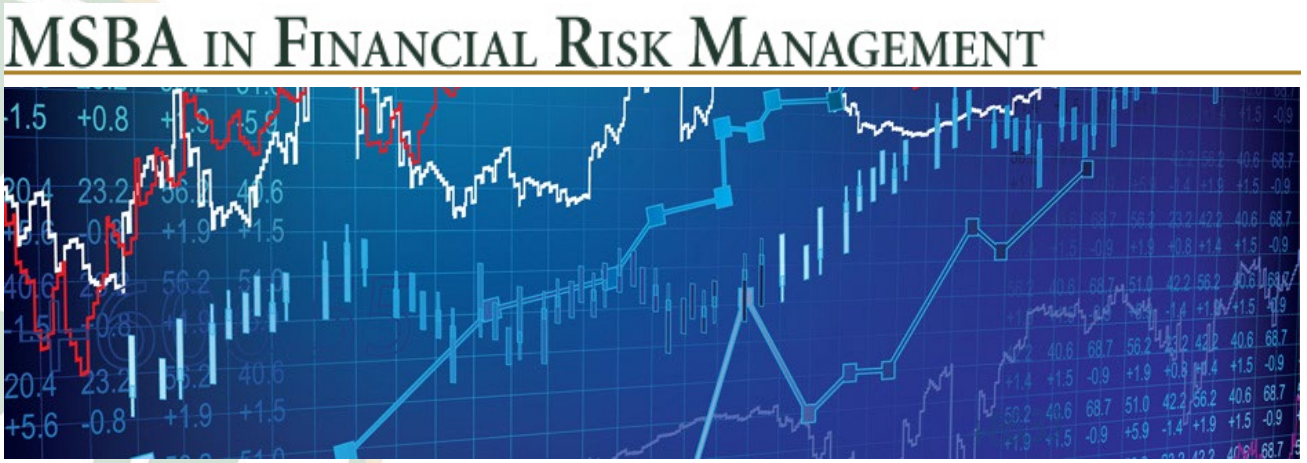
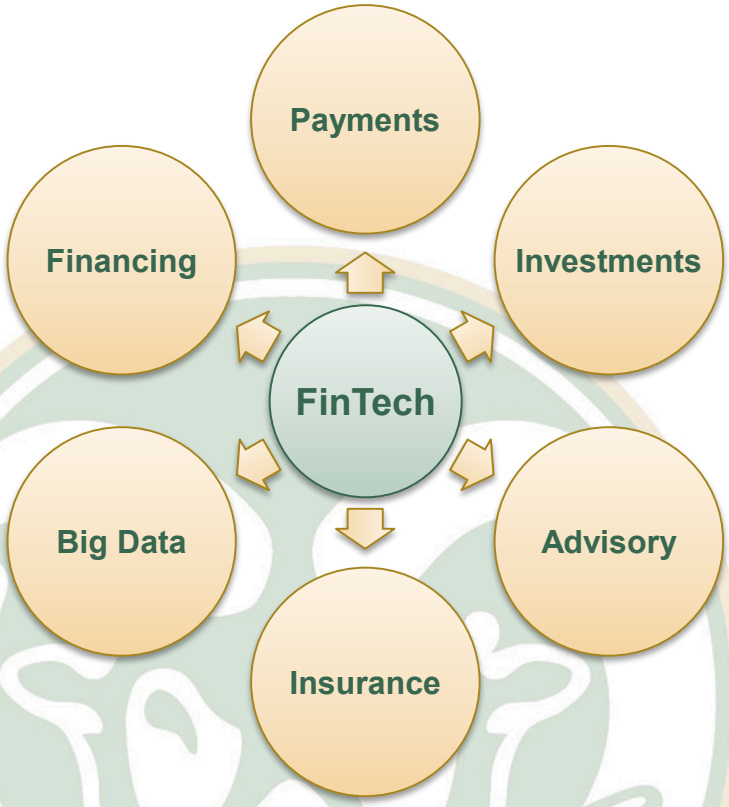
Financial Risk Management

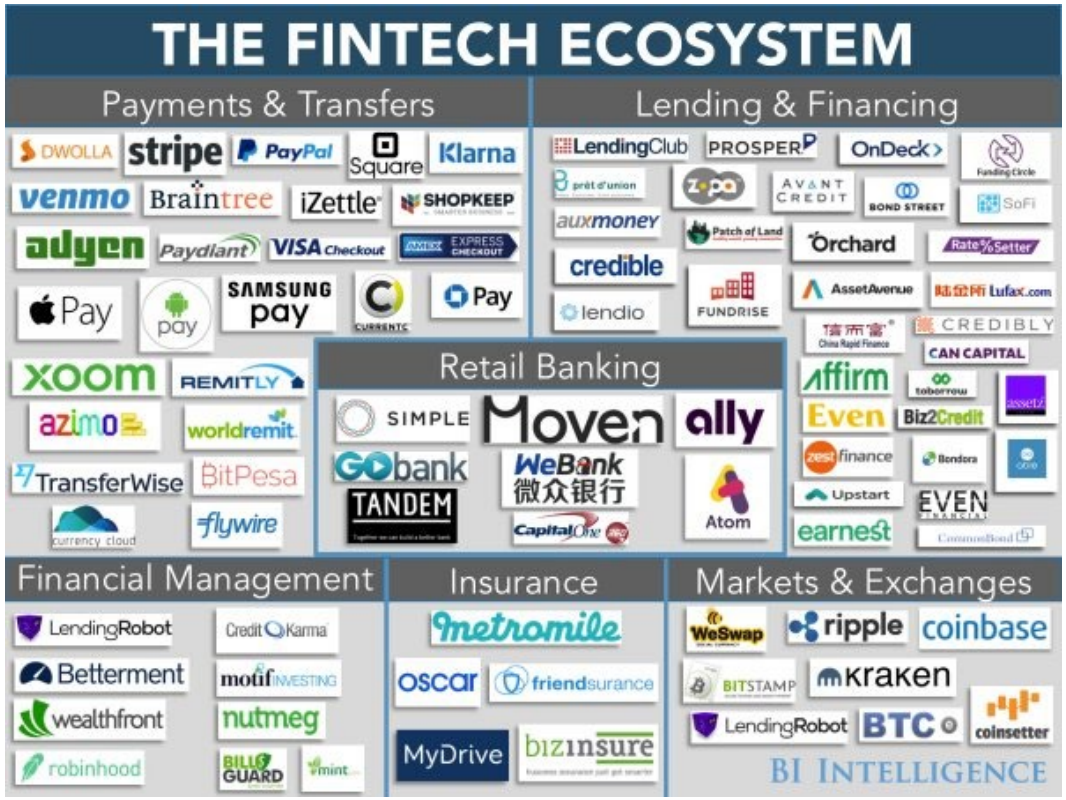


What is FinTech?

