The Impact of Blockchain Technology on News Industry Business Models: Postprint

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Abstract

As an underlying architecture technology, blockchain possesses several key features including decentralization, immutability, timestamping, and smart contracts, and is considered a new hope for saving journalism. Through investigating the practices of blockchain media platforms Civil and PressCoin, this paper argues that while blockchain can theoretically innovate media business models, such innovation faces numerous challenges. Blockchain technology can create a self-sufficient system that enables media to break free from reliance on advertisers, obtain revenue directly from users, strengthen direct connections with users, promote user participation in news production and dissemination processes, help self-media break free from channel dependency, and also protect media intellectual property rights. However, in practical operation, blockchain media also harbors several concerns: it may trigger economic speculation, must ensure platform exclusivity of high-quality content, faces significant platform promotion difficulties, requires users to possess high media literacy, and media may face ethical dilemmas regarding whether to report negative news about blockchain technology.

Full Text

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Abstract

As an underlying architecture technology, blockchain features decentralization, immutability, timestamping, and smart contracts, and is considered a new hope for saving journalism. Through an investigation of blockchain media platforms Civil and PressCoin, this paper argues that while blockchain can theoretically innovate media business models, such innovation faces numerous challenges. Blockchain technology can create a self-sufficient system that enables media

organizations to break free from advertiser dependence, obtain revenue directly from users, strengthen direct user relationships, promote user participation in news production and distribution processes, help self-media break channel dependencies, and protect media intellectual property rights. However, in practice, blockchain media also presents significant concerns: potential economic speculation, the necessity of ensuring platform exclusivity of quality content, difficulties in platform promotion, the requirement for high user media literacy, and potential ethical dilemmas regarding whether to report negative information about blockchain technology itself.

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Introduction

In recent years, the development and application of blockchain technology have shown explosive growth. In 2015, blockchain enthusiasts primarily focused on Bitcoin and its applications. By 2016, interest in blockchain had grown substantially and the technology matured. In 2016, China' s State Council issued the *13th Five-Year National Informatization Plan*, which emphasized strengthening basic research and forward-looking deployment of blockchain and other technologies, elevating blockchain development to a national strategic consideration. While early attention to blockchain concentrated mainly on the financial sector, since 2017, increasing consideration has been given to "blockchain+" —the integration of blockchain technology with other industries. In July 2017, the State Council' s *New Generation Artificial Intelligence Development Plan* specifically mentioned "promoting the integration of blockchain technology and artificial intelligence to establish a new social credit system that minimizes interpersonal communication costs and risks." In October 2017, the State Council' s *Guiding Opinions on Actively Promoting Supply Chain Innovation and Application* proposed "researching the use of emerging technologies such as blockchain and artificial intelligence to establish a supply chain-based credit evaluation mechanism." In March 2018, the People' s Bank of China held a national monetary gold and silver work teleconference, stating that it would steadily advance central bank digital currency research and development [1]. On May 20, 2018, the Ministry of Industry and Information Technology' s Information Center stated in the *2018 China Blockchain Industry White Paper* that as of 2018, there were 456 blockchain enterprises covering upstream sectors such as hardware manufacturing, platform services, and security services, as well as downstream sectors including industrial technology application services, media, and talent services [2]. For the journalism industry, blockchain as a foundational technology presents opportunities for transformative development. Many believe that blockchain can completely save journalism from its crisis and create new business models for the industry. This paper aims to explore whether blockchain

technology applications can truly create new journalism business models.

1. Blockchain Technology and Its Characteristics

Blockchain technology originated from the foundational 2008 paper *Bitcoin: A Peer-to-Peer Electronic Cash System* by the pseudonymous Satoshi Nakamoto. Blockchain technology is "a new decentralized infrastructure and distributed computing paradigm that uses encrypted chain-of-blocks structures to verify and store data, distributed node consensus algorithms to generate and update data, and automated script code (smart contracts) to program and operate" [3]. "It can enable trusted transactions without trusted intermediaries in a trustless environment"[4]. Blockchain's main characteristics are decentralization, immutability, timestamping, and smart contracts.

