

"Exploring the Relevance of Blockchain for Your Business"

The Fundamentals of Blockchain

Blockchain has amassed a massive fan following in recent years, especially due to the popularity of Bitcoin, which is based on blockchain technology. However, there is also a lot of noise & hype associated with Blockchain. Some proclaim that it will revolutionize the internet and usher in a new phase of decentralization and others say that it is nothing more than unsubstantiated tall claims. In this article, we shall filter the noise and help you assess the question "Should you and your organization invest in blockchain?" and "is there a strategic business value in adopting blockchain?"

For beginners, we present a simple explanation of blockchain: "An ever-growing distributed digital ledger or database that keeps a permanent record of all transactions in a secure, chronological, and immutable manner. This is done by keeping sync over a network of computers where a copy of the ledger is maintained so that there is no single point of failure". One can also look at it as a novel technology that has the potential to eliminate the requirement for a neutral third or centralized party to verify data and create trust since every piece of information is mathematically encrypted with built-in consensus protocols.

Key features of Blockchain

Features of Blockchain



Decentralized

There is no central decision making authority



Distributed

Data is distributed with all members in the network



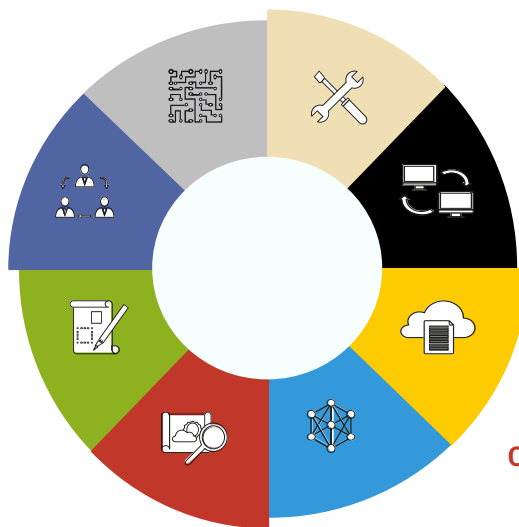
Timestamped

Date & time of data creation is recorded accurately



Traceable

Any changes to the data can be tracked by everyone



Reliable

It is a reliable since information is distributed



Transparent

Changes or additions to the data can be viewed by all



Immutable

Data once entered cannot be altered & will be stored



Cryptographically Secured

Hacking the encryption is almost impossible



Source: Avalon Consulting and Research

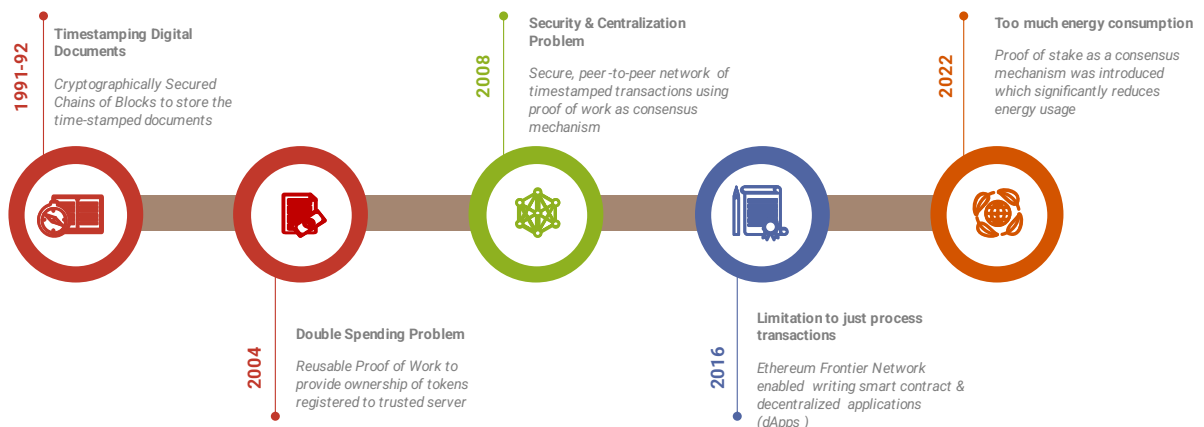


Is there a need for Blockchain?

