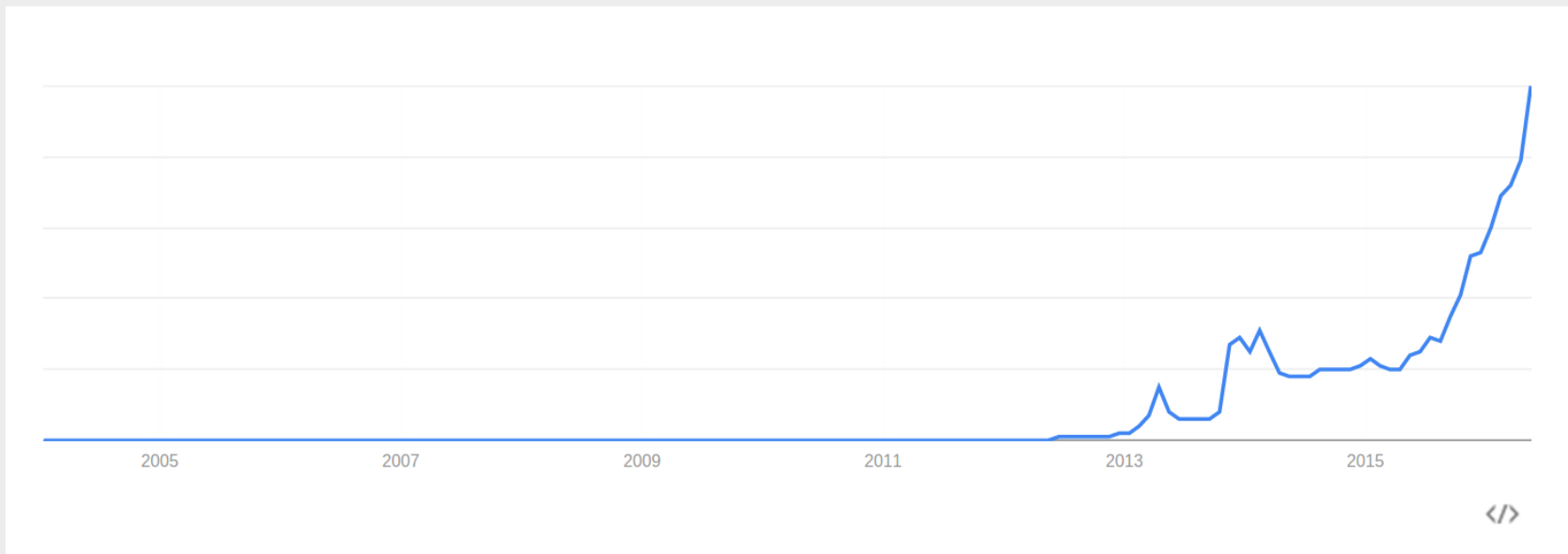


# Intro to The Blockchain





## Interest over time



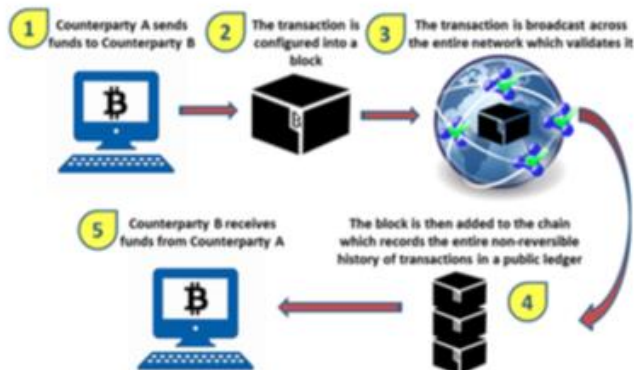
## What if I Told You ... the Blockchain Could Disrupt ... Everything

# Goldman Sachs

From Silicon Valley to Wall Street, technologists and investors alike are buzzing about the potential for the Blockchain to revolutionize ... well everything. The hype is high and the potential is real but roadblocks remain. The funding backdrop is healthy and the application eco-system is growing. Once considered the underlying pipes of Bitcoin, this technology is quickly taking center stage from its crypto-currency parent promising an ushering in of a new set of tools to cut costs and challenge the profit pool of the middle-man with a promise to make centralized institutions obsolete. This solution promises to not just address consumer opportunities but also those for the far more lucrative enterprise.

