



Blockchain Case Studies

Blockchain case studies

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Blockchain in Retail and Entertainment

Retail

The main benefit of blockchain in retail is that it can boost customer satisfaction by providing: product provenance and authenticity, transparency, traceability and inventory management¹. Hence, it entails positive impacts like fraud and counterfeit prevention and enforcement of labour rights².

Furthermore, blockchain allows for the use of cryptocurrencies as a means of exchanging value (new payment method).

Many retail companies use Blockchain Technology for product traceability, such as: Walmart, Alibaba, Carrefour, Auchan³.

E-commerce

E-commerce platforms facilitate transactions. However, transactions on the e-commerce platform can face security problems⁴. This problem can be solved combining e-commerce platforms and blockchain technology, since blockchain makes transactions safer⁵. This technology has the capacity to handle user activities such as payment processing, product searches, product purchases and customer care.

Food and beverage

Blockchain technology brings many advantages to the food industry:

- Strengthening of the Supply Chain Management through improving transparency, security, and robustness of the food supply chain. The technology verifies the origin of food products or raw materials, real-time location, and status of the product at any step to monitor inventory and quality standard along the supply chain. In addition, it gathers detailed information such as product temperature, environmental conditions and other important factors for quality management purposes, which is particularly important for perishable products.
- Mitigation of food fraud and brand protection
- Transparency builds trust among consumers
- Prevention of food waste thanks to food traceability along the chain⁶.

¹ Source: https://link.springer.com/chapter/10.1007/978-3-030-47531-4_6

² Source: <https://www.getsmarter.com/blog/market-trends/the-applications-of-blockchain-technology-in-the-retail-industry/>

³ Source: <https://101blockchains.com/blockchain-in-retail/>

⁴ Jiang, J.; Chen, J. Framework of Blockchain-Supported E-Commerce Platform for Small and Medium Enterprises. Sustainability 2021, 13, 8158. <https://doi.org/10.3390/su13158158>

⁵ Source: <https://www.eteam.io/blog/blockchain-and-ecommerce>

⁶ Source: <https://axis-consulting.com/blockchain-technology-in-the-food-industry/>

A real example of blockchain technology used in this sector is given by Nestlé, which collaborated with OpenSc, a blockchain platform, to trace milk from farms and producers in New Zealand to Nestlé factories and warehouses in the Middle East⁷.

Gift cards and loyalty programs

Loyalty reward points are a form of non-fiat currency. Sandblock uses blockchain to reward consumers with loyalty points can be transferred to crypto assets.

Gift cards are another form of non-fiat currency that can be combined with blockchain.

Zeex (ZIX) is a blockchain that is doing just that. Through the Zeex app, you can deposit your crypto into your Zeex account. From there, the Zeex system converts your crypto into gift cards. This allows you to buy from any shop that is on the Zeex platform, paid for by your crypto-turned-gift card⁸.

Music, entertainment rights and IP

- Blockchain technology could offer a networked database for music copyright. Metadata embedded into every piece of recorded music could include terms of use and contact details for the copyright holders, making it far easier to locate the owners of a piece of recorded music and to obtain a license to use it.
- It could facilitate fast, frictionless and transparent royalty payments thanks to smart contracts and consensus mechanisms⁹.

Art, photography and IP

Blockchain technology in the art/creative sector can guarantee copyright, transparency in sales and the provenance of the works, solving what generally can represent serious problems in this industry.

What can blockchain bring to this industry?

- Reduction of intermediaries: The number of mediators in sales transactions makes it very difficult for authors to reach their target audience and makes their work more expensive. For example, Maecenas Fine Art uses this technology. On this platform, sellers make an inventory of their works and investors can buy them in fragments, lowering the cost of the operation.
- Guaranteed intellectual property: thanks to blockchain, intellectual property of a work can be permanently stored in the cloud. Kodak and Baidu are two companies that have blockchain

⁷ Source: <https://www.newfoodmagazine.com/article/110116/blockchain/>

⁸ Source: <https://cryptopotato.com/crypto-can-replace-gift-cards-loyalty-programs/>

⁹ Source: <https://www.digicatapult.org.uk/news-and-insights/blog/blockchain-music-industry>

initiatives to protect and manage the intellectual property of photographs circulating on the web.

- Improved traceability of creative content: blockchain technology can track the complete journey of any kind of art piece from its creation to its final destination, monitoring different information: sales, studies, analyses, certifications, appraisals, etc. This reduces illicit trafficking in cultural property and solves the problem of counterfeiting¹⁰.

Video streaming

Actual famous video platforms have many issues in terms of: strict video monetisation policies, unfair video promotion algorithms, lack of a personalized support service, vague terms & conditions, data collection controversies, and privacy concerns. Blockchain alternatives can solve most of these issues¹¹.

Decentralized social media platforms

Blockchain Social Media are decentralized platforms that allow the development of applications and smart contracts. The significant benefit of such platforms is that they offer end-to-end encryptions for every interaction enabling individuals to have more privacy and control over their information¹².

Most decentralized social networks reward users (nodes) for posting on their network. Similar to most blockchain ecosystems, such rewards come in the form of the network's native cryptocurrency¹³.

Gaming

Blockchain games include blockchain technology in their mechanics. One feature driving the adoption and use of blockchain tech in games is the ability of players to store items on the blockchain and trade them with digital tokens. Purchased items can be transferred to a wallet¹⁴.

This model will make game economies more secure while creating scarcity and preventing fraud. Furthermore, gamers can quickly transfer their assets between games, enhancing their gaming experience¹⁵. Decentralized servers will be the key to deal with hackers.

¹⁰ Source: <https://www.iberdrola.com/culture/blockchain-applications-in-art>

¹¹ Source: <https://blockonomi.com/youtube-alternative/>

¹² Source: <https://www.blockchain-council.org/blockchain/blockchain-a-new-generation-of-decentralized-social-media-platforms/>

¹³ Source: <https://www.leewayhertz.com/blockchain-social-media-platforms/>

¹⁴ Source: <https://dappradar.com/topic/games>

¹⁵ Source: <https://www.cgmonline.com/articles/features/benefits-of-blockchain-for-the-gaming-industry/>

Gambling

The gambling industry has already embraced digital payment methods and with blockchain this trend can be expanded further.

Blockchain advantages in this industry are:

- Instantaneous and Cost-Effective Transactions: no more need to wait for a bank or third-party company to verify transactions since there is not a central authority
- Anonymity and Privacy: private data is protected by the blockchain structure, reducing the risk that personal data will be compromised
- Security: this technology prevents illegal trading of digital assets and reduces the risk of both hacking and payment duplication¹⁶.

Sports management

The introduction of blockchain in the sports industry will bring the following changes:

- Handle sponsorships: clubs can track all transactions and handle sponsorships using cryptocurrencies;
- Better Management of Ticket sales: blockchain technology makes it easy to verify authenticity of tickets¹⁷;
- Secure performance data: to be shared among trainers, coaches and managers;
- Drug Testing Transparency: recording all prescriptions and results for each athlete;
- Fans Engagement: through the use of tokens that clubs will give to supporting fans;
- Better monitoring of broadcasting rights: thanks to smart contracts¹⁸.

