Blockchain in the Lens of Populism : A Short Communication of Research Evidence

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Abstract

Purpose : Blockchains are a sophisticated and extensively utilized technology that facilitates bulk data management operations and increases productivity for many companies, including governments. However, because of the high prices and complexity, not all large firms could take advantage of this disruptive weapon, which leads to populist ideas. The purpose of this brief message was to examine the new, popular ideas in blockchain technology that improve the global productive efficiencies of businesses.

Methodology : The two-stage method that produced the insights in this communication was followed by a sentiment analysis, network map, theme map, and latent Dirichlet allocation.

Findings : Blockchain technology has been widely adopted by the majority of the major services businesses. The industries that are currently scaling up, however, lack the viability to use this technology. The results also showed that neither academic research nor the corporate framework had examined the new populism situation.

Practical Implications : The productive efficiency of industries would be improved if governments and policymakers used populistic settings in blockchain technology. Additionally, eliminating the cost-based inequalities would inspire populist ideas throughout all industries, generating combined revenues.

Originality/Value : This brief message implied negative opinions about blockchain technology and was taken from a significant study on the impact of this technology on business success. This message is meant to benefit not only corporations but also governments and policymakers in facilitating regular access to technology for expanding industries that could strengthen economies.

Keywords : **blockchain, populism, technology, medium and small-scale organizations, data efficiency, profit maximization**

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Blockchain is a technological innovation that has permeated business dealings, improving productivity, and handling enormous databases. The blockchain was developed as a substitute for using a bank to mediate payments securely. Nakamoto (2008) defined blockchain as a purely peer-to-peer version of electronic cash that would allow online payments to be sent directly from one party to another without going through a financial institution. A blockchain is a distributed database that is append-only and holds a time-ordered collection of facts called transactions. The term "blockchain" refers to the grouping of transactions into batches or "blocks" that together create a cryptographic hash chain. As a result, the transaction remains immutable, decentralized, and safe (Baharmand et al., 2021; Luu et al., 2016). This is evidenced in most industries, including healthcare and higher education.

However, not all organizations can afford to use blockchain due to its complexities in costs, and perhaps being populist is a big quest. While blockchain can be superior in facilitating businesses in increasing total productivity (Xu & Guan, 2023), there are numerous thoughts of inequality and weakening democracy of the accessibility (Manski, 2017). However, the decentralization of data resources on blockchain may lead to control instability and influence the behavior of those using the workaround (Wright & De Filippi, 2015). Medium and small enterprises in India find it difficult to adopt these technologies because of the costs involved (Kumar et al., 2023). In India, there has been a lot of interest in industries like banking, winemaking, tourism, advertising on apps etc., where technology can play a strong role in building trust in Indian brands by making customers feel more secure (Mishra et al., 2023; Ravichandran et al., 2023; Sardana et al., 2024; Singh et al., 2023). One technology that can increase customer security is blockchain, which can do this by keeping records, expediting operations, and spotting any anomalies. Due to the significant risk to data privacy, these difficulties will eventually necessitate cautious streamlining of blockchain accessibility. As a result, massive tests and study evidence are required (Pournaras, 2020). Therefore, it becomes important to comprehend where these blockchain technologies are most commonly used and whether they function in a populist environment. This short communication focuses on that perspective. This message is a condensed version of a large-scale blockchain research project. It aims to produce insights about populism by analyzing the application of blockchain-related research outputs.

The Process

This communication is based on secondary sources; the research papers published in journals have been referred to through Web of Science, Scopus, and Google Scholar. The documents published between 2016 and 2023 were downloaded. The search terms were created using R Software's Litsearcher. The terms utilized in Stage 1 included blockchain, blockchain technology, the Internet of Things, privacy, smart contracts, sustainability-based systems, driven, and enabled. Out of the 100 research papers that were obtained from Scopus using the first five search phrases, 82 publications were chosen. A word cloud has been created to help narrow the focus down to the important subjects. Every paper's "abstract" made use of the "bibliometrics" package and the "biblioshiny" app. Figure 1 illustrates how the word "blockchain" dominated the initial word cloud that was generated. Additionally, the word cloud reveals that the word "data" has been referenced more than three thousand times. Due to obscured data regarding blockchain trends and applications, a second-word cloud was created by eliminating the same word from the corpus of the analysis data.

