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BLOCKCHAIN: How the Technology behind Bitcoin is Revolutionizing Currency, Commerce and Economics of the World

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I. INTRODUCTION

The technology which will likely to have the greatest impact on the next few decades has arrived. It's not social media, neither big data, nor robotics, it's not even AI (Artificial Intelligence). It is the underlying technology of digital currencies like Bitcoin which is called the Blockchain Technology. In present times Blockchain is not the most sonorous word in the world, but this is now the next generation of the internet. It holds vast promise for every business and every society.

A. The Internet of Information

For the past few decades, people were having the internet of information. When a person sends another person an email or a power point file, he is not actually sending the other person the original but he is sending a copy of the original. This is called information democratized. But when it comes to assets – things like money, financial assets like stocks and bonds, loyalty points, intellectual property, music, art, a vote, carbon credit and other assets, sending someone a copy is a really bad idea. If Mr. A is sending 100 rupees to Mr. B, it's really important that Mr. A don't still be having the money, and Mr. A won't be able to send it again to Mr. C. This has been called the "double-spend" problem by cryptographers for a long time.

B. The Middleman

So today, people rely entirely on big intermediaries, middleman like banks, government, big social media companies, credit card companies and so on to establish trust in the economy. perform all the business and transaction logic of commerce, from authentication, identification of people, through to clearing, settling and maintenance of records. Overall the intermediaries are doing a good job but this good job is also growing a lot of problems. To begin with, these intermediaries are centralized. That means they can be hacked and increasingly they are being hacked ! Secondly, they exclude billions of people from the global economy who don't have enough money to have a bank account. This system slows down the process. It can take a second for an email to go around the world, but it can take days or weeks for money to move through the banking system across a city. And they take a big piece of the action i.e. 10 to 20 percent of the amount in consideration, just to send money to another country. Intermediaries capture people's data, and that means that people can't monetize it or use it to better manage their lives. And above all the privacy of people is being undermined. And the biggest problem is that overall, they've allocated largest part of the digital age asymmetrically; wealth has been created but also grows with it the social inequality. So what if there were not only an internet of information, what if there were an internet of value! What is there is some kind of vast, global, distributed ledger running on millions of computers and available to everybody. And what if every kind of asset from money to music, could be stored, moved, transacted, exchanged and managed, all without powerful intermediaries? Can there be some other medium for value which is native in nature? In 2008, when the world financial industry fall off, an anonymous person or persons named Satoshi Nakamoto created a paper where he developed a protocol for digital cash that used an underlying cryptocurrency called **Bitcoin**.

II. BLOCKCHAIN : THE SECOND ERA OF THE INTERNET

Cryptocurrency enabled people to establish trust and do transactions without a third party intervention. This seemingly simple act set off a spark that ignited the world which has everyone excited or terrified or otherwise interested in many places. A lot of people gets confused between Bitcoin and Blockchain.

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Bitcoin is an asset; it goes up and down, and that should be of interest to someone who is a speculator. More broadly, Bitcoin is a cryptocurrency and not a fiat currency which is controlled by a nation-state. But the real game changer element in this field is the underlying technology called Blockchain. For the first time now in human history, people everywhere can trust each other and transact peer to peer.

A. The Trust Protocol

Trust in Blockchain is established not by large institutions, but by collaboration, by cryptography and by intelligent coding and because trust is native to the technology, this trust factor is called "The Trust Protocol". People who here the word Blockchain for the first time would probably wonder: how does this thing work? In Blockchain, digital assets like money to music and everything in between are not stored in a central place, but they're distributed across a global ledger, using the highest level of cryptography. And when a transaction is conducted, it's posted globally, across millions and millions of computers. On that vast network around the world, there are **"Miners".** These are young people, known as Bitcoin miners. They have massive computing power at their fingertips, 10 to 100 times bigger than all of google coders worldwide. These miners basically runs the show. In every 10 minutes, like the heartbeat of a network, a block gets created that has all the transactions from the previous 10 minutes. Then the miners start decoding the blocks through solving puzzles associated with that particular Blockchain. As the fastest of the miner solve the puzzle and validate the block, is rewarded in the form of digital currency. In the case of the Bitcoin-blockchain, miner is rewarded with a Bitcoin. And the key part of this transaction is that current block is linked to the previous all the blocks creating a chain of blocks. And every block is time-stamped, just like a digital waxed seal.

