

MAGISTER ADVISORS BLOCKCHAIN & BITCOIN IN 2016 A SURVEY OF GLOBAL LEADERS

DECEMBER 2015

Private and Confidential



MAGISTER
ADVISORS

BITCOIN & BLOCKCHAIN IN 2016

A SURVEY OF GLOBAL LEADERS

Executive Summary

- Bitcoin and Blockchain markets have fundamentally diverged over the past 12 months
- Bitcoin governance (as a ‘standard’), compliance and regulation is maturing quickly. Lack of clear ‘Bitcoin native’ use cases in developed markets giving way to consumer finance apps with ‘Bitcoin inside’ combined with a surge of developing economy applications
- We estimate over \$1bn will be spent by large financial institutions on Blockchain over the next 24 months



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- Partner at Magister Advisors (London, UK)
- Mentor at Barclays/TechStars FinTech Accelerator
- Angel Investor: Origin, Ravelin, EngageSciences
- Previously
 - Goldman Sachs—Advised on >\$25B of transactions
 - Oracle—Senior roles building Oracle’s Java business from 1998–2005



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- Analyst at Magister Advisors (London, UK)
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Companies Surveyed

Bitcoin

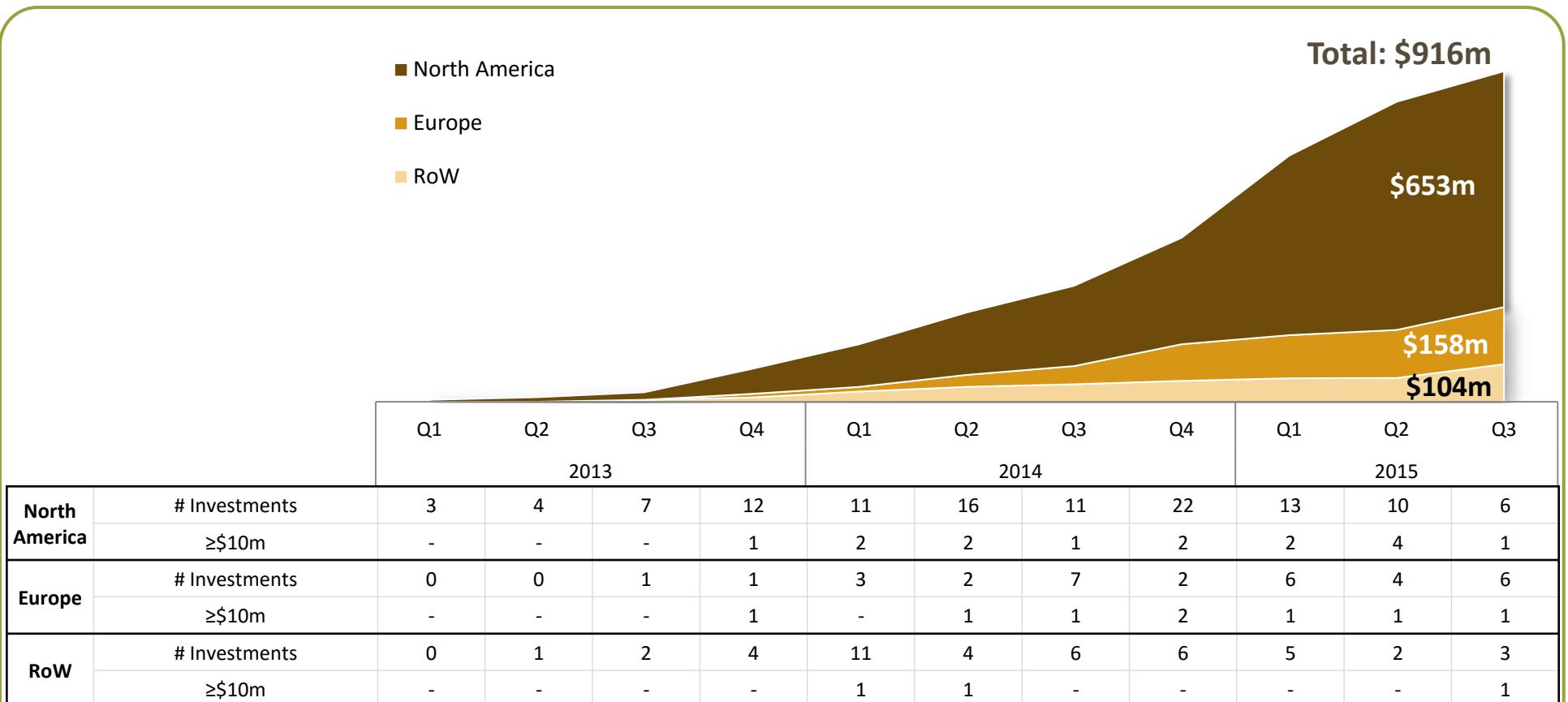


Blockchain



- **\$474m** of venture funding covered
- Equivalent to **51%** of global funding in Bitcoin/Blockchain
- **33** companies (**21** EU, **10** US and **2** from RoW)
 - **12** Blockchain companies
 - **21** Bitcoin companies including **6** Exchanges, **2** Miners, **4** Wallets, **5** Payments and **4** Others
- Large Financial Institutions, Hedge Funds and Investment Banks were also part of the survey

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

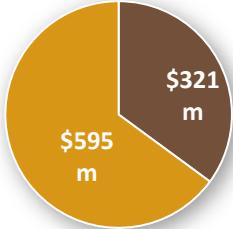


2015 has marked a transition to investors backing leaders rather than experiments, with the top 10 companies raising more than 80% of the total funding this year

FINANCIAL INSTITUTIONS HIGHLY ACTIVE INVESTORS

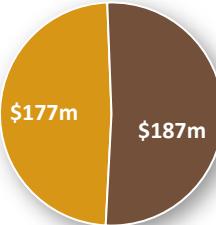
FIs are even more represented in large rounds

All financing rounds



■ No Financial Institution Participation

\$25m+ financing rounds



■ Financial Institution Participation

Jul 2014: Fortress invested in Xapo's \$40m financing round

Xapo Sets \$40 Million Fundraising Record for Bitcoin Industry

Online wallet provider [Xapo](#) has raised its funding total to \$40m, leapfrogging BitPay to become the best-funded bitcoin startup to date.

Announced today, the startup's second Series A-1 funding round took \$20m in total. Spearheaded by [Index Ventures](#) and [Greylock Partners](#), the round also included [Emergence Capital Partners](#), venture capitalist [Yuri Milner](#), PayPal co-founder [Max Levchin](#) and former Yahoo! CEO Jerry Yang.

Jan 2015: NYSE & BBVA invested in Coinbase's \$75m financing round

MARKETS

Coinbase Raises \$75 Million in Funding Round

Investors in Bitcoin-Related Startup Include Traditional Financial Institutions and NYSE

Coinbase said it raised \$75 million in the single largest venture-capital fundraising by a bitcoin-related startup.

Investors included banks and the New York Stock Exchange, apparently the first time any traditional financial institutions have taken direct stakes in a bitcoin enterprise.

Coinbase, based in San Francisco, offers a number of financial services for individuals and businesses, such as processing transactions for merchants that accept bitcoin.

Bitcoin, a digital currency created six years ago that allows for peer-to-peer transactions outside the traditional banking system, has been beset by bad news, most prominently a brutal selloff in the currency. After falling 67% in 2014, it careened down 44% in January before stabilizing.

Apr 2015: GS invested in Circle's \$50m financing round

Goldman Joins Bitcoin Startup Circle's \$50 Million Fundraising

Goldman Sachs Group Inc. invested in a \$50 million fundraising round in bitcoin startup Circle Internet Financial Ltd., another sign of the growing interest in digital currency technology by established financial institutions.

IDG Capital Partners co-led the round, which also included existing Circle investors such as Breyer Capital, General Catalyst Partners, Accel Partners and Oak Investment Partners, Circle said in a statement late Wednesday. The company offers a variety of services for storing and using bitcoins.

The round brings Circle's total funding to \$76 million, and "is a material step-up in valuation from our past financing," Jeremy Allaire, chief executive officer of the Boston-based venture, said in a telephone interview. He declined to disclose the specific value.

May 2015: CME invested in Ripple's \$28m Series A round

Ripple Labs Raises \$28 Million in Series A Round

Digital currency startup Ripple Labs announced today that it has closed a new \$28m Series A funding round.

The company drew support from a mixture of new and existing investors, including the venture arms of US futures and options exchange CME Group and data storage firm Seagate Technology.

Sep 2015: Visa, Nasdaq & Citi invested in Chain's \$30m round

Fintech Bitcoin Blockchain startup Chain raises \$30M Series B from Visa, Nasdaq, Citi and others

Fintech Bitcoin Blockchain startup [Chain, Inc.](#) has raised \$30 million Series B in a round that included financial heavyweights Visa, Nasdaq, Citi Ventures and Capital One, along with Fiserv, Orange, RRE Ventures, Khosla Ventures, Thrive Capital, SV Angel and individual investors including former Bank of America Chief Executive Officer David Coulter, XPrize Foundation Chief Executive Officer Peter Diamandis and MongoDB Co-founder Kevin Ryan.

Although not officially disclosed, [Forbes puts the valuation on](#) the round at \$150 million.

Founded in 2014, Chain utilizes the Blockchain, the underlying digital ledger that powers Bitcoin, to assist banks and other institutions in developing ways to trade and transfer financial assets.

The company claims that their solutions enable institutions to design, deploy and operate Blockchain networks that can power any type of asset in any market.

Being based on the Bitcoin Blockchain, Chain says that its platform delivers interoperability across systems and networks while also offering APIs and SDKs that enable partners to test ideas faster in a private environment.

Sep 2015: AmEx invested in Abra's \$12m financing round

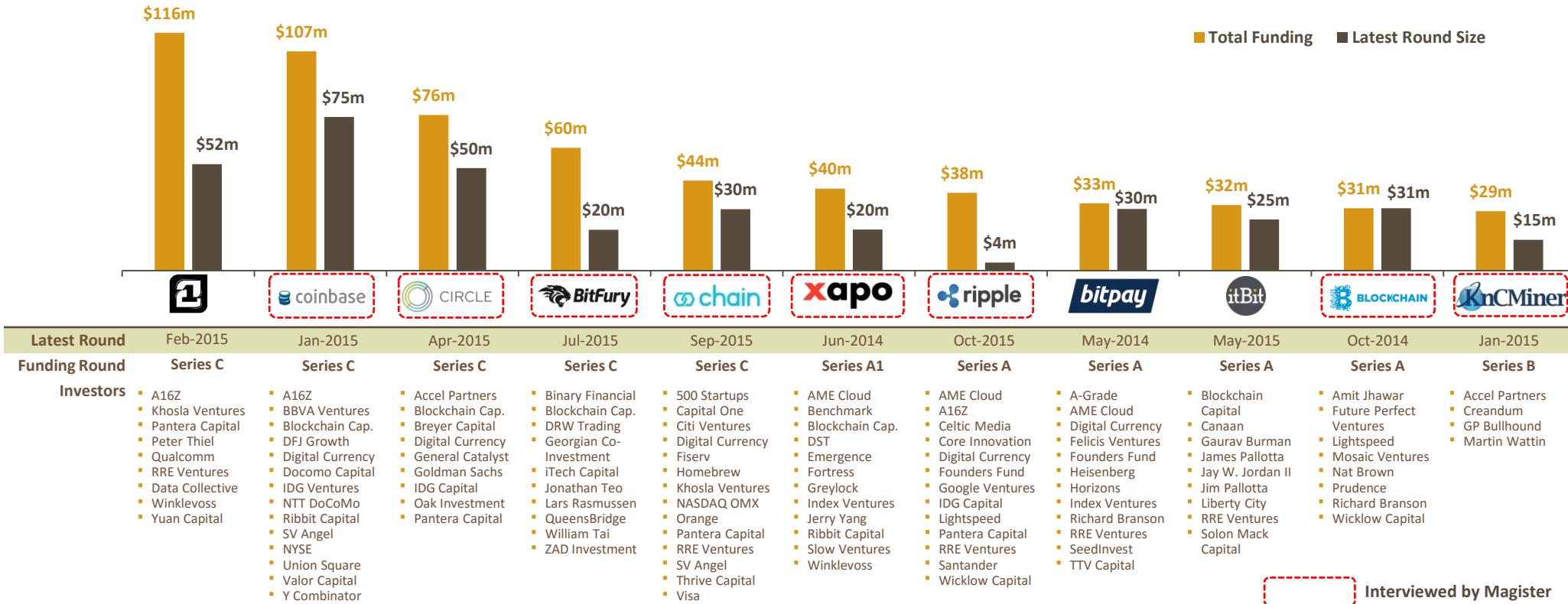
Bitcoin-based mobile app Abra raises \$12 million

A bitcoin-based challenger to Western Union just raised \$12 million as it gears up to launch a low-cost, global cash-transfer network.

The new mobile app, called Abra, will begin transmitting money this fall between more than 80 countries for fees of less than 2 percent — less than half the fee of traditional services.

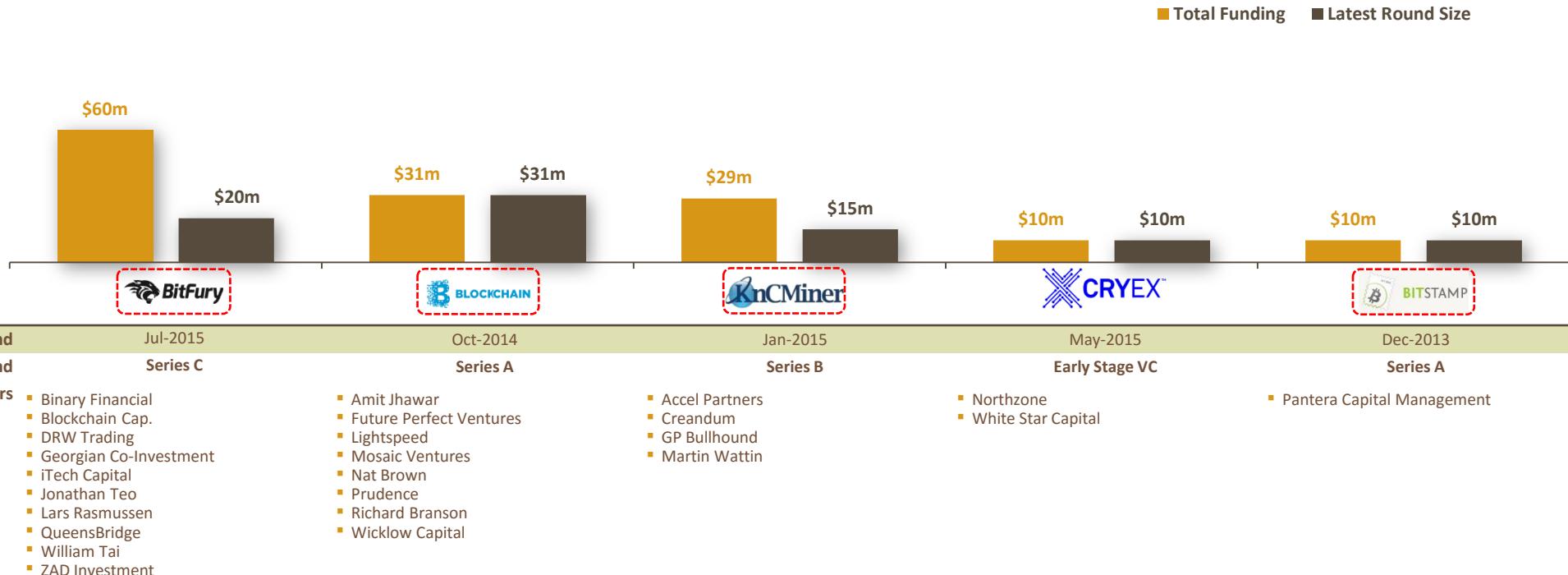
FIs have participated in \$321m worth of financing rounds in 18 Bitcoin/Blockchain companies and have invested in more than half of all \$25m+ financing rounds

LARGEST VC-BACKED COMPANIES BITCOIN/BLOCKCHAIN



2/3rds of total Bitcoin/Blockchain investment has been raised by the top 11 companies

EU BITCOIN/BLOCKCHAIN COMPANIES WITH \$10M+ OF FUNDING



Interviewed by Magister

Only 5 Bitcoin/Blockchain companies in Europe have raised at least \$10m

BITCOIN AND BLOCKCHAIN HAVE DIVERGED OVER THE PAST 12-18 MONTHS



Bitcoin

- The leading digital currency
- Numerous consumer/SME and financial service payment applications, particularly in developing economies
- A favourite for speculators given its volatility and liquidity, with high-frequency trading and hedge fund participation



Blockchain

- Distributed ledger with cryptographic integrity
- Potential replacement for middleware networks and clearing houses in financial transactions where 3rd party verification is required
- Applications extend to other networks where veracity is critical to performance

While Bitcoin is established as the leading digital currency, banks are more focused on applications of the underlying Blockchain technology

WHAT IS DRIVING BITCOIN EVOLUTION AND WHAT IS NEXT?

1

Rapidly maturing governance, regulation and compliance

2

Improving 'on/off ramps' between Bitcoin and local banking networks
(a potentially 'hidden' value of regional exchanges)

3

Next-Gen Consumer finance apps leveraging Bitcoin
as an alternative payment rail, but not branded Bitcoin

4

Bitcoin wallet leaders are well-funded, and some have started to become
'Bitcoin banks', raising barriers to entry

5

Accelerating adoption in developing economies, particularly those with
frequent cross-currency payment requirements and weak financial institutions

6

Institutional-like usage as instrument for speculation,
given backdrop of low yields and volatility

- Failures and consolidation where economies of scale and network effects drive economics, notably exchanges and mining
- In established Bitcoin markets, the full service model has gained significant traction and scale
- In the developing economies, local market considerations are significant
- Consumer services with 'Bitcoin inside', but the crypto-currency aspects to be largely invisible
- Continued growth both as a store value and transactions



WHAT IS DRIVING BLOCKCHAIN EVOLUTION AND WHAT IS NEXT?