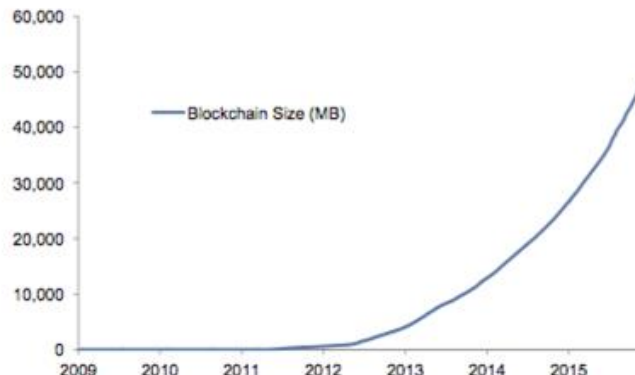
What if I told you that Bitcoin was just the opening act ... with the Blockchain ready to take center stage. In its purest form the Blockchain is a digital platform that records and verifies transactions in a tamper- and revision-proof way that is public to all (Exhibit 1). Levering the same peer-to-peer technology first developed in a dorm room at Northeastern University with Napster (and subsequently built upon by folks like Skype and Spotify) the tool was first born out of a need to track and create Bitcoin. Specifically Bitcoin and other cryptocurrencies required a way of building agreement between all parties involved in a transaction. From buying to selling to trading to storing, every transaction would be chained to each other so one could never duplicate or change the ownership of Bitcoin. This Blockchain allows information to be put in, but never deleted. This complete history ... a "shared public ledger" that a network (and the currency) relies on, if you will - made, in the user's mind, the role of a Central Bank obsolete (Exhibit 2). The fiat of the currency, as a result, was born of the citizens of the internet, not a central clearing institution or agency. Lastly, while the Blockchain associated with Bitcoin remains the most well known, there are growing sets of private and permission-driven shared ledgers gaining traction and worth focusing on.

**Exhibit 1: The Blockchain is a distributed, public ledger, most commonly known as the core underlying technology for Bitcoin**



Source: Goldman Sachs Global Investment Research.

**Exhibit 2: The size of the Blockchain grows along with the no. of transactions**  
Aggregate size of the Bitcoin Blockchain (MB) since inception (2009)



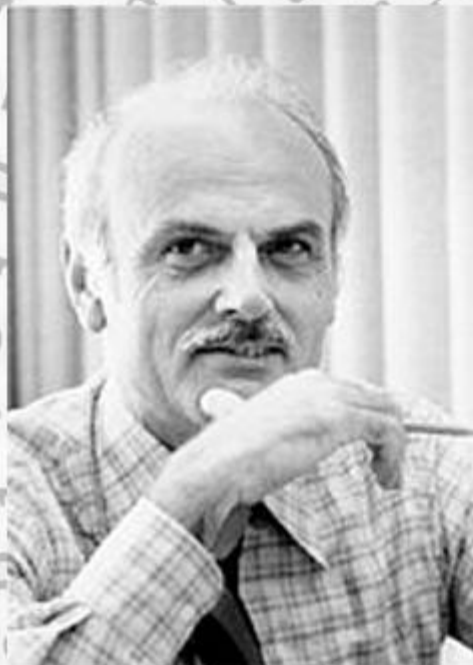
Source: blockchain.info, Goldman Sachs Global Investment Research.



**Why?**



*"In the mainframe's early days, the 1950s, IBM sold the first era of mainframes to businesses that didn't even know they needed them."*



