



# Blockchain

The real beginning of recorded history



**H**umans have been recording things ever since we discovered that images could be made on cave walls. But up until the creation of internet communications, the process was a bit sloppy. Massive paper files, and the people responsible for keeping track of their contents, were notorious for losing things. Even the internet (intentionally or unintentionally) loses information. GeoCities is a good example of a site where tons of information disappeared overnight.

The information loss is glaring in the above example, but it doesn't require much analysis to realize that even with heavy investments in information security, the information lifecycle today leaves many holes at the backend. Motivated individuals can easily change and represent information differently to their discretion.

## Beyond the Bitcoin

That's where blockchain technologies, invented back in the 1980s, can change everything. Instead of layers of external security built around data, blockchain addresses security in a different way. It engraves cryptographic security right into the information itself, making it virtually immutable. This fundamentally opens up many possibilities because information could be on sites that cannot be fully trusted or are loosely protected. Recent interesting innovations have extended the concept and solved many fundamental problems in a very different way.

Blockchain is not just the technological backbone of Bitcoin, it is a deceptively powerful technology capable of much more than just supporting a virtual monetary system. Experts are extremely enthusiastic about what it can do. But what can it do, and what is it? To put it simply, a blockchain is an automated ledger system that provides immutability on information, establishes transparency, and prevents control regimes. The successful run of Bitcoin proved that all of these can be accomplished in a hostile, untrusted computer environment. The conceptualized algorithms and open source implementation created a consensus agreement-based computing system, which allows participants to work together in a truly democratic computing paradigm.

So how important is blockchain to the future of information exchange? To put it mildly, it's responsible for recording every transaction ever made in Bitcoin, and blockchain is aimed at accomplishing this for everything that becomes digital.

## Critical uses for blockchain

It's unclear whether Bitcoin is going to be with us for much longer, or if it will explode and see even wider use. But there are uses for its backbone technology, which will certainly be very useful in the foreseeable future.

### Financial services

In addition to various cryptocurrencies, smart contracts, trading platforms, fund transfers, record keeping, and customer identifications are some of the areas where a blockchain-related solution is aggressively explored today.

### Notary services

Once a piece of information is inserted into a blockchain, it's almost impossible to change it. This means important records like birth, death, marriage, land records, and so on, can be faithfully recorded with far greater fidelity and security than ever before.

### Supply chains

Managing supply chains requires a great deal of transactional data to be moved, shared across parties, and stored. Small errors in reproduction can be a huge problem for large companies - especially where money is involved. Blockchain will virtually eliminate all of these problems and make corporate waste and fraud much more difficult to pull off. Blockchains are a great tool for supply chain transparency.

### Intellectual property

Protecting intellectual property is important to all kinds of businesses and entrepreneurs - including small-time hopeful inventors, novelists, and musicians, who are betting on a poor man's copyright to protect their creations. Blockchain will make these types of capital infinitely more secure with a fail-safe proof of origin for a given piece of intellectual property. There is even a simple application called Satoshi Proof that lets you try this out by yourself.

## Medicine

It's unknown how valuable blockchain might be to medical practice and research. On the patient-records side of the industry, this technology is certain to save the medical industry millions in waste and abuse, as well as save incalculable amounts of time and data. In the pharmaceutical industry, it offers a perfect means to guarantee drugs pedigree through supply chain transparency as described above.

## The Internet of Things

As more and more business tasks are automated, blockchain could report on anything that has been done in the physical world through automation. In today's volatile business climate, it is quite possible for smart products to survive in the field while the manufacturer ceases to exist anymore. Blockchain based solutions are an ideal approach here. Blockchain-based implementation is already being pursued by large providers. IoT devices can propose services that are automatically billed to their blockchain account, and they can use the currency stored on these same accounts to pay for the utility/services they consume (electricity, water, maintenance).

## Education

Blockchain can help secure educational materials and their distribution far more effectively. It can also maintain administrative data of each student, such as grades, certifications, and test records.

## Government

Across the board, there needs to be transparency in government services and the functioning of their departments and agencies. Pilot projects in blockchain are already being tested in a few countries.

Beyond acting as a godlike logbook for everything digital, some experts believe that blockchain has the potential to transform our world into a simpler and more just one. Paul Levy wrote an article for *Phys.org* last December, claiming, in part, that blockchain might even have the potential to decentralize governments. This would eliminate the opportunity for backroom dealing and corruption - the kind of things that now plague societies all over the world.

It's a big responsibility for a little piece of software that you had probably never heard of before now. While the euphoria around the new tool is justified, it should be realized that many of its aspects are still being researched, on drawing boards, in testing programs, etc. During some of the pilots and proof-of-concept project work in our labs, we sometimes go back to reference materials dating a couple of decades back! We also realise that some of the new approaches are not always acceptable in existing computing practices and compliances. But if blockchain stacks up the way its creators and the industry leaders think it will, we may be in store for a shining new age of accountability the likes of which few have dreamt.

What other industries and applications do you foresee blockchain disrupting? Please post your thoughts as comments below.

### About the author

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He has behind him a global career spanning 25 years and has long association with industry consortium and has contributed to the evolution of standards like OASIS TOSCA. He has contributed to many IPs of Wipro and has played the role of a CTO and provided strategic direction in many large engagements of Wipro. He was recently recognized as a Fellow, Distinguished Member of Technical Staff, Wipro Limited



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