- Fintech, an abbreviation for Financial Technology that describes the evolving intersection of financial services and technology.
- The term Fintech originally referred to the technology applied to the back-end of established consumer and trade financial institutions.
- Since the internet revolution, the term Fintech stands for technologies that are disrupting traditional financial services, including mobile payments, money transfers, loans, fundraising, and asset management.
- Although, in its broadest sense, Fintech stands for technologies used and applied in the financial services sector, it also touches every other business the financial services industry deals with.

What is FinTech?





Digital Innovation across different areas of the financial sector

Payment services and market infrastructures	Leveraging transaction data and other sources of data for credit appraisals	Deposits, Lending and Capital Raising	Investment Management
• E-money and mobile money products • Application program interfaces allowing overlay of services on existing products • Use of distributed ledger technologies for new ways of structuring market infrastructures	• Transaction data from e-commerce and payment platforms like **Alibaba** and **Paypal** • Mobile phone usage data • Social Network related data	• Crowd-sourcing ideas and funding them through crowd-funding • Peer 2 peer lending • Internet-only banks	• Automated processing and dissemination of investment advice

Potential to significantly enhance efficiencies, reduce costs and expand access to financial services

ABCD of FinTech

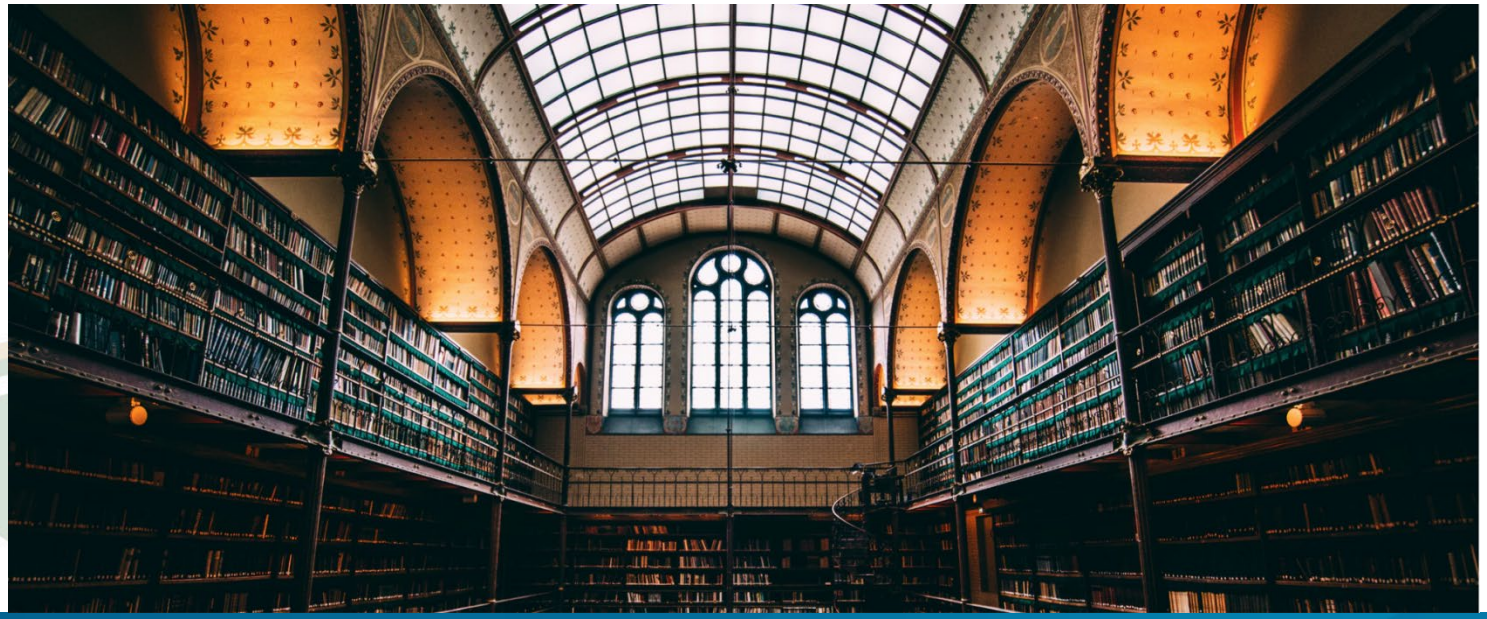
- Artificial Intelligence
- Block chain/Bitcoin/Big Data
- Could Computing / Crypto Currency
- Deep Learning

