

DONATION TRANSPARENCY THROUGH BLOCKCHAIN TECHNOLOGY: A BIBLIOMETRIC ANALYSIS

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Abstract: This bibliometric study explores blockchain technology in the donation ecosystem using 44 scholarly publications from SCOPUS (2016-2024). Employing Biblioshiny from the Bibliometrix R package, the study identifies patterns and research gaps. Significant findings highlight the role of smart contracts and cryptocurrency in fostering transparency and security in donations. Additionally, cross-disciplinary discussions are encouraged to integrate blockchain into the donation system effectively. The study enhances understanding and offers strategic insights for future research.

Keywords: blockchain, bibliometrics, donation, financial technology, smart contract

1. Introduction

In recent years, donations have played a critical role during global crises, such as natural disasters, economic downturns, and, more recently, the COVID-19 pandemic (Penta et al., 2020). During such times, donations help bridge gaps in government funding, providing essential resources for affected communities. However, a significant issue facing nonprofit organizations today is the decline in donations, primarily due to donor mistrust and concerns over how their contributions are utilized (Sung et al., 2023). This decline has raised critical questions regarding the transparency and accountability of donation management, underscoring the need for innovative solutions to restore donor confidence.

A growing body of literature suggests that blockchain technology has the potential to address these challenges. By providing a decentralized, transparent, and secure platform for tracking donations, blockchain can enhance trust between donors and charitable organizations (Howson, 2021). Blockchain's ability to record immutable transactions allows for greater transparency, ensuring that donors can track their contributions in real-time and verify that their donations are reaching the intended beneficiaries (Baudier et al., 2023). This increased transparency not only fosters trust but also encourages continued donations, particularly in times of crisis.

Despite the growing interest in blockchain's potential for the donation ecosystem, there remains a significant gap in understanding its practical applications. Existing studies largely focus on theoretical frameworks or case studies of individual blockchain initiatives, with limited analysis of broader trends and challenges (Cerf et al., 2020). Furthermore, while blockchain has been widely adopted in sectors like finance and supply chain management, its implementation in the charitable sector is still in its infancy. Therefore, this study aims to fill this gap by conducting a bibliometric analysis of blockchain technology's role in the donation

ecosystem, providing insights into the current state of research, and identifying potential areas for future exploration.

2. Literature Review

Charitable donations have long been recognized as a crucial mechanism for mobilizing resources to support disaster relief, recovery efforts, and long-term community development (Shin et al., 2020). Donations are typically facilitated by a range of actors, including individual donors, corporate sponsors, and nonprofit organizations, who work together to address urgent humanitarian needs (Costa et al., 2022). However, despite their importance, the donation ecosystem faces numerous challenges, chief among them being the issue of trust. Donors are increasingly concerned about how their contributions are managed and whether their donations are being used effectively and ethically (Lee et al., 2018).

One of the key issues contributing to donor mistrust is the lack of transparency in how charitable organizations manage donations. Traditional donation systems are often opaque, making it difficult for donors to track the flow of funds and verify whether their contributions are being used for their intended purposes (Rangone & Busolli, 2021). This lack of transparency can lead to skepticism, particularly in cases where funds are mismanaged or diverted to administrative expenses rather than directly benefiting the intended recipients (Kumar, 2021). As a result, there is a growing need for more transparent and accountable systems that allow donors to monitor their contributions in real time.

Blockchain technology has emerged as a promising solution to these challenges. By providing a decentralized ledger that records all transactions in a secure and immutable manner, blockchain enables charitable organizations to offer greater transparency to their donors (Nasir et al., 2021). Smart contracts, a key feature of blockchain technology, can automate the donation process, ensuring that funds are only released when specific conditions are met (He et al., 2023). This reduces the risk of fraud and ensures that donations are directed to their intended purposes. Moreover, blockchain's ability to provide real-time tracking of donations enhances accountability, allowing donors to verify that their contributions are being used as promised (Liu et al., 2021). Despite these potential benefits, the adoption of blockchain in the donation ecosystem is still limited, and more research is needed to fully understand its implications and challenges.

3. Methodology

This bibliometric study utilizes a quantitative approach to examine the literature on blockchain technology in donation systems. The SCOPUS database was selected for its comprehensive coverage of academic publications. Articles published between 2016 and 2024 were included, with keywords such as "blockchain," "donation," "charity," and "philanthropy" used to retrieve relevant studies. A total of 222 articles were initially identified, of which 44 met the inclusion criteria. These articles were analyzed using the Bibliometrix R package, with the Biblioshiny application used for data visualization. The analysis focused on identifying key trends, patterns, and research gaps in the field.

4. Discussion and Conclusion

This research examined blockchain technology in donations from 2016 until 2024. Based on Table 1, the articles comprise a total of 44 documents, reflecting a diverse collection of research

or information over the selected timespan from 2016 to 2024. The annual growth rate of these documents is approximately 9.05%, indicating a steady increase in the volume of documents produced or collected each year. This growth rate suggests an active and expanding field of study or area of interest.

The average age of the documents is 2.86 years, which suggests that the collection is relatively recent and potentially relevant to current trends or developments. Moreover, each document has, on average, about 8.727 citations, indicating that the documents are not only current but also of significant interest to the community, as evidenced by the citation rate. With a total of 1868 references cited across all documents, shows a rich network of knowledge, underscoring the extensive research and background supporting the content of these documents.