1

Broad recognition of potential transformational impact for financial institutions, with benefits estimated in the tens of billions annually in infrastructure savings alone

2

Large financial institutions typically already have identified portfolios of 10-20 potential Blockchain projects to evaluate

3

Blockchain technology providers have adopted a collaborative approach to working with financial institutions, who in turn are frequently major investors

4

The market has already split between broad platform or 'fabric' vendors and domain-specific application providers

5

The largest technology providers we spoke with tended to have 20-30 client projects underway, often involving multiple counter-parties collaborating on projects

6

The market is largely at the POC phase, proving that Blockchain-based implementations can replicate or complement existing infrastructure

- 2016 marks a 'race to production' as innovators seek to push beyond the prototype stage. This is particularly important for the vendors looking to establish market position
- We estimate that over \$1bn will be spent by large financial institutions on Blockchain projects over the next 24 months
- Even within the collaborative approach, we see a certain degree of 'co-opetition' between the vendors and financial institutions vying for technology leadership



I. BITCOIN LANDSCAPE

BITCOIN TECHNOLOGY OVERVIEW

Key Concepts

Created by Satoshi Nakamoto in 2008, Bitcoin is a decentralised cryptocurrency based on Blockchain technology. Bitcoin provides lower transaction costs, cryptographic security and cross-currency portability



Transaction: Transactions in Bitcoin are made by sending an encrypted message signed by a key which is private to the user. This transaction can be verified by others in the network by using a public key



Blockchain: The public ledger refers to a long list of blocks known as Blockchain. Whenever a new block of transactions is created, it is added to the Blockchain, creating an increasingly lengthy list of all the transactions that ever took place on the Bitcoin network



Mining: Bitcoin mining is a decentralized computational process where miners use their computing power to calculate cryptographic hash functions in order to verify and record payments into a public ledger



Proof of Work: Miners can create a hash to update the Blockchain after each transaction. Creating a hash, however, requires solving a cryptographic function. This process is called proof of work

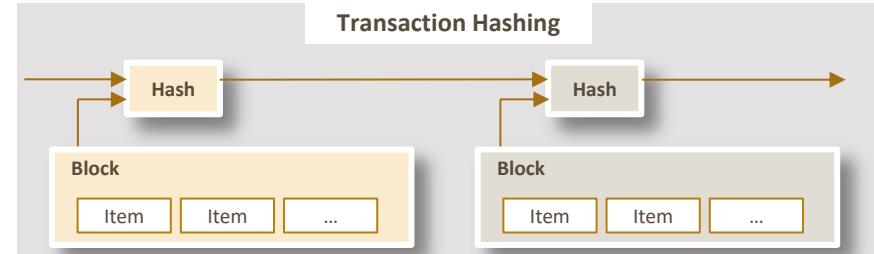
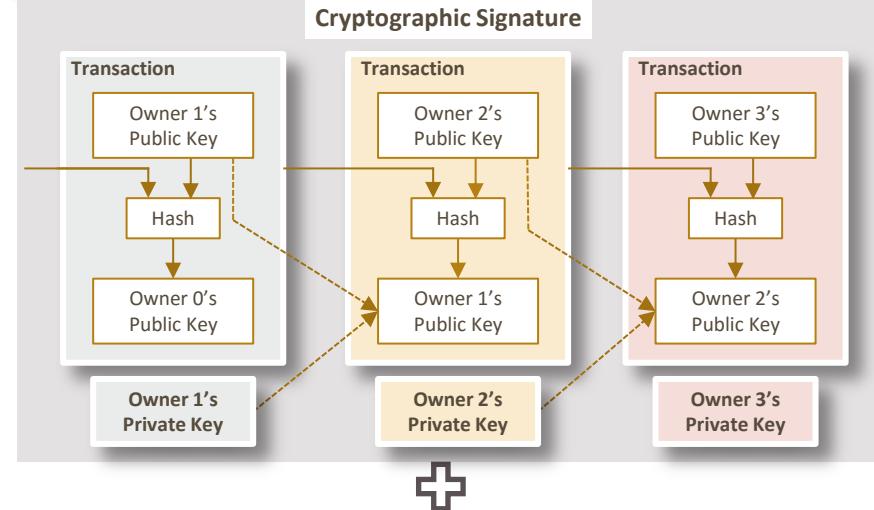


Reward: Proof of work requires significant computational power. To provide incentives to the miners, they are rewarded with Bitcoin every time they create a hash to update the Blockchain. Today, miners receive 25 Bitcoins per hash and transactions fees



Security: Blockchain serves to confirm to the rest of the network what transactions have already taken place. Bitcoin nodes use the Blockchain to distinguish legitimate Bitcoin transactions from attempts to re-spend coins that have already been spent elsewhere

Cryptographic Integrity



No wonder Bitcoin has captured the imagination. It combines a number of complex theoretical constructs from computer science and economics, into a globally distributed system that has already scaled to millions of transactions a day globally, operating in near real-time

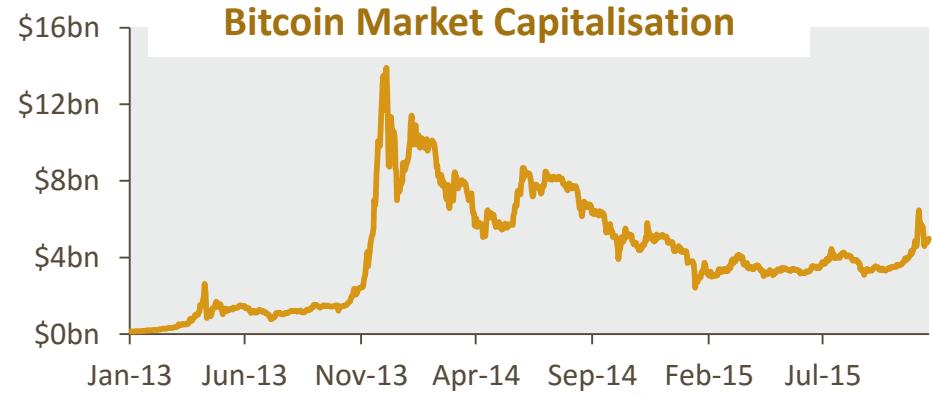
BITCOIN: A HISTORY OF VOLATILITY THOUGH RELATIVELY STABLE IN '15 TILL LATE



Significant Bitcoin price volatility in 2013 and 2014 hindered general Bitcoin adoption;
However, the price stability since the beginning of 2015 is now helping to support adoption

BITCOIN: 6TH LARGEST RESERVE CURRENCY BY 2030?

#	Currency	Total FX Reserves \$B (COFER)	% Reserves
1	🇺🇸 \$	4,250	65.8%
2	🇪🇺 €	1,367	21.2%
3	🇬🇧 £	313	4.8%
4	🇯🇵 ¥	255	4.0%
T-5	🇨🇦 C\$	128	2.0%
T-5	🇦🇺 A\$	128	2.0%
6	🇨🇭 SFr	20	0.3%
-	Bitcoin	5	n.m.



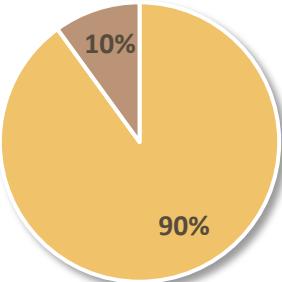
'Adding Bitcoin to the reserve portfolio of the central bank would not significantly increase volatility, but could provide opportunities to offset exchange rate depreciations against major currencies such as the Pound and the Euro. In addition, the appreciation in the value of the Bitcoin portfolio (in US dollars) would have also generated a significant return for the Bank.'

— Central Bank of Barbados Working Paper, Nov 2015

Becoming the 6th largest currency globally is well in sight, given the sharp drop-off outside the top 5

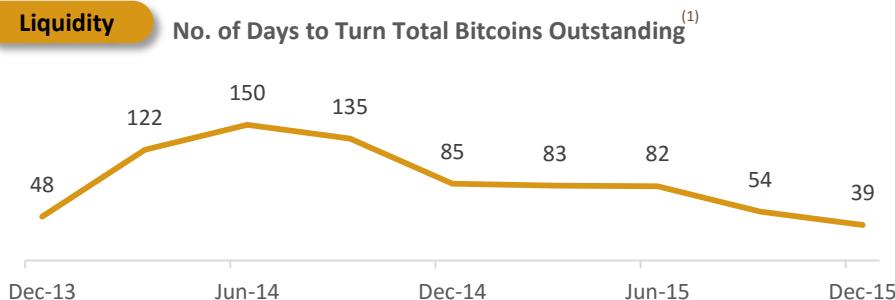
BEYOND PRICE A FEW STATISTICS

Volume vs.
Value



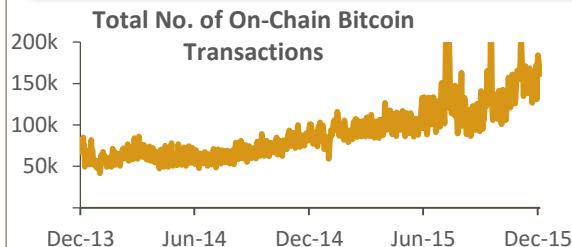
According to our survey c. 90% of transactions by volume are for commercial purposes, whereas 90% of Bitcoin value is held for speculation

Liquidity



The number of days to turn total Bitcoins outstanding has been constantly decreasing since Jun 2014, implying an increase in liquidity and confidence

Actual vs. Reported Bitcoin Transaction



Transaction volume reported on public sources such as Blockchain.info are misleading because they fail to take off-chain transactions by wallets and custodian into account

270%

Growth of on-chain transactions
between Dec-13 and Dec-15

But under-reported by

3-5x more

Off-chain transactions

According to our survey, ~90% of total Bitcoin transactions by volume are used for commercial purposes (frequently in developing and emerging markets) while 90% of Bitcoin value is retained for speculation, often by HNW and 'near-institutional' purposes

SECURITY & TRUST HAVE CREATED ANXIETIES THAT LEADERS ARE ADDRESSING

Proceeds of Crime

Meet The 'Bitcoin Millionaire' Arrested For Allegedly Helping Silk Road Launder \$1 Million

The Bitcoin community faces a major publicity crisis this week with the arrest of BitInstant CEO Charlie Shrem on charges of money laundering for users of the digital black market known as Silk Road.

Shrem, though only 24, is considered an important figure in the Bitcoin community.

In less than three years, he went from being a college senior investing in a silly bubble, to one of the publicly known "Bitcoin millionaires" — a face for a concept just hitting the



BitInstant CEO Charlie Shrem

Deposit Security

Bitstamp Claims \$5 Million Lost in Hot Wallet Hack

Bitstamp has released a new statement regarding the security of its website, admitting that it has lost "less than 19,000 BTC", about \$5.1m at press time.

The revelation follows the disclosure that Bitstamp's [wallet system was compromised](#), prompting it to halt deposits and later shut down its platform entirely.

According to the statement, an undisclosed number of wallets were compromised and upon learning of the breach, the Bitstamp team issued warnings about deposits and moved to suspend operations. Bitstamp CEO Nejc Kodrić said that all other funds held by the bitcoin exchange are secure in cold storage, stating:



Bitcoin Governance

What is the Bitcoin Block Size Debate and Why Does it Matter?

Bitcoin is divided. Some are calling it the currency's "constitutional crisis", a debate that has split its community right down the middle.

The crux of the issue comes down to a single technical detail: the size of bitcoin's blocks.

The question of scale in bitcoin is not a new one. But as transaction volumes are expected to increase in the years ahead, questions about the cryptocurrency's future composition must, in the eyes of those who favor change, be answered sooner rather than later: who does it serve? How should it look? What makes it unique?

As the block size debate rages on, here's a primer on its broad strokes and why it matters.

The Bitcoin Big Bang – Elliptic's Remarkable Breakthrough in AML

New bitcoin technology can tell banks where coins come from with incredible accuracy

UK-based Bitcoin analytics and security firm [Elliptic](#) today announced the launch of [The Bitcoin Big Bang](#) – an interactive visualization that marks the emergence and interconnectivity of key Bitcoin names since the cryptocurrency was first heard in 2009.

The Bitcoin Big Bang is a landmark achievement in itself. The interactive visualization tool debunks the anonymity myth of the blockchain technology and tracks the flow of Bitcoin from one entity to another.



WE'VE BUILT A FORTRESS

Secure bitcoin storage is what we do best. We've developed a new standard in bitcoin security that insures your assets by using man, machine and even a mountain to keep your money safe.

WHAT IF HACKERS ATTACK? INSURANCE

Xapo reduces risks and provides you with the peace of mind that comes from knowing that your bitcoins are safe. Bitcoins stored in the Xapo Vault are insured by third party insurance companies with an A.M. Best rating of A.



Bitcoin Scalability Workshops

In recent months the Bitcoin development community has faced difficult discussions of how to safely improve the scalability and decentralized nature of the Bitcoin network. To aid the technical consensus building process we are organizing a pair of workshops to collect technical criteria, present proposals and evaluate technical materials and data with academic discipline and analysis that fully considers the complex tradeoffs between decentralization, utility, security and operational realities. This may be considered as similar in intent and process to the NIST-SHA3 design process where performance and security were in a tradeoff for a security critical application.

Since Bitcoin is a P2P currency with many stakeholders, it is important to collect requirements as broadly as possible, and through the process enhance everyone's understanding of the technical properties of Bitcoin to help foster an inclusive, transparent, and informed process.

Bitcoin has held a negative reputation particularly in regards to crime and fraud, but over the past 12-24 months leaders have moved quickly to address concerns.

BITCOIN REGULATION IS DEVELOPING RAPIDLY



Mar-2015

Anti-money laundering rules to apply to digital currency exchanges in the UK

Operators of digital currency trading platforms will be required to carry out anti-money laundering (AML) checks in future under new plans outlined by the UK government. | 19 Mar 2015

The Treasury said it would consult on the plans "early in the next parliament" in an effort to ensure people cannot use digital currency exchanges to conceal criminal behaviour.

"The government intends to apply anti-money laundering regulation to digital currency exchanges in the UK, to support innovation and prevent criminal use," the Treasury said. "The government will formally consult on the proposed regulatory approach early in the next parliament."

Last year, Singapore announced it would regulate digital currency intermediaries to address AML risks, whilst an AML regime for digital currencies was implemented in Canada.



Jun-2015

New York Releases Final BitLicense

The New York State Department of Financial Services (NYDFS) released the final version of its long-awaited regulatory framework for digital currency companies today.

The final release of the [BitLicense](#) follows nearly two years of [fact-finding](#) and [debate](#). The NYDFS began crafting the rules after it determined the technology should not be regulated under existing state law.

The bill will not become law until its publication in the New York state register, a weekly government-issued guide to proposed rulemakings.

In remarks issued by NYDFS at the [BITS Emerging Payments Forum](#) in Washington, DC today, superintendent Benjamin Lawsky clarified that the final regulation meant firms will no longer need the agency's approval for each new software update or round of venture capital funding.



Oct-2015

European Court of Justice: Bitcoin is a currency and exchanges are VAT-exempt

The European Court of Justice (ECJ) has ruled that bitcoin exchange transactions should be exempt from VAT. The ECJ ruling stated that bitcoin transactions "are exempt from VAT under the provision concerning transactions relating to currency, bank notes and coins used as legal tender."

The ECJ's top legal advisors had already recommended the exemption, but the judges do not always agree with them. Had the decision gone the other way, it would have caused a huge headache for European bitcoin exchanges.

The case involved a request regarding the tax status on exchange commissions and margins which came from a Swede called David Hedqvist who was looking to set up a one-man bitcoin exchange. He had approached Swedish tax authorities for an advanced decision on whether or not the exchange of Bitcoin into Swedish Krona and vice versa should be considered as a VAT taxable or VAT exempt activity.

The tax authorities said Bitcoin trading should be subject to VAT, but Hedqvist thought the answer should be no, and he took it to court and eventually it reached the appeal court in Sweden. Since all VAT law flows from Europe, the appeal court passed the case on to the ECJ to decide.

There have been some limited decisions in the US involving criminal cases where bitcoin was viewed as money, for the purposes of money laundering offence. Meanwhile, the US Commodity Futures Trading Commission (CFTC) last month deemed bitcoin to be a commodity and closed down trading platform Coinflip in the process.

The most surprising aspect to note is the speed and pragmatism with which regulators are taking action towards Bitcoin

BITCOIN ECOSYSTEM COVERED IN THIS SURVEY



Mining

- Mining – i.e. compute farm which maintain the cryptographic integrity of the network - is evolving into a 'natural monopoly' due to economies of scale and increasing capital intensity with the top five players collectively commanding c. 78% of market share



Exchanges

- There are many regional players but only a few market leaders crossing only a few currencies
- Unlike elsewhere in the Bitcoin ecosystem, exchanges have seen an early wave of M&A activity



Wallets

- Wallets are evolving into banks, crossing their own currency pairs and making off-chain transactions
- Development of full-service models including forex, custody, payments and brokerage
- Offer SaaS platforms/SDKs providing APIs for others to build consumer applications



Payment & Remittance

- Few clear commercial use cases are visible in the developed world beyond speculation
- The last mile is the key challenge in developing and emerging markets
- Next-gen consumer services are leveraging 'Bitcoin inside' as a payment rail



Financial Products

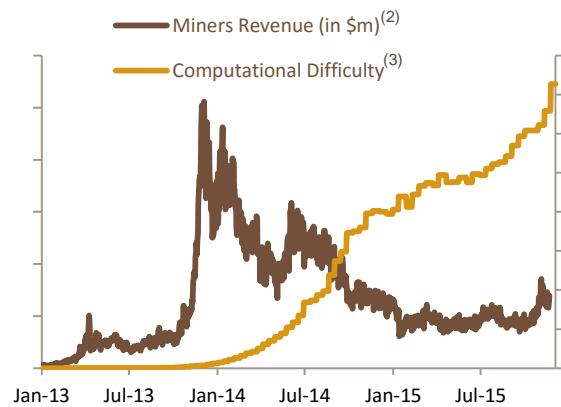
- Financial products have emerged in the Bitcoin ecosystem ranging from ETFs and saving accounts to derivatives
- With a lack of mass public adoption, Bitcoin-related financial products are still in their infancy





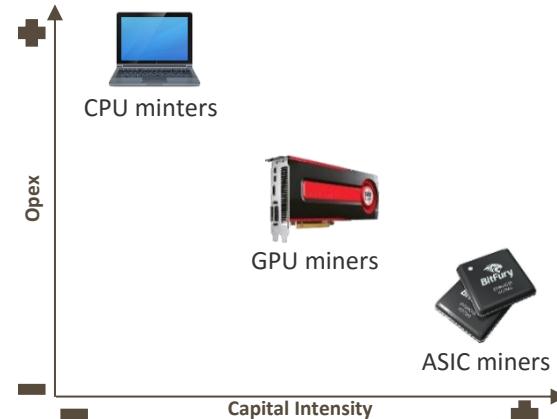
ECONOMIES OF SCALE & CAPITAL INTENSITY LEAD TO NATURAL MONOPOLY

Increase in computational difficulty and reduction in rewards...



