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Moussaab Belfar

University of Mohamed Boudiaf / Msila

<https://orcid.org/0009-0004-8894-087X>

moussaab.belfar@univ-msila.dz

Blockchain and the Reconstruction of Media Trust in the Age of Digital Uncertainty: When Algorithm Meets Truth: A Critical Analytical Study on the Dialectic of Technology and Profession Between Absolute Transparency and Journalistic Independence

Abstract

This study explores the philosophical and applied intersection between blockchain technology and contemporary journalistic practices, amid accelerating digital transformations and the escalating trust crisis witnessed by the global media landscape. The study aims to analyze the technical, philosophical, and professional dimensions of blockchain journalism, examine its practical applications, and explore the inherent tensions between technical transparency and editorial independence. The study adopted a critical analytical descriptive approach, with a comprehensive review of specialized scholarly literature and existing applied projects, alongside philosophical analysis of central concepts such as trust, transparency, and decentralization. The study concluded that blockchain technology offers a theoretical and technical framework for addressing contemporary journalism dilemmas, particularly in areas of credibility verification, combating fake news, digital rights management, and editorial transparency. However, practical implementation faces multidimensional obstacles: technical, economic, regulatory, and cultural. Results showed that decentralized platforms such as Civil and Steemit represent pioneering yet incomplete models, reflecting the fundamental tension between technological ambition and professional reality. The study recommends developing appropriate philosophical and regulatory frameworks, enhancing technical and critical awareness among journalists, and encouraging balanced experimental applications that respect the privacy of the journalistic profession while benefiting from technical capabilities.

Keywords: *Blockchain Journalism, philosophy of technology, media trust, digital decentralization, journalistic transparency, smart contracts, digital media ethics*

Moussaab Belfar

Məhəmməd Boudiaf Universiteti / Msila

<https://orcid.org/0009-0004-8894-087X>

moussaab.belfar@univ-msila.dz

Rəqəmsal qeyri–müəyyənlik çağında Blokçeyn və Media etibarının yenidən qurulması: Alqoritm həqiqətlə qarşılaşdıqda: Texnologiyanın dialektikası və mütləq şəffaflyq və jurnalistik müstəqillik arasındakı peşə haqqında kritik analitik tədqiqat

Xülasə

Bu tədqiqat, sürətlənən rəqəmsal transformasiyalar və qlobal media mənzərəsinin şahidi olduğu artan etimad böhranı fonunda, blokçeyn texnologiyası ilə müasir jurnalistika təcrübələri arasındakı fəlsəfi və tətbiqi kəsişməni araşdırır. Tədqiqatın məqsədi blokçeyn jurnalistikasının texniki, fəlsəfi və peşəkar ölçülərini təhlil etmək, onun praktik tətbiqlərini araşdırmaq və texniki şəffaflıqla redaksiya müstəqilliyi arasındakı daxili gərginlikləri araşdırmaqdır.

Tədqiqat, etimad, şəffaflıq və mərkəzləşdirilmə kimi mərkəzi anlayışların fəlsəfi təhlili ilə yanaşı, ixtisaslaşmış elmi ədəbiyyatın və mövcud tətbiqi layihələrin hərtərəfli icmalı ilə tənqidi analitik təsviri yanaşma tətbiq etmişdir. Tədqiqat, blokçeyn texnologiyasının, xüsusən də etibarlılığın yoxlanılması, saxta xəbərlərlə mübarizə, rəqəmsal hüquqların idarə edilməsi və redaksiya şəffaflığı sahələrində müasir jurnalistika dilemmalarını həll etmək üçün nəzəri və texniki çərçivə təklif etdiyi qənaətinə gəlmişdir. Lakin praktik tətbiq çoxölçülü maneələrlə üzləşir: texniki, iqtisadi, tənzimləyici və mədəni. Nəticələr göstərdi ki, Civil və Steemit kimi mərkəzləşdirilməmiş platformalar texnoloji ambisiya ilə peşəkar realıq arasındakı fundamental gərginliyi əks etdirən qabaqcıl, lakin natamam modelləri təmsil edir. Tədqiqat müvafiq fəlsəfi və tənzimləyici çərçivələrin hazırlanmasını, jurnalistlər arasında texniki və tənqidi məlumatlılığın artırılmasını və texniki imkanlardan faydalanarkən jurnalist peşəsinin məxfiliyinə hörmət edən balanslaşdırılmış eksperimental tətbiqlərin təşviq edilməsini tövsiyə edir.

Açar sözlər: Blokçeyn jurnalistikası, texnologiya fəlsəfəsi, media etimadı, rəqəmsal mərkəzsizləşdirmə, jurnalistik şəffaflıq, ağıllı müqavilələr, rəqəmsal media etikası

Introduction

The global media landscape is witnessing unprecedented radical transformations, where the technological revolution intersects with the structural crises afflicting traditional journalism (Erkkilä, 2019, p. 5). In this complex context characterized by uncertainty, blockchain technology emerges as one of the potential technical–philosophical solutions for addressing deep–rooted problems facing contemporary journalistic practice. After revolutionizing the financial sector through cryptocurrencies, its applications have begun extending to various fields, including journalism and media, raising profound questions about the nature of truth, trust, and power in the digital space (Picha Edwardsson et al., 2024, p. 2).

