

Cryptocurrencies and Blockchain technology:

What are they and what are the killer applications?

WU

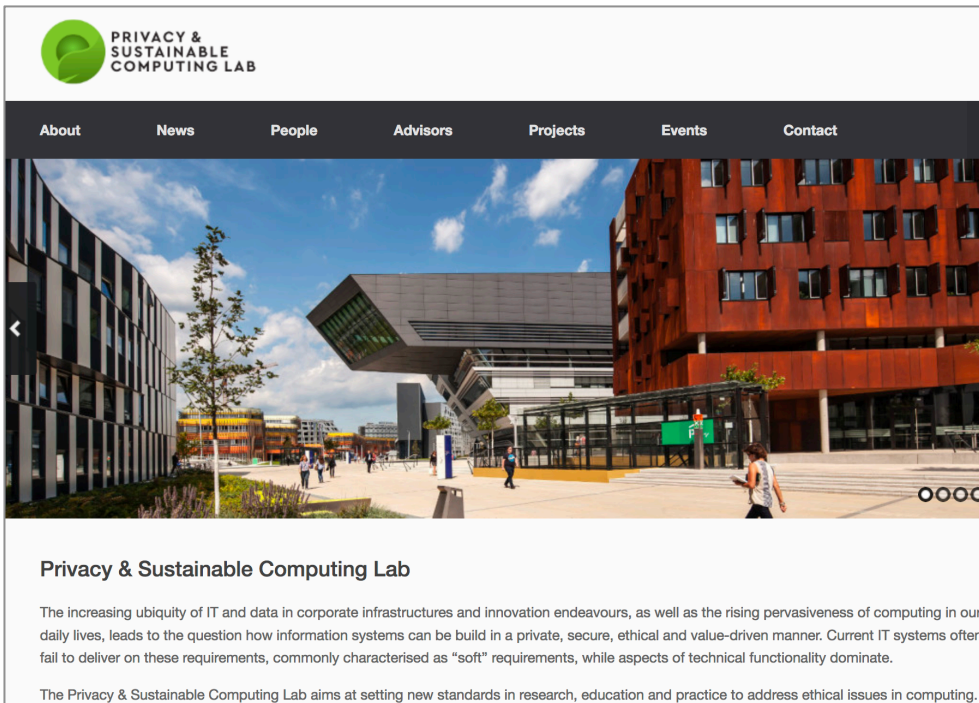
WIRTSCHAFTS
UNIVERSITÄT
WIEN VIENNA
UNIVERSITY OF
ECONOMICS
AND BUSINESS

Sabrina Kirrane, 12.04.2018



Background Information

- **Privacy & Sustainable Computing Lab**
- Launched September 2016: launch event with various important stakeholders: technologists, standardization, activists...
- Mission: Developing sustainable and privacy-preserving computer systems by bringing together computer science & human-centric behavioral science



PRIVACY & SUSTAINABLE COMPUTING LAB

About News People Advisors Projects Events Contact

Privacy & Sustainable Computing Lab

The increasing ubiquity of IT and data in corporate infrastructures and innovation endeavours, as well as the rising pervasiveness of computing in our daily lives, leads to the question how information systems can be build in a private, secure, ethical and value-driven manner. Current IT systems often fail to deliver on these requirements, commonly characterised as "soft" requirements, while aspects of technical functionality dominate.

The Privacy & Sustainable Computing Lab aims at setting new standards in research, education and practice to address ethical issues in computing.

<http://www.privacylab.at/>



**Dr. Ben Wagner
(Director)**



**Dr. Sabrina Kirrane
(Founding Director)**



**Prof. Sarah Spiekermann
(Founder)**



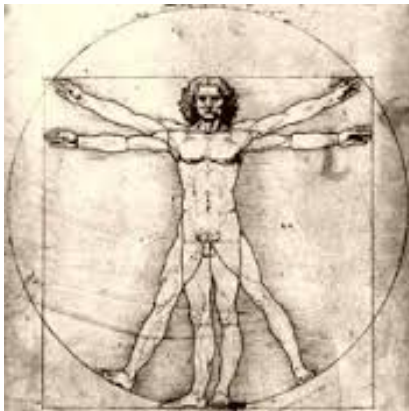
**Prof. Axel Polleres
(Founder)**

Background Information

Online Privacy

Public Policy and Legislation

Ethical Design



Humanities

MISSION

Developing sustainable and privacy-preserving computer systems by bringing together computer science & human-centric behavioral science.



Computer Science

Net Neutrality

Big Data Analytics

Fragmentation

Artificial Intelligence

Open Data

Data Science

Open Standards



Legal

Background Information

SPECIAL ABOUT PUBLICATIONS ALLIANCES MEMBERS



Home



Scalable policy-aware linked data architecture
for privacy, transparency and compliance



Project news



Two new papers on RDF data storage

The paper 'Evaluating Query and Storage Strategies for RDF Archives' studies how to measure the performance of RDF databases. 'HDTQ: Managing RDF Datasets in Compressed Space' presents a compact representation of RDF as 4-tuples that can be efficiently queried.



Less than one month to register for our workshop!

The deadline to submit something to our workshop 'Data Privacy Controls and Vocabularies' is 28 February 2018.

[Read more](#)

Other news



New Community Group 'Credible Web' at W3C

'Credible Web' is a new Community Group at W3C for discussing the possibility of using RDF annotations on data in a distributed fashion to help people evaluate the credibility of information.

[Read more](#)



First draft of a standard for verifiable claims

A new working group in W3C recently published the first draft of a future standard model for verifiable claims.

[Read more](#)

<https://www.specialprivacy.eu/>



Horizon 2020
European Union funding
for Research & Innovation

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement

No. 731601

Background Information



LICENSE YOUR DIGITAL ASSETS AND DERIVATIVES

DALICC is a software framework that supports the automated clearance of rights thus supporting the legally secure and time-efficient reutilization of third party data sources.

READ MORE

DALICC is funded by the Austrian Federal Ministry of Transport, Innovation and Technology (BMVIT) under the program "ICT of the Future" between November 2016 - October 2018. More information

<https://iktderzukunft.at/en/>

SEARCH

Browse our knowledge base and choose an appropriate license for your work

COMPOSE

Use our license composer and create a custom license license for your work

MIX

Consult our license negotiator to check license compatibility and detect conflicts

<https://www.dalicc.net/>

Background Information



[Home](#) \ [Team](#)

Team

The goal of the research institute is to bundle the interdisciplinary competence of the Vienna University of Economics and Business. Only through an interdisciplinary approach, which considers the technical possibilities together with economic, social and legal aspects, the potential of this new technology can be met.

