

# Module 1. Introduction to Blockchain & Crypto

## Introduction

We are living in times of revolution, as you have surely heard many, many times. “Blockchain is a revolutionary technology”, “it will change everything”, etc. But I believe that most of us do not realize just how much blockchain is changing the world.

This course, “The Future of Crypto and Sports”, will help you understand and investigate how blockchain technology works, and what it means in the world of gaming, sports and football. Hopefully, you will learn something new, leave the course with a fresh perspective on blockchain and with a profound understanding of the revolutionary implications this technology entails.

## What Is Blockchain?

### Internet, the network of information

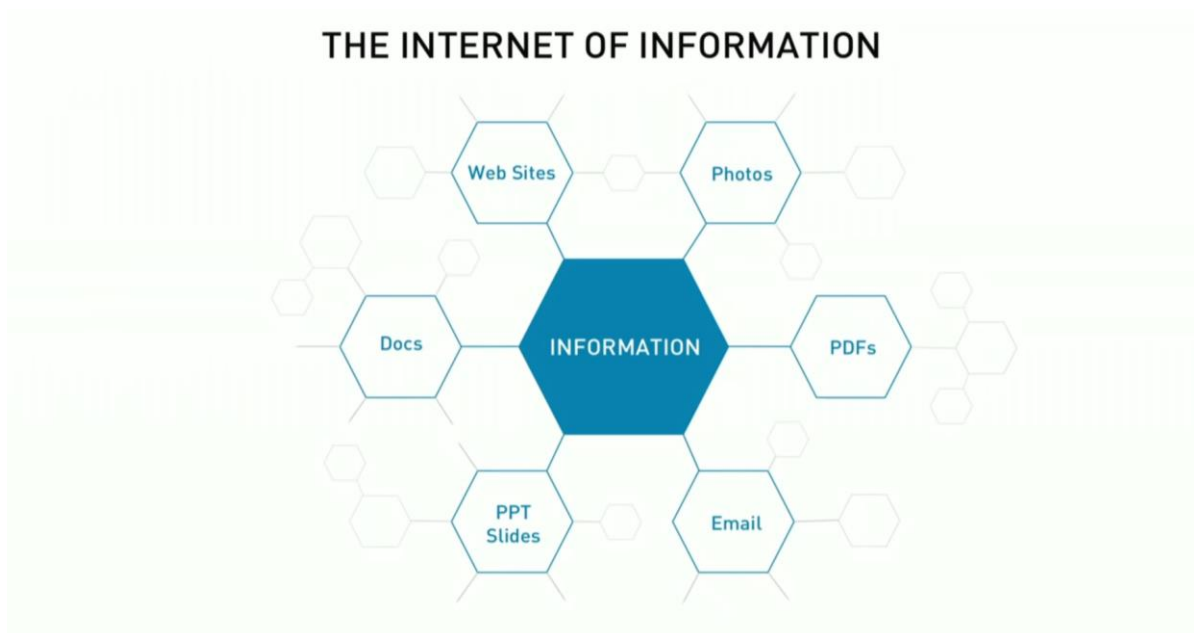
Many people make blockchain sound more complicated than what it actually is. Sure, the technical aspect of it might get very complicated quite fast, but we do not need to get into all that yet.

To understand blockchain, it is useful to think about how the internet actually works in the first place, and what we have made of it for the last 30 years, approximately. Until the blockchain was born, the internet was a network of information. It was only that, a network in which anyone could share information with the world, and get information in return. This does not imply that this innovation is not a big deal, as you know, it changed the world forever.

Information suddenly became ubiquitous, so easy to exchange, and practically free. There is one aspect of this network of information, though, that we have to consider because it is of crucial importance to understand blockchain. The internet shares information by making **copies** of it.



**Figure 1: The internet of information**



Source: Tapscott, 2016, <https://bit.ly/3tyOMqK>

Take an email, for example. When you send an email, you do not send the email itself. The receiver gets a copy of that email, and you also keep a copy of the email in your “sent” folder. So actually, now there are two emails. And if the receiver responds, yet another copy is made, if the conversation keeps going, eventually, there will be so many copies of the original email that you cannot keep track of them. Same thing for downloads, like movies. You do not download the film itself, you download a copy of the film, or a song, or a book. If you upload a picture to social media, you do not upload the picture itself, but a copy of the picture. You still have the picture on your phone. And that is how the internet works! It is a network of information that gets freely distributed copies of information across.