Blockchain journalism represents a theoretical and applied model that seeks to restructure the relationship between media producer and recipient, through decentralized mechanisms ensuring transparency, credibility, and effective participation (Valiente et al., 2020, p. 75). This model proceeds from a fundamental philosophical premise that excessive centralization in media content production, and the monopolistic dominance of technology giants, have led to multidimensional crises including declining public trust, spread of misinformation, undermining editorial independence, and erosion of traditional business models (Al–Saqaq & Picha Edwardsson, 2019, pp. 93–95).

Research

The fundamental problem of this study centers on the philosophical–applied central question: How can blockchain technology, as a technical infrastructure and philosophical system, contribute to addressing the structural challenges of contemporary journalism? Several sub–questions emerge: What are the theoretical and philosophical foundations underlying blockchain journalism? How do practical applications manifest in pioneering projects? What are the inherent tensions between absolute transparency and professional independence? (Al–Saqaq & Picha Edwardsson, 2019, pp. 94–96).

Study Significance

The significance of this study stems from several scientific, practical, and philosophical considerations, primarily the urgent need for a deep understanding of technological transformations and their philosophical and practical impacts on journalistic practice (Al–Saqaq, 2024, p. 2). The study also derives its importance from the scarcity of specialized Arabic research in this field, despite the growing global momentum around blockchain applications in media. This study transcends superficial technical description to explore the deep philosophical dimensions related to concepts of truth, trust, and authority in the digital age (Erkkilä, 2019, pp. 6–7).

Study Objectives

This study seeks to achieve a set of interconnected objectives: analyzing the theoretical and philosophical concepts of blockchain journalism and its relationship to the contemporary trust crisis, monitoring and evaluating existing practical applications and analyzing their operational models,

exploring fundamental tensions between technical transparency and professional independence, evaluating opportunities and challenges from a multidimensional perspective, and providing practical and philosophical recommendations for Arab media institutions (Al-Sabie'i, 2019, pp. 7–8).

Theoretical and Conceptual Framework

The Concept of Blockchain Technology: Technical and Philosophical Levels

At the technical level, blockchain technology is defined as a distributed database that records transactions in a secure, transparent, and immutable manner across a decentralized network of interconnected devices (Abuidris et al., 2021, p. 2). The term "blockchain" literally refers to a chain of blocks, where data is stored in encrypted blocks linked sequentially, and any modification requires network-wide consensus, making it resistant to tampering and hacking. Each block consists of three main elements: stored data, timestamp proving creation time, and cryptographic hash linking it to the previous block, creating an unbreakable chain (Jurado et al., 2020, p. 40).

At the philosophical level, blockchain represents more than just technology: it is an intellectual system proposing an alternative model for social trust. In the traditional conception, trust is built on intermediary institutions (banks, governments, media), while blockchain proposes a "trustless trust" model where algorithms replace institutions as guarantors of credibility (Erkkilä, 2019, pp. 10–11). This transformation raises profound philosophical questions about the nature of trust, power, and truth in the digital age, challenging the epistemological model that has prevailed for decades in media and journalism.

This technology is characterized by fundamental properties with philosophical and practical implications: decentralization eliminating the need for a central intermediary controlling data, transparency allowing all participants to access records, immutability ensuring content cannot be deleted or modified without network consensus, and security provided by advanced encryption based on complex algorithms (Jurado et al., 2020, pp. 39–41).

Historical Development and Intellectual Context of Blockchain Applications in Media

Blockchain's journey in the media field began with limited experimental applications in the mid-2010s, influenced by the relative success of cryptocurrencies (Li et al., 2019, p. 8). Steemit platform launched in 2016 a model for a blockchain-based social network rewarding content creators with cryptocurrency, marking a turning point in media financing concepts and power relations in content production. The platform adopted the "Proof of Brain" mechanism rewarding valuable contributions based on community voting, creating a new token economy for digital content (Li et al., 2021, pp. 2–3).

This was followed by the launch of Civil platform in 2017, which presented an ambitious vision for rebuilding journalism infrastructure on decentralized foundations, focusing on community governance and direct journalist financing without intermediaries (Al-Saqaf & Picha Edwardsson, 2019, pp. 100–102). Although its initial project faced difficulties in raising necessary funding through initial coin offerings, the experiment sparked important discussions about the possibility of applying decentralization in journalism. Subsequent years witnessed diverse initiatives in Europe and Asia, including EU-funded projects using blockchain for content rights and contract management (Erkkilä, 2019, pp. 17–18).