¹⁶ Source: <https://www.winston.com/en/the-playbook/blockchain-and-cryptocurrency-the-future-of-online-gambling.html>

¹⁷ Source: <https://www.sotatek.com/how-will-blockchain-technology-disrupt-the-sport-management-sector/>

¹⁸ Source: <https://www.allerin.com/blog/how-blockchain-can-transform-sports-management>

Blockchain in Agriculture and Mining

Blockchain is an innovative technological solution for the new ways of working within the agriculture and mining industries. Through blockchain, individuals and businesses can benefit from *efficiency gains* through a reduction of manual and repetitive processes; *risk reduces* and can save *costs* through streamlining operations. Using a blockchain-based system could also improve the speed at which data can be collected from diverse locations.



Crops and agriculture

There is great potential for Blockchain to have a positive impact in farming and agriculture. This is not only because the technology can increase trust between parties, but also because it can facilitate information sharing throughout the supply chain and significantly reduce agricultural transaction costs. Blockchain enables consumers to verify the journey of their product, tracing it from farm to table. Also, it provides data and information on the harvesting of the product and its origin.

Blockchain also communicates loads, geo way-points, and basic compliance information with carriers. It registers the quality of the product, its price, location, and parties involved, thus providing crop insurance.

Blockchain can also help farmers sell commodities at fair prices and lower transaction fees thereby supporting smaller farmers to enter the market.



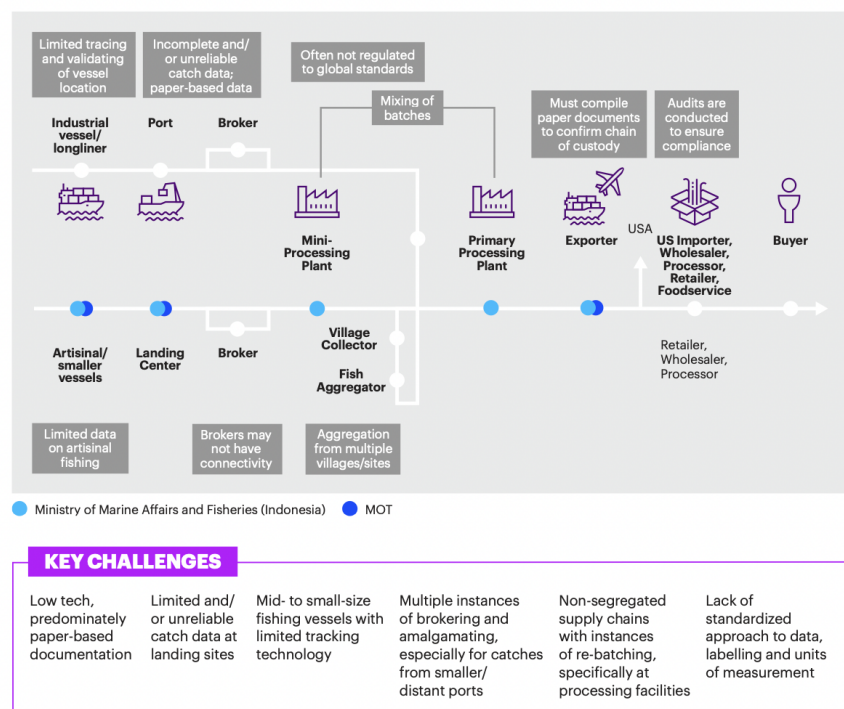
Animal husbandry and fishing

In aquaculture, once again blockchain reduces transaction processing time, fostering a relationship of reliability and trust between the food producers, governments, retailers, certification bodies, and consumers. For instance, in tuna and shrimp supply chains, Accenture reports, that there have been significant issues with product fraud and inaccurate labelling. It has been difficult to detect fraudulent actors and/or transactions and hold them accountable in the typical cycle as seen in figure 5.

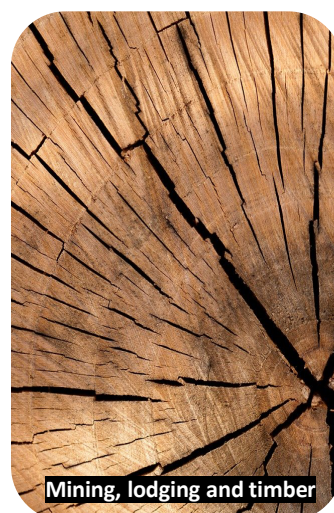
Blockchain provides a solution to many of the key challenges identified in this case study, including contributing to sustainability.

For more insights, see this video by the World Economic Forum:
<https://www.youtube.com/watch?v=wY1SFY7h98w>

Figure 5: Current Indonesian wild-caught, fresh / frozen tuna supply chain process map



Source: Accenture Stakeholder Analysis

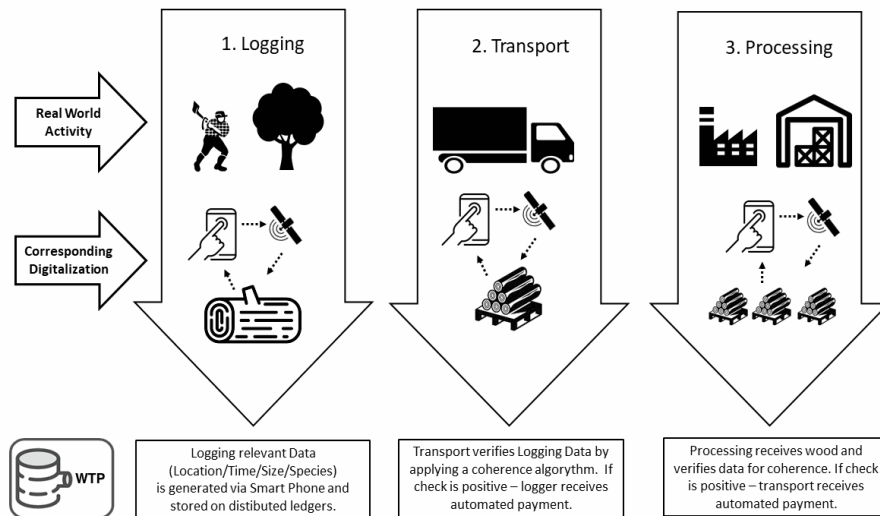


Illegal logging and related trade occur when timber is harvested, transported, processed, bought or sold in violation of national or subnational laws. Illegal logging exists because of increasing demand for timber, paper, and derivative products including packaging.

Illegal logging not only leaves an obvious mark of destruction on forests – gaping holes where ancient trees once stood – it further strips the economic livelihood of local communities and responsible companies.

The Wood Tracking Protocol aims to create a new means of tracking timber by developing a tamper proof digital system based on Blockchain technology. Blockchain will be combined with new digital protocols for physical verification and authentication.

Blockchain could ease the complex job of timber procurement officers in companies that seek to purchase timber products from trustworthy origins.



For more information visit the following link: <https://wtp-project.com>



Blockchain enables data sharing without the need to change the systems that each entity has and thus enables greater traceability of products across multiple partners, locations, and facilities. Each stakeholder can view the same data on a product's lifecycle.

Many businesses believe that blockchain will transform the Food Supply Chain and thus continuously invest in automated food safety software that allows them to see where products are and where they came from within the supply chain.

