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# An Introduction to Bitcoin

# Why Bitcoin Will Disrupt...Everything

An introduction to cryptocurrencies and blockchain technology and an overview of how they are changing business and finance

### CBOE OEX PIT circa 1996



### CBOE OEX PIT circa 1996



## CBOE OEX PIT March 27, 2017



# An Introduction to Bitcoin

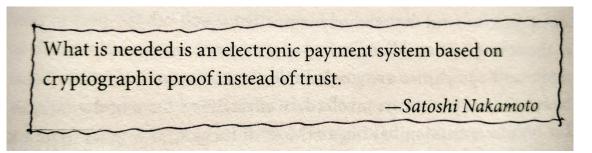
## • The Creation of Bitcoin

What is Bitcoin?

Centralized vs
 Decentralized

# The Creation of Bitcoin

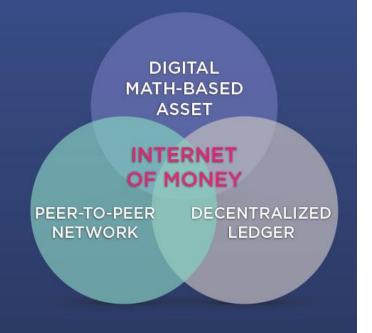
The birth of bitcoin occurred on the 31st of October, 2008 (a time period of great <u>economic distress worldwide</u>) when a pseudonymous creator using the name Satoshi Nakamoto published his <u>Bitcoin Whitepaper</u> and shared it on an obscure cryptography <u>mailing list</u>.



This seemingly small event set into motion a worldwide financial and technological revolution which spreads and grows <u>exponentially stronger to this day</u>.

# WHAT IS BITCOIN?

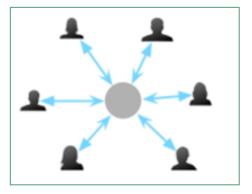
- Bitcoin (capital "B") is a peer-to-peer network that maintains a public decentralized ledger of digital math-based assets known as bitcoins (lowercase "b"). The integrity of this ledger is backed and secured by a subnetwork of computers (miners) who audit and archive its transactions for a reward.
- The supply of bitcoins is fixed at 21 million and each bitcoin can be divided into a hundred million pieces.
- Their ownership cannot be changed within the ledger without instructions from their current owner that have been cryptographically authenticated (digital signatures) by a majority of nodes on the Bitcoin network. In essence, "sending a bitcoin" is sending instructions to the network to make a change of custody in the public ledger.
- These attributes make the Bitcoin network a financial network, or the "Internet of Money".



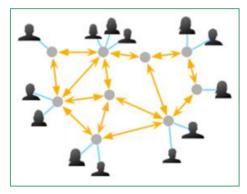
Bitcoin's most important characteristic, and the thing that makes it different from conventional money, is that it is *decentralized*. No single institution controls the bitcoin network.

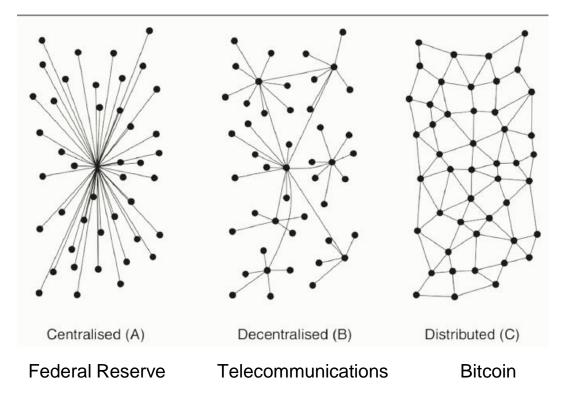
Decentralization allows for users of bitcoin to operate outside of the confines of bank holidays and fees. **Bitcoin users need no form of identity or residency documentation**.

#### CENTRALIZED



DECENTRALIZED

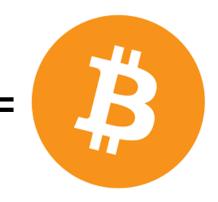




Send money {value} from any point in the world, to another point instantaneously, securely and for minimal fees, without a bank.







Bitcoin is a form of digital currency, created and held electronically.

No human entity controls it or dictates its rules. It is based entirely upon complex mathematical processes. Violations of the math are rejected by the system as invalid, making forgery statistically impossible.

Bitcoins aren't printed, like dollars or euros – they're produced by people, and increasingly businesses, running computers all around the world, using software that solves mathematical problems (a process known as "mining").