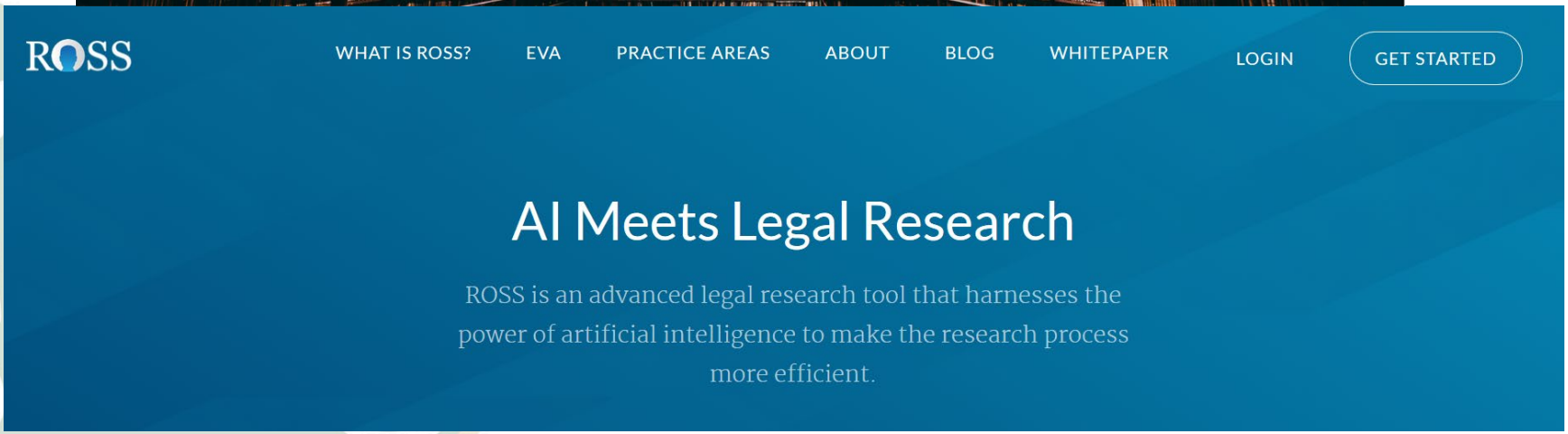
Artificial Intelligence

The Rise of AI

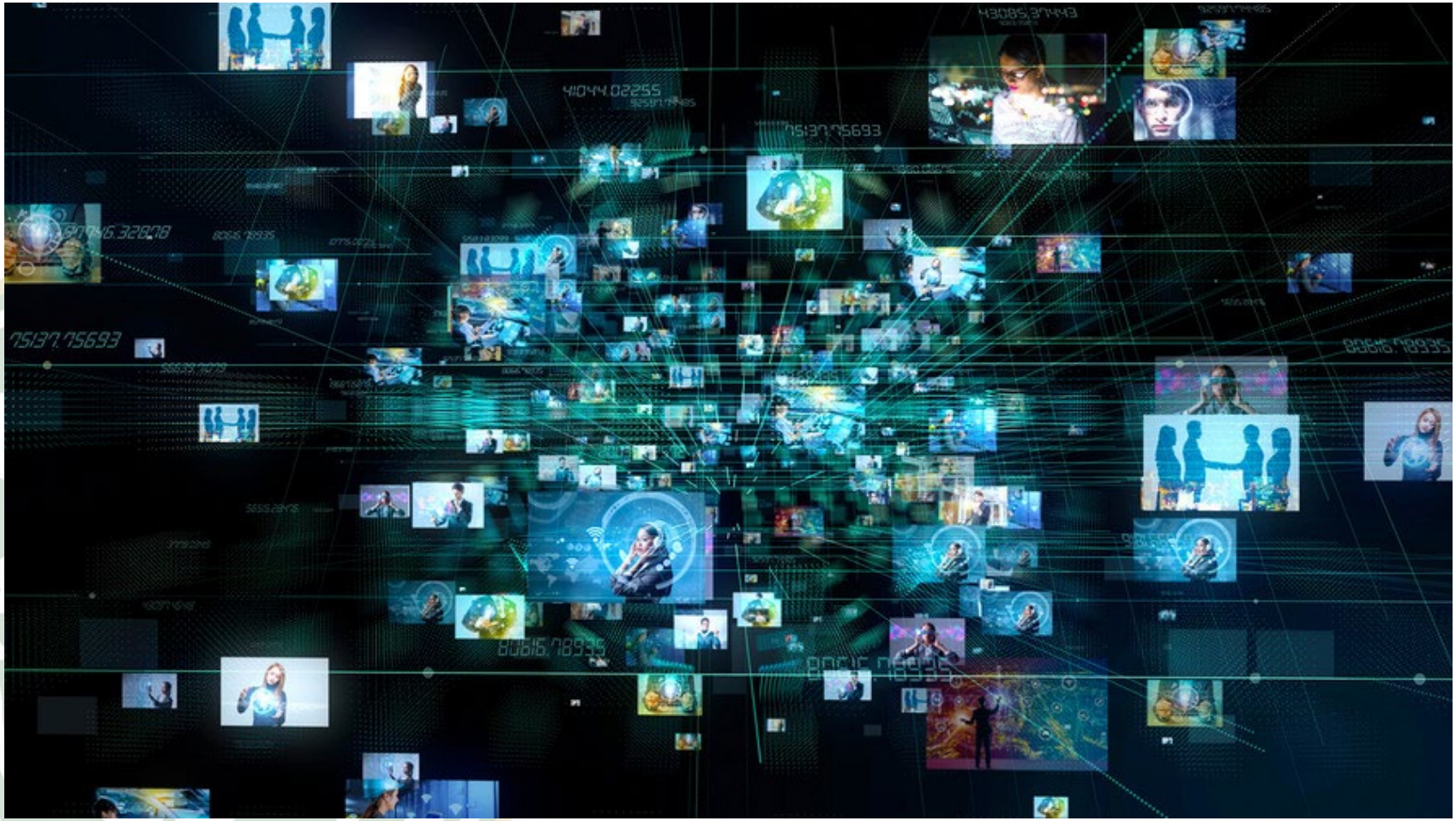
- The rise of AI is being considered part of the fourth industrial revolution. This revolution is getting a boost from three exponential laws: Moore's law, Metcalfe's law, and Kryder's law.
- Moore's law predicts the exponential increase of processing power of computers.
- Metcalfe's law talks about how the value of a network increases proportionally to the number of connected users to the system.
- Kryder's law looks into storage expansion.
- All of these laws are great news for finance. More processing power helps finance companies achieve faster analytics. More network connectivity increases the ability to collect data. More storage helps store big data. It has led to efficient machine learning algorithms for finance.

Meet Ross, the IBM Watson-Powered Lawyer

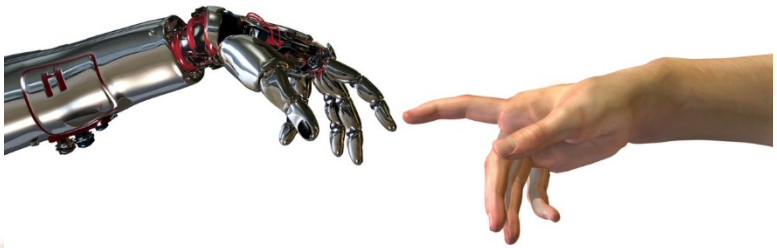


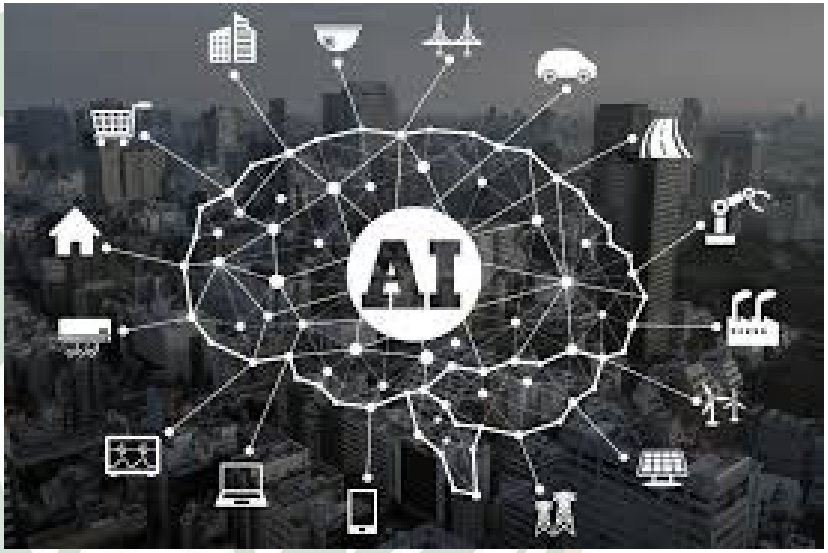


Fooling all the people all the time: the rise of artificial intelligence and fake news



