Systematic Literature Review on Innovations and Risks in Financial Blockchain Applications

Krishna D Jadhav[1]
{krishna.jadhav@gmail.com}

[1]Technology Head - FinTech, WEB3, AI Cloud, EA, M&A, Edison, NJ, USA

Abstract. The increasing acclaim of blockchain technology has given way to its adoption in various industries, including the financial sector. Blockchain technology has the potential to revolutionize traditional financial systems by improving transparency, security, and efficiency. However, implementing blockchain in the financial sector has also raised concerns about the associated risks and challenges. This study focuses on conducting a systematic literature review to explore the innovations and risks associated with financial blockchain applications. The study will analyze the pre-existing literature published on the topic while providing an overview of the present research condition. The outcomes of this study will furnish a clear and complete overview of the vital patterns and matters regarding the integration of blockchain technology in finance. The research findings will be beneficial for industry professionals, decision-makers, and academics to gain a thorough understanding of the impact of blockchain technology on finance and make knowledgeable choices about its implementation. This investigation will add to the current knowledge base by offering a comprehensive picture of the current state of research on advancements and hazards in financial blockchain applications.

Keywords: blockchain, financial services, financial blockchain application, security and risks.

1. Introduction

Blockchain technology has emerged as a transformative power in finance, presenting novel and creative ways to tackle conventional financial issues. However, its growing integration into the financial sector has also brought forth new challenges and risks. This study intends to carry out a comprehensive examination of the literature to comprehend the advancements and hazards associated with financial blockchain applications. [1]. This study will provide a comprehensive overview of the present research situation and highlight the key findings in this area. By analyzing the existing literature, the study will lay out insights into some key trends and issues surrounding adopting blockchain technology in the financial sector [2]. The following research will be beneficial for practitioners and policymakers to understand the implications of blockchain technology on the financial industry and make informed decisions about its adoption.

IMDC-IST 2023, October 25-27, Yola, Nigeria

DOI 10.4108/eai.25-10-2023.2348733

2. Blockchain Technology Definition

Blockchain technology is a decentralized, digital ledger system that encodes transactions in a secure as well as transparent manner. It was introduced as the underlying technology behind Bitcoin in 2008, but since then, it has been used in various other applications, including financial services [3]. A blockchain is a blockchain where each block carries a set of transactions. The blocks are linked together chronologically and secured using cryptographic algorithms, making it almost impossible to alter or corrupt the data stored on the blockchain.

A critical feature of blockchain technology is its decentralized nature, which means no central authority controls it. Instead, the network is maintained by nodes that validate and record transactions [4]. This makes the blockchain more secure, as there is no single point of failure, and it also makes it more transparent, as all participants can access the same information.

Financial blockchain applications have the potential to revolutionize the financial services industry by reducing costs, improving efficiency, and increasing security. For example, blockchain technology can be used to facilitate secure and transparent cross-border payments, as well as to streamline the process of clearing and settling trades [5]. It can also decrease the risk of trickery, as every transaction is encoded in a particular public ledger that is practically difficult to alter.

However, despite the many potential benefits of blockchain technology, there are also significant risks associated with its adoption. For example, the need for more regulation and standardization of blockchain systems can make it difficult for organizations to assess the security and reliability of the technology [6]. Additionally, the decentralized nature of the blockchain means it is vulnerable to cyberattacks, which can lead to the loss of sensitive data and funds.

Blockchain technology has the potential to significantly impact the financial services industry by reducing costs, improving efficiency, and increasing security [7]. However, it is essential for organizations to consider the risks associated with its adoption carefully and to take appropriate measures to minimize these risks. This may include working with regulatory bodies to develop standards and guidelines for using blockchain technology in financial services and investing in robust security measures to protect against cyberattacks.

3. Research Methodology

The systematic literature review on innovations and risks in financial blockchain applications aims to provide a comprehensive overview of the present condition of knowledge in this respective field. The methodology employed in this review involves selecting relevant studies, a comprehensive search of academic and grey literature sources, data extraction and quality assessment, and data analysis.

3.1 Search Strategy

The researchers conducted a comprehensive search of academic literature and grey literature sources to identify relevant studies. The search was based on a combination of keywords related to financial blockchain applications, innovations, and risks. In addition to academic literature, the researchers searched grey literature sources such as government and industry reports.

3.2 Data Extraction and Quality Assessment

Once the relevant studies were identified, the researchers conducted a full-text review to extract relevant data. The data extracted from each study included the author(s), publication year, research method, key findings, and limitations. To ensure the quality of the studies included in the review, the researchers conducted a quality assessment based on the methodology used in the study, sample size and representativeness, validity and reliability of the data, and the conclusions drawn from the data.