Some groups/governments classify cryptocurrency as currency while others consider cryptocurrency to be a new classification of commodity, or "Digital Asset."

The entire bitcoin network runs on a global peer-to-peer distributed ledger system called a "*blockchain*" which can be easily accessed from any location via the internet.

The transactions which take place between the users are verified and added to the global blockchain ledger by "*miners*" who, by contributing their computing power, earn small transaction fees and generate new bitcoins.

The distributed nature of the blockchain ledger adds a level of resiliency and redundancy that is unmatched in the current payment processing space.

### Centralized -vs- Decentralized

#### FEDERAL RESERVE

The Federal Reserve calculates all their payment processing at <u>100 Orchard Street</u>, <u>East</u> <u>Rutherford</u>, <u>New Jersey</u>. They also have back-up systems that can be brought online within 60-90 minutes at the Federal Reserve Banks of Richmond and Dallas. If those **three** centers were compromised or destroyed then the entire monetary system of the United States would be completely nonfunctional.

#### **BITCOIN NETWORK**

The Bitcoin network cannot be so easily compromised in this way as it has a <u>current total</u> of 5920 mining nodes (or "processing centers") with more being added every day by various individuals and companies around the world. In order for the Bitcoin network to be taken out by a physical attack, all of the **thousands** of Bitcoin nodes scattered around the world would have to be destroyed.

Bitcoin system equally distributes authority to all users.

Entire system is governed by the protocol which clearly lays out the never-changing rules of the system.

Will never favor the system over the users of the system because the users ARE the system.

#### 

"There is not a single instance until bitcoin, of a truly trustworthy form of money, one whose value was constrained not by the laws and weaknesses of man, but by the universal laws of mathematics."

CNBC News – December 9, 2014

Source: <u>CNBC News</u>

#### THE AGE OF CRYPTOCURRENCY

New York Times - Best Seller (2015)

"At its core, cryptocurrency is not about the ups and downs of the digital currency market; it's not even about a new unit of exchange to replace the dollar or the euro or the yen. It's about freeing people from the tyranny of centralized trust. It speaks to the tantalizing prospect that we can take power away from the center – away from banks, governments, lawyers, and the tribal leaders of Afghanistan – and transfer it to the periphery, to We, the People."

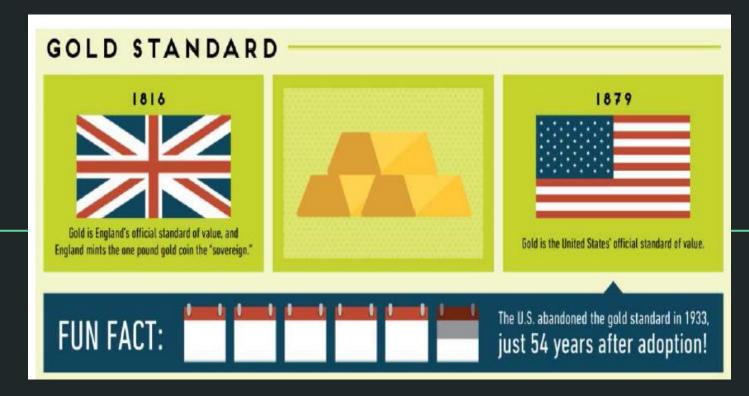
#### AUTHORS

#### Paul Vigna Markets reporter The Wall Street Journal

Michael Casey

Former global finance columnist <u>The Wall Street Journal</u>

# Bitcoin is the New Gold



# **Bitcoin Use Cases**

- Sending money "person to person" without the need for intermediaries
- Portable currency and immutable record of wealth
- Reduce dependency on FX markets, T+3, reduced wire transfer friction
- Immediate use of "cash"
- Solves the "double spend" issue
- No honeypot of personal private data
- Allows efficient micro-payments of .00000001 of a bitcoin
- Doesn't discriminate on gender, politics, religion, caste, age or geography
- Doesn't require a SS#, home address, email address or mother's maiden name

# An Introduction to Blockchain

# An Introduction to Blockchain

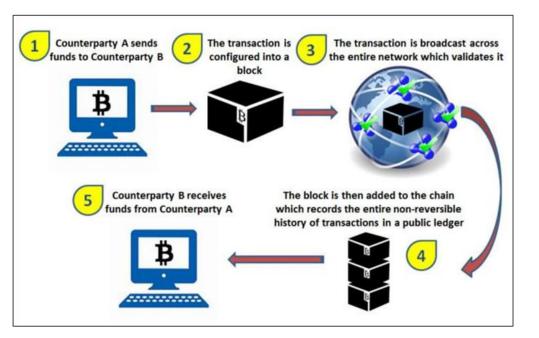
- A Distributed Ledger
- Public Key Cryptography
- Fraud Prevention
- Thousands of Blockchains
- Supply Chain Solutions
- Banking the Unbanked

Global Remittance

## **Distributed Ledger**

All digital assets are defined and governed by a protocol which acts as a peer-to-peer distributed ledger system called the blockchain.