What's Next for AI





Man vs. Machine

- Yes, give it time, machine learning will take over!
- No way, machine learning is just a tool for humans!
- Wait, there's another option: machine learning can take our profession to the next level!

QUARTZ

Wall Street's research jobs are the most likely to be upended by artificial intelligence

By John Detrixhe | October 27, 2017

- Research analysts are the most likely employees on Wall Street to find themselves working with—or being replaced by—robots, according to a survey by Greenwich Associates.
- By next year, some 75% of banks and financial firms will either explore or implement artificial intelligence technologies, harnessing a variety of digital services to extract insights from mountains of data.

https://qz.com/1113633/wall-street-analyst-jobs-are-the-most-likely-to-be-disrupted-by-artificial-intelligence/

Markets

Robots in Finance Could Wipe Out Some of Its Highest-Paying Jobs

By Lananh Nguyen
December 6, 2019, 2:24 PM MST

- ▶ Experts testify about AI on Wall Street for House committee
- ▶ Lawmakers ask about jobs, bias from AI and market surveillance

Robots have replaced thousands of routine jobs on Wall Street. Now, they're coming for higher-ups.

"Financial machine learning creates a number of challenges for the 6.14 million people employed in the finance and insurance industry, many of whom will lose their jobs -- not necessarily because they are replaced by machines, but because they are not trained to work alongside algorithms," Lopez de Prado told the U.S. House Committee on Financial Services.

UBS has officially ditched its massive trading floor

By Kevin Dugan

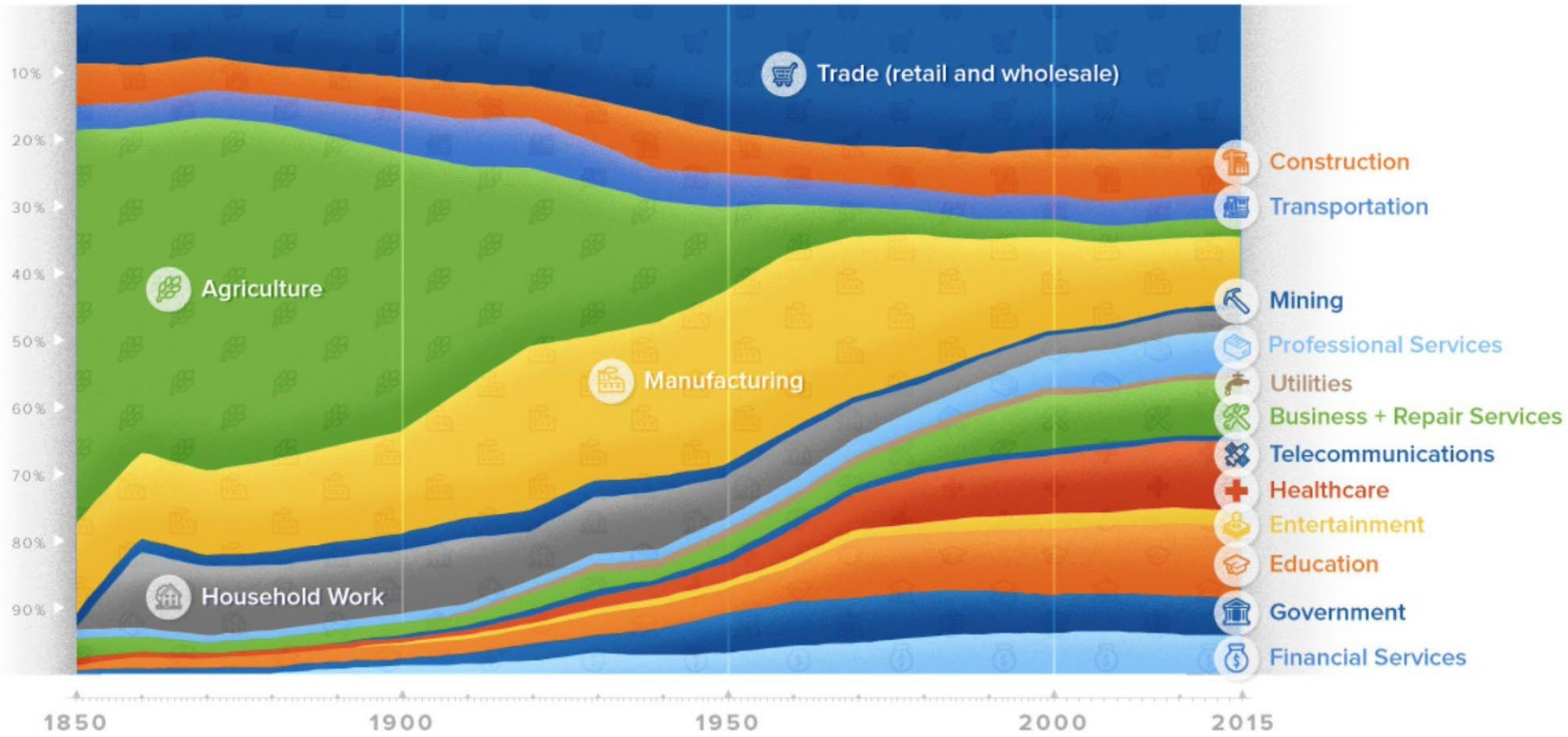
April 19, 2017 | 10:42pm | Updated

2008

2016

VISUALIZING 150 YEARS OF U.S. EMPLOYMENT HISTORY

How sector shares of jobs have changed over time



Big Data

Big Data

"Big Data" means:

- using new or expanded datasets and data, including data from unconventional sources such as social media
- adopting the technologies required to generate, collect and store these new forms of data
- using advanced data processing technologies
- using sophisticated analytical techniques such as predictive analytics
- applying this data knowledge in business decisions and activities
- By analyzing payment information, firms can build an insight into customer intelligence and behaviors that they may be able to monetize.