Management

Director of Research Institute



Dr. rer. soc. oec. Shermin
Voshmgir

✉ shermin.voshmgir@wu.ac.at

<https://www.wu.ac.at/en/cryptoeconomics/team/>

Research Institute for Cryptoeconomics

[Team](#)

[Research](#)

[Teaching](#)

[Companies](#)

[Partners](#)

[Media & Events](#)

12.04.2018 | doors open at 18:30

Expat Center, Schmerlingplatz 3, 1010 Wien



Dr. Sabrina Kirrane, who is a postdoctoral researcher working at the Institute of Information Business at the Vienna University of Economics and Business, will be holding a talk on:

Cryptocurrencies and Blockchain technology: What are they and what are the killer applications?

Some of the topics that will be covered are:

- The historical perspective of trading in Cryptocurrencies (e.g. the initial Montgox platform, and influence of Jed McCaleb, etc.)
- What is Blockchain technology? What is its value? What are its potential future applications?
- Bitcoin and its importance as the first cryptocurrency
- What is the difference between Mining vs. Trading and is it necessary to have a Digital Wallet?
- The integration of cryptocurrencies into the mainstream financial markets. The regulation of cryptocurrencies – taxation and transparency
- What is the intrinsic value of Bitcoins/Altcoins and what is a ICO (Initial Coin Offering) and how is it calculated?
- Blockchain for distributed data management and decentralised application development

As usual after the main event, there will an opportunity to network and discuss the topic in more detail in an informal atmosphere.

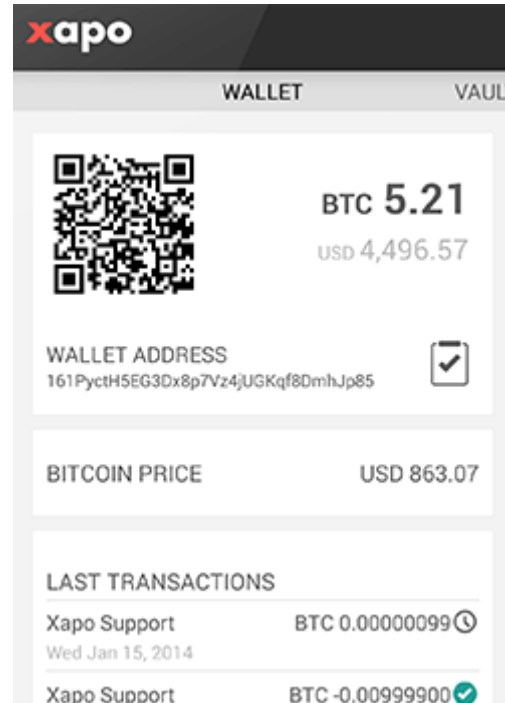
Cryptocurrencies



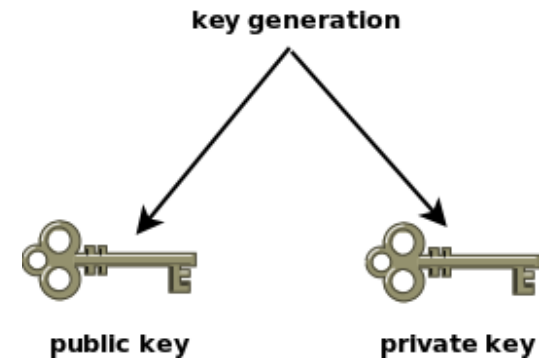
Cryptocurrencies: What are they?



<http://bitcoin-wiki.com/bitcoin-wallet/>



<https://www.bitcoin.com/choose-your-wallet/xapo>





















<https://courses.cs.ut.ee/2015/infsec/fall/Main/PKC-PKI>

In Bitcoin, a private key is usually a 256-bit number

Cryptocurrencies: Where can I find more information?

All ▾ Coins ▾ Tokens ▾ USD ▾ Next 100 → View All

| # | Name | Market Cap | Price | Volume (24h) | Circulating Supply | Change (24h) | Price Graph (7d) |
|---|--|-------------------|------------|-----------------|----------------------|--------------|---|
| 1 |  Bitcoin | \$116,239,652,176 | \$6,849.23 | \$4,215,820,000 | 16,971,200 BTC | 1.41% |  |
| 2 |  Ethereum | \$40,932,647,530 | \$414.50 | \$1,261,660,000 | 98,752,578 ETH | 4.36% |  |
| 3 |  Ripple | \$19,236,458,873 | \$0.492050 | \$148,291,000 | 39,094,520,623 XRP * | 1.37% |  |
| 4 |  Bitcoin Cash | \$11,091,615,608 | \$649.87 | \$231,482,000 | 17,067,438 BCH | 2.03% |  |
| 5 |  Litecoin | \$6,392,440,868 | \$114.08 | \$192,791,000 | 56,033,738 LTC | 0.46% |  |
| 6 |  EOS | \$5,237,431,848 | \$6.66 | \$523,805,000 | 786,581,880 EOS * | 11.75% |  |
| 7 |  Cardano | \$4,004,254,555 | \$0.154443 | \$49,708,000 | 25,927,070,538 ADA * | 2.04% |  |
| 8 |  Stellar | \$3,733,810,071 | \$0.201270 | \$25,028,300 | 18,551,249,919 XLM * | 1.01% |  |
| 9 |  NEO | \$3,511,527,500 | \$54.02 | \$101,777,000 | 65,000,000 NEO * | 7.51% |  |

<https://coinmarketcap.com/>

Cryptocurrencies: Where can I find more information?

| | | # | Name | Symbol | Market Cap | Price | Circulating Supply | Volume (24h) | % 1h | % 24h | % 7d |
|-------|-------------|------|------------------|--------|------------|------------|--------------------|--------------|--------|--------|---------|
| All ▾ | Coins ▾ | 1550 | Cheapcoin | CHEAP | \$? | \$0.000555 | ?* | \$1 | -0.03% | -9.68% | -6.20% |
| # | Name | 1551 | Sand Coin | SND | \$? | \$0.700278 | ?* | \$1 | -0.02% | 1.67% | -4.26% |
| 1 | Bitcoin | 1552 | SuperNET | UNITY | \$? | \$87.98 | ?* | \$1 | -0.39% | 17.36% | 21.03% |
| | | 1553 | Qora | QORA | \$? | \$0.400008 | ?* | \$0 | -0.02% | 1.61% | 72.61% |
| 2 | Ethereum | 1554 | KlondikeCoin | KDC | \$? | \$0.009268 | ? | \$0 | ? | 0.75% | -19.70% |
| | | 1555 | LLToken | LLT | \$? | \$? | ?* | \$0 | ? | ? | ? |
| 3 | Ripple | 1556 | ANRYZE | RYZ | \$? | \$0.004798 | ?* | \$0 | ? | ? | -13.39% |
| | | 1557 | Infinitecoin | IFC | \$? | \$0.000099 | ? | \$? | ? | ? | ? |
| 4 | Bitcoin Gas | 1558 | GameLeagueCoin | GML | \$? | \$0.010049 | ?* | \$? | ? | 0.20% | 6.90% |
| | | 1559 | VPNCoin | VASH | \$? | \$0.003349 | ?* | \$? | ? | 0.16% | -2.97% |
| 5 | Litecoin | 1560 | Cycling Coin | CYC | \$? | \$0.001093 | ?* | \$? | ? | 0.15% | 21.72% |
| | | 1561 | Psilocybin | PSY | \$? | \$0.025807 | ? | \$? | ? | ? | ? |
| 6 | EOS | 1562 | TheCreed | TCR | \$? | \$0.000274 | ? | \$? | ? | ? | -33.80% |
| | | 1563 | Happy Creator... | HCC | \$? | \$0.000069 | ?* | \$? | ? | 0.43% | -0.82% |
| 7 | Cardano | 1564 | MergeCoin | MGC | \$? | \$0.199032 | ?* | \$? | ? | 4.40% | 12.16% |
| | | 1565 | Farstcoin | FRCT | \$? | \$? | ?* | \$? | ? | ? | ? |
| 8 | Stellar | 1566 | TimesCoin | TMC | \$? | \$0.650958 | ?* | \$? | ? | ? | ? |
| 9 | NEO | | | | | | | | | | |