This is generally not a problem for emails, media, or websites. But say you want to send 100 dollars across the internet. It is very, very important that you do not send a copy! When you send money to someone, the other person gets 100 dollars, and you lose 100 dollars. If I kept a copy of those 100 dollars in my “sent” folder, then I would be able to spend those 100 dollars again. This is a concern known as “double spend”, and it has traditionally been solved by proposing a third-party entity that would overlook transactions. We will get back to this idea.

### **Blockchain, the network of assets**

We have established that, until blockchain, the internet had been a network of information, which was distributed across the internet through copies. But right now, the internet is going through a profound transformation, and it is entering a brand-new era: the internet of digital assets. I am sure you have heard of cryptocurrencies, tokens, NFTs,



or digital assets. These are all new terms that refer to a whole new kind of property: digital property. Blockchain technology is the backbone of this new system of ownership, that enables to keep track of who owns what, without the need of third parties or centralized entities.

### **Double spend problem**

Before blockchain was born, if you wanted to spend money online, you had to do it through a bank or some sort of institutional payment system that you could trust. You could not send cash through your screen, so you trust some big institution to handle your payments.

The reason for this is to prevent the famous double-spending problem (Rhodes, 2022), as we mentioned before. You want to make sure that when somebody uses their money, they will not be able to keep using it over and over again. So, a central authority is needed to keep track of all the payments being made across the board. This ensures that when you pay 20 dollars, the receiver gets \$20, and you lose \$20. This central authority can be a bank or any other entity that is trusted by both buyer and seller, or sender and receiver. You need to trust the overlooking authority to make the transaction. If there is no trust, then in due time transactions will stop being made. Traditionally, banks keep track of how much money each person has, spends or receives.

Generally, it is a good solution to have third-parties that can keep track of money, and it is what enables us to spend and receive money without major inconveniences. But it is not without its inconveniences.

The most significant of the concerns is that banks and financial institutions that keep track of money represent a single point of failure. If the bank fails, the whole network fails, and there is no backup or second option to keep using the network reliably. So basically, if the central node of the network fails, the entire network fails. In consequence, banks are very vulnerable targets by thefts and hacker attacks. That is why security in banks is so tight.

Another significant concern is that the network relies on banks, and therefore we have to trust banks. But the people who run banks are human, and are liable to every human defect there is, just like the rest of us. There is no shortage of examples of banks and institutions making huge mistakes, and that generally ends up with everyday people losing money – sometimes, a lot of money.

### **How blockchain was born**

In 2008, a new solution to this double-spend dilemma was put forward in a publication by someone named Satoshi Nakamoto. Today, we still do not know who Satoshi Nakamoto is, whether he is one person, a man, or a woman, or a group of people,



American, European, or Japanese. Nothing is known about Satoshi, but what was published under his name started a revolution.

Under the name “Bitcoin: a peer-to-peer electronic cash system”, Satoshi Nakamoto proposed a system that could handle online payments without the need for third-parties or central authorities like banks or governments. The “bitcoin white paper”, as it is known today, suggested a decentralized network that could be used to transfer money between two nodes, without the risk of double spending and with no single point of failure.

Remember that in 2008 the world was facing one of the worst economic crisis ever, definitely the most severe crisis since the big crash of '29. And the responsible behind this massive crisis (which at that time, looked like the apocalypse) were, you guessed it, banks. The sudden burst of a housing bubble produced by indiscriminate loans given by banks ended up with millions of people unemployed and a huge government bailout that went down in the history books. So many consider Bitcoin as the result of the crisis, a product of the anger and lack of trust that banks had at the time (Winklevoss & Winklevoss, 2021).

Another issue that Bitcoin takes a stance against is irresponsible monetary policy. During 2008, banks were given a big bail-out by the U.S. government to avoid bankruptcy. That money was issued at will by the state. Money printing is a huge debate among economists, with most orthodox leaning economists assuring that issuing money by the government without proper backing leads to a devaluating currency. Bitcoin clearly falls in this category: a restricted amount of Bitcoin is what will give the currency its value. For this reason, there will only be 21 million Bitcoin issued ever. It is written in the code of the Blockchain itself, and the final Bitcoin will be issued in the year 2140. There will never be more than 21 million Bitcoin, and that scarcity is what makes it valuable and in high demand.

