

Blockchain Technology & CSR Compliance: How to Build a System Based on Cooperation Among Stakeholders and Save Important Resources

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Abstract

There is a growing interest in blockchain technology nowadays. Today there are applications of this type of technology in many fields. Why is it so innovative? Which are the conditions of this technology that allow companies to save resources and be in compliance with CSR? Corporate social responsibility is changing, especially if we consider the introduction of new technologies such as blockchain. This application would replace various sets of established principles such as Ethical Codes or Codes of Conduct. The Codes of Conduct are typically promulgated directly by companies, by professional institutions, or by national and governmental institutions, to identify and formalize ethically correct professional behavior of employees and stakeholders. Blockchain is going to change common principles because it eliminates the arbitrariness that the ethical evaluation process by an external guarantor like commissions, delegates, consultants, ethics committees, and so on. This process makes the ethical evaluation process of the behavior of a company more objective. How blockchain can effectively and in a practical way help companies with CSR Compliance is a theme there will be better developed in the next pages.

Keywords

Blockchain solutions; sustainability; CSR; compliance; technology; reducing transaction costs; digital society; remove intermediaries.

Introduction

To better explain the Blockchain idea, it is necessary to start with the concept of “trust”. The global economy, organizations, and relations among individuals are based on the concept of trust. Laws, finance, employees’ contracts are elements that can rule until there is trust among participants and individuals can trust institutions and companies. If the institution that has published a law, or a contract, decodes (for example, a public institution that is not able to certify that a person has a certain qualification like a master’s degree), in this case, that person has not anymore that certification, but the person didn’t lose the ability and the knowledge that has gained. This example wants to demonstrate that technologies like blockchain can eliminate or partially eliminate the need for an intermediate and in some cases could be an interesting solution for example when we talk about companies and compliance with sustainability practices and CSR. For example, it is possible to use blockchain technology to generate a traceable supply chain, from food, textile, drugs, and more.

Blockchain technology has great potential in terms of environmental and social sustainability, but it is only a tool that helps and could facilitate the adoption of "green" and "fair" practices.

The objective of this paper is to show possible and various applications of blockchain technology in different sectors and for different purposes to have an interesting view on the advantages of adoption and areas in which blockchain could help companies comply with CSR principles.

The European Commission objectives and blockchain applications

European Strategy in response to the "Agenda 2030 of the United Nations", in its content, is particularly sensitive to the theme of sustainability and sustainable development. Many are the challenges we are still facing today such as poverty, inequality, climate change, environmental degradation, peace, and justice. In this sense, the European Commission has developed a plan for the next few years to conduct European countries into more sustainable development practice.

Blockchain technology application has been considered into European strategy as an instrument able to build an inclusive, sustainable, and transparent citizen-centric digital society. In that sense, this technology can be used to facilitate and reinforce trust, control of own data, and interaction between citizens, enterprises, and public organizations. (European Commission website, 2021). There are minimum requirements, areas, and standards to be respected when developing blockchain models and solutions. Standards of blockchain technology provided by the European Commission are basically the following:

- The entire system should be sustainable and energy-efficient.
- Blockchain networks should comply with principles related to data protection and privacy regulations and e-signature regulations. In this area, there is the need also to develop a regulatory framework regarding digital assets & smart contracts able to protect consumers and businesses.
- Be interoperable between other blockchain systems and with legacy systems in the outside world, but at the same time provide high levels of cybersecurity.

As a conclusion of this section, it is possible to say that the European Commission strategy has a real optimistic approach towards the diffusion of blockchain technology allocating financial resources dedicated to research, development, and education.

Blockchain's advantages for companies

Businesses can benefit from blockchain technology in many ways. For example, it can be used to reduce transaction costs making more transparent and automated intellectual property ownership, traceability of supply chain and payments (Felin & Lakhani, 2018). Many researchers have discussed the application of blockchain for businesses, in aspects like accounting settlement and crowdfunding, data storage, and sharing, supply chain management, and smart trading for example (Xu et al., 2019).

In the following paragraphs, it is possible to have a view on which are the advantages related to the usage of blockchain technology for a sustainable development model of companies.