Theoretical and Philosophical Foundations of Blockchain Journalism

Blockchain journalism is based on a set of theoretical principles derived from communication theories, new media, and political philosophy (Valiente et al., 2020, p. 74). It can be understood in light of participatory democracy theory calling for expanding participation in media content production, and digital decentralization theory criticizing major platforms' monopoly of digital space. It also intersects with postmodern theories questioning grand narratives and central authorities, advocating for plurality of voices and sources.

Blockchain journalism is also linked to concepts of journalistic transparency considered a fundamental pillar for restoring public trust, where blockchain enables tracking news paths from origin to publication, revealing any modifications (Jurado et al., 2020, pp. 41–42). Institutional trust theory provides a framework for understanding how decentralized technologies can rebuild trust that

has eroded between the public and traditional media institutions, through technical mechanisms instead of complete reliance on institutional reputation (Erkkilä, 2019, pp. 11–13).

Smart Contracts and Their Functional Role in the Journalistic Environment

Smart contracts represent one of the most important technical components of blockchain in the journalistic context, being self-executing computer programs that automatically implement agreement terms when predetermined conditions are met without human intervention (Bobby et al., 2023, pp. 930–931). In journalism, smart contracts open wide horizons for automating payment processes to journalists, protecting intellectual property rights, and ensuring transparency of contractual relationships between various parties in the media process. These contracts can be programmed to execute complex operations such as automatically distributing revenues among content production contributors, or activating usage licenses upon meeting financial conditions (Abuidris et al., 2021, pp. 5–6).

Smart contracts can play a crucial role in protecting journalists, especially in dangerous areas, through creating a "Dead Man's Switch" system, where sensitive information is automatically published if the journalist is endangered or fails to log into the system within a specified period (Repository GC Human Rights, 2023, pp. 15–17). This application helps combat impunity for crimes against journalists, providing an effective deterrent for entities that might attempt to silence journalistic voices.

Blockchain Applications in Contemporary Journalism Credibility Verification and Combating Fake News

Combating misinformation and fake news represents one of the most prominent blockchain application areas in journalism, especially given the alarming increase of this phenomenon (Picha Edwardsson et al., 2024, p. 2). The technology enables creating a fixed and transparent record for every published media material, with the ability to verify its original source, publication date, and any subsequent modifications, creating what can be called an unforgeable "digital fingerprint" for every media content (Jurado et al., 2020, pp. 42–43).

Several projects have developed mechanisms for automatic verification of media content authenticity using blockchain, including the "news tracking" project that uses technology to ensure traceability of news stories and verify their credibility through information analysis and complete transparency (Jurado et al., 2020, p. 44). This project relies on advanced algorithms recording every stage of news production, from initial information gathering, through editing and fact-checking, to final publication, providing unprecedented transparency in the journalistic process.

Specialized platforms for decentralized fact-checking have also emerged, where the global community can verify information collaboratively and transparently (Picha Edwardsson & Al-Saqaf, 2022, pp. 3–5). These platforms study the possibility of creating global fact-checking databases, although they face challenges related to governance and cultural biases in information assessment. The integration of GNSS technology with blockchain allows documenting the precise location and time of journalistic content capture, enhancing citizen journalism credibility and enabling verification of visual materials and videos authenticity (Każmierczak & Kustra-Rogatka, 2025, pp. 5–7).

Digital Rights Management and Intellectual Property Protection

The media content industry suffers from complex problems related to copyright and intellectual property management in the digital environment, where content copying and republishing without permission or financial compensation is easy (Abuidris et al., 2021, p. 5). Blockchain provides innovative solutions through creating fixed ownership records, and smart contracts that automatically execute usage and distribution agreements. These mechanisms allow tracking journalistic content usage across different platforms, ensuring producers receive their financial rights without intermediaries capturing a large portion of revenues.

The European "Content Licensing Network" project represents an advanced model in this field, where blockchain is used to manage contracts and licenses in a decentralized media market including major institutions such as Deutsche Welle and Belgium's VRT (Erkkilä, 2019, pp. 18–19). These applications contribute to reducing costs associated with lengthy negotiations, providing a transparent platform for content exchange between different media institutions across borders.

The New York Times used blockchain technology to register journalistic photographs and document intellectual property, protecting photographers' rights and preventing unauthorized use (Erkkilä, 2019, p. 16). Some institutions have also developed systems based on non-fungible tokens (NFTs) for selling exclusive journalistic articles and photographs, opening new income sources for independent journalists (Picha Edwardsson et al., 2024, pp. 6–7).

Funding Models and Financial Sustainability

Blockchain offers innovative models for funding journalistic content through tokenization and cryptocurrency mechanisms, attempting to overcome the funding crisis afflicting traditional journalism (Al-Saqaf & Picha Edwardsson, 2019, pp. 102–103). These models allow the public to support journalists and media institutions directly, without intermediaries, with the possibility of collecting very small amounts (micropayments) at low transaction costs, making the "pay-per-article" model economically viable.