Automated food safety software also is known to help with U.S. Food and Drug Administration (FDA) compliance requirements in the event of a recall, allowing them to more quickly access data and detect a problem, including lot codes, production and expiration dates, and product order numbers.

Blockchain enhances the ability to quickly pinpoint potential sources of contamination to efficiently prevent, contain or rectify outbreaks. Transparency in terms of blockchain food traceability can validate and authenticate food origin and improve brand credibility.

In short, it can be summarized that blockchain can be used to solve urgent issues such as food fraud, safety recalls, supply chain inefficiency and food traceability in the current food system and will overall make a positive impact on the food ecosystem.

The use cases of blockchain in food go beyond ensuring food safety. It also adds value to the current market by establishing a ledger in the network and balancing market pricing. The traditional price mechanism for buying and selling relies on judgments of the involved players, rather than the information provided by the entire value chain. Giving access to data would create a holistic picture of the supply and demand. The blockchain application for trades might revolutionize traditional commodity trading and hedging as well. Blockchain enables verified transactions to be securely shared with every player in the food supply chain, creating a marketplace with immense transparency. The biggest challenge here is the complexity of the food ecosystem.

Blockchain in Infrastructure

Blockchain technology can be implemented in many different industries and can serve both public and private organizational initiatives. One of the most intriguing possibilities in public infrastructure is for transportation. With the rise of autonomous and connected vehicles, the potential for e-commerce will only increase. Though, it must be noted that blockchain may not be suitable for all applications and environments and should be part of an overall layered security approach. Regulation and legislation need to be developed to facilitate these advancements while also protecting equity for all citizens. And, consumers would need to show a willingness to embrace these technologies on a day-to-day level, beyond the early adopters now investing in cryptocurrencies.

Internet of Things



Internet of Things (IoT) enables devices across the Internet to send data to blockchain networks to create tamper-resistant records of shared transactions. A major obstacle for IoT is that it still depends largely on centralized platforms. This increases vulnerability to external factors by creating a single point of failure.

Blockchain encryption makes it virtually impossible for anyone to overwrite existing data records. Using blockchain to store IoT data adds another layer of **security** to prevent malicious attackers from changing and falsifying information.

Telecom



Blockchain for telecom operators has moved beyond being a concept, with cases being identified every day and shared excitement about its application to solve some of the long-standing industry challenges. Here are a few examples related to security.

1. Roaming and Settlements fraud, human error, lack of transparency can be eliminated with smart contracts on blockchain
2. Identity Management can be taken from multiple third-party agents and placed securely with Blockchain solutions, which give greater control to the individual
3. SLA Monitoring can be made easier with blockchain-powered smart contracts which create 'one version of truth'
4. Prevention of Phone Theft by allowing telecom service providers to store unique device/SIM data on the blockchain along with customer profile, block a stolen device instantaneously and also keep third parties informed of any change of status of a device
5. Mobile Number Portability can be streamlined with a blockchain solution that will act as one network where all service providers can review and act on requests.

Construction



Blockchain in the construction and architecture industry can be thought of like a literal chain, each link a separate transaction in a project. If one supplier completes a delivery and fulfills their contract, the completed contract is finalized and added as a new “block,” or link in the chain. This gives blockchains a natural order that’s easy to follow when looking for information. As more construction companies adopt blockchain, larger projects will see improved management. It is expected that blockchain adoption will help the construction industry become more efficient overall.

There are six immediate benefits to the construction industry that blockchain technology provides:

- ***Predictive asset maintenance***

Using Building Information Management (BIM) technology, an immutable, digital replica of the construction project is set up within the blockchain. This acts as a model to ensure the project is within scope, but also as a virtual home for assets so they can be easily searched and quantified. Monitoring an individual asset’s lifecycle and scheduling maintenance become automated processes, especially if equipped with artificial intelligence.

- ***Smart contracts that stay on track***

Smart contracts infuse blockchain technology into traditional, written agreements. All contracts live in the blockchain and are accessible with a simple search.

- ***Proactive third-party oversight***

When dozens of subcontractors are hired to complete tasks, additional oversight is needed to ensure a complex project will adhere to local standards and regulations. This might be legal consultation to comply with government regulations, safety management to monitor worksite processes or union representation to advocate for site workers. These third parties can be seamlessly integrated into project oversight. They have access to crucial documents from the moment they’re included in the blockchain, reducing time wasted in submitting information requests.

- ***Accelerated payment processing***

Processing payments via blockchain is free in most cases. No authorization or processing fees mean faster payments and less back-and-forth.

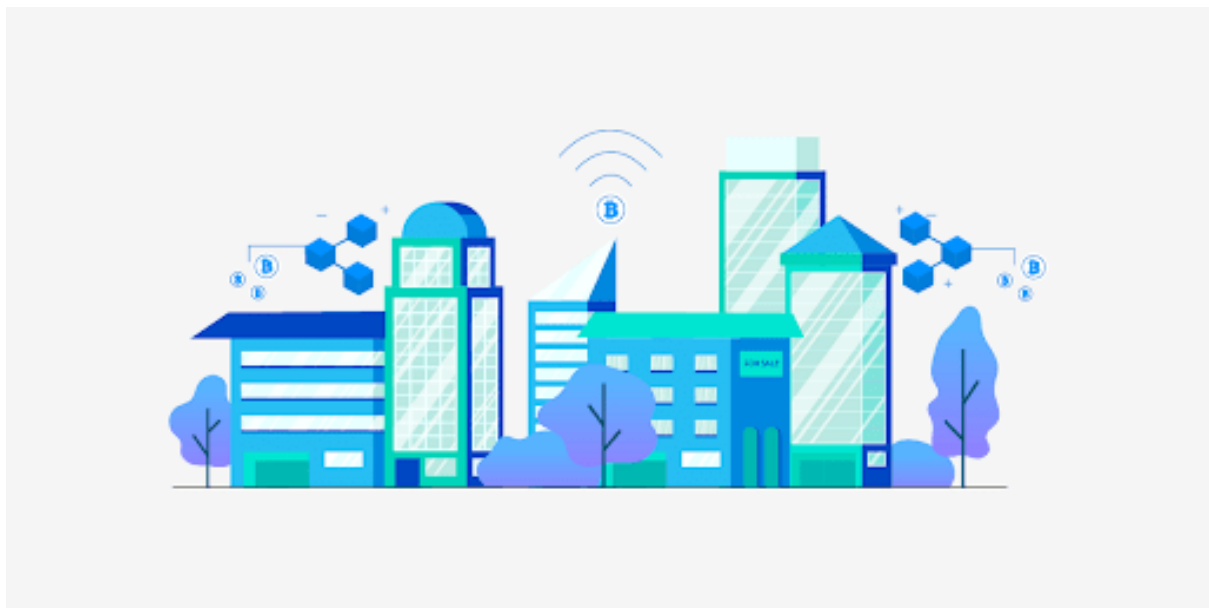
- ***Instantaneous collaboration***

Blockchain also fosters an environment of open collaboration where parties make recommendations to improve an aspect of the project. The specific benefit of blockchain is that it encourages round-the-clock input from all involved parties—no waiting for meetings or phone calls to discuss ideas.

