

## Unraveling the Mysteries of Blockchain

By Mohamed Rajraji, Dynanet Corporation Senior Director of Technology

The technology behind Bitcoin is generating fanfare and shifting exchange of value paradigm. Financial services actors were the first to be enthusiastic about blockchain and continue to forward this technology. According to IBM, 66% of banks around the world will use blockchain by 2021. Recently, other industries in many areas are exploring blockchain-based solutions as viable alternatives. But the technical complexities of the blockchain are raising barriers to adoption. As a result, the technology's footprint remains modest. The aim of this blog and future posts is to introduce major blockchain concepts. In future posts, we will introduce Dynanet's holistic approach to blockchain's implementation.

### ***It all started by a 9-page paper by a mysterious person.***

Blockchain took root in November 2008 when Satoshi Nakamoto published a white paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System". The paper introduced the Bitcoin protocol, and the basis for a new economic structure. It also described a creative method to store value in a completely digital form. Soon, Satoshi mined the first bitcoin in early 2009, marking the birth of the first blockchain. Six years later, the second-generation came into view when Vitalik Buterin launched Ethereum. And with that, blockchains became capable of tracking other things besides cryptocurrencies. Today, these second-generation platforms host decentralized applications (Dapps), also run smart contracts. Smart contracts, simply put, are computer programs to automate transactions, and contract execution.

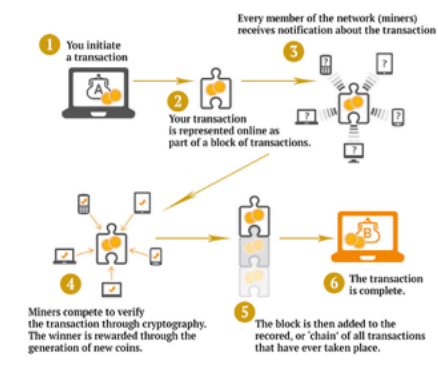
### ***So, what is a blockchain, anyway?***

A blockchain is a distributed and immutable ledger of data. It uses thousands of computers to transfer value in a transparent and secure manner. This is possible because of cryptography, and clever consensus mechanisms between participants. To further explain blockchain, let us consider a simple scenario: Carol wants to transfer money to Dan.

1. Carol submits her transaction request to all network participants (nodes).
2. The nodes verify and place her transaction in a waiting area.
3. A subgroup of nodes in the network called miners pick out her transaction and include it in a block. A block in this case is a structure containing unconfirmed transactions.
4. The miners race to resolve a difficult mathematical problem.
5. The first miner to solve the puzzle will append the block that contains Carol's transaction to the chain.
6. The transaction becomes visible to Dan and to the entire network.

This example is further illustrated in **Figure 1: Blockchain Transaction Lifecycle**.

Blockchains fall into one of two categories: public or private. Public blockchains are permissionless and open networks. Thus, anyone can become part of the network and view data. These platforms incentivize participants to join the network using digital currency. Private blockchains required permission and are closed networks, in which members are selected. These networks incorporate no digital currency.



Source: Digital Gold Club

Figure 1: Blockchain Transaction Lifecycle

***Blockchain application: the possibilities are infinite***

The fields of application of blockchains are immense. In theory, blockchains could replace most trusted third parties such as banks. Blockchain has a much wider application than digital currency. It could be used to transfer assets and to ensure better traceability of assets and products. In this blog, we will discuss four prominent applications of the blockchain.

***1. Cybersecurity***

The technology is minimizing security challenges facing the private and public sectors. Unlike centralized networks, blockchains are decentralized and replicated across all network nodes. This makes network penetration by bad actors impossible. But this claim is only accurate when excluding networks' endpoints. Also, blockchain offers robust hashing and cryptography mechanisms. This eliminates data tampering and manipulation.

***2. Artificial Intelligence (AI)***

Only a few companies are leading the race to dominate artificial intelligence. This dominance is fueled by massive amounts of data these companies own. Blockchain is democratizing artificial intelligence. Today, decentralized networks are allowing private and public entities to access large datasets.

***3. Internet of Things (IoT)***

The blockchain is replacing the traditional IoT router to manage all local network transactions. It provides a security layer capable of preventing unauthorized network access. And it allows IoT devices to be autonomous and to communicate with each other in a secure matter.

***4. Banking***

The blockchain is allowing banks to transfer funds across borders at a low fee. As a result, it is saving customers billions in transaction fees in a \$20 billion market.

***The future of blockchain***

Blockchain isn't a household buzzword. There is strong possibility blockchain will impact your business. In the next blog, we will cover Dynanet's method to ease your blockchain adoption.

***About the Author:*** *Mohamed Rajraji, Dynanet Senior Director of Technology, is a strategic thinker and IT leader, driven to excel through rapid consumption of new technology capabilities, continuous team motivation, and collaborative work with technical and functional stakeholders. Strong advocate for continual technology and business transformation—passionate in driving innovation, building viable business cases for modernizing IT infrastructures and practices.*

**Dynanet Corporation**, a minority-owned small business located in Maryland, has provided a range of information technology services to multiple Government agencies. Our focus on customer satisfaction and performance has established long-term relationships with the federal, civilian and state government agencies. Our executive leadership team has built Dynanet's dedicated workforce from 20 employees to over 100 key personnel, while maintaining a 90% retention rate. Our managers are PMP certified and our employees maintain many sought after professional certifications, such as Certified Scrum Masters and ITIL certified. Dynanet has been appraised at CMMI Maturity Level 3 and our quality management processes have been audited and found to be in compliance with the ISO 9001:2015 quality standards. For more information, please visit Dynanet's website at [www.dynanetcorp.com](http://www.dynanetcorp.com).