### **But how does it work?**

Essentially, the blockchain is a network of computers that keeps track of every transaction taking place in it. The Bitcoin blockchain, for example, keeps track of every Bitcoin transaction in the world. The Ethereum blockchain, on the other hand, keeps track of every Ether transaction (the native currency of the Ethereum blockchain) and of every transaction taking place within a smart contract on the Ethereum blockchain. We will see more on that (much more) later. Bitcoin is the most straightforward example, so let us stick to it.

Imagine a network of computers. Each computer is a node on the Bitcoin blockchain. In each one of those computers, there is a copy of a registry. That registry holds every transaction from the Bitcoin blockchain written into it.



So, suppose Node A of the network wants to send Bitcoin to Node B. The whole network knows how much Bitcoin Node A has and how much they send to Node B. Let us imagine Node A sends one Bitcoin to Node B.

What happens next is that every single computer in the network updates the registry (generally called ledger), so all the members of the network know that Node A gave one Bitcoin to Node B. Node A no longer has a claim over the Bitcoin it just sent, now the ownership of that Bitcoin belongs to Node B, and the entire network knows it.

The trick here is that there is no one single ledger, or one single registry, that is being supervised by a central institution, or a bank. Instead, there are many copies of that same registry kept in many computers, and updated in real time by every computer of the network every time a transaction is made. Of course, the computers in the network talk to each other and verify that they all have the same information. So, if Node A sends one Bitcoin to Node B, the transaction is only settled once every computer in the network agrees that the transaction is being made, and the copy of the registry is updated in every computer.

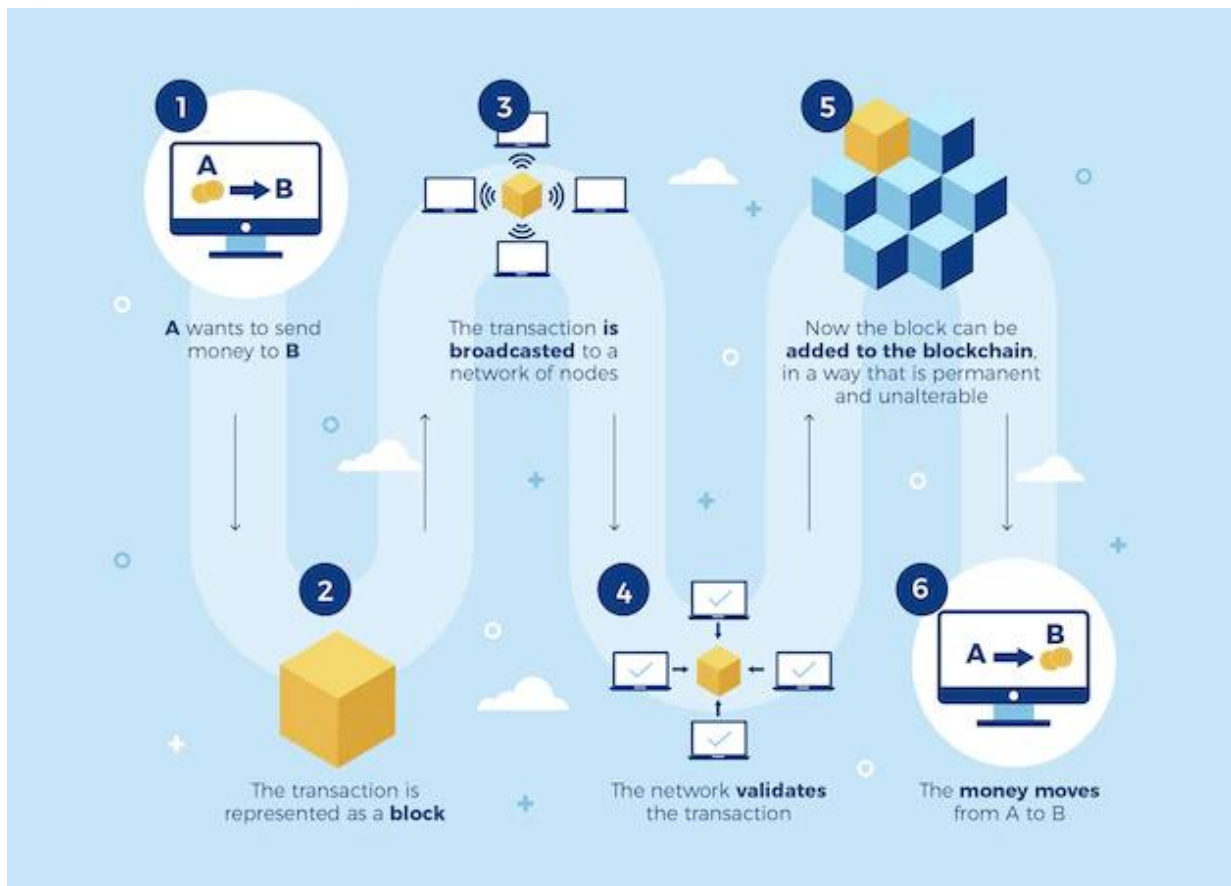
The registry is the same in each single computer that belongs to the network, and every single change, however minimal, is being updated on the whole network, that is, each registry updates their information.