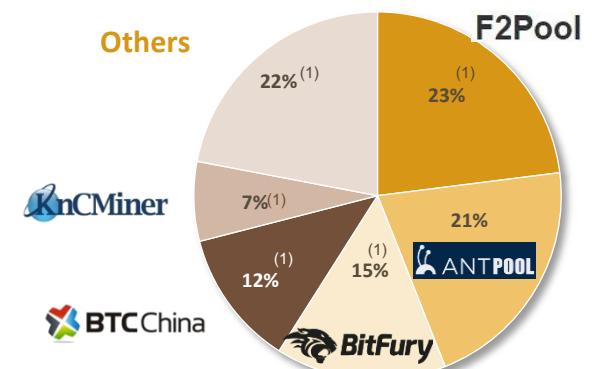
Mining capacity has increased, driving up computational difficulty while rewards are falling

...require increasing capital costs / complexity and lowering Opex



To maintain margin, the leading miners have evolved from simple computer to custom ASIC systems

...creating barriers to entry and market concentration



The leading five miners are generating 78% of the revenue

Started as a hobby for tech enthusiasts, Bitcoin mining has moved to enterprise-grade data centres with specialized ASICs and \$100m+ facilities; today the market is fragmented with only a handful of leaders including 2 European companies (KnCMiner and BitFury)

Note: 1: Source Blockchain.info as of November 3, 2015

2: Miner's revenue is the revenue earners for mining a block (in USD)

3: Computational Difficulty refers to difficulty in mining a block





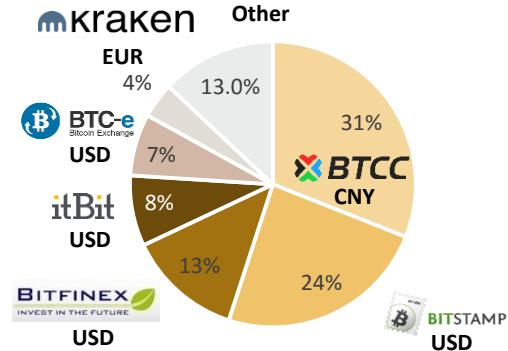
BITCOIN EXCHANGES HAVE BECOME AN OLIGOPOLISTIC MARKET

Many Regional Players....



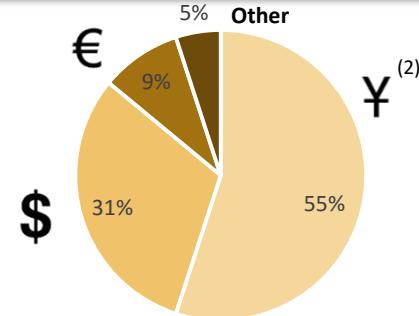
... But Few Winners At Scale...

Segmented By
Bitcoin Exchange
Firms⁽¹⁾



... Crossing Only a Few Currencies

Segmented By
Bitcoin Exchange
Currency⁽¹⁾



Depth of liquidity rewards scale but local bank partnership critical;
M&A consolidation a natural consequence



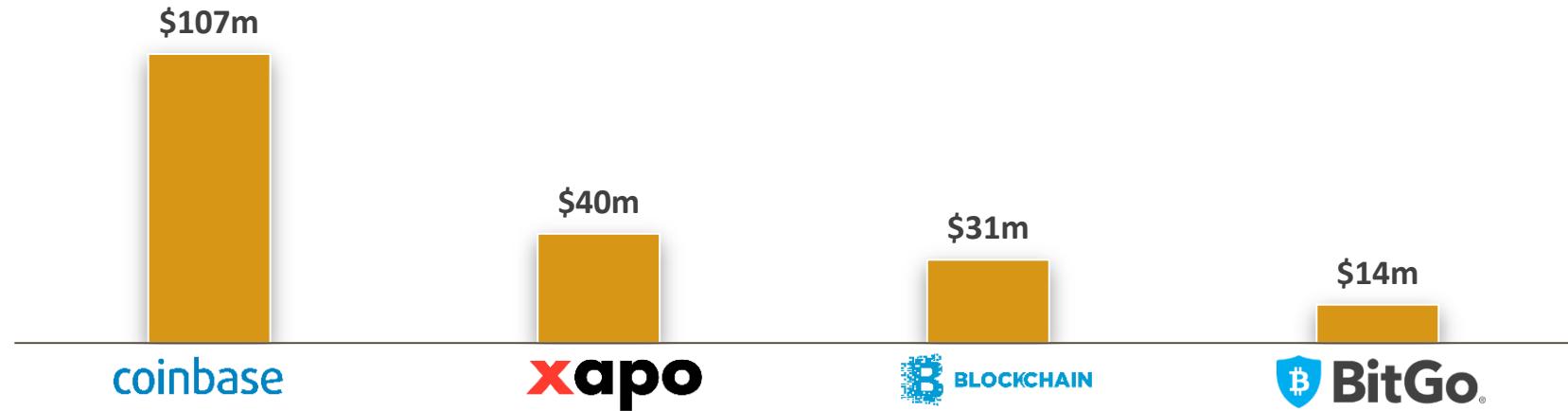
EARLY EXCHANGE CONSOLIDATION ALREADY OCCURRING

Announced	Acquirer	Country	Target	Country
Sep-15	BIT Pagos		Unisend	
Aug-15	mexbt <small>CRYPTO EXCHANGE OF THE AMERICAS</small>			
Jun-15	coinBR.net Bitcoin Services		Coinverse	
Apr-15	coinsetter		CAVIRTEX <small>CANADIAN VIRTUAL EXCHANGE</small>	
Apr-15	SATOSHI CITADEL INDUSTRIES		BuyBitcoin.ph	
Jan-15	ANX <small>INTERNATIONAL</small>		CoinMKT <small>how the world trades cryptocurrency</small>	
Jul-14	MOOLAH		mintpal	
Mar-14	ZEROBLOCK <small>BLOCKCHAIN</small>		RTBTC	
Dec-13	WPCS <small>International Incorporated</small>		BTX Trader	

Given the potential economies of scale we expect consolidation to continue or even accelerate in 2016



WALLET LEADERS HEAVILY FUNDED CREATING HIGH BARRIERS TO ENTRY

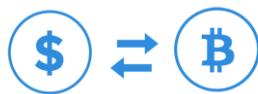


Latest Round	Jan-2015	Jun-2014	Oct-2014	Sep-2014
Funding Round	Series C	Series A1	Series A	Series A
Investors	<ul style="list-style-type: none">▪ A16Z▪ BBVA Ventures▪ Blockchain Capital▪ DFJ Growth▪ Digital Currency Group▪ Docomo Capital▪ IDG Ventures▪ NTT DoCoMo▪ Ribbit Capital▪ SV Angel▪ NYSE▪ Union Square▪ Valor Capital▪ Y Combinator	<ul style="list-style-type: none">▪ AME Cloud▪ Benchmark▪ Blockchain Capital▪ BitFury Group▪ DST▪ Emergence Capital▪ Fortress▪ Greylock▪ Index Ventures▪ Jerry Yang▪ Ribbit Capital▪ Slow Ventures▪ Winklevoss Capital	<ul style="list-style-type: none">▪ Amit Jhawar▪ Future Perfect Ventures▪ Lightspeed▪ Mosaic Ventures▪ Nat Brown▪ Prudence▪ Richard Branson▪ Wicklow Capital	<ul style="list-style-type: none">▪ Redpoint Ventures▪ Bridgescale Partners▪ BitFury Group▪ A-Grade Investments▪ Blockchain Capital▪ Founders Fund▪ Inventures Group▪ Liberty City Ventures▪ Radar Partners

21% of total VC funding is invested in the top 4 Bitcoin wallets



WALLETS ARE EVOLVING INTO BANKS... COINBASE DEVELOPMENT SINCE 2012



Jan 2012: Coinbase launches Bitcoin wallet

Dec 2012: Launch of Coinbase payment button to accept Bitcoin on any website by copying and pasting a few lines of code

May 2013: Coinbase launches subscription payments

Jan 2013: Coinbase launches a new version of its API enabling users to buy, send, and accept Bitcoin

Aug 2014: Coinbase announces that it holds insurance against theft or loss of its Bitcoins

Jul 2014: Coinbase Vault goes live to all customers

Jun 2014: Coinbase launches new mobile site

Jan 2015: Coinbase launches the first regulated Bitcoin exchange in the US

Jun 2015: Coinbase launches Instant Exchange, a feature that allows users to send or receive Bitcoin payments while eliminating exposure to Bitcoin exchange rate fluctuations

Jul 2015: Coinbase launches market orders on Coinbase Exchange

Nov 2015: Coinbase launches first US-issued Bitcoin debit card, the Shift Card

2012

2013

2014

2015

coinbase

Since its inception in 2012, Coinbase has expanded its offering from a Bitcoin wallet to a full-featured Bitcoin bank. This exemplifies the trend of wallet providers evolving to gain additional market share



... AND SAAS PLATFORMS BLOCKCHAIN IS A PRIME EXAMPLE

Our Mission

BLOCKCHAIN

At Blockchain, we build innovative software that makes using Bitcoin safe, easy, and secure for all consumers and businesses anywhere in the world. We have raised over 30M in capital from top tier investors including Lightspeed Venture Partners, Wicklow Capital, and Sir Richard Branson.

Blockchain is currently the provider of the world's most popular Bitcoin wallet, the most widely used Bitcoin APIs, the most popular block explorer and search engine, and has what is widely recognized as the strongest, most trusted brand in Bitcoin. Experiencing a rapid expansion during the course of two years, Blockchain exploded from 100,000 users to over 3,500,000 users.

'Our API solution may be our most valuable piece of technology.'

Developers can build on the top of it and have access to all of our data including wallet information, data on transactions & blocks, and market information.'

— Nicolas Cary, Co-Founder of Blockchain

In contrast, Blockchain has been pursuing a strategy of providing software and data to the ecosystem

Payment Processing

Blockchain Wallet API

Bitcoin-Qt Compatible
JSON RPC

Create Wallets

Blockchain Data API



Simple
Query API



WebSocket



Exchange
Rates



Charts and
Statistics



B BLOCKCHAIN API

BIT Pagos

CoinTap

genesiscoin

LAMASSU
BITCOIN VENTURES

Lawnmower

Libra

magnr

ONENAME

SARUJIBI

Snapshot of API Users



PAYMENT USE CASES VARY SIGNIFICANTLY BY GEOGRAPHY AND APPLICATION

Emerging Markets

Remittance

How BitPesa Plans to Reduce Friction in the Remittances Market

Bitcoin remittance service Rebit rolls out zero transaction fees, KYC policy



- The remittance market could benefit substantially from Bitcoin given the high fees on international money transfers and the oligopoly of incumbents with limited competition and accessibility (due to the limited number of locations and opening hours of branches)

Cross-Currency Payment

Starting Bitwage, An International Payroll Company That Uses Bitcoin

Align Commerce Raises \$12.5 Million To Simplify Cross Border Payments For Business Using Blockchain



- Tight capital control policies are a hurdle for traditional cross-border payments
- Bitcoin technology can replace correspondent banks in the cross-border process by providing cheaper transactions for merchant clients

Developed Markets

Consumer Products

Bitcoin goes mainstream: Circle's payments make cryptocurrencies easy

COINBASE JUST DEBUTED THE FIRST BITCOIN DEBIT CARD IN THE US



- Circle uses Bitcoin technology to offer digital money transfers to consumers, thereby competing against Venmo, Google Wallet, and Apple; users do not know they are exchanging through Bitcoin, but nonetheless enjoy Bitcoin benefits

Micropayments

Faradam: Bitcoin Micropayments for Freelancers

Streamium Allows You To Earn Bitcoin Per Minute



- Traditional cards were not designed to support online micropayments. Bitcoin offers a flexible solution without borders
- Ability to charge for services rather than content would be broadly useful

The Bitcoin payment landscape is rapidly evolving and is use case dependent



FINANCIAL PRODUCTS ARE STARTING TO EMERGE

Bitcoin Hedge Funds

Sep-2014

Hedge Fund GABI Makes First Bitcoin Purchase via DigitalBTC

The Global Advisors Bitcoin Investment Fund (GABI) has completed its first initial offer period and made its first purchase of bitcoin, according to the company.

While the amount of cryptocurrency purchased has not been announced, it is clear that the fund delayed the move to make the most of the [current decrease](#) in the bitcoin price.

GABI is incorporated in the island of Jersey and is possibly the world's [first regulated bitcoin investment fund](#).

Transparency and compliance

GABI made the decision to execute its first bitcoin purchase via [digitalBTC](#), Australia's [first publicly listed bitcoin company](#).

Daniel Masters, director of GABI and co-founder of Global Advisors Jersey Limited (GAJL), which set up the fund, explains:

Bitcoin ETFs

May-2015

Bitcoin Tracker One ETN Starts Trading on Nasdaq Stockholm

Two weeks ago XBT Provider AB announced the authorization of Bitcoin Tracker One, the first Bitcoin-based security available on a regulated exchange. Today, Bitcoin Tracker One started [trading](#) on Nasdaq Stockholm.

"NASDAQ OMX Stockholm decides to officially list 1 Exchange Traded Note issued by XBT Provider AB with effect from 2015-05-18," announced XBT Provider AB on Friday. "We are proud to offer the world's first "Bitcoin tracker" to be traded on a regulated exchange," states the XBT Provider website. "By enabling this easy and secure way to invest in Bitcoin we hope to have eliminated the boundaries that earlier prevented individuals and companies from being able to actively invest in what we believe to be the future of money."

Bitcoin Savings Accounts

Jun-2015

BTC.sx Rebrands as Magnr in Bitcoin Savings Account Launch

Magnr, formerly [BTC.sx](#) – a bitcoin derivatives trading platform – has rebranded and is now offering bitcoin saving accounts with an interest rate fixed at 2.18% for a promotional period of six months.

Following this, the interest rate will be variable, dependent on trading fees generated by users on the platform. Magnr declined to reveal its trading volume but said that it had surpassed 60,000 total trades earlier this year.

Bitcoin Derivatives

Sep-2015

Alt-Options Launches Bitcoin Derivative Market

A group of students from Boston University has set out to build a commodity derivative exchange for digital currencies, allowing those who hold large amounts of bitcoin to hedge against market volatility.

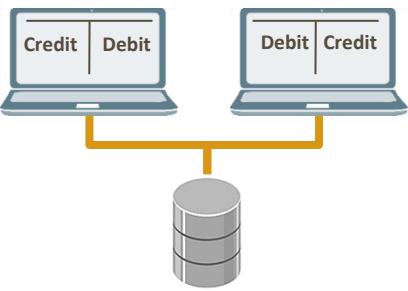
Alt-Options, co-founded in June 2014 by Joe Zhou, Kevin Foo and Marco Cuesta, aims to act as the Chicago Mercantile Exchange for bitcoin, allowing digital currency derivatives to be publicly bought and sold instantly on its platform. The new platform launches in this month with a competition in collaboration with the College Cryptocurrency Network.

Bitcoin financial products have started to emerge, but the sector is still in its infancy

II. BLOCKCHAIN LANDSCAPE

BLOCKCHAIN FOR FINANCIAL INSTITUTIONS DIFFERENCES VS. EXISTING ARCHITECTURES

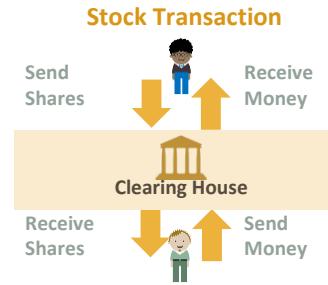
Internal Transaction Systems



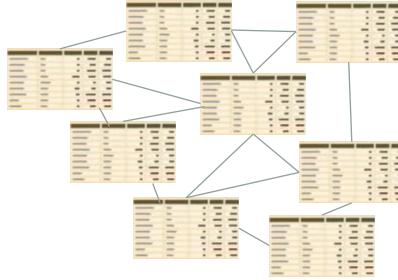
Middleware/Messaging



Clearing Houses



Blockchain



- **Architecture:** Centralized internal database (e.g. IBM, Oracle)
- **Settlement Process:** Internal
- **Speed:** Real-time
- **Transaction Cost:** Internal IT
- **Benefits:** Speed, cost and (relative) simplicity
- **Limitations:** Committing transactions with third parties/across network

- **Architecture:** Secure inter-party messaging/queue-based middleware
- **Settlement Process:** Independent (but enabled by messaging)
- **Speed:** Up to 3–5 days
- **Transaction Cost:** External provider + settlement costs
- **Benefits:** Secure transaction between external parties, standardized data formats
- **Limitations:** Data errors slow transactions, flexibility

- **Architecture:** Third party agent-in-possession
- **Settlement Process:** Via clearing house
- **Speed:** Days (transaction dependent)
- **Transaction Cost:** Third-party service
- **Benefits:** Reduced settlement risk/ DVP
- **Limitations:** Complex and cumbersome, expensive

- **Architecture:** Distributed ledger with cryptographic integrity
- **Settlement Process:** Consensus
- **Speed:** Near real-time to minutes
- **Transaction Cost:** Similar to internal databases
- **Benefits:** Enables third-party transaction to be as simple and efficient as internal transactions
- **Issues:** Tech maturity, integration with existing systems/workflows

Blockchain/distributed ledgers provide the potential efficiency of a central database and the robustness of a third-party clearing house for complex/distributed transactions without costly middleware

BLOCKCHAIN ‘FLAVOURS’

Bitcoin Blockchain

- ✓ Mining-based Proof-of-Work consensus model enables a global, permissionless currency network
- ✓ Extensibility through e.g. side chains
- ✓ Can be layered, e.g. Lightning payment contracts
- ? Speed and weight for financial institutions
- ? Permissioning where trust is already established between counterparties

Proof-of-work consensus and permissionless model enables Bitcoin to function without established trust relationships between counterparties. However, this overhead is not required for most applications between financial institutions where trust levels are well understood

Domain-Specific

- ✓ Focus on specific applications
- ✓ Integration into existing systems / processes key priority
- ✓ Significant domain-specific logic and workflow
- ? Interoperability and cross-chain integration will require additional protocols