<https://coinmarketcap.com/>

Cryptocurrencies: Where can I get them?

The screenshot shows a green navigation bar at the top with the OXYGEN logo, the text "All eyes are on our new project:", and logos for Forbes, Nasdaq, and Bloomberg. A "DISCOVER NOW" button and a close icon (X) are also present. The main content area features a dark background with a view of Earth from space. The headline reads "Exchange cryptocurrency at the best rate". Below this, a sub-headline states "Transfer from one wallet to another within seconds. It's that simple." The exchange interface includes a "YOU HAVE" section with "5718 EUR" and a "YOU GET" section with "1.00002285 BTC". A green "Exchange!" button is positioned to the right. At the bottom left, there is a "Buy Bitcoin with Credit Card" button with VISA and Mastercard logos.

<https://changelly.com/>

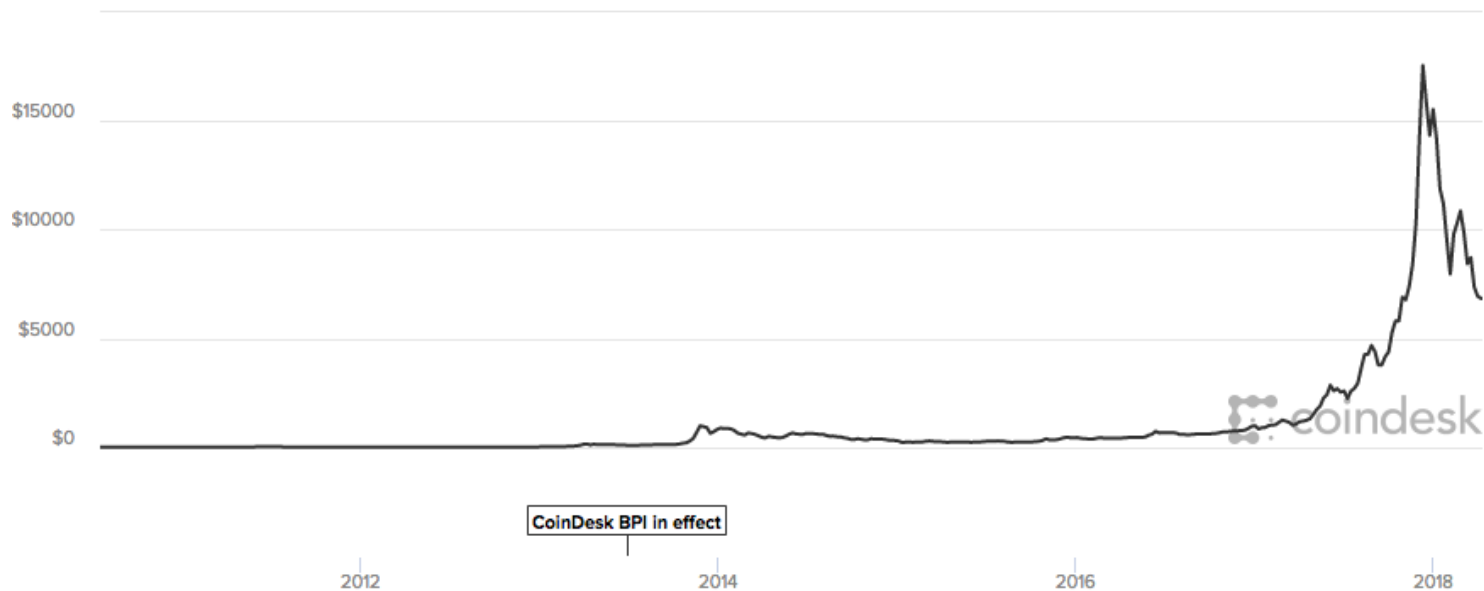
Cryptocurrencies: Fluctuation

Bitcoin (USD) Price

Closing Price OHLC

1h 12h 1d 1w 1m 3m 1y All

Jul 18, 2010 to Apr 11, 2018 [Export](#)



\$6,920.86 ▲ 1.32%

| | | | |
|--------------|------------|------------|------------|
| Today's Open | \$6,830.90 | Change | ▲ \$89.95 |
| Today's High | \$6,958.89 | Market Cap | \$0.117T |
| Today's Low | \$6,807.44 | Supply | 16,971,488 |

Cryptocurrencies: Fluctuation

Bitcoin (USD) Price

Closing Price OHLC

1h 12h 1d 1w 1m 3m **1y** All

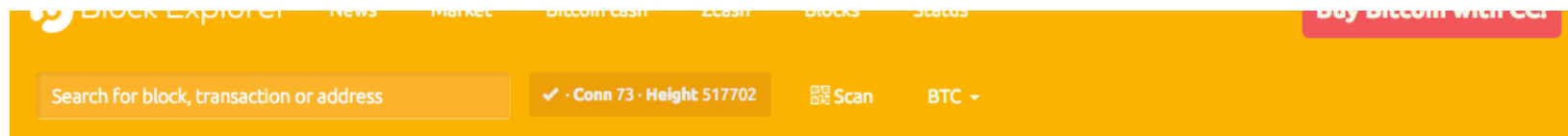
Apr 11, 2017 to Apr 11, 2018 [Export](#)



\$6,920.86 ▲ **1.32%**

| | | | |
|--------------|------------|------------|------------|
| Today's Open | \$6,830.90 | Change | ▲ \$89.95 |
| Today's High | \$6,958.89 | Market Cap | \$0.117T |
| Today's Low | \$6,807.44 | Supply | 16,971,488 |

Cryptocurrencies: How are financial transactions handled?