Table 1 displays the outcomes of the word cloud analysis conducted on the abstracts. Table 2 displays the frequency of words when the authors' keywords were included in the analysis.

Since the first stage's word cloud failed to generate a clear visualization, a second-word cloud was created by eliminating the crucial terms "blockchain," "data," and "blockchain technology." The stage 2 word cloud is depicted in Figure 2.

Figure 2 provides an overview of the key developments in the blockchain space as well as the domains where

Figure 1. ***Word Cloud on the Blockchain Key Terms***

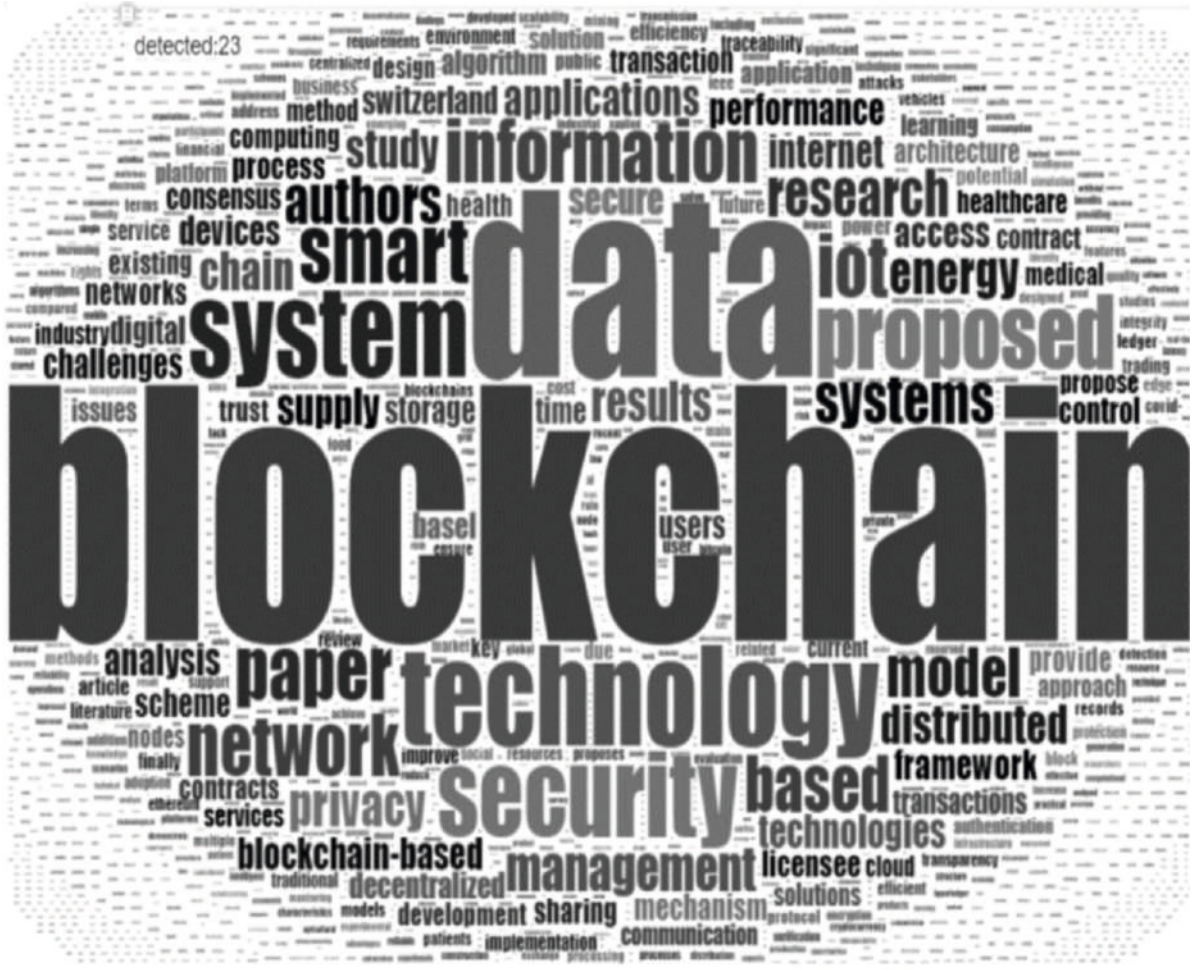


Table 1. ***Abstracts and Frequency at Stage 1***

Terms	Frequency
Blockchain	5,136
Data	3,761
Technology	2,033
System	1,852
Security	1,731
Proposed	1,498
Smart	1,371
Paper	1,277
Information	1,271
IOT	1,270

Table 2. ***Authors' Keywords and Frequency at Stage 1***

Terms	Frequency
Blockchain	1,430
Security	171
Smart Contract	171
Internet of Things	152
Smart Contracts	109
IOT	106
Privacy	104
Ethereum	79
COVID-19	66
Bitcoin	56

Figure 2. ***Word Cloud After Removing the Dominating Key Terms***

blockchain technology has been applied. The word "technology" has been used more than 600 times, and the word "adoption" has been mentioned more than 200 times. This suggests that the adoption of the blockchain (200+) is one of the industry's primary issues, which is consistent with the literature review's finding that adoption is costly (Ali & Bhaya, 2020). This word cloud illustrates how blockchain technology has been used in the following domains: energy, healthcare, mortgages, wills, donations, voting, etc. Here, the writers' keywords were used in the research process. Table 3 indicates the numerical frequency.

Table 3. ***Authors' Keywords and Frequency at Stage 2***

Terms	Frequency
Internet of Things	152
IOT	106
Ethereum	79
COVID-19	66
Bitcoin	56
Supply Chain	54
Distributed Ledger Technology	53
Artificial Intelligence	52
Edge Computing	48
Hyperledger Fabric	48

Network Map

A network map technique has been used here to see which areas deploy blockchain more. This analysis is to infer the adequacy of any technology that is useful only when it can be put to practical use. The result, as shown in Figure 3, shows that blockchain technology is connected most closely to the Internet of Things. The topic modeling corroborates this in the next section.

Thematic Map

The theme map illustrates how the blockchain theme has developed. The technology itself was given more attention in the past. However, these days, apps are valued more highly. The map is divided into four quadrants (Figure 4). The Internet of Things is developing at the fastest rate possible, according to the most significant quadrant, which concentrates on motor themes.

