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A Systematic Mapping of the Emergence of Blockchain and Business Applications: A Literature Review

Emergent Research Forum (ERF)

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Abstract

Blockchain, also known as the Distributed Ledger Technology (DLT) behind cryptocurrencies like Bitcoin, has gotten a lot of attention from both professionals and scholars, and it's starting to change how companies operate. The systematic mapping approach is used in this study to review current papers about blockchain applications and analysis in various business areas (accounting, banking, information systems, marketing, and supply chain). Fifty primary papers were collected from several scientific sources using the prescribed steps of the systematic mapping process. There is a discussion of research gaps and potential future research directions.

Keywords

Blockchain technology, business application, systematic mapping.

Introduction

The way companies run their day-to-day activities is changing thanks to blockchain. The majority of companies depend on centralized transaction structures, in which information is managed by third parties rather than the parties involved in the transaction. Blockchain is a decentralized network that allows transactions to take place without the intervention or control of a third party. It is an open, distributed database in which the transaction is validated by several participating computers (or nodes), and then added to a continuously expanding list of the ledger (Iansiti & Karim, 2017). One of the most popular uses of blockchain is cryptocurrency, which uses hash numbers, timestamps, and an append-only decentralized framework to remove the problem of double spending the same currency and improve transaction protection (Miraz & Ali, 2018). Due to its stability, reliability, accountability, traceability, inherent data provenance, and immutability, blockchain can be used in a variety of business sectors. Blockchain also opens up new market opportunities and applications.

Blockchain, like any other new technology in its early stages, has challenges that must be overcome before it can have a significant effect on industry. Since blockchain network nodes can be located anywhere in the world, complicated jurisdictional issues can arise. Furthermore, any transaction necessitates peer-to-peer authentication, which can take a long time as more data is added. As a consequence, blockchain could be unsuitable for transactions that must be completed quickly. Blockchain has gotten a lot of attention from academics and practitioners, and it's only going to get more. In order to recognize areas that need future attention, it is critical to synthesize existing progress related to blockchain technologies and research in industry. This study will address following research question: What is the state of blockchain research in the business area right now?

Understanding the above research question will help researchers and practitioners gain a better understanding of current blockchain implementations and research from various fields, as well as identify gaps that need to be addressed in the future. A systematic mapping study is performed to answer the research question, in which 50 papers about blockchain are collected from scientific databases. A number of research gaps are established, as well as potential research directions.

The rest of the paper is structured in the following manner. First, the literature review approach is defined. Figures depicting the current state of blockchain research in the business study are then discussed. The paper's final section addresses the research gaps discovered through the literature review and suggests some possible research directions.

Research Methodology

Methodology for Systematic Mapping

To classify, review, and summarize relevant research papers, the systematic mapping study mentioned by Petersen et al. (2008) was used. The systematic mapping approach is appropriate for this paper because the aim is to define and map current blockchain research and applications in various business areas (such as accounting, finance, information systems, marketing, and supply chain) as well as potential research gaps. In this paper, Table 1 summarizes the systematic mapping approach as well as its implementation.

Steps	Application in the study
Defining research questions	Research protocol was established, and research questions were narrowed down to the previously listed research question.
Searching for relevant papers	Scientific databases such as Springer Link, EBSCO, JSTOR, and ScienceDirect were searched using search strings related to blockchain and business. The papers selected were peer-reviewed studies that appeared in journals and conferences. At first, 93 papers were found.
Screening of papers	<p>The first stage of inclusion and exclusion was determined by the relevance of the chosen papers' titles to research questions in this study; papers written in a language other than English, duplicate papers, and posters were all excluded. 60 papers were held after the initial screening.</p> <p>Abstracts were tested again in the second stage of screening to see whether they concentrated on blockchain in business fields, in order to determine if the papers could proceed to the next stage. Ten papers were disqualified because they either concentrated solely on the technological aspects of blockchain or failed to include any actual or specific scientific results or facts. 50 papers were selected at last.</p>
Keywording	To gain a higher-level understanding of the papers, read all 50 papers and identify the keywords and principles associated with various business areas. Following that, based on the year of publication, publication style, source, and sector, clusters and categories were created for each business area.
Data extraction and mapping process	To collect the data necessary to answer the research questions, a data extraction form (Table 2) is developed. The data was extracted in Excel so that it could be organized and analyzed quickly.

Table 1: Systematic mapping method used in this article

Title	Paper's Title
Authors Name	Name of the author(s)
Publication	Name of the publication place
Publication Type	Conference, journal, working paper, magazine article, etc.
Publication Source	Academia or Industrial
Abstract	Abstract if the paper selected
Research Aim	Aim of the paper selected
Field	Business areas focused in the study
Findings	Major findings of the paper selected

Table 2: Data Items

Findings and Discussion

RQ: *What is the status of current blockchain research in the business field?*

The distribution of selected papers by publication year is depicted in Figure 1. Many of the articles that were chosen were written after 2015. This illustrates the fact that Blockchain is a relatively new idea for business study. However, articles focusing primarily on Bitcoin and the technological workings of blockchain technology (which were not included in this study) were published as early as 2012.

When looked at the publication year, we can see that only 2 papers (4 percent) were released in 2015, 5 papers (10 percent) in 2016, 10 papers (20 percent) in 2017, 15 papers (30 percent) in 2018, and 18 papers (36 percent) in 2019. This indicates an upward trend, with a rising number of papers published each year, indicating that blockchain technology is gaining traction in a variety of industries.