Understanding how the blockchain mechanism really works may be complicated and takes some thought. Of course, it is something that takes time. You can also support your learning with the video “Bitcoin: How Cryptocurrencies Work”, by the SciShow. It does an impressive job explaining the details of blockchain.

Source: SciShow. (2016, December 21). *Bitcoin: How Cryptocurrencies Work* [Video]. YouTube. <https://www.youtube.com/watch?v=kubGCSj5y3k>



Figure 2: Blockchain infographic



Source: [Online image of blockchain infographic], (2021), <https://bit.ly/3tyDZNh>

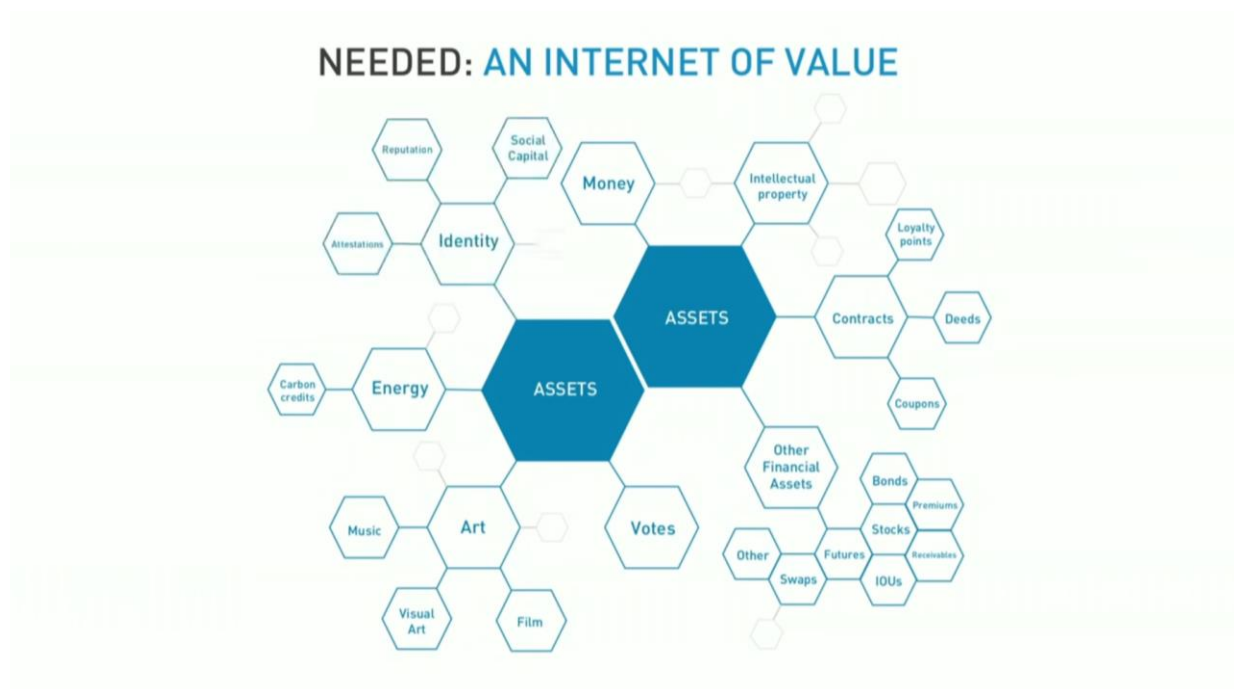
### Digital assets were born

This is a word you will hear a lot in the world of blockchain. Like we talked before, Internet was previously a network of information, where copies of information were distributed freely and endlessly. Now, with the birth of blockchain, the internet became a network of assets, where we can exchange not only value, but also property. Now, thanks to blockchain, we can transfer assets from one user to another, without need for an intermediary, in a permissionless, trustless environment.