Figure 3. ***Network Map Analysis Indicating the Factor : Internet of Things***

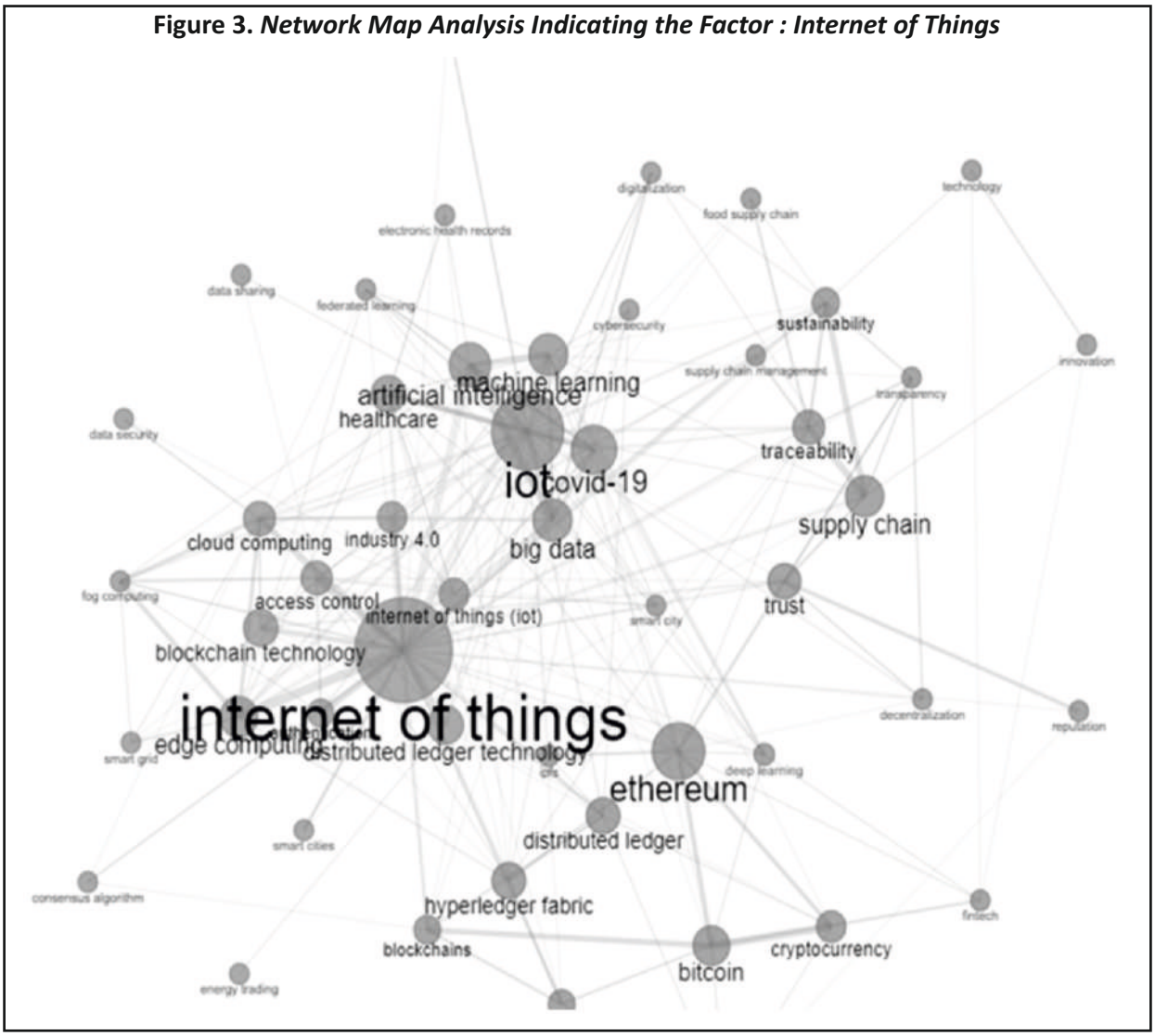
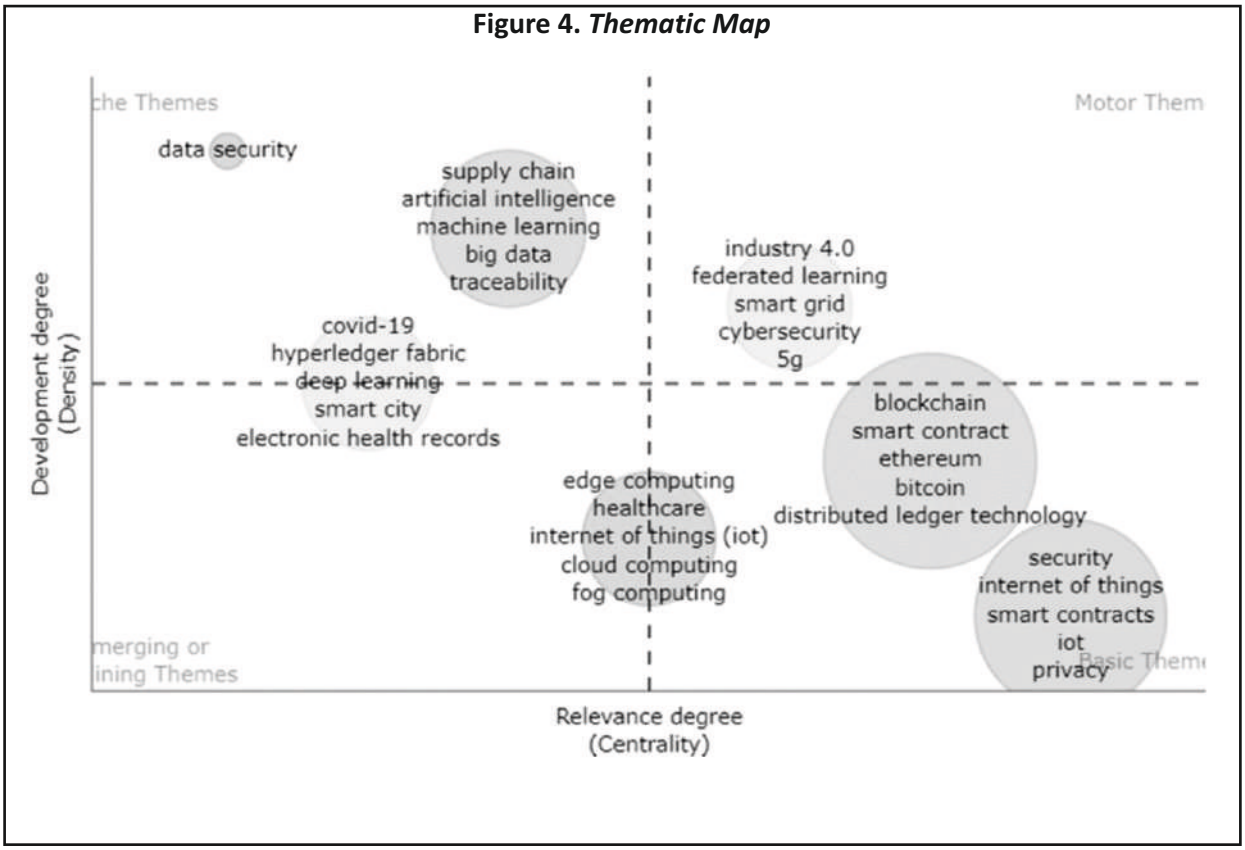