Table 1. Main Information About Data

Description	Results
Sources (Journals, Books, etc)	35
Documents	44
Annual Growth Rate %	9.05
Average citations per doc	8.727
References	1868

Figure 1 depicts the keyword "blockchain" stands out as the most central term in the dataset, highlighting its significance as the primary focus of research. Its size and position indicate that it is frequently mentioned, and closely associated with other key concepts such as "cryptocurrency," "bitcoin," "distributed ledger," and "encryption." These terms represent fundamental aspects of blockchain technology and its applications.

The connection between "cryptocurrency," "bitcoin," and "fundraising" forms a cluster focused on blockchain's financial applications, including digital currencies and fundraising mechanisms like Initial Coin Offerings (ICOs) or crowdfunding. Additionally, terms like "governance" and "trust" suggest an interest in exploring how blockchain enhances governance structures and trust within these systems.

"Ethereum" is another key node, reflecting its role as a platform for developing blockchain applications, especially in creating "smart contracts." Smart contracts are further linked to concepts like "charity" and "transparency," indicating research into their potential to improve transparency in charitable organizations. Other related nodes, such as "crowdfunding" and "encryption," though smaller, are still important in understanding the broader technical and practical aspects of blockchain.

In summary, the network of keywords shows that blockchain research covers a wide range of topics, from financial applications to governance and transparency. The ties to Ethereum and smart contracts point to both technical innovations and practical uses. Overall, this network highlights blockchain's diverse implications and research opportunities across various sectors.

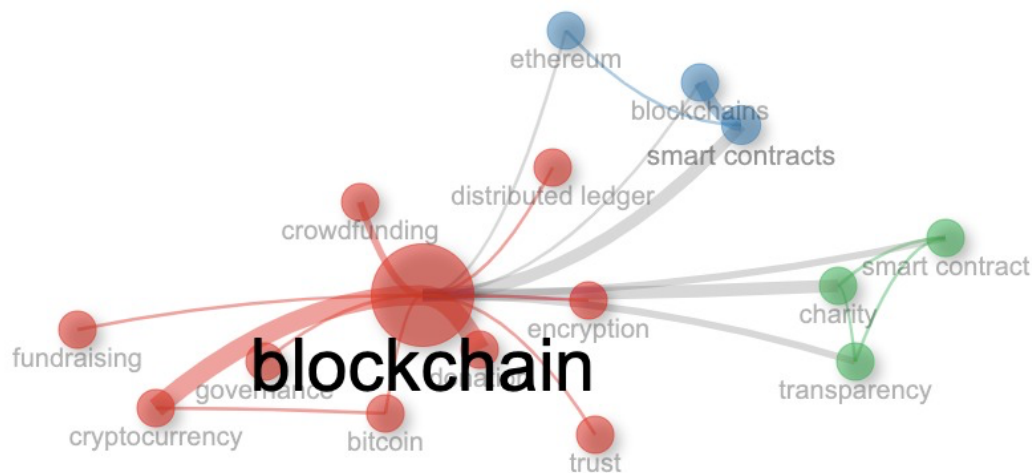


Figure 1. Network of Keyword Cluster

One of the most significant findings of the analysis is the potential for blockchain technology, particularly smart contracts, to enhance the transparency and security of donation systems. Smart contracts allow for the automation of donation processes, ensuring that funds are only transferred when predefined conditions are met (Howson, 2021). This feature reduces the risk of misuse and ensures that donations are directed to their intended recipients. Furthermore, blockchain's decentralized nature provides a secure platform for tracking donations, reducing the likelihood of fraud and enhancing donor confidence (Baudier et al., 2023).

5. Discussion and Conclusion

This study highlights the potential of blockchain technology, particularly smart contracts, to transform the donation ecosystem by enhancing transparency, security, and efficiency. Smart contracts ensure that funds are only transferred when specific conditions are met, which significantly reduces the risk of fraud and fosters greater donor trust. Blockchain's decentralized, tamper-resistant nature also ensures that donations can be tracked securely, increasing accountability within charitable organizations. These features address the long-standing issue of donor skepticism and the lack of transparency in donation management (Howson, 2021; Baudier et al., 2023).

Despite its promise, the adoption of blockchain in the charitable sector is still limited due to challenges related to scalability, high energy consumption, and regulatory uncertainty, particularly around cryptocurrency use. Although countries such as Korea and China are leading in blockchain research, practical implementation in the nonprofit sector remains in its infancy. Regulatory frameworks and technological innovations need to be developed to support the widespread use of blockchain in donation systems (Cerf et al., 2020; Liu et al., 2021).

In terms of future research, several key areas have been identified. First, there is a need for more empirical studies that evaluate the effectiveness of smart contract-enabled donation platforms. Such research should investigate how these platforms impact donor engagement and whether they lead to more transparent and accountable donation practices. Furthermore, the adoption of cryptocurrency in charitable donations remains underexplored. While cryptocurrency offers a new avenue for donations, there are concerns about its volatility and donor apprehension regarding its use. Future studies should address these concerns and explore

strategies to encourage wider acceptance of cryptocurrency in the donation sector (Alexakis et al., 2024).

At the policy level, governments and nonprofit organizations need to develop regulatory frameworks that facilitate the adoption of blockchain while ensuring data privacy and security. Cross-disciplinary collaborations, particularly between technologists, economists, and policymakers, are essential to address the technical and regulatory challenges that currently impede blockchain's broader adoption in the donation ecosystem.

In conclusion, blockchain has the potential to revolutionize the donation ecosystem by ensuring more transparent, efficient, and secure donation processes. However, for this potential to be fully realized, ongoing challenges such as regulatory barriers and technology integration must be addressed. Cross-disciplinary collaborations and supportive policy frameworks will be crucial in promoting the broader adoption of blockchain technology, ultimately benefiting both donors and recipients by ensuring greater transparency and trust in charitable donations.

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