

# TECH

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Microsoft Technical Community

BLOCKCHAIN



- Blockchain
- Consensus Algorithm
- Roblox
- The Chained Blocks
- Voice Technology Reshaping the Business

# BLOCKCHAIN

# FROM THE JOINT SECRETARY

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Your skill set will prove to be your key to the door of success you wish to enter. And becoming a part of Microsoft Technical Community has lead me to build the skill set of my wish. My story in MTC begun as the Management and Records Head which pushed me to work under extreme pressure and to build, as well as showcase, my managerial skills by heading a team. As it was all going smooth, one day it turned out that I have ceased the day and successfully been selected as the Joint Secretary of MTC. Currently, writing my experience as the JS, I wish to do justice to this honorable post and contribute my best and take MTC to the next and the later level, so that everyone forgets that it is some new community of students, but remembers MTC for its quality and dedication to do something better for the future IT professionals.

- Manila Chawla  
(Joint Secretary)

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# A CHAIN OF REVOLUTIONS



# THE BLOCKCHAIN REVOLUTION

If your life is somewhat related to the technical field then you must have heard the term 'Blockchain' more than once in your life so far! Blockchain itself is a very complicated term. In order to understand it completely you'd have to go through a lot of other technical terms.

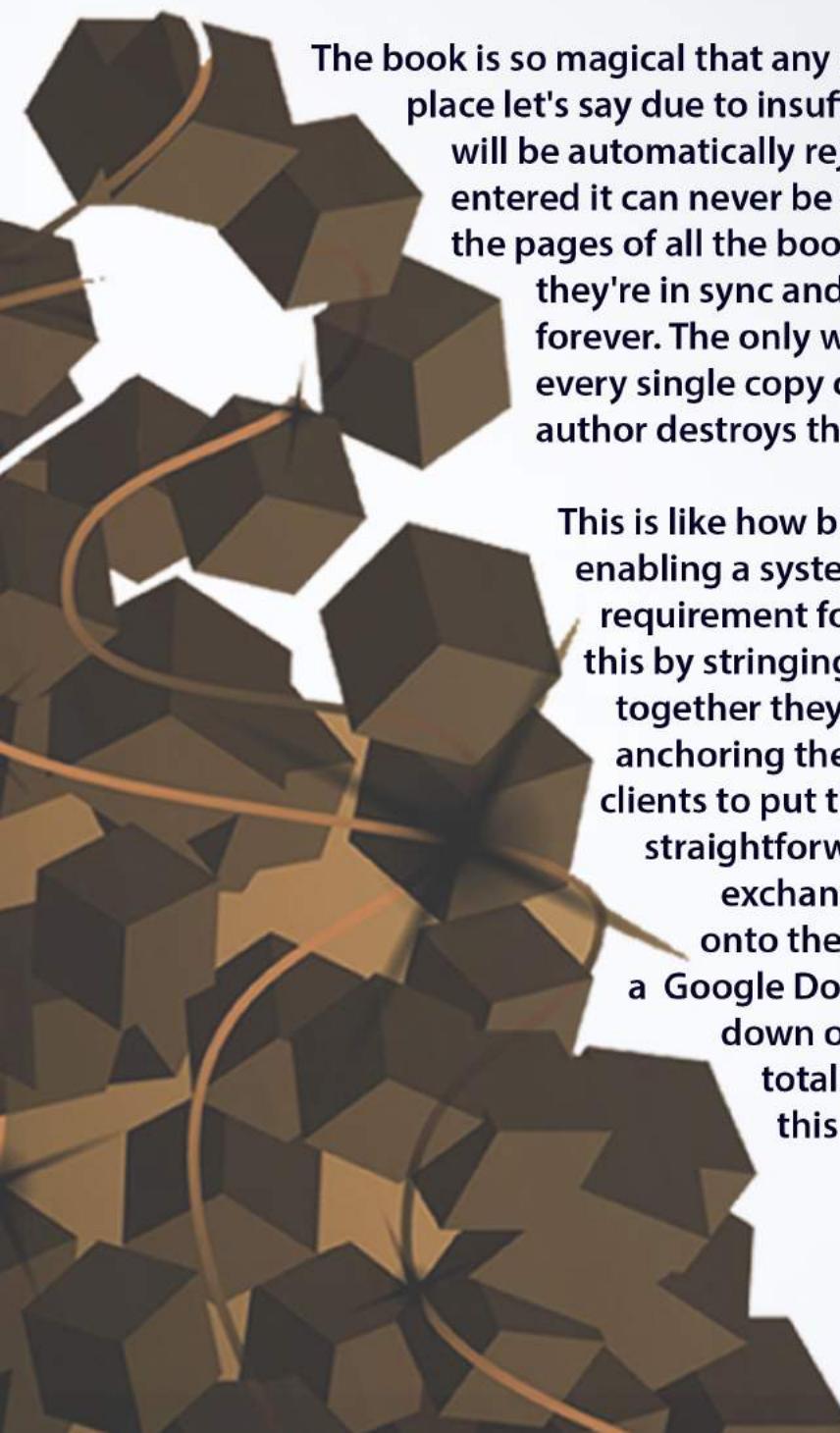
How this complicated thing is changing our lives? And how this technology might ignite a revolution? Why people are crazy for bitcoins? Let's seek the answers to these questions along with understanding what blockchain technology is and how does it work.