The decentralization characteristic stems from the system's organizational structure. System management and control do not rely on top-down centralized or hierarchical structures but rather on interactions among network nodes [5]. Blockchain' s immutability, or extreme difficulty to forge, is also related to this decentralized structure. Before newly generated data can be written into a block, it must be verified by all or most nodes. Only after verification can it be written into a shared ledger maintained collectively by all nodes. Since each node stores the data, tampering with individual or a few nodes cannot affect the entire system' s data, making data storage using blockchain highly secure. Following the 2018 Changchun Changsheng vaccine incident, to prevent post deletion, at 2:49:54 AM on July 22, an article titled *The King of Vaccines* was permanently recorded at Ethereum block height 6007493 as a note to a transaction on the blockchain network. Even if the article is deleted again on other platforms, the version stored on the blockchain cannot be deleted or altered and will be preserved permanently as a record. Timestamping is a feature of blockchain data storage, adding temporal dimension information to data and making it highly traceable and verifiable [3]. Smart contracts are an application model of blockchain technology, essentially code that can be automatically triggered according to pre-specified conditions [4]. Depending on the blockchain system, smart contracts can take different forms.

2. Existing Business Models in Journalism

As an underlying architecture technology, blockchain can integrate with many industries and bring disruptive innovation. Journalism currently faces two widely recognized crises. First, the proliferation of fake news, with media increasingly emphasizing click-through rates and declining credibility. Second, the collapse of journalism' s traditional advertising model and increasingly depleted funding sources. Scholars and media practitioners believe that blockchain can not only provide highly credible information through encryption technology but also offer readers convenient payment methods, bringing hope for solving journalism' s crisis. This paper primarily discusses the relationship between blockchain and journalism business models.

Traditional journalism revenue channels mainly include retail, subscription, and advertising, with advertising accounting for the largest share. These channels can be summarized into two models—the primary sales model and the secondary sales model. Primary sales refers to media organizations selling products directly to audiences to obtain profits for operations. Secondary sales involves media selling products to users and then selling users to advertisers, obtaining profits through advertising fees. In the secondary sales model, news media' s first sale is selling information to users, and the second sale is selling users' attention to advertisers.

Since the advent of the Internet era, Internet platforms and social platforms such as Google and Facebook, with their massive traffic, have gained advertisers' favor. The Internet era has also allowed users to enjoy large amounts of free news. Traditional media face continuous declines in both users and advertising revenue. Realizing the crisis of the Internet era, traditional media have begun self-rescue efforts. Traditional news media such as *The New York Times* have undergone digital transformation, with increasing numbers of media erecting paywalls through online or mobile platforms. In January 1997, *The Wall Street Journal* website established a paywall, becoming a pioneer among mainstream American newspaper websites in content charging. In May 2009, Murdoch announced that newspapers under his News Corporation, including *The Times*, *The Wall Street Journal*, and *News of the World*, would stop providing free content, establish paywalls, and implement paid reading [6].

Existing paywalls can be divided into two types: "hard" walls and "soft" walls. Hard walls completely isolate users from content, with all information requiring payment. Soft walls allow some content to be free [7]. Hard paywalls are suitable for media where content is dominant, attracting users to pay through unique value and advantages. Most media currently adopt soft paywalls. Different media implement different charging policies. For example, Singapore' s *Lianhe Zaobao* divides news into regular news and premium paid news, requiring payment only when reading articles for paid users. *The New York Times* sets a free quantity limit, allowing users to browse 25 articles for free before charging.

Although paywalls have increased the proportion of primary sales to some extent, they are not a panacea. Even for an established newspaper like *The New York Times* with a fixed and large loyal user base, user attitudes were relatively negative when the paywall was first established [8]. For small regional media, making users accustomed to free content willing to pay for paywalls remains a formidable task. *The Guardian* columnist Nikki Wolf believes that besides relying on paywalls and advertising, micropayments are also a funding model for media, where each user pays a small price for each news product consumed. This approach has long been considered a feasible solution to online news dilemmas but is difficult to implement in reality. Emily Bell, Director of the Tow Center for Digital Journalism at Columbia University, believes that blockchain technology enables journalists and interest groups to provide a funding market for journalism operations [9]. Gerald Dick, CEO of blockchain startup media

company Po.et, believes that due to the immutability of data recorded in the blockchain, if content producers can prove ownership of content or even its authenticity, they do not need to rely on advertising revenue but can obtain income directly from content consumers [10]. Li Tai' an, in the article *Blockchain Reconstructs the Online Public Opinion Environment*, argues that blockchain can achieve digital content protection, fragmented sales, and micropayments, making payments more frequent and ultimately achieving the purpose of protecting and realizing creators' interests [11].