- ***Streamlined supply chains***

The blockchain would also incorporate construction equipment to manage rental timelines or depreciation costs as well as ensuring effective utilization of materials.

Real Estate



Blockchain-based in real estate markets is already gaining popularity as a way for buyers, sellers and investors to interact with each other and learn about properties. Companies all over the globe are using blockchain's smart contracts and ledger abilities to transparently and efficiently facilitate renting, buying, investing and even lending.

By leveraging Distributed Ledger Technology (DLT), it increases trust through greater transparency. In real-estate, trust — of a website, an agent, a listing — is imperative. Blockchain also expedites contract processes, saves time and reduces costs.

Since the daily rate of real estate transactions is so immense, a common database of leases and purchases is more necessary than ever. Blockchain can provide that. Upgrading the traditional Multiple Listing Service (MLS) database to a blockchain-based one would create a far more transparent ledger system where brokers and agents could see the entire transaction history of a property.

Energy Management



Blockchain technology has the potential to transform the energy sector.

The energy industry has been consistently catalyzed by innovations including rooftop solar, electric vehicles, and smart metering. Large scale oil and gas conglomerates are seeking to invest in and implement blockchain technology because of its ability to lower costs and reduce harmful environmental impacts.

For the energy sector, blockchain provides a collaborative effort to explore this technology's potential by leveraging learnings to drive industry adoption and promote opportunities to optimize costs, increase efficiencies, and unlock new business paradigms that will transform the future of the energy industry.

Blockchain can provide consumers greater efficiency and control over their energy sources. Additionally, an immutable ledger provides secure and real-time updates of energy usage data. Beyond provenance tracking, blockchain offers unique solutions for renewable energy distribution.

A range of blockchain products can be tailored to address various energy or sustainability applications, including the following:

- Wholesale electricity distribution
- Peer-to-peer energy trading
- Electricity data management
- Commodity trading
- Utility providers
- Oil and gas resource exploration
- Oil and gas resource storage and transportation
- Refined resource management and sale

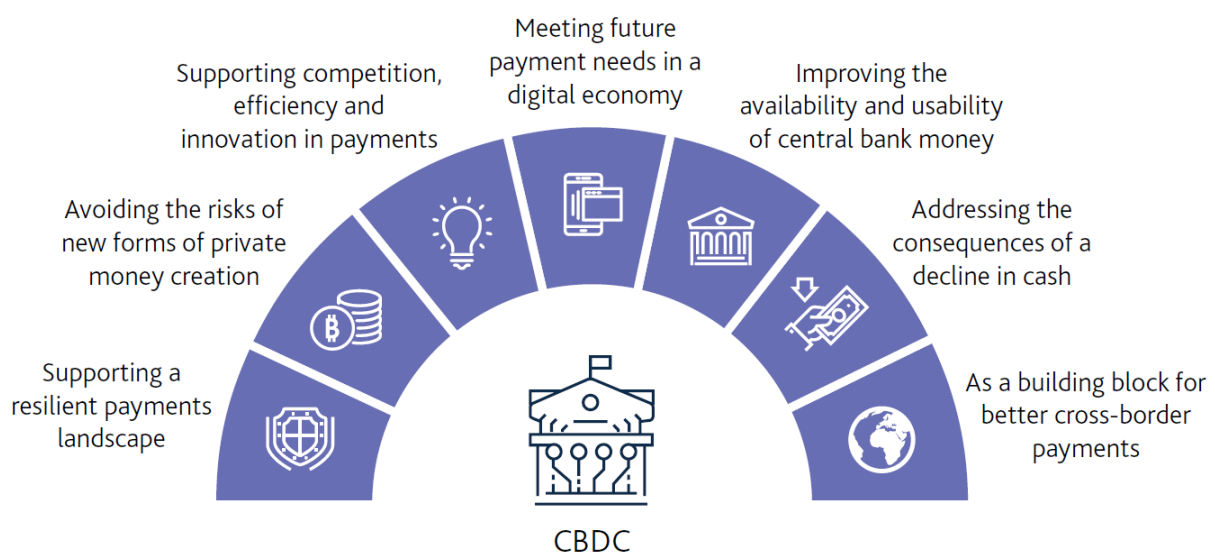
Blockchain in Banking

Central Bank Digital Currency

The central Bank of England is proposing a plan for creating a Central Bank Digital Currency (CBDC). It is a plan of implementing a digital currency that can be used in everyday transactions for personal and business to use. Nevertheless, a point was made that cash will still be available. The scope of this new digital currency is to promote the safest type of money provided by the central institution. Digital currency would be a complement to the already existing payment methods.

The Central Bank presented 7 different “Use cases”:

- Supporting a resilient payments landscape
- Avoiding the risks of new forms of private money creation
- Supporting competition, efficiency and innovation in payments
- Meeting future payment needs in a digital economy
- Improving the availability and usability of central bank money
- Addressing the consequences of a decline in cash
- As a building block for better cross-border payments

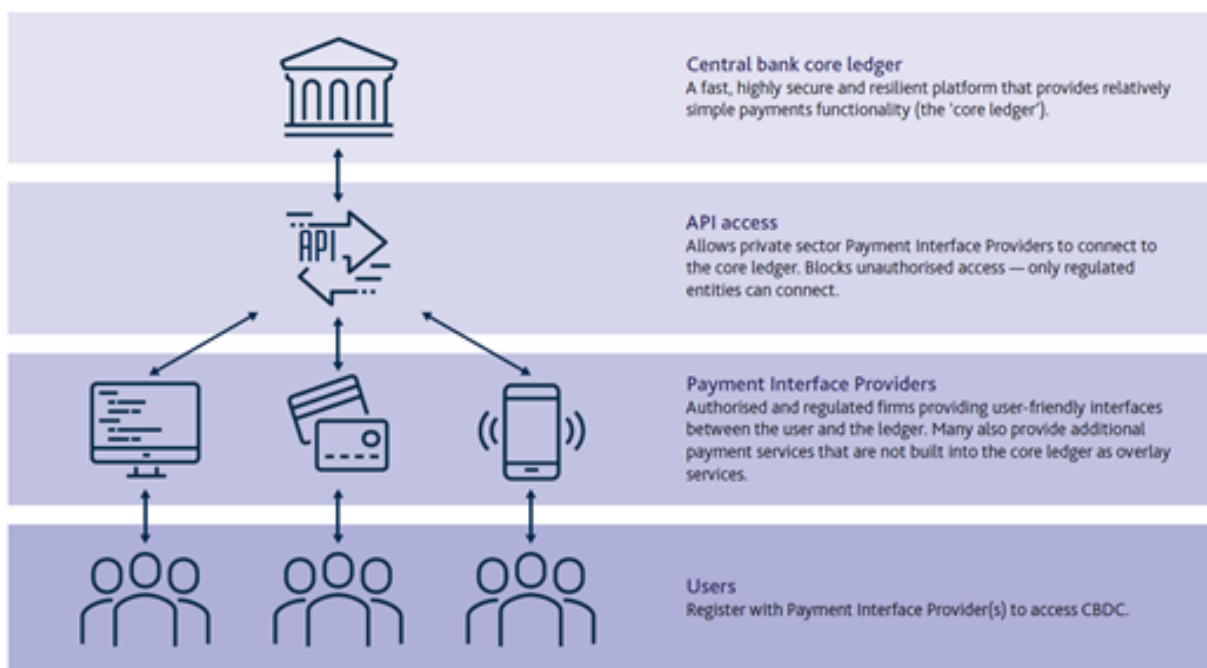


The main concerns regarding the implementation of said technology reside in the confidence of the public, preserving the privacy of the users and the energy consumption of this type of technology. These topics are still on debate and still being discussed by diverse stakeholders because it was clear that there is still room for improvement and discussion prior to any implementation.