Blockchain is a technology, a global online database that anyone, anywhere with an internet connection can use. Unlike traditional databases which are owned by central figures like banks and governments, a blockchain doesn't belong to anyone. Blockchains store information forever over a network of PCs. This decentralizes the information, as well as distributes it as well. In a blockchain, diverse information/transactions are assembled together and stored as chain of blocks. Each block is connected to 2 others blocks. One preceding it and one succeeding it. Similarly, each transaction is linked to other transactions forming a Merkle Tree.

Well, it might be little bit difficult to understand this technical stuff. Galia Benartzi, a technology entrepreneur magnificently explains the working of block chain technology in her TEDx video on Blockchain though a lucid example.



"Imagine a magical book. Anyone who wants it can get a copy of this book for free. And what's magic about it is that anyone can add lines of text to the book and those lines will automatically appear in everyone's copy! Now imagine that those lines aren't just text but transaction records so the book is like a database or an Excel spreadsheet and it's a long and growing record of all the transactions info ever added.



The book is so magical that any transaction that cannot actually take place let's say due to insufficient funds or an incorrect password will be automatically rejected by the book but once a line is entered it can never be changed or deleted. Every few seconds the pages of all the books check in with each other to make sure they're in sync and once a page is verified it is sealed forever. The only way to destroy this book is to destroy every single copy of it out there. So even if the original author destroys the original copy the book will live on."

This is like how blockchain functions and its capacity is in enabling a system to work dependably without the requirement for an essential point of control. It does this by stringing PCs into a network with the goal that together they're accountable for running and anchoring the framework. What's more, it enables clients to put their trust not in magic but rather in a straightforward algorithm that reliably logs and exchanges value starting with one place then onto the next with no focal control. It's sort of like a Google Doc with no Google! Nobody can close it down or change the Terms of Service, it's totally decentralized and the magic behind this is math.

**Bitcoin was the first decentralized money based on blockchain innovation. It was the progressive start that roused a large number of business people to consider a world without a monopoly on the exchange of value between individuals. Money stored away as cryptographic currency is the first-since forever individuals' money on the web. Today, there are more than 700 crypto currencies already on the market.**

**Think about the other services in our lives beyond money that are likewise controlled midway. Blockchain is now finding applications in every region and sector.**

**For example:**

- Europe's largest shipping port, Rotterdam, has launched a research lab to explore the technology's applications in logistics.
- Utilities in North America and Europe are using blockchain to trade energy futures and manage billing at electric vehicle charging stations.
- Blockchain is disrupting social media by giving users an opportunity to own and control their images and content.
- Blockchain consortiums—including the Enterprise Ethereum Alliance, Hyperledger Project, R3, and B3i—are developing an array of enterprise blockchain solutions.