Big Data

- Offers can be driven by analytics into a combination of historical payments information and big data analysis of demographics, location positioning and peer group analysis.
- By understanding customer behavior, firms can target new customers and cross-sell to existing customers.
- Firms can incorporate transactional-level data analysis within credit risk model development.
- Firms can give customers access to their own data, and help them manage their finances via apps that make use of the data.
- Big Data can be used to identify problems, for example, how credit lines are being used against agreed limits and to identify payments patterns of potential interest.

Big Data


PRADA
MARFA
PRADA


GOOD CREDIT
BAD CREDIT
PHOTO: SHUTTERSTOCK


AC
%
MRC

New Big Brother: Market-Moving Satellite Images

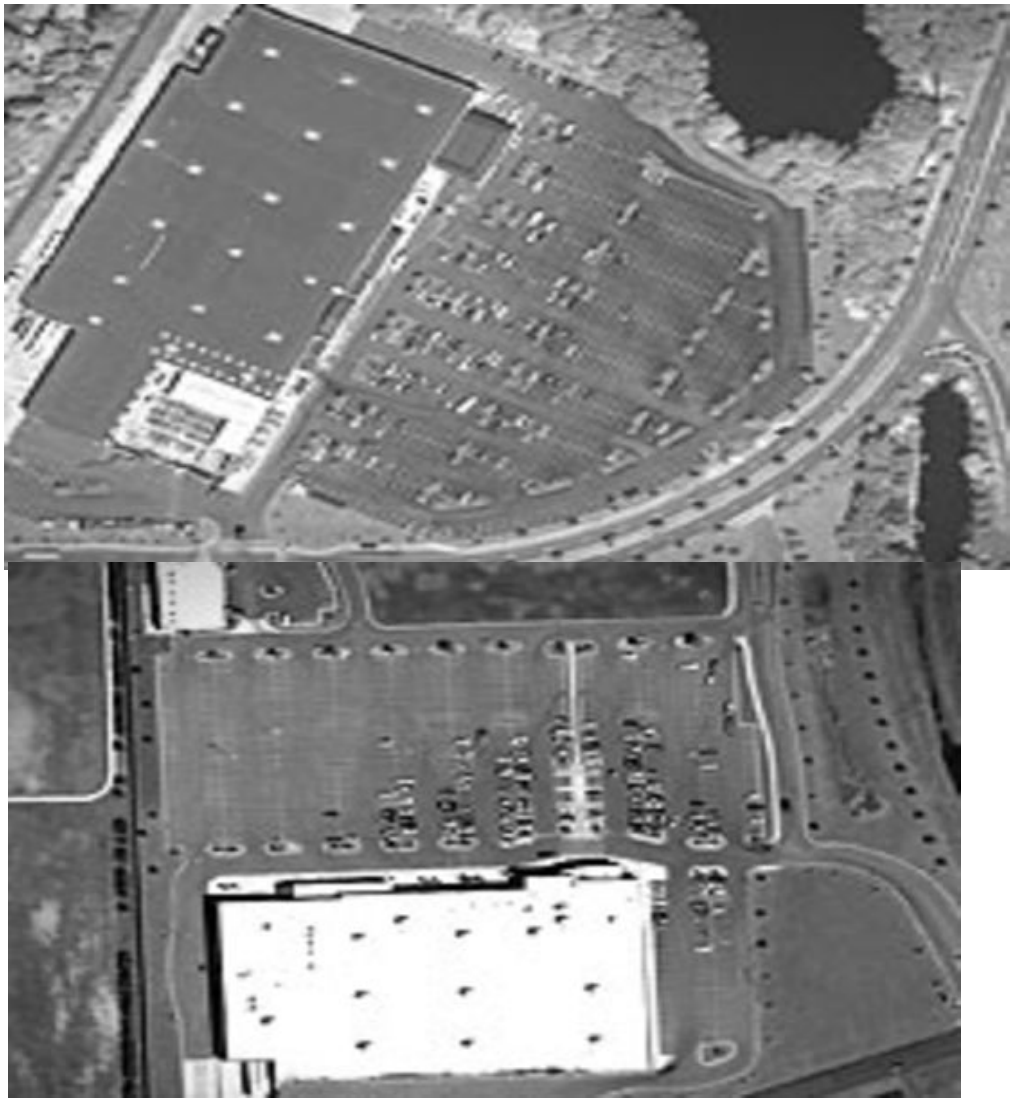
CNBC

As part of a growing trend among hedge funds and Wall Street firms, Cold War-style satellite surveillance is being used to gather market-moving information.

The surveillance pictures are often provided by private- sector companies like DigitalGlobein Colorado and GeoEyein Virginia, which build and launch satellites and take pictures for US government intelligence agency clients and private-sector satellite analysis firms.

That means there are two links in the chain before the satellite data gets to Wall Street—a satellite firm takes the pictures and sells them to an analysis firm, which scrutinizes the images and sells the aggregated data to hedge funds and Wall Street analysts.

As an example of how Wall Street getting in on this techhology, the UBS Investment Research issued its earnings preview for Wal-Mart's second quarter, which publicly revealed that UBS had been using used satellite services of private-sector satellite companies to gather the comings and goings of the parking lots at Wal-Mart stores. "UBS proprietary satellite parking lot fill rate analysis points to an interesting cadence intra-quarter and potential upside to our view," the report read.



https://www.cnbc.com/id/38722872

Connecting Satellite Imagery and the Oil Industry

TECH • TRADE

Satellites Are Being Used to Expose Tightly Held Secrets in the Commodity Trading World