The blockchain news platform Civil, founded in 2017, is considered a pioneer in integrating blockchain technology with the media industry. The platform was developed with a $5 million investment from blockchain company ConsenSys and consists of three markets: newsrooms, stations, and fact-checking. Both newsrooms and stations are staffed by registered news producers but operate differently. Newsrooms are reader-driven. Readers can sponsor topics of interest to promote investigative reporting by journalists. Stations are journalist-led, where reporters work on topics of interest and can set their own prices. Fact-checking is a function that Civil attaches great importance to, aiming to minimize misinformation. Both newsrooms and stations must contribute a portion of funds for fact-checking [12]. Currently, 18 media newsrooms have launched on Civil, divided into four categories: media focusing on regional news reporting, such as *The Colorado Sun*; media focusing on investigations, such as Sludge; media focusing on policy, such as Cannabis Wire, which focuses on the cannabis industry; and international news media, such as Popula. Civil' s white paper states that the Civil platform has no advertisements, no fake news, and is free from external interference [13]. Due to the use of blockchain technology, Civil is theoretically a decentralized platform where media publishing news on Civil will not be restricted by policy or other factors. As long as content passes fact-checking, it will not face other censorship or restrictions.

Civil plans to create a new media business model. In this model, media workers' income comes entirely from users, with zero proportion from advertising. To achieve this goal, Civil plans to issue virtual currency CVL. Officially registered news producers will receive a certain amount of CVL, similar to equity, for rewards, promotion, and maintenance expenses. Users can purchase publicly issued CVL through ICO. Users who own CVL have the power to access content, participate in voting on news editorial decisions, and penalize erroneous content. The total amount of CVL on the entire Civil platform is limited, so as the number of participants increases, the value of CVL will rise accordingly. Currently, Civil does not mandate CVL purchases. As long as media workers on the platform do not make mandatory requirements, users can voluntarily choose whether to purchase CVL. To create a good content platform and encourage user participation in news production and distribution processes, Civil will also reward users who actively comment and receive positive feedback with a certain amount of CVL in the future, mobilizing user participation enthusiasm.

Also in 2017, blockchain news company PressCoin was founded by independent

journalist Nafeez Ahmed and has been called "the Bitcoin of journalism" [14]. PressCoin believes that the current journalism industry is struggling because journalists have heavy workloads and low salaries, while giant platforms such as Google and Facebook control content flow and revenue on Internet platforms. It hopes to use cryptocurrency to create an independent journalism industry, break the control of media giants over content production, and open up a new funding source for journalism.

PressCoin' s goal is to create a "decentralized value redistribution system" [15]. Each news organization on the platform has a dedicated data block storing that organization' s information. The value created by each organization is recorded on the blockchain in real-time through encryption. Smart contracts calculate each block' s contribution to the entire system, using this as the standard for wealth distribution. To maximize its user base, PressCoin has launched a mechanism similar to "reader compensation." Readers who provide insightful views and promote healthy discussion operations can receive rewards [16].

Although the practices of Civil and PressCoin in introducing blockchain technology into media business models are just beginning and their future success remains uncertain, the impact of technology on media development has been evident throughout history. Whether blockchain can disrupt existing business models and save journalism can only be discovered through practical exploration. The attempts by Civil and PressCoin can provide academics and industry professionals with a glimpse into blockchain technology' s impact on journalism development, enabling deeper thinking about the future of journalism and providing beneficial experiential lessons.