**These are some instances that are already taking place but this technology opens a gate to ocean of revolutions! All you need is just to use your mind to dive into this ocean.**

**For example, just think about it, what might social network look like without an organization in the middle keeping all the benefit that is produced from our content and comments?**



**What might a news organization look like without a media organization in the middle indebted to investors and legislators?**

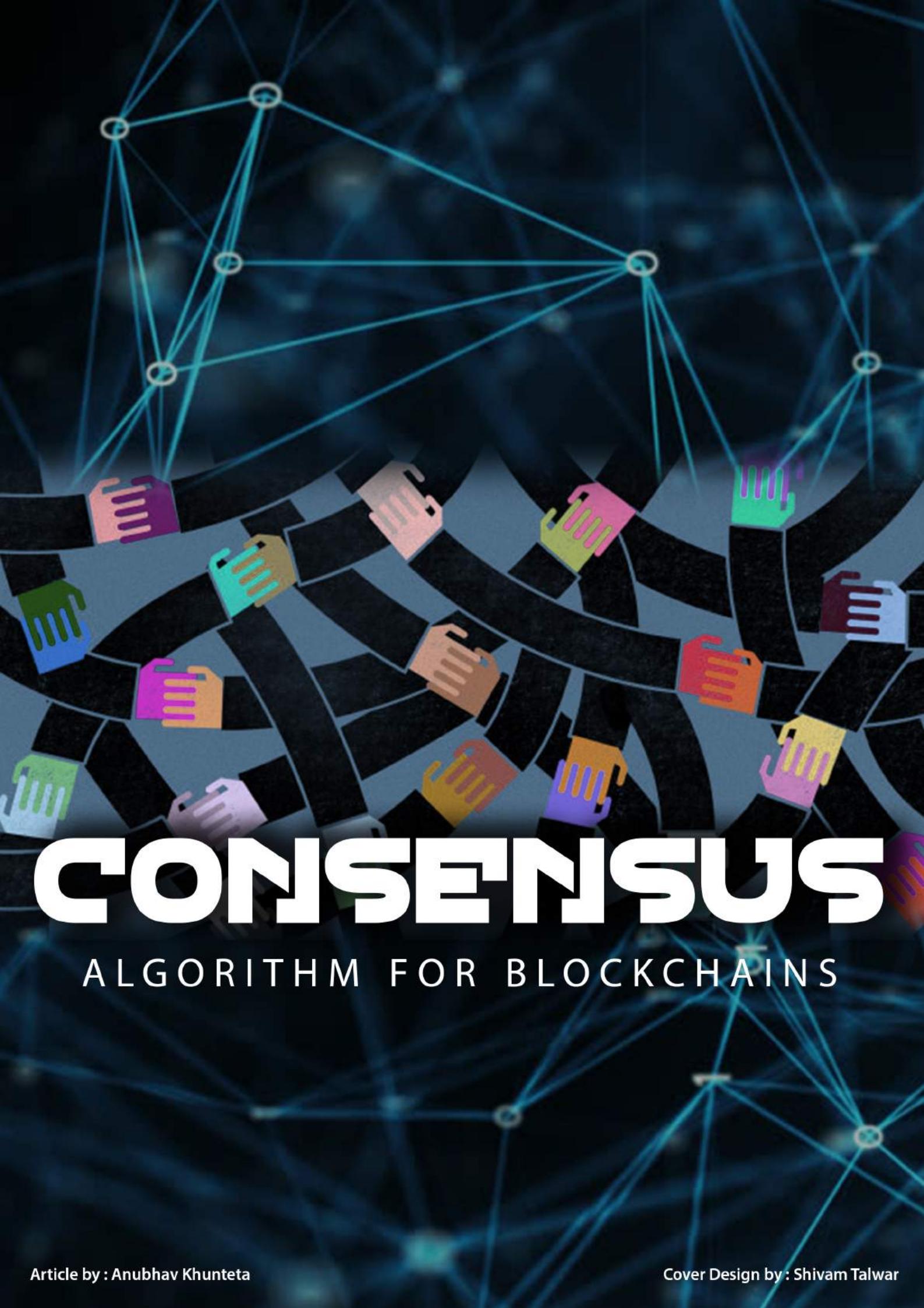
**What might a computerized cloud look like without servers in the inside however just the greater part of our PCs strung together?**