An oil tanker in Curacao Prisma Bildagentur—UIG/Getty Images

By BLOOMBERG December 16, 2017

A lump of coal is scooped onto a truck bed in Australia, driven to a port, loaded

http://fortune.com/2017/12/16/satellites-commodity-trading-world/

https://www.geospatial-insight.com/blog/satellite-imagery-oil-industry/

Supply Chain Finance

Bloomberg

Technology

Apple Has a Plan B as iPhone Demand Peaks; Many Suppliers Don't

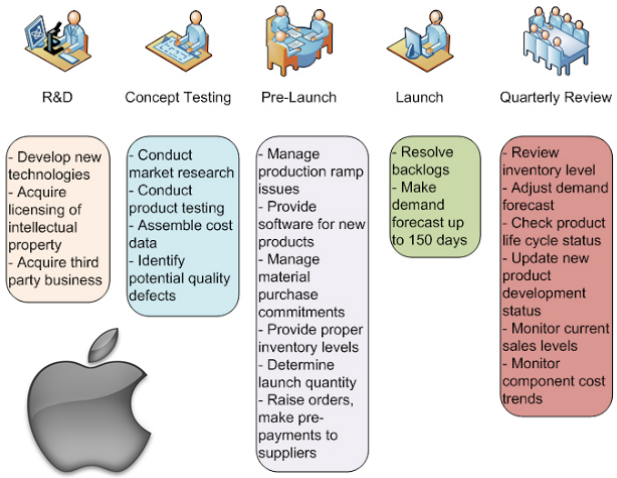
By Jeran Wittenstein and Mark Gurman

November 12, 2018, 7:32 PM MST *Updated on November 13, 2018, 4:30 AM MST*

In a world where iPhone demand is on the wane, Apple Inc. has a Plan B. As customers wait longer between upgrades and the smartphone market saturates, Apple can fall back on charging higher prices for each handset and raking in more money from services such as streaming music, digital videos and data storage.

But there's no back-up for many of the companies that supply components for the iPhone.

The latest evidence that what's bad for Apple can be terrible for suppliers came on two continents within hours of each other. Japan Display Inc., which gets more than half its revenue from the iPhone maker, cut forecasts. Then Lumentum Holdings Inc., a top maker of iPhone facial-recognition sensors, lowered its second-quarter outlook. On Tuesday, Hon Hai Precision Industry Co., the biggest assembler, missed estimates.



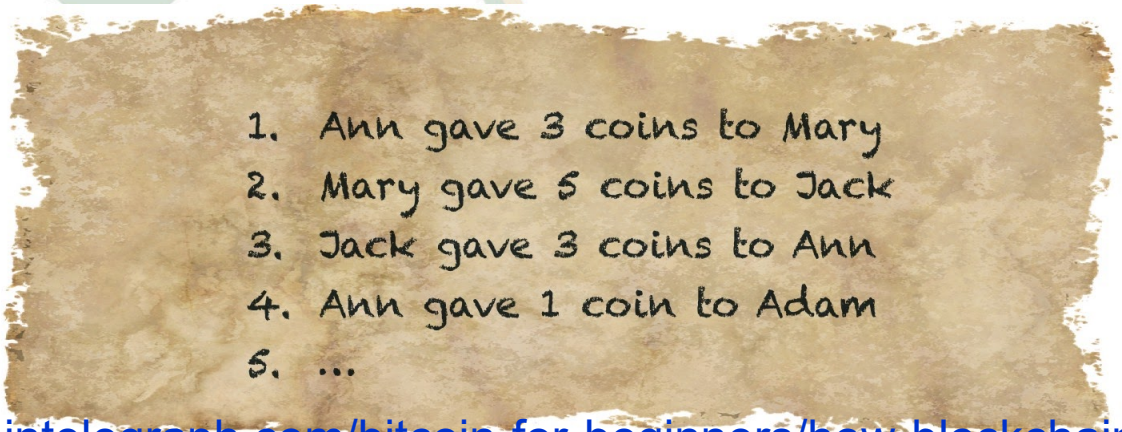
Blockchain

Blockchain

- A ‘blockchain’ is the cryptographic technology that underlies bitcoin. It is effectively a public ledger of all transactions that have ever been executed with that bitcoin.
- A Blockchain is a type of decentralized and distributed ledger for maintaining a permanent and immutable record of transactional data in a chronological order. Blockchain stores transactional data in a continuously growing list of records called blocks. Blockchain uses cryptography to link and secure these blocks. Each block typically contains three elements:
  - A Hash pointer- link to the previous block
  - A timestamp
  - Transaction data

Decentralized and Distributed Ledger

- A Blockchain is a diary that is almost impossible to forge.
- Let's imagine that 10 people in one room decided to make a separate currency. They have to follow the flow of funds, and one person – let's call him Bob – decided to keep a list of all actions in a diary:



https://cointelegraph.com/bitcoin-for-beginners/how-blockchain-technology-works-guide-for-beginners

What is mining?

- Miners on a Blockchain are nodes that produce blocks by solving proof of work problems. If a miner produces a block that is approved by an electronic consensus of nodes then the miner is rewarded with coins. As of October 2017, Bitcoin miners get 12.5 Bitcoins per block.
- The reward is not the only incentive for miners to keep running their hardware. They also get the transaction fees that Bitcoin users pay. Currently, as there is a huge amount of transactions happening within the Bitcoin network, the transaction fees have skyrocketed. Even though the fees are voluntary on the part of the sender, miners will always prioritize transfers with higher transaction fees. So, unless you are willing to pay a rather high fee, your transaction might take a very long time to be processed.

Transparency yet pseudonymity

- Anyone inspecting the Blockchain is capable of seeing every transaction and its hash value.
- Someone using the Blockchain is able to be anonymous if they wish or they can give their identification to others. All that you see on the Blockchain is a record of transactions between Blockchain addresses.

Height	Age	Transactions	Total Sent	Relayed By	Size (kB)	Weight (kWU)
489124	11 minutes	1480	3,324.06 BTC	BitFury	1,038.8	3,992.56
489123	14 minutes	2219	11,111.62 BTC	BTC.TOP	999.31	3,844.66
489122	28 minutes	2080	6,188.77 BTC	BTC.com	1,042.23	3,992.66
489121	35 minutes	2099	5,546.92 BTC	Bixin	1,033.51	3,992.81

Recording

- Once the recording of a transaction is on the Blockchain and the Blockchain has been updated, then the alteration of the records of this transaction is impossible. This is due to that particular transaction record being linked to the record of every preceding one. Blockchain records are permanent, they are ordered chronologically, and they are available to all the other nodes.