4. Advantages of Blockchain Media

From the business concepts of Civil and PressCoin, blockchain media have several major advantages:

Breaking media dependence on advertisers and strengthening direct connections between content producers and consumers. In traditional media business models, advertising is the main source of media revenue. However, dependence on advertising causes media to lose a certain degree of autonomy in production, constrained by advertisers. When facing news that conflicts with advertisers' interests, media also face ethical dilemmas about whether to report truthfully. Blockchain media transforms the entire media ecosystem into a theoretically self-sufficient system. Media and platforms, as well as media and users, form contractual relationships through smart contracts. Media revenue comes directly from users, and media can also receive dividends based on their contribution to the platform. Users can choose to purchase media products or receive additional allowances by participating in news production and distribution processes. In such a system, media no longer sacrifice content quality to meet advertisers' traffic demands but can instead improve content quality to attract and consolidate user groups. Additionally, since every user trajectory is

recorded on the blockchain, media can obtain more precise data for effectiveness evaluation, creating more accurate user portraits that better facilitate targeted content production.

Promoting citizen participation in news production and distribution. In traditional media news production processes, user participation is limited. Before the Internet era, news media' s understanding of users was limited to subscription numbers and ratings, with user profiles remaining vague. Users' contributions to news production were limited to providing clues. After entering the Internet era, media understanding of users has increased in several dimensions. For example, users can leave comments on web news, and media can interact with users in comment sections to understand their thoughts. Users can also express content preferences through likes and shares. Media can profile users' age, gender, and other characteristics through registration information. However, even though users can interact with media, their participation in media content production remains low, with editorial decisions still made within media organizations and ordinary users unable to participate. In blockchain media operations, users who purchase virtual currency have the right to participate in voting on news editorial decisions and penalizing erroneous content, effectively becoming shareholders of the media and directly participating in media operations.

Breaking self-media dependence on channels. In the Web 2.0 era, the rise of self-media is also a phenomenon that cannot be ignored. However, self-media in the current media market often have strong dependence on channels. Channel policy changes directly affect self-media operating conditions, which in turn often lead to adjustments in self-media content production. Self-media dependent on channels not only have content production affected by channel policies but also occupy a "Party B" position in profit distribution, with dividends completely determined by channels. Blockchain platforms are different. When self-media join the platform, they sign smart contracts with the platform. As long as contract conditions are met, the contract executes automatically. Once joined, self-media become part of the collective platform maintenance. Even if they want to change terms in the smart contract, they are no longer in a passive acceptance position.

Protecting intellectual property rights. In the Internet era, the convenience of copy-paste makes creators constantly face risks of piracy and plagiarism. Creators often discover their works have been misappropriated only after infringement has occurred for some time. Protecting intellectual property rights involves difficult evidence collection and cumbersome legal procedures, and whether victims can successfully protect their rights after going through appeals remains uncertain. On blockchain media, operations on content require verification by most or all network nodes, making piracy and plagiarism no longer easy. Additionally, blockchain' s unique timestamping function makes information source traceability well-documented. Even if piracy or plagiarism occurs, rights protection becomes very easy.

5. Concerns About Blockchain Media

Although blockchain media have the above advantages, they are not perfect. In practical operation, blockchain media also face the following concerns:

Economic speculation behavior may emerge. The virtual currency used by blockchain media is essentially an investment. As blockchain popularity continues to rise, it is difficult to ensure that all virtual currency purchasers are genuine consumers rather than speculators. Large-scale speculation will bring adverse effects to blockchain media development.

Platform exclusivity of quality content must be guaranteed. Blockchain media encouraging users to purchase virtual currency is essentially encouraging users to pay for content. However, in an era of exploding free information, expecting users to pay without providing exclusive quality content is unrealistic. And if every platform can achieve information exclusivity, will this create a fragmented news market, making society that should have smooth information flow become closed off?

Platform promotion is difficult. Currently, few people in society understand blockchain technology, and even fewer media practitioners understand blockchain. Changing the status quo of journalism and promoting blockchain media still has a long way to go. Additionally, different platforms issue different virtual currencies—is this not inconvenient for users? And will this inconvenience reduce user participation enthusiasm?