Blockchain technology, by design, has the potential to offer the greatest level of transparency instead of other technologies or other practices. By design, blockchain technology has a distributed ledger, where each node of the network has a copy of the ledger. Information on the ledger is immutable. This means that what has been recorded is recorded forever in the ledger and no institution, company or government can force, manipulate or falsify the recorded information. This feature eliminates the need for a guarantor or a trusted party to be an intermediary in relationships among individuals and companies.

Traceability of supply chain

Nowadays it is difficult to monitor transparency among supply chains. This opens challenges related to fraud, pollution, human exploitation, and many other inefficiencies. Application of transparency property of blockchain technology can be very useful among supply chains of products and services and in institutional scenarios applied to prevent corruption. (Marchesoni, 2019).

Supply chains are a complex network of different actors (institutions, companies, guarantors, and so on) that exchange goods payments, and data across from different locations and in a dynamic scenario. Blockchain technology has in some sense a similar structure, and so is configured as a decentralized network with distributed and transparent data structures. Blockchain network structure allows network actors to exchange data relatively easily and from anywhere in the world without having a central authority owning data and so avoiding concentration of power.

Blockchain technology enables the automation of electronic transaction management. Businesses can automate transactions on blockchain networks using smart contracts without manual confirmation. For example, companies can enable smart contracts that file taxes automatically (Vishnevsky & Chekina, 2018). This can help companies to improve efficiency on control of accounting settlements, and improve the level of control of monetary business execution, at the internal level and also external level. (Zadorozhnyi et al., 2018). Companies can handle financial-related issues more flexibly by holding, transferring, and issuing digital currencies that are based on blockchain technology.

Decentralized data storage

Data for companies is a really valuable resource. Blockchain technology, by design, provides reliable decentralized storage to be used for efficient data-usage and data-keeping (Novikov et al., 2018). This type of decentralized ledger can keep records of many kinds of companies' digital assets (Dutra et al., 2018). This means that companies don't give their data to a centralized agency, but they are giving data to people that participate in the blockchain network all around the world. Data that cannot be modified by anyone.

Businesses can in this way improve the transparency and security of their data and prevent the data from being falsified or stolen. This avoids the possibility of a central party modifying and corrupting data or a central point of failure from the central agency because, in case of data loss, there are many other copies of the ledger in all the other nodes of the networks.

At the same time, this technology supports data sharing, and this helps key parties of a transaction to aggregate and share information (and for example instances of practitioner misconduct) across the country on a nearly real-time basis. (Sheldon, 2018).

An example of blockchain-based on IPFS hypermedia protocol is Filecoin, a cryptocurrency that aims to incentivize a global network of computer operators to provide a file sharing and storage service. It would not rely on a central authority, which means that the exchange of its files could not be censored by governments or other actors. Filecoin miners get paid to make storage space available to users. Filecoin users, in turn, must pay miners for the storage, recovery, or distribution of this data. Miners are incentivized to make available storage in exchange for Filecoin's cryptocurrency tokens. Transaction costs are determined by an open market where miners compete with each other to offer the lowest storage price. A super-competitive market and maybe in the near future, cheaper than centralized data storage such as Amazon Web Services.

Traceability of transactions

The transparency property of blockchain can help to monitor funds donated to charity organizations effectively used for social purposes, supporting the responsibility of civil society and eliminating risks of corruption in the bureaucracy (Marchesoni, 2019).

In the US, the Binance Charity Foundation supports high ethical value projects, by raising funds for projects with a high social impact such as saving lives in poor countries. The idea based on this project is to exploit the DLT technology as an element that guarantees transparency and trust to donors, thus using technology as an enabler of a broader cultural revolution. Another example is Charity Wall is an Italian startup born in early 2019, intending to trace charity donations via blockchain, certify the use of funds, and allow donors to monitor, comment and verify the development of each specific social project. The platform works as a marketplace for launching charity projects, which can be financed via cryptocurrencies like Bitcoin and Ethereum.