Latest Blocks

| Height | Age | Transactions | Mined by | Size |
|------------------------|----------------|--------------|----------|--------|
| 517702 | 22 minutes ago | 30 | | 7522 |
| 517701 | 22 minutes ago | 568 | AntMiner | 242365 |
| 517700 | 26 minutes ago | 908 | | 359790 |

[See all blocks](#)

Latest Transactions

| Hash | Value Out |
|--|----------------|
| 7d683d237438dbf63ed07669b2d102f5c5dd38beeb... | 0.60096836 BTC |
| 266ed2ec43186f198099e7f69b527aab762d6bd59b8... | 0.15002142 BTC |
| 09d3db0d578f8e4d59ad2a00689ef097775bb9867... | 0.10340446 BTC |
| ba29ea87a9b7d2c9d5a6d56c2504f96dc6b122b1422... | 0.00260313 BTC |
| 76c1575f1909f6eaa660cb460b495ba964c591bf081... | 1.9762774 BTC |
| ada8d2052dfc4c2e46120306e2c562bf9acf0b5ed4... | 0.3545435 BTC |

<https://blockexplorer.com/>

Subscribe for updates!

email address

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About Block Explorer

Bitcoin Block Explorer is an open source web tool that allows you to view information about [blocks](#), [addresses](#), and [transactions](#) on the Bitcoin blockchain. The [source code](#) is on GitHub.

[What is bitcoin?](#)

Public Bitcoin API: Machine readable stats & blockchain info can be accessed directly through the [REST](#) and [Websockets APIs](#).

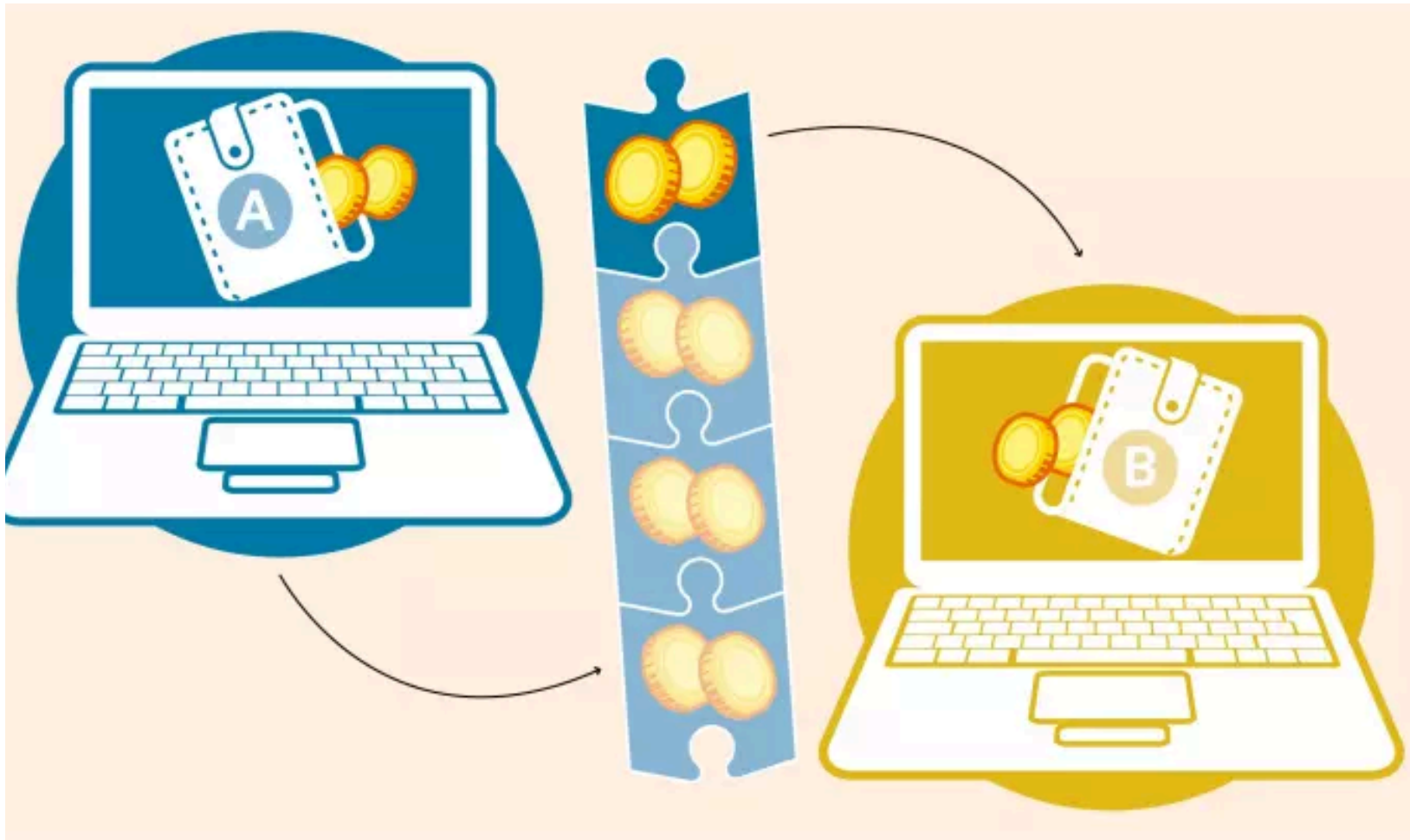
Testnet is Bitcoin's sandbox. Block Explorer supports viewing both the [testnet](#) and [mainnet](#) blockchains.

Thanks to [Private Internet Access](#) for hosting the site. They provide a [VPN Service](#) that accepts Bitcoin.