One might wonder, do we need a technology such as Blockchain? Especially when everything seems to be working just fine with the rapid growth of Cloud computing, emerging AI & ML data management, and many more advances. Let us examine the emergence of blockchain to better understand why it is being developed:

Blockchain has emerged as a result of solutions developed for complex problems

A brief history



Source: Avalon Consulting and Research



Blockchain For All

Before we proceed further, we must understand that despite blockchain's relative complexity, it is not something exclusive to deep tech companies led by engineers & scientists with cutting-edge technology. It can very well be implemented for any business which generates and/or processes data and applications – thus any and every organization under this spectrum qualify for utilizing Blockchain in their business.

Blockchain can enable businesses to reap benefits including but not limited to a reduction in operation time, Data immutability, Enhanced security, Instant traceability, and Automation. Many businesses, from global supply chains to financial services and healthcare, across the globe, have already started investing in this technology to revolutionize their way of working.

Potential use cases of blockchain

Where can it be used



Source: Avalon Consulting and Research



Multiple challenges remain but can they be resolved?

Despite an undeniable consensus that Blockchain can help, there are challenges in adopting & implementing this technology as it is with almost all new developments. To holistically understand blockchain as a solution, let us understand these challenges and their probable resolutions.

Blockchain with all its features isn't prone to challenges in adoption but comes out on top with the resolutions

Challenges to blockchain's adoption



Source: Avalon Consulting and Research



Success and Failure

Now that we have understood the challenges in the adoption of blockchain as a solution, and the inherent resolutions to each of these challenges, let's look at some pioneers who have successfully implemented the technology and of one where this did not work out as desired:--

BMW – tracking the manufacturing value chain

The Purchasing & Supplier Network team from BMW had faced several challenges in their value chain and in 2018 decided to look to blockchain for a solution. The BMW Group produced ~10,000 vehicles/day in 31 plants across 15 countries at that time with the help of a globally distributed supplier network making it a highly complex operation.

Since the partners were distributed all over the world in separate IT systems, data transparency & security were not present. The earlier process of using spreadsheets and emails to manage huge volumes of data also meant that collaboration was limited, and traceability & visibility of the supplier network was not possible. Frequent disruption of production & quality issues arose from these restrictions where fraud and mismatch of supply & demand were rife which directly affected the balance sheet of the company.

BMW tackled this problem with a proof of concept that allowed them and some suppliers to easily share the supply chain data over a blockchain which was highly secure and also transparent to everyone. This real-time visibility available to all members of the supply chain led to several improvements such as:

- a. Prevented overstocking & shortages.
- b. Detailed information on the origin of parts
- c. Reveal improvement opportunities to decrease cost/time

Thus, with visible benefits from the pilot, the blockchain technology was soon scaled up to more suppliers and titled 'Partchain', enabling BMW to track data across their entire supply chain.

Ripple – simplifying cross border banking transactions

SWIFT is a secure messaging system that financial organizations use for cross-border transactions across the world. It has more than 8,000 institutions from over 200 countries and acts as an intermediary for banking, brokerage, and stock transactions.

Although SWIFT has been lauded for making international money transfer simpler and friction-free as against the older system, it faces some major issues.

- a. Slow transaction processing – can take up to 5 working days
- b. Higher fees due to multiple banks involved in transactions
- c. Currency exchange fees added to the total cost
- d. Possibility of fraud in which the guidelines are not followed as exemplified by the PNB Scam
- e. Requires reliable IT infrastructure from both sides.

To counter these problems that SWIFT faces, Ripple came up with a blockchain-based technology that can process transactions globally in all currencies. It was created for banks & financial institutions and is a P2P decentralized platform that allows for the transfer of money in any form – whether fiat or cryptocurrencies. It can also be termed as a 'digital hawala network' and the costs are very low since it is done directly on the ripple network.