Bitcoin is considered the father of the digital asset class because bitcoin was the world's first functioning application of the blockchain protocol.

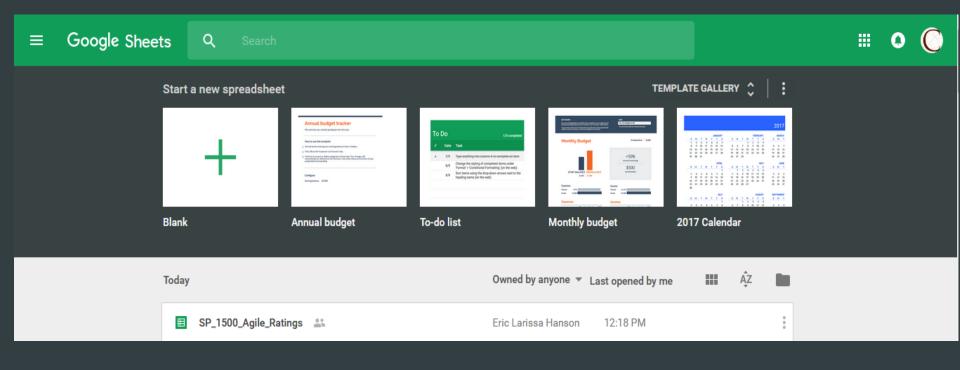


Source: Goldman Sachs Global Investment Research

## Excel- Centralized Ledger

	Book1	-	-	-	_	
	A	B	С	D	E	F
1	3/13/2017 18:04					
2	Buyer Address	Sender Address	Amt Sent \$ 422.85		Transaction Fees	
3	19oXekcFt7kbKSgXC1rbviLHmLaPUw7sjg	1Fq627T44dw4eerA7Wk6MX7ATjMYPyokvs	\$ 422.85	\$ 420.13	\$ 2.72	
4						
6	1NrPF9iBgjVfpEkkV2JkekYFFvvuM9f25T (\$ 68.21 - Output)					
7	1s8uztgKZzCmbdJkwDoN5HD5AvHnRonrd (\$ 0.89 - Output)					
8	1LiYrzHY9guwEUpX42DTnmGNZmKbPNBQQQ (\$ 77.15 - Output)					
9	1MbnFc8xHdDBj7KAQL8SDGsz8aYUYYj3uB (\$ 2,169.97 - Output)					
-	1EDtYido8GCFENAVmn7qTjuwsTLYedPFhP (\$ 285.37 - Output)					
	13LJk9p4xkVtaggwM2f8nZCZB2ziwLkhPJ (\$ 4.05 - Output)					
	18S1ktfQGyZRdFRGenHzsKVA37vYVXajSD (\$ 12.40 - Output)					
	12iD9VuYUCLpXJeT95EA3NgGrLzrE7bLuS (\$ 12.19 - Output)					
14	1LJyDENCuHHpzcjTpPB9WLwv1CUZ4Cwtnj (\$ 346.45 - Output)					
15	1BCaC7JkmAwZ87dzutHXH7XWk5dWMj5cCQ (\$ 12.40 - Output)					
16	1KtarYV8k4NUXCXfnNQYf1UGSqfEmBtF3X (\$619.83 - Output)					
17	12ZxaeeA55MhWampGyUD5oPxfsuVHpLZS3 (\$ 7.75 - Output)					
18	1JYcRwMVjbFp2BCDThRAp8k5MYc8vj1mRt (\$864.79 - Output)					
19	1D78zbZJBscrjA8yw4aLu6hxELs7XtF9r1 (\$8.58 - Output)					
20	19u87GjgCRbjcr7xfynbAJGjKLGQRNhTSD (\$ 101.86 - Output)					
21	1Dw1D67uxMqpov9ibpu6ubWEi5jVe792Qr (\$ 221.22 - Output)					
22	14zdkm131L32mEFnEAqnaH6ZzJ6LgwuX6q (\$ 102.28 - Output)					
23	18Ajn2N7HWUHuyoyVK4g8cuT9FvbcW9Arp (\$6.01 - Output)					
	1MoPCQQGZkJsqWNAMtLei7ATecWovLeMTu (\$160.83 - Output)					
25	1AUWuY9MLc2AzW9Yi41ivqS9wMkEV5EPke (\$ 74.50 - Output)					
14 -	Genesis Block Block 1 Block 2 Block 3 Block 457084	4 / Block 457085 / 🖏 /				