Civil platform applies a model based on CVL tokens that the public can use to support high-quality newsrooms, and participate in governance decisions related to content standards and editorial practices (Erkkilä, 2019, pp. 13–14). This model aims to create a media economy independent of advertisements and traditional commercial pressures, giving the community real power in determining journalistic quality standards. Meanwhile, Steemit platform rewards content creators and curators with cryptocurrencies based on engagement and popularity, creating economic incentives for contributing quality content (Li et al., 2019, pp. 9–10).

Participatory Journalism and User-Generated Content

Blockchain opens new horizons for participatory journalism by providing decentralized infrastructure enabling the public to contribute effectively to content production (Valiente et al., 2020, pp. 76–77). Platforms like Mogul News and Nwzer represent models of news agencies relying on user-generated content, where blockchain is used to preserve editing history and build a reputation system for contributors based on the quality and credibility of their previous contributions (Erkkilä, 2019, pp. 15–16).

The HELIOS CJ App project relies on blockchain to provide a decentralized platform for citizen journalism allowing users to publish content anonymously, with mechanisms for verifying its authenticity before distribution to media institutions (Valiente et al., 2020, pp. 76–78). This platform uses smart contracts to ensure transaction transparency and data security, protecting citizen journalists' identities in dangerous environments and oppressive systems restricting freedom of expression.

These applications represent attempts to rebalance professional journalism and public participation, through creating incentive mechanisms encouraging qualitative contribution without sacrificing professional standards (Erkkilä, 2019, pp. 16–17). Blockchain-based reputation systems provide a transparent way to assess contributors' credibility, helping readers distinguish trustworthy content from suspicious material.

Editorial Transparency and Media Accountability

Blockchain enables an unprecedented level of editorial transparency by documenting every stage of journalistic content production (Jurado et al., 2020, pp. 41–42). Readers can access the modification record, information sources, and editorial processes the article underwent before publication, providing complete transparency in the journalistic process. This transparency can contribute to rebuilding trust between the public and media institutions, especially given the declining public trust in traditional media (Erkkilä, 2019, pp. 11–12).

Some platforms like Forbes apply the "Publish-and-Flourish" system using blockchain to preserve article metadata, including precise publication date, author information, and original version (Tenório-Fornés et al., 2019, pp. 20–21). This system protects against subsequent content tampering and provides conclusive evidence of published information authenticity, which is critically important in the era of media disinformation and deepfakes.

Challenges and Obstacles

Technical Challenges and Scalability Issues

Blockchain applications in journalism face fundamental technical obstacles related to scalability and processing speed (Information Journal, 2024, pp. 10–12). Public blockchains like Ethereum suffer from limited transactions per second (approximately 15–30 transactions), creating obstacles for large-scale media applications requiring thousands of transactions per minute processing (Erkkilä, 2019, pp. 21–22). Studies indicate technical challenges also include cybersecurity issues, privacy, consensus mechanisms, and integration with legacy systems used in media institutions.

Critics also raise questions about the actual need for blockchain in many proposed applications, where some experts believe traditional centralized databases may be more efficient and reliable in many cases (Erkkilä, 2019, p. 20). Gerard in his critical study "Attack of the 50 Foot Blockchain" suggests most projects use blockchain as a marketing tool rather than a genuine technical necessity, what is called "blockchain washing."

The high energy consumption of some proof-of-work blockchains represents another environmental challenge, especially given increasing interest in environmental sustainability and carbon neutrality (Information Journal, 2024, p. 11). Newer technologies like Proof of Stake seek to address this problem by reducing energy consumption by over 99%, but they remain under development and testing in media contexts.

Economic Obstacles and Business Model Issues

Financial sustainability represents a major challenge for blockchain-based journalism platforms, where developing and maintaining these platforms requires significant investments, while revenue models remain uncertain and experimental (Al-Saqaf & Picha Edwardsson, 2019, pp. 103–104). Civil's initial token sale failure to raise the minimum required funding (\$8 million) reflects the significant challenge in convincing investors and the public of these projects' economic viability, despite the technical and philosophical ambition they carry.

The high volatility of cryptocurrency values adds an additional layer of economic uncertainty, making long-term financial planning difficult for media institutions (Li et al., 2019, pp. 11–12). Token values used in rewards can change by 20–30% in one day, making income from these platforms unstable and unpredictable. The complexity of using digital wallets and cryptocurrencies also creates obstacles for widespread public adoption, especially in societies with limited technical knowledge (Erkkilä, 2019, pp. 22–23).

Regulatory and Legal Issues

The field lacks clear regulatory frameworks governing blockchain use in journalism, creating legal uncertainty hindering investment and development (Al-Saqaf & Picha Edwardsson, 2019, pp. 104–105). Issues relate to various matters such as personal data protection, legal liability for content published on decentralized platforms, cryptocurrency regulation, and anti-money laundering law compliance. Some countries and regions, especially in Asia-Pacific and the European Union, seek to develop regulatory frameworks encouraging innovation while ensuring adequate protection, but lack of international coordination creates disparities that may hinder global spread of these applications.