In many application areas traceability can be reached even without the blockchain, but different is the case of the charity sector where the transparency of donations becomes a winning element, and where the blockchain becomes an enabler of virtuous processes as well as an engine of 'increase of the donations themselves (Jovacchini, 2020). In addition, blockchain technology represents an emerging source of venture capital crowdfunding (O'Dair & Owen, 2019). Investors or founders of enterprises can obtain alternative entrepreneurial finance through token sales or ICO's (Initial Coin

Offerings). This is for sure an interesting system for enabling the creation of startups and for example incentivizing investments and projects related to sustainable actions.

Blockchain as an instrument for CSR and sustainability

In the previous paragraphs were presented advantages of the application of blockchain technology in different fields. In this section, the objective is to understand how this technology can help and become a tool to monitor the sustainability and CSR compliance of people, companies, and institutions.

This technology makes it possible to implement transparent economic practices and audits, in the network protocol itself, simplifying the monitoring and application of all sustainability objectives. Unfortunately, until now, monitoring and reducing our impact on the planet has been difficult, especially since access to data on each of our actions is limited; now, the combination of Blockchain with AI and IoT will allow us to extract, process, and interpret better data for evaluating the impact of our actions. The result will be complete information transparency on collective sustainability behaviors, without geographical limitations, leading to faster results and feedback cycles and the affirmation of global "green" standards (Marchesoni, 2019).

Trace provenance of raw materials

Blockchain technology has the potential to improve the efficiency and traceability of transactions related to supply chain management (Treiblmaier, 2018). Blockchain technology is evolving and practices like interoperability of the system with machine learning models and IOT systems. This will significantly support the supply chain provenance of raw materials and effectively trace whether certain products effectively had a sustainable and ethical provenance. This enables effective monitoring of the entire supply chain. When the product goes from the manufacturer to the customer, all the related and important data are recorded in the blockchain's distributed ledger. In this way, industries and companies can trace products and raw materials to effectively monitor product quality (Kim & Laskowski, 2016).

We can take the example of textile production, where traceability is an important issue, both from the point of view of consumer protection and of company management and logistics. In the textile sector, it becomes very important to be aware of the place of origin of a product, yarn, or fabric to guarantee its characteristics to the customer. Many attempts have been made to regulate and define traceability methods at a legal level and there are many textile companies, especially Italian, which are committed to guaranteeing high standards of traceability and sustainability to become competitive in the global textile market and preserve *Made in Italy* as a synonym of quality and excellence.

Another important sector requiring a high standard of traceability is the Food Industry. In this case, it is possible to talk about the IBM company that realized many blockchain solutions in which there is also "Food Trust" which is an interesting solution enabling traceability of the supply chain in the food sector. *Food Trust* is a

blockchain network able to connect participants throughout the food chain through a permanent, authorized, and shared record of food system data.

These examples both in the textile and food industry are crucial for companies not just from the point of view of consumer protection but also from the perspective of company management and logistics. Blockchain solutions can increase supply chain efficiency, minimize waste, improve brand reputation and directly help the bottom line.

Prevent corruption

Distributed Ledger Technologies like blockchain, have the potential to mitigate institutional weaknesses and at the same time ensure transparency of processes, limiting fraud, corruption, and uncertainty. The application of blockchain technology eliminates quite completely falsification opportunities and human error in data and asset management. This could be an interesting application to prevent tax evasion. Enable and facilitate communication among bureaucratic institutions, eliminating no-sense intermediate steps (Marchesoni, 2019).

Reduce bureaucracy and transaction costs

Consensus protocol based on blockchain and embedded smart contracts have the potential to reduce the cost of bureaucracy in many fields. For example, eliminating or simplifying procedures to obtain certifications, identity documents, register a new car, and many others. As blockchain is basically a digital technology, its application could also bring ecological benefits by reducing the need to go directly to government offices to obtain certain documentation reducing CO2 emissions. By reducing costs of bureaucracy through e-government solutions, facilitating procedures and reducing time to access documents, and reducing transactions costs.

Avoid concentration of power and information asymmetries

Blockchain applications could be a development vehicle that can help directly give more power to individuals, mitigating power and information asymmetries by replacing some aspects of clearing or government institutions with smart contracts.