Domain-specific approaches, focusing on specific business processes such as forex or settlement, benefit from focus and delivery of complete solutions that can be readily adopted

Private Platform

- ✓ General purpose Blockchain platforms, akin to e.g. relational databases for building enterprise applications
- ? Vendor-specific implementations will vary
- ? Interoperability and cross-chain integration will require additional protocols

General purpose platforms provide flexibility and allow institutions to tailor their applications to their individual requirements, unrestricted from assumptions on business processes

Open Source (Non-Bitcoin)

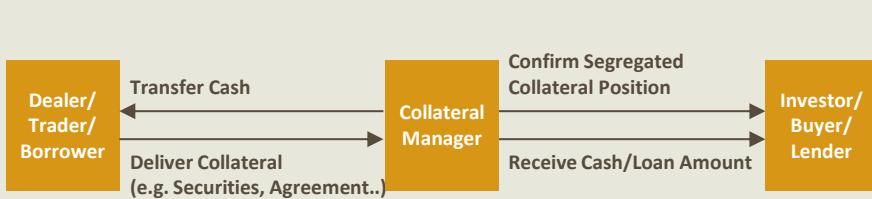
- ✓ Significant groundswell support/enthusiasm for e.g. Ethereum
- ✓ Open source is a proven model, e.g. Linux, Hadoop
- ✓ Ambitious projects to date
- ? Funding and ability to deliver enterprise-class solutions
- ? Potential for conflicts, scope creep in projects

The Ethereum smart contract platform in particular has garnered interest from both IT vendors, such as Microsoft, and financial institutions. However, the project is hugely ambitious and funding has been in question

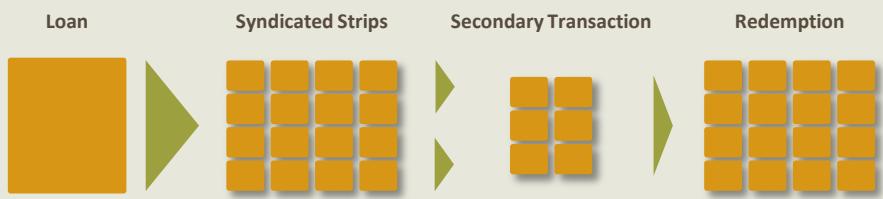
Currently, financial institutions are experimenting with all flavours of Blockchain. Winners can come from any category, and winning will rely on successful deployment and ROI over the next 12–24 months

BLOCKCHAIN APPLICATIONS ALREADY IN DEVELOPMENT WITH FIs

Repurchase Agreement



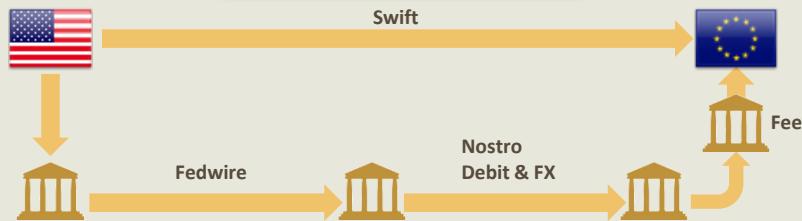
Debt Distribution



- Within a trusted network of counterparties, replace the collateral manager with a distributed ledger, thereby removing the bottleneck and simplifying the transaction

- Ownership can be tracked, retained, and monitored by the Blockchain
- Significant reduction in loan administration and improved accuracy

International Payment



- Remove middleware network and replace with a distributed ledger application

Insurance Processing

- 1 Claim Verification/Assessment
- 2 Auto/Manual Claim Adjudication
- 3 Follow-ups/Chasers For Missing Information/Documents
- 4 Case Management/Assignments
- 5 Reserve Calculation
- 6 Claim Payment Processing
- 7 Recurring Payment Processing

- Leverage Blockchain to ensure process compliance, reduce fraud, and streamline document management

Successful Blockchain initiatives depend on the business process and application as much as, if not more than, the underlying technology. These involve multi-party exchanges of value where currently a third-party agent or system is required to ensure transaction robustness

POTENTIAL IMPACT OF MOVING TRANSACTIONS TO THE BLOCKCHAIN

'In lots of areas, it looks like the Blockchain will work and it is easy to see how it could revolutionise finance [...] The speed of execution is so much faster for securities settlement. [And] you can see how it could reduce the capital, that banks have to hold, against each trade.'

– Rhomaios Ram
Head of Product Management
Deutsche Bank Global Transaction Banking
Financial Times, Nov-2015



[Blockchain has] the potential to facilitate the fast, efficient, and secure transfer of ownership of assets – including bonds, shares, and other instruments – [and to help] maintain records securely and efficiently. In other words, it's all about making processes simpler and life easier.'

– Harriett Baldwin
Economic Secretary to HM Treasury
Oct-15



'This technology has the potential to open the door to revolutionary possibilities. Any financial asset that currently requires a trusted third party to provide verification could, theoretically, be disrupted.'

– Understanding the Evolving
Cryptocurrency Market
PwC, Aug-15



'Our analysis suggests that distributed ledger technology could reduce banks' infrastructure costs attributable to cross-border payments, securities trading, and regulatory compliance by between \$15-20 billion per annum by 2022.'



– The Fintech 2.0 Paper: Rebooting Financial Services

2016 BEGINS THE RACE TO PRODUCTION



Oct-2015

UBS Working with Blockchain Prototypes

Oliver Bussmann, CIO at Swiss bank UBS AG, is connecting the company to startups, entrepreneurs and others that can help the bank as digital technologies such as the Internet and blockchain transform financial services.

Mr. Bussmann in April created an innovation lab in London where the bank is looking at blockchain, the technology that underpins bitcoin digital currency. About six weeks ago, he also launched **The UBS Future of Finance Challenge**, an open competition for entrepreneurs and technology startups around the world. The new UBS lab is part of Level39, a large technology accelerator that includes about 170 startups in the financial technology area.

These efforts underpin the culture of open innovation occurring not only at UBS but at a number of financial institutions as they open their research and development programs to outside partners to spark innovation in everything from security technologies to new payment platforms.

In Sep 2015, UBS became one of the first banks to join the R3 consortium; at the same time, UBS is experimenting with using Blockchain for various applications, such as issuing bonds and settling trades



Sep-2015

Barclays wants to help blockchain startups understand investment banking requirements

There's plenty of hype about blockchain technology these days, but only a handful of people who actually understand the challenge of engineering a distributed ledger system for say, an investment bank.

Dr Lee Braine of the Investment Bank CTO Office at Barclays is one such person. He said the current startup ecosystem and its fount of ideas is inspiring and banks are actively engaged in exploring the right opportunities.



For their part, startups should take a step back and consider the core kinds of non-functional requirements that products must meet if they pass through an architecture review.

Braine said developers should ask themselves, 'If you are going to have an enterprise-scale solution, what type of things would you need to adjust?'

'And if we are looking at rollback, recovery, scalability, timeliness of transaction processing and so on – then there's a whole host of things that normally get baked in from the bottom up.'

Barclays has been one of the most active financial institutions in the Bitcoin/Blockchain ecosystem supporting Fintech startups via its incubator, joining the R3 consortium, and experimenting with various Blockchain projects



Oct-2015

Santander plans to become 'Ripple evangelist'

Spanish banking giant Santander said its recent investment in Ripple is a strategy it promises will continue with a number of roll outs and pilots. Santander InnoVentures pumped \$4m into Ripple earlier this month, bringing the technology provider's Series A funding round to \$32m.

Mariano Belinsky, managing partner of Santander InnoVentures, told **IBTimes UK** there are a number of ways the bank will participate with Ripple going forward: "Actively let's say we can act as a facilitator for them to meet other financial institutions and discuss their capabilities with them. We are evangelists if you will."

"We are soon to join their board as well. I think that will be announced in the coming days. They have created a sort of senior advisory board with a number of financial institutions and we are part of that advisory board."

He said Santander had stuck close to technology-driven use cases most relevant to its clients - the most sensible being international payments. In this respect Ripple was the obvious partner.

To this end Belinsky sang Ripple's praises: "They have been around for quite a while, and they have already gone through some regulatory scrutiny, which we see as positive. I think they have established a number of very credible relationships with regulators. They are part of the faster payments initiative in the US; they are only non-financial institution participating at the Fed level, which gives us a lot of comfort. They are very serious and credible guys with a large development team and knowledge and really good banking relationships."

Santander is one of the most active institutions within the Bitcoin/Blockchain ecosystem, investing in Ripple and creating a Bitcoin/Blockchain lab working on 20–25 projects



Nov-2015

30 top banks and Mike Hearn have now joined R3 Global Consortium

The New York-based financial innovation startup, **R3 CEV**, continues to add to its impressive list of partner banks. The company announced today that five more banks have joined its global consortium, bringing the total to 30. The firm also revealed the team that would design the system.

Led by Wall Street veteran, David Rutter, R3 is self-described as "a financial markets crypto, exchanges and venture practice." The company is working on a framework for using blockchain technology in financial markets.

In September, the company launched the initiative with nine banks, attracting the attention of the financial industry. However, nine banks were just a start and the company soon added 13 more, in the same month.

The latest round of five banks to join R3 are BNP Paribas, Canadian Imperial Bank of Commerce, ING Bank, Macquarie Bank, and Wells Fargo & Co. This follows last month's additions of Japan's Mizuho Bank, Italy's UniCredit and Stockholm-based Nordea.

According to the latest list of the top banks in the world from **Acuity's Bankers Almanac**, BNP Paribas is the world's fourth largest bank by asset. An independent list of the world's biggest bank by **Forbes** lists Wells Fargo as the second largest bank by market capitalization (US\$278.3 billion). However, top banks lists often vary based on the date of data gathering and exchange rates.

In Nov 2015, 5 additional investment banks signed up with the R3 consortium. The total number of participants has now increased to 30 banks

According to our survey, large financial institutions have typically already identified 10 – 20 (or more) potential Blockchain applications and are in prototype stages with multiples projects



REACHING \$1BN IN BLOCKCHAIN SPEND BY '17 IS NOT A STRETCH FOR LARGE FIs

100 Top Global Financial Institutions



Average of 10 Projects Per Financial Institution



Average of \$1m of Investment Per Project



c. \$1B of Total Investment in Blockchain Project By FIs

Blockchain has evolved from zero to the cusp of being a multi billion dollar market in less than 24 months

Barclays has two blockchain 'labs' in London and is planning 45 experiments with the technology

UBS to Open Blockchain Research Lab in London

Citi builds blockchains

BBVA selected 10 bitcoin and blockchain start-ups for Open Talent finals

Goldman Sachs Seeking Crypto Trade Settlement Patent

BARCLAYS

UBS

citi

BBVA

Goldman Sachs

EARLY LEADERS HAVE SIGNIFICANT MOMENTUM



Provider of software used by businesses to design, deploy and operate private Blockchain networks

- Sep 10, 2015:** Chain raises \$30m from Visa, Nasdaq, Citi, Capital One, Fiserv and Orange
- Jun 24, 2015:** Nasdaq selects Chain to run pilot in private market arm
- Jun 19, 2015:** Gyft partners with Chain for Blockchain-powered gift cards

- Founded:** 2013
- FTE:** c. 15
- Total Funding:** \$44m (Series C, \$30m, Sep 2015)
- Investors:** Capital One, Citi, DCG, Fiserv, Khosla, NASDAQ, Pantera, RRE, Visa
- Clients/Partners:**



CONSENSYS

Developer of decentralized applications and end-user tools for blockchain ecosystems on Ethereum

- Nov 9-13, 2015:** Help to set up 5 days event about the Ethereum Foundation in London
- Oct 28, 2015:** Microsoft partners with ConsenSys to offer blockchain technology to financial institutions
- Oct 13, 2015:** ConsenSys announces that it has been in long term talk with Deloitte and Microsoft

- Launched:** 2014

- FTE:** 60

- Total Funding:** Internal funding

- Investors:** n/a

- Clients/Partners:**



Developer of Blockchain/distributed ledger applications for the financial services industry

- Nov 23, 2015:** ING bank joins R3
- Nov 19, 2015:** Five more banks join R3
- Oct 28, 2015:** Three banks join R3 Blockchain consortium taking total to 25
- Sep 29, 2015:** An additional 13 banks joined R3 consortium including Citi and RBC
- Sep 15, 2015:** 9 banks, including Goldman Sachs and Barclays have joined forces R3

- Launched:** September 2015

- FTE:** c. 20

- Total Funding:** n/a

- Investors:** n/a

- Clients/Partners:** 30+ banks including:



Provider of a cross-currency payment and settlement services using a distributed financial technology called consensus

- Oct 21, 2015:** Santander to become 'Ripple evangelist'
- Oct 6, 2015:** Ripple receives \$4m from Santander arm and inks partnership with Accenture
- Aug 5, 2015:** Ripple is named a 2015 World Economic Forum Technology Pioneer
- May 19, 2015:** Ripple closes \$28m in funding

- Founded:** 2012

- FTE:** c. 120

- Total Funding:** \$38m (Series A, May/Oct 2015)

- Investors:** Core Innovation, Lightspeed, Pantera, RRE, Santander and DCG

- Clients/Partners:**



At this stage of market development, there is scope for multiple winners. The early leaders have momentum and emerging clear value propositions

FEW EU BLOCKCHAIN COMPANIES BEGINNING TO GAIN MOMENTUM WITH FIs



Oct-2015

Blockchain Platform Setl Exceeds 1 Billion Transaction 'Milestone'

Blockchain platform Setl claims it is now capable of processing 1 billion transactions per day, a figure it terms a "milestone" for scaling the technology.

The firm, which is building a private network of distributed ledgers that can settle cash and assets in real time, says its testnet can now match the volume of non-cash electronic payments made globally.

When announced in July, Setl's network was handling 5,000 transactions per second, which amounts to 432 million a day.

While blockchain technology is gaining traction as a cheaper, leaner alternative to legacy financial systems – settlement, for example, currently costs firms \$65-\$80bn annually – bankers remain skeptical about the speed and reputation of open systems such as bitcoin.



Developer of a multi-asset, multi-currency institutional payment and settlement infrastructure based on Blockchain technology



Sep-2015

Credits testing KYC blockchain on the Isle of Man

Blockchain specialist Credits is following a tradition of testing new technologies on the Isle of Man with a federated know your customer (KYC) application which leverages the jurisdiction's financial services pedigree.

Nick Williamson, co-founder of Credits told IBTimes: "We are still evolving exactly how it's going to play out but it would initially be for people living or present on the Isle of Man."

"We wanted to set it out on that small scale and build up the technology before looking to expand it wider.

Williamson agreed that rolling out this sort of KYC technology beyond the Isle of Man was by no means a straightforward undertaking.

He pointed out that KYC is "such a huge pain point for every company that touches it. There's a lot of institutional will to try new approaches that are promising both in reducing cost and fraud in a systemic way.

Developer of a hybrid Blockchain platform that provides interoperability between private and public chains



Nov-2015

Sending money overseas: could the blockchain hold the answer?

Here at Visa Europe Collab, we recognise the potential of blockchain technology to improve existing processes and protocols, particularly in areas that traditional payment rails have been less suitable for.

One such area is international remittances. Transferring money overseas is vital for millions of families across the world, but it can be expensive, cumbersome and slow.

We believe there's a real opportunity to develop an improved remittance service for both the sender and receiver of payments in terms of fees, speed and ease of use. That's why we have partnered with Epiphyte, a startup specialising in distributed ledger solutions for the mainstream financial market, to see if blockchain technology holds the key. We're working with them on a proof of concept to run a series of simulations within a test environment and explore an alternative to conventional remittance processing.

Provider of Blockchain-powered SaaS that delivers instant settlement and delivery versus payment for financial trades



Sep-2015

Bitcoin 2.0: Eris is talking to banks first and worrying about revenues later

Eris Industries, the smart contracts blockchain platform, says it's currently inundated with tier one banks, but is still exploring where its actual business model might lie.

Brian Fabian Crain, head of business development, Eris told IBTimes: "So we haven't got a proven business model that we know like, this is where we are going to go.



"We do have some early revenue. Let's put it like this - this is all very new so it is unclear where it is going and it is unclear where blockchains will have the most utility and the most impact.

"So we are fairly open to and are exploring our customers - I think everybody is kind of exploring."

Eris emerged as fork of Ethereum and as such its core competency is the code based execution of smart contracts, the sort of thing that fills the world's registries in the form of centralised databases or on paper.

Provider of a free software platform that allows anyone to build their own data infrastructure using Blockchain and smart contract technology

Although the European Blockchain ecosystem is still nascent relative to the US, a few companies are gaining momentum

BROAD APPLICATIONS WHERE VERACITY IS IMPORTANT



Why blockchains work for the IoT

A technology breakthrough that has fundamentally changed our notions of centralized authority, the blockchain is a universal digital ledger that functions at the heart of decentralized financial systems such as Bitcoin, and increasingly, many other decentralized systems.

The blockchain functions as a universal digital ledger facilitating various types of IoT transactions between devices



IBM has developed a proof-of-concept that uses Blockchain technology to build a decentralized IoT



Ericsson and Guardtime create secure cloud and big data

- Ericsson and Guardtime partner to enable all businesses and governments to monetize their data assets with confidence and knowledge of data history with immutable proof
- Real time governance of cloud operations and data assets at scale is possible for the first time leveraging Guardtime's Keyless Signature Infrastructure (KSI) in Ericsson's offerings
- Ericsson offerings have built in forensics capabilities at point of receipt and offer real time protection from Advanced Persistent Threats (APTs), malicious insiders and corrupt practices. Evidence of data history is portable and independently verifiable



Lockheed Martin and Guardtime
Technology Target Data
Manipulation Cyber Threats

SUFFOLK, Va., Oct. 7, 2015 — Using a specialized mission support system, Lockheed Martin (NYSE: LMT) and Guardtime demonstrated a pre-packaged technology that mitigates data manipulation attempts by internal and external threats to a networked mission centric environment.

Guardtime's Blockchain-based data integrity solutions can be applied to the telco, defense, digital advertising, and public sectors



Honduras



Honduras to build land title registry using bitcoin technology

Honduras, one of the poorest countries in the Americas, has agreed to use a Texas-based company to build a permanent and secure land title record system using the underlying technology behind bitcoin, a company official said late Thursday.

Factom, a U.S. blockchain technology company based in Austin, Texas, will provide the service to the government of Honduras, the firm's president, Peter Kirby, said. The company is doing the project with Epigraph, a title software company that uses blockchain technology, also based in Austin.