Figure 4. ***Thematic Map***



Co-word analysis creates keyword clusters. They are seen as motifs that can be mapped in a two-dimensional diagram and classified based on their density and centrality. The strategic diagram permits the following four categories of topics to be highlighted based on the quadrant in which they are mapped.

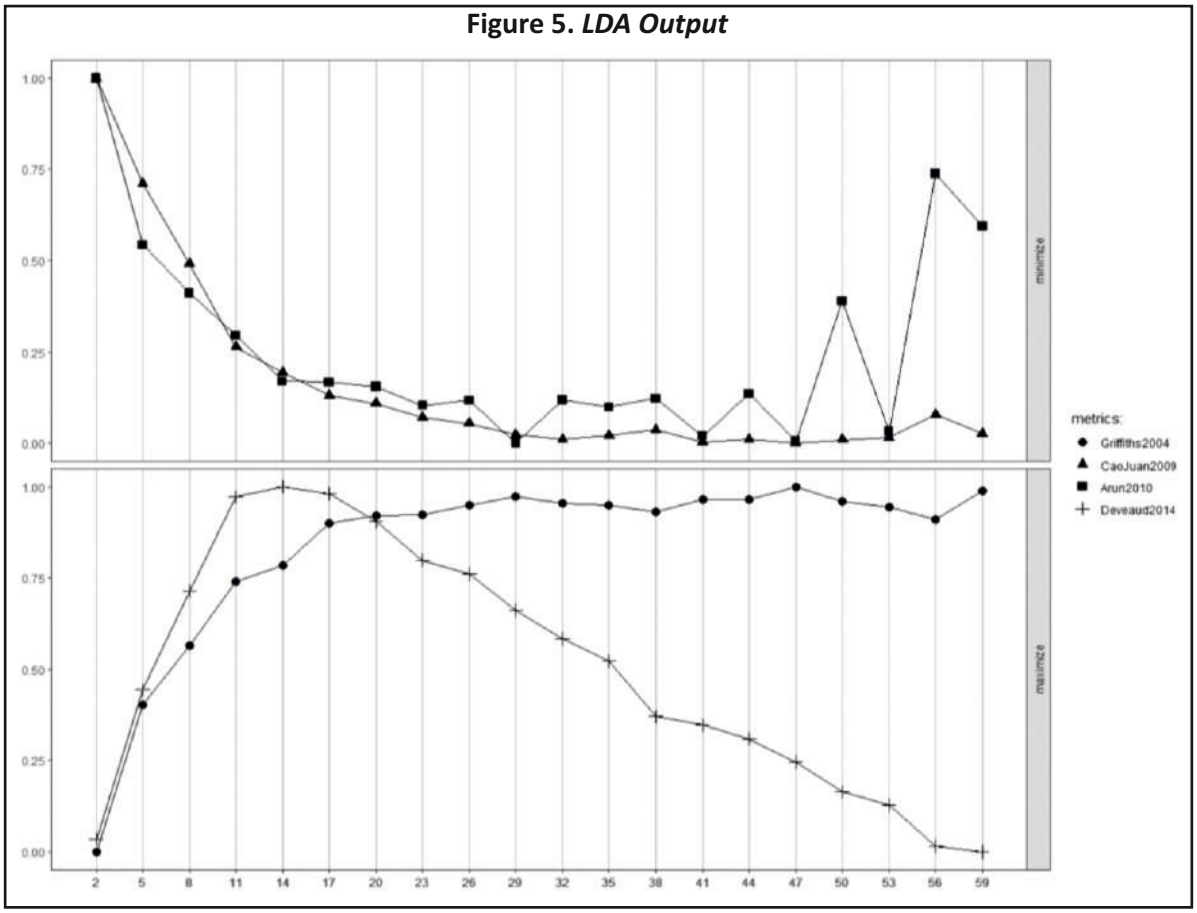
Figure 4 reveals the following:

- More developed and pertinent hot issues (motor subjects) are identified by higher degrees of centrality and density in the domain's conceptual framework. Cybersecurity, federated learning, Industry 4.0, and smart grid apply to this data.
- The fundamental subjects that are important for the domain and cross-cutting to its many regions are defined by higher centrality and lower density values. The key concepts covered here are distributed ledger technology, smart contracts, Ethereum, bitcoin, security, the Internet of Things, and privacy.
- In the domain, developing themes are defined by lower values of density and centrality. Things like IoT, smart city computing, and electronic health records are present here.
- Niche themes are well-developed but yet peripheral to the domain being studied; they are defined by lower centrality and greater density values. These include supply chain, edge computing, and COVID-19.

Latent Dirichlet Allocation (LDA) Technique

For collections of discrete data, like text, latent Dirichlet allocation (LDA) has been referred to as a flexible generative probabilistic model. It can be thought of as a dimensionality reduction strategy and is based on a

Figure 5. ***LDA Output***



Note. Tuning of the Latent Dirichlet Allocation Models Parameters (2021) was used to divide the content under appropriate heads.

straightforward exchangeability assumption for the words and themes in a document (Xu & He, 2022). To have a better understanding of the data, an LDA was performed. After applying an LDA, these were stored as PDFs in a folder.

It can be inferred from Figure 5 that the algorithm recognized four major categories of concepts. The algorithm found four strands, three of which had to do with the uses of blockchain technology across different industries. The following four groupings are given names:

↳ ***Transactional.*** These are the words that signify a transaction that is being conducted directly with the end user. The primary benefit of blockchain technology is its ability to safely and transparently store data in decentralized databases. The cost of maintenance might be high in the beginning, so that most players will be governments. Thus, it can be advantageous in all domains where there is a need to maintain records like property registrations, wills, lotteries, land transactions, IoT, chit funds, etc (Javaid et al., 2021).

