. To effectively improve content quality and news authenticity, ANSA (Agenzia Nazionale Stampa Associata) has utilized cutting-edge blockchain technology to become the world' s first news agency to truly implement a blockchain news tracking system. This technology ensures news quality and accuracy, combats fake news, and protects the agency' s copyright.

4.1 Solution Overview

ANSA uses a tag with a hyperlink (ANSAcheck sticker) to identify every news article created and published by ANSA or republished after citation and modification. This tag enables tracing any news content to its source, helping users verify the news' s reliability. Through blockchain, this approach enhances public credibility for both ANSA and its news-feed users while improving brand effect. When third-party institutions use ANSA news and wish to display the ANSAcheck sticker, they must introduce a package into their development library. Any article citing ANSA can then connect to ANSA' s lightweight blockchain node to prove the news' s authenticity, as shown in [Figure 4: see original paper]-1.

When clicking on a news article' s ANSAcheck sticker, content including the news text, hash value, publication date, news ID, and blockchain registration information is displayed, as shown in [FIGURE:4-2]. Within the blockchain registration information block, the ANSACHECK certificate can be viewed. This certificate is generated on the blockchain and features loss-proof on-chain storage, easy evidence collection, and strong evidence solidification. The certificate details are shown in [FIGURE:4-3].

By clicking the "ESEGUI VERIFICA" (Verify) button in the certificate shown in [FIGURE:4-3], real-time news data verification can be performed. The verification process occurs on the client side, primarily involving hash value calculation and comparison with the hash value retrieved from ANSA. The verification result is shown in [FIGURE:4-4]. The results demonstrate that once verification succeeds, the news' s reliability and authenticity are confirmed.

4.2 System Architecture

ANSA' s blockchain solution involves three main components in its workflow.

4.2.1 Ecosystem News content production at ANSA primarily comes from original creation and secondarily processed content after manual review. News

content is confirmed on Ethereum' s public blockchain. Ethereum, known in Chinese as "以太坊," is an open-source public blockchain platform with smart contract functionality. This platform provides decentralized peer-to-peer contracts through its dedicated cryptocurrency, Ether (ETH). Developers can create and run code on the distributed network, requiring only ETH payment to support application operation. Like other digital currencies, ETH can be traded on exchanges. All of this means that applications and their content theoretically cannot be shut down or deleted.

After registration, any news event becomes traceable and can be linked to relevant offchain data (data not stored on the blockchain). When any third-party institution cites and publishes ANSA news content, they must reference the news ID. This ensures traceability and immutability on the blockchain while preserving the original ANSA news link, indirectly enhancing ANSA' s brand effect.

4.2.2 Third-party Users Any third-party user subscribed to ANSA news who wishes to display the ANSAcheck sticker on all ANSA-sourced articles on their website must introduce a development package to that site. The third-party website can then link to ANSA's lightweight blockchain node, enabling the ANSAcheck sticker to display normally on all ANSA news articles. Other non-subscribed third-party users who wish to publish ANSA news must first register on the ANSA system and obtain blockchain platform access permissions. Only after obtaining relevant permissions can they be allowed to verify news reliability on the ANSA website.

4.3 Implementation Process

The implementation process involves three key steps.

4.3.1 Identity Verification and Tag Acquisition First, any news organization or third-party media using ANSA' s blockchain technology must use frontend JavaScript to initiate requests connecting to ANSA' s blockchain system for identity verification. Request information is processed by the publishing system backend and ultimately sends final requests to the ANSA confirmation system, receiving verification result feedback.

After identity verification passes, the news organization or third-party media can identify and obtain the ANSAcheck sticker for referenced ANSA news and embed it into their news pages.

4.3.2 ANSA Confirmation System ANSA maintains a blockchain-related management system that provides request services for other domestic and international news agencies and third-party users.

4.3.3 ANSA Monitoring System ANSA has built its own monitoring system that can track status information for any published ANSA news while also obtaining statistical data on ANSA news citations by other news agencies and third-party users.

4.4 Application Scenarios

ANSA' s blockchain technology applications involve social media, digital signatures, and image copyright.

4.4.1 Social Media Social media is developing vigorously on the internet, with information flooding into people' s view like a torrent every moment. Social media refers to media where netizens spontaneously create or provide news information that is then disseminated through forwarding or citation by multiple people, primarily including Weibo, WeChat, Twitter, Facebook, YouTube, etc. Introducing the ANSAcheck sticker on social media websites can not only drive traffic to ANSA's website but also indirectly enhance its brand effect and further expand its influence and recognition.

4.4.2 Digital Signatures By confirming journalist information on the blockchain, journalists can directly upload firsthand news reports on the platform, ensuring timeliness while guaranteeing authenticity and traceability.

4.4.3 Image Copyright Due to the rapid development of neural network technologies, many individuals tamper with images and videos with high realism for profit and secondary dissemination of false information. Coupled with lowered barriers for open-source technology, the cost of publishing fake news is decreasing. If news media employs blockchain technology, it can effectively circumvent most hidden dangers, ensure the authenticity of image and video content, and improve the resolution of ownership issues for historical images and videos.

5. Technical Considerations and Outlook

Every technological transformation drives changes in news production and dissemination methods. Ignoring new technologies and changes is equivalent to giving up future initiative. There is an urgent need for bold attempts and practices using blockchain technology in the news field. However, despite its various advantages, blockchain also faces issues of instability, limited markets, and lack of supervision, which will constrain deep integration between blockchain and journalism. We should closely monitor blockchain' s potential impact on journalism and continue to leverage technology' s role in driving industry transformation.

Meanwhile, fake news generation methods continue to evolve with technological development. Placing complete hope in purely technical solutions like

blockchain to eliminate fake news is unrealistic. Manual review and technology must work together to better serve the news industry and maximize the assurance of authentic and reliable news reporting.

References

[1] Zhu Tong, Zhang Wen. Research on Combating Fake News with Blockchain Technology [J]. Compilation, Writing and Editing, 2020(1): 14-16.

[2] Xu Ye. Analysis of Blockchain Technology Application Scenarios in Smart Libraries [J]. Media Forum, 2020(17): 110-111.

[3] Li Xianguo. Research on the Application of Blockchain-based Smart Contracts in the Sharing Economy [D]. Harbin: Harbin Institute of Technology, 2019.

[4] Kuang Wenbo, Yang Mengyuan, Guo Yi. How Blockchain Technology Can Solve Journalism' s Dilemma [J]. News Forum, 2020(1): 18-20.

[5] Shi Anbin, Ye Qian. Blockchain Technology and Journalism Transformation [J]. Youth Journalist, 2019(16): 75-78.

Author Biography: Liu Xiaowan (1987-), female, from Suzhou, Anhui, engineer at Xinhua News Agency.

(Responsible Editor: Li Jing)

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