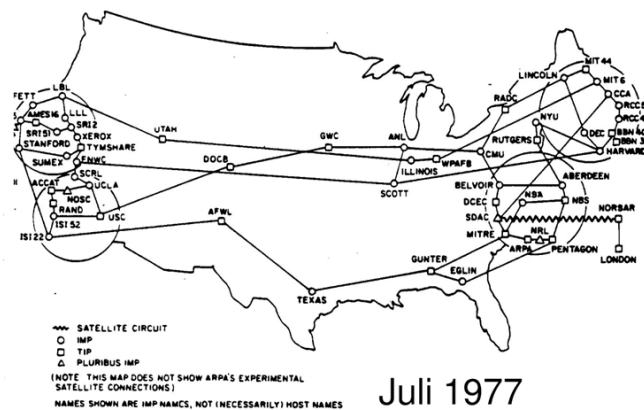
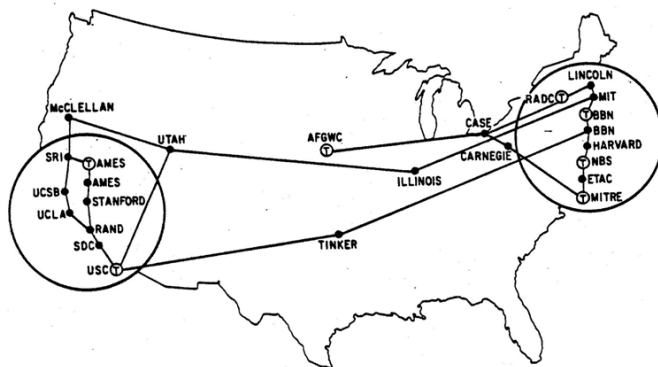
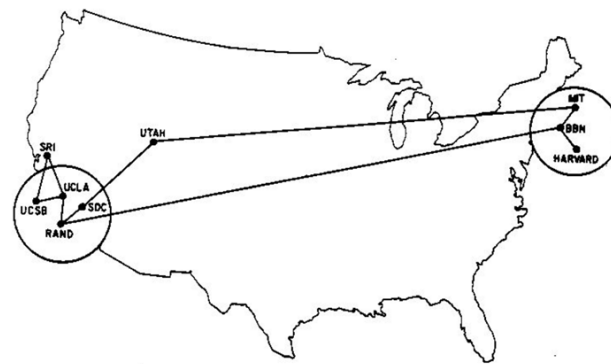
## Edgar F. Codd

1923-2003

Codd invented the relational database while working for IBM.

He revolutionised the way in which data was stored and retrieved.













**and then...**

INSIDE THIS WEEK: A 14-PAGE SPECIAL REPORT ON GLOBALISATION

# The Economist

SEPTEMBER 20TH - 26TH 2008

www.economist.com

Who killed New Labour?

The war in Pakistan's tribal areas

America's unending culture wars

How to save fish

The last typewriter-repair man

## What next?





**Open Source Peer-to-Peer Money**



## Bitcoin Network statistics (as of 2016-05-16 22:57:13)

First Block	2009-01-03 18:15:05
Total number of full nodes on the network	5,635
Total monetary base	15,552,450 BTC
Total market capitalization	\$ 7,061,994,286
24 hour trade volume	\$ 60,323,200
Transactions per second	~ 7
Size of blockchain	68 GB
Hash rate of the network	1,616,378,377,000,000,000 hashes/second (exa)





INSIDE: A 12-PAGE SPECIAL REPORT ON COLOMBIA

**The  
Economist**

OCTOBER 31ST-NOVEMBER 6TH 2013

[Economist.com](http://economist.com)

