BLOCKCHAIN TECHNOLOGY ENABLER FOR CSR AND ESG REPORTING

Abstract

This chapter delves into the transformative role of blockchain technology as an enabler for Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) reporting. The first section explores the specific applications and advantages of utilizing blockchain in CSR initiatives. It discusses how blockchain enhances transparency, accountability, and traceability, thereby revolutionizing the way organizations engages in responsible business practices. The second part of the chapter investigates the intricate integration of blockchain with CSR, illustrating how the technology can be seamlessly woven into existing frameworks to amplify the impact of socially responsible activities. This integration not only facilitates seamless tracking of CSR efforts but also enhances the credibility of reported data. Additionally, the next segment examines the pivotal role of blockchain in Environmental, Social, and Governance reporting, shedding light on its contributions to sustainable and ethical business practices. While recognizing the potential benefits, the next part addresses the challenges associated with implementing blockchain in CSR and ESG contexts, including issues related to scalability, interoperability, and regulatory concerns. The final section presents two compelling case studies: one on Svojas Farms, showcasing how they build trustworthy consumer brands through the implementation of TraceX Solutions, and the other focusing on IBM's innovative use of blockchain in supply chain management for enhanced ESG reporting. These cases provide real-world examples of successful blockchain integration in CSR and ESG practices, offering valuable insights for organizations seeking to adopt similar solutions. In conclusion, this chapter demonstrates the multifaceted impact of blockchain technology on fostering sustainable and responsible business practices.

Keywords: Blockchain technology, CSR, ESG.

Authors

Dr. Roshan R
Kirloskar Institute of Management
Maval,Pune, Maharashtra.

Dr. Smita K
Kirloskar Institute of management
Maval,Pune, Maharashtra.

I. INTRODUCTION

The blockchain is a distributed public ledger that stores transactions (or any other type of digital data) in a sequential order of blocks.

There are three types of blockchain networks, each with its own set of characteristics and trade-offs: fully permissioned, public-permissioned, and permission less, each with pros and cons depending on the purpose of its use. First, permission less block chains are open to anyone who wants to participate in validating or making transactions without any restrictions. This type offers high decentralization, transparency, and resistance to censorship, and prevents the risk of centralization. However, it has lower expandable and slower transaction speediness due to a huge number of nodes. Second, fully permissioned blockchains are private links with limited access to meticulous users or organizations. This type offers high scalability, fast transaction speeds, privacy, and control over governance and decision-making.

However, it has small amount of transparency and confrontation to restriction, as only network members can validate operations and govern or the system's requirements and contribution. Third, a public-permissioned blockchain is a mixture of permissioned and permission less blockchains, where approach is restricted to some nodes while others are open to the public. This type of blockchain creates an existing increase in devolution as equated to fully permissioned blockchains, which can improve security and reduce the centralization of power. Moreover, expansible is also an advantage if equated to permission less blockchains due to the peri metered number of permissioned nodes, which qualify quicker auction. Thus, a key planner shall be evaluated on the business prerequisites previously choosing a blockchain category for its scheme tender. Moreover, some blockchain technologies permit the implementation of smart conventions, which are programming code that includes business logic in the execution process and can be deployed on a block chain platform. Keen conventions enable complex transactions without intermediaries such as centralized servers, and they also consent for tokenization, where digital symbolises can represent benefits like currency, securities, and property. Blockchain is defined as allocated register or record that is accomplished in a decentralized technique to accumulate the information in digital format. Originated in finance, blockchain is initially used to serve crypto currencies based secured and tampered proof transactions in 2008. This vital technology creates authentic and protected records of transaction; therefore, upholds security and improves trust without the trustworthy third party. Regarding blockchain application, Chiu and Koeppl (2019) model a trading period where stockholders meet and negotiate bilaterally to settle an asset trading, find that blockchain facilitate the asset transfer and money payment, while avoid trading losses by following a proof of work protocol. The blockchain technology in smart contracts, show that blockchain can produce the tamper-proof and self-enforcing decentralized consensus and better refection of the business operation's contingency, therefore improving the efficiency of the contract. Blockchain also support "sophisticated fractional calculus models" for supply chain finance systems. Recognizing to these innovations as the lifeblood of the business, blockchain has contributed to the changes towards efficiency and modernization of the economy.

Corporate Social Responsibility (CSR) is characterised as the responsibility of business entities to undertake actions that align with the desirable objectives and values of our society. As per the findings of a recent report by EY [2021], a significant proportion of

investors, namely 78%, rely on Corporate Social Responsibility (CSR) reporting in the form of Environmental, Social, and Governance (ESG) disclosure to inform their investment decisions. This underscores the importance of providing investors with access to CSR reporting.