**Start making chain of your thoughts, innovate as much as you can! Keep innovating the ideas before the wave of blockchain submerge your brain encrypt your thoughts!**



**Blockchain**





# CONSENSUS

ALGORITHM FOR BLOCKCHAINS

Consensus is a fundamental problem in fault-tolerant distributed systems. Consensus involves multiple servers agreeing on values. Once they reach a decision on a value, that decision is final. Typical consensus algorithms make progress when any majority of their servers is available; for example, a cluster of 5 servers can continue to operate even if 2 servers fail. If more servers fail, they stop making progress (but will never return an incorrect result).

Consensus typically arises in the context of replicated state machines, a general approach to building fault-tolerant systems. Each server has a state machine and a log. The state machine is the component that we want to make fault-tolerant, such as a hash table. It will appear to clients that they are interacting with a single, reliable state machine, even if a minority of the servers in the cluster fail. Each state machine takes as input commands from its log. In our hash table example, the log would include commands like set x to 3. A consensus algorithm is used to agree on the commands in the servers' logs. The consensus algorithm must ensure that if any state machine applies set x to 3 as the n-th command, no other state machine will ever apply a different n-th command. As a result, each state machine processes the same series of commands and thus produces the same series of results and arrives at the same series of states.

Consensus is a procedure to reach in a common agreement in a distributed or decentralized multi-agent platform like blockchains as we see here. Like if there is an argument between a few individuals, then to reach a common solution, they could take a poll, similarly we have consensus for online solution to such argument of commands. Blockchain is a long chain formed of several nodes that have been a result of some transaction taken place in the network.

The need for consensus arrives due to the following reasons: -

- 1. Crash Fault:** A node suddenly crashes or becomes unavailable in the middle of a communication.
- 2. Network or Partitioned Faults:** A network fault occurs (say the link failure) and the network gets partitioned.
- 3. Byzantine Faults:** A node starts behaving maliciously.

A few of the Consensus algorithm used in blockchains are:-

## 1. PAXOS

It was the first algorithm proposed and applied to work by L. Lamport in 1989. It was applied to crash or specifically network faults. Its objective is to choose a single value under crash or network fault, like if we have entries from two or more nodes for transaction on the same node, then there is a network crash which will be handled using this algorithm. System processes include

- Making a proposal
- Accepting a value
- Handling Failures

## 2. RAFT

It was designed as an alternative to Paxos. It gives a generic way to distribute a state machine among a set of servers. It also ensures that every server agrees upon same series of state transitions.

There are several more consensus algorithm which made the use of blockchain possible in areas other than the cryptocurrency.





When it comes about online gaming platforms, the only name that nowadays comes to mind is PUBG, but there are some other platforms also, like Roblox. Roblox is the largest online platform for gaming. Here, you not only get to play but you can also create games. There are over 15 million games created by its users and this number keeps on increasing. The online gaming platform, Roblox stepped into the virtual world in September 2006. But the history of its creation and testing traces back to 2004 when its co-founder and CEO David Baszucki tested the demo version under the name of DynaBlocks. In 2007, further experiments were performed and then it was made available to PCs under the name 'Roblox'. Talking about today, there are more than 64 million active players on this envisage gaming platform. It also allows the user to do further customization inside the game.