Factom would not reveal the cost of the project. Honduras would become only the second government to use blockchain, which increases transparency in a transaction, to manage government data, after reports that the Isle of Man would test a government-run blockchain project.

"In the past, Honduras has struggled with land title fraud," said Kirby. "The country's database was basically hacked. So bureaucrats could get in there and they could get themselves beachfront properties."

Ebal Jair Diaz Lupian, the Honduran government's chief of staff, did not respond to several attempts from Reuters to contact him via email and telephone.

Honduras is using Blockchain technology to build a land title registry, which will help to reduce land title fraud

Blockchain technology has many applications outside the financial industry, though these use cases are less publicized

III. COMPANIES SURVEYED

BITCOIN

BITCOIN COMPANIES SURVEYED

SHORT PROFILES (1/2)

Company	Description	Company	Description
ABRA US	<ul style="list-style-type: none"> Description: Provider of a P2P money transfer platform; globally accessible through the Bitcoin Blockchain network enabling fast and secure transactions with no transfer fees Total Funding: \$14m (Amex VC, First Round, RRE VC) Founded: 2014 / Headquarters: SF, US / FTE: c. 20 	BLOCKCHAIN UK / US	<ul style="list-style-type: none"> Description: Provider of Bitcoin wallets, block explorers, and APIs Total Funding: \$30m (Lightspeed VC, Wicklow, Mosaic) Founded: 2011 / Headquarters: LDN, UK/NYC, US / FTE: c.40
Bitcurex Bitcoin Exchange PO	<ul style="list-style-type: none"> Description: Provider of an exchange platform for buying and selling Bitcoins and Dashcoins Total Funding: No external funding Founded: 2012 / Headquarters: Łódź, Poland / FTE: c. 20 	CEX.IO UK	<ul style="list-style-type: none"> Description: Provider of Bitcoin cloud mining services and a Bitcoin exchange platform Founded: 2013 / Headquarters: London, UK / FTE: 20
Butex.la AR / NL	<ul style="list-style-type: none"> Description: Largest Latin American Bitcoin exchange with 25%+ market share Total Funding: No external funding Founded: 2013 / Headquarters: Argentina / NL / FTE: c. 5 	Chainalysis US	<ul style="list-style-type: none"> Description: Provider of a compliance solution for the Blockchain, enabling monitoring of connections between entities and identification of malicious actors / activity Founded: 2014 / Headquarters: New York, US / FTE: 8
BitFury US / NL	<ul style="list-style-type: none"> Description: Provider of ASICs to consumers for Bitcoin mining (i.e. performing cryptographic hashes to process transactions on the Bitcoin Blockchain network) Total Funding: \$60m (Georgian Co-Inv. Fund, Blockchain, Binary Fin., iTech Capital, DRW Trading, QueensBridge) Founded: 2012 / Headquarters: US / NL / FTE: 70+ 	CIRCLE US	<ul style="list-style-type: none"> Description: Provider of an app for sending and receiving money free of charge, with Bitcoin acting as an intermediate currency Total Funding: \$76m (Accel, General Catalyst, Goldman Sachs, IDG Capital Partners, Oak Investment, Pantera) Founded: 2013 / Headquarters: Boston, US / FTE: c. 80
bitonic NL	<ul style="list-style-type: none"> Description: Largest Bitcoin trading platform in the Netherlands and Belgium, representing more than half of the market or equivalent to \$30m+ of transactions annually Founded: 2012 / Headquarters: Utrecht, NL / FTE: c. 11 	coinbase US	<ul style="list-style-type: none"> Description: Provider of a Bitcoin transaction platform, comprising an exchange, wallet, and API for developers Total Funding: \$106m (A16Z, BBVA, DFJ Growth, IDG, NYSE, Ribbit Capital, Union Square Ventures, USAA) Founded: 2012 / Headquarters: SF, CA / FTE: 100
BITSTAMP LU	<ul style="list-style-type: none"> Description: Online Bitcoin marketplace for selling and buying Bitcoins Total Funding: \$10m (Pantera Capital) Founded: 2011 / Headquarters: Luxembourg / FTE: c. 27 	coinfloor UK	<ul style="list-style-type: none"> Description: UK-focused Bitcoin marketplace enabling users to buy and trade Bitcoins with GBP, EUR, PLN, and USD Total Funding: \$0.25m (Angel Investors) Founded: 2013 / Headquarters: London, UK / FTE: c. 7

BITCOIN COMPANIES SURVEYED

SHORT PROFILES (2/2)

Company	Description	Company	Description
CRYPTOPAY UK	<ul style="list-style-type: none"> Description: Provider of a Bitcoin wallet and payments platform that enables users to buy, sell, and store Bitcoins Investor: Coinsilium Founded: 2013 / Headquarters: London, UK / FTE: c. 7 	safello SE	<ul style="list-style-type: none"> Description: Operator of a Bitcoin trading portal that enables users to buy, sell, and store Bitcoins; also enables users to make donations and send money in Bitcoins Total Funding: \$1.0m (DCG, Barclays, and Techstars) Founded: 2013 / Headquarters: Stockholm, SE / FTE: c. 11
 ELLPTIC UK	<ul style="list-style-type: none"> Description: Provider of an AML solution for Blockchain as well as a Bitcoin vault and Bitcoin wallet hosting services Total Funding: \$2m (Octopus Investments and Seedcamp) Founded: 2013 / Headquarters: London, UK / FTE: 10 	 Casino Softswiss AT	<ul style="list-style-type: none"> Description: Provider of B2B solution enabling online casino payment processing functionality through Bitcoin Founded: 2008 / Headquarters: Pöttelsdorf, Austria FTE: 40+ including 15+ developers
 Fuzo HK & AU	<ul style="list-style-type: none"> Description: Provider of an enabling platform that uses mobile virtual SIM cards to secure mobile money, Bitcoin, and Blockchain asset transactions Founded: 2014 / Headquarters: HK & Australia / FTE: c. 12 	 xapo US	<ul style="list-style-type: none"> Description: Provider of a Bitcoin storage platform for businesses and financial institutions, and provider of Bitcoin wallets and debit cards to retail customers Total Funding: \$40m (Benchmark, DCG, Fortress Investment Group, Greylock, Index, Pantera, Ribbit) Founded: 2014 / Headquarters: Palo Alto, US / FTE: 60+
 KnCMiner SE	<ul style="list-style-type: none"> Description: One of the largest Bitcoin miners in the world with c. 10% of the global Bitcoin mining market share Total Funding: \$29m (Accel Partners, Creandum) Founded: 2013 / Headquarters: Stockholm, SE / FTE: c. 40 		
 magnr UK	<ul style="list-style-type: none"> Description: Provider of an online Bitcoin trading platform that allows users to open both long and short positions Total Funding: \$0.5m / Investor: Coinsilium Founded: 2013 / Headquarters: London, UK / FTE: c. 6 		
 rivetz US	<ul style="list-style-type: none"> Description: Developer of tools that enable app developers to easily leverage advanced hardware security on phones, tablets, and PCs Total Funding: \$1.2m (Coinsilium) Founded: 2014 / Headquarters: San Mateo, US / FTE: c. 8 		

ABRA 'REPLACING CASH GLOBALLY'

Company Overview

- Description:** Provider of a peer to peer money transfer platform; Globally accessible through the Bitcoin Blockchain network enabling fast, secure and transfer-fee transactions
- The Company has three main sources of revenue: teller fee, currency conversion fee and merchant transaction fee
- Currently operating in SEA regions and the US, Abra is planning to expand in Europe and North America by Q4 2015 / Q1 2016
- Total Funding:** \$14m
- Investors:** American Express Ventures, Ratan Tata, First Round Capital, RRE Ventures
- Founded:** 2014 / **Headquarters:** San Francisco, CA
- Employees:** c. 20

Key Management



- Bill Barhydt** – Founder & CEO
Current Advisor at Boost VC - accelerator focusing on Bitcoin



- Peter Kelly** – Co-Founder & VP of Business Development
Former VP of Business Development at Boom Financial



- Daryl Puryear** – CTO
Former VP Engineering at Motif Investing

Products & Technology



- Abra Tellers:** Establishing relationships with individuals and large tellers (e.g. supermarkets) to create a network effect



- Money Transfer:** Focus on two main markets, merchant transactions (mainly e-commerce) and peer to peer payment via web and mobile applications



- Liquidity Management System:** Built a sound hedging and liquidity management system to ensure Abra is not exposed to any liquidity risks

'After a decade of research, we, at Abra, have identified the right tools to make mobile money transfer easy to use for anyone. Using the Bitcoin Blockchain technology, we are able to reduce frictions in financial services and solve problems for consumers worldwide. However, for us, the Bitcoin Blockchain technology is just a means to an end as which enables to provide consumers with the best experience at the lowest price.'

- Bill Barhydt, CEO at Abra



BITCUREX 'LARGEST EXCHANGE IN CENTRAL EUROPE'

Company Overview

- **Description:** Provider of an exchange platform for buying and selling Bitcoins and Dashcoins
- Bitcurex's trading volume consists of:
 - 50% speculation
 - 50% payments / e-commerce
- **Total Funding:** No external funding / investors
- **Founded:** 2012 / **Headquarters:** Łódź, Poland
- **Employees:** c. 20
- **Key Facts:**
 - c. 1,000 - 2,000 Bitcoins traded per day
 - Trades in 3 currencies: Polish Zloty, Euros, and USD

Key Management



▪ **Sebastian Woźniak** – CEO



▪ **Filip Godecki** – Chief Communications Officer
Former Client Service Director at Toolbox Creative



▪ **Anna Płuciennik** – Project Manager
Former Project Manager at Catch me and SMD-ART

Products & Technology



- **Instant Transfer:** Bitcurex allows instant transfers between exchanges in real time



- **Security:** Bitcurex is certified by DigiCert, a third-party SSL certificate provider, and has bank-grade two-factor authentication protocols



- **Cold Storage:** Bitcurex's Bitcoins are held in cold storage, i.e. stored offline, for extra security



- **Dashcoin:** Bitcurex also supports trading in Dashcoins, another crypto-currency

'We realized that the Bitcoin market is emerging and there was no reliable platform to buy, sell, and trade Bitcoins and other crypto-currencies. Now we are the biggest exchange in Central Europe supporting three currencies: Polish Zloty, USD, and Euros; and have partnerships with the largest Central European e-commerce companies.'

- Sebastian Woźniak, CEO of Bitcurex

BITEX.LA (1/2)

'NEXT-GEN DIGITAL BANK OF LATAM'

Company Overview

- **Description:** Based in Argentina, Bitex.la is the largest Latin American Bitcoin exchange with 25%+ market share
- In addition to its exchange services, Bitex.la also provides a Bitcoin payment gateway, API, and cross-border financial services
- **Founded:** 2013
- **Headquarters:** Argentina / **Registered:** Netherlands
- **Employees:** c. 5
- **Statistics:**
 - Monthly Average Trading Volume: \$550k+
 - Market Share: 77% in Argentina, 34% in Brazil, and 49% in Hispanic regions

Key Management

-  ▪ **Eduardo Del Pino** – CEO
Former Business Developer at Mirabaud & Cie
-  ▪ **Tomas Rojas** – CTO
Former Django Developer at Ticketek and Woobiz
-  ▪ **Nubis Bruno** – Chief Product Officer
Co-Founder of Conectabitcoin and gluon.in

Products & Technology



- **Cross-Border Financial Services:** Bitex.la provides cross-border financial services helping companies to pay employees abroad and charge clients globally



- **Bitcoin Payment Gateway:** Bitex.la allows clients to charge in Bitcoins and receive local currency in their bank accounts or branch offices



- **API:** Bitex.la offers an API that allows developers to build Bitcoin applications for Bitcoin trading, Bitcoin payments, and remittance

'All of our operations are in Latin America, where we have 25%+ market share. In LatAm, there is high inflation, and banks do not work properly. For instance, only 35% of the population have bank accounts whereas 50% are already online. We want to become the digital bank of LatAm and serve people who do not have an opportunity in the traditional banking system.'

- Manuel Beaudroit, CMO & Co-Founder of Bitex.la

BITEX.LA (2/2)

'NEXT-GEN DIGITAL BANK OF LATAM'

Strategic Partners



Deloitte.

- Remittance:** Bitex.la has partnered with Western Union and More Money Transfers to allow users to deposit and withdraw cash in exchange for Bitcoins from their local branch offices. This partnership empowers the underbanked with access to digital banking
- Security:** Bitex.la is the first Bitcoin exchange to be reviewed and verified by Deloitte for both its operations and its cold storage process

Customers

- Bitex.la's customers come from a diverse range of industries and include the following:
 - An e-commerce website accepting Bitcoin payments
 - An online freelancer marketplace using Bitcoins as a payments medium for its users
 - A refurbished smartphone and tablet marketplace accepting Bitcoins
 - A social news and entertainment website using Bitcoin to pay its contributors

Key Differences Between LatAm and Europe Driving Usage of Bitcoin For Remittance and Payment Purposes



LatAm

- High inflation exceeding 25% in some cases
- Tight capital controls
- Low banking presence; <35% of the adult population have access to banks

VS

Europe

- Low inflation approaching zero or negative values in some cases
- Free capital flows
- High banking presence; 89% of the adult population have access to banks



BITONIC 'BITCOIN TRADING MADE EASY AND RELIABLE'

Company Overview

- **Description:** Largest Bitcoin trading platform in the Netherlands and Belgium, representing more than half of the market or equivalent to \$30m+ of transactions annually
- Also provides merchant solutions and consultancy services
- **Founded:** April 2012 / **Headquarters:** Utrecht, Netherlands
- **Employees:** c. 11
- **Statistics:** More than 200,000 Bitcoins sold to date
- **Clients:** ABN Amro Bank, ING Bank, SNS Bank, IBM, Enigma Consulting, Dutch Central Bank, Dutch Tax Authorities, TU Eindhoven University, and TU Delft University

Products & Technology



- **Bitonic:** Enables fast and efficient Bitcoin transactions through iDeal and Mistercash



- **BitMerchant:** Delivers powerful merchant solutions for receiving and accepting Bitcoin



- **Consultancy:** Provides consultancy services (e.g. Bitcoin technical protocol) to financial institutions, public authorities, and universities



- **BL3P:** Latest venture by Bitonic focuses on providing a Bitcoin exchange platform for European markets

Key Management



- **Jouke Hofman** – CEO & General Manager
- **Robert de Waard** – CTO & Co-Founder
Former Software Engineer at INFI B.V. and De Wal ICT
- **Niels van Groningen** – COO & Co-Founder
Graduate Studies in A.I. at the University of Amsterdam

'In our early days, we spent all of our time explaining our business model and convincing the banks to partner with us. In doing so, we forged and sustained relationships with ING and ABN Amro Group, the third-biggest Dutch bank. With the introduction of a range of innovative enterprise solutions and by working with financial firms, we aim to be in the front seat of Bitcoin's future while remaining a leader in our traditional field of business.'

- Daan Kleiman, Marketing Manager at Bitonic



BITSTAMP

BITSTAMP

'SERVING THE BITCOIN INDUSTRY SINCE 2011'

Company Overview

- **Description:** Bitstamp is an online Bitcoin marketplace for selling and buying Bitcoins
- The Company's operational efficiency and 'know-how' allows it to function with half the workforce of a comparable exchange
- The Company invests heavily in compliance and co-operates with regulators to report any suspicious activity among users
- **Total Funding:** \$10.0m (Jan 2014) / **Investor:** Pantera Capital
- **Post Series A Valuation:** c. \$44m
- **Monthly Trading Volume:** c. \$140m
- **Global Market Share:** c. 25-30% excluding Chinese exchanges
- **Founded:** 2011 / **Headquarters:** Luxembourg / **Employees:** c. 27

Products & Technology



- **Trading Platform:** Allows users to trade fiat currency into Bitcoins



- **Tradeview:** Provides users with Bitcoin market information, including market book order, depth, and volume



- **Security:** Offers enhanced security by co-signing every transaction using BitGo

Key Management



- **Nejc Kodrič** – CEO & Co-Founder
Former Marketing Director at GSračunalniki (online retailer)



- **Miha Grcar** – COO
Former Freelance Journalist for Athens News



- **Damijan Merlak** – CTO & Co-Founder
Former Developer at Lyst and Klika

'As a leader in Bitcoin trading, we, at Bitstamp, are committed to providing our traders with the best-in-class user interface. Bitstamp is pushing the envelope of user experience in trading systems by bringing sleek, modern, advanced, yet secure functionality and design to the world of Bitcoin.'

- Nejc Kodrič, CEO and Co-Founder of Bitstamp



BLOCKCHAIN 'MOST TRUSTED BRAND IN BITCOIN'

Company Overview

- **Description:** Blockchain.info is one of the most well-known Bitcoin software companies and is a category leader in three areas: wallets, block explorers, and APIs
- Today, Blockchain.info is focusing on building a large user base and trusted brand, and offers its three main solutions for free
- With a non-custodial approach, Blockchain.info does not have to comply with the stringent regulations that banks face; this enables the Company to have a low cost structure and low regulatory risk
- **Total Funding:** \$30.5m (Series A, October 2014)
- **Investors:** Lightspeed Venture Partners, Wicklow Capital, Mosaic Ventures, Prudence Holdings, FuturePerfect Ventures, Virgin
- **Founded:** 2011 / **Headquarters:** London, UK; New York, US
- **Employees:** c. 40

Key Management



▪ **Peter Smith** – CEO & Co-Founder



▪ **Ben Reeves** – CTO & Co-Founder
Former Mobile Software and Web Developer



▪ **Nicolas Cary** – Co-Founder
Former Manager at PipelineDeals, a CRM platform

Products & Technology



- **Wallet:** World's most popular Bitcoin wallet. Free of charge and offered in iOS, Android, and Web format. Provides users with access to industry standard AES encryption. Today, user base consists of c. 5m+ wallet users and is growing by 60-90k per week



- **Block Explorer:** A search engine and market data tool for analysing activity on the Bitcoin blockchain. Blockchain.info is the world's most widely used, widely trusted source of information on Bitcoin transactions and network statistics, providing real-time confirmation of blockchain payments, address and block history, and 25+ market information charts



- **API:** Tools enabling developers to retrieve data about the Blockchain and to build solutions on top of Blockchain.info. Currently offered in open licence to build a large customer base. In the near future, the Company plans to adopt a SaaS model

'Bitcoin is a new transformative innovation in computer science. It is the first time in the history of the world that we have a financial protocol for the Internet, and that means we can conduct global value transfer. The first experiment with that is payments.'

