

# Bitcoin Currency & Blockchain Technology

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The logo for Glenmede, featuring the word "GLENMEDE" in a large, blue, serif typeface. The letters are closely spaced and have a classic, institutional feel.

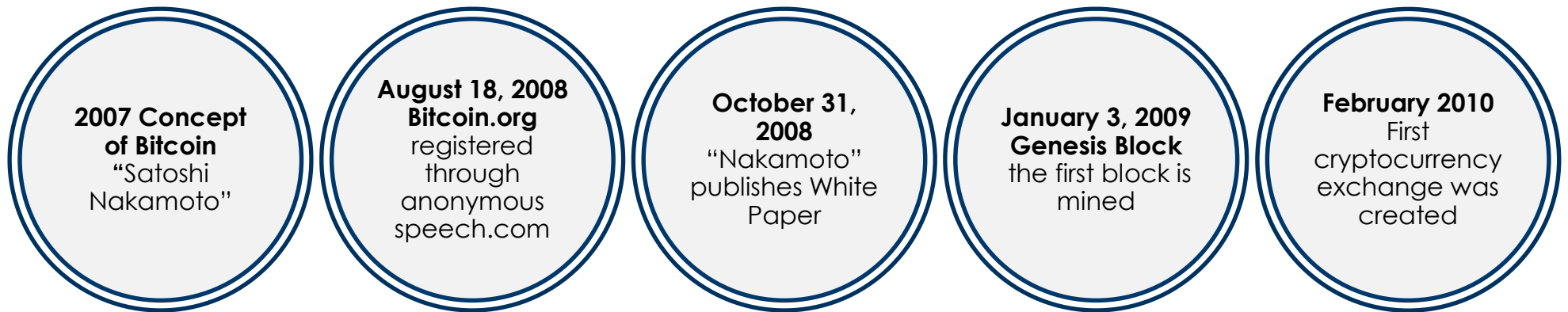
Founded on ideals.  
Built on ideas.

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**“How seriously should we take this [Blockchain]? I would take it as seriously as we should have taken the concept of the Internet in the 1990s.”**

— Blythe Masters, DAH <http://bit.ly/1JENgb4>

***Satoshi Nakamoto (whoever he or she is) made a significant contribution to the field of computer science by introducing the Bitcoin concept in 2007***



### **Bitcoin:**

- ❖ a form of **digital currency**
- ❖ **created** and **held electronically**
- ❖ **produced** ("**mined**") by **people**, and **businesses**, running computers all around the world, using software that solves **mathematical algorithms**
- ❖ **first example** of a growing category of money known as **cryptocurrency**



Bitcoin Mining Rig

# BITCOIN: DEFINING CHARACTERISTICS

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## Decentralized

- One central authority cannot manipulate monetary policy.
- Machine mine bitcoin and process transactions, making a network



## Fast & Easy

- A bitcoin address can be set up in seconds, no questions asked, and with no fees payable.
- Payments are processed in real time



## Anonymous

- Users can hold multiple bitcoin addresses, and there is no link to names, addresses, or other personally identifying information.



## Transparent

- Bitcoin stores details of every transaction that ever happened in the network in the blockchain.