Blockchain technology

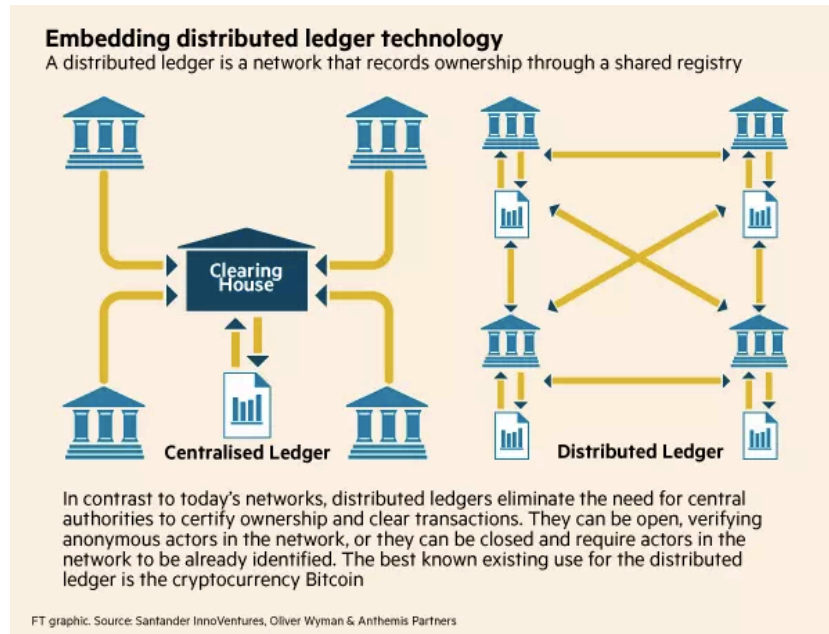


Blockchain technology



<https://www.ft.com/content/eb1f8256-7b4b-11e5-a1fe-567b37f80b64>

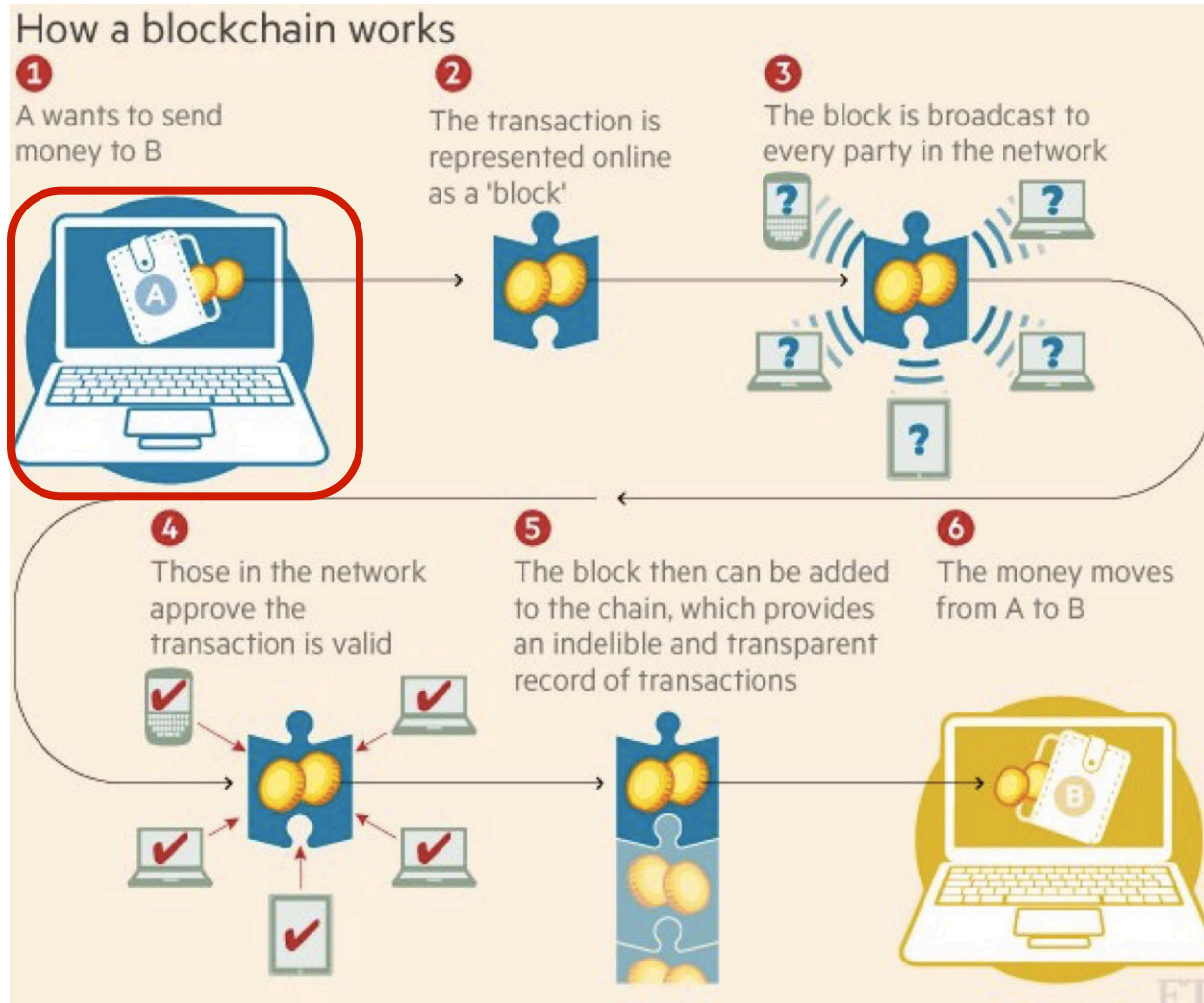
Centralised vs Distributed Ledger



- When one bank sends money to another, no physical currency changes hands.
- Banks and settlement systems use central electronic ledgers to track assets.
- But they can be slow and inefficient, often relying on faxes or manual input.
- That not only wastes time but racks up fees.
- The system is also open to hacking and fraud.