- Nicolas Cary, Co-Founder of Blockchain



CHAINALYSIS 'DE-ANONYMISING BITCOIN TRANSACTIONS'

Company Overview

- **Description:** Provider of a compliance solution for the Blockchain
- Chainalysis is able to monitor connections between entities on the Blockchain and can identify malicious actors and activity
- The Company has been working with law enforcement bodies and financial institutions. For instance, in October 2015 Chainalysis has started working with Barclays's financial crime and transaction monitoring teams to arm the bank with the skills needed to onboard Bitcoin clients
- **Founded:** 2014 / **Headquarters:** New York, US / **Employees:** 8
- **Statistics:**
 - Currently has more than 30 paying customers
 - 62 contracts with law enforcement bodies and banks
 - Monthly revenue of \$40k

Key Management



▪ **Michael Gronager** – Co-Founder & CEO

Former COO at Kraken



▪ **Jan Moller** – Co-Founder & CTO

Former Principal Engineer at Mycelium



▪ **Jonathan Levin** – Co-Founder & CRO

Former Co-Founder & CEO at Clinometric

Products & Technology



- **Reactor:** A visualisation tool that allows a manual inspection to detect suspicious activity



- **API:** Provides customers with an API that identifies the entities involved in a transaction and the risk profile of the entities



- **Heuristics:** Uses in-depth real-time transaction analysis to determine unique entities within the blockchain

'The pain point of Bitcoin has always been from the compliance side (e.g. fraud and money laundering). By working with financial institutions and law enforcement groups, we, at Chainalysis, play a major role in ensuring their compliance divisions are ready for the latest technology trend. And hopefully, this will open the door for a wider usage range of Bitcoin.'

- Michael Gronager, CEO of Chainalysis

CIRCLE 'DISRUPTING P2P PAYMENTS'

Company Overview

- Description:** Circle is a provider of an app for sending and receiving money free of charge with Bitcoin acting as an intermediate currency
- The app can be linked to bank accounts and credit / debit cards
- Customer can send and receive US dollars in Circle, and can also making payments outside of Circle over the open Internet using US dollars running over the Bitcoin blockchain network
- First company to receive a BitLicense from the New York State Department of Financial Services (NYDFS)
- Total Funding:** \$76m / **Employees:** c. 80
- Investors:** Accel, Breyer Capital, Fenway Summer, General Catalyst, Goldman Sachs, IDG Capital Partners, Oak Investment, Pantera
- Founded:** 2013 / **Headquarters:** Boston, US / Dublin, Ireland

Key Management



Jeremy Allaire – Chairman, CEO & Founder
Former Chairman & Founder of Brightcove (video adtech)

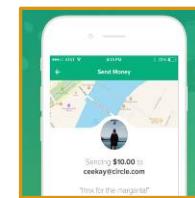


Paul Camp – CFO, Treasurer, & EVP of Financial Operations
Former Head & MD of Transaction Services at JPMorgan

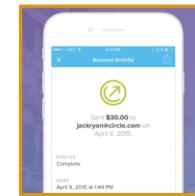


Sean Neville – Co-founder and President
Former CEO of Sevenchord

Products & Technology



- Send / Receive Money:** After linking a debit card to a Circle account, users can start sending and receiving money free of charge. A user can use Circle without knowledge of Bitcoins since the end currency is a fiat currency such as USD. Circle views of payments is simply messages with value, and thus includes multiple media types - photos, emoji and other forms of social engagement



- Secure & Insured Deposit:** On top of Circle's highly secure facilities, the entire balance of a customer's account is fully insured. This insurance and security enables customers to transact without bearing any risks

'Most people don't want a new currency, they get paid in dollars, euros, pounds, yuan, and yen, and they understand these currencies. Yet, they yearn for instant settlements, global interoperability, high levels of security, and no transfer fees. We, at Circle, see Bitcoin as the solution, and it serves as an enabling technology for the consumer finance field we operate in.'

- Jeremy Allaire, Chairman, CEO & Founder

COINBASE

'THE WEB BROWSER FOR BITCOIN'

Company Overview

- Description:** Coinbase is a provider of a Bitcoin transaction platform
- The Company primarily offers 3 services: Bitcoin exchange, wallet storage, and API for developers
- Total Funding:** \$106m+ / **Employees:** c. 100
- Key Investors:** Andreessen Horowitz, BBVA, DFJ Growth, IDG Ventures, NYSE, Ribbit Capital, Union Square Ventures, USAA
- Founded:** 2012 / **Headquarters:** San Francisco, US
- Key Statistics:**
 - Transacted \$3bn+ worth of Bitcoins
 - 2.8m+ users and 4.2m+ wallets
 - 41k merchants using Coinbase's payment processing tools
 - 7k developer applications
 - Currently operating in 32 countries

Key Management



Brian Armstrong – CEO & Co-Founder
Former Software Engineer at Airbnb



Fred Ehrsam – Co-Founder
Former Trader at Goldman Sachs



Adam White – VP & Product Manager
Former Consultant at Bain & Co

Products & Technology



- Bitcoin Exchange:** Allows trading of Bitcoins across four currency pairs: BTC-USD, BTC-EUR, BTC-GBP and BTC-CAD



- API for Developers:** Allows developers to harness Coinbase's APIs to easily build applications and end-products



- Secure Storage:** One of the largest custodians for Bitcoins. 98% of Coinbase's customer Bitcoins are in cold storage



- AML/KYC Initiatives:** The 'secret sauce' of Coinbase. The majority of this work is done by Coinbase's in-house compliance team

'We, at Coinbase want the world to have an open payment network. The value of the Bitcoin technology is the open access, as it allows for permission-less innovation'. Also, we are here for the long-term play, as the real usage of Bitcoin gradually catches up to the hype, we will be here for our customers.'

- Adam White, VP & Product Manager at Coinbase

COINFLOOR 'UK'S LARGEST BITCOIN MARKETPLACE'

Company Overview

- **Description:** UK's Bitcoin marketplace where user can buy and trade Bitcoin to GBP, EUR, PLN and USD
- Coinfloor has built a strong banking partnerships as well as an extensive broker network which enables the Company to process payments faster and to expand in new geographies
- **Total Funding:** \$0.25m
- **Investors:** Passion Capital, Adam Knight (Adam Knight, the former MD of Goldman Sachs and Credit Suisse's commodities trading business), Taavet Hinrikus (Co-founder of TransferWise)
- **Founded:** 2013 / **Headquarters:** London, UK / **Employees:** c. 7
- **Key statistics:**
 - Daily volume: 300-500 Bitcoins
 - Depth of order book: 300-500 Bitcoins
 - Monthly trading value: c. £1.5m (Oct-15) vs £0.4m (Jan-15)

Key Management



- **Mark Lamb – CEO & Founder**
Former CEO of Rewardr (Mobile App Company)
- **Obi Nwosu – CTO & Founder**
Former Founder of Supalocal (Software Company)

Products & Technology

-  **Compliant & Safe:** Strict identity verification and two-factor authentication to help protect Coinfloor's customers
-  **Professional Brokers:** Work with the UK's most experienced Bitcoin brokers
-  **Secure Cold Storage:** Bitcoin accounts can be withdrawn or held safe in underground vaults
-  **Strong Banking Partners:** All GBP, EUR, PLN and USD is held in LHV Bank in Estonia
-  **Powerful Trade Engine:** Built from the ground up powering every transactions

'Today, as a UK based Bitcoin exchange it is almost impossible to have a bank account at a UK based bank. Therefore, we opened one at LHV Bank based in Estonia. We believe that many Bitcoin exchanges underestimate banking relationships. At the end of the day, we want to make very easy and safe for anyone to buy and sell Bitcoin. Hence, it is not just matter of software but it is also about banking relationships.[...]Our broker network operates just as the NYSE and its decentralised network of brokers. This is important for our clients as we are able to have a fast, reliable exchange without having a UK based account.'

- **Mark Lamb, CEO of Coinfloor**

CRYPTOPAY 'LIVE AND CUSTOMISED CUSTOMER SUPPORT'

Company Overview

- Description:** Provider of a Bitcoin wallet and payments platform that enables users to buy, sell, and store Bitcoins
- Also offers white-labelled debit cards and other B2B services
- Total Funding:** \$65k (seed round, Feb 2014)
- Investor:** Coinsilium
- Founded:** 2013 / **Headquarters:** London, UK
- Employees:** c. 7
- Statistics:**
 - c. \$50k in daily trading volume
 - Supports EUR and GBP debit cards

Key Management



- George Basiladze** – Co-Founder
Former Chief Analyst at NordWest Energy
- Dmitry Gunyashov** – Co-Founder
Former Director of Business Development at SMTDP Tech
- Vadim Marchenko** – Lead Developer
Former Developer at Robobel, Epicenter, and Sovolve

Products & Technology



- Bitcoin Wallet:** Works like other Bitcoin wallets, but features 3 different FLEX accounts allowing users to hedge against EUR, GBP, and BTC



- Prepaid Debit Cards:** Offers white-labeled Visa debit cards for offline and online payments from its Bitcoin wallet



- B2B Services:** Provides an API for businesses, such as payment institutions, that want access to Bitcoins

"Although many companies offer Bitcoin wallets, what differentiates us is our customised customer support which unlike others is 'live'. We also offer innovative solutions to our clients such as a prepaid Visa debit cards for offline shopping. We are also planning to offer B2B payroll services to our business clients."

- George Basiladze, Co-Founder of Cryptopay



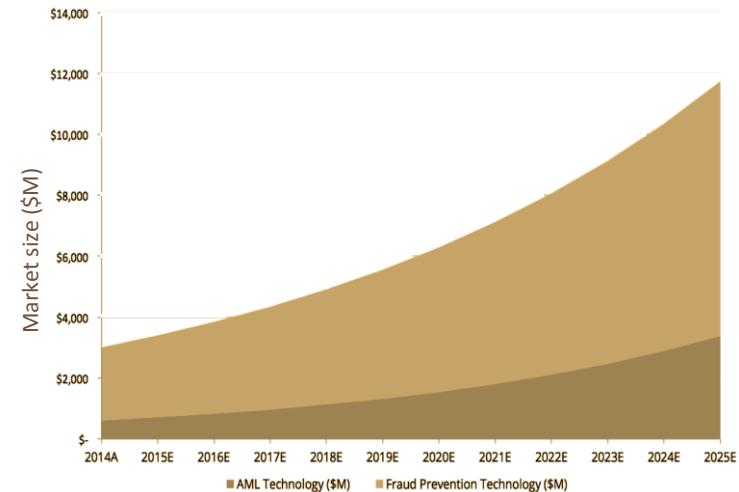
ELLIPTIC 'AML SOLUTION FOR THE BLOCKCHAIN' (1/2)

Company Overview

- **Description:** Provider of an Anti Money Laundering (AML) solution for Blockchain as well as a Bitcoin vault and Bitcoin wallet hosting services
- Elliptic aims to address the problem of identifying illicit transactions and money laundering on the Blockchain
- Elliptic's AML solution leverages its proprietary data and applies Machine Learning to Blockchain
- Elliptic builds its data through data partnerships and client contributions
- **Snapshot of Clients:**
 - Digital Asset Holdings (Distributed ledger), Gem (Bitcoin security), Global Advisors Bitcoin Investment Fund (Bitcoin fund)
 - Leading law enforcement agencies
 - Elliptic's 8 beta clients represent 40% of total VC investments in Bitcoin and Blockchain companies
- **Awards:**
 - First Blockchain company to have received accreditation from KPMG
 - Won The Banker 'Security Project of the Year' award in 2015
- **Total Funding:** \$2m (Jul-14)
- **Investors:** Octopus Investments and Seedcamp
- **Founded:** 2013 / **Headquarters:** London, UK / **Employees:** 10

Market Size Projection for AML and Fraud Prevention Technology

AML and Fraud Prevention Software Market:(1)
c. \$4bn in 2016 growing to \$12bn by 2025



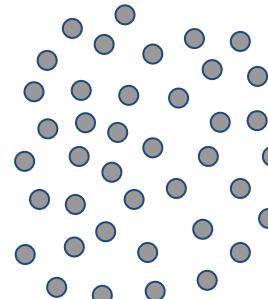
'The central issue with Bitcoin has been the compliance with anti-money laundering regulation especially in identifying proceeds of crime. In bringing confidence and certainty to enterprises working with Bitcoin, we, at Elliptic, utilise data partnerships and client-contributed data. This will not just solve for identity on Blockchains, but also position Elliptic well to achieve long term differentiation.'

- James Smith, CEO of Elliptic

ELLIPTIC 'AML SOLUTION FOR THE BLOCKCHAIN' (2/2)

Overview of Elliptic's Anti Money Laundering (AML) Solution

1qCNygwY4ovqoqXaDQ4VS
8F3CT1Ww3esXAnJ9NwJe
1FKZMpTRLEUZZ7WgJqng
EHRCXqPEPgEkKtg8oGeTX
DhmGEDCFnh2WRd
KuzJjs35uyQGdhwu1z3Mq
DhmGEDCFnh2WRd
GRKfMMqnU3pkCW56sAhR
...



- Automatically searches millions of transactions
- Automatically classifies the transactions and outputs suspicious activity
- Provides an auditable proof for every claim



- | | |
|-------------|---------------------------------|
| ● ● ● ● ● ● | BitStamp - Bitcoin exchange |
| ● ● ● ● ● ● | BitStamp - Bitcoin exchange |
| ● ● ● ● ● ● | Coinbase - Bitcoin Wallet |
| ● ● ● ● ● ● | Coinbase - Bitcoin Wallet |
| ● ● ● ● ● ● | Circle – Bitcoin payments |
| ● ● ● ● ● ● | Silk Road - Illicit marketplace |

Without Elliptic's AML solution, Bitcoin transactions are anonymous and disordered

Elliptic's AML solution identifies Bitcoin transactions and classifies them based on the entities involved

Key Management



▪ **Dr. James Smith** – CEO
D.Phil in Natural Language Processing, University of Oxford
Former Trader at Wolverine Trading - Proprietary trading firm



▪ **Yacoob Kurimbokus** – CTO
MBA, University of Oxford; BA in Computer Science, University of Cambridge
Former Business Intelligence Manager at McLagan



▪ **Dr. Tom Robinson** – COO
D.Phil in Atomic and Laser Physics, University of Oxford
Former CEO at MOF Technologies



▪ **Dr. Adam Joyce** – Co-Founder & Chief Scientist
PhD in Mathematics, Imperial College London
Former Quantitative Analyst at Liquid Capital Group - Proprietary trading firm

FUZO LIMITED 'TARGETING COMPLETE FINANCIAL INCLUSION'

Company Overview

- **Description:** Provider of enabling platform that uses mobile virtual SIM cards (embedded JavaCard) to secure mobile money, Bitcoin, and Blockchain asset transactions (Any Blockchain on Any Mobile)
- Targets the 2.5B of unbanked / underbanked that would benefit from Bitcoin technology on a mobile phone
- The Company is planning to scale their distribution by working with remittance companies such as bitPesa / Moneygram / Tether.to
- **Total Funding:** 200 Bitcoin + USD (2 rounds = \$350k) = \$450k USD Total
- **Investors:** Dominet.com.au Coinsilium.com, Angels
- **Founded:** 2014 / **Headquarters:** Hong Kong / **R&D Labs:** Australia
- **Employees:** c. 12

Key Management



- **Frank Falco** – CEO
Former Chief Information Officer at Internode Systems



- **Leon-Gerard Vandenberg** – CTO & Founder
Former VP Technology & Co-Creator of US NavyCash
(onboard cashless system)



- **George Samman** – Chief Marketing Officer
Former Portfolio Manager at Wellington Shields

Products & Technology



- **zSIM:** Thin overlay card that sits on top of regular SIM cards, turning any mobile phone into a portable Bitcoin / Blockchain hardware secure wallet. Potential applications include: m-Identity, m-banking, m-commerce, and m-remittance



- **bitSIM :** Bluetooth, NFC and PIN-enabled device offers Bitcoin mobile merchant transactions via mobile phone and ruggedized Bluetooth accessories

'We solve three things on the zSIM hardware solution: (1) seamless mobile identity; (2) secure Blockchains (digital assets); and (3) secure Bitcoin / Altcoin wallets. This simple application can potentially disrupt the \$1 trillion remittance market, which is poorly served by companies such as Western Union.' Patents Pending exclusive license Patents Granted

- Leon-Gerard Vandenberg, CTO of Fuzo Limited

KNCMINER (1/2)

'WE WANT TO BE THE CISCO OF BLOCKCHAIN'

Company Overview

- Based in Sweden, KnCMiner is one of the largest Bitcoin processors in the world with c. 10% of the global Bitcoin mining market (i.e. performing cryptographic hashes to process transactions on the Bitcoin/Blockchain network)
 - Leading-edge, proprietary chip design, specialized in cryptographic hashing, and custom servers designed for high scale mining
 - First in the world to deliver 28nm and 20nm Bitcoin chip technology as well as 16nm FinFET 3D node
 - Four data centers (expanding to five) across the Nordics and Iceland, with a focus on green operations
- **Total Funding:** \$29m (\$15m Series B, Jan-15; \$14m Series A, Sep-14)
- **Investor:** Accel Partners, Creandum and GP Bullhound
- **Founded:** 2013 / **Headquarters:** Stockholm, Sweden
- **Employees:** c. 40



Products & Technology



- **Processing facility :** Through its proprietary hardware and datacentres, KnCMiner is able to maintain and protect its processing share and aims to become the largest processing facility in the world at the lowest cost per coin possible



- **Processing API:** Offering API access to processing facility for other Blockchain services (e.g., private Blockchains, machine to machine payments)



- **Asset management:** 2 listed certificates on Nasdaq to offer safe and secure access to Bitcoin for investors

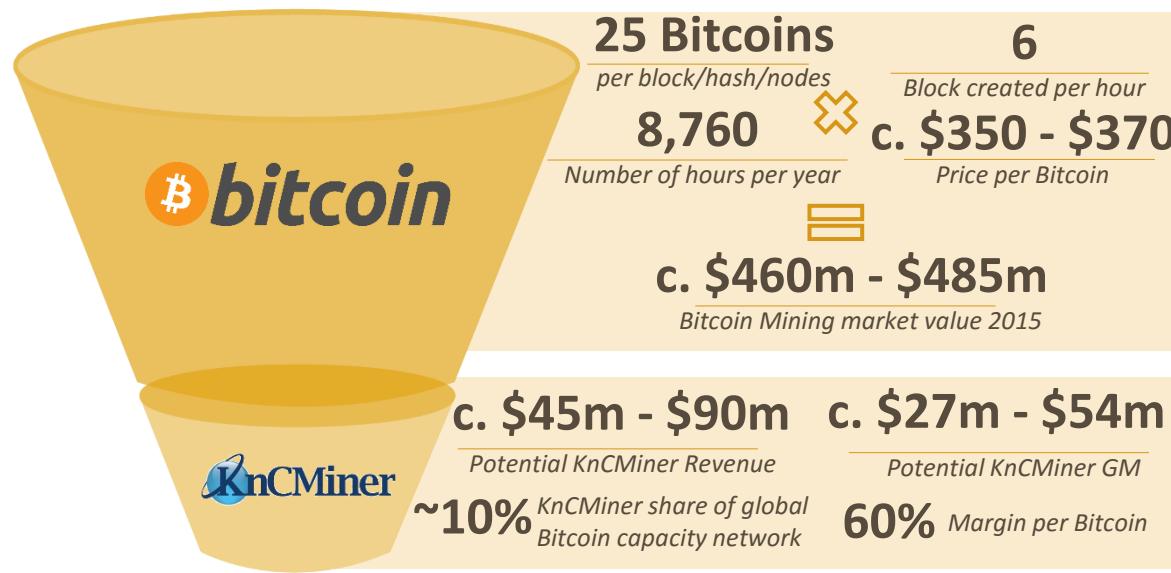
'We believe that there is a great opportunity to build the infrastructure of the Blockchain ecosystem. We, at KnCMiner, want to be the Cisco of the Blockchain by providing any user the possibility to transmit any message to the global Bitcoin network and by using state-of-the-art technology.'