## Non-Repudiable

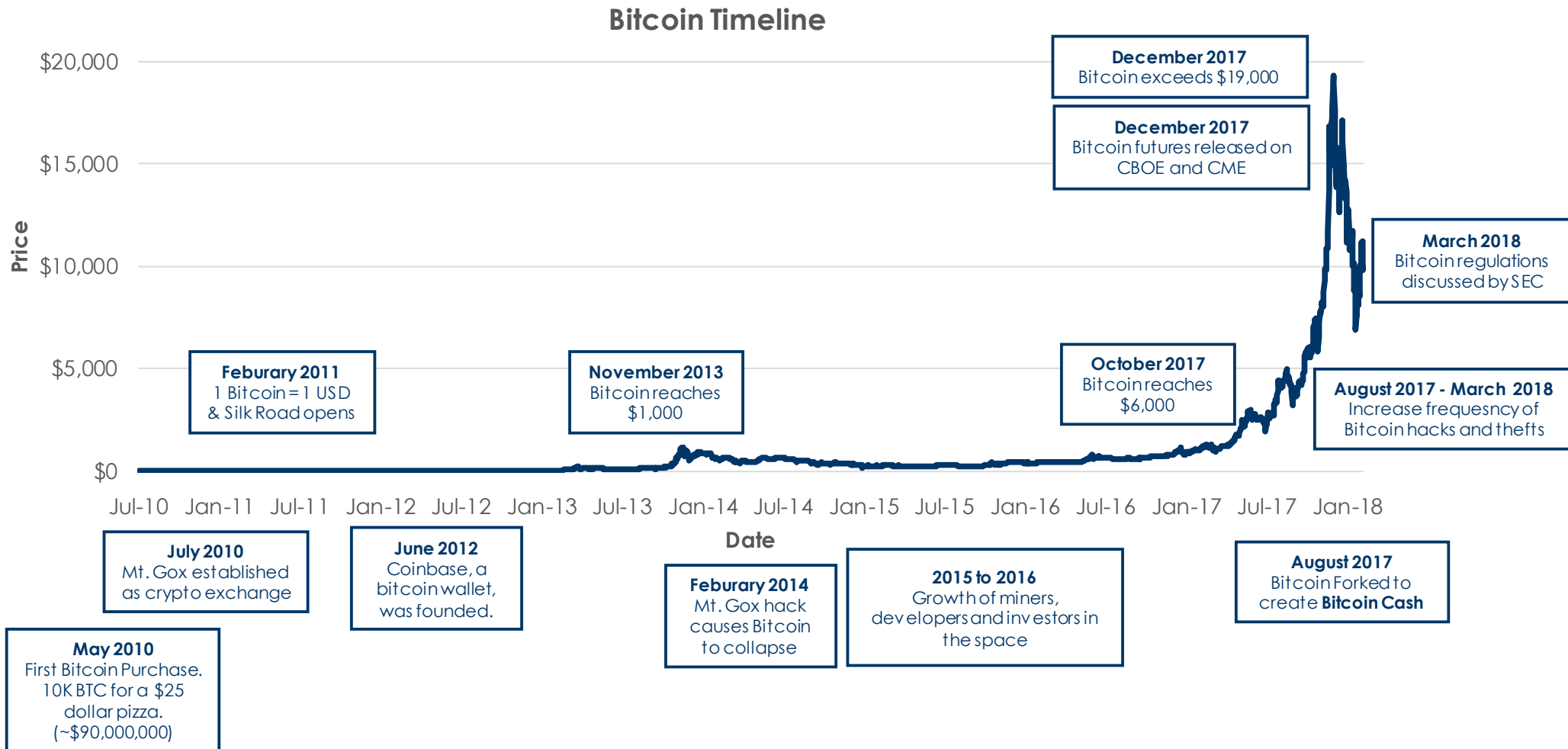
- After sending your bitcoins, there's no getting them back, unless the recipient returns them to you.



## Low Fees

- No transaction fees
- Minimal conversion fees

# BITCOIN (BTC) TIMELINE



# HISTORY OF RECORD KEEPING



# WHAT IS BLOCKCHAIN?

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A database or a ledger that maintains a continuously growing list of data records or transactions.

## So, it's a spreadsheet, like Excel?

In a way yes, but it has special qualities that make it better than traditional databases.



### SHARED PUBLICLY

Servers, or nodes, maintain the entries (known as blocks) and every node sees the transaction data stored in the blocks when created.



### DECENTRALIZED

There is no central authority required to approve transactions and set rules.



### SECURE

The database is an immutable and irreversible record. Posts to the ledger cannot be revised or tampered with – not even by the operators of the database.



### TRUSTED

Distributed nature of the network requires computer servers to reach a consensus, which allows for transactions to occur between unknown parties.