<https://www.ft.com/content/454be1c8-2577-11e5-9c4e-a775d2b173ca>

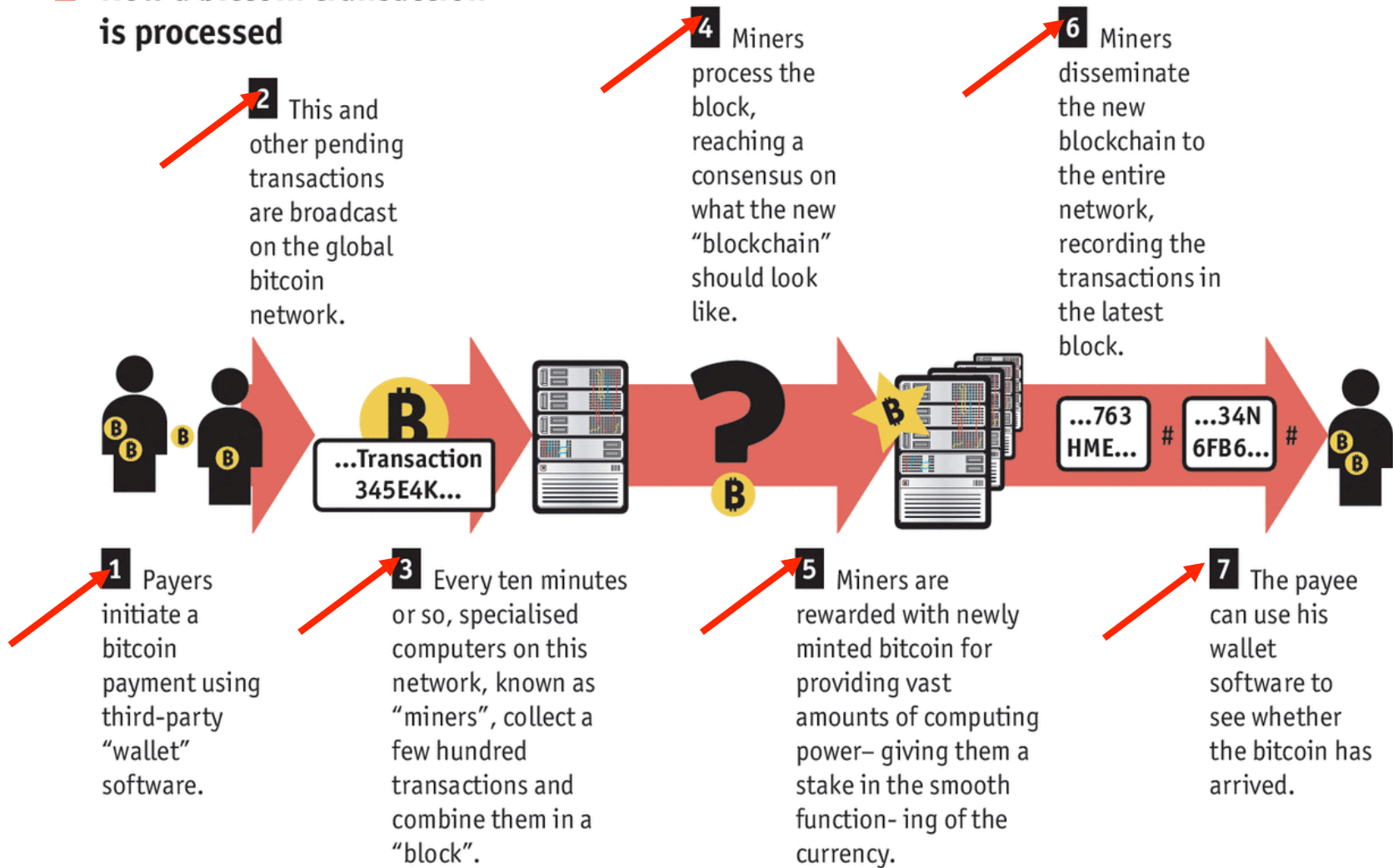
Executing Transactions - Trading



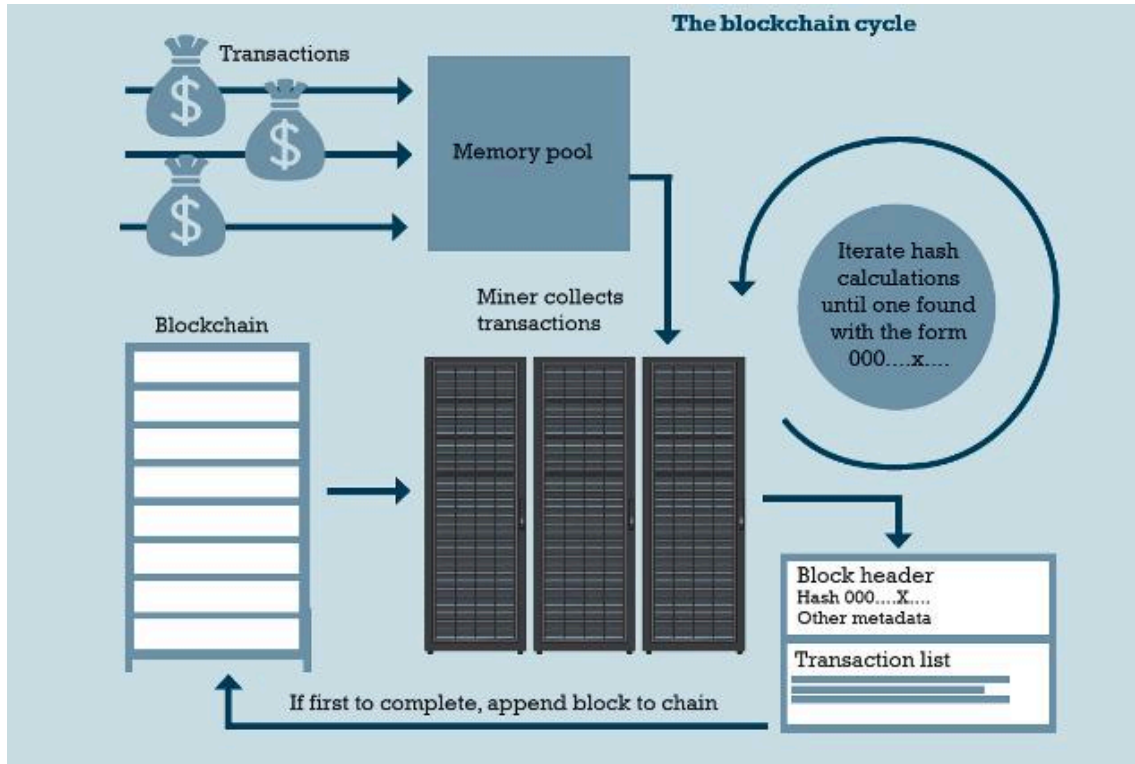
- Major technologies that make Bitcoin include:
 - Hashes
 - Digital signatures
 - Public key cryptography
 - P2P
 - Proof of Work