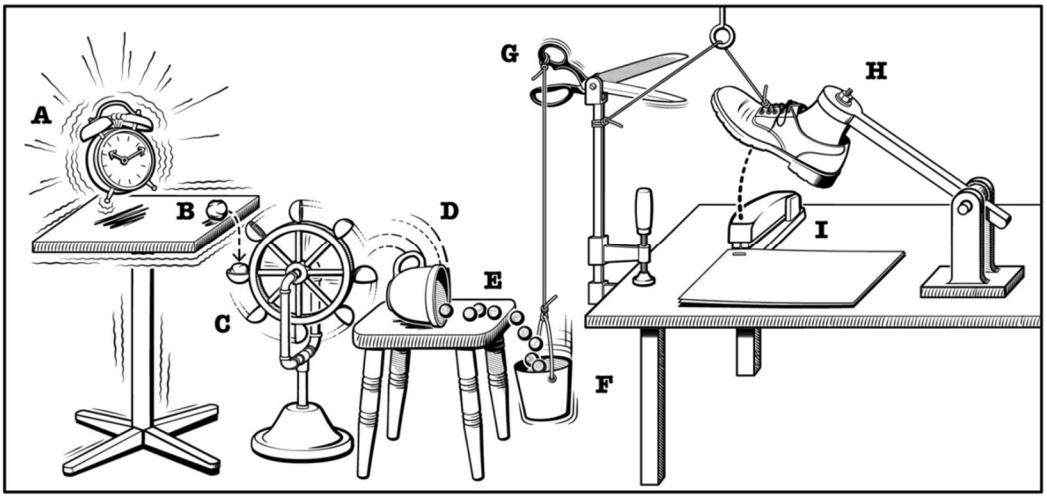
So if someone wanted to go and hack a block and pay multiple people with the same money, he'd have to hack that block, plus all the preceding blocks plus the entire history of commerce on that blockchain and he has to hack not just one computer but across millions of computers involved in creating that particular Blockchain, simultaneously, all using the highest levels of encryption. It's almost next to impossible. This is infinitely more secured then the computer systems that we have today.

B. Blockchains – As Platforms of Innovation

Bitcoin-blockchain is just one type of Blockchain. There are many. The Ethereum blockchain developed by a Canadian named Vitalik Buterin. He was 19 years old when he introduced Ethereum blockchain, having has some extraordinary capabilities. One of them is that user can build smart contracts which are self-executables, and the contract handles the enforcement, the management, performance and payment – just like a bank account. Today, on the Ethereum blockchain, there are projects underway to do everything from creating a new stock market systems replacement to building supply chain systems, health-care applications, insurance, banking and real estate systems integration.

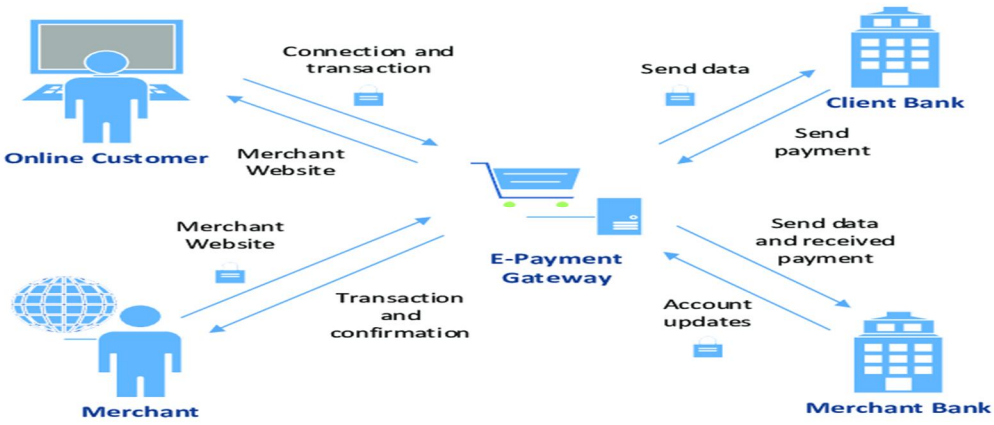
C. Rethinking the Financial Services Industry

An in-depth example of financial services industry reveals the radical changes Blockchain technology is accomplishing. The below picture is of a Rube Goldberg machine. It's ridiculously complicated machine that does something really simple, like crack an egg or shut a door. This model is an example of how financial industry works.