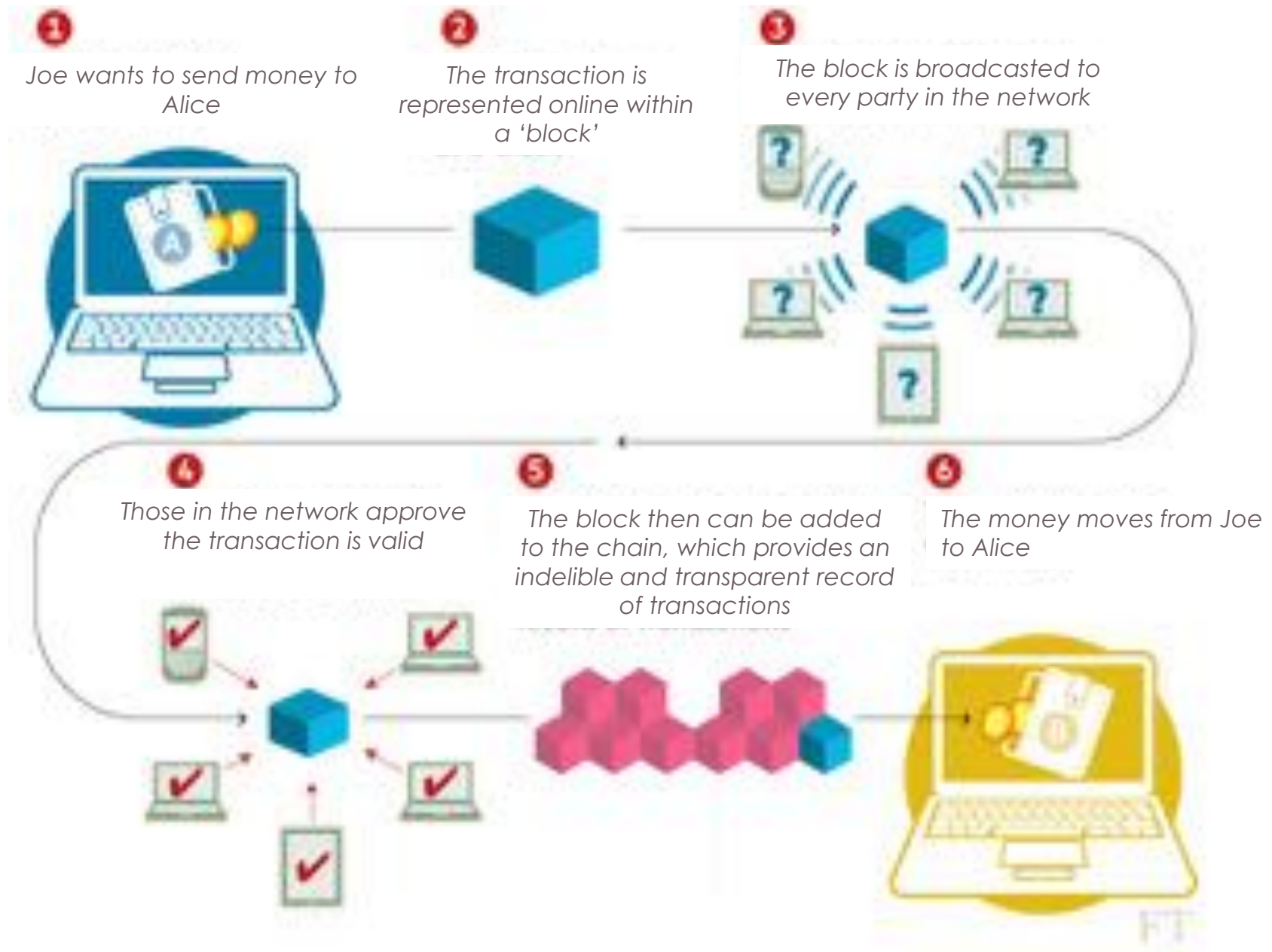
### AUTOMATED

The software is written so that conflicting or double transactions do not become written in the data set and transactions occur automatically.