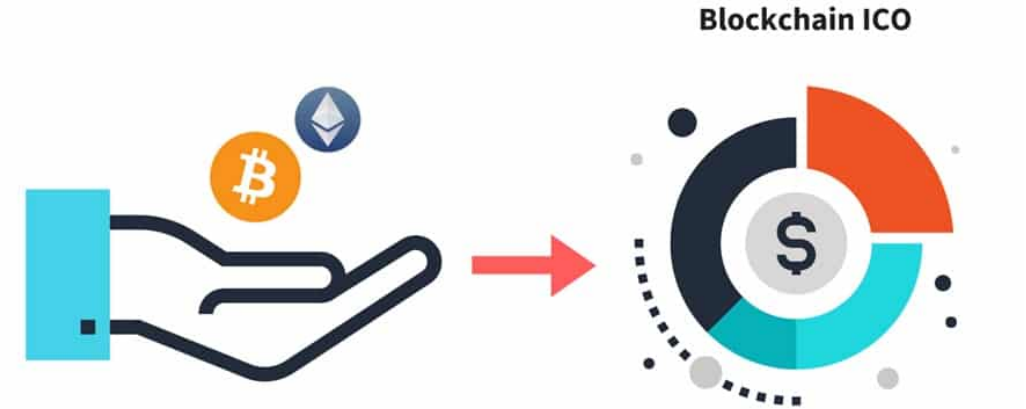
Key features of Blockchain

- **Decentralized**– A Blockchain-enabled decentralized network operates on a peer to peer basis. Meaning that by storing data across its network, blockchain eliminates the risks that come with data being held centrally.
- **Distributed ledger**– A distributed ledger allows sharing of a ledger of activity- such as arbitrary data or virtually anything of value between multiple parties. Each of the computers in the distributed network maintains a copy of the ledger to ensure transparency and also prevent a single point of failure (SPOF) and all copies are updated and validated simultaneously.
- **Immutable record**– By design, blockchains are inherently resistant to modification of data. All blockchain networks adhere to a certain protocol for validating new blocks. Once recorded, the data in any given block cannot be altered without the alteration of all the subsequent blocks, which requires the consensus of the network majority.

Blockchain Technology

- Blockchain opens new doors of opportunities for all the stakeholders in the financial world.
- The future of the financial services industry depends on how these stakeholders capitalize on this technology and how do they interact with each other. Let us have a look at the different participants of the Fintech ecosystem and what are the various challenges faced by them.

Block chain, Bitcoin, and ICO



Blockchain in FinTech

- **Smart Contracts**: A smart contract is a computer code running on top of a blockchain containing a set of rules under which the parties to that smart contract agree to interact with each other. When these predefined rules are met, the agreement is automatically enforced. The smart contract code has the ability to facilitate, verify, and enforce the negotiation or performance of an agreement or transaction.
- **Digital Payments**: The transfer of value or assets has always been a slow and expensive process. Imagine you have to send $100 from the USA to your friend in your Europe, who have an account with a local bank, it takes a number of banks and institutions to finally collect the money. With Blockchain, this process is simplified and faster at a cost much less than the traditional banking institutions.

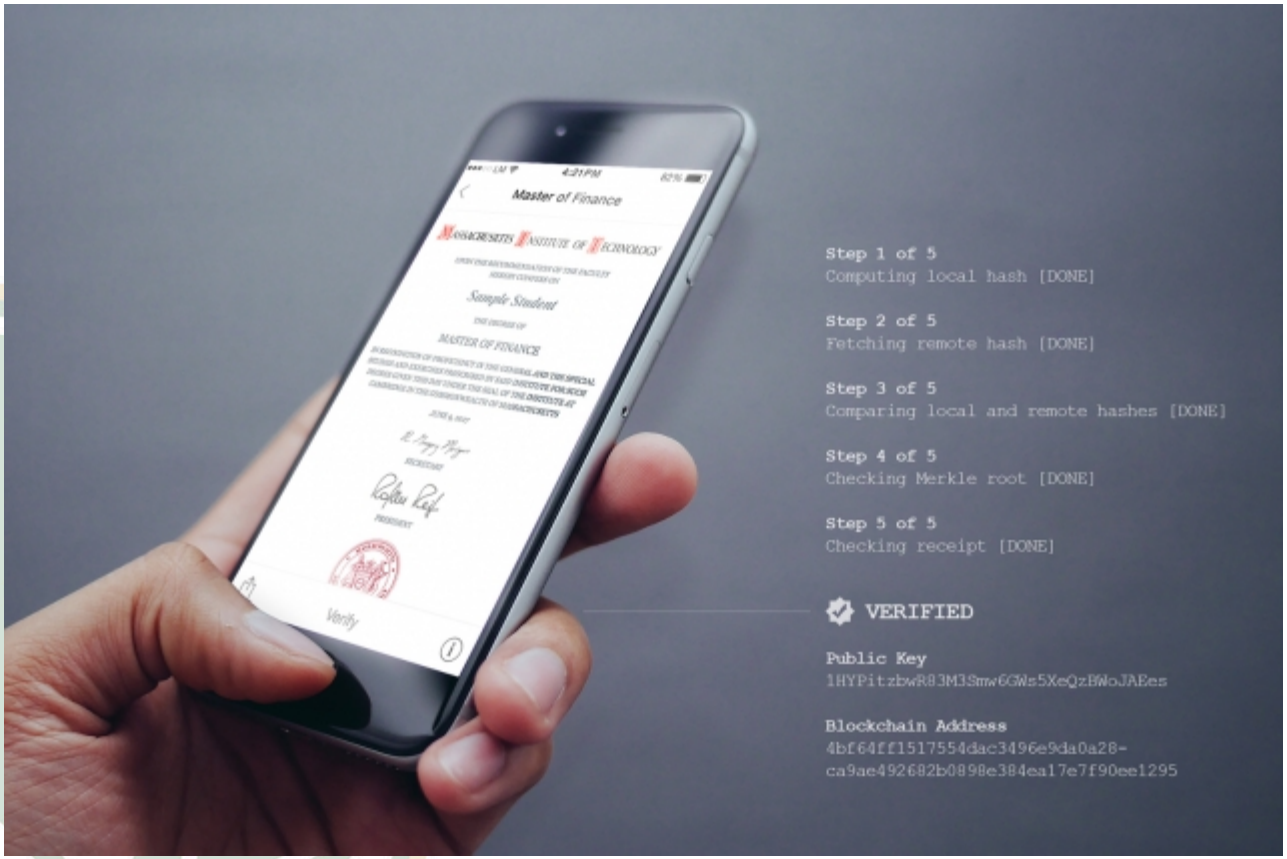
Blockchain in FinTech

- **Insurance claims**
- With smart contracts, a certain set of criteria for specific insurance-related situations can be established. In theory, with the implementation of Blockchain technology, you could just submit your insurance claim online and receive an instant automatic payout. Providing, of course, that your claim meets all the required criteria.
- French insurance giant AXA is the first major insurance group to offer insurance using Blockchain technology. They've recently introduced a new flight-delay insurance product that will use smart contracts to store and process payouts. Other insurance companies will surely follow suit.

