

Blockchain Technology.

Subject: How can Tesco's utilise blockchain?

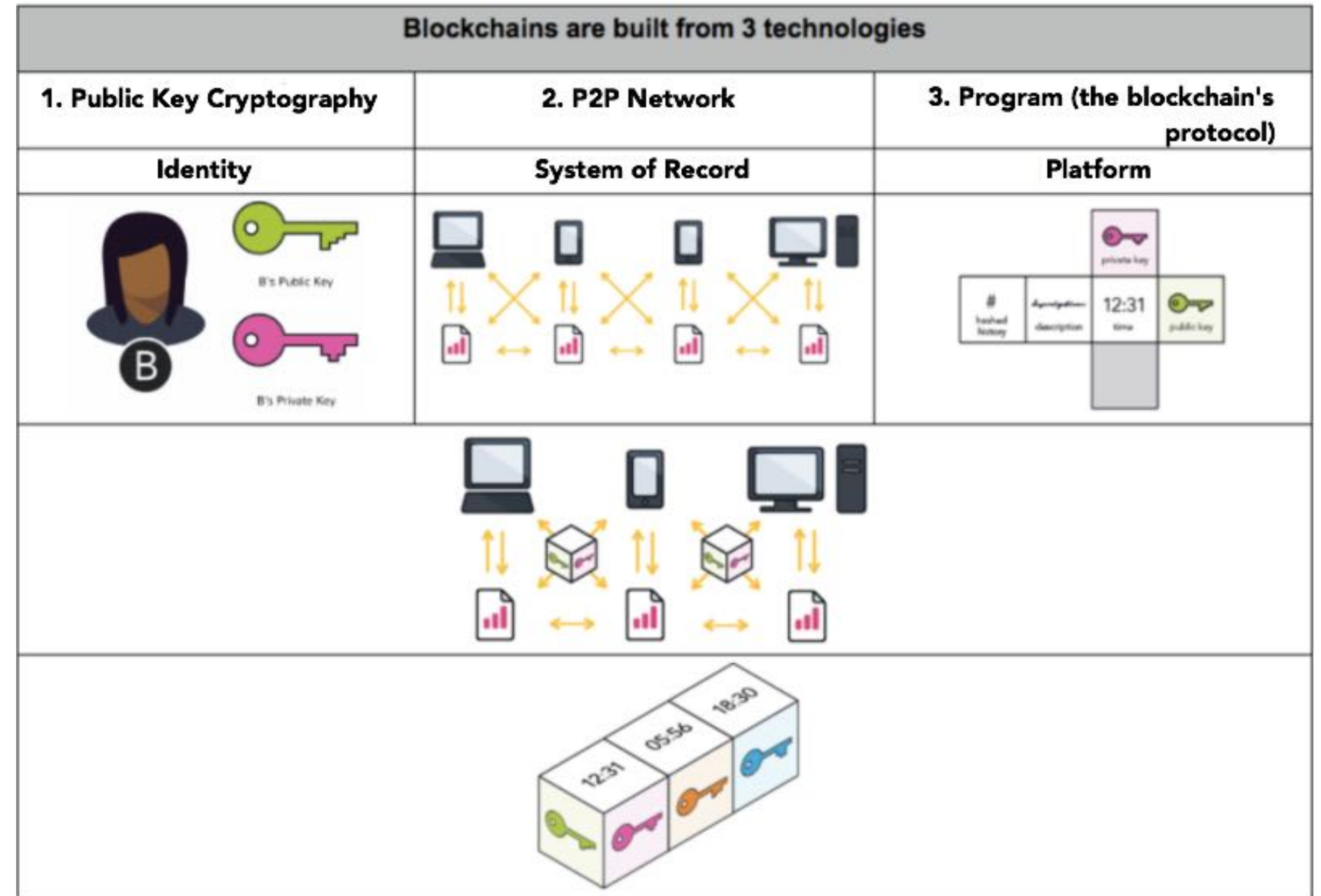