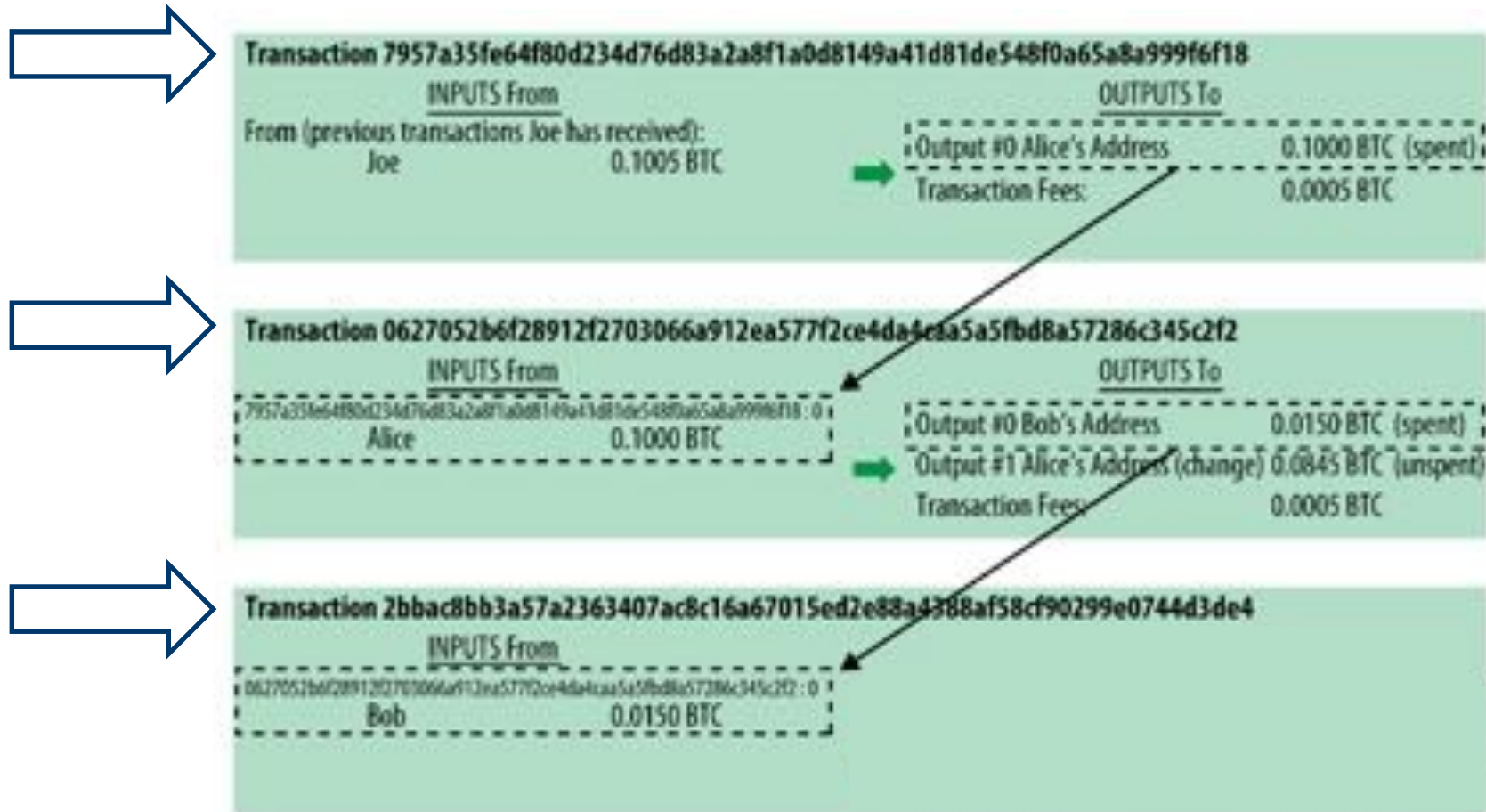
By design, no one party can modify, delete, or even append any record to the ledger without the consensus, making the system useful for ensuring the **immutability of transactions, contracts, and other legal documents.**



# HOW DOES BLOCKCHAIN WORK?



## DEEPER INTO BLOCKCHAIN



Transaction	Block	Blockchain
Inputs from network participants that describe changes in asset control, or insertion of contracts and/or related legal documents	Among other things, a block contains a list of validated transaction defined around the time frame when the block was created	A record repository of ordered collection of blocks. It records the history of asset control and state changes, as well as creation of contracts and legal documents

## BITCOIN USES BLOCKCHAIN

**Bitcoin** is a **cryptocurrency** based on Blockchain technology. **Blockchains** can radically improve banking, supply-chain and other transaction networks, giving them new opportunities for innovation and growth while reducing cost and risk.

**Currency** ←————→ **Technology**

### Bitcoin

- Leading **digital currency**
- Financial service payment applications
- Highly speculative and volatile
- Uncorrelated asset

### Blockchain

- Emerging **technology**
- Distributed database
- Secure platform
- Replacement for 3<sup>rd</sup> party verification (i.e., bank, custodian)

### **Blockchain:**

- ❖ **Verify ownership** by checking the **immutable history** recorded on a blockchain
- ❖ Provide **efficient exchange** of **ownership**
- ❖ **Direct transactions** without middle person

### **Imagine ...**

#### Buying and selling stock:

- » T+0 settlement
- » All stock transactions would reside in a secure ledger devoted to a company's equity

#### Purchasing Property:

- » No title insurance
- » Minimal legal fees
- » No title search
- » Simply consult a secure ledger that establishes the person you are buying the house from actually owns it