When you think about digital assets, probably the first thing that comes to mind is cryptocurrencies. And yes, of course, cryptos are digital assets, and the most prominent ones. But there are so many types of assets that can be exchanged through the blockchain. Think of financial assets like bonds, stocks, futures, or contracts, intellectual property, digital IDs, coupons or loyalty points, carbon credits, and even art, such as music, images, and films. The list is endless.



Figure 3: An internet of value



Source: Tapscott, 2016, <https://bit.ly/3ty0MqK>

### What is a block? Why is it called blockchain?

We have not yet talked about how a blockchain is structured. We said that the blockchain is a network of computers that are keeping track of every transaction across the network. Well, the way they do it is through a complex set of mathematical problems (involving a high-end cryptography algorithm called SHA-256, developed by the NSA in the early 2000s). Every computer of the network competes against each other in the hopes of being the first one to solve the problem. When a computer solves the problem (one problem every 10 minutes, approximately), it seals a **block**.

A block is basically a list of all the transactions that took place in the last 10 minutes in the network. That block is cryptographically coded (therefore, secured and anonymous), and timestamped (so everybody knows when those transactions took place). When a computer solves the mathematical problem, they “seal” the block, that is, the transactions within that block are established, time stamped, and here is the important part, it is broadcasted to every node of the network. So, every computer receives the latest block, and now every node knows the transactions of the last 10 minutes. Each time a block is created, it is added to a chain of blocks. From the very beginning of Bitcoin, every transaction was recorded into these blocks, that are connected to each other. The last block is connected to the previous block, and that one, to the one before it, and so on. Every transaction in Bitcoin’s history has been recorded in these blocks and linked to previous blocks, so you can actually see how transactions took place up to the



very beginning of Bitcoin's history. The first block, called the "genesis block", is available and public for anyone to see and revise, and so is every other block, ever.

This chain of blocks (or blockchain, that is where it gets its name), is stored and constantly updated by every computer in the network. And that is crucial for securing the blockchain, and it is what makes blockchain one of the safest ways of storing information. Imagine you would want to hack the network, and wanted to make everyone believe that you received 100 Bitcoins, when actually, you did not. It is really (I mean, really) hard to do.

You would have to hack a block in the blockchain and adjudicate yourself 100 Bitcoins you do not own. But not only just one block, but every block previously linked to it, all the way to the beginning, and then every block linked after it. Not only in one computer, but in every computer of the network (that is, millions of computers as of now), simultaneously. And each of the blocks secured with the highest levels of encryption. This is why this is very hard to do.

Quick side note, which is not essential, but it is helpful to know, since you will probably come across the term "51% attack". This means that, technically, the whole network could be compromised if at least 51% of the computers are hacked, since it is based on a consensus protocol and if more than half the computers agree that something happened, then the rest of the network would have to follow, even if they are not hacked. Think of congress. It is only necessary that 51% of the members of congress agree on something to have a law passed. The same applies for blockchain. Still, it would be practically impossible to compromise even 51% of the network, since it is so big, and growing every day. A 51% attack on, for example, the Bitcoin blockchain, would require a huge amount of computational power.

Presently, the only conceivable way of (maybe) getting that amount of computer power, is with quantum computers. And quantum computing, although it promises to increase computer power exponentially, is still in an early, experimental stage of development. Even if quantum computing entered the scene, most crypto enthusiasts agree that once that technology is available, it could also be applied to strengthen blockchain technology and thus, making it even quantum computing resistant (McShane, 2021).

### **What are miners? Is it true that they use a lot of energy?**

You probably heard hundreds of times the word "miners". How they spend a lot of energy, how they were banned in China, and how much money they make. But what is a miner?

So far, we have been referring to blockchain as a "network of computers" that keeps track of the transactions taking place in the network. Well, it is a network of computers, in fact, but you should not think of them as personal computers, or anything that you would normally see in your daily life. At first, when Bitcoin was a small network, it was run



through personal computers. As the network grew larger and larger, running so many numbers and keeping track of the transactions grew increasingly more difficult and energy expensive. So people had to start using more specific computers. What we have today are small devices that are specifically built for mining cryptocurrencies. They are built only to run the complex mathematical problems that we mentioned before that were an integral part of the way blockchain works. They look like little hard drives and have to be stacked one upon the other, since one alone would do close to nothing, and you must have a large mining rig to see any significant profits.