The confidence from the public regarding the new type of currency can be addressed by the fact that the CBDC will be issued by a public institution such as the Bank of England this can give more confidence to the users hence maintain financial stability also by the capacity to convert on demand private money into “public” money. It also promotes the understanding that different types of money are uniform and makes them substitutable.

The Bank of England has laid out certain 'design principles' for CBDC, based on the notions of 'resilience and security,' 'speed and efficiency,' and 'innovation and competition,' for the technologies and platforms that may offer the service of the CBDC. The Bank also outlined a number of key functional factors, including programmability, micropayments, and offline transactions, which are all relevant to payments. This model is denominated "Platform model":

1. **Central bank core ledger:** A fast, highly secure and resilient platform that provides relatively simple payments functionality (the 'core ledger').
2. **API access:** Allows private sector Payment Interface Providers to connect to the core ledger. Blocks unauthorised access – only regulated entities can connect.
3. **Payment Interface Providers:** Authorised and regulated firms providing user-friendly interfaces between the user and the ledger. Many also provide additional payment services that are not built into the core ledger as overlay services.
4. **Users:** Register with Payment Interface Provider(s) to access CBDC.



This is how the blockchain technology can be seen used in a real life example because it has a base of concept the fact that the technology is the most secure at the moment and a constant fight to reduce financial crime some of that information will need to be used to identify and prevent illicit activity.

The Central Bank has made it a priority to support payment innovation. As a result, they'll examine the argument for CBDC with zeal and purpose, but with an open mind about whether it's necessary. Those investigations will be driven by the aforementioned principles, and the bank will continue to interact with a wide range of stakeholders to gain their perspectives as the CBDC debate continues.

Trading

Blockchain trading, which implies transparent pricing, new alternative marketplaces, quicker payment processing, and immutable transaction recording, is a typical approach to demonstrate how blockchain may be seen applied in real life. People may now trade at cheaper costs and at faster speeds than ever before because to blockchain's ledger technology.

There are several companies around the world that use blockchain in trading, here is a list of some of them.

ShapeShift	ShapeShift uses blockchain to facilitate real-time, secure cryptocurrency swaps. If users want to switch out Bitcoin for Ether, users can quickly change out their alternative currencies for each other at real-time rates.
Strix Leviathan	builds enterprise-grade crypto trading platforms for large enterprises like hedge funds and banks. The company combines proprietary big data and algorithms to pull data from multiple exchanges to help institutions make the most up-to-date trading decisions. The Strix Leviathan trade execution engine is built on a single API that allows for simultaneous trading on multiple blockchain platforms.
Ambisafe	creates tailor-made, blockchain-backed software solutions for everything from ICO launches to trading platforms. The company's financial solutions include the creation and management of digital assets and a platform called Orderbook that facilitates the simultaneous trade of multiple cryptocurrencies.
Circle	Circle allows users to trade and invest in cryptocurrencies. The platform offers a wide variety of crypto investment opportunities in everything from Bitcoin to Ethereum and the Basic Attention Token (BAT). Circle trading supports both crypto-for-crypto and crypto-for-fiat currency trading.
Paxos	Paxos is the first regulated Trust company using blockchain. By using ledger technology, the company can settle trades instantaneously, automate payment processes and eliminate third-parties. Additionally, the Paxos Standard Token (PAX) is equal to \$1 USD, making it stable for digital trades.

According to a statement from the blockchain's community organization, Nasdaq's and Finnhub's feeds will power services on DeFiChain, a native decentralized finance blockchain for the Bitcoin network focused to monetary applications and services. The Nasdaq stock exchange will be one of the firms supplying price feeds to a tokenized stock service.

Decentralized Cryptocurrency Exchanges:

A decentralized exchange (DEX) is a peer-to-peer (P2P) marketplace that connects cryptocurrency buyers and sellers. In contrast to centralized exchanges (CEXs), decentralized platforms are non-custodial, meaning a user remains in control of their private keys when transacting on a DEX platform. In the absence of a central authority, DEXs employ smart contracts that self-execute under set conditions and record each transaction to the blockchain. These trustless, secure transactions represent an accelerating segment of the digital asset market, and are pioneering new financial products.

DEX systems use a unique method to make it easier to purchase and sell digital assets. DEXs use the ability of self-executing smart contracts to clear transactions rather than relying on an intermediate entity. DEXs use a non-custodial structure in the absence of intermediaries, allowing you to keep

ownership of your private keys and bitcoin money. Most DEXs have no credit risk, which means they are not exposed to credit risk, and they do not adhere to Know Your Customer (KYC) or Anti-Money Laundering (AML) regulations.

Some advantages of DEX are:

- **Custody:** are non-custodial, traders don't need to relinquish the control of private keys to transact. Instead, externally held wallets interact with DEXs, and trades self-execute through smart contracts.
- **Diversity:** there were over 7,400 cryptocurrencies on the market. CEXs exercise control over the cryptocurrencies they will list, and will generally only list those with adequate trading activity, prevalence, and effective security standards to ensure profitability and legal compliance.
- **Trustless Transactions:** On CEXs, every transaction is overseen and recorded by a central authority, the exchange itself. And since DEXs do not hold your funds, they are less likely to be targeted by hackers.
- **Lower Fees:** Decentralized exchanges function through the use of self-executing smart contracts. DEXs charge a low fee, around 0.3% for exchanges. Although these fees fluctuate in response to the network utilization, they remain far lower than the costs incurred on centralized alternatives.
- **Privacy:** Traders using decentralized exchanges don't need to disclose their private keys because wallets are held externally, and the DEX is not liable for the funds. While this may be advantageous in regards to convenience, it is potentially problematic from a legal perspective.

Decentralized exchanges provide an interesting alternative to centralized exchanges, which still dominate crypto markets and fulfill the requirements of regular crypto traders and investors. DEXs enable a trustless means of linking buyers and sellers via on-chain smart contracts, as well as new forms of fair engagement and governance for stakeholders. However, these platforms are still in their infancy, and future acceptance will depend on further refinement of the user experience, infrastructure development, improved scaling mechanisms, and increased links to centralized crypto and traditional financial institutions.

Will and Inheritance

Heir - Next Generation Inheritance Planning & Digital Wills

Powered by Blockchain, Artificial Intelligence and Deep Machine Learning Technology. Protecting Legacies. Forever.

Heir is ushering in the next generation inheritance & estate planning solution to ensure digital and traditional real-world assets are protected for next of kin and loved ones. With holistic suite of services powered by cutting-edge technology, provides all the benefits of a traditional estate plan, with none of the pitfalls.