#### Instantly Transferring Funds:

- » Transfers are not immediate today
- » Transfers are secure and inexpensive

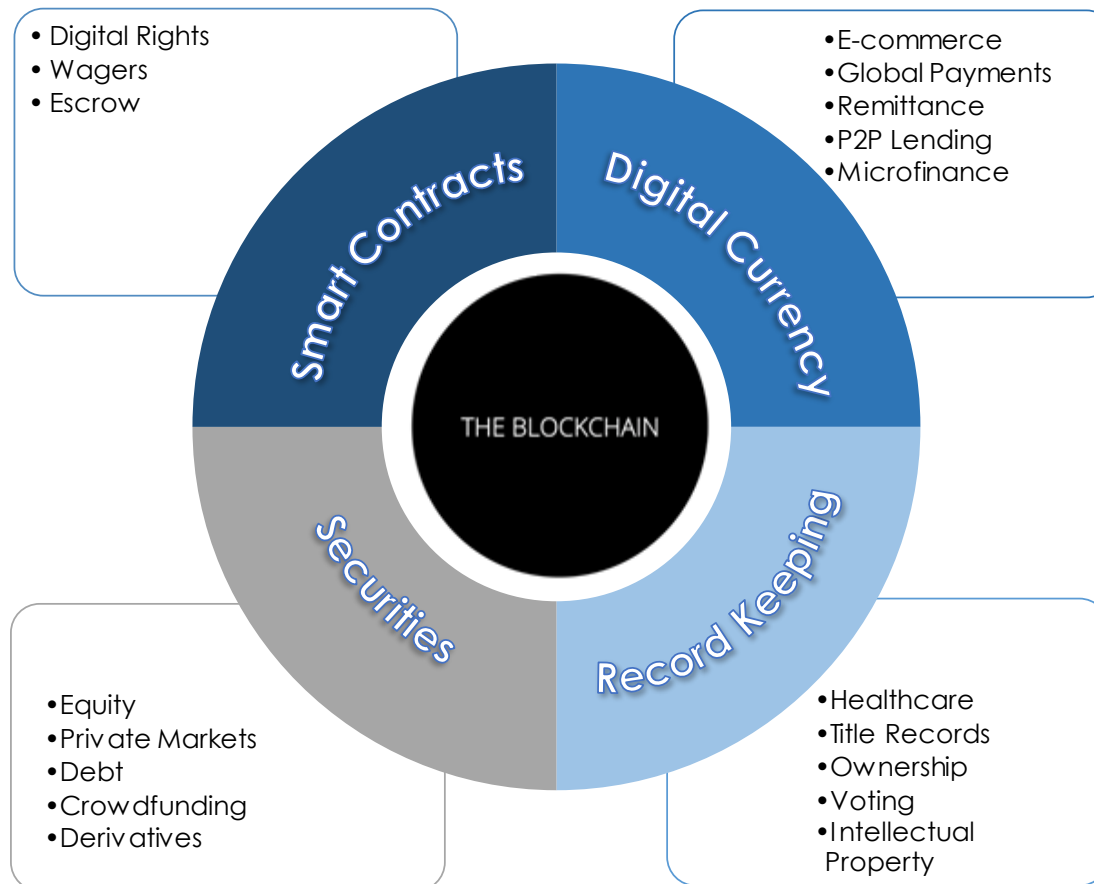
#### Other innovations:

- » Starting your car with your thumb print, a secure ledger is checked to verify that you own the car

## WHAT CAN BLOCKCHAIN TECHNOLOGY DO?

**Economic transactions on a distributed ledger can be programmed to record virtually anything of value:** your identity, a will, a deed, a title, a license, intellectual property, and also almost any type of financial instrument.

**Blockchain** can be **disruptive** in any situation where there are **middle men**.



## GRAYSCALE BITCOIN INVESTMENT TRUST (GBTC)

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- The Bitcoin Investment Trust is an open-ended grantor trust based in the U.S., sponsored by Grayscale Investments.
- Invested exclusively in bitcoin and derives its value solely from the price of bitcoin. The objective is for the NAV per share to track bitcoin's market price
- Trades OTCQX : GBTC
  - Publically traded (premium on average of 46%, currently only at 54%)
  - Eligible for Tax Advantaged Accounts
  - 2% Annual Fee

# SEMICONDUCTOR STOCKS VERSUS S&P 500

## Advanced Micro Devices, Inc. (AMD)

- Global semiconductor company that develops computer processors and related technologies for business and consumer markets.