### Google Sheets-Decentralized Ledger



## Blockchain - Distributed Ledger

#### Transaction View information about a bitcoin transaction

1Ecc07TAAdeutoorA7M	KENVZATINVPusikus /E. 493.85 Output	10 aVakaEt7kbK2aVC1rbuil UmLaBLbu7aia	- (Unspent) \$ 420.13		
1Fq027144dw4eeIA7W	k6MX7ATjMYPyokvs (\$ 422.85 - Output)				
			1 Confirmations \$ 420.13		
Summary		Inputs and Outputs			
Size	191 (bytes)	Total Input	\$ 422.85		
Received Time	2017-03-13 18:04:01	Total Output	\$ 420.13		
ncluded in Blocks	457085 ( 2017-03-13 18:11:27 + 7 minutes )	Fees	\$ 2.72		
Confirmations	1 Confirmations	Fee per byte	1,151.832 sat/B		
Relayed by IP	72.174.135.148 (whois)	Estimated BTC Transacted	\$ 420.13		
Visualize	View Tree Chart	Scripts	Hide scripts & coinbase		

# Blockchain Could Be a New Operating System for the Planet Says Jeremy Wilson, Vice Chairman of Barclays Corporate Banking

"It will change not just finance, but the lives of almost everyone, directly or indirectly"

By Richard Kastelein - February 20, 2017

#### Harvard Business Review

**INFORMATION & TECHNOLOGY** 

# The Promise of Blockchain Is a World Without Middlemen

by Vinay Gupta

MARCH 06, 2017





"On the one hand, eliminating the middleman would result in lower costs, increased sales, and greater consumer satisfaction; on the other hand, we're the middleman."

# **Blockchain Attributes**

- Integrity of network is encoded in every step of the process
- Solves "double-spend" problem
- Distributed computing power spread thinly across a global network
- Network security provides no single point of failure
- Each user gets two cryptographic keys. One private; one public
- Ultimate privacy protection because identity is not needed
- Real time audit trail and reconciliation of transactions
- To be "in" a blockchain network, means to <u>obey</u> the rules of the network protocol
- Multi-signature feature available to exercise control over release of funds
- Immutable database gives control back to the owner of the data
- Data is spread so thin, there is no central point of attack

# Blockchain Use Cases

- Trusted attestation between unknown parties
- Banks can reduce \$20 billion in back office expenses
- Remittances can take 3 to 7 days to settle; blockchain can settle in a fraction of a second
- Stock, option, bond and futures Exchanges can trade 24/7/365 with a perfect audit trail
- T+3 stock, option and futures trades can clear in 10 minutes
- SWIFT payments takes days to clear. Blockchain can reduce to minutes
- Real time risk management upon execution of trade
- Greatly reduces counterparty risk of default before settlement
- Proxy voting on a smartphone by share holders possible
- Pensions and stock lending departments will know location and owner of assets
- Execution of "smart contracts" will replace need for escrow companies
- 500M trillion calculations per second dedicated to solving social, biotech & health care
- Blockchain voting restores election privacy, transparency & absentee voting
- No "shredding parties" by companies under investigation
- No email or data servers wiped clean
- Immutable providence of art, jewelry, music, IP, land title, food, medicine, anything of value

# Blockchain Use Case

Chicago's Cook County to Test Bitcoin Blockchain-Based Property Title Transfer

4390 REPUBLIC OF THE DEPARTMENT OF J LAND REGISTRATION A REGISTRY OF DEEDS FOR THE <u>PROP</u> **Transfer Øertifin** No. <u>2960</u> n accordance with Presidential Deci

Through an exclusive partnership with real estate tech startup Velox.re, Chicago's Cook County will test the use of the Bitcoin blockchain for transferring and tracking property titles and other public records. The Cook County Recorder's Office is the second largest such office in the United States, and it it will be the first in the country to experiment with blockchain technology.