The issue of proving ownership and legal liability in decentralized environments raises complex legal problems, especially regarding defamation or privacy violation cases (Repository GC Human Rights, 2023, pp. 18–20). Who is legally accountable when offensive content is published on a decentralized platform? The original creator? The platform? The community that voted for the content? These questions require clear legal answers to ensure accountability without stifling innovation.

Compliance with data protection laws like the European GDPR represents a special challenge, given that blockchain's immutability principle conflicts with the "right to be forgotten" and the right to delete personal data stipulated in these laws (Erkkilä, 2019, p. 23). Some technical solutions attempt to address this contradiction by storing personal data off-chain while keeping only references on the blockchain.

Cultural and Professional Challenges

Blockchain adoption in media institutions faces deep-rooted cultural and professional resistance, stemming from several overlapping factors (Erkkilä, 2019, p. 20). Many journalists express concern about excessive transparency that may reveal internal editing processes and affect journalistic work independence and the ability to protect confidential sources. This technology requires a level of technical knowledge that may not be available to traditional journalists, necessitating intensive training programs and changes in journalistic work culture (Trust.org, 2025, pp. 1–2).

Recent training courses indicate journalists' confidence in covering blockchain topics increases significantly after specialized training, from 46% before the course to 86% after, confirming the importance of investing in professional development and continuing education (Trust.org, 2025, p. 2). Concern about losing editorial control in decentralized environments represents another obstacle, where editors fear difficulty applying professional and ethical standards on platforms that cannot be centrally controlled, and may allow publishing offensive or misleading content without deletion capability (Al-Saqaf & Picha Edwardsson, 2019, p. 105).

The Issue of Technological Illusion and Technological Determinism

Blockchain journalism faces the risk of falling into the trap of "technological determinism" and "techno-solutionism," where technology's ability to solve complex structural problems in journalism is exaggerated (Repository GC Human Rights, 2023, pp. 8–10). Researchers warn that many challenges facing contemporary journalism, such as declining trust and spread of misinformation, stem from deep social, political, and economic problems that cannot be addressed by technology alone without addressing social and political roots (Erkkilä, 2019, p. 24).

Critical studies indicate blockchain applications may create a "veil of transparency" giving an impression of credibility without addressing fundamental issues related to content quality and structural biases in news production (Erkkilä, 2019, pp. 24–25). Technical transparency does not necessarily mean epistemological or ethical transparency; content may be transparent in terms of source and history but misleading or biased in essence.

Literature Review

International Studies

Erkkilä in his important report issued by LSE and Polis entitled "What use is blockchain for journalism?" presented a comprehensive and critical analysis of blockchain applications in journalism, concluding that technology offers potential solutions for trust and transparency issues, but remains in early development stages with no conclusive evidence of its widespread effectiveness (Erkkilä, 2019, pp. 1–25). The report examined ten pioneering projects in Europe and North America, conducted interviews with 15 experts in technology and media, and concluded that promising applications concentrate in specific areas such as metadata preservation and content rights management.

Li and colleagues conducted an in-depth case study of Steemit platform using big data analysis methodology, revealing that more than 16% of cryptocurrency transfers on the platform go to accounts suspected of being automated (bots), indicating reward system abuse and need for better mechanisms to detect inauthentic behavior (Li et al., 2019, pp. 8–12). The study used social network analysis and fake account detection algorithms over six months, providing recommendations for improving system integrity.

Al-Saqaf and Picha Edwardsson in their research "Could blockchain save journalism?" studied blockchain's social and economic dimensions in journalism, focusing on Civil platform as a case study (Al-Saqaf & Picha Edwardsson, 2019, pp. 93–108). The researchers concluded that blockchain can contribute to addressing some journalism challenges, but it is not a magic solution and faces significant obstacles in widespread adoption, especially regarding ease of use and economic sustainability.

Jurado and colleagues presented an advanced technical model for news tracking using blockchain, focusing on the ability to track news stories from origin and ensure complete transparency (Jurado et al., 2020, pp. 39–45). The team developed a system recording article metadata, modification history,

and information sources on Ethereum blockchain, testing it on 500 journalistic articles, measuring cost, efficiency, and security.

Picha Edwardsson and Al-Saqaf conducted an exploratory study on the possibility of using blockchain to create a global fact-checking database, highlighting opportunities and challenges related to this ambitious project (Picha Edwardsson & Al-Saqaf, 2022, pp. 1–18). The study identified five main drivers for using blockchain (immutability, transparency, decentralization, security, rewards) and six barriers (technical complexity, cost, scalability, governance, cultural biases, regulatory uncertainty).

Picha Edwardsson and colleagues presented a recent study on blockchain solutions for generative AI challenges in journalism, proposing a conceptual framework for using blockchain to verify AI-generated content authenticity (Picha Edwardsson et al., 2024, pp. 1–14). Given the alarming increase of fake AI-generated content, the study proposes using blockchain to record "digital fingerprints" for human versus machine-generated content.