The significance of Environmental, Social, and Governance (ESG) has escalated for contemporary businesses. According to the 2022 Resilience Barometer survey conducted by FTI Consulting, a significant proportion of corporate leaders, specifically 86%, have reported an increase in their expenditure on ESG and sustainability initiatives. The significance of ESG factors has increased due to the growing demand from investors, customers, and other stakeholders for businesses that prioritise social responsibility and sustainability.

Thus, block chain technology has the potential to address ESG challenges by providing a transparent and tamper-proof record of a company's financial and social activities. By leveraging blockchain, companies can create an in controvertible archive of their investments in ESG, providing greater transparency and accountability. This can be used to track a company's social impact, including its contributions to local communities, labour practices, and stakeholder engagement.

II. USE OF BLOCKCHAIN TECHNOLOGY IN CSR

Blockchain technology opinions are to always stand high when in view of its effect on social problems. One such unit can be a corporate take on corporate social responsibility (CSR). It not only develops and builds the trust along with particular patrons but also holds up the see-through. The development of block chain has directed to the variations and applications diagonally in the world in the interior of many sectors. From cyber security to gaming, all have fused blockchain in one way or another.

Blockchain can oblige multiple purposes in the empire of CSR. First, in origin, chasing the uniqueness and the source of something back to its origin. Examples of this embrace organic food products, expensive commodities, or even the digital identity of immigrants, where distinctiveness is hard to come by.

As it is see-through, everlasting, and undisputable, blockchain technology launches accountability and offers validity to all parts of the supply chain. This helps to reserve CSR's authenticity instead of companies just using it as a marketing trick to get encouraging public relations. The tokenized economy of blockchain presents potential avenues for the digitization of land rights or titles, which can be leveraged to enhance the creditworthiness of small and medium-sized enterprises. This can be achieved through the collateralization of crop yield or improved access to financing and insurance. The current estimate suggests that approximately 1.4 billion individuals globally lack access to banking services.

A blockchain is a digital record of transactions. It consists of records labelled as "blocks", which are then linked together in a chain-like formation. The technology known as blockchain derives its nomenclature from its distinctive composition and is frequently employed for the purpose of documenting digital currency transactions, with its most prevalent application being the Bitcoin system.

Apart from the financial domain, it is a flexible device that has many bids beyond just crypto currency. In recent years, it has come to be recognised as a potent instrument in the business sector. This is due to the fact that it boosts business productivity while simultaneously lowering costs. Though it is a desirable device in the business world, it was disreputable for using abundant quantity of vigorous foremost to a massive conservational influence. In spite of this, blockchain has arisen as an exceptional instrument for industries to acquaint Corporate Social Responsibility (CSR), a management concept where companies integrate social and environmental issues in their business model and stakeholder interactions.

III. BLOCKCHAIN ENTWINED WITH CSR

The crusade of social responsibility is collectively growing in fame cross ways in the world. Blockchain can be applied to integrate several justifiable actions that come underneath CSR. For example, it can aid as a stand for edifice a structure in a globular economy, where as it is an economic strategy intended to eradicate left-over and recurrently use the available resources.

CSR and blockchain can be merged into a company's supply chain. The advantage of blockchain is to integrate CSR into a business model is an outstanding chance for businesses to track gradually the note worthy drift of social responsibility in civilized world.

Clients are now demand of factual, concrete efforts thru by corporations, and they approximately likewise entitlement that they would be desiring to obtain facility as of from the industries that parade their keenness to ecological conservancy.

Companies' part is extensively under passions in militants, being exposed for fraudulence. Long story is made short, businesses frequently put out of site under the pretext of environmental and social sustainability whereas they are vigorously contributing in hurtful doings. The aids of blockchain to the clients, commerce and its efficacy in Corporate Social Responsibility are entangled. Its fundamental ideologies of faith and transparency speak to us with a prospect to counterbalance the undesirable influence and move frontward& further for justifiable forth coming future.

IV. BLOCKCHAIN'S BENEFITS FOR CONSUMERS AND BUSINESSES

Blockchain can confirm socially responsible supply chain management over transparency. It provides better-quality prominence crossways to the complete landscape:

- Conveyance of goods from warehouses to markets
- State, quality, and price of the products
- Order execution and business execution.