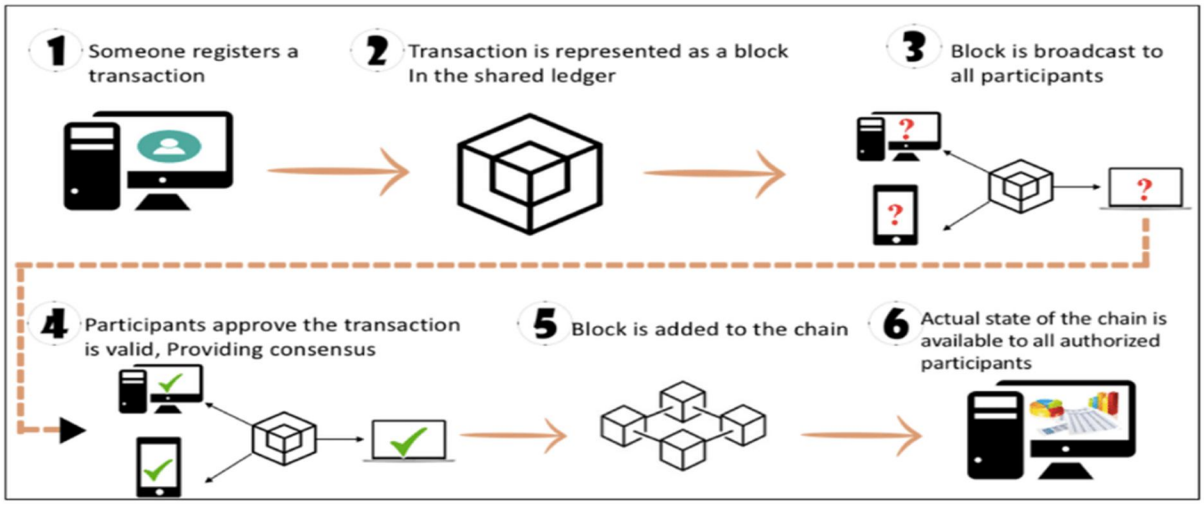


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You tap your card in the corner store, and a bitstream goes through a dozen companies, each with their own computer system, some of them being 1970s mainframe computers, older than most of the people reading this article. Settlement of this transaction occurs after 3 days.



With a blockchain financial industry, there would be no settlement, because the payment and the settlement is the same activity, just a change in the ledger.



BSE, NIFTY, Wall Street and all around the world, the financial industry is in a big upheaval about this, wondering, can we be replaced? Or how do we embrace this technology for success?

III. WHY PEOPLE SHOULD REALLY CARE FOR BLOCK-CHAIN TECHNOLOGY?

The first era of the internet (the internet of information) brought us wealth but not shared prosperity because social inequality is growing. And this is at the heart of all the anger and extremism, protectionism, xenophobia and worse that we are seeing growing in the world today, 'Brexit' being the most recent case. So, it gives birth to a question – could we develop some new approaches to this problem of inequality? Can we we pre-distribute the wealth? Could we change wealth creation in the first place by democratizing wealth creation, engaging more people in the economy, and then ensuring that they got fair compensation?

There can be 5 ways that this can be done:

70 percent of the people in India who have land, have a tenuous title to it? So a farmer having a little farm in some remote village of Uttar Pradesh, a politician or a strongman comes and says "I know that you are owner of this land but the government computer says I owns your farm". This happened on a mass scale in every part of India and this exists everywhere in the world. Hernando de Soto – the great Latin American economist, says "this is the number one issue in the world in terms of economic mobility more important than having a bank account". Because if farmer do not have a valid title to his land, he cannot borrow against it to plan for the future.

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A. Protecting Rights through Immutable Records

So today, companies are working with governments to put land titles on a Blockchain. Once it is there, this is immutable. No one can hack it. This creates the conditions for prosperity for potentially billions of people.