Processing Transactions - Mining

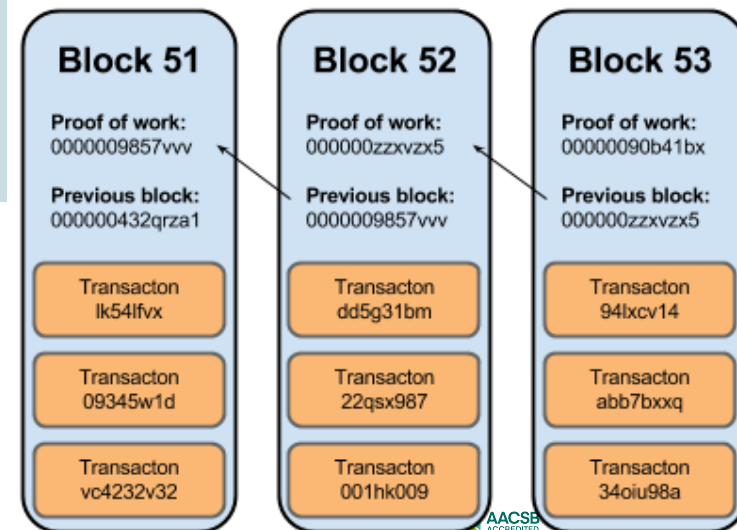
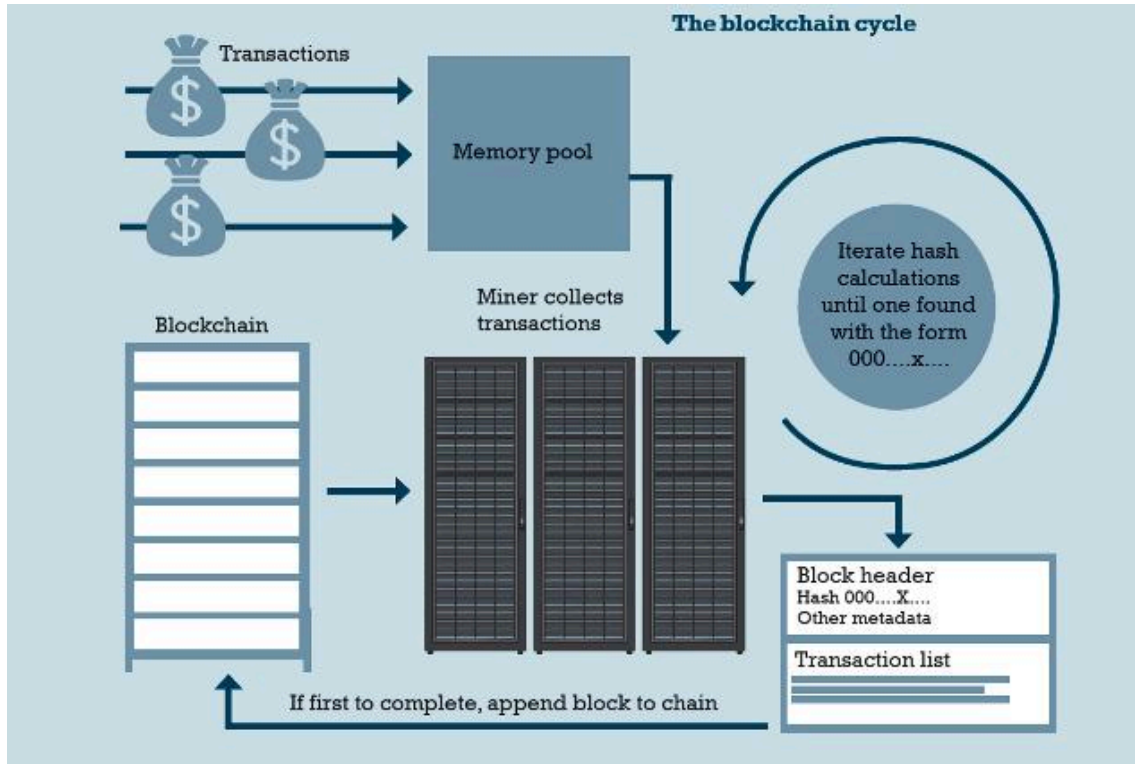
How a bitcoin transaction is processed



Processing Transactions - Mining



Processing Transactions - Mining



Beyond the Bitcoin Blockchain



Ethereum



The advertisement features a central graphic of the Ethereum logo (a blue diamond) above the word "ethereum" in a light blue font, with "BLOCKCHAIN APP PLATFORM" in a dark blue box below it. The background is a perspective view of a modern building's glass and metal structure. At the bottom left, there is a section titled "Build unstoppable applications" with two paragraphs of text. At the bottom right, there is a network diagram with five nodes labeled "YOUR KARMA", "YOUR FRIENDS", "YOUR REPUTATION", "YOUR IDENTITY", and "YOUR WEALTH", connected by lines.

Build unstoppable applications

Ethereum 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.

These apps run on a custom built **blockchain, an enormously powerful shared global infrastructure that can move value around and represent the ownership of property.**

YOUR KARMA YOUR FRIENDS YOUR REPUTATION
YOUR IDENTITY YOUR WEALTH

<https://www.ethereum.org/>



Business Blockchain Frameworks Hosted with Hyperledger

Burrow

Provides a modular blockchain client with a permissioned smart contract interpreter partially developed to the Ethereum Virtual Machine (EVM) specification.

Fabric

An implementation of blockchain technology intended as a foundation for developing blockchain applications or solutions.

Iroha


A blockchain framework designed for simple and easy incorporation into infrastructure projects requiring distributed ledger technology.

Sawtooth

A modular platform designed for building, deploying, and running versatile and scalable distributed ledgers.

Indy

A distributed ledger that provides tools, libraries, and reusable components for creating and using independent, decentralized and digital identities.

 [Learn More About Hyperledger Projects](#)

<https://www.hyperledger.org/>

Killer Applications



WHAT'S NEXT FOR BLOCKCHAIN PAYMENTS IN 2018?

👤 Miranda Marquit © January 2, 2018



The year closed out with a wild ride for Bitcoin. The cryptocurrency surged to \$20,000 and then fell by about 40% before rebounding to some degree.

But Bitcoin **isn't the be all and end all of blockchain technology**. Indeed, blockchain payments are seeing more interest. So, as a new year gets underway, what can we expect from blockchain payments?

Bitcoin Unlikely to Remain the Main Platform for Blockchain Payments

Notaries turn blockchain into ally for digital transactions

By Jorge Valero | EURACTIV.com

📅 4 Oct 2017

Supporters



Haiti is still struggling to get back on its feet after the 2010 earthquake. All their records were on paper and most of them disappeared. Notaries could build new land registries based on blockchain technology to increase efficiency. [DG ECHO/Flickr]

Comments Print 50

This article is part of our special report EU law goes digital.

Once feared as a technology that would make legal practitioners redundant, blockchain has now actually strengthened the role of notaries as interpreters of complex transactions, best illustrated by the convoluted issue of land registries.

<https://www.euractiv.com/section/digital/news/notaries-turn-blockchain-into-ally-in-digital-transactions/>



Advertisement

Killer Apps: Internet of Things

Blockchain And The Internet Of Things: 4 Important Benefits Of Combining These Two Mega Trends



Bernard Marr, CONTRIBUTOR
FULL BIO ▾

Opinions expressed by Forbes Contributors are their own.

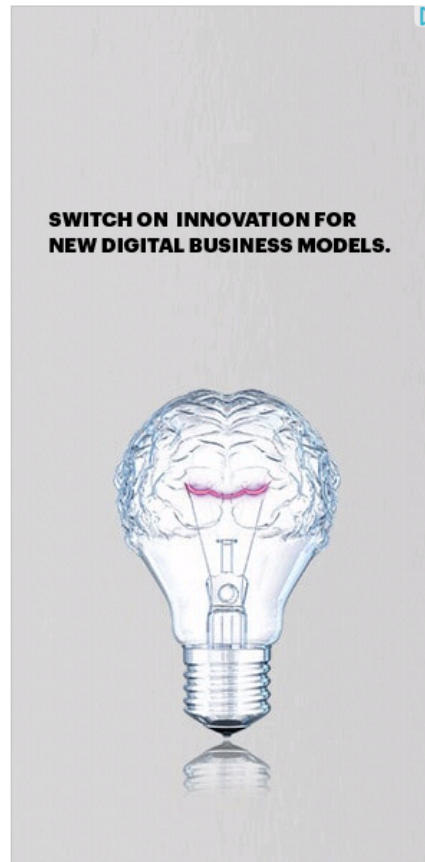
The **Internet of Things (IoT)** and **blockchain** are two topics which are causing a great deal of hype and excitement, not just in the technology circle but in the wider business world, too.