## NVIDIA Corp. (NVDA)

- Designs and manufactures computer graphics processors, chipsets, and related multimedia software.

**Range: 12/31/15 – 02/28/2018**

Security	Price Change	Total Return	Annualized
AMD US Equity	321.95%	321.95%	94.49%
NVDA US Equity	634.22%	644.56%	152.84%
SPX Index	32.77%	38.87%	16.38%



## DIFFICULT TO USE AS A CURRENCY

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- Value of car = \$100,000
- 01/1/18 Value of Bitcoin = \$10,000
- Agree to purchase for 10 Bitcoin on 01/01/18
- You pay 10 Bitcoin @ 10k = 100,000
- 01/03/18 Value of Bitcoin = \$7,500
- Car Dealer just lost \$25,000

***Stability in currency is key***





## Positives

- Decentralized
- Anonymous
- Transparent
  - Fast
- Non-Repudiable
- Low Transaction Costs
- No Regulations

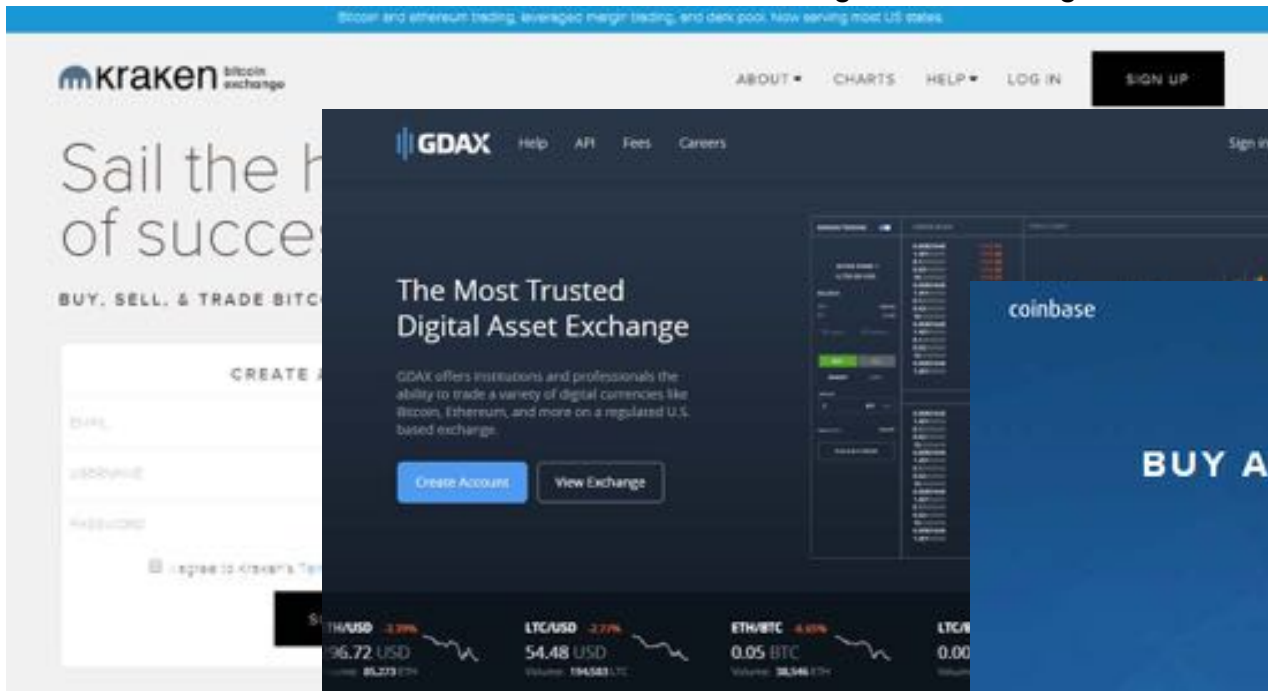
## Negatives

- Price Volatility
- Complicated
- Safety/Hacking
- Energy Consumption
- No Sovereign Authority
  - No Regulations

## HOW DO YOU MAKE MONEY?

- **Mining currencies** - Verifying transactions using blockchain will reward miners with cryptocurrencies.
  - Considerations:
    - » Energy consumption
    - » Oligopoly
- **Trading digital currencies** has become popular and multiple platforms are being created for investors and users.