B. Creating a True Sharing Economy

Lots of writers talk about Uber, Airbnb and TaskRabbit, as part of the sharing economy. This is a very powerful idea, that peers can come together and create and share wealth. These companies are not really sharing. In fact, these companies are successful precisely because they do not share. They actually aggregate services together, and then sell them. What if, rather than Airbnb being a $25 billion corporation, there was a distributed application on a Blockchain called B-Airbnb, and it was essentially owned by all of the people who have a room to rent. And when someone wants to rent a room, they go on to the Blockchain database and all the criteria, they sift through, it helps them find the right room and then the Blockchain helps with the contracting. It identifies the party, it handles the payments, just through digital payments – they are built into the system and it even handles reputation. Because if customer rates a room as a five-star room, that room is there and the rating is immutable. So, the big sharing-economy disruptors in Silicon Valley could be disrupted, and this would be good for prosperity.

C. Ending the Remittance Ripoff

The biggest flow of funds from the developed world to the developing world is not corporate investment, and it's not even foreign aid. It is remittances. This is the global diaspora; people left their ancestral lands and sending money back to their families at home. This is 600 billion dollars transaction per year and growing exponentially. But the commissions on the transactions are ripping off these people. A common housekeeper working in dubai, every month he goes to the western union office with some cash to send remittance to his family in kerala. It costs him around 5-10 percent; the money takes four to seven days to get there; family never knows when it's going to arrive. It takes five hours of the housekeeper's week to do this.

Now think of this housekeeper using a Blockchain application called "Easypay". From his mobile device, he sent 500 rupees, it went directly to his family member's mobile device without going through an intermediary. And then the family member looked at their mobile device – its kind of like an Uber interface, there is Easypay "tellers" moving around. The family member clicks on a teller that is a five-star teller, who's seven minutes away. This teller person shows up at their door, gives them Indian Rupees. He puts them in his wallet. The whole thing took 7 minutes, and it costs the housekeeper only two percent. This is a big opportunity for growing prosperity.

D. Recapturing Identities (Enabling citizens to own & monetize their own data)

The most powerful asset of the digital age is data. Data today is a new asset class, bigger than previous asset classes like land under the agrarian economy, or an industrial plant or even money. All the people using mobiles and computers have created this data. They have created this asset, and they leave this trail of digital crumbs behind them throughout life and these crumbs are collected by Facebook, Instagram and Google into a mirror image of these people and create a strong virtual personality of that person. This virtual personality knows about the person more then he himself knows about. A general person can't remember what he bought a year ago, or said a year ago, or his exact location a year ago but his virtual identity which is now owned by facebook or google exactly knows it.

Zomato – a food delivery app is having $12 billion valuation on stock market, what is his asset – Data. Imagine a pizza company opening its outlet in Indian cities, it can pay millions to get hold on a public data which tells them in any given residential complex, how many people order pizza, type of pizza, frequency of order in a week and average order size.

Your virtual identity is owned by someone else, that's the big problem. So today, there are companies working to create identity in a black box, the virtual you owned by you. This black box moves around with you as you travel throughout the world, and this black box only gives away the shred of information that is required to do something. A lot of transactions, the seller do not even need to know who you are. They just need to know that they got paid. And then this avatar is sweeping up all of this data and enabling you to monetize it. And this is a wonderful thing. It can also help protect privacy and privacy is the foundation of a free society. Let's get this asset that we create back under our control, where we can own our identity and manage it responsibly.

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E. Ensuring Compensation for the Creators

There are whole numbers of creators of content who don't receive fair compensation, because the system for intellectual property is broken. It was broken by the first era of the internet. Take example of music. Musicians are left with crumbs at the end of the whole food chain. A songwriter, 25 years ago, wrote a hit song, it got a million singles, singer could get royalties of around 30 lakh rupees. Today, if that songwriter, writes a hit song, it gets a million streams but the songwriter don't even get 30 lakh rupees, he will only get 3500 rupees. Not even enough to throw a success party with his friends.

'Imogen Heap' the Grammy-winning singer-songwriter, is now putting music on a Blockchain ecosystem. She calls it "Mycelia." Her music has a smart contract surrounding it to protect her intellectual property rights. Anybody wants to listen to the song, it's free, or may be a few micro-cents that flow into a digital account. If someone want to put the song in their movie, that's different because IP rights are all specified. Anybody want to make a ringtone? That's different.

She describes that the song becomes a business. It's out there on this platform marketing itself, protecting the rights of the author, and because the song has a payment system in the sense of bank account, all the money flows back to the artist, now the artists control the music industry, rather than some powerful intermediaries.