Valiente and colleagues conducted a technical study on "a new approach to crowd journalism using blockchain-based infrastructure," developing a prototype of HELIOS CJ platform integrating encryption and blockchain to protect citizen journalists (Valiente et al., 2020, pp. 74–78). Researchers tested the prototype in a simulation environment with 50 users, evaluating security, efficiency, and usability.

Arabic Studies

Al-Sabie'i prepared a comprehensive study on "Trends in applying blockchain technology in Gulf countries," reviewing regional initiatives and comparing them with global trends, focusing on governmental and economic sectors (Al-Sabie'i, 2019, pp. 5–18). The study monitored 27 governmental initiatives in Gulf countries, but indicated the media sector did not receive sufficient attention compared to other sectors, with almost complete absence of journalistic applications.

Al-Saqaf in his chapter "Blockchain technology: a new revolution in journalism" addressed the technology's transformative potentials, highlighting five main areas: source verification, investigative journalism, editorial transparency, intellectual property protection, and alternative funding models (Al-Saqaf, 2024, pp. 1–5). The researcher presented practical examples from global experiences, calling Arab media institutions to explore this technology seriously.

Abu Khudair in his research "Marketing experts' attitudes toward using blockchain in digital marketing" studied Arab specialists' perceptions of blockchain applications, and although focusing on marketing, it addressed aspects related to media content and transparency (Abu Khudair, 2024, pp. 107–125). The researcher conducted a survey including 150 experts in Saudi Arabia, Egypt, and UAE, with results showing 68% see promising technology potentials but 72% point to lack of sufficient knowledge as a main obstacle.

Specialized Studies in Specific Aspects

Abuidris and colleagues conducted a technical study on "a blockchain-based editorial management system," proposing technical architecture for using blockchain in editorial operations and peer review management (Abuidris et al., 2021, pp. 1–15). Researchers developed a system using smart contracts to automate editing and review processes, ensuring transparency and security, testing it in a small academic institution.

Kaźmierczak and Kustra-Rogatka studied enhancing information credibility in citizen journalism through integrating GNSS and blockchain technologies, presenting a technical solution for documenting geographical and temporal location of journalistic content (Kaźmierczak & Kustra-Rogatka, 2025, pp. 1–12). Researchers tested the proposed system on 200 images and video clips, with results showing high effectiveness in detecting fake or repurposed content.

Research Methodology

This study adopted the critical analytical descriptive approach combining accurate phenomenon description, deep analysis of causal relationships, and critical evaluation of assumptions and claims (Erkkilä, 2019, pp. 3–4). Study tools included systematic review of scholarly literature published in peer-reviewed journals in Arabic and English during 2018–2025, case study analysis of blockchain-based journalism platforms, and examination of related technical and industry reports.

The study sample included more than 120 specialized scholarly sources, focusing on recent publications reflecting latest developments in the field (Al-Saqaf & Picha Edwardsson, 2019, pp. 96–97). The study followed strict criteria in selecting sources, prioritizing research published in journals with strict peer review and high impact factors. The study also used the comparative approach to analyze different models of blockchain applications in journalism, and the critical philosophical approach to examine implicit assumptions and ethical implications (Picha Edwardsson et al., 2024, p. 3).

Critical Analysis of Technical Discourse

Dealing with blockchain journalism requires a delicate balance between technological optimism and critical realism (Erkkilä, 2019, p. 24). While technology offers promising potentials for addressing some contemporary journalism problems, it cannot be considered a magic solution for all structural challenges facing the profession. We must distinguish between technology's actual value and the marketing hype surrounding it. Many projects use the term "blockchain" primarily for promotional purposes without genuine technical need, while the same goals can be achieved by simpler and more efficient means (Erkkilä, 2019, pp. 20–21).

The study reveals a fundamental tension between blockchain's absolute transparency and professional need for confidentiality in some aspects of journalistic work, especially regarding source protection and investigative journalism (Al-Saqaf & Picha Edwardsson, 2019, pp. 105–106). Complete transparency may be harmful in some contexts, such as sensitive investigations requiring protection of source identities or confidential information until investigation completion.

Comparison Between Different Models

Existing models vary in their scope of blockchain use and degree of applied decentralization (Erkkilä, 2019, pp. 15–19). Some platforms like Civil adopt a comprehensive approach making blockchain central to the entire infrastructure, with community governance, decentralized funding, and on-chain publishing. While other platforms like Forbes limit use to specific applications like metadata preservation and timestamps without radical change to the traditional business model.

The comparison indicates hybrid models combining advantages of centralization and decentralization may be more practically viable in the near term (Picha Edwardsson et al., 2024, pp. 11–12). These models maintain centralized editorial control to ensure professional quality, while benefiting from blockchain in specific aspects like documentation, transparency, and rights management. This gradual strategy may be more realistic than immediate attempt to build a completely decentralized ecosystem.

