

## Introduction

Blockchain is a decentralized, distributed ledger that is used for the recording and tracking of different transactions that are done across multiple different computer systems or nodes. It is essentially a database that stores information electronically. It holds information in blocks and these blocks can become a chain, hence blockchain.

This was thought of to place a digital timestamp on electronic documents back in 1991. The idea behind this was for security and credibility, ensuring that these documents could not be tampered with. It was only until 2009 when this was used as a means of cryptocurrency for Bitcoin. It is difficult to amend data once it gets recorded inside the blockchain. This feature of blockchains makes it quite popular.

The structure of a block in a blockchain is that there are three major elements the data, the hash value and the hash of the previous block. Data the stored varies from blockchain technology but typically can include the details of the transactions such as who was involved and the amount. The hash is a unique identification for the block. Which each change on the block, the hash gets amended, so changes can be found almost immediately. The hash of the previous block leaves a trail or footprints, so the block is secure in this way. (Hayes, 2022)

Blockchains are distributed and so use peer-to-peer networking. When a peer joins the network, they receive the copy of the network, and this is how it can be used to check if things are in order. The nodes will verify a new block before it is to get added to the chain. If the block has been changed and tampered with in any way, the peer-to-peer network will reject it as it does not follow the consensus that is set out by the network. (Hayes, 2022)

Due to blockchain becoming more and more popular, it has become more mainstream with blockchain technologies such as Bitcoin and Ethereum, cryptocurrencies haven't taken off. Although blockchain has its uses in cryptocurrency, providing a safer and more secure way to invest, it also displays its practical functionality in enterprise. These use cases along with their effectiveness and efficiency will be discussed below.

## Smart Contracts

As Javaid et al. (2021, p. 2) said, 'to maintain record and information, blockchain is the perfect technology which can fulfil major challenges.' Blockchain technology spreads far in its uses and due to being able to fulfil major challenges, it makes it suitable for smart contracts and the like. For an enterprise, this can be technology that could greatly help them. It reduces the need for third-parties such as lawyers and so the way it works is 'the program automatically executes the contract agreements fairly when its conditions are satisfied.' (Mohd Javaid, 2021)

This can prove to be especially advantageous as it will not only securely execute and store contract details but will also be an easier way to do this for enterprises due to this automation. The lack of a third party being involved means an enterprise gets to save time and money, reducing the costs and increasing efficiency, where they can focus their attention elsewhere.

While it largely improves the effectiveness and the efficiency of an enterprise, security is another aspect to look at. For the most part, these forms of contracts can prove to be more secure as stated by Ali Syed et al. 'the data and information once uploaded to the network can never be altered or

removed without consensus.’ (2019, p. 176861) However it is very important that enterprises follow smart contract security guidelines, as in any system, vulnerabilities can be exploited.

### Supply Chain Management

Smart contracts are one use case for enterprises in order to allow efficiency, effectiveness, and security of their processes. Another use cases blockchain has for business is the supply chain management process. For an enterprise, this process can be lengthy, Ali Syed et al. (2019, p. 176862) saying that ‘there are at least five parties involved and challenges include placing orders with manufacturers from the buyer, calculation of demand payment of order through a third party which forwards order to the supplier and makes arrangement for transportation’ and can get more complicated with the use of translators when dealing with foreign trades.

To combat this, blockchain can be used where it streamlines this process, making it faster and easier for an enterprise. Data and information regarding this process can be stored on the blockchain, where this can be tracked more easily and verified for security. As stated by Sanka et al. (2021, p. 188) ‘at any instant time, all parties involved in the supply chain will be aware that certain goods are at a particular location, or a certain trade occurred.’ This creates efficiency for the enterprise as everyone involved is aware of what is happening quickly. Information is being sent to the appropriate people in due time.

Those involved in the transactions are shows the changes if made and each transaction that takes place. This means that this process is transparent and accountability can be placed where it is needed to be. This can make for an effective and efficient process compared to the traditional supply chain management system, where it could take a long time to get each part completed and stored. These speeds up the process.

From a security aspect, this is more secure in that no third party can tamper with the supply chain management process this way as it reduces the risk of certain parties acting basely. Not only this but this process is now secure, preventing the loss of records and important information.