Source: Bitcoin Magazine

# Blockchain Disrupts Shipping Bill of Lading



IBM and Maersk have teamed up to build a blockchain network to improve container shipping, a project that could save the entire industry billions of dollars every year.

IBM estimates that blockchain, if incorporated successfully, could save the container shipping industry billions of euros annually. It will do this by managing and tracking the trail of tens of millions of containers that constantly navigate the waves.

# CRYPTO -CURRENCY

**CRYPTO** - Comes from the root word "cryptography", which is the science of codes and encryption. Therefore, just as the word suggests, cryptocurrency is a form of money built upon the modern mathematically derived systems of encryption.

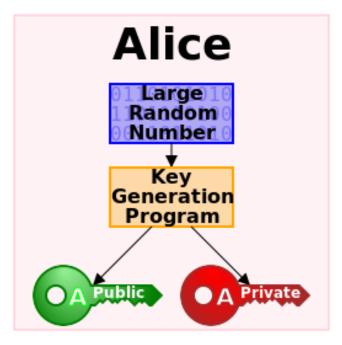
# Public Key Cryptography

- It was invented in 1970 by James H. Ellis, a British cryptographer at the UK Government Communications Headquarters (GCHQ).
- It's hard to crack! If you used a modern supercomputer and attempted a "brute force" attack on this type of cryptography it is estimated that the attempt would take roughly <u>0.65 billion billion</u> years to successfully complete.
- For 38 years this form of cryptography was used almost exclusively for communication purposes until Satoshi invented bitcoin in 2008.
- Public Key Cryptography is the foundation of blockchain technology.
- Because of this secure foundation, Bitcoin has never been successfully "hacked" and likely never will be.

# Public Key Cryptography

When a user generates a new bitcoin wallet they are given two keys.

- **PUBLIC KEY** = The bitcoin wallet address. It works similar to a bank account number, although unlike a bank account number you can share it with anyone in the world and nobody can use it to steal your funds.
- **PRIVATE KEY** = Essentially this is the "password" to your bitcoin wallet. Every time you send bitcoin from your wallet to your friend's PUBLIC KEY (or "bitcoin address") your private key is used to authorize the sending operation.

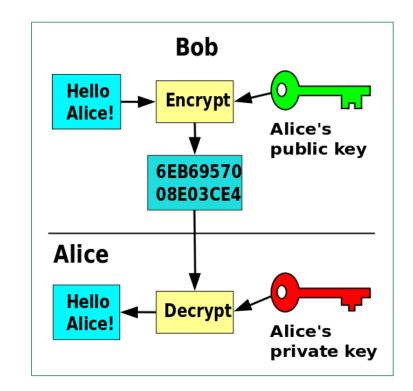


## Public Key Cryptography

This simple process is what makes blockchain possible.

Public key cryptography is used (behind the scenes) to authorize every single transaction that occurs on the blockchain around the world. When you "send" bitcoin, your key is used to authorize that "sending" action and no one else in the world is able to stop you or "fake" your private key.

Your PRIVATE KEY grants you access to subtract from the public ledger balance of your PUBLIC KEY. After doing so, the miners verify that your key is valid and then the global ledger is updated (usually within 10-40 minutes).



## What an Encrypted Key Might Look Like

746bb201a1e7231745592c8e3ca4fd2643acdc04e02f2f25842ca1a2b6104347 Translation: Ulivieri

Aa73e92c46d13ef8f32dc86466761e1beb7157c927c0c6d70ebefe3c2aba1bc7 Translation: Gettysburg Address

41386d91ee65265c8f4f644696ca4e52d2de6d80a2968e6d6702a95b4e607ef Translation: Book of Exodus

Bitcoin uses SHA-256 encryption. Whether you encrypt a single digit or the entire US Tax Code, the output is 64 hexadecimal characters.



Money stolen every minute of every day

(due to identity theft)

Source: Javelin strategy and research



## 2013 International Wire Transfer Took 23 Days



### **Bitcoin Takes 10 Minutes**



### **International Remittance**

#### "It is faster to mail an anvil to China that it is to send money through the banking system to China." *Erik Voorhees*

#### "Money is already digital, it's not like they're shipping pallets of cash when you do a wire." *Erik Voorhees*

"...you can send one-thousandth of a euro or one-millionth of a euro, you can send a billion or a trillion euros. The fee will be exactly the same, because fees depend on the size of the transaction in kilobytes, not on the amount or content." Andreas M. Antonopoulos