So, that is what miners are, in essence. The people owning these computers that are in charge of running the Bitcoin network through complex mathematical calculations. The computers are called mining rigs, the people owning them, are the miners.

It can be very profitable to be a miner. They are the ones who receive the newly issued Bitcoin that the network produces. Each time a transaction is made in the network, a mathematical problem is posed to the miners by the network to corroborate and certify the transaction into a block. The first miner to do this gets rewarded by the network, by giving them brand-new Bitcoins (Hong, 2022).

At first, since the network was tiny, the number of transactions that took place was little, which means that they were easy to corroborate, so mining was easy. Now, it takes a lot more processing to do, since the network has grown so much, and one little mining computer is certainly not enough to solve the complex maths that the network requires. Miners get together then, into what is called “mining pools”, which increases their chances of being the first group to solve the maths problems, and then split the reward.

Furthermore, as the number of Bitcoin transactions grow, and mining complexity increases, every four years, the number of Bitcoin being rewarded to the miners is reduced by half. This event is known as “halving”, and it ensures that the number of Bitcoin being issued through time decreases, and thus making Bitcoin scarce, and therefore, more valuable.

Miners also get a bit of Bitcoin by taking a fee of every transaction. And in the future, when all the 21 million Bitcoin are fully mined, they will make profit through those fees being charged on every Bitcoin transaction.

Running the whole number of Bitcoin transactions every day consumes a huge amount of energy. In fact, the miner rigs produce so much heat that it has been known that some people in Nordic countries used them as their heating system.

This is probably the main point that Bitcoin detractors raise when criticizing this new technology. As of today, the bitcoin network consumes as much energy as a small country, like Lebanon. It is a fact that cannot be denied, but that does not mean that it



cannot be improved. We are not going to discuss this topic in this course, since it is not pertinent to our subject. But we must acknowledge that Bitcoin uses a significant amount of electrical energy, but also, it might be the biggest opportunity to accelerate the transition to a sustainable energy future. A huge amount of the Bitcoin grid runs on renewables (some estimates assure that it is up to 75% of the Bitcoin network that runs on renewable energy) (Zmudzinski, 2019). It makes sense, since to maximize profits while mining Bitcoin, one has to keep energy costs down. So, Bitcoin actually generates an economical incentive to use sustainable energy.

### **What is proof of work?**

Usually abbreviated as POW, proof-of-work (Hertig, 2022) is the protocol that assures that each block of the chain has enough computational power behind it to provide it value. It is the protocol that provides the consensus behind the network.

Each payment done in Bitcoin has to be certified, or corroborated, by the miners. As we have seen, each miner invests a certain amount of energy (computational power, solving maths problems) in doing this. It is difficult to run the blockchain, the miners have to “work”. That is why every Bitcoin is secured by the “proof-of-work” protocol. If a Bitcoin transaction has taken place, you can rest assured, it has been secured by POW.

Moreover, if Bitcoins were easier to make (or fake), the double-spending issue we talked about before would not be solved. In short, proof-of-work is what facilitates complete decentralization of the network and no need for a central controlling third-party or overseeing institution. You can check this video for a bit more information on proof-of-work.

So far, we have been using the term blockchain and Bitcoin almost interchangeably. Of course, Bitcoin is the cryptocurrency, and blockchain is the technology that enabled it. They were born together, Bitcoin and blockchain, hand in hand. The Satoshi Nakamoto white paper talked about Bitcoin, and implicitly it created this new technology. Surely, for whoever wrote the white paper, Bitcoin and blockchain were one same thing. But a lot has happened since then. And Satoshi started a revolution. Many people took his idea and developed it into many things. So many blockchains were born, for other cryptocurrencies, apart from Bitcoin.

Source: Binance Academy. (2018, October 22). What is Proof of Work (PoW) – Explained for beginners [Video]. YouTube.  
[https://www.youtube.com/watch?v=3EUAcxhuoU4&ab\\_channel=BinanceAcademy](https://www.youtube.com/watch?v=3EUAcxhuoU4&ab_channel=BinanceAcademy)

Among the other blockchains that were created, there is one that is the most famous, and just as revolutionary as Bitcoin, called the Ethereum blockchain.