### Banking and Finance

As seen above, blockchain use cases can be observed for enterprises both for improving the ability of contracts and for streamlining the supply chain management process. It also has great uses in the banking and financial site of an enterprise, where security is key. As said by Krichen (2022), ‘Blockchain technology has been massively used in the financial and economic sectors. For instance, it has been used for the settlement of financial market transactions, trade finance, insurance, real-time money transfer, cross-border payments, etc. Bitcoin was the world’s first decentralized cryptocurrency and a payment system not backed by a central bank.’

Blockchain’s nature allows for accountability and traceability, and this grants it to be a suitable system for banking where security is the most important part of this process. For an enterprise, this increases security. Transactions will not be accepted without the consensus of others in the peer-to-peer system means that the transactions enterprises use will not be tampered with. This can provide a higher level of security than the traditional methods of banking.

Not only does it affect security it also has a major impact in the efficiency and effectiveness on an enterprise. Sanka et al. (2021, p. 187) states that ‘Many banks have been trying blockchain to

improve their systems. The first banking transaction with blockchain was carried out in 2016 between Commonwealth Bank of Australia and Wells Fargo.' Blockchain technology is fast and so these transactions for the business can happen quickly and reduce the need to spend hours if not days waiting for approval. Once again, this kind of thing can reduce the need of third parties and thus reducing costs and improving efficiency.

## Conclusion

In conclusion, blockchain technology can impact a business or enterprise efficiently and effectively, improving security for enterprises as a whole. Blockchain is great for allowing a secure, transparent, and decentralised way of recording transactions and ensuring accountability and traceability on these transactions.

Blockchain has a structure that accommodates for this, with its major elements such as the data it holds, the hash value, which is uniquely identified, and the previous hash value used for tracking. The peer-to-peer networking allows for a general consensus to be reached before the block on a chain can be accepted and these are the components of a blockchain that make up for a traceable piece of technology.

Smart contracts, as discussed above, reduce the need for third parties and thus reduce the costs for an enterprise. The security that something like this provides allows for enterprise to be at ease knowing their contracts are safe from being tampered. Blockchain technology is faster than the conventional methods and so it will make it more fast for a business to use.

The supply chain management process, as seen above, is greatly streamlined, and improved using this blockchain technology, where each person involved in this supply chain management system will have a copy of the transaction and they will see if any changes are made very clearly due to blockchain's structure, thus making this a great piece of technology for increasing efficiency, security and effectiveness for an enterprise.

It also improves the performance greatly, of banking and finance systems, where were discussed above. Many say that blockchain has the potential to shake the traditional banking systems and this can be seen by the fact that this blockchain technology greatly improves and increases the performance and security of these processes. Because these transactions are processed and secured through this blockchain technology, it becomes impossible to tamper with the data that stored on this means it is more secure for an enterprise.

As stated by Krichen (2022) 'Blockchain is a revolutionary and exciting technology with enormous potential for usage in a wide range of modern applications.' It has possibilities that are endless, and the way forward seems to be blockchain. The features that were discussed, such as its traceability and accountability, make blockchain attractive for enterprises to use where they can be granted that the important, common processes they go through, such as the supply chain management process, will be streamlined to a more effective and efficient manner, all the way ensuring security for their data and information which is so vital to enterprises.

## References

Abdurrashid Ibrahim Sanka, M. I. I. H. R. C. C., 2021. A survey of breakthrough in blockchain technology: Adoptions, applications, challenges and future research. *Computer Communications*, Volume 169, pp. 179-201.

Hayes, A., 2022. *Blockchain Facts, What Is It, How It Works and How It Can Be Used*. [Online] Available at: <https://www.investopedia.com/terms/b/blockchain.asp> [Accessed 31 March 2023].

Krichen M, A. M. M. A. A. M., 2022. Blockchain for Modern Applications: A Survey. *PubMed Central*.

Mohd Javaid, A. H. R. P. S. S. K. R. S., 2021. Blockchain technology applications for Industry 4.0: A literature-based review. *Blockchain: Research and Applications*, 2(4), p. 100027.

Toqeer Ali Syed, A. A. S. J. M. S. S. A. N. T. A., 2019. A Comparative Analysis of Blockchain Architecture and its Applications: Problems and Recommendations. *IEEE Access*, Volume 7, pp. 176838-176869.

The video recording can be found on this link: [AssignmentCA2-LinaMir.mp4](#)