The publication sources are summarized as academia or industry. Academic sources are those published by specialists in the field for a general audience to make the findings accessible to the scholarly world. Industry sources are those published by freelancers or academics for the general public who have little to no prior knowledge of the subject in order to provide general/informative information on the subject. The results show that academic sources published 40 papers (80%), while industry sources published just 10 papers (20%).

Figure 2 depicts the various publication forms (as mentioned in Table 2) (i.e., the medium by which the paper is published).

Figure 3 depicts the distribution of business fields associated with selected journals. The IS filed 15 papers (30%), with 11 papers focusing on Internet of Things (IoT) and 10 papers focused on supply chain (20 percent). There were 7 papers (14%) in the accounting sector, 8 papers (16%) in banking, 2 papers (4%) in marketing, and 8 papers (16%) that discussed the use of blockchain in a general business environment.

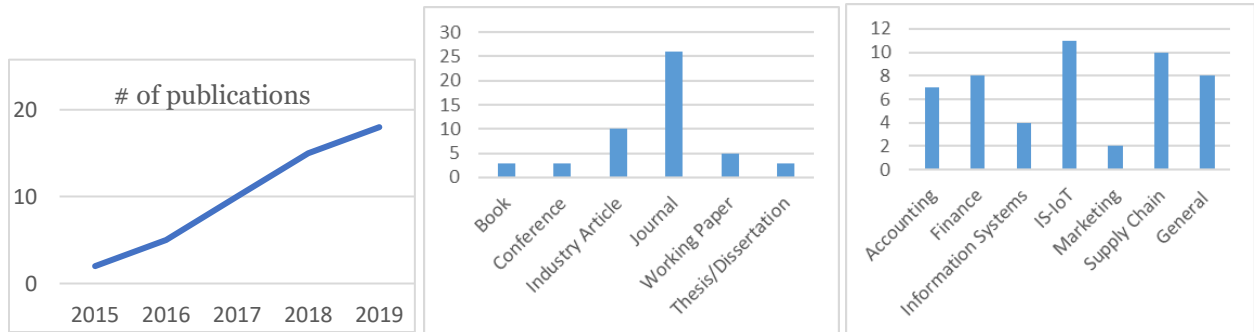


Figure 1

Figure 2

Figure 3

Research Gaps and Future Research Directions

The abundance of research papers on bitcoin and the relative lack of research focusing on business areas, especially in the fields of marketing and accounting, were identified as one of the research gaps identified during the study. Since the implementation of blockchain is likely to have a significant effect on both fields, additional research is needed. Furthermore, due to the uncertainty and fundamental changes that blockchain will bring to various business fields, potential research directions for blockchain in various business fields will vary, and it will be fascinating to see where each business area is headed. Bitcoin's value has plummeted since the cryptocurrency crash of 2018. Academic and industry researchers are more interested in understanding the market and technological applications of the fundamental technology behind blockchain. I assume that as more companies begin to use blockchain in their day-to-day operations, a considerable amount of new research on the adoption of blockchain technology in various contexts will emerge. As the blockchain's spectrum and user base expands, more attention must be given to overcoming implementation limitations and challenges (such as the scalability issues mentioned earlier). The security and privacy concerns are particularly important because, as the blockchain network grows in popularity, more and more sophisticated attacks are likely to target it.

The second research gap is that the majority of research focuses on corporate blockchain applications (especially large companies). Would our current understandings of blockchain hold true if the adopters were small-medium sized businesses, teams, or even individuals? Factors influencing person versus team versus organizational attitudes and behaviors (e.g., adoption) toward an innovation are likely to differ, according to accumulated experience of information systems (e.g., Hwang 2005; Park, Lee, & Yi, 2011; Venkatesh et al 2016). As a result, future studies should look at people's attitudes and actions when it comes to blockchain at various levels of study.

The third research discrepancy found is that most recent studies on blockchain are based on the technological aspects of the technology. More attention should be paid to the behavioral and regulatory aspects of blockchain. For example, researchers should look into what factors (e.g., individual or organizational or industry or cultural characteristics, blockchain characteristics, network externality) (e.g., Venkatesh et al 2003; Venkatesh and Zhang, 2010) influence the adoption and implementation of blockchain? What impact do the various issues listed earlier (e.g., privacy concerns) have on adopters' attitudes and behaviors toward blockchain? Is there a similar bandwagon effect with blockchain technology as we've seen with other common technologies (e.g., Abrahamson & Rosenkopf, 1993)?

Aside from the behavioral aspect, the regulatory aspect (i.e., business or national regulations) needs further focus. The Chinese government, for example, sets limits on the amount of money that individuals and businesses can send abroad. What obstacles would such legislation face if it were to be implemented using blockchain technology? Furthermore, what kind of authority (if any) could assist in resolving conflicts involving transactions that took place on the blockchain platform?

Finally, the most of blockchain implementations in various business fields are still in the experimental or pilot stage. There is a scarcity of data on the performance or failure of blockchain in various industries. Such information should be sought in future study. Researchers can also look at market reactions (for example, stock market price changes) to companies announcing blockchain adoption and implementation (e.g., Wang, 2010).

Conclusion

Blockchain, a decentralized distributed ledger in which transactions are authenticated by participating nodes and available to all on the network, has gotten a lot of attention from academia and industry as an emerging and in-fashion technology. This paper performs a systematic analysis to understand the applications and current research status related to blockchain in various business fields, using the systematic mapping approach and collecting 50 primary papers from various scientific databases. Future research directions are highlighted, as well as research gaps are found.

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