**Figure 4: Ethereum blockchain**



Source: [Online image of Ethereum blockchain], (n.d.), <https://bit.ly/3MM8m9X>

### **What is Ethereum?**

Ethereum is a different blockchain than Bitcoin. It is a brand-new blockchain all by itself. Ethereum is the name of the blockchain, and the currency native to it is called Ether. The blockchain also works with the proof-of-work protocol, but it promises to change to a different consensus mechanism by 2023, called proof-of-stake, which will be much more energy efficient and still be safe and secure. Although it is not significant right now in our understanding of the subject, it is good to know that, unlike the Bitcoin blockchain, that is already established and will remain like that permanently, the Ethereum blockchain is constantly being worked on and has improved significantly.

What we do have to understand is that the Ethereum blockchain introduced an amazing concept called “smart contracts”. The idea of a smart contract was first introduced by a computer scientist called Nick Szabo, who imagined a digital contract stored in a decentralized ledger like the one blockchain enables. Ethereum is a cryptocurrency like Bitcoin, but it is also so much more. Some call it “programmable money”, because of smart contracts, that enable people to write code into the blockchain and get it to do all sort of stuff.

### **What is a smart contract?**



A smart contract is basically a contract that self-executes. It is an agreement between two or more people, a written statement that ensures that something gets done. In the past, there had to be a third party that made sure that the contract was being observed by all the parties involved and if not, there would be consequences, either legal, financial, or other type.

Generally, we rely on the justice system to make sure that the conditions of a contract are being met. We need lawyers, notaries, and if contracts are not being obeyed, judges make sentences, governments impose fines and sanctions. If we think not only of the justice system, but also the financial system, it works similarly. We require banks and institutions to validate and oversee transactions. If we want to send money to another country, hundreds of processes need to take place to achieve that goal.

Instead, with smart contracts, all of that changes. What is particularly spectacular about blockchain smart contracts is that you can write a contract and translate it into computer code, and then record it on the blockchain (in this case, the Ethereum blockchain). Therefore, just as in the Bitcoin blockchain, every single node of the Ethereum blockchain will have a copy of the contract and will make sure the contract is executed when it is supposed to.

In the words of Don Tapscott, executive chairman of the Blockchain Research Institute, the financial system is like a Rube Goldberg machine.

A ridiculously complex machine that does something very simple like crack an egg or shut a door. It reminds me a little bit of the financial services industry, honestly. You tap your card in a corner store and an order goes through a dozen companies, each with their own computer systems, some of them being 1970s mainframes, really old (...) and three days later, a settlement occurs. Well, with the blockchain financial industry, there would be no settlement, because the payment and the settlement is the same activity. It is just a change in the ledger. (Tapscott, 2016, <https://bit.ly/3tyOMqK>)



Figure 5: Rube Goldberg machine



Source: Swartz, n.d., <https://bit.ly/3Hmgsop>

Indeed, a blockchain smart contract executes itself instantly. And the fact that it is decentralized, allows avoiding any tampering by third-parties. Every node in the blockchain knows when and how the contract has to work. Once the contract is written in code on the blockchain, it is immutable. That is why countless people use the phrase “code is law” because once the smart contract is created, there is no going back.

So, for example, pretend a person wants to loan one bitcoin to another person. They do not necessarily need to know each other. They just have to agree on the terms. “I loan you a Bitcoin, that has to be paid back with this interest rate by this date. And if you do not give it back, I will take the collateral”. Once the contract is written in code (the Ethereum code language is called Solidity), the rest will take care of itself. No need of lawyers or lawsuits.

### **Smart contracts gave rise to a swarm of innovations**

It might sound incredibly simple, but the smart contract creation opened a whole new world of possibilities. If you think about it, almost anything can be established as a contract, not only financial or legal settlements. For example, a game is a contract. A set of established rules that have to be followed or else something happens. Moreover, an



organization, a company, even a government. The constitution of a country is a contract. I am sure you can start to see how a smart contract begins to have considerable implications, way further than just decentralized finance (which, in itself, is a giant innovation already).

So, soon after it was created, people started building projects on top of the Ethereum blockchain. Each one of these projects is based on a specific smart contract written in code, and thus, immutable. Within these contracts, many conditions, and rules are introduced. Many smart contracts even included the creation of “tokens”: digital crypto-assets that can be exchanged between parties participating in the smart contract (Cryptopedia Staff, 2021).

It might be helpful at first to think of tokens as “coins” that is built on top of another “coin”. Although this is not technically accurate and many tokens are not necessarily a “cryptocurrency” in itself, it might be easier to think about tokens in this way.