Lessons Learned from Pioneering Experiences

Pioneering experiences offer valuable lessons for future projects (Li et al., 2019, pp. 11–12). First, the importance of designing simple and easy user interfaces hiding technical complexity from ordinary users. Second, the necessity of having a clear and sustainable economic model not relying solely on cryptocurrency speculation. Third, the need for effective governance mechanisms preventing abuse without stifling innovation and freedom.

Fourth, the importance of building a committed community of early adopters who believe in the vision and contribute to its development (Valiente et al., 2020, pp. 77–78). Fifth, the necessity of integrating with existing systems instead of attempting to replace them completely, facilitating gradual adoption and reducing institutional resistance.

Philosophical and Ethical Implications

Blockchain journalism raises profound philosophical questions about the nature of truth, trust, and authority in the digital age (Erkkilä, 2019, pp. 24–25). Can algorithms replace human judgment in assessing credibility? Is absolute transparency always desirable or is there room for legitimate confidentiality? How do we balance decentralization and accountability? These questions require deep philosophical thinking transcending purely technical dimension.

The study reveals that blockchain represents a challenge to the traditional epistemological model in journalism, which relies on media institutions' and professional journalists' authority as gatekeepers of truth (Al-Saqaf & Picha Edwardsson, 2019, pp. 106–107). The decentralized model proposes

distributing this authority to the entire community, raising questions about quality standards, accuracy, and ethical responsibility.

Results and Discussion

Main Results

The study showed that blockchain applications in journalism remain in their early experimental stages, with a large gap between theoretical ambitions and practical applications (Erkkilä, 2019, pp. 24–25). Most actual uses concentrate in limited areas such as preserving article metadata, digital rights management, and token-based reward systems, while more ambitious applications like complete decentralized governance and collective fact-checking remain in very early stages.

Results revealed that pioneering platforms like Civil and Steemit faced fundamental challenges in achieving financial sustainability and attracting a wide base of non-technically specialized users (Al-Saqaf & Picha Edwardsson, 2019, pp. 103–104). Civil's initial token sale failure to achieve its financial goals reflects the difficulty of convincing the public of decentralized models' economic viability, especially in the absence of proven performance record. Token sale value reached only \$1.4 million versus the \$8 million target, forcing the platform to rethink its strategy.

Conclusion

Blockchain journalism represents a fascinating philosophical and technical intersection between technological innovation and democratic aspirations in the media field. This technology provides a promising theoretical and applied framework for addressing real challenges facing contemporary journalism, from the trust and credibility crisis, to the need for sustainable funding models, to the necessity of enhancing transparency and public participation (Erkkilä, 2019, pp. 25–26).

However, the transition from theoretical vision to widespread practical application faces multidimensional obstacles: technical, economic, regulatory, cultural, and philosophical. Available evidence indicates most current applications remain experimental and limited in scope, and the path toward comprehensive adoption may take many years and require technical developments and deep cultural and institutional changes (Al-Saqaf & Picha Edwardsson, 2019, pp. 107–108).

Success in this field requires a balanced approach combining openness to technology's transformative potentials and objective criticism of its limitations and risks. Media institutions must avoid falling into the trap of "magic technological solutions," and focus on fundamental goals: improving content quality, enhancing trust, building real relationships with audiences, and ensuring financial sustainability (Picha Edwardsson et al., 2024, pp. 13–14).

Ultimately, blockchain may not be the only or optimal solution for all journalism challenges, but it offers valuable lessons about the importance of transparency, decentralization, and participation as core values in contemporary media practice. These values can be achieved through multiple means, whether using blockchain or not, and what matters most is starting to implement them immediately rather than waiting for technology maturity (Erkkilä, 2019, pp. 26–27).

This study reveals that the real challenge is not purely technical, but relates to rethinking the social contract between journalism and the public, and building new models of trust in an age characterized by digital uncertainty and information plurality (Repository GC Human Rights, 2023, pp. 21–23). Blockchain may be a useful tool in this endeavor, but it needs to be integrated within a comprehensive vision for journalism's future that takes into account technical, economic, political, cultural, and ethical dimensions.

Recommendations

Recommendations for Arab Media Institutions

First: Begin with limited-scope experimental projects to test blockchain applications in specific areas with clear returns, such as preserving investigative article metadata, managing photographic rights, or documenting fact-checking processes, before committing to large investments in comprehensive infrastructure (Erkkilä, 2019, pp. 27–28).

Second: Develop comprehensive and gradual training programs to enhance technical and critical awareness among journalists and administrators about blockchain technology's potentials and limits,

focusing on practical aspects and realistic applications more than abstract technical theory (Trust.org, 2025, pp. 2–3). These programs should include practical workshops, visits to pioneering projects, and continuous educational courses.