# Real Time Bitcoin Transactions

Latest Transactions							
edebd9887818dd876e38202c7	< 1 minute	\$ 994.61					
1a3597e4741e0690f135eab1a	< 1 minute	\$ 20,080.08					
3889bc95341b6389ddb80c3a5	< 1 minute	\$ 44.93					
14d6a206d8df8fcde97fbd7de	< 1 minute	\$ 511.69					
b3fa335b556ca31e3682fb707	< 1 minute	\$ 0.73					
8a10503349acaf4f78d2a1379	< 1 minute	\$ 96.71					
d26b8d7b97c225e36925a7cf8	< 1 minute	\$ 9.56					
0ec58a6989acbece0e475ca21	< 1 minute	\$ 40.15					
34beff579c913198aef2c2849	< 1 minute	\$ 23.36					
c9f8aa8a2e2b24b39ebe6001c	< 1 minute	\$ 58.25					

## Thousands of Blockchains

The simple, powerful technology of blockchain has already been applied in thousands of ways. Almost every version of blockchain brings another "token" or cryptocurrency along with it. These digital assets are all traded on global exchange platforms much like stocks and forex. Cryptocurrency trading takes place all day (24 hours) every day of the year.

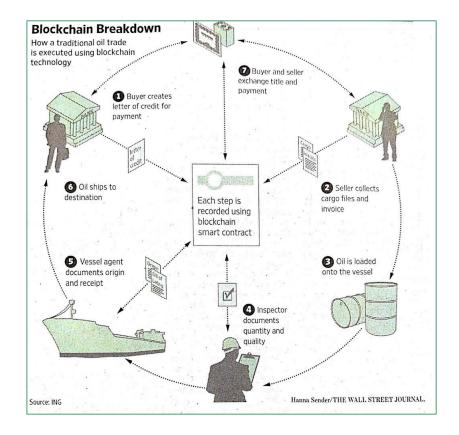
703 Currencies / 91 Assets / 3050 Markets Market Cap: \$29,602,503,800 / 24h Vol: \$553,418,080 / BTC Dominance: 66.7%								
CryptoCurrency Market Capitalizations								
Market Cap + Trade Volume + Trending + Tools + Search Currencies								٩
All ▼         Currencies ▼         Assets ▼         USD ▼         Next 100 →         View All								
<b>^</b> #	Na	me	Market Cap	Price	Circulating Supply	Volume (24h)	% Change (24h)	Price Graph (7d)
1	8	Bitcoin	\$19,723,514,492	\$1211.40	16,281,587 BTC	\$255,283,000	0.26%	m
2	÷	Ethereum	\$4,602,231,679	\$50.66	90,848,701 ETH	\$77,495,400	4.05%	m
3	-4	Ripple	\$1,228,219,270	\$0.032724	37,532,331,339 XRP *	\$11,590,100	-3.44%	mm
4	9	Dash	\$545,686,052	<b>\$7</b> 5.37	7,239,635 DASH	\$15,055,000	2.93%	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
5	0	Litecoin	\$511,665,668	\$10.09	50,706,657 LTC	\$62,300,600	-1.57%	month
6	•	NEM	\$308,799,900	\$0.034311	8,999,999,999 XEM *	\$7,851,530	25.16%	
7	٢	Monero	\$300,007,712	\$20.95	14,317,854 XMR	\$4,947,380	1.32%	mymm
8	\$	Ethereum Classic	\$260,538,047	\$2.87	90,816,197 ETC	\$13,461,300	9.03%	m
9	۵	Augur	\$135,845,600	\$12.35	11,000,000 REP *	\$556,646	3.26%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
10	P	PIVX	\$102,173,446	\$1.93	53,046,251 PIVX *	\$941,259	4.06%	m
								A. Mar

# Supply Chain Solutions

<u>The Wall Street Journal</u> explains how the blockchain is being implemented in the commodities markets with the help of IBM's Hyperledger Project.

Reduced involvement with supply chain from **3 hours down to 25 minutes**.

Supply chain costs were reduced by 30% during the testing of this new method.



## Banking the Unbanked

"2.5 billion of the world's adults don't use banks or microfinance institutions to save or borrow money" (Research from <u>McKinsey & Company</u>)

Unbanked people remain at an economic disadvantage because they have no way to easily conduct business on a global level (among other things)

Blockchain has provided a solution. Users are not required to have identification documents so they can exchange monetary value with cryptocurrency.

Traditional banks have yet to provide a working solution for this problem.