Blockchain in FinTech

- **Digital Identity**: When identity management is moved to blockchain technology, users are able to choose how they identify themselves and with whom their identity is shared. Users still need to register their identity on the blockchain of course. But, they don't need a new registration for every service provider, provided those providers are also connected to the blockchain.
- **Share Trading**: Buying and selling stocks and shares involves many middlemen, such as brokers and the stock exchange itself. A blockchain is a decentralized and secure ledger that gives every stakeholder a say in the validation of a transaction and eliminates some of the 'middlemen' while changing the role of others. Eliminating the middlemen from the share trading process speeds up the settlement process and allows for greater trade accuracy.

Digital Diploma debuts at MIT



Blockchain Technology

- Blockchain technology has other applications, for example, the NASDAQ exchange will soon start using a blockchain-based system to record trades in privately held companies.
- Blockchain technology introduced in the back-office in order to settle transactions and keep track of money flows in real-time has the potential to be the efficiency innovation in payments.

The Internet of Things (IoT)

- The Internet of Things (IoT) is the network of physical devices, vehicles and other items embedded with software, actuators, sensors, software and network connectivity, connected to the Internet. All of those features enable such objects to collect and exchange data. Blockchain and its smart contracts are ideal for this.
- Blockchain will play a major role in the roll out of IoT, but will also provide ways of guarding against hackers. Because it is built for decentralized control, a security scheme based on it should be scalable enough to cover the rapid growth of the IoT. Moreover, Blockchain's strong protection against data tampering will help prevent a rogue device from disrupting a home, factory or transportation system by relaying misleading information.

The Future Of Blockchain: Fintech 50 2019

Michael del Castillo Forbes Staff
Crypto & Blockchain
I cover enterprise adoption of blockchain and cryptocurrency.

As the price of bitcoin collapsed last year from a high of $19,000 to less than $4,000, skepticism fell over many other applications of blockchain, the technology that powers most cryptocurrencies by recording transactions without a central authority.

Much of the hype surrounding promises that sounded too good to be true is dissipating as reality and regulations set in. What remains however, are proven teams, flush with cash from mainstream investors, and increasingly, actual revenue.

https://www.forbes.com/sites/michaeldelcastillo/2019/02/04/top-crypto-blockchain-fintech-companies/#a824f856a9ce

Limitations and vulnerability

- Any Blockchain network largely depends on the amount of active users within it. In order to operate to its full potential, a network has to be a robust one with a widely distributed grid of nodes.
- Moreover, there is no Blockchain network in existence that could sustain the same amount of transactions as major card issuers like Visa or MasterCard do. As of 2017, Blockchain still has a very long way to go before it will be capable of replacing the giants of the financial world.
- Finally, there is always a theoretical possibility of a large-scale capture of any given Blockchain network. If a single organization will somehow manage to gain control of the majority of the network's nodes, it will no longer be decentralized in the full sense of the word.

Cloud Computing

Cloud Computing

- Cloud technology makes it possible for fintech companies to scale processing capacity quickly up or down so that they may react to the changes in customer demand.
- Financial Institutions Leverage Cloud Services for Reaping the Benefits of Dedicated and Secure Cloud Technology

https://medium.com/@iamthevishnupriya/how-cloud-computing-benefits-fintech-companies-fc5d028e973f

Role of Cloud-Based Services in FinTech

- With progress in technology, unprecedented changes have been taking place in all industries.
- The financial sector, particularly, has been experiencing significant evolution.
- Regulatory upheaval and the new approach to supervising financial services and institutions have given rise to financial technology start-ups in the recent past. Here's where cloud technology helps with features such as speed to market and scalability.

Why is Cloud Technology Crucial?

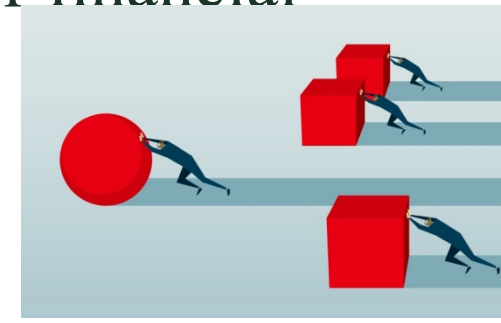
- Cloud technology offers storage space and immense computing power.
- It doesn't require upfront investment and one needs to pay for only what they use.
- Offering to be elastically scaled up or down rapidly in tune with demand levels, it enables businesses to fine-tune their product offerings according to user demand in real-time.
- This facilitates fintech companies to compete with competitors and larger financial institutions that are commonly tied down by legacy IT Systems.

Benefits Reaped by Cloud Computing

- Clients can be served faster: Development and launching of new as well as bundled products and services is rendered easier. This can be performed in partnership or on a stand-alone basis, eliminating software or hardware procurement. Corporates can access the systems from anywhere using web browsers.
- Cost reduction: There's no need to invest heavily on software, hardware, and related manual resources. IT infrastructure can be updated while fintech companies only need to pay for the essential software and hardware.

Benefits Reaped by Cloud Computing

- Scalability and flexibility are increased: Cloud enables financial services companies to quickly respond to the changing customer, market, and technological requirements. This provides an effective competitive edge.
- Efficiency is increased: Cloud offers standardization that facilitates integration of new applications and technologies in the future. Business operations in the modern world are closely aligned with technology, thus cloud service providers make it possible for financial services to drive out complexity.



Benefits Reaped by Cloud Computing

- Business continuity: Cloud technology is highly reliable for businesses. It provides sophisticated systems for data storage that offer a much greater level of resilience to the businesses. Storing everything on the internet also ensures higher data security in cases of disasters. Moreover, the data saved in the cloud storage is encrypted well to eliminate hacks and major sorts of insecurity threats.
- Cloud technology has made it possible for Fintech companies to advance their business models and deliver better services at a lesser cost. The technology has also enabled businesses to accelerate their workflow to make them secure and more customer-centric.
- Businesses that adopt cloud technology obtain increased security with reduced infrastructure. Cloud computing solutions for Fintech companies cannot be matched by other on-premises server systems.

Crypto Currency

Equity Crowdfunding

- funding a project or venture by raising money from a large number of people
- may be regulated for arranging securities transactions or operating an unregulated investment fund

Virtual currencies

- Bitcoin etc. might constitute currencies if the trading in them is regulated; also raises AML issues

Greed and Fear