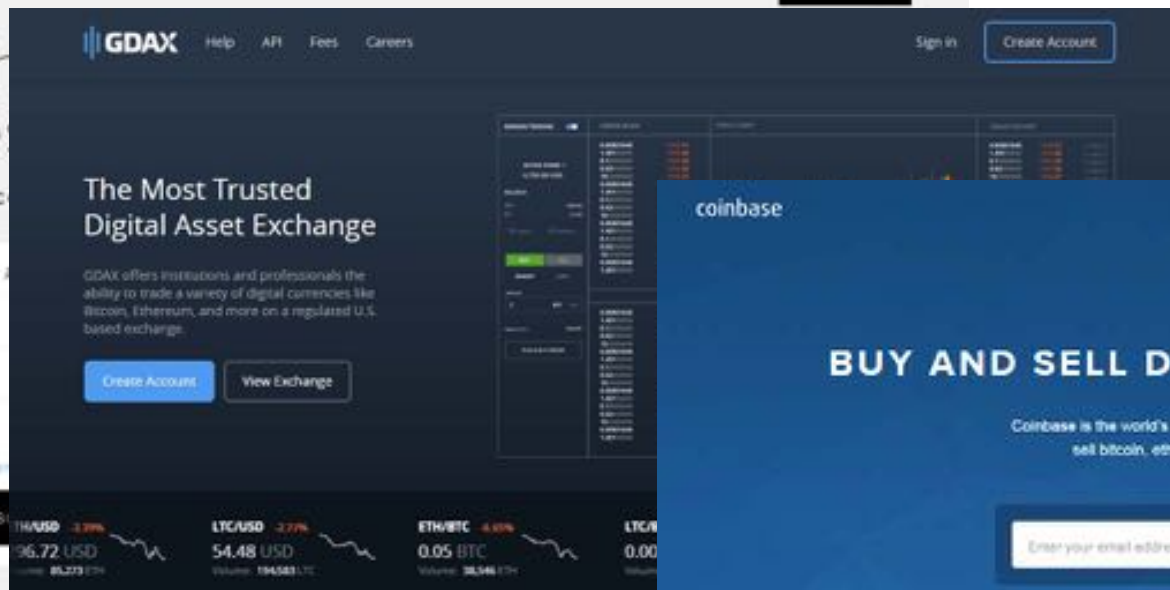
Kraken: Brokerage Account for Digital Currencies








Coinbase: Buy, Sell, Store Digital Currencies



GDAX: Brokerage Account for Digital Currencies








## TOP 5 CRYPTOCURRENCIES

Name	Symbol	Market Cap	Price	Circulating Supply
 <b>Bitcoin</b>	BTC	\$72,139,715,980	\$ 4,343.81	16,607,475
 <b>Ethereum</b>	ETH	\$28,612,378,024	\$ 301.24	94,983,578
 <b>Ripple</b>	XRP	\$9,164,891,486	\$ 0.24	38,597,142,499 *
 <b>Bitcoin Cash</b>	BCH	\$6,131,197,615	\$ 367.70	16,674,275
 <b>Litecoin</b>	LTC	\$2,766,428,461	\$ 51.94	53,259,132








**90 Days Price Change**

Name	Symbol	Market Cap	Price	Circulating Supply
 Bitcoin	BTC	\$288,502,931,560	\$17,239.70	16,734,800
 Ethereum	ETH	\$45,695,761,770	\$474.62	96,277,815
 Bitcoin Cash	BCH	\$23,888,262,721	\$1,417.70	16,850,013
 IOTA	MIOTA	\$12,067,997,811	\$4.34	2,779,530,283
 Litecoin	LTC	\$10,430,226,345	\$192.23	54,258,533