- Sam Saatchi, CFO of KnCMiner

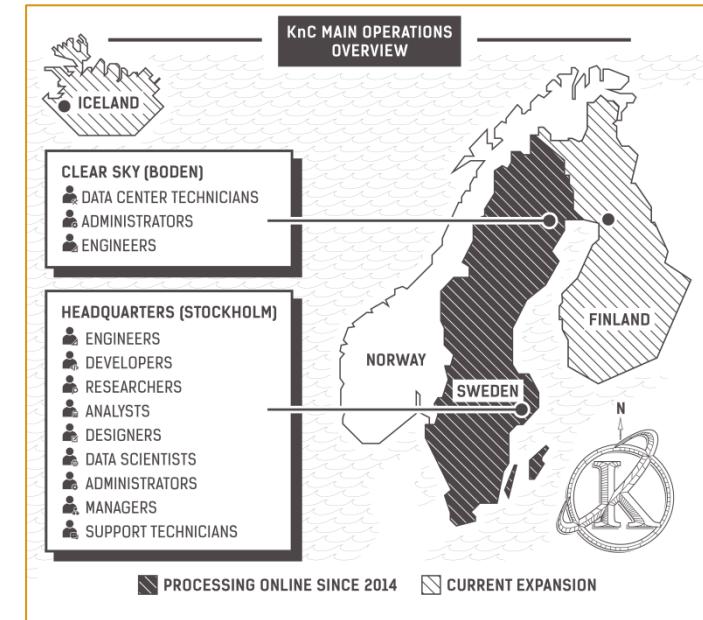
KNCMINER (2/2)

'WE WANT TO BE THE CISCO OF BLOCKCHAIN'

Bitcoin Mining Model (2015)



Company Operation



Key Management



▪ **Sam Cole** – CEO & Co-founder

Former System Architect Saxo-Etrade and Nestlé Suisse



▪ **Marcu Erlandsson** – CTO & Co-founder

Current CTO & Founder of ORSoC



▪ **Michael Unnebäck** – FPGA/ASIC designer & co-founder

Former FPGA/ASIC specialist at ORSoC



▪ **Sam Saatchi** – CFO

Former Engagement Manager at McKinsey&Co

MAGNR 'WORLD'S FIRST BITCOIN SAVINGS ACCOUNT'

Company Overview

- **Description:** Provider of an online Bitcoin trading platform that allows users to open both long and short positions in Bitcoins
- Also offers a Bitcoin savings account that earns an annual interest of 2.18%
- **Total Funding:** \$0.5m (2 rounds) / **Investor:** Coinsilium
- **Founded:** May 2013 / **Headquarters:** London, United Kingdom
- **Employees:** 6
- **Statistics:**
 - Provides up to 10x leverage to investors
 - Approximately \$100m traded since inception
 - Over to \$1m of AuM

Key Management

- | | |
|--|--|
| | ▪ Colin Kwan – CEO
Former VP at Deutsche Bank |
| | ▪ Joe Lee – CIO
Former Business Intelligence Analyst at Barclays |
| | ▪ James Turner – CTO
Former Developer at BBC, BSkyB, and eBay |

Products & Features



- **Bitcoin Deposit:** Sends Bitcoins from any Bitcoin wallet into a Magnr account



- **Magnr Savings:** Bitcoin savings account allowing investors to earn monthly interest on their Bitcoin deposits



- **Magnr Trading:** Bitcoin trading platform allowing investors to trade market movements and place leveraged long / short trades



- **Multi-Sig Storage:** Protects Bitcoins using BitGo technology including multiple private keys and a hierarchical address structure

'Bitcoin is still in its infancy. At Magnr, we plan to provide Bitcoin holders a way to invest using this new asset class. Starting with Magnr Savings, Bitcoins deposited are interest bearing. Even if the price of Bitcoin falls, the users are still in a better position than keeping their funds in a wallet. Bitcoin is evolving and with it more investment products are being created to meet growing demand.'

- Colin Kwan, CEO at Magnr

RIVETZ 'LEVERAGING BUILT-IN HARDWARE SECURITY'

Company Overview

- **Description:** Developer of tools to enable app developers to easily leverage advanced hardware security on phones, tablets and PCs. Providing state of the art hardware protection of Cryptographic keys, messages and transactions.
- This cryptographic key can then be used for multiple use cases such as data encryption, Bitcoin transaction signing, Bitcoin account creation, and KYC
- **Clients / Partners:** Chadder (messaging app), Storj (cloud storage), BitPay (cyber security for Bitcoins)
- **Total Funding:** \$1.2m (bridge financing, February 2015)
- **Investor:** Coinsilium
- **Founded:** 2014 / **Headquarters:** San Mateo, US / **Employees:** c. 8

Key Management

- | | |
|---|--|
|  | ▪ Steven Sprague – CEO & Co-Founder
Former CEO & President of Wave Systems |
|  | ▪ Michael Sprague – CTO & Co-Founder
Former VP of Web Services at Wave Systems |
|  | ▪ Rich Wheless – CFO & COO
Former CEO & Co-Founder of BRIVAS Technologies |

Products & Technology



- **Cryptographic Key:** Rivetz creates cryptographic public and private keys linked to the chip in a device. These keys are less prone to cyber attacks since they are linked to hardware which cannot be altered unlike software



- **Bitcoin Transaction Signing:** The cryptographic key generated can be used to authorise a Bitcoin transaction through the Rivetz SDK interacting with the chip



- **Data Encryption / Decryption:** Rivetz is capable of data encryption used in privacy-focused messaging apps such as Chadder

'Half a billion phones have very strong security capabilities in the chip of the phone, but they haven't been leveraged yet. These chips can be used in applications ranging from Bitcoin accounts and transactions to data security and KYC. At Rivetz, we combine this technology with our decades of experience to provide holistic cyber security solutions.'

- **Steven Sprague, CEO & Co-Founder of Rivetz**

SAFELLO 'THE NEXT GENERATION BITCOIN EXCHANGE'

Company Overview

- Description:** Operator of a Bitcoin trading portal that enables users to buy, sell, and store Bitcoins; also enables users to make donations and send money in Bitcoin
- Supports 32 countries in Europe with direct payments, SEPA, Faster Payments, Bankgiro, Swish, and International Wire**
- First Bitcoin company to close a deal with a Tier-1 bank (Barclays); working on 'proof of concepts' testing traditional banking processes on the Blockchain to prove they work**
- Total Funding: \$1.0m / Investors:** Angels, Digital Currency Group, Barclays Accelerator, and Techstars
- Founded:** July 2013 / **Headquarters:** Stockholm, Sweden
- Employees:** c. 11

Key Management



- Frank Schuil** – CEO
Founder of Rhino Ventures



- Ludvig Öberg** – VP of Business Development
Board Member of the Swedish Bitcoin Foundation



- Joakim Johansson** – Lead Developer
Former Computer and Systems Sciences Graduate

Products & Technology



- Safello Exchange:** Enables users to buy and sell Bitcoins using a number of direct payment options



- Donations:** Enables charities to set up Bitcoin donation campaigns for free, and enables users to donate to these charities using Bitcoins



- White label for Financial Institutions:** Built a platform that is easy to use and to customize directly through the Cloud platform; Currently used as a proof of concept by Barclays

'A clear gap in the market for a pan-European exchange has existed for some time, and we intend to fill that gap as soon as possible. By making the platform simple and intuitive for the average user, I believe Safello is marching towards a global introduction, and will become the leader in the European Bitcoin exchange market.'

- Ludvig Öberg, VP of Bus Dev at Safello

SOFTSWISS 'GAMING AND GAMBLING USING BITCOINS'

Company Overview

- Description:** Provider of B2B gaming solutions through Merkeleon (auction solution) and SoftSwiss (casino solution)
- The Company provides 3rd party content from industry leaders such as NetEnt, Microgaming, Amatic, Betsoft, Casino Technology as well as its proprietary content
- Gaming solution was started in Sep-2012 and released at ICE Totally Gaming in London in Feb-2013
- Other services include iGaming consulting, marketing support, and custom software development
- Provides solutions to more than 10 online casinos
- Founded:** 2008
- Headquarters:** Pöttelsdorf, Austria
- Employees:** 40+ including 15+ developers

Key Management

-  **Ivan Montik** – CEO & Co-Founder
Former Corporate Client Manager at Priorbank JSC
-  **Dmitry Yaikov** – CTO & Co-Founder
Former Software Developer
-  **Aleksey Ulanov** – Lead Designer & Co-Founder
Former Lead Designer at Viaden

Products & Technology



- Turnkey Solution:** Leading-edge gaming software designed for standalone online casinos

- White Label Solution:** Gaming platform that includes a legal and financial infrastructure to cover licensing and payment processing matters

- Auction Platform:** Solution designed only for B2B trading-auction and marketplace including a crypto-currency exchange platform

- Bitcoin Casino:** Bitcoin gaming platform that supports a variety of Bitcoin-adapted games which are also available in other cryptocurrencies

'While online gaming and e-commerce will definitely remain our primary focus, we would like to expand into the world of Bitcoin, improve our current solution, and explore the unlimited possibilities of Bitcoin in various business areas. We would like to become pioneers in Bitcoin-enabled online gaming.'

- Ivan Montik, CEO of SoftSwiss

XAPO

'THE WORLD LARGEST BITCOIN CUSTODIAN'

Company Overview

- Description:** Provider of a Bitcoin storage platform for businesses and financial institutions, and provider of Bitcoin wallets and debit cards to retail customers
 - Vault security features include third-party insurance and offline encrypted servers inside decommissioned military bunker
 - Strong team of advisors including Dee Hock (Visa Founder), John Reed (Former Citibank CEO) and Lawrence H. Summers (Secretary of the Treasury under President Bill Clinton)
- Total Funding:** \$40m
- Investors:** AME Cloud Ventures, Benchmark, Blockchain Capital, Digital Currency Group, Emergence Capital, Fortress Investment Group, Greylock, Index Ventures, Pantera Capital, and Ribbit Capital
- Founded:** 2014 / **Headquarters:** Palo Alto, US / **Employees:** 60+

Key Management

-  **Wences Casares** – CEO & Founder
Former CEO of Bling Nation and Lemon Wallet
-  **Ted Rogers** – President
Former Co-Founder & General Partner of Arpex Capital
-  **Carlos Rienzi** – SVP of Security & Technology Operations
Former Systems Engineer at Cisco

Products & Technology



- Xapo Wallet:** Allows deposit, transfer, and withdrawal of Bitcoins. Majority of customers are unbanked/underbanked emerging market consumers
- Xapo Debit Card:** Works in a similar way to other debit cards, but debits purchases directly in Bitcoin from the Xapo Wallet
- Xapo Vault:** Provides three layers of security: cryptographic, physical, and jurisdictional, with 97% of Bitcoins in cold storage. The vault is also insured by a third-party insurance company

'Xapo is primarily interested in promoting user privacy within a certain set of rules. This includes monitoring transactions for potential money laundering, illegal transactions, and terrorist financing. We want to do it from one permanent platform, Xapo. Ultimately, we hope to promote Bitcoin's success and be a part of the thriving ecosystem.'

- Wences Casares, CEO of Xapo



IV. COMPANIES SURVEYED BLOCKCHAIN

BLOCKCHAIN COMPANIES SURVEYED

SHORT PROFILES

Company	Description
 ascribe®	<ul style="list-style-type: none"> Description: Provider of registry, licensing and visibility services for using Blockchain technology Funding to date: \$2m (Earlybird, Frelands Ventures, DCG) Founded: 2014 / Headquarters: Berlin, Germany / FTE: c. 15
DE	
 Chain	<ul style="list-style-type: none"> Description: Provider of software used by businesses to design, deploy and operate private Blockchain networks (hosted or on-premise) Funding to date: \$44m (Citi, DCG, Khosla, Nasdaq, Pantera) Founded: 2013 / Headquarters: SF, US / FTE: c. 15
US	
 CONSENSYS	<ul style="list-style-type: none"> Description: Developer of decentralized applications and end-user tools for blockchain ecosystems on Ethereum Founded: 2014 / Headquarters: New York, US / FTE: 60
US	
 C CREDITS	<ul style="list-style-type: none"> Description: Developer of a hybrid Blockchain platform that provides interoperability between private and public chains Founded: 2014 Headquarters: London & Isle of Man, UK / FTE: c. 12
UK	
 eris INDUSTRIES	<ul style="list-style-type: none"> Description: Provider of an open-source software platform stack to build smart contract applications and permissioned Blockchains Funding to date: n/a (Anthemis Group) Founded: 2014 / Headquarters: London, UK / FTE: 9
UK	
 everledger	<ul style="list-style-type: none"> Description: Provider of certification and verification services for diamonds and other luxury goods using smart contracts (Blockchain technology) Funding to date: Seed round (Barclays, Techstars) Founded: 2015 / Headquarters: London, UK
UK	

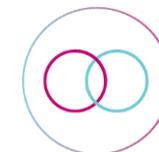
Company	Description
 factom	<ul style="list-style-type: none"> Description: Provider of a data layer solution described as a giant database in which anyone can insert any type of data directly on the Blockchain Funding to date: \$1.3m (Coinsilium & Kuala Innovations) Founded: 2014 / Headquarters: Texas, US / Employees: c. 17
US	
 funderbeam	<ul style="list-style-type: none"> Description: Provider of a subscription-based database of early-stage startups that allows angel investors and entrepreneurs to discover, benchmark, and analyse startups Funding to date: \$2.2m (3TS Capital Partners, Rockspring) Founded: 2013 / Headquarters: Tallinn, Estonia / FTE: c. 16
EE	
 guardtime	<ul style="list-style-type: none"> Description: Provider of a platform that ensures the integrity of systems, networks, and data at industrial scale using Blockchain technology Founded: 2007 / Headquarters: Amsterdam, NL FTE: c. 100
NL	
 R3 CEV	<ul style="list-style-type: none"> Description: Developer of blockchain/distributed ledger applications for the financial services industry Works in conjunction with a consortium of 30+ banks Launched: Sep-2015 / Headquarters: NYC, US / FTE: c.20
US	
 ripple	<ul style="list-style-type: none"> Description: Provider of a cross-currency payment and settlement services using a distributed financial technology called consensus Funding to date: \$38.4m (GV, A16Z, Santander, CME Group, Seagate Technology, IDG Capital Partners) Founded: 2012 / Headquarters: SF, US / Employees: c.120+
US	
 SETL	<ul style="list-style-type: none"> Description: Provider of a private Blockchain-based payments and settlements system for financial institutions Founded: 2015 / Headquarters: London, UK / FTE: c. 5
UK	

ASCRIBE 'INTELLECTUAL PROPERTY ON THE BLOCKCHAIN'

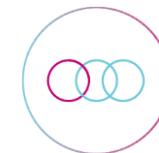
Company Overview

- Description:** Provider of registry, licensing and visibility services for using Blockchain technology
- Ascribe enables creators and content holders to manage and protect their assets.
- Markets:** Intellectual Property, Blockchain Technology
- Total Funding:** \$2m (seed round, June 2015)
- Investors:** Earlybird VC, Freelands Ventures, Digital Currency Group
- Founded:** 2014 / **Headquarters:** Berlin, Germany / **Employees:** c. 15
- Statistics:** c. 3,000 monthly active users, c. 20 marketplaces and 100,000+ transactions/ month

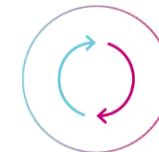
Products & Technology



- Secure Attribution:** Uses Blockchain technology to assign a unique cryptographic ID to a piece of art / intellectual property



- Create Limited Editions:** Allows for the creation of unique editions, enabling the transfer of digital art in a similar way to physical art



- Easy Transfer:** legal framework to enable the transfer or loan of intellectual property

Key Management



- Bruce Pon** – CEO & Co-Founder
Founder at Avantalion, previously with Accenture, Daimler



- Trent McConaghy** – CTO & Co-Founder
Founder/CTO at ADA & Solido Design Automation



- Masha McConaghy** – COO & Co-Founder
PhD. Museology, Former Art Curator

'At ascribe, we believe there is an extremely long tail of digital property that is not being leveraged. For instance, there is no real marketplace to transfer, rent, sell and value intellectual property for creators and consumers. ascribe is able to bring transparency and clarity to markets for digital art, virtual goods and designs. We want to be the ownership layer on the Internet.'