## **Global Remittance**

As the world continues to globalize through use of the internet, more people are sending funds across borders than at any other time in the history of the world.

The current monetary system requires long waiting times and often outrageously high fees in order for one to remit funds abroad.

Users are moving to cryptocurrencies in an effort to circumvent all fees and waiting times.

# Cryptocurrency as a Digital Asset

Bitcoin: The First Digital Asset
Bitcoin vs. Other Assets
Value By Design
Growing Global User Base
Historical Price

**"BITCOIN** is a remarkable cryptographic achievement and the ability to create something that is not duplicable in the digital world has enormous value, **Eric Schmidt** 

CEO of Google

# Cryptocurrency as a Digital Asset

# \$29,130,000,000

Cryptocurrency Market Capitalization

(April 19, 2017)

# \$54,031,301,382

Cryptocurrency Market Capitalization

(May 11, 2017)

# \$527,240,000

24 Hour Exchange Volume

(April 19, 2017)

# \$1,781.28

Price of one bitcoin

(May 12, 2017)

## Bitcoin vs. Other Assets

"Bitcoin, that nebulous digital currency that trades in cyberspace and is "mined" by code-cracking computers, emerged as a better bet this year than every major foreign-exchange trade, stock index and commodity contract. The electronic coin that trades and is regulated like oil and gold surged 79 percent since the start of 2016 to \$778, its highest level since early 2014, data compiled by Bloomberg show. That's four times the gains posted by Russia's ruble and Brazil's real, the world's top two hard currencies."

#### ~ Bloomberg

Source: <u>Bloomberg data</u> December 16, 2016, 5:00 AM EST

# Bitcoin vs. Foreign Currencies

#### Performance

**Bitcoin Hedged** 

	Symbol	Name	Last (\$)	1 Year	3 Year	5 Year
1	BITCOIN	Bitcoin	1,820.99	280.82	280.50	34107.46
2	FXA	CurrencyShares Australian Dollar Trust	73.78	-0.03	-21.19	-26.54
3	FXB	CurrencyShares British Pound Sterling Trust	125.60	-11.11	-24.24	-21.15
4	FXC	CurrencyShares Canadian Dollar Trust	72.12	-6.44	-20.97	-27.39
5	FXE	CurrencyShares Euro Trust	105.20	-5.69	-22.54	-18.17
6	FXF	CurrencyShares Swiss Franc	94.37	-4.68	-14.48	-11.03
7	FXS	CurrencyShares Swedish Krona Trust	108.25	-9.97	-28.48	-24.43
8	FXSG	CurrencyShares Singapore Dollar Trust	70.51	-2.97	-10.97	0.00
9	FXY	CurrencyShares Japanese Yen Trust	84.58	-5.15	-11.71	-31.26
10	GLD	SPDR Gold Trust	116.50	-4.60	-6.12	-24.13
11	SLV	iShares Silver Trust	15.45	-6.70	-16.12	-44.98
12	SPY	SPDR S&P 500 ETF Trust	239.38	15.92	27.36	76.52

Currency Comparisons (as of May 11, 2017)

#### **Rising Above** Bitcoin outpaced gold, U.S. stocks and the ruble in 2016



Source: Bloomberg data

# **Digital Scarcity**

The blockchain protocol dictates that the supply of bitcoin is limited to 21,000,000 bitcoins.

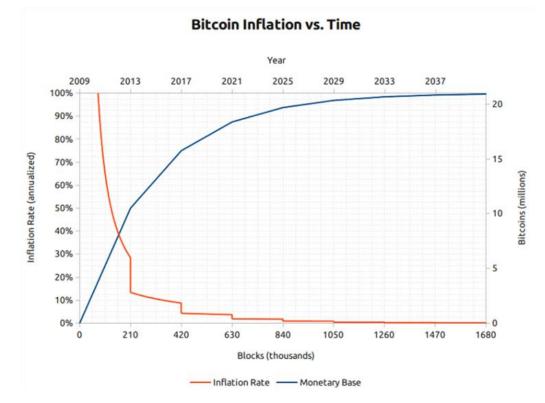
In addition to this limitation of the supply, the reward given to the miners who verify the transactions of the network is designed to decrease by one-half roughly every four years. As a result the supply of newly created coins will dwindle over time until all 21,000,000 have been mined.

Once new bitcoins are no longer being awarded to miners, the miners will be compensated by transaction fees instead of newly created bitcoins. While the supply grows less and the demand is growing larger, the value of bitcoin can only increase. Satoshi Nakamoto engineered this feature deliberately, and as we have seen, his purpose of continued valuation has worked flawlessly.