- **Digital Inheritance Planning:** Heir enables an intuitive and highly secure online estate trust creation and management system. Protection of digital and traditional real-world assets done right.
- **Blockchain Immutability:** Leverage distributed ledger technology to preserve assets and ensure Heir powered estate trusts are executed per the exact parameters set by a user. Misinterpretation and corruption eliminated.
- **Simplicity and Elegance:** Drive an effortless user experience to import assets, select beneficiaries, and configure rules for estate distribution, management & planning. No more printed documents prone to loss and destruction, and the complete overhaul of archaic processes.
- **AI & Machine Learning Power:** Seamlessly marry a user with their intelligent Heir powered estate trust using Heir's next generation AI and ML based proof-of-life & wellness engine.
- **Fail Safe Asset Distribution:** Distribution of funds/assets to beneficiaries upon the passing of a user in an automated, effective and fail-proof manner, with a caring touch. Heir preserves legacies in servitude of progenies.
- **Accessibility for All:** A full-suite of estate planning services accessible to all individuals, regardless of geography, socio-economic background, among all other classifications. Heir believes in estate planning for all without discrimination.

Heirlooms (HEIR), will be the cryptocurrency powering and utilized within the Heir ecosystem. Heirlooms are considered utility tokens, and will serve as the medium of digital asset transfer to beneficiaries. By possessing Heirlooms, users will be able to take full advantage of Heir's advanced suite of offerings and services.

Loans and Credit

Blockchain Lending Platform Applications

Blockchain-based lending systems cut loan processing times and expenses. Blockchain eliminates the need for middlemen, providing lenders with competitive loan offers and safe transactions. Smart contracts built on the blockchain ensure that both borrowers and lenders agree on fair and practical conditions for things like proof-of-funds and payment planning. The decentralized structure of alternative lending allows borrowers to access a broader pool of competitive funding options, and these real-time contracts validate and record transactions without the involvement of expensive attorneys and banks.

Some examples of companies at the forefront of blockchain in lending:

1. **SALT Lending:** uses blockchain's flexibility to offer cash loans that leverage digital assets. By leveraging Bitcoin, Ether or even Dogecoin, borrowers can lock into cash loans from 1-36 months with an APR as low as 5.99%. SALT is available for business or personal loans in almost every U.S. state. The company recently expanded its services to New Zealand, Brazil, the U.K. and Switzerland.

2. **Celsius Network:** is a blockchain-based borrowing and lending platform that allows users to leverage cryptocurrency to borrow U.S. dollars. Those looking for cash loans exceeding \$5,000 can use their Bitcoin, Ethereum, Litecoin or Ripple tokens as collateral. The company's loans start at 5% APR, and a borrower receives their crypto back upon making the final payment. In addition, Celsius Network will manage the Sustainable Development Goals Impact Fund within the United Nations' Sustainable Goals Initiative.
3. **BlockFi:** is a lending platform that uses crypto as collateral. Need to repair your home, buy a car or just want to go on vacation? Borrowers can receive 12-month cash loans by leveraging their Ether, Litecoin or Bitcoin. Industry impact: BlockFi recently received \$52.5 million in funding from Galaxy Digital Ventures and famous crypto investor Mike Novogratz in order to expand its lending capabilities.

Insurance

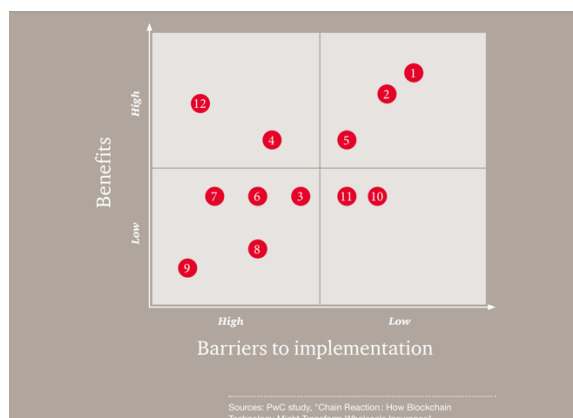
Blockchain, a catalyst for new approaches in insurance

Blockchains will help in the management of growing global complexity by combining security, decentralization, and transparency. They will provide customers more leverage and aid in the entry of new market participants. Blockchains have technological limitations that must be taken into account.

By combining security, decentralization, and transparency, blockchains will aid in the management of rising global complexity. They will return power to the customer and assist in the introduction of new participants to the market. Blockchains have technological restrictions that must be considered.

However, regardless of whether blockchain technology or an alternative is used, the use cases for which blockchains are paving the way will be implemented. The number of potential use cases in the insurance sector much exceeds those described in this paper, with different implications on the value chain. Certain uses appear to be easy to adopt and give considerable benefits, while others appear to be riskier, especially when compared to the promised profits. In the insurance sector, the blockchain's breadth of potential is enormous, but it will take some time to adapt and adjust.

Regardless of industry, the primary task for all participants will be to determine the use case that will be most beneficial to them and to investigate other options if their initial decision fails.



Examples of blockchain use cases	
1	Contract documentation
2	Claims management
3	Contract eligibility
4	Multi-national insurance policy
5	KYC/AML
6	Inter-firm accounting
7	Sensitive data management
8	Management of exposure in real time
9	Guarantee management
10	Excess of loss reinsurance
11	Personal data management
12	Emerging market

Peer to peer payment systems

Peer-to-peer payment

Peer-to-peer payment systems allow you to pay friends and relatives from your phone using a bank account or a credit or debit card. P2P payment systems, often known as money transfer applications, such as Venmo and PayPal, allow users to send money to one another via their mobile devices using a linked bank account or card. They make bill sharing with friends and family a breeze.

Despite the fact that all major P2P networks encrypt or shield your money information, some have been hacked and scammed. However, many applications offer fraud detection and support teams to assist in the resolution of illegal transactions. Before you join up with a service, look through their security processes and fraud rules.

Crowdfunding

BlockChain support Crowdfunding

Crowdfunding on the blockchain opens up new opportunities for companies by allowing them to raise cash to establish their own digital currency. It is a peer-to-peer fundraising model, and some of the most well-known crowdfunding cryptocurrencies are coinspace, swarm, and judobaby. Crowdfunding has advantages for both artists and consumers. Anyone who has created a new cryptocurrency (e.g., Ethereum) can join in this crowdfunding and donate as much as they wish. There are several areas where blockchain supports and improves crowdfunding, the platforms for crowdfunding powered by blockchain technology removes the need for intermediate third party.

- **Decentralization:** Since block-chain is decentralized it doesn't rely on any other platforms to create funds. for starters, no longer to be obliged to any rules and any project can get visibility and funded if the investors think to invest, eliminates fees which makes crowdfunding less expensive for the creators.
- **Access Equity:** To provide investors equity or ownership block-chain relies on asset tokenization. For example, a person who plans to create multiple new products with the incoming funds and grant small ownerships stake in the company. This could potentially open whole new world of opportunity.
- **Universal Opportunity:** Any project using a block-chain-based crowdfunding model can get funded. Any person with an internet connection can contribute projects.
- **Flexible Options:** Using block-chain as asset tokenization grants creators and entrepreneurs more liberties. Usually asset tokens have their own currency to enable organizations to hire professionals and advertisers.
- **Peer-to-Peer:** The cryptocurrencies are exchangeable on a peer-to-peer network. This usually help the people for their investment which even generates more interest in the entire process.