The wide accessibility of data generates a flawless atmosphere for data accuracy. Blockchain's dispersed the structure that ensures every person is in control of their procedures and has admittance to suitable facts and figures. Through the whole supply chain progression, the particulars of every single deal are chronicled and made reachable via a

everlasting antiquity – once the statistics is formed, it cannot be erased or reformed. This makes it impossible to compromise the archive.

Through this comprehensive tracing and authentication method, connecting and distribution can be done simultaneously. Rewards container abdicating human errors, reducing costs, and curtailing time adjournments allied with, while carrying out the transactions. This will form and shape supply chains exponentially more effectual.

By means offending overhead costs and the participation of third parties, blockchain offers a prospect to significantly reduce the transaction cost and time. For instance, the charge of bill factoring can be made compact by as much as 25%, as blockchain diminutions the menace of selling several invoices.

Blockchain can support in classifying and modifying contract violations, dismissals, and blockages in the flow of goods. This comfort of tracing and identification also progresses Corporate Social Responsibility. Blockchain can be merged in a business' & CSR effort as it can generate a record of transaction and creation history. This can oblige as resistant of a company's application of caringly located raw materials or goods.

It also makes available prospect for consumers to be educate on a firm's business does and sustainability within their products, permitting them to make well-informed verdicts from where to spend their money. Enlarged purchaser consciousness shall also inspire companies too sustainably to source their materials and permit social responsibility in overall steps of the supply chain.

Blockchain not only benefits consumers and businesses, but its benefits society as a whole as we move towards more ethical business models.

V. BLOCKCHAIN ADOPTION

Blockchain Company Civic Ledger spoke to BeInCrypto on the topic of adoption rates of the technology. Following the conversation via Twitter, the team shared valuable information regarding blockchain's play in enhancing its CSR footprint.

"Blockchain technology enables a much higher level of transparency and visibility, and companies that are first to adopt will reap the rewards — consumer trust and loyalty, cost and time-savings, improved efficiency and safety, plus, potentially, government support for sustainability initiatives and innovation

Second is the exchange of value, where something goes from one party to another, whether it's the monetary value or something of value to the receiving end. So, it could be of financial value to refugees who are displaced in different parts of the world or government to citizens on a welfare program. Permanent, and immutable, blockchain technology establishes accountability and provides legitimacy to all parts of the supply chain. This helps preserve CSR's genuineness instead of companies just using it as a marketing gimmick to get positive public relations.

At this point, CSR has become more than just a marketing strategy to endorse a company. Aggressive against global warming is probably the biggest example of CSR in

recent times. As per a recent global CSR report, around 86% of respondents expected companies to participate in CSR-led changes converging on social and environmental issues.

VI. USE OF BLOCKCHAIN TECHNOLOGY IN ESG

"Blockchain will save the planet." It sounds like a bold announcement in an interpretation of around the energy it takes to mine coins. But the certainty is that blockchain goes beyond crypto. It bids a result for individuals who need to build, manage, and report on environmental, social, and governance (ESG) initiatives.

ESG refers to a tripartite framework that evaluates a company's environmental responsibility, social responsibility, and governance. The environmental aspect assesses the company's waste management, water usage, and environmental impact. The social aspect employs metrics to gauge the company's treatment of its workers and clients. Lastly, the governance aspect evaluates the company's overall management and operational efficiency. The framework presented is a commendable approach for evaluating firms, albeit its monitoring has historically posed challenges.

Blockchain reports environmental effect in more detail, systematizes reporting, and keeps records. This gives consumers, managers, and investors more lucidity into the practices of a company.

ESG influences and have gained substantial importance as investors, customers and other stakeholders are increasingly looking out for businesses that arrange sustainability and social responsibility. Blockchain technology has a great potential to address ESG challenges. Increased transparency, traceability, and efficient management of supply chains are just some of the benefits that can come from using the distributed ledger technology provided by blockchain. A significant challenge in the determination to report ESG is that ESG standards and regulations remain cloudy—benchmarks span a wide spectrum of variables, with no universally adopted standardization.

Along with the lack of standard metrics, the vitalproblem of proof is a significant stake in locating high standards for ESG compliance. The requirement for transparency in Environmental, Social, and Governance (ESG) evaluation and disclosure poses a difficulty for both commercial enterprises and regulatory bodies. Given the prevalence of metric misreporting among numerous companies, what measures can be taken to ensure the reliability of data for consumers? What methods can regulators employ to discern the authenticity of information?