Another example of the application of blockchain is one of the renewable energy sectors: once on the grid, renewable electricity is indistinguishable from electricity which was instead obtained from conventional sources. Existing mechanisms, such as the recurring exchange of certificates related to renewable sources, require excessive time, energy, and resources; this is how these certificates could be replaced by a system that monitors the renewable electricity generated on-site, by entering the data on a blockchain. This would involve the automated creation and distribution of certificates to participants of the smart contracts. Additionally, the use of smart meters and other IoT devices could enable P2P energy trading, where owners of distributed energy grids could efficiently and legitimately sell excess energy to anyone else in the open market (Marchesoni, 2019).

Incentivize sustainable actions

Governance rules of all the blockchain ecosystems founded on the circulation of token utilities have introduced a new form of shared value creation, in which networks agree on a specific objective creating value and at the same time, share across network proof that they have contributed to this goal. Smart Contracts, on Ethereum or other similar blockchains, could be used for enabling cryptographic tokens that incentivize individuals to act sustainably through gamification mechanisms. Tokens can be used as a representation of the rewards collected for actions, for reducing CO2 emissions, energy consumption, and incentivize actions like:

- cycling, walking, using public transport instead of using a car;
- use of highly energy-saving devices, turning off the lights;
- take actions to safeguard natural resources, such as planting trees, cleaning a beach, reducing food waste, recycling products;
- staying in environmentally friendly hotels;
- using Blockchain-based solutions to certify the sustainability of the tourism service provider

To give an example, EartBi is an Italian project of the company “Bio Valore World S.p.A” that uses blockchain technology for traceability and the release of incentivization tokens. The objective of the EarthBi project is to reduce pollution caused by plastics, EarthBi bioplastics are made using patented and innovative production processes and blockchain technology to ensure transparency in the traceability of the entire production chain. EartBi also opts for the release of digital tokens that allow buyers to obtain more quantities of raw materials and discounts on design products made with bioplastics, thus contributing to the mass adoption of these materials.

These types of incentivization mechanisms for individuals could enable an interesting key to building a sustainable future (Marchesoni, 2019).

Challenges and limitations

How to share transaction data while protecting personal data privacy at the same time is a very important issue (Xu et al., 2019). The General Data Protection Regulation (EU) 2016/679 is an Act regulating EU law on data protection and privacy. It is usually called GDPR. The objective of this Act and subsequent updates is to protect the personal data of natural persons, and it clashes with Blockchain technology especially for one principle “the right to be forgotten”. When the processing of data is based on consent the data subject must have the right to revoke it at any time.

With blockchain this is difficult. Immutability is one of the characteristics that makes this system interesting, especially for companies. For blockchain to be compliant with GDPR data should be stored in an external database and erased when requested. Of course, this is a case of hard erasure and it allows some nodes of the network to make actions on the off-chain storage to have a permission/privilege.

Another barrier for blockchain systems to be also suitable at all levels in the financial system is the lack of standardization of KYC (Know Your Customer). In every country regulation is different and this is why it is so difficult to build a global system. According to the banking system, blockchain usage is difficult also when you talk about liability. Who should be accountable when there is an event of a fraudulent transaction if the role of intermediaries is outclassed?

Those are for sure issues that should be discussed in future research to really understand if blockchain is just an interesting technology used in many sectors, but it is or not the model we are going towards.

Conclusions

Blockchain technology has today much more applications than just the financial and cryptocurrency market. The application of blockchain technology across different industries and sectors is going to have even bigger impacts on global governance. As we've seen in the previous section, blockchain brings about benefits and challenges at the same time for business governance (Hooper et. al, 2020).

Blockchain, smart contracts, and incentive mechanisms on tokens have great potential in terms of environmental and social sustainability, however, it is necessary to keep in mind that technology is only a tool enabling and facilitating the adoption of practices "green" and fair by producers and consumers, governments and society. The technology is still in its liquid state, with many challenges ahead (Marchesoni, 2019).

Talking about blockchain doesn't mean that we are talking about a completely decentralized system allowing complete democracy. There are different levels of decentralization. Today many researchers are talking about decentralized autonomous organizations (DAO's). We don't know if in the future there will be a consistent spread of DAO's or partially autonomous organizations, and if this will bring innovations in organizational frameworks of businesses. This is an issue that needs to be discussed in future research according to possible applications and understanding effective positive social impact.

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