Blockchain in Travel, Transportation and Logistics

Automotive

Aetsoft is ready to design and create a DLT-based solution for an automotive business or startup that meets your needs, guided by blockchain development best practices. Aetsoft's blockchain solutions for automotive, you can eliminate data fragmentation, speed up and simplify operations, and track and check car components in real time:

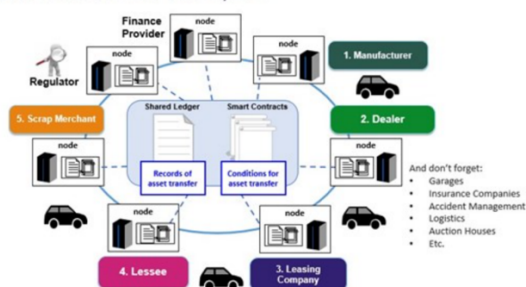
- **Shared data:** The decentralized structure of blockchains enables for smooth data dissemination, with all users of a single network having access to the same supply chain information.
- **Fake identification:** Blockchain can assign digital IDs to all vehicle parts in a supply chain to track their provenance. Every forgery attempt will be immediately spotted thanks to real-time alerts.
- **Recall targeting:** Car manufacturers might quickly discover problematic parts and request more precise recalls with digital confirmation of the authenticity of produced components, reducing recall costs and eliminating the need for frequent recalls.
- **Safe insights from smart vehicles:** Integrated with smart vehicles, blockchain could record such data as average speed and mileage in a permanent log for a more meaningful analysis of driver behaviour.

Car leasing and sales

A consumer auto loan company is unaware of its automobile drivers' genuine driving habits or their vehicle's true servicing history. Driving behaviour events (mileage, g-force threshold exceeded), safety events (airbag deployed, part replacement warning), and service events (annual service, part replaced) would all be sent to a shared ledger that was accessible to all parties, including the owner/leaseholder, using a Blockchain-based system.

Transparency of information regarding a vehicle's actual wear and tear would allow the car loan provider to more properly estimate the vehicle's residual value as the lease approached its end of the contract date. This would allow the car financing company to get a better price on the next sale than they would otherwise be able to get.

Automotive Retail Lifecycle



Automotive Retail Lifecycle

Ride-sharing

A growing number of businesses are turning to blockchain technology to tackle real-world challenges. Big firms are warming up to the concept of running their operations on distributed ledger technology. Big organizations in the healthcare, pharmaceutical, and financial services industries were among the first to adopt this technology, and it has been shown to be the right option for them because blockchain technology has more benefits than drawbacks.

Regardless of the sector or class, blockchain technology offers a means to make life and work simpler, and the ride-sharing market is one in which many innovators and firms in the blockchain area are seeking to become big participants. There have been a lot of bold promises about using decentralized technologies like the blockchain to provide drivers and consumers more flexibility.

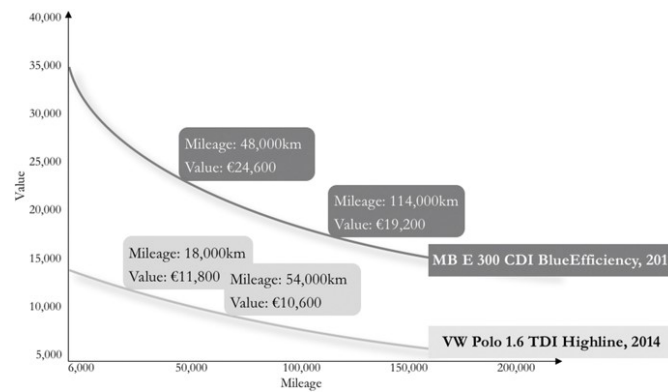
The Drife app has a feature that lets you calculate a basic price based on market circumstances. This function also allows the driver and the rider to bargain over the fare price, ensuring fairness in pricing. Drife further eliminates the issue of rates being unjustifiably increased while a ride is in the process because it is a decentralized blockchain application with no middlemen.

Drife's entry into ride-sharing services aims to eliminate the need for a central authority, as typical ride-sharing applications do. Blockchain is also used by the firm for identification and governance. Drife app users may stake Drife's native DRF token, and those who stake more tokens on the platform have a better chance of being chosen for rides. Riders will also receive "extra advantages" if they bet the DRF coin.

Freight tracking and vehicle performance history

A wide range of application cases might benefit from blockchain technology's openness and trust. Our research shows that by overcoming trust gaps, technology may minimize asymmetric information in marketplaces. The combination of blockchain with Internet of Things technology, which collects sensor data automatically, presents a decentralized technical solution for such an inefficient "Market of Lemons," as defined by Nobel Laureate Georg Akerlof. We design a system prototype in this study to decrease mileage fraud on used automobile marketplaces.

The uses a distributed database based on the public Ethereum network and smart contracts to show the possibility of a trustworthy system of records for (vehicle) data such as mileage statistics. We defined eight requirements that the prototype meets, and the solution's functional logic and architecture may be applied to any other application characterized by a lack of confidence between actors or the absence of a trusted central authority. However, the prototype created has the same limitations and problems as the technology. Low throughput limits scalability, but transaction costs are unpredictably high. These concerns will be addressed through further development of blockchain technology and consideration of more cost-effective consensus processes.



Hospitality

Top use cases for Blockchain in Hospitality

1. Hospitality Supply Chain Management Using Blockchain:

The supply chain is intrinsically fragmented since it is made up of a series of complicated events orchestrated by numerous stakeholders across different regions. In order for a supply chain to be efficient, all stakeholders must have a certain amount of confidence in one another. Let us explore three distinct workflows where Blockchain is important inside the Supply Chain Management (SCM) process: Vendor Management, Inventory Management, and Payment Management.

2. Hospitality Loyalty and Rewards Management Using Blockchain

Any company will tell you that keeping a current client is considerably less expensive than finding a new one. Customer loyalty management has now become a basic element of business, particularly in the hotel industry. As a result, every hospitality business will require information systems to handle the reward points given to loyal customers, as well as to track the redemption of these points. Consider a Blockchain-based network where the loyalty point is a digital asset that consumers accumulate as part of their interactions with the hotel operator. When we treat loyalty points as a digital asset with a monetary value, both the partner onboarding and points redemption procedures become much easier. Every Blockchain platform partner can establish its own digital asset and its monetary worth.

3. In the hospitality industry, blockchain is being used to manage customer identity.

Customers are at the heart of every organization and using their identification to customize interactions with them may improve their overall experience. Consider the case when a person checks into a hotel using only his or her smartphone and is given a room that can be unlocked or locked using only the smartphone. With the introduction of IoT and Blockchain technologies, this is now achievable. In the hospitality sector, blockchain as a technology offers a lot of potentials. Some cases can have a direct influence on day-to-day operations and customer experience.

This technology is continuously developing, and as the ecosystem grows, expected integration and interoperability standards to emerge shortly. As more businesses use the technology, we can expect to see larger Blockchain networks emerge, as well as the establishment of wider consortiums. This terrain will eventually become saturated enough to reach critical mass, which will stimulate continuing innovation for years to come.