Adobe Stock

Many say they are set to revolutionize all aspects of our lives, while others point out that there is a lot of hot air around both ideas, and a lot is yet to be proved.

However, the idea that putting them together could result in something even greater than the sum of its (not insignificant) parts, is something which is starting to gain traction.



<https://www.forbes.com/sites/bernardmarr/2018/01/28/blockchain-and-the-internet-of-things-4-important-benefits-of-combining-these-two-mega-trends/#635c031c19e7>

Killer Apps: Media and Entertainment

How Blockchain Could Start To Make Waves In Media And Entertainment In 2018



Nelson Granados, CONTRIBUTOR

I cover digital trends in travel, media and entertainment.

[FULL BIO](#) ▾

Opinions expressed by Forbes Contributors are their own.

TWEET THIS

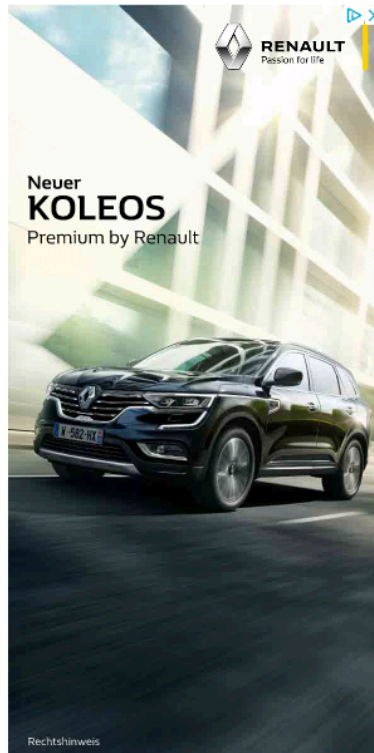


If you are in media and entertainment, 2018 will be a year to closely monitor and possibly experiment or invest in blockchain innovation, if you haven't done so yet. Otherwise, you could be left behind.



A woman touches an ATM machine for digital currency Bitcoin in Hong [+]

Blockchain technology made big news in December thanks to the bitcoin cryptocurrency surging past \$10,000 to a \$20,000 peak, the launch of [bitcoin futures](#) in major exchanges, and the [announcement](#) that the Australian Stock Exchange will use blockchain technology for trade settlement. Blockchain could also start to be implemented in media and entertainment in 2018.



<https://www.forbes.com/sites/nelsongranados/2018/01/04/what-blockchain-has-in-store-for-media-and-entertainment-in-2018/#3045f0b771f4>

Killer Apps: Supply Chain Management

Perspectives

Using blockchain to drive supply chain transparency

Future trends in supply chain

New technologies are presenting promising opportunities for improvement across the supply chain. Using blockchain in the supply chain has the potential to improve supply chain transparency and traceability as well as reduce administrative costs.



Monitor advancements

A blockchain supply chain can help participants record price, date, location, quality, certification, and other relevant information to more effectively manage the supply chain. The availability of this information within blockchain can increase traceability of material supply chain, lower losses from counterfeit and gray market, improve visibility and compliance over outsourced contract manufacturing, and potentially enhance an organization's position as a leader in responsible manufacturing.

Deloitte recommends: Using blockchain in the supply chain can help participants record price, date, location, quality, certification, and other relevant information to more effectively manage the supply chain.



Using blockchain to drive
supply chain innovation

[Download the PDF](#)

<https://www2.deloitte.com/us/en/pages/operations/articles/blockchain-supply-chain-innovation.html>

ICTworks

Two Blockchain Use Cases for Self-Sovereign Digital Identities

By Wayan Vota on January 31, 2018



Source: Gravity

Blockchain initiatives





A slide from a presentation titled 'Blockchain Austria'. The background features a complex network of red lines connecting various nodes. At the top center, there is a black square with the text 'BLOCKCHAIN AUSTRIA' in white. Below this, a list of agenda items is presented in white text on dark red rectangular backgrounds. At the bottom of the slide, there is a grey bar containing a quote and the name 'Harald Mahrer', along with the 'bmwfw' logo.

BLOCKCHAIN AUSTRIA

- Blockchain SUMMIT: 5.12.2017**
- Blockchain wird unsere Welt verändern**
- Ein dezentrales Netz für Österreich**
- Die Blockchain in der Timeline**
- Unser 9 Punkte Plan für Österreich**
- Wo wird Blockchain bereits eingesetzt?**

„Diese Technologie hat unglaubliches Potenzial. Wir müssen schnell sein. Wer zögert, hat verloren!“
Harald Mahrer

bmwfw

KRYPTO-INSTITUT

Blockchain Summit 2017: „Nicht vor Technologien zurückschrecken, die von Staats skeptikern entworfen wurden“



06. Dezember 2017, 13:45

Bastian Kellhofer FOLLOW LIKE

122
SHARES



Harald Mahrer. © BMWFV

KRYPTO-INSTITUT

Blockchain Summit 2017: „Nicht vor Technologien zurückschrecken, die von Staats skeptikern entworfen wurden“



06. Dezember 2017, 13:45

Bastian Kellhofer FOLLOW LIKE

122
SHARES



„Wer zu der Spitze der innovativen Leader gehören möchte, darf auch vor Technologien nicht zurückschrecken, die von Staats skeptikern entworfen wurden. In der heutigen Welt entscheidet sich der Wettlauf häufig zugunsten derer, die dazu imstande sind 'sowohl, als auch' zu denken. ‚Entweder oder‘ ist zu einer anachronistischen Haltung geworden“, so Mahrer vor rund 500 Besuchern beim Blockchain Summit 2017 weiter.





About

ABC – Austrian Blockchain Center
Proposed COMET K1 Research Center

The Center's mission is to be the one-stop-shop Austrian Research Center for Blockchain (and related) technologies to be applied in industrial applications like industry 4.0 / IoT as well as financial, energy, logistics, government and administrative applications. Those new applications and business models resulting from collaborations between established players, innovative startups and top R&D institutes will be the key for the creation of new jobs and establishing Austria among the top ten innovative countries in Europe.

The R&D themes of the center have been organized in 5 Areas targeting economic, technological, applications as well as political and legal topics interfacing with existing COMET centers like CDP, SBA as well as international Blockchain initiatives.

- Emerging Industries
 - *Databases and implementation aspects (Single Source of Truth, Semantics)*
 - *Technological aspects of Industry 4.0 & IoT*
 - *Optimization of processes in Emerging Industries based on blockchain*

- Legal Aspects and Political Implications
 - DLT and Investment
 - Governance and Smart Contracts
 - Data Protection and Privacy
 - Blockchain-based business models

- **Cryptoeconomics**
 - Business Applications of Distributed Data Management & Smart Contracts
 - Blockchain applications in different industries
 - Economical aspects

- **Cryptography, Technology & Security**
 - Smart Contracts
 - Consensus Mechanisms
 - Payment Channels

Thank you / contact details



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