Users must have high media literacy. According to the concepts of Civil and PressCoin, the entire blockchain media system is decentralized, with consumers actively participating in news production and distribution. This assumes by default that user participation is a positive promoting factor for the entire system. However, in real life, news consumers differ in age, region, preferences, education level, and media literacy. Pornographic and violent information naturally has eye-catching appeal, especially for those with low media literacy. If left unchecked, there is no guarantee that information on blockchain platforms will not become a mixed bag of good and bad. Perhaps considering this, the Chinese blockchain media platform Matters only distributes invitation codes to select individuals. On its invitation code application page, it describes early user base members as "willing to actively interact with others and participate in digital currency circulation" and "hoping to contribute quality content and become part of the circulation economy," requiring self-introductions for platform review. This shows that to maintain a quality platform, user media literacy is a factor that cannot be ignored. Achieving "small but beautiful" quality platforms is not difficult, but whether "large but beautiful" can be achieved remains to be tested in practice.

Media may face ethical dilemmas when reporting negative information related to blockchain. For blockchain platforms, since the issued virtual currency is limited, the more participants, the more valuable the currency. Although blockchain

technology frees media from advertiser dependence, it creates dependence on blockchain technology itself. If negative information related to blockchain technology emerges, media will face ethical dilemmas about whether to report it. Reporting may shake users and reduce usage numbers, but not reporting would violate professional ethics.

6. The Long Road Ahead for Blockchain Media Models

Technological transformation always brings significant changes to journalism development. In contemporary society where traditional media profit models have collapsed, the promising prospects of new business models brought by blockchain technology are exciting and bring hope for solving journalism' s crisis. However, blockchain media still face many problems in actual operation. Whether technical difficulties, media content, user media literacy, or potential ethical dilemmas, all mean that using blockchain technology for business model innovation is by no means easy. While viewing blockchain as journalism' s savior, we need to rationally consider blockchain technology, continuously summarize and learn from experience in practice, and avoid technological determinism.

Blockchain as an emerging technology has attracted considerable attention. Discussions on the deep integration of blockchain with industries are also increasing. As an underlying architecture technology, blockchain' s main characteristics are decentralization, immutability, timestamping, and smart contracts. In today' s society where traditional media business models have collapsed, blockchain technology brings opportunities and hope for journalism transformation. Several blockchain media platforms have begun media practice, hoping to use blockchain to create a new media ecosystem and construct new journalism business models. Blockchain media represented by Civil and PressCoin all issue their own virtual currencies and introduce systems similar to "reader incentives" to encourage user participation in news production and distribution.

Media platforms adopting blockchain architecture have many advantages. Using virtual currency economies, blockchain media can break dependence on advertisers and strengthen direct connections between content producers and consumers. Blockchain platforms can record all data, helping media obtain precise user portraits. The introduction of reader incentive mechanisms can also promote direct citizen participation in news production and distribution, helping media produce news products that better meet user expectations. For self-media, due to the existence of smart contracts, blockchain media platforms can help them escape passive positions of excessive channel dependence and enhance autonomy. For media workers, the traceability brought by blockchain technology can help them better protect intellectual property rights.

From a theoretical perspective, blockchain creates a self-sufficient space for media, bringing hope for solving the current crises facing journalism. However, in practice, blockchain media still have many hidden dangers. Since blockchain media use virtual currency, their value increases with the number of participants,

making economic speculation difficult to avoid. Blockchain media encouraging users to purchase virtual currency is actually encouraging users to pay for content. Without quality content and without guaranteeing exclusive ownership of quality content, blockchain technology cannot guarantee user purchase enthusiasm in the era of free information proliferation. But if every blockchain media platform guarantees its own exclusivity, whether this will create a fragmented news market and cause information blockage remains unknown. Currently, few people understand blockchain technology, and promotion will require a long cycle. Additionally, different platforms issuing different virtual currencies disperses user attention and may reduce user participation enthusiasm. And user participation does not necessarily mean maintaining a quality platform. Only when users have high media literacy will the platform' s tone and quality content be maintained; otherwise, it will only make the platform become chaotic, with pornographic and violent content continuing to attract attention. And once faced with negative information about blockchain, these media built upon it may also face ethical dilemmas about whether to report it.

The path to using blockchain technology to innovate journalism business models is long and arduous.

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