Digital tokens then are created by developers (programmers) that write smart contracts on the Ethereum blockchain with certain rules and conditions that are established in the contract, and therefore, each token has a specific use and purpose. And if the use case is really significant, and sufficient demand is created for a specific token, that token goes up in value and can be sold, purchased or traded.

Since the creation of smart contracts, there has been an absolute explosion of tokens available for purchases. Many of the so called “cryptocurrencies” you see and hear about everywhere, are actually Ethereum-based tokens, such as Solana, USDC and polygon.

## **Dapps and DAOs**

In an article, Vitalik Buterin (2014) laid out some of the most important topics we are going to discuss next, including smart contracts, DAOs, Dapps, and more. So, the reading of that article (posted in the official Ethereum foundation page) is strongly recommended.

As we said, smart contracts have considerable implications. Everything can be translated as a contract if you think about it. Take, for example, an app in your phone. If you want to know the weather, you download an app that gives you data in an orderly way based on the information you give as input data. So, theoretically, the only thing that is going on is you doing something, and as a consequence, something else happens, following an established set of rules. You give your location and an established time-frame, and the app responds in consequence: you get this weather in the next few days.

So, when a smart contract gives birth to an application, it is called a Dapp, or decentralized applications. Take, for example, the famous exchange platform Uniswap. What it does is facilitate the exchange of cryptocurrencies between users (whether they know each other



or not, it does not matter, that is why we have a smart contract). A user has a token, and wants to sell it. The smart contract has written in its code an established set of rules and conditions that match the seller and the buyer, making sure that none of them has ill intentions or that they can incur in some sort of theft.

Something to be aware of, is that decentralized apps such as Uniswap do not have a centralized control centre, or anyone to oversee what is going on. It works completely by itself, it is a crypto-market place where nobody has any central control. So make sure you do not make any mistakes because there is no one to complain to. If you wanted to sell 2 Bitcoins, but instead you sold 3, that is it, there is no going back. Once it is established on the blockchain, it stays on the blockchain.

Another phenomenal use of smart contracts is the creation of DAOs (Monolith, 2021). DAO stands for decentralized autonomous organization. It is an organization that is run by the community as a whole, with no central authority. Usually, the smart contract that establishes a DAO, also creates its own tokens, used to run and regulate the DAO in what is known as "tokenomics". Occasionally, when choices or changes on the DAO have to be made, it is the people who own tokens that have a say in the matter. So, everyone with a token can participate in the regulation of the DAO.

You can see how smart contracts are not just an agreement between two parties on how much Bitcoin they want to loan. I think we are only seeing the beginning of the possibilities that smart contracts allow. If adoption increases, smart contracts will start to be evermore present.

The incredible advantage of having smart contracts is that they preserve the anonymity of the user, and also, they are very transparent, since anyone can see on the blockchain what is taking place. Our data is safe, and so is our money, since we are using a way safer network than the current banking system.

We will discuss more deeply in the following lessons how the blockchain environment is evolving, and how new and innovative use cases are being developed every day. A few years ago, thinking about a 3D world game land such as Decentraland was absolutely unimaginable. Or the NFT revolution, that although many people regard as a fad or a speculative bubble, I can assure it has amazing potential, and it has come to redefine what digital ownership is. Everything is changing very fast, and we have not even scratched the surface. It might be a little hard to understand, specially at first, but these notions are essential to understand how the future of blockchain will unfold.



Figure 6: Traditional economy vs crypto economy

## Traditional Economy vs. Crypto Economy

Economic Agents	<p>Central Banks Corporations Governments Households</p>	<p>Core Developers Miners/Validators Investors Entrepreneurs</p>
Money	<p>Fiat (eg. dollars, euro, yen)</p>	<p>Fungible ERC20 tokens (ETH, DAI, etc)</p>
Productive Assets	<p>Factories Machines Software</p>	<p>Smart contracts</p>
Goods	<p>Food Clothing Cars Electronics</p>	<p>NFTs</p>
Exchange Mechanisms	<p>E-Commerce Retail Stores Stock Market</p>	<p>Decentralized exchanges Smart Contracts</p>
Institutions	<p>Governments Central Banks Corporations</p>	<p>DAOs</p>

Source:[Online image], (n.d.), <https://images.app.goo.gl/dyPeobtR9TuuYLV46>

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