- Bruce Pon, CEO of ascribe.io

CHAIN 'BUILDING PRIVATE BLOCKCHAINS'

Company Overview

- Description:** Chain is a provider of software used by businesses to design, deploy and operate private Blockchain networks (hosted or on premise)
- Also provides consulting services in addition to its software solutions
- Select Clients:** NASDAQ, Capital One, Orange, Fidelity, First Data (Gyft), Visa, Citi, Fiserv
- Total Funding:** \$44m (Last Funding Round: Series C, \$30m, Sep 2015)
- Investors:** Blockchain Capital, Capital One Ventures, Citi Ventures, Digital Currency Group, Fiserv, Khosla Ventures, NASDAQ, Orange, Pantera Capital, RRE Ventures, Visa
- Founded:** 2013 / **Headquarters:** San Francisco, US / **Employees:** c. 15

Key Management

- 
- Adam Ludwin** – CEO & Co-Founder
Former Venture Partner at RRE Ventures
 - Devon Gundry** – Chief Product Officer & Co-Founder
Former CEO & Co-Founder of SoulPanCake
 - Ryan Smith** – CTO & Co-Founder
Former Engineer at Heroku
 - Erik Olofsson** – Business Development Manager
Former VC at Creandum and Case Team Leader at Bain & Co.

Products & Technology



- Capital Markets:** Chain's cloud platform builds private Blockchain networks for repurchase agreements and cap table management



- Digital Gift Cards:** Chain's cloud platform leverages Blockchain networks to help card providers in eliminating fraud in digital gift cards



- Prepaid Mobile Airtime:** Chain's cloud platform transfers airtime minutes between telecom carriers and programmatically exchanges them at market rates

'There is great value in deploying private blockchain networks especially to facilitate value transfer between different legal entities. [...] Yes there are other actors in this space with similar focus to us even though I believe our tech is the most proven which is a clear differentiator. We're working with senior executives at Citi, Nasdaq, Visa, Fiserv, Capital One, Orange and others which is a great testament to the importance of this technology as well as the quality of Chain's product and services.'

- Erik Olofsson , Business Development Manager at Chain

CONSENSYS 'ETHEREUM INFRASTRUCTURE AND SERVICES'

Company Overview

- Description:** Developer of decentralized applications, infrastructure and end-user tools for Ethereum
- Through its ConsenSys 'hub', ConsenSys creates, incubates and acquires multiple proof of concepts benefiting its platform and highlighting the flexibility and ease to build on the Ethereum platform compared to the Bitcoin blockchain
- In ConsenSys has more than 16 projects including Balanc3 (a smart contract powered Triple-Entry Accounting system), BlockApps (a full stack application platform for decentralized applications) or DAOWars (Video games based on languages and techniques of smart contract development)
- Founded:** 2014 / **Headquarters:** New York City, US / **Employees:** 60

Technology & Partnerships



- Ethereum:** Released in July 2014, it is a decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third party interference
- Announced in November 2015 a partnership with Microsoft to release Ethereum Blockchain-as-a-Service where customers of Azure can build products that can digitize and automate a plethora of operations, from securities trading to cross-border payments to corporate accounting

Key Management



- Joseph Lubin** – Founder
Former CEO at SyNergMusic
- James Slazas** – CFO
Former CEO at Healthcare Inside/Med A-Z
- Andrew Keys** – Head of Bus Dev / IR
Former Director at Dovetail Capital

'We are at a very exciting time similar to the gold rush of internet 1.0. People are leaving accounting firms and large investment banks to join the decentralized rush. We, at ConsenSys, want to be at the forefront of this revolution by being the largest developer of decentralized applications in order to make Ethereum the reference platform. Bitcoin is a very difficult platform to build arbitrarily difficult functionality into a program whereas Ethereum enables average developer to build fully secure platform.'

- Joseph Lubin , Founder & CEO at ConsenSys

CREDITS 'INTEROPERABLE BLOCKCHAIN PLATFORM'

Company Overview

- **Description:** A built-from-scratch framework for building interoperable blockchains
- Offers a federated Blockchain framework that can communicate agnostically with other chains and act solely based on information contained outside the ledger
- Technology platform is scalable, secure, and transparent; and enables real-time clearing and settlement of transactions
- **Clients:** Includes 2 major European central securities depositories (CSD's), a major credit card network, the Isle of Man government, other financial industry participant, and blockchain companies
- **Founded:** 2014
- **Headquarters:** London & Isle of Man, UK / **Employees:** c. 10

Key Management



▪ **Nick Williamson** – CEO & Co-Founder
Former Ring Games Manager at PokerStars



▪ **Eric Benz** – COO & Co-Founder
Fintech Strategist & Serial Entrepreneur



▪ **Justin Martin** – CFO
Former Director of Private Equity Companies

Technology & Customer Use Case



- **Financial Services:** Enables financial institutions to automate processes such as loan origination, trade settlement using Blockchain technology



- **Government:** 1st Govt/Blockchain Partnership
 - Building a government KYC service providing a new way to identify clients
 - Engaged on 2 active projects around registries and federated identity



- **Identity:** Allows enterprises and banks to create a digital identity using Blockchain technology that can be used across borders

'At Credits, we are focusing on fixing broken processes in three key areas: identity, financial services and Government. Our enterprise platform provides blockchain systems capable of working without special configuration, fully customizable and supporting in excess of 130k transactions per second.'

- Nick Williamson, CEO & Co-Founder of Credits

ERIS INDUSTRIES 'SMART CONTRACTS FOR BUSINESSES'

Company Overview

- Description:** Provider of an open-source software platform stack to build smart contract applications and permissioned Blockchain
- Eris' secure, low-cost, 'run-anywhere' data infrastructure technology can be accessed through a free, open platform
- Clients:** 4 of 9 bulge bracket banks are customers and many other leading financial institutions use the platform. Moreover, the Company has been working with Big-4 integrators to provide enterprise tools to rapidly prototype applications
- Products:** Eris has developed smart contract libraries focused on debt (e.g. bond lifecycle management), trade finance as well as PoC applications including bond lifecycle management application
- Total Funding:** n/a / **Investor:** Anthemis Group
- Founded:** June 2014 / **Headquarters:** London, UK
- Employees:** 9

Key Management

- | | |
|---|---|
|  | <ul style="list-style-type: none"> Casey Kuhlman – CEO
Former Marine & International Development Practitioner |
|  | <ul style="list-style-type: none"> Preston Byrne – COO & General Counsel
Former Structured Finance & Derivatives Lawyer |
|  | <ul style="list-style-type: none"> Tyler Jackson – Chief of Innovation
Former Quantum Information Academic |

Components & Technology

eris:cli

- Command line interface to the eris platform

eris:db

- A permissionable smart contracts solution with an enterprise-grade API server

eris:pm

- Smart contracts package manager

eris:legal

- Implementation of legal markdown document assembly mechanism

'Blockchain 2.0 has nothing to do with money and everything to do with data. This forward thinking has led us to identify a definite business goal, especially in terms of enterprise. Eris Industries' technology will be a huge cost-saver in terms of corporate infrastructure, and if it's rolled out properly, it will be a definite winner.'

Brian Fabian Crain, Head of Bus. Dev.



EVERLEDGER 'FRAUD DETECTION USING BLOCKCHAIN'

Company Overview

- **Description:** Provider of certification and verification services for diamonds and other luxury goods, such as designer bags, using smart contracts (Blockchain technology)
- Target customers are certification houses, banks, insurance companies, law enforcement, and the online retail industry
- Everledger combines its private Blockchain to serve & protect industry trade coupled with the public Blockchain in the serving of item provenance & consumer interest data
- The Company has digitized and embedded 430k+ diamonds
- **Total Funding:** \$118k (seed round, Mar 2015)
- **Investors:** Barclays Accelerator, Techstars
- **Founded:** 2015 / **Headquarters:** London, UK

Founder



- **Leanne Kemp – CEO & Co-Founder**
Former Director of International Strategy, Marketing & Operations at Phenix Jewellery

Products & Technology



- **Smart Contracts:** Uses hybrid Blockchain technology, combining the security of a public Blockchain with the complexity of a private Blockchain



- **API:** Offers an API for the following markets
 - **Banks & Insurers:** Tracks the identity of digitized items to help insurers & banks in the management of fraudulent transactions
 - **Law Enforcement:** Enables the tracking of fraud based on data collected
 - **Online Marketplaces:** Assists with detecting the sale of stolen items

'The diamond industry is based on a consensus and trust mechanism - the industry has relied on these relationships for 100's of years. A surge of synthetics is infiltrating supply chains. We have not discovered a diamond mine in 10-15 years, so having a distributed ledger around diamonds will be hugely important. We have already on-boarded major diamond certification houses, and have multiple touchpoints across the entire industry, all the way from mines to retailers. We are not limiting ourselves to markets in the UK, but also focusing on emerging markets such as China.'

- Leanne Kemp, CEO and Founder of Everledger



FACTOM 'REINVENTING DATA MANAGEMENT SYSTEMS'

Company Overview

- **Description:** Provider of a data layer solution described as a giant database in which anyone can insert any type of data directly on the Blockchain
- Bitcoin is restricted to 10-minute-grouped transactions and with less than 10MB of data whereas Factom is able to anchor a single hash containing millions of documents every 10mn
- **Use cases:** Supply chain management, voting systems, property titles, legal applications and financial systems
- **Technology overview:** Factom technology starts off the Blockchain and then, takes multiple data entries and reduces them to a single verifiable hash and inserts that hash, of minuscule data size, into the ledger
- **Total Funding:** \$1.3m / **Post Money Valuation:** \$11.4m (Oct 2015)
- **Investors:** Coinsilium & Kuala Innovations
- **Founded:** 2014 / **Headquarters:** Texas, US / **Employees:** c. 17

Key Management



▪ **Peter Kirby – CEO & President**
Former VP Sales & Ops at CoinTerra



▪ **Paul Snow – Founder & Lead Developer**
President of Texas Bitcoin Conference

Product & Technology Overview



- **Factoids:** Factoids are tokens used to create incentives to support the protocol
- **Factom Proof:** Enables immutable records to take place and provide proof of existence and audit
- **Factom Layers:** Data is organized into four layers of block structures with different functionalities

'We, at Factom, built a big storage facility that allows users to publish chain of data composed of sequential transactions representing all kind of information from mortgage chain, trade finance chain and could be combine together and create for instance a mortgage backed security chain. With Factom's proprietary consensus tool, we have built a much more robust tool than the classic Bitcoin Blockchain network.'

- Peter Kirby, CEO of Factom

FUNDERBEAM 'FACILITATING INVESTMENTS IN STARTUPS'

Company Overview

- **Description:** Provider of a subscription-based database of early-stage startups that allows angel investors and entrepreneurs to discover, benchmark, and analyse startups
- Leveraging the database, Funderbeam plans to use Blockchain technology to launch a startup marketplace for investing and trading in early-stage companies
- **Total Funding:** \$2.2m (seed round, Oct 2015)
- **Investors:** 3TS Capital Partners, Rockspring, angel investors
- **Founded:** 2013 / **Headquarters:** Tallinn, Estonia / **Employees:** c. 16
- **Statistics:**
 - 145,000+ startup profiles
 - 19,000+ investor profiles

Key Management



▪ **Kaidi Ruusalepp** – CEO & Co-Founder
Former CEO of NASDAQ OMX Tallinn



▪ **Taivo Tender** – CTO & Co-Founder
Former Head of B2B Solutions at Elion Enterprises



▪ **Urmas Peiker** – Co-Founder
Former Head of Market Surveillance at Estonian FSA

Products & Technology



- **Profiles & Filtering:** Allows users to search for startups using 13 relevant filters



- **Benchmarking:** Enables users to benchmark startups against a range of other companies and startup market



- **Network Map:** Provides a visual depiction of connections between people and companies in the startup universe



- **Trading Platform (in Private Beta):** Leverages Blockchain technology to enable users to invest and trade in early-stage companies

'There are some firms that provide liquidity in early-stage companies, but they are limited to local markets. We, at Funderbeam, use our experience in financial markets to facilitate cross-border investments in early-stage companies. As a former CEO of NASDAQ Tallinn, I realize that smaller investors create liquidity. So, we want to lower the barrier by using Blockchain to break an investment into thousands of parts.'

- Kaidi Ruusalepp, CEO & Co-Founder of Funderbeam

GUARDTIME (1/2) 'VALIDATING THE WORLD'S INFORMATION'

Company Overview

- **Description:** Provider of a platform that ensures the integrity of systems, networks, and data at industrial scale using Blockchain technology
- Leverage cryptographic integrity of the blockchain to trace data and user authentication, monitor systems integrity, and detect unauthorised access across globally distributed networks in real-time
- Deployed in highly sensitive, military grade applications, including projects with Ericsson and Lockheed Martin
- Provides full-stack infrastructure, from appliances to embeddable systems
- **Founded:** 2007 / **Headquarters:** Amsterdam, NL / **Employees:** c. 100
- **Technology:**
 - **Keyless Signature Infrastructure (KSI):** A Blockchain technology providing scale data authentication without reliance on centralized trust authorities
 - **Black Lantern Security Appliance:** Installed within the customer perimeter providing KSI Service access at the client level

Company Key Statistics

\$65M+

2015 Contract Value

\$20M+

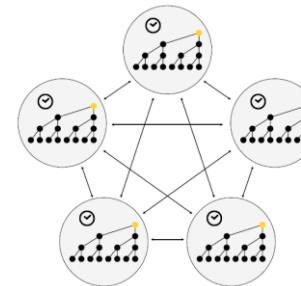
2015 Cash Flow

30+

Global Patent Portfolio

Technology overview

KSI blockchain: Synchronises data integrity on the blockchain



Black Lantern Security Appliance: Provides KSI service access at the client level



Key Customers



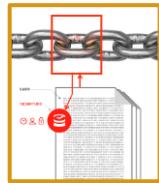
'For the last few years, security has been focused on confidentiality, not on integrity. Whereas companies rely on processes and humans, Guardtime eliminates the uncertainty and solves software regression testing. In other words, Google organizes the world's information; Guardtime validates it and makes it universally reliable.'

- Mike Gault, CEO of Guardtime

GUARDTIME (2/2) 'VALIDATING THE WORLD'S INFORMATION'

Key Technology Features

Step 1: Register All Digital Assets in the Blockchain



- KSI signatures, linked to the Blockchain, enable the properties of data to be verified without the need for trusted third parties, keys, or credentials that can be compromised

Step 2: Continuously Monitor the State of Those Assets



- An early warning system into the integrity breaches by constant re-verification of existing signatures, make it possible to discover and remedy any vulnerabilities before large-scale damages can occur and ensure business continuance

Key Management



- Mike Gault – CEO**
Former MD at Barclays Capital
- Matthew Johnson – CTO**
Former VP at Modern Technology Solution

Selected Industries



Telecommunications: Provides data-centric security solutions that enable telcos to differentiate themselves from competitors



Defense and Aerospace: Provides next-gen anti-tamper hardware and integrity solutions to detect and mitigate network compromises



Financial Markets: Provides solutions to reduce the dwell time of Advanced Persistent Threats and to detect data poisoning



Digital Advertising: Provides solutions to eradicate malware, verify ad inventory in real time, and collect, correlate at scale without cookies



Insurance: Provides KSI-based solutions that enable insurance companies to run their businesses more efficiently



eGovernment: Provides KSI solutions that make it impossible for anyone to manipulate government networks

R3 CEV 'BLOCKCHAIN, IN CONSORTIUM WITH BANKS'

Company Overview

- Description:** Developer of blockchain/distributed ledger applications for the financial services industry
- Works in conjunction with a consortium of 30+ member banks, including Bank of America, Morgan Stanley, Commerzbank to identify and implement potential applications
- A key aspect of this work is collaborating on protocols to standardise and make interoperable common, core processes for distributed ledgers
- Team includes senior financial institution veterans working collaboratively with recognised blockchain/distributed ledger experts
- Launched:** Sep-2015 / **Headquarters:** New York, US / **Employees:** c.20

Key Management



David Rutter – Founder & CEO
Former CEO of Electronic Broking at ICAP



Todd McDonald – Co-Founder & Managing Director
Former Head of FX Americas at Standard Chartered



Jesse Edwards – Co-Founder & CFO
Former Investment Banking Vice President at AGC Partners



Richard G Brown – Head of Technology
Executive Architect, Banking and Financial Markets at IBM

Technology & Strategy



- Crypto 2.0:** R3 developed a reference architecture based on Blockchain technology for financial industry



- Exchanges:** R3 develops trade execution solutions such as trade settlement for existing and evolving asset classes



- Ventures:** R3 makes investments in early stage companies that use Blockchain technology in financial applications

'Collaborative model is the best way to deliver these Blockchain-based technologies to the financial markets where they hold infinite potential. By placing emphasis on working with the market from day one, we formed partnerships with more than 25 banks. This signals a significant commitment by the banks to collaborate and apply this emerging technology to the global financial system.'

- Jacob Farber, General Counsel of R3 CEV

RIPPLE 'SOLVE CROSS-BORDER PAYMENT ISSUES'

Company Overview

- Description:** Provider of a cross-currency payment and settlement services using a distributed financial technology called consensus
- Connects the global FX marketplace through a real-time network of banks, financial institutions, market makers and corporations
- Widely seen as one of the most common Blockchain solutions in early deployment within financial institutions
- Total Funding:** \$38.4m (Last Funding Round: Series A, Oct 2015)
- Investors:** Google Ventures, Andreessen Horowitz, Santander InnoVentures, CME Group, Seagate Technology, IDG Capital Partners
- Founded:** 2012 / **Headquarters:** San Francisco, US
- Employees:** c.120+

Products & Technology



- Financial Institutions:** Access to instantly and directly settle cross-currency payments with other financial institutions with no central counterparty resulting in lower operational costs and improved certainty/settlement



- Market Makers:** Real-time access to demand and opportunity to provide liquidity, directly integrated into the transaction flow



- Integration Platform:** Enables organizations to integrate internal systems with the Ripple network such as Accenture (preferred blockchain solution) and CGI

Key Management



- Chris Larsen** – CEO & Co-Founder
Former CEO & Co-Founder at Prosper



- Bret Allenbach** – CFO
Former CFO of Payments & Risk at PayPal



- Brad Garlinghouse** – COO & President
Former President of Consumer Applications at AOL

'We are seeking to address inefficiencies in cross border payments, improving speed, certainty and costs. On average 4% of cross border payments fail, and up to 12% require reconciliation. There's no way today for most banks to transact instantly and directly with end to end visibility into payments. Ripple solves all of these problems, while also increasing liquidity options by connecting counter-parties and market makers on a real-time network powered by a distributed solution.'

- Monica Long, VP of Marketing at Ripple



Contacts

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