The Ripple network does not run with a bitcoin-like proof-of-work (PoW) system or even proof-of-stake (PoS) system. Instead, a consensus protocol is used to validate transactions & validate account balances and it is much faster than the SWIFT system. Major banks such as IndusInd Bank, Santander, and Bank of America utilize Ripple to process cross-border payments & transactions in a faster and cheaper way.

Estonia – the Digital Republic

Governments have always faced challenges in managing administrative capabilities and handling massive troves of sensitive data of their people. However, Estonia has always had a highly developed digital infrastructure for providing all kinds of government services – citizens have been able to vote online since 2005, it takes them 5 minutes to file their income tax, and doctors can view collated patient records securely.

To allow secure data sharing between public and private organizations, Estonia had developed X-Road, a data exchange system, where the information is kept private through cryptography. However, the Estonian institutions faced a massive cyberattack in 2007 – thus exposing the vulnerability of centralized data. To avoid such a scenario from repeating, they moved to the distributed ledger based on Blockchain in 2012 which nullifies any cyberattacks.

There are 3 aspects to Estonia's technology: e-ID, X-Road, and KSI Blockchain. E-ID is the digital identity of the citizens where their data is stored. Even though there might be fear of data hacking by the government, it is owned by the citizens & they can allow which part of their data to be made available. X-Road is the exchange medium that allows connectivity & data sharing between institutions. Finally, KSI Blockchain (also used by NATO & US DoD) ensures the security of the system – the data never leaves the system & no data is stored in the blockchain.

This move by Estonia of providing digital service through blockchain is helping them save an estimated 2% of their GDP, provides immutability of the data (e.g. property registry), allows transparency of government services, security from cyber hacking, and saves time since it is faster, among other benefits.

TradeLens – Challenge of scale

TradeLens was a blockchain-based platform aimed at digitizing and improving the shipping industry's processes and interconnectivity between multiple stakeholders such as shippers, ports, customs brokers, and more. It was sponsored by Maersk and IBM and had processed over 70 million containers and was connected to 40 ports worldwide. Despite its potential benefits, TradeLens faced several challenges and was eventually shut down in 2023. Some of the reasons for its failure were the lack of trust among participants, insufficient revenue, insufficient research into the root causes of inefficiencies, and a perceived lack of neutrality due to the network being sponsored by Maersk. These challenges highlight the importance of considering all potential obstacles before implementing a blockchain solution, especially in complex industries like global trade.

Key takeaways from the failure of TradeLens include:

- The need for a clear understanding of the root causes of inefficiencies and how blockchain can address them
- Ensuring sufficient revenue generation and buy-in from all participants
- Building trust among all stakeholders and avoiding a perceived lack of neutrality
- Thoroughly researching the feasibility of blockchain implementation and considering all potential obstacles

