Ethereum

"Ethereum is the beginning of Web 3.0"

The Offshoots of Bitcoin

There is currently more than 700 cryptocurrencies, each with their own network of miners and each has its own market value and supply of coins. After the concept of Bitcoin became widespread, more and more independent Cryptocoins established themselves on the same technology that bitcoin pioneered. Some of them is simply an attempt to take market share away from the original bitcoin domain and others have sought to address some issues with the current Bitcoin system.

An important thing to note though is that for any Cryptocoin to have any value, it must be traded on an exchange, and most cryptocurrencies are traded directly against Bitcoin, as Bitcoin is still the gold standard of cryptocurrencies.

For the last few years however, there has been lots of talk about improvements for this technology. It became more and more evident that a blockchain could be used for far more than a simple currency system.

One notable contender is Ethereum which has recently sparked a great amount of interest due to the fact that the technology can be used much more than just a currency system. The largest crowd-sourcing event in history took place on May 28, 2016. An organization called The DAO raised over $164,400,000 in less than a few weeks, with the help of the Ethereum Blockchain Network.

Launched in 2015, Ethereum is based on Blcokchain 2.0 or Bitcoin 2.0 technology and allows one to create and execute decentralized turing complete applications and by using the same private key methodology as Bitcoin for trusted verification of transactions.

Ethereum would never have existed without Bitcoin as a forerunner but is making advancements that are core to even basic transactions. It has also created a new generation of developers which never worked with Bitcoin but are interested in Ethereum.

The creator of Ethereum is Vitalik Buterin. After discovering cryptocurrency technologies through Bitcoin, he was immediately adrenalized by the technology and its potential. He cofounded Bitcoin Magazine in September 2011 and after two and a half years looking at what the existing Blockchain Technology and applications had to offer, in the great tradition of Satoshi Nagamoto, he wrote the Ethereum white paper in November 2013.

Ethereum is not Cryptocurrency

What was discovered was that the use of a Blockchain can enable far more applications than simply enabling a system of token exchange between private key holders- in other words, a cryptocurrency system. In fact, by enabling custom made programs to run in transactions on the Blockchain, it was made possible to create a global decentralized computer.

Example applications of Ethereum

Crowdfunding

Kickstarter, Indiegogo, and others have dominated the crowdfunding space for years. A start-up pitches an idea and sets a target for funding. Kickstarter charges 5% and passes the rest on to the start-up. On the Ethereum Blockchain, a start-up pitches an idea and sets a target for funding. If successful, the smart contract automatically sends the money to the startup and takes 0% as a fee.

At the start of May, the largest crowdfund in history began with the launch of TheDAO. TheDAO is essentially a decentralized venture capital fund that relies on a wisdom-of-the-crowd voting system to make investment decisions. This is one of those revolutionary experiments that throws absolutely everybody off guard.

Decentralized voting
There is much speculation around the world that many democratic elections are less than democratic indeed. Fraud and tampering are common stories. Ethereum enables us to vote anonymously, but in such a way that each vote it counted openly and transparently. True democracy enabler!

Financial and Legal contracts
Futures and options contracts, family trusts, marriage contracts and wills. Make your marriage official and put it on the Blockchain. A smart contract can transfer assets to next of kin following death.

Prediction Markets
Prediction Markets offer a way for market makers/speculators to bet on the binary outcome of an event. We will be able to see a new wisdom-of-the-crowd type of governance that has been thought to have many useful applications.

Social media
A decentralized microblogging service running on the Ethereum Blockchain can provide basic Twitter-like functionality to tweet messages of up to 160 characters.

AKASHA is working on decentralizing online communities with a clever rating system. With open source code and rules governed by smart contracts, you should expect to eliminate future censorship scandals.

Managing identity, identity verification
In the digital age, the increasing risk of financial crime arising from fraud and identity theft demonstrates the importance of a reliable means to safeguard the individual's identity.

A trusted gatekeeper would perform an individual check on a user's ID using KYC and authenticate them. The files would be stored in a distributed database system, which can later be retrieved by the trusted gatekeeper, or the user, to demonstrate with certainty that the ID is genuine.

By proving that you own the private key associated with that verified ID on the Blockchain, you can verify that you are in fact who you claim to be.

Payment System
The primary use case of Bitcoin can also be run on the Ethereum network.

Internet of Things
The IoT will become a multi-trillion dollar market.

Online gambling/lotteries
On the Ethereum platform, you can code provably fair casino style gambling. What this means is that a casino can prove to you that they are in fact paying out in accordance to set rates and not that they may be cheating you.

Web Hosting
Decentralized web hosting means that a website is hosted by everyone at once, meaning that it cannot be DDoS attacked or censored by any government. So what we have here is a potentially censorship-free Internet.

Cryptocurrency exchange
EtherEx is a decentralized exchange in the works for cryptocurrencies. More on financial markets later.

Other use cases
Escrow, time stamping, proof of work delivery

Smart contracts

Smart contracts are the building blocks for decentralized applications. A smart contract is equivalent to a little program that you can entrust with a unit of value (as a token or money), and rules around that value. The basic idea behind smart contracts is that a transaction's contractual governance between two or more parties can be verified programmatically via the Blockchain, instead of via a central arbitrator, rule maker, or gatekeeper. Why depend on a central authority when two (or more) parties can agree between themselves? And when they can make the terms and implications of their agreement programmatically and conditionally?

The starting point that you assume when applying smart contracts is that third-party intermediaries are not needed in order to conduct transactions between multiple parties. Instead, the parties define and agree on rules and they embed them inside the transactions, enabling an end-to-end resolution to be self-managed between computers that represent the interests of the users. Smart properties are digital assets which can identify who their owners are. Their ownership is typically linked to the Blockchain.

Smart contracts represent an "intermediate state" between parties and we will trust these smart programs to verify plus take action based on the logic behind these state changes.

Key technologies for developers

Solidity is a Javascript-like programming language of choice for smart contract development on Ethereum. There is also Serpent (Python based) and LLL (Lisp based). They all run on the Eithereum Virtula Machine, just like Java runs on the JVM.

Web3.js is the javascript browser interface to the Blockchain. The web graphical user interfaces, or front ends running in your browser can make use of web3.js in order to interface directly with Ethereum client.

Ether

Ether is the token of the Ethereum system. Like a Bitcoin unit is to the bitcoin system. And although Ether is also a crypto currency (because it has all the properties of any cryptocurrency), the main idea behind Ether is that it is used to pay for running contracts on the Ethereum network. Just like on Bitcoin network there are also miners who mine for Ether. It can be bought and sold on many exchanges, just like bitcoin, but it allows the main fuel used to pay for running the smart contracts on the Ethereum Network.

Noteworthy exchanges to buy, sell and hold Ether

Bitfinex, Poloniex, Kraken, CIX

Conclusion

Hopefully, I have made the potential uses of Blockchain Technology and smart contracts a little bit clearer to you. The power of Blockchain Technology comes from its diversity of use cases and just how many use cases are out there that haven't even been discovered yet? Ethereum has only been in the development for two years and is by all accounts still raw and unfinished. Its potential as a game changer coupled with some smart and creative thinkers will only mean incredible applications and valuable real life utility which will improve the quality of our lives.

Ethereum is opening the door to a new class of applications, it has never been seen before.