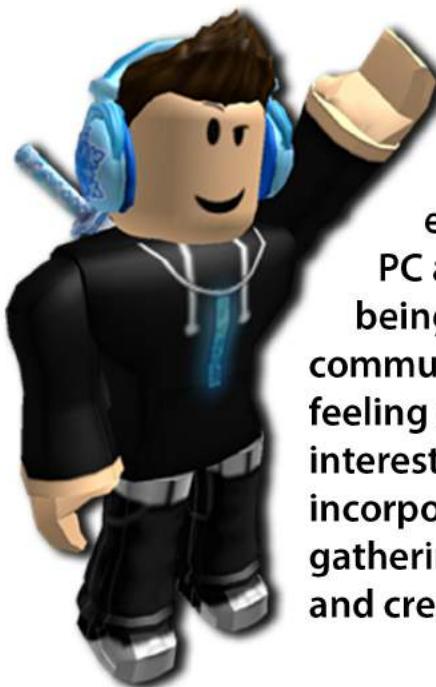
Basically, it is a game creation platform which enables anyone to create their own games on it. Its proprietary engine 'Roblox Studio' is used for the same. It enables you to transform your dreams into reality with the help of its developing tools. It also gives the user the feature of testing his or her game in a completely isolated environment before launching it. Roblox Studio can be downloaded easily from the website of Roblox after creating an account.

Scripting language 'Lua' is used for developing the games. 'Lua' is a flexible programming language that can be integrated easily with the games making them more suitable for the online platform.





Apart from just creating and playing the games, you can create your own virtual items! Shirts, T-Shirts, trousers, Hats and lot of stuff can be created. Just like buying and selling on any other online shopping portal, here also these items can be sold and bought. There are certain norms regarding selling and buying of items. Anyone can buy Shirts, T-Shirts, and trousers but only a certain type of players having the membership of Builders Club can sell them. Hats, gear and some other stuff can be sold only by registered admins. Now you might be wondering how do we purchase? The answer to this question is 'Robux'. Robux is the virtual currency of the gaming kingdom of Roblox. Players can acquire Robux through basic operations like purchasing in real life, selling their items to other players or by earning credits through membership. Builders Club members earn a daily stipend in the form of Robux.



Roblox games are picking up ubiquity at a quick rate. This is because of the numerous advantages that players get when they play these games. The games are exceptionally captivating and engaging. Playing games on PC alone and that too offline was a traditional thing which is being replaced by online gaming rapidly. The cosmic community of players on platforms like Roblox increases the feeling of competition among themselves and this makes it more interesting. A portion of the gaming activities that guarantee fun incorporate creating items, investigating, battle, combat and asset gathering. In simple words, Roblox is a complete package of fun and creativity.

# THE CHAINED BLOCKS

# OVERVIEW

A blockchain is a decentralized, distributed and public digital ledger used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the consensus of the network.

The work on a cryptographically secured chain of blocks was first described in 1991 by Stuart Haber and W. Scott Stornetta. They wanted to implement a system where documents' timestamps could not be tampered with or backdated. In 1992, Bayer, Haber and Stornetta implemented Merkle trees, which resulted in improved efficiency by allowing several documents to be collected into one block. The first ever blockchain was conceptualized by Satoshi Nakamoto in 2008. It was the following year wherein Nakamoto implemented a core component of the crypto currency bitcoin, where it serves as the public ledger for all transactions on the network. In August 2014, the bitcoin blockchain file size, containing records of all transactions that have occurred on the network, reached 20 GB. In January 2015, the size had grown to almost 30 GB, and from January 2016 to January 2017, the bitcoin blockchain grew from 50 GB to 100 GB in size.

A blockchain, thus, is a growing list of blocks, which are linked using cryptography. Blockchains which are readable by the public are widely used by crypto-currencies. Private blockchains are suggested for business use. A blockchain database is managed using a peer-to-peer network and a distributed time stamping server. They are authenticated by mass collaboration powered by collective self-interests. The use of blockchains confirms that each unit of value was transferred only once, solving the long-standing problem of double spending. Blockchains have been described as a value exchange protocol. This blockchain-based exchange of value is far quicker, safer and cheaper than traditional systems

# TYPES OF BLOCKCHAINS

At present, we can witness three types of blockchain networks:



## Public Blockchains

A public blockchain has absolutely no access restrictions. Anyone with an internet connection can send transactions as well as participate in its execution. Usually, such networks offer economic incentives for those who secure them. Some of the largest, most known public blockchains are Bitcoin and Ethereum.