007 and the spectre of Britain's past

Turkey votes to the sound of bombs

Those ever-creative accountants

America takes the fight to IS

Coywolves: the new superpredator

# The trust machine

How the technology behind bitcoin  
could change the world

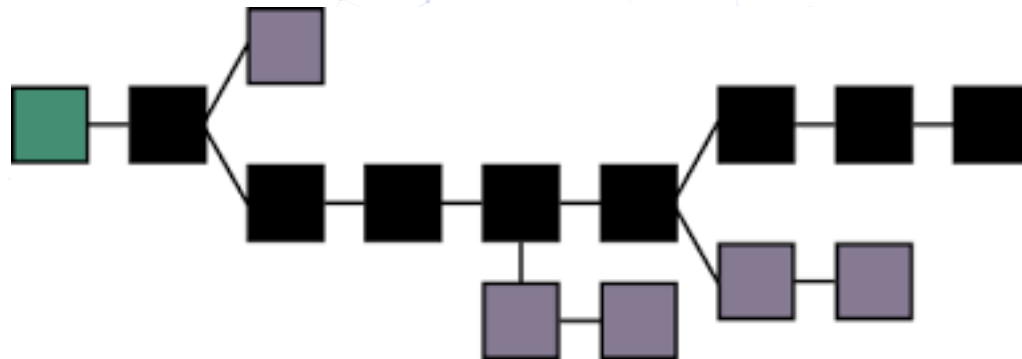






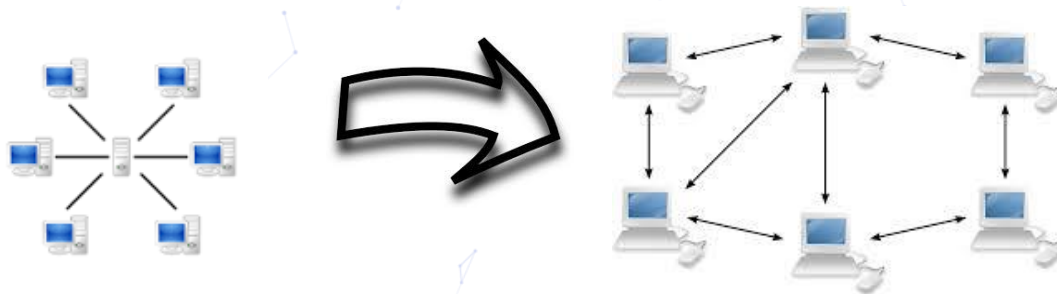
**A blockchain is a time-stamped, non-repudiable database that contains the entire logged history of transactions on the system.**

**Each transaction processor on the system maintains their own local copy of this database and the consensus formation algorithms enable every copy to stay in sync.**





**Blockchain networks are peer-to-peer networks. Open blockchain networks are permissionless - any client can sync to the network and begin to participate.**





**Consensus mechanisms determine the state of the blockchain database, as well as which state transitions are acceptable according to protocol rules. Transaction processors are often referred to as miners.**







**Cryptographic tokens (cryptocurrency) are cryptographically secured digital unit of account (numeraire), medium of exchange (currency), and a store of value. These tokens play an integral role in the incentivization mechanisms of public blockchain networks.**

**Token balances are stored via entries on the blockchain database. An account address is identified by the public key of a user.**