↳ ***Services.*** Large industries like education, energy, general insurance, agriculture, renewable energy, and gas allocation make up the majority of this cohort. In all of these sectors, including education, it is utilized to keep records. Take certificates, for instance. It can assist farmers in selecting the best crop to plant, protecting crops from pests, and informing customers about the source of the crop. Blockchain should be used in a new domain: the registration of political pledges. Supply chain finance sourcing is another emerging field. Supply chains using

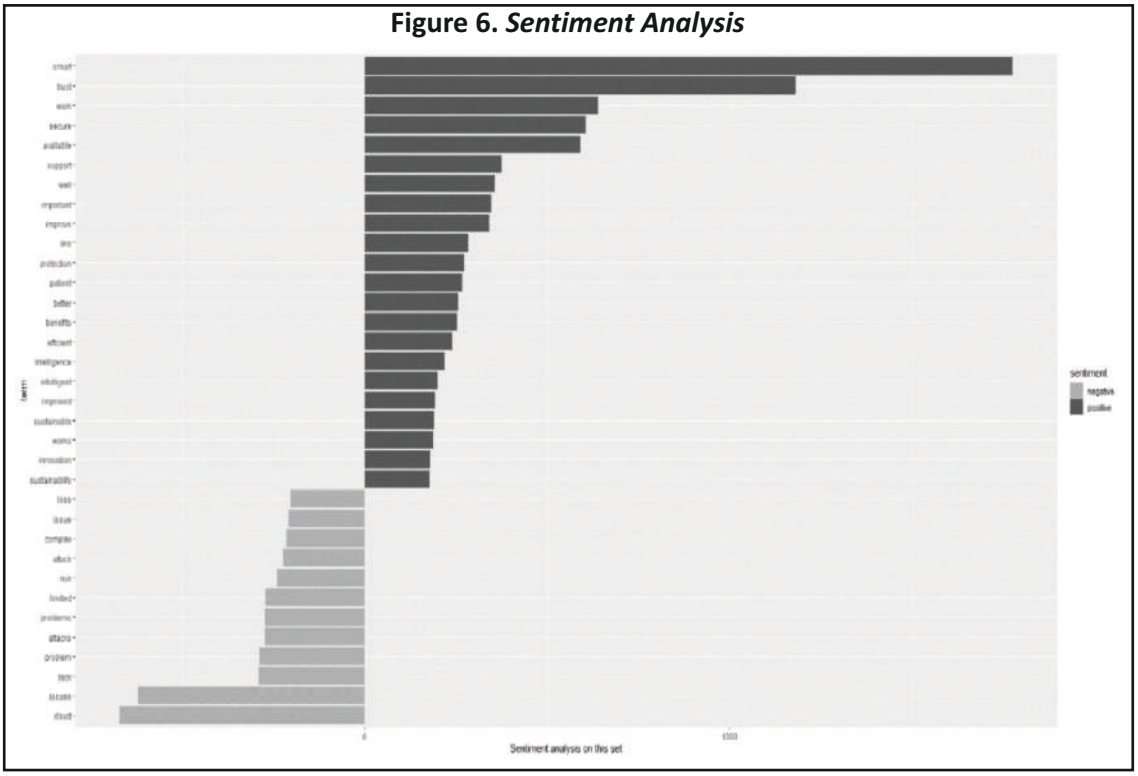
blockchains find it simpler to obtain financing since they become more transparent and, thus, more creditworthy (Chen et al., 2022).

↳ ***Medical.*** The pandemic has brought to the fore the need to gather data to maintain medical records, immunization records, records of blood donation, transparency in healthcare supply chains, etc. This will benefit healthcare companies as well as patients (Fusco et al., 2020). Improved and quicker patient care is possible with the utilization of these data. Keeping consumers' privacy and anonymity when their data is being exploited has been a source of concern. According to Priya and Palanisamy (2023), newer blockchain technologies make this data even more secure.