## Private Blockchains

A private blockchain comes with permissions. There are restrictions in joining it unless invited by the network administrators. This type of blockchains can be considered a middle-ground for companies that are interested in the blockchain technology in general but are not comfortable with a level of control offered by public networks. Typically, they seek to incorporate blockchain into their accounting and record-keeping procedures without sacrificing autonomy and running the risk of exposing sensitive data to the public internet.

## Consortium Blockchains

A consortium blockchain is often said to be semi decentralized. It involves permission too but instead of a single organization controlling it, a number of companies might operate a node on such a network. The administrators of a consortium chain restrict users' reading rights, moreover only allow a limited set of trusted nodes to execute a consensus protocol.



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# VOICE TECHNOLOGY RESHAPING THE BUSINESS

# VOICE TECHNOLOGY RESHAPING THE BUSINESSES

A huge gulf exists between what businesses know about voice-enabled technologies, and what they do about it.

To illustrate that fact, Globant surveyed more than 600 senior decision makers and found that while huge majority of respondents see big benefits to voice technology, only 31% use it daily at work. It's no secret that voice technology is valuable. Just look at the consumer smart speaker market. More than 43 million Americans now own one.



Many of the people who will eventually use voice technology at work are already using it every day at home. Google says some 20% of all searches today are voice searches. Within two years, 30% of all web browsing will be done without a screen, according to Gartner, along with half of all searches, according to ComScore. And yet only a tiny fraction of this is being done at work for professional purposes. Smart speakers - such as the Amazon Echo line and related devices, Google Home devices and the Apple Home Pod - are directly aimed at consumers. But all the major companies are working on developing platforms for businesses and enterprises.

## THE PRODUCTS:



Pindrop says that three-quarters of all businesses are planning to invest in customer-facing voice systems based on Cortana, Google Assistant and Alexa. Smaller but significant percentages are investing in similar systems based on IBM's Watson, Apple's Siri and even Samsung's Bixby. IBM's Watson Assistant is a white label tool for enterprises to build voice-activated virtual assistants using their own datasets. It's basically Watson Conversation and Watson Virtual Agent cobbled together, and uses IBM's analytics APIs.

IBM says the tool is preferable to using Alexa for Business because it doesn't give the data and control to Amazon - or IBM, for that matter. Cisco's Spark Assistant is focused entirely on meetings inside enterprises. The company intends to build it into all its conference room devices and make it available on any client device. The Spark Assistant is especially interesting, because it's based on the work of a company called MindMeld. Five years ago, MindMeld was an experimental app I used; it would listen to a conversation and kind of free-associate with search results based on what was said.



Further development of this concept, especially if in-house data were employed, would make an amazing meeting tool, where a screen would be constantly refreshed with facts and context about whatever's being discussed at the moment. In a few years, voice technology will enable intelligent products like Spark Assistant to actually participate in meetings, interjecting facts, making suggestions and answering questions.

The assistant can also record meetings with a command, and the product will be able to take action items, send meeting summaries and help plan future meetings, according to the company. Even Mozilla is building a voice-activated web browser called Scout, according to a leaked agenda item for a company all-hands meeting in San Francisco recently

Everybody knows these products are here or coming soon. And the consensus is they'll make a big impact. But what's poorly understood is the glaring problem we're facing with one application - voice search - and the true benefit of voice-enabled technology. Let's start with the Big Problem with voice technology: search.

## THE SEARCH PROBLEM :-



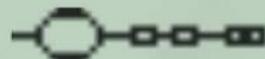
The unresolved problem with voice-activated search, which is a major part of how people do and will use virtual assistants, is that the result is a single answer, not an endless list of ranked options. That sounds like a small thing; in fact, it's a huge problem that nobody has a solution for.

Search result rankings today are highly contentious, the source of major investigations and fines when companies like Google are found to favour their own results unfairly. Such cases are almost always brought by Google's competitors, who feel that the order of results on the first page of results is unfair. Such complaints are likely to grow when virtual assistant-based replies represent not all results ranked, but a single result chosen by companies like Google. This is why the new realm of voice search optimization will become a make-or-break skill and task for enterprises hoping to stay relevant.