## **Digital Scarcity**

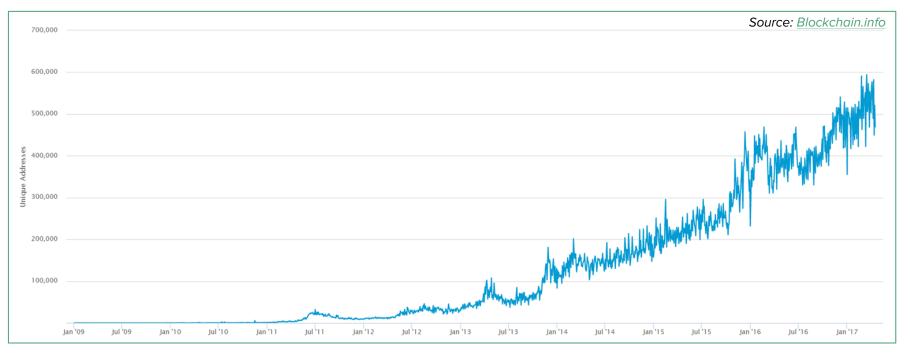
This is a graph that shows the chronological progression of the monetary base and inflation rate of bitcoin.

Source: Official Bitcoin Talk Forum



# Digital Scarcity: Growing Global User-Base

In 2016, the daily number of unique bitcoin addresses in use more than doubled from previous years which suggests a growing user base. A growing user base implies an increased demand.

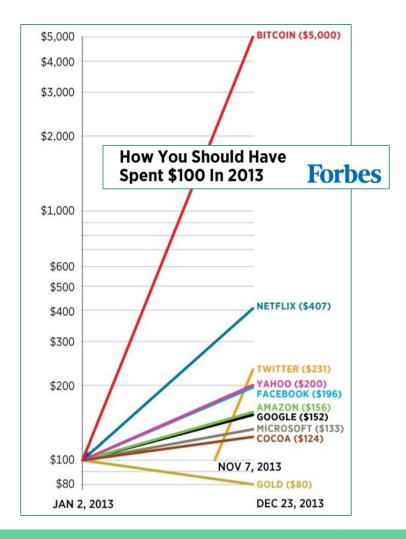


# **Historical Price Action**

While the daily price of bitcoin fluctuates wildly, the long term trends have been upward.

In an article written by Forbes magazine, Kashmir Hill illustrated the price action of bitcoin by comparing it to the performance of other major assets during the same time period.

Source: Forbes



# **Practical Application**



# **Financial Services Needs Disruption**

~ 3 billion global citizens with no banking facilities

2.5 billion more "underbanked" w/o credit or ID

• Western Union Fee 7% -30% per transaction

Nicaragua 60% of population lives below poverty line 19% have a formal bank account 14% able to borrow but have 93% own prepaid cellphones 10% of its GDP are remittances "It took Western Union 150 years to build 500,000 points of sale around the world. What is the point today, when more than half the world's population owns a cellphone?"

HOMEPAGE / News / Top stories / 21 days of M-Shwari: 645,000 clients, KSh. 150 million saved

# 21 days of M-Shwari: 645,000 clients, KSh. 150 million saved

/ Staff Writer

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*M-Shwari, the new banking product that seeks to widen financial access amongst Kenyans has roped in 645, 000 savers in a span of three weeks since launch in an emerging case study that sets the pace for accelerated financial inclusion within the Kenyan economy.* 

Since the launch of M-Shwari - a banking product of the Commercial Bank of Africa (CBA) offered through Safaricom's M-PESA platform - on November 27th, an average of 40,000 Kenyans have been signing up to the service daily, making its uptake one of the most compelling financial services propositions in recent years.

# **Direct Charitable Donations Instantly**

#### United Way To Accept Bitcoin Digital Donations

② SEPTEMBER 15, 2014 ▲ ZACH HALPER ④ (1) ● 0

United Way Worldwide (UWW) is joining the digital currency world, announcing currency.



www.thenonprofittimes.com

# 75% of Kenyan Economy Uses a Cell Phone



Source: CNN.com

### Be the first to use blockchain!

We recently launched **Mining Rig Solutions, LLC** to provide a turn-key mining solution designed for family offices and hedge funds, seeking a pragmatic approach to acquire tokens while providing an attractive ROI.

# Thank You!

Mining Rig Solutions, LLC

www.MiningRigSolutions.com