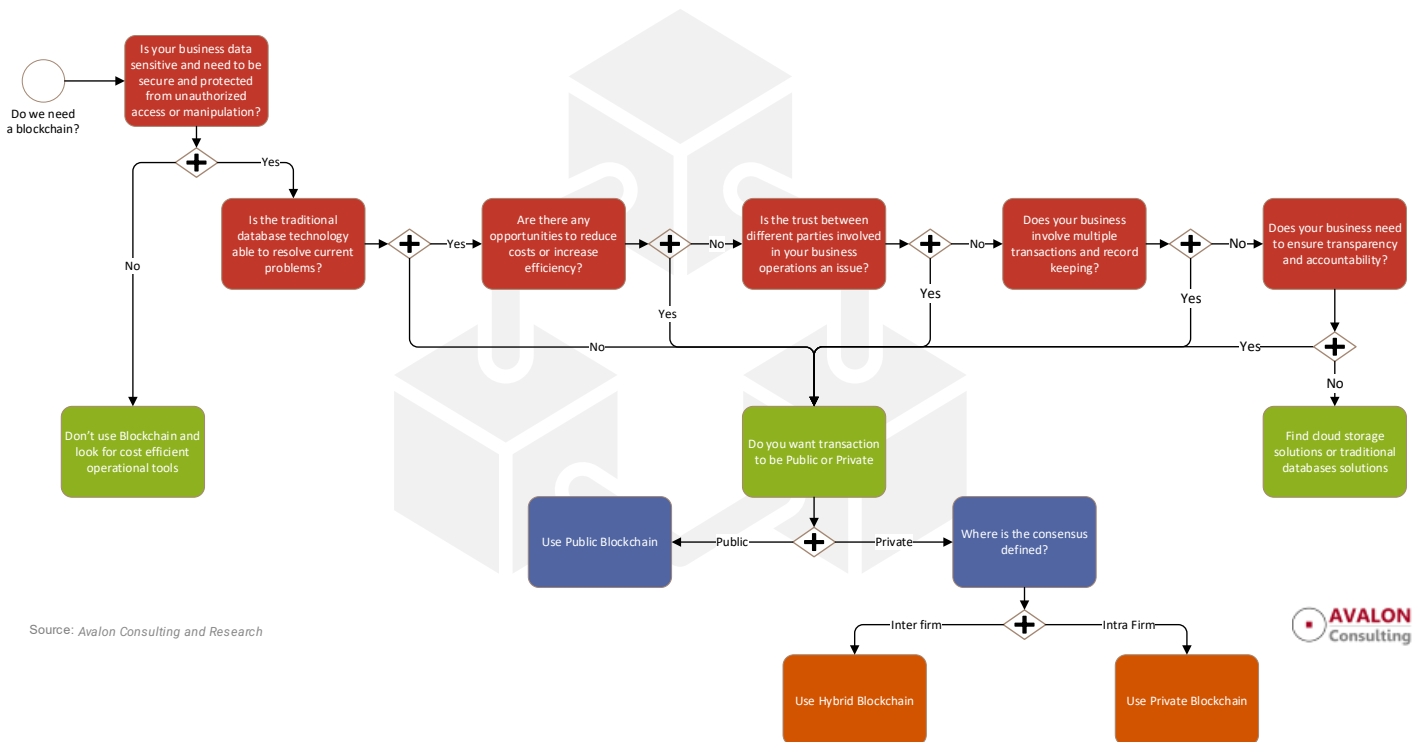
Should you employ Blockchain?

Now, after understanding the background of blockchain and the variety of use cases where blockchain has helped change how businesses' function, let us weigh in on the primary question— should you invest in blockchain?

After having done a careful study of various case studies and real-world applications of blockchain, we have arrived at a structured approach that can be utilized by organizations to make an informed decision. The simple decision tree shall guide your thinking toward the answer: should you adopt blockchain to turbocharge growth in your company/solve specific problems that you have been facing or should you skip it and instead continue with your existing infrastructure? Simply follow the decision tree below and choose your answer based on your problem/solution requirement and arrive at the final level. It is important to note that 'not taking an action' is still an action since in some cases there is no viable benefit of blockchain adoption and look at an alternative or sticking with the existing format is the best choice.

Making Informed Decisions: Evaluating if your business needs blockchain

Decision Tree



Once you have determined if blockchain is a viable solution for your business's problem, it's important to consider the challenges associated with the technology to ensure success. By factoring in these challenges mentioned previously and taking a leaf from the successful as well as failure cases during implementation, you can safeguard the success of adopting Blockchain.

Everyone can leverage blockchain in a meaningful way

Blockchain is a technology that has revolutionized the business world. It has become a critical tool for organizations looking to drive digital transformation and improve transparency, security, and efficiency in their operations. The features of blockchain such as immutability, decentralization, and smart contracts, have opened up new avenues for businesses to explore, and it has shown promising results in verticals such as finance, supply chain management, and auditing.

However, the complexity of blockchain and its high associated costs have been a hindrance for some organizations. It is important to understand that blockchain is not a one-size-fits-all solution and to determine if it is well-suited for your business, our well-structured approach can assist you to explore the relevance of blockchain and to determine if it is the right fit for your business. By considering the unique characteristics and requirements of your business, you can harness the full potential of blockchain and unlock new opportunities in the market.

In conclusion, blockchain has immense potential for organizations looking to drive transformation, and the future of this technology looks bright. The time to act is now, and organizations that take the lead in adopting blockchain will have a competitive edge in the market.