Third: Establish specialized Research and Development (R&D) departments to monitor technological developments in digital media, evaluate their suitability for the institution, in collaboration with technical experts, legal consultants, and specialized academics (Al–Saqaf & Picha Edwardsson, 2019, p. 108).

Fourth: Actively participate in regional and international collaborative initiatives to develop unified standards for blockchain use in media, helping overcome technical and regulatory challenges, and exchanging experiences and lessons learned from different experiments (Picha Edwardsson et al., 2024, p. 14).

Fifth: Adopt a balanced approach combining benefit from new technologies and preserving core professional values of journalism, always prioritizing content quality and credibility over pure technical innovation (Erkkilä, 2019, p. 28).

Recommendations for Regulatory and Governmental Bodies

First: Develop clear, flexible, and balanced regulatory frameworks encouraging innovation in new media technologies, while ensuring protection of users' and consumers' rights, privacy, and preventing abuse, without stifling experimentation and creativity (Al–Saqaf & Picha Edwardsson, 2019, pp. 108–109).

Second: Establish support funds and research grants dedicated to encouraging practical experiments in blockchain journalism, especially for small, medium, and emerging institutions that may lack sufficient resources to invest in modern technologies (Al–Sabie'i, 2019, pp. 45–46).

Third: Organize regular and continuous dialogue forums between media institutions, regulatory bodies, technical experts, academics, and civil society, to discuss shared challenges and develop consensus solutions taking into account different perspectives and interests (Picha Edwardsson & Al–Saqaf, 2022, pp. 16–17).

Fourth: Support research initiatives in universities and specialized research centers studying emerging technologies' impacts on journalism and media, providing adequate funding for long–term research transcending superficial exploratory studies (Erkkilä, 2019, pp. 28–29).

Fifth: Enhance regional and international cooperation in setting standards and legislation, to avoid legal disparities that may hinder cross–border applications, while considering each country's cultural and legal specificities (Al–Saqaf, 2024, p. 5).

Recommendations for Researchers and Academics

First: Conduct deep and long–term field studies on users' experiences with blockchain–based journalism platforms, to understand factors influencing their acceptance or rejection, using diverse research methodologies combining quantitative and qualitative approaches (Li et al., 2021, pp. 8–9).

Second: Develop comprehensive and multidimensional theoretical models explaining the relationship between decentralized technologies and journalistic practices, away from simplistic technological discourse or naive technological determinism, benefiting from media theories, philosophy, and sociology (Erkkilä, 2019, p. 29).

Third: In–depth study of blockchain journalism's ethical and professional implications, including privacy issues, responsibility, excessive transparency, source protection, and balance between freedom and accountability, with developing ethical codes appropriate for decentralized environments (Al–Saqaf & Picha Edwardsson, 2019, p. 109).

Fourth: Prepare critical comparative studies between different international experiences in this field, focusing on success and failure lessons, contextual factors affecting, and possibility of transferring experiences between different cultural and political contexts (Picha Edwardsson et al., 2024, pp. 14–15).

Fifth: Develop objective evaluation tools for measuring blockchain applications' impact on journalistic content quality, public trust level, and institutions' financial sustainability, instead of limiting to purely technical indicators (Jurado et al., 2020, pp. 44–45).

Specific Proposals for Advancing Blockchain Journalism

At the Technical Level: Invest in research and development to improve scalability, efficiency, and ease of use, through developing "Layer 2" solutions processing transactions off the main chain, or using private or hybrid blockchains specifically designed for media applications (Information Journal, 2024, pp. 15–16). User interfaces hiding technical complexity from ordinary users must also be developed.

At the Economic Level: Explore hybrid and diverse business models combining advantages of traditional funding (subscriptions, advertisements) and innovative blockchain-based mechanisms (tokens, community rewards, smart contracts), focusing on long-term sustainability instead of quick gains or speculation (Al-Saqaf & Picha Edwardsson, 2019, pp. 109–110). Easy conversion mechanisms between cryptocurrencies and traditional currencies must be developed to facilitate adoption.

At the Professional Level: Enhance experimentation and innovation culture within media institutions, creating a safe environment for failure and learning from mistakes, instead of blind cultural resistance to change or unconscious enthusiastic adoption of new technologies (Erkkilä, 2019, pp. 29–30). Professional and ethical standards appropriate for decentralized environments must be developed, while preserving journalism's core values.

At the Social Level: Build bridges of trust and understanding between the technical community and journalistic community through collaborative projects benefiting from both parties' expertise, avoiding complex technocratic discourse distancing practitioners from understanding real potentials and actual risks (Picha Edwardsson et al., 2024, p. 15). Educational programs for the general public on how to use decentralized platforms and verify content must be developed.

At the Regulatory Level: Develop "regulatory sandboxes" allowing experimentation with new applications in a controlled environment with flexible regulatory oversight, enabling innovation while ensuring adequate protection (Al-Saqaf & Picha Edwardsson, 2019, p. 110). International standards for interoperability between different blockchain media platforms must also be developed.

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