Businesses are already uneasy about the power of search engine companies like Google because their search algorithms determine the rank or order of search results. With voice search, such companies will choose the one and only result.

While voice search is probably the No. 1 application for voice technology today, in the future it will be stalled and hampered by the one-result problem. For non-search tasks, however, voice technology will be far more transformative than expected.

## THE PROMISE:

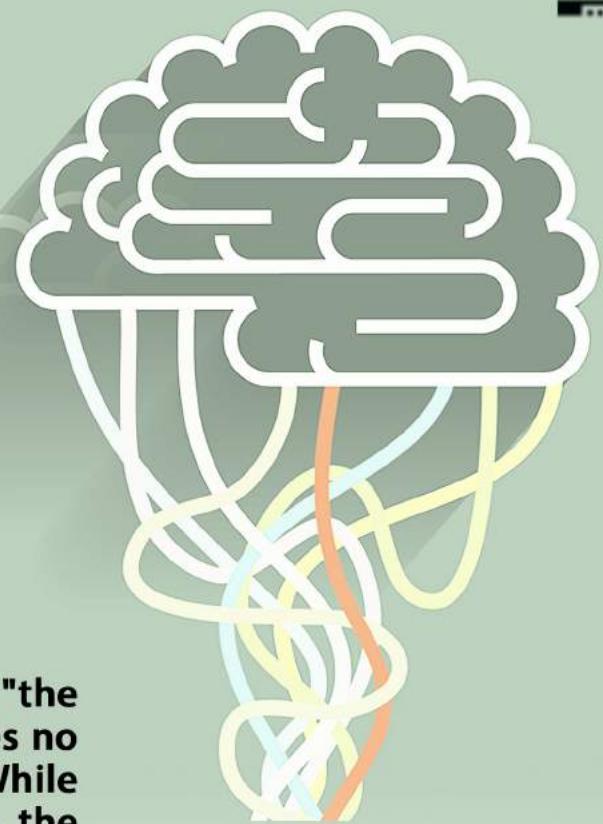


Amazon's CTO, Werner Vogels, calls voice the "the universal user interface." It's the UI that requires no training, and which almost anybody can use. While voice interaction is, in fact, a user interface, the impact will go far beyond how people interact. It will change how companies' function.

Voice-activated technologies will facilitate the smart office, where IoT devices will transform how everything works. Office management will be transformed by intelligent devices, which will increasingly enable voice interaction for finding out basic facts about office equipment, including location, service status, who the users were and others.

Voice-based note-taking means meeting participants are free to participate, instead of keeping their eyes glued to a screen and their hands glued to a keyboard for note-taking. And voice will transform business communication. Increasingly, instead of every user crafting exact wording for email or, say, a Slack communication, voice technology will enable a command and description - for example, "tell Janet I'd like to meet tomorrow afternoon" - and the virtual assistant will arrange the meeting. This kind of A.I. assisted communication will increase collaboration. It will increasingly enable employees who used to be considered disabled, and unlock new talent for an organization. In manufacturing and distribution centers, much of the work conducted with a screen, keyboard and mouse will be replaced by a spoken conversation with an agent, freeing up hands for other duties and enabling employees to stay focused on the job.

Voice technology will similarly transform customer service, training, data access, identification and authentication and nearly all aspects of IT. Everyone who interfaces with a company using voice technology - whether C-level executives, rank-and-file employees, customers, partners or the government - will enjoy a sense of intimacy, personalization, frictionless data access and even a sense of fun.





We'll move from everyone focusing on using equipment operation skills to focusing instead on problem solving, creative thinking and learning. Over the next three years, enterprises will increasingly adopt voice-enabled technologies. In advance of this change, it's time we stop thinking about voice tech as a great boon to search - it's not. And we should also stop thinking about it as nothing more than a user interface - it's not that, either. In reality, voice-enabled technology is part of a total and largely positive shift in how enterprises will operate, how business people interface with both data and each other and how customers are ultimately served.



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