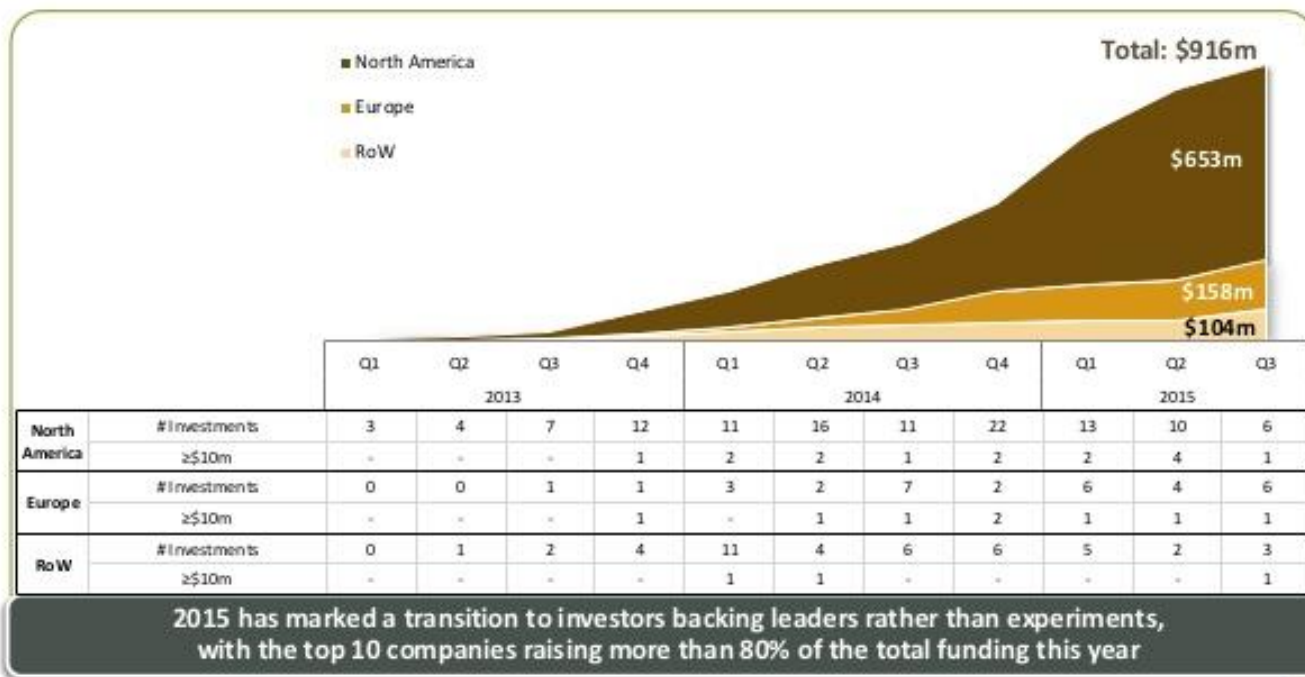


**A virtual machine enables programmable blockchain transactions. The virtual machine is the mechanism that allows for smart contract based decentralized applications.**





## ALMOST \$1BN OF TOTAL INVESTMENT OVER THE PAST 36 MONTHS



Source: CoFundr, Pitchbook, VentureSource, VentureScanner, Crunchbase  
Note: Data as of December 1, 2015



3





ethereum

**The World Computer - Open Source Peer-to-Peer Applications**





## Ethereum Network statistics (as of 2016-05-16 22:57:13)

First Block	2015-07-30 15:26:13
Total number of full nodes on the network	6,934
Total monetary base	80,098,146 ETH
Total market capitalization	\$ ~ 1.1 B
24 hour trade volume	\$ 32,997,600
Transactions per second	~ 20
Size of blockchain	18 GB
Hash rate of the network	2,100,000,000,000 hashes/second (tera)
Total funding raised by Ethereum projects	> \$125,000,000

init

note: \*\*\* An Ethereum smart contract to sell a website for "5000 by March"

note: First, store buyer's ethereum address:

in save slot BUYER put 0x6af26739b9ffef8aa2985252e5357fde

note: Then, store seller's ethereum address:

in save slot SELLER put 0xfeab802c014588f08bfee2741086c375

note: April 1, 2014 is 1396310400 in "computer time"

in save slot DEADLINE put 1396310400

body

note: If the agreed amount is received on time...

when

contract balance  $\geq$  5000 ether

and

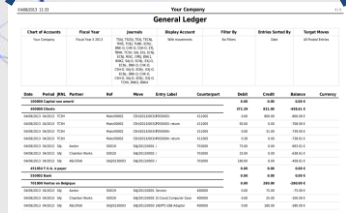
block timestamp  $\leq$  data at save slot DEADLINE

then

note: ... then designate the buyer as the new website admin and pay the seller

in save slot WEBSITE\_ADMIN put data at save slot BUYER

spend contract balance to data at save slot SELLER

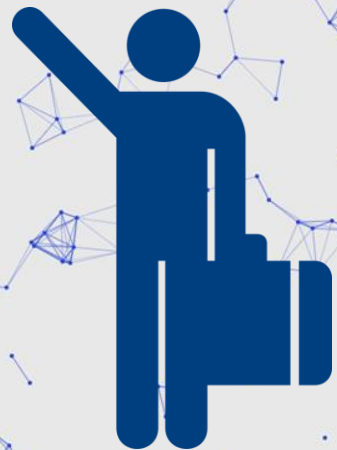


Securing Today. Shaping Tomorrow.<sup>SM</sup>

[illegible]