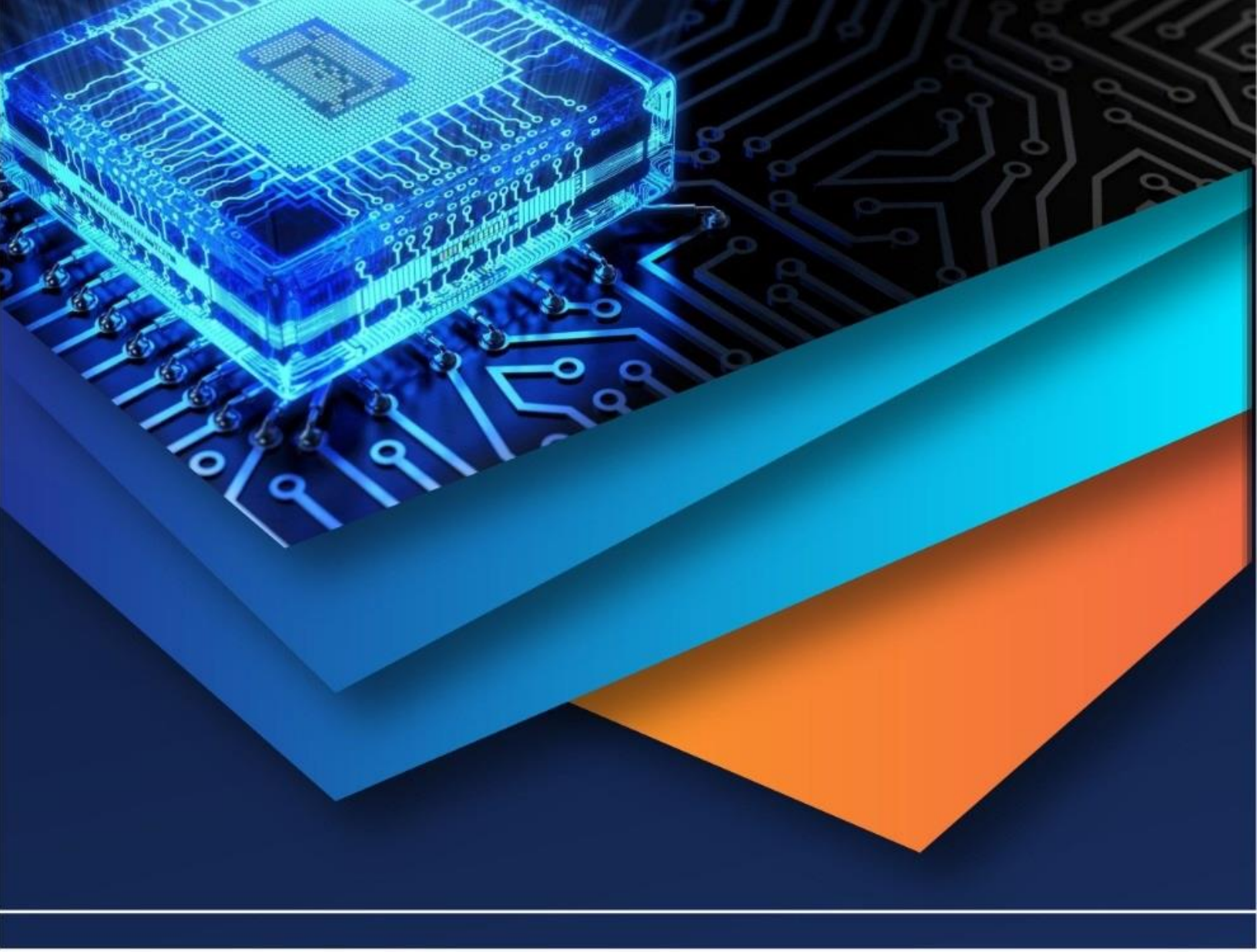
This is not just song writer, it's any creator of content, like art, inventions, scientific discoveries, journalists. There are all kinds of people who don't get fair compensation, and with Blockchain, they are going to be able to make it rain.

These five opportunities to solve one problem, prosperity, which is one of countless problems that blockchains are applicable to. Now, technology doesn't create prosperity, of course – people do.

This article particularly would like to emphasize that, once again, the technology genie has escaped from the bottle, and it was summoned by an unknown person or persons at this uncertain time in human history. Blockchain giving people another opportunity to rewrite the economic power grid and the old order of things, and solve some of the world's most difficult problems.

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