VII. HOW CAN BLOCKCHAIN HELP PROVE IT?

The implementation of blockchain technology can effectively tackle the environmental, social, and governance (ESG) challenges by promoting transparency, traceability, and accountability. Blockchain technology employs decentralised ledgers to store transactional data that is both secure and immutable. The system in question is a network of interconnected records that are stored in a peer-to-peer fashion and have the ability to expand. The blockchain technology enables all network participants to access information without any central point of failure, thus instilling confidence in the system. This presents a significant advantage of blockchain. The aforementioned technology has the

capability to provide comprehensive validation and automatic documentation of numerous data elements pertaining to a company's environmental, social, and governance (ESG) tracking. Numerous corporations have made a pledge to substantially decrease or decline their carbon footprint. The carbon emissions and credits of an organisation, such as flight miles and goods shipments, can be monitored and compared against established objectives through the use of blockchain technology. These data can be accurately recorded and verified, enabling organisations to track their progress towards their sustainability targets.

Similarly, organizations can track and trace products and labour situations along their supply chains, storing the findings on the blockchain along with other ESG metrics. Statistics information from their vendors and suppliers could be unified so that every relevant metric is measured using the same device. All the information would remain on-chain and unchallengeable.

The immutable documentation of essential environmental, social, and governance (ESG) metrics can be disseminated in a transparent and effective manner via smart contracts, which is a resolution provided by my organisation and other entities. The aforementioned contracts are characterised by their digital nature, immutability, and automation, as they are implemented on a block chain platform and feature self-executing code that contains the rules and instructions for their execution. Pre-established procedures guarantee that associated transactions are automatically initiated upon the occurrence of specific events. The elimination of human supervision results in a reduction of errors and enhances the verification of the legitimacy of executed data and transactions.

Smart contracts can be utilised in an ESG scenario to facilitate automated disclosure of data to the public and/or regulators, either in real-time or according to a predetermined schedule, without any human intervention or interference. The veracity of this data can be authenticated by regulatory bodies or a reputable third-party entity to corroborate that the operations of the organisation are in compliance with established benchmarks, and that its assertions, communication, and promotional materials are congruous with its factual conduct. This phenomenon ultimately engenders a self-perpetuating cycle, whereby an entity's authentic ESG stance is substantiated, while simultaneously showcasing its willingness to exhibit transparency and active participation in public dialogue.

VIII. CHALLENGES

The World Economic Forum has taken significant steps towards the consolidation of international corporations around uniform metrics.

However, numerous companies encounter difficulties in maintaining records, exchanging data, and monitoring sustainable initiatives across the supply chain, hindering their ability to expand responsibly and appeal to investments based on values.Apart from assessing the impact, organisations must opt for a blockchain platform that exhibits lower energy consumption.

While Bitcoin's Proof of Work mechanism demands significant energy consumption, enterpriseoriented alternatives such as Fabric, Geth, and Cord do not share this characteristic. There exist several obstacles confronting ESGs, nevertheless, they are not impeding the progress of the sector.

As per the National Law Review, it is anticipated that the value of ESG assets will sur pass $53 trillion by the year 2025.This implies that in order to satisfy the expectations of con sumers who seek companies and products that align with their values, and investors who seek to invest in socially responsible brands, companies must take prompt action.

The blockchain technology in and of itself does not provide an infallible system. The financial sector has become cognizant of the fact that programming errors and other technical inadequacies can pave the way for unsanctioned entry of third parties into a smart contract, thereby leading to manipulation of contract conditions or outcomes. The occurrence of time lapses has the potential to create an impression of validity for a transaction, which may subsequently be overturned at a later point in time. Contracts delineate the actions that are expected to be performed, regardless of one's level of intelligence. It is possible for both individuals and organisations to engage in insincere agreements and evade their obligations. However, the enhanced transparency and lucidity that can be facilitated by blockchain technology may prove advantageous for corporate social responsibility endeavours. Investors seek assurance that corporations are fulfilling their commitments. The implementation of blockchain technology is a potential avenue for organisations to effectively actualize their corporate social responsibility commitments, rather than solely espousing them. In the event that an organisation opts to integrate blockchain technology in the context of corporate social responsibility, it is imperative to ensure that investors are apprised of the implementation and its potential advantages for the organisation and its principles.