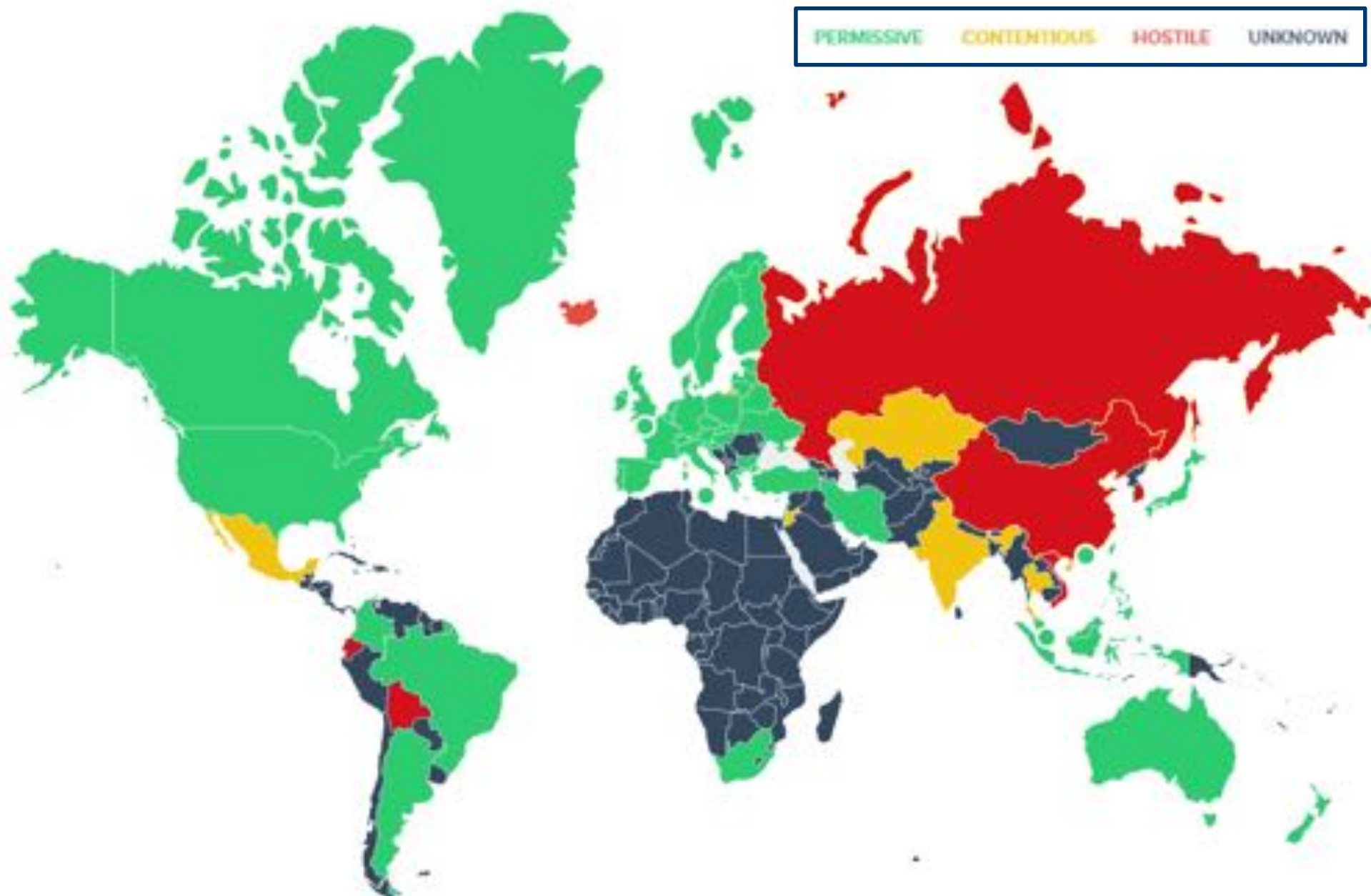


**90 Days Price Change**

Name	Symbol	Market Cap	Price	Circulating Supply
 Bitcoin	BTC	\$166,523,559,745	\$9,849.16	16,907,387
 Ethereum	ETH	\$73,301,397,148	\$747.51	98,061,020
 Ripple	XRP	\$33,571,781,500	\$0.86	39,091,956,706*
 Bitcoin Cash	BCH	\$18,388,135,091	\$1,081.24	17,006,525
 Litecoin	LTC	\$10,089,285,608	\$181.67	55,537,556

Source: CoinMarketCap

## LEGITIMACY



- ❖ **CoinDesk** – the world leader in bitcoin news. Additionally, an industry-leading source for data and information on topics like price, venture capital investments and a number of bitcoin network statistics.
- ❖ **Coinmap** – site with a minimalist design, but is well populated with information on hundreds of retailers that accept bitcoin at their physical store locations.
- ❖ **Blockchain.info** – basic information on a number of metrics like market capitalization, transaction volume, hash rate and more. In addition, users can look up every bitcoin transaction on the block chain by searching a bitcoin address to trace where the coins came from and how much BTC is stored at any particular wallet address.
- ❖ **CoinMarketCap** – this site keeps an up-to-date record of the market capitalization of over 450 digital currencies.
- ❖ **Bitnodes** – in development, to estimate and visualize the size of the bitcoin network. Powered by the Bitcoin Foundation.