Blockchain in Healthcare

Health records and information exchange

The security and privacy of health data has always been a main concern for mankind. The current systems for managing and storing health data are slow and complicated and can also be very expensive. They are also subject to human errors.

Blockchains can offer solutions within this sector due to the fact that they can store and manage patients' health records by guaranteeing transparency, immutability and efficiency.

One example is the "Medicalchain" <https://medicalchain.com/en/>, which is a platform that offers different applications and services. On the one hand, it uses smart contracts which allow patients unlimited access to their medical data; on the other hand, patients can use it to give healthcare professional access to their health records by allowing doctor to also add scans, test results and notes. Even pharmacists can record all the patients' transactions. Moreover, this platform works with tokens: patients can earn or spend tokens. They might for example receive tokens if they participate in a survey.

Medicalchain can also be used to create different applications able to analyse the medical data and give for example advice with regards to a specific diet to follow.

Claims management

In the existing insurance claim system, the claim process is coordinated between the health care provider and the insurance company. Insurance agents may not be in possession of all the critical documents like patient information, medical health records and insurance policy records. The whole claiming process is being conducted manually and it is therefore very time consuming. Furthermore, there is a risk of data breach, false record, frauds etc.

Using a system based on blockchain can guarantee transparency between the insurer and the company. Insurance policies could be written as coded, decentralized smart contracts. In the smart contract could be stated that the individual agrees to pay the insurance company money in order to receive the cover of the future medical costs. Blockchain can subsequently automatically accept or refuse any insurance claim depending on the agreement of the smart contract.

An insurance company which uses the blockchain technology is ETHERISC which is based in Munich in Germany (<https://etherisc.com/>).

Drug traceability

Blockchain systems are also used in the pharmaceutical sector to trace the different products:

- Product identification
- Tracing of manufacturers, distributors or dispensers
- Product verification
- Notification of regulatory authorities in case of non-compliant products.

Example: During the recent pandemic various issues arose with regards to the supply of medical equipment to fight Covid-19. Due to the high demand, supply chains of known vendors broke down and concern about new vendors and their compliance with standards, certifications, delivery etc. arose. In this case blockchain can help with the certification of supplies, Degnarain (2020):

“1. Product requirements: provide a mechanism for health systems to continually update factories with the latest product requirements and specifications, almost like a production auction.

2. Supplier credibility provide a way for health systems to credibly assess which factories have high quality control, and can meet the specifications and production volumes needed.

3. Financial Payments: act as a trade finance mechanism to ensure upfront blockchain-backed payments to factories that is then released as working capital upon pre-agreed production milestones and as supplies move to the next step of the supply chain.

4. Customs certifications: blockchain-based Customs Certifications have been used to regulate export of many products from “wildlife trade” to pharmaceuticals, and can be applied here.

5. Transportation tracking: supplies need to be securely tracked around the world to ensure transparency in the supply chain, which can occur with blockchain-based provenance tracking.”¹⁹

Research and clinical trial

Using Blockchain for clinical trials can be very efficient due to the fact that data recorded on a blockchain can be used also years after the fact by knowing that they preserved their full integrity. Blockchain guarantees traceability and it prevents a posteriori reconstruction. Furthermore, by using smart contracts it allows the automation of a clinical trial. Moreover, all the data can be used in a decentralised way. This means that nobody has exclusive control over the data.

An example of a blockchain application used in research is “Research Foundry” (<https://www.burstiq.com/research-foundry-calling-all-the-thinkers-dreamers-and-doers/>).

This application was developed by the company BurstIQ with the support of an international coalition of researchers, public health officials and organizations with the aim to solve large scale collaboratively. The goal is to support the global community in responding to COVID-19 in order to gain deeper public health insights and research progress. The platform provides the infrastructure, tools, and the connected community to enable this collaboration with security, traceability, and compliance by remaining compliant with the privacy law: for example, the metadata repository may be share with all participants while the health data repository remains private and not visible to everybody.

¹⁹ [Five Ways Blockchain Can Unblock The Coronavirus Medical Supply Chain \(forbes.com\)](https://www.burstiq.com/research-foundry-calling-all-the-thinkers-dreamers-and-doers/)

Blockchain in Education, Communication and Information Services

Education and Academia

Proof of certifications, evidence of learning

Blockchain can be used to secure, share or verify certificates. The proof of certificates can be stored permanently and securely on a blockchain; this means that they will always be available, even if a school closes down or a whole educational system collapses. Blockchain can store the digital fingerprints of the certificate or the certificates themselves and become so a public certificate registry.

By using blockchain there is no need for resources to confirm the validity by a third party due to the fact that they can be verified directly on the blockchain.

Furthermore, also accreditation bodies can apply their digital signature on a certificate in the blockchain in order to demonstrate the quality of the educational institution.

Example of an organization which uses blockchain to issue certificates:
<https://www.dnv.com/assurance/certificates-in-the-blockchain.html>

The following is a company which creates blockchain systems for educational institutions:
<https://certifaction.io/education/>

On a blockchain also evidence of formal, nonformal or informal learning can be stored in a form of an automatically verifiable CV, therefore reducing the workload of the organizations who have an interest in verifying the CV.

Lessons and courses.

By using blockchains, which are able to work with smart contracts, lessons and courses can be developed and executed if certain conditions are met. Through blockchain the completion of the tasks could be automatically verified and, subsequently, teachers could be paid with crypto tokens and students awarded with credentials.

Messaging apps

Messaging apps often have a problem of lack of privacy. Even though they use secure technologies and strong encryption methods private data might not be properly secured. Blockchains, which are permissionless, can also offer the solution to this problem due to their distributed protection of user data privacy. This approach is quite new and even though it has some restrictions it has a much higher

degree of privacy than other centralized messaging apps: no one can access and change the messages sent. The following are apps which use blockchain:

- Dust <https://usedust.com/>
- BCM Because Communication Matters
- Status <https://status.im/>
- E-Chat
- BeeChat <https://beechat.io/>

Publishing

Blockchain for tracking intellectual property

Blockchain would enable researchers and teachers to publish without restrictions. They would be able to monitor the use of their work and also be able to observe how often their work has been quoted or used as teaching material.

This process could also be linked to a smart contract that would distribute payment to the authors of the material based on the quantity of use of their intellectual property.

Streaming payments

Publishers could request streaming payments using blockchain and would be able to collaborate with content creators by sharing revenue directly with them in real time. Furthermore, users would only pay for the contents they visited.

Libraries

Facilitate Partnerships Across Centres/Organizations:

By using blockchain libraries can partner with museums, universities, and government agencies to share MARC records, authority control, and user-generated content.

Support Community-Based Collections:

Blockchain could be used to ease processes adopted in libraries. With the support of “smart contracts” indexing and sharing of community items could be made easier, due to the fact that the blockchain would govern who has borrowed items or who has originally loaned them.

Further reading

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- *Blockchain development for automotive*
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- <https://coinmarketcap.com/rankings/exchanges/dex/>
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- *DeFiChain to Offer Tokenized Versions of Apple, Tesla*
- *Mindtree Top use cases for Blockchain in Hospitality*

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TRANSITION

Blockchain Case Studies