↳ ***Technology.*** This cohort mainly studies technology and its management of it. It examines whether this is a disruptive technology and can be scaled up or down. It also examines whether this needs to be regulated, what regulation would mean, and the attendant security risks (Sotoudehnia, 2021).

↳ ***Miscellaneous.*** These are the areas that do not fit into the other four main topics. These are comparatively newer areas in which blockchain can be applied, such as in tracking government schemes, art, nonfungible tokens (NFT), tracking orders in retail, the source of news in journalism, tracking royalties in music, tracking data for the internet of vehicles, map ocean intelligence, maintain credibility on matrimonial sites, help in swapping of batteries for electric vehicles, and voting using mobiles (Baharmand et al., 2021). In the age of fake news, blockchain technology can also improve journalism by enabling publications to use blockchains to validate articles from pre-approved, reputable journalists before they are published (Kim & Yoon, 2018).

Figure 6. ***Sentiment Analysis***



Sentiment Analysis

Sentiment analysis has been applied to the research papers to identify whether the overall sentiment toward this technology was positive or negative and to identify areas that were positively related to blockchain and which were areas of concern. Positive attitudes toward the technology are shown in Figure 6. The data also reveals that positive sentiment is related to areas where apps have been implemented, such as healthcare and education. In contrast, bad sentiment is associated with implementation issues, hype, and other issues.

Implications and Recommendations

The overall analysis results show that the transactional, healthcare, technology, and other industries employ blockchain technology extensively. Though the study of those sectors is still in its early stages, one of the main viewpoints on populism has not yet been examined in any setting. However, there is a lack of studies supporting blockchain's accessibility for everyone, that is, in the context of populism. The majority of these studies concentrate on the productivity perspective, technical inculcations, and other aspects like the Internet of Things, among other things. This is a crucial guide for academics conducting a variety of studies that combine populism with blockchain technology. This will lead to the adoption of efficient research techniques and a number of innovative blockchain approaches.

Similarly, this perspective has to be accounted for in the organizational contexts where the link between computational and transactional costs that bring public access to high-end technology should be carefully considered and worked upon. Technology disruption may lead to enhanced organizational productivity. However, such a populism context will eventually reduce the unethical and fraudulent practices on a blockchain. That is to say, when technology is widely accessible, individuals have a greater personal responsibility for data privacy than businesses. This could potentially open the door for innovative company models that depend on cost-effectiveness. The implementation will break the limitations of blockchain being utilized only in major government entities of populist ideas in blockchain technology.

Conclusion

The effectiveness of blockchain is greatly impacted by its status as a cutting-edge technology tool for larger companies, including governments. There may not be as many populist ideas as there should be. Although centralized databases are not the primary target of blockchain technologies, they nevertheless provide a challenge to enterprises expanding their data management operations. Moreover, firms that fall into a particular category according to their operational scale shouldn't ever face discrimination because of technological disruption. This assertion is emphasized at industrial levels and not at organizational levels provided the industries' growth is considered in parlance to the economic growth. The development of regulatory frameworks and legal implications pertaining to blockchain accessibility, along with a mechanism for measuring data privacy and security, is crucial. But, it is also critical for businesses to determine whether implementing blockchain technology will be beneficial and how much it will likely increase profits.

Limitations and Scope of this Communication

This brief discourse is derived from extensive blockchain research and is confined to the conclusions drawn by the writers. With very little support in the literature, this message offers a fresh understanding of the new populist context in blockchain technology. Still, this also points to the need for additional research in the field of

blockchain from other angles. Incorporating the ideas presented in this study into research frameworks will enhance the literature and provide new insights into the intersections between blockchain technology and populism.

Authors' Contribution

This communication is primarily written by Dr. Aarti Mehta Sharma. Dr. Madhvi Sethi and Prof. A. Vidyasagar worked on the study frame design, data analysis, and inference production. Dr. Sabari Shankar Ravichandran created this message's written portions. Each author has made a significant contribution to the communication's outcomes.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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