IX. CASES: USE OF BLOCKCHAIN TECHNOLOGY IN ESG & CSR

1. **Case A :** Svojas Farms builds Trustworthy Consumer Brands with TraceX Solutions
   Using only natural ingredients, Svojas Farms is a woman-owned business that places a high priority on client happiness. They support a path to health and wellbeing by providing chemical-free goods to the final customer through sustainable agriculture. They are moving forward with SAFE (Svojas Assured Food Experience), a programme that puts food quality and safety first. Their products are designed to introduce healthy millets and clean, organic products like honey, ghee, and a few spices into people's culinary cultures.

   - **Stinging Challenges of Svojas Farms**

     ➢ Svojas' main priorities are the quality and safety of their goods' food.
     ➢ They place a high value on the product's authenticity and source their materials ethically and naturally for their goods.
     ➢ Using sustainable farming methods to produce ecologically friendly goods
     ➢ Promote healthy plant-based choices for everyone.
     ➢ Demonstrate consumer trust in brands..

   - **Traceability Solutions for a Healthy Future**: The increasing consumer demand for transparency in the food they ingest is propelling the necessity for comprehensive traceability throughout food value chains. Tracing a product's journey from its origin on the farm through various stages of processing, distribution, transportation, and ultimately to the end consumer has become a customary practise among all stakeholders in contemporary supply chains.

The implementation of traceability solutions powered by blockchain technology affords brands a competitive advantage by enabling them to promptly demonstrate trust and transparency to their customers. The narrative of the QR code serves to replicate the trajectory of the commodity from its origin on the farm to its ultimate destination on the plate, thereby instilling confidence in consumers regarding the calibre, genuineness, and ecological soundness of the product. In addition, this facilitates the optimisation of product management workflows and inventory management for brands. Batch management facilitates the monitoring and tracing of products. The inclusion of quality certifications can serve as a valuable addition to audit trails, while the utilisation of QR code labelling can effectively facilitate end-to-end transparency of products.

2. **Case B: A Supply Chain use Case:** An examination of the advantages of blockchain technology will be conducted through an empirical example pertaining to the supply chain and the traceability of commodities and their constituent parts.

It is a common characteristic of globally retailed products that their constituent parts are sourced from various regions of the world, and their value chains and logistics frequently involve international operations. The intricate nature of logistics and supply chains, production, and retail processes necessitates a significant reliance on copious amounts of dependable data, as well as meticulous coordination and surveillance.

Contemporary supply chains generate a significant volume of documentation. Consider the ocean freight sector, which is responsible for transporting 90% of commodities in worldwide commerce. According to IBM's estimation, the process of shipping typically necessitates approximately 30 signatures from various organisations and 200 instances of communication. The inefficiency of international shipping and its reliance on paper-based processes, which have detrimental environmental impacts, is a topic that warrants further discussion. Furthermore, international supply chains are subject to various limitations such as fraudulent activities, data and product manipulation, human errors, susceptibility to delays, and lack of transparency.

The aforementioned statement appears to present an apparent inconsistency with the essential requirement in supply chain management of possessing dependable and mutually accepted data sets while also being efficient with time.

Furthermore, it is apparent that there is a requirement for increased transparency, regulation, and establishment of standards. This is due to instances where consumer protection and adherence to manufacturer guidelines were breached, resulting in the need for product recalls. Such occurrences have undermined consumer confidence in the past. Enterprises have addressed the aforementioned challenges and deficiencies of current supply chain and provenance mechanisms by investigating blockchain-based solutions in this domain. The projects are presently at varying stages of development, encompassing use case development to proof-of-concepts, and have distinct success narratives. Several prominent entities, including Microsoft, Walmart, IBM, and Maersk, are currently investigating blockchain solutions for supply chain management, chain of custody tracking, anti-counterfeiting, and traceability.

X. CONCLUSION

The use of blockchain in ESG and CSR reporting and investing is projected to increase as the world continues to deal with environmental and social concerns. It can assist businesses in accurately disclosing their sustainability initiatives and enable investors to make wise choices. Additionally, it can make it easier to develop sustainable financial instruments that can aid in raising money for environmentally friendly projects.

However, there are issues with trustworthy and accurate data that must be resolved, as well as worries about data privacy and security and the requirement for a standardised framework for sustainable reporting. However, the potency of blockchain in the ESG space cannot be disregarded since it has the potential to revolutionise how we think about sustainability and responsible investing.

Global challenges in sustainability, equity, and ethics must be resolved via innovation and coordination on many levels. One piece of this problem is blockchain. This technology can exhibit action in opposition to strategy and instil trust in an environment that urgently needs it. Organisations may be held accountable for their actions with a public and verified record of ESG measures, and those that are making progress can be recognised appropriately. Although the widespread adoption of blockchain technology may be a long-term process, entities that undertake measures to comprehend the technology at present will be the most equipped for the forthcoming future.