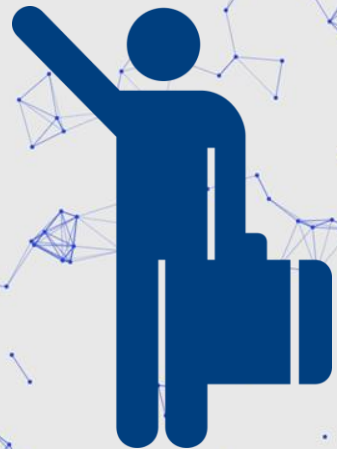
Your Company											
General Ledger											
Chart of Accounts		Period Year	Journal		Display Account	Filter By	Entries Sorted By		Target Month		
Your Company		Period Year 2013	The 2013 Year To Date		All Accounts	By Name	Date		All Dates Entry		
Date	Account	Ref.	Number	Ref	Entry Label	Debit	Credit	Balance	Currency		
<b>Assets</b>											
<b>Cash</b>											
2013-01-01	100		100		100.00	100.00		100.00	USD		
<b>Accounts Receivable</b>											
2013-01-01	110		110		110.00	110.00		110.00	USD		
<b>Accounts Payable</b>											
2013-01-01	200		200		200.00		200.00	200.00	USD		
<b>Equity</b>											
2013-01-01	300		300		300.00			300.00	USD		
<b>Liability</b>											
2013-01-01	400		400		400.00			400.00	USD		
<b>Income Statement</b>											
2013-01-01	500		500		500.00			500.00	USD		
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2013-01-01	13700		13700		13700.00			13700.00	USD		
2013											







```
int
note: "An Ethereum smart contract to sell a website for "5000 by March"
note: First, store buyer's ethereum address:
in (save slot / BUYER) put (/ 0x6af20738b9f6e6a296c252e53571de)
note: Then, store seller's ethereum address:
in (save slot / SELLER) put (/ 0x4eab802c014568f08bfee27410b6c375)
note: April 1, 2014 is 1396310400 in "computer time"
in (save slot / DEADLINE) put (/ 1396310400)
body
note: If the agreed amount is received on time...
when (
  contract balance >= 5000 ether
  and
  block timestamp < data at (save slot / DEADLINE)
)
then
note: then designate the buyer as the new website admin and pay the seller
in (save slot / WEBSITE_ADMIN) put (data at (save slot / BUYER))
spend (contract balance) to (data at (save slot / SELLER))
```





CONSENSYS



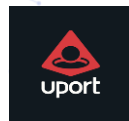


**Application**



**User Interface, Business Logic**

**Core Components**



**Wallet, identity, persona, reputation**

**Tools**



**Developer tools and infrastructure**

**Infrastructure**



**Ethereum Clients, RESTful APIs**

**Blockchain**



**Ethereum - Public, Consortium and Private Networks**

# Imogen Heap



## Tiny Human



download  
\$0.60

• Junge Deutsche Philharmonie

• Percussion

• Mixing Engineer

• Brass Ensemble

[Credits](#) [Stems](#) [Lyrics](#) [Inspiration](#) [Licensing](#) ▾

5 MINUTE READ | TECHNOLOGY

# This New York Project Fuses Energy Microgrids With Blockchain Technology

A microgrid using TransActive Grid's model could let you directly sell energy generated from your rooftop solar panels to your neighbor.



[Photo: [f11photo](#) via Shutterstock]



CANONICAL

Deloitte.

UJO MUSIC

BTC  
RELAY

TRANSACTIONAL  
GRID

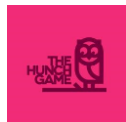
Pivotal™



TRUFFLE



WeiFund



BoardRoom

Proof of Physical  
Address

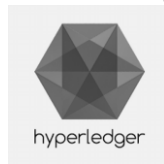
code  
to  
(inspire)

GNOSIS



BLOCKAPPS

uport



BALANCE

LOFT  
LAB OF FORWARD THINKING

CONSENSYS

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*"Anything that can be digitized, cryptocurrencies, derivatives trading, securities trading and settlement, even property titles, is a potential service on Ethereum."*

- [Wall Street Journal](#)

*"It's available as part of [Microsoft](#) Azure cloud and is primarily targeted at the financial services industry."*

- [Wired](#)



**ETH BaaS**  
**Ethereum Blockchain**  
**as a Service**

*"The [Ethereum project](#) and [ConsenSys](#), the company created by one of the project's co-creators, have received a huge vote of approval from one of the world's biggest enterprise software providers — Microsoft."*

- [Tech Crunch](#)

*"We've found Azure to be an efficient and powerful cloud to deploy our offerings and are looking forward to further collaboration with Microsoft. The initial offerings of BlockApps Strato and Ether.Camp will serve as foundational protocols and tools for developers to create blockchain applications immediately."*

- [Coin Desk](#)

**Thank You!**