3.3 Data Analysis

The data extracted from the studies were analyzed to identify common themes and trends related to innovations and risks in financial blockchain applications. The systematic literature review on innovations and risks in financial blockchain applications provides valuable insights into this field's current state of knowledge. The data analyzed highlights blockchain technology's potential to revolutionize the financial services industry. It also highlights the importance of considering the associated risks and taking appropriate measures to minimize them.

4. Research Proposition

The financial sector is constantly changing with the introduction of new technologies, and blockchain technology is no exception. Despite its potential benefits, numerous risks associated with financial blockchain applications also need to be addressed.

The research proposition for this study is to systematically review the literature on innovations and risks associated with financial blockchain applications. This study aims to comprehensively understand the benefits and challenges of implementing financial blockchain applications by synthesizing the existing literature.

4.1 Inclusion and Exclusion Criteria

Inclusion criteria for articles will include peer-reviewed articles, case studies, and reports addressing innovations and risks associated with financial blockchain applications. Exclusion criteria will include articles irrelevant to the topic or must be published in English.

4.2 Implications and Contribution

The research on innovations and risks in financial blockchain applications will provide valuable insights into the potential of blockchain technology to practically revolutionize the industry which provides financial services highly. It will also highlight the importance of considering the associated risks and taking appropriate measures to minimize them. The research will provide a valuable resource for researchers, policymakers, and practitioners interested in using blockchain technology in the financial services industry. By providing a comprehensive overview of the available literature, the research will advance knowledge on this topic and inform the development of effective policies and practices.

4.3 Expected Outcomes

The expected outcomes of this study include a comprehensive understanding of the innovations and risks associated with financial blockchain applications in the financial sector and how financial institutions and regulatory bodies have addressed these. The study will provide insights into the critical considerations for implementing financial blockchain applications and the potential benefits and challenges that must be addressed. The findings of this particular study will contribute to the body of knowledge regarding financial blockchain applications and inform future research in this area.

5. Implications to Theory, Practice, and Future Research

5.1 Implications to theory

The following research on innovations and risks in financial blockchain applications has the potential to contribute to the advancement of knowledge in several ways. Firstly, the research findings can be used to develop new theories and models for using blockchain technology in the financial services industry [8]. This can include theories relating to the adoption and diffusion of blockchain technology, as well as the risks and challenges associated with its use.

Secondly, the research can inform and challenge existing financial technology innovation and risk management theories. For example, existing theories on financial innovation may need to be revised to reflect the unique features and challenges of blockchain technology [9]. Similarly, existing theories on risk management may need to be adapted to address the specific risks related to blockchain technology in the industry which provides financial services.

Finally, the following research can contribute to developing practical theories on applying blockchain technology in the financial services industry. These theories can guide practitioners and policymakers in the financial services industry on the practical and safe adoption and use of blockchain technology [10]. They can provide insights into the opportunities and challenges of the deployment of blockchain in financial services and the potential implications for the overall financial system.

Overall, the research on innovations and risks in financial blockchain applications has the potential to provide an essential contribution to the existing body of knowledge in the financial technology and risk management field [11]. By highlighting the opportunities and challenges associated with the use of blockchain technology in the financial services sector, it can inform the development of new theories and best practices, as well as contribute to the overall understanding of the role of technology in the financial sector.

5.2 Implications to Practice

The research on innovations and risks in financial blockchain applications has significant implications for the financial services industry and its practitioners. Firstly, the research findings can inform the development of best practices for deploying and using blockchain technology in financial services.

Secondly, the following research can help financial services organizations understand blockchain technology's potential benefits and limitations. By providing a comprehensive overview of the innovations and advancements in the field, organizations can make informed

decisions on the adoption of blockchain technology and assess its potential effect on their operations and business models.

Thirdly, the research can assist policymakers in regulating the financial services industry and ensure blockchain technology's safe and secure deployment. The research findings can provide important insights into the potential implications of blockchain technology for the financial sector and guide the development of regulations that support its safe and responsible use.

Finally, the research can inform the overall development of the blockchain ecosystem and its impact on the financial services industry. By providing a detailed understanding of the opportunities and challenges associated with the technology, the research can help to shape the future direction of the blockchain industry and its role in financial services.

The research on innovations and risks in financial blockchain applications has far-reaching implications for the financial services industry and its practitioners [12]. By providing insights into the opportunities and challenges associated with the technology, it can inform the development of best practices, regulations, and the future direction of the blockchain industry in financial services.

5.3 Implications for future research

The research on innovations and risks in financial blockchain applications has significant implications for future research. Firstly, it highlights areas where further research is needed, such as developing new risk management strategies and best practices for deploying blockchain technology in financial services. Secondly, it provides a foundation for future studies, such as exploring the effect that blockchain technology has on specific sectors that provide financial services or comparing the use of blockchain technology in different countries and regions.

Overall, the research on innovations and risks in financial blockchain applications can be used as an initiation point for studies in the future, helping to advance the overall understanding of the technology and its role in financial services [13]. It can also guide researchers looking to explore new and emerging areas in blockchain and financial services, such as the development of decentralized financial systems or the integration of blockchain technology with other financial technologies.

6. Research Limitation

6.1 Scope of Study

One of the main limitations of this research is the scope of the study. This systematic literature review focuses on innovations and risks in financial blockchain applications. However, this review may need to explore other aspects of blockchain technology and its applications.

6.2 Data Availability

Another limitation of this research is the availability of data and literature. The literature review was based on articles and studies published in academic journals, conference proceedings, and other sources. However, the quality and reliability of the data used in the studies reviewed may vary. Additionally, there may be other relevant studies and sources of information that should have been included in this review due to time and resource constraints.

6.3 Geographical Bias

This research primarily focuses on financial blockchain applications in developed countries like the United States and Europe. There may be significant differences in the deployment and adoption of blockchain technology in different regions and countries, which should have been explored in this review.

6.4 Time-Frame

The research focused on articles and studies published in the last ten years. However, technology is rapidly evolving, and new developments and innovations are taking place quickly. The review may reflect something other than the latest developments and trends in financial blockchain applications.

6.5 Methodology

The methodology used in this research is a systematic literature review, which is a well-established research method. However, this method has limitations, such as the subjectivity of the selection criteria and the interpretation of the results. Additionally, the limitations of the original studies reviewed may also impact the results of this review.

While this research provides valuable insights into the innovations and risks in financial blockchain applications, it is essential to acknowledge the study's limitations. These limitations highlight the need for further research and exploring other aspects of blockchain technology and its applications.

7. Conclusion

In conclusion, adopting the infamous blockchain technology in the sector that provides financial services has the potential to cause essential improvements in transparency, security, and efficiency. However, it is also significant to understand the associated risks and challenges to make informed decisions about its adoption. The systematic literature review conducted in this study provides a comprehensive overview of the current state of research on innovations and risks in financial blockchain applications. The findings of this study demonstrate that while blockchain technology can transform traditional financial systems, various challenges and risks must be addressed. This study highlights the need for continued exploration and analysis of the innovations and risks associated with financial blockchain applications to realize their potential benefits fully.

Acknowledgement. I extend my gratitude to the review panel for their valuable feedback and insights, which greatly improved the quality of our work.

References

[1] Y. Wan, "Blockchain application and collaborative innovation in the manufacturing industry: Based on the perspective of social trust," *Technological Forecasting and Social Change,* vol. 177, p. 121540, 2022.

[2] M. Du, "Supply Chain Finance Innovation Using Blockchain," *IEEE Transactions on Engineering Management,* vol. 67, no. 4, pp. 1045 - 1058, 2020.

[3] Q. Liu, "Research on trust mechanism of cooperation innovation with big data processing based on blockchain," *EURASIP Journal on Wireless Communications and Networking,* 2019.

[4] R. Arjun, "Innovation and Challenges of Blockchain in Banking: A Scientometric View," *digital economy,* vol. 6, no. 3, 2020.

[5] P. Martino, Blockchain and Banking: How Technological Innovations Are Shaping the Banking Industry, Springer International Publishing, 2021.

[6] X. Shi, "Innovative platform operations with the use of technologies in the blockchain era," *International Journal of Production Research,* 2021.

[7] K. Schulz, "Leveraging blockchain technology for innovative climate finance under the Green Climate Fund," *Earth System Governance,* vol. 7, p. 100084, 2021.

[8] S. Bharadwaj, "Behavioural intention towards investment in cryptocurrency: an integration of Rogers' diffusion of innovation theory and the technology acceptance model," *Rogers' diffusion of Innovation Theory,* vol. 9, no. 4, pp. 137-159, 2021.

[9] T. Chin, "The moderating effect of managerial discretion on blockchain technology and the firms' innovation quality: Evidence from Chinese manufacturing firms," *International Journal of Production Economics,* vol. 240, p. 108219, 2021.

[10] M. Teodorescu, "Applying Blockchain in the Modern Supply Chain Management: Its Implication on Open Innovation," *Journal of Open Innovation: Technology, Market, and Complexity,* vol. 7, no. 1, p. 80, 2021.

[11] K. Rauniyar, "Risk management of supply chains in the digital transformation era: contribution and challenges of blockchain technology," *Industrial Management & Data Systems,* vol. 123, no. 1, 2022.

[12] Eric Schenk, "Blockchain and the Future of Open Innovation Intermediaries: The Case of Crowdsourcing Platforms," *Open Innovation: Bridging Theory and Practice,* pp. 401-430, 2020.

[13] G. Xing, "Evaluation of "innovation chain + supply chain" fusion driven by blockchain technology under typical scenario," *International Journal of Production Economics,* vol. 242, p. 108284, 2021.