REFERENCES

[1] Adams, R.; Parry, G.; Godsiff, P.; Ward, P. The future of money and further applications of the blockchain. Strat. Change 2017, 26, 417–422.
[2] Almeshal TA, Alhogail AA. Blockchain for businesses: A scoping review of suitability evaluations frameworks. IEEE Access. 2021;9:155425-155442
[3] Berke, A. How Safe are Blockchains? It Depends Harvard Business review. Available at: https://hbr.org/2017/03/how-safe-are-blockchains-it-depends
[4] Beaconvc, 2023, Empowering ESG with Blockchain Technology,Available at: https://www.beaconvc.fund/knowledge/empowering-esg-with-blockchain-technology
[5] Bloomberg, 2021, ESG assets may hit $53 trillion by 2025, a third of global AUM, Available at: https://www.bloomberg.com/professional/blog/esg-assets-may-hit-53-trillion-by-2025-a-third-of-global-aum/
[6] Bowen HR. Social Responsibilities of the Businessman. New York: Harper & Row; 1953
[7] Chiu, Jonathan; Koeppl, Thorsten V. (2018) : Blockchain-based settlementfor asset trading, Bank of Canada Staff Working Paper, No. 2018-45, Bank of Canada, Ottawa,https://doi.org/10.34989/swp-2018-45
Christidis K, Devetsikiotis M. Blockchains and smart contracts for the internet of things. IEEE Access. 2016;4:2292-2303
[8] Civic ledger, 2021, "How Blockchain Can Enhance Your CSR Footprint", Available at: https://medium.com/civic-ledger/how-blockchain-can-enhance-your-csr-footprint-e741969cf0b7
[9] EY. Blockchain: Is your ESG Data Unlocking Long-Term Value? Why Nonfinancial Information, Data Analytics and Better Performance Insight Can be Key to Enhancing the ESG Premium. 2021. Available at: https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/assurance/assurance-pdfs/ey-institutional-investor-survey.pdf.
[10] Forbes, 2022, How Blockchain Can Help Measure And Prove ESG Milestones, Available at : https://www.forbes.com/sites/forbesbusinessdevelopmentcouncil/2022/11/08/how-blockchain-can-help-measure-and-prove-esg-milestones/?sh=716ba52f4444
[11] Lindman, J.; Rossi, M.; Tuunainen, V.K. Opportunities and Risks of Blockchain Technologies in Payment—A research agenda. In Proceedings of the 50th Hawaii International Conference on System Sciences, HICSS/IEEE Computer Society, Waikoloa, HI, USA, 4–7 January 2017; pp. 1533–1542

[12] Pedersen AB, Risius M, Beck R. A ten-step decision path to determine when to use blockchain technologies. MIS Quarterly Executive. 2019;18(2):99-115

[13] Pucker KP. Overselling sustainability reporting. Harvard Business Review. 2021;99(3):134-143

[14] Sarajoti, P., Chatjuthamard, P., Papangkorn, S., & Phiromswad, P. (2023). CSR Reporting and Blockchain Technology. IntechOpen. doi: 10.5772/intechopen.105512

[15] Sadouskaya, K., 2017, Adoption of Blockchain Technology in Supply Chain and Logistics, Available at : https://www.theseus.fi/bitstream/handle/10024/126096/Adoption%20of%20Blockchain%20Technology%20in%20Supply%20Chain%20and%20Logistics.pdf?sequence=1

[16] Sheehy B. Defining CSR: Problems and solutions. Journal of Business Ethics. 2015;131(3):625-648

[17] TechBullion,2018,Who Invented Blockchain Technology? Available online: https://www.techbullion.com/

[18] Tracextech, 2022, Svojas Farms builds Trustworthy Consumer Brands with TraceX Solutions,Available at: https://tracextech.com/svojas-farms-builds-trustworthy-consumer-brands-with-tracex-solutions/

[19] Tracextech, 2023, ESG reporting with blockchain, Available at: https://tracextech.com/esg-reporting-with-blockchain/

[20] World Economic Forum, Blockchain Beyond the Hype, April 2018 , Available at: http://www3.weforum.org/docs/48423_Whether_BlockchainWP.pdf

[21] Zheng Z, Xie S, Dai HN, Chen X, Wang H. Blockchain challenges and opportunities: A survey. International Journal of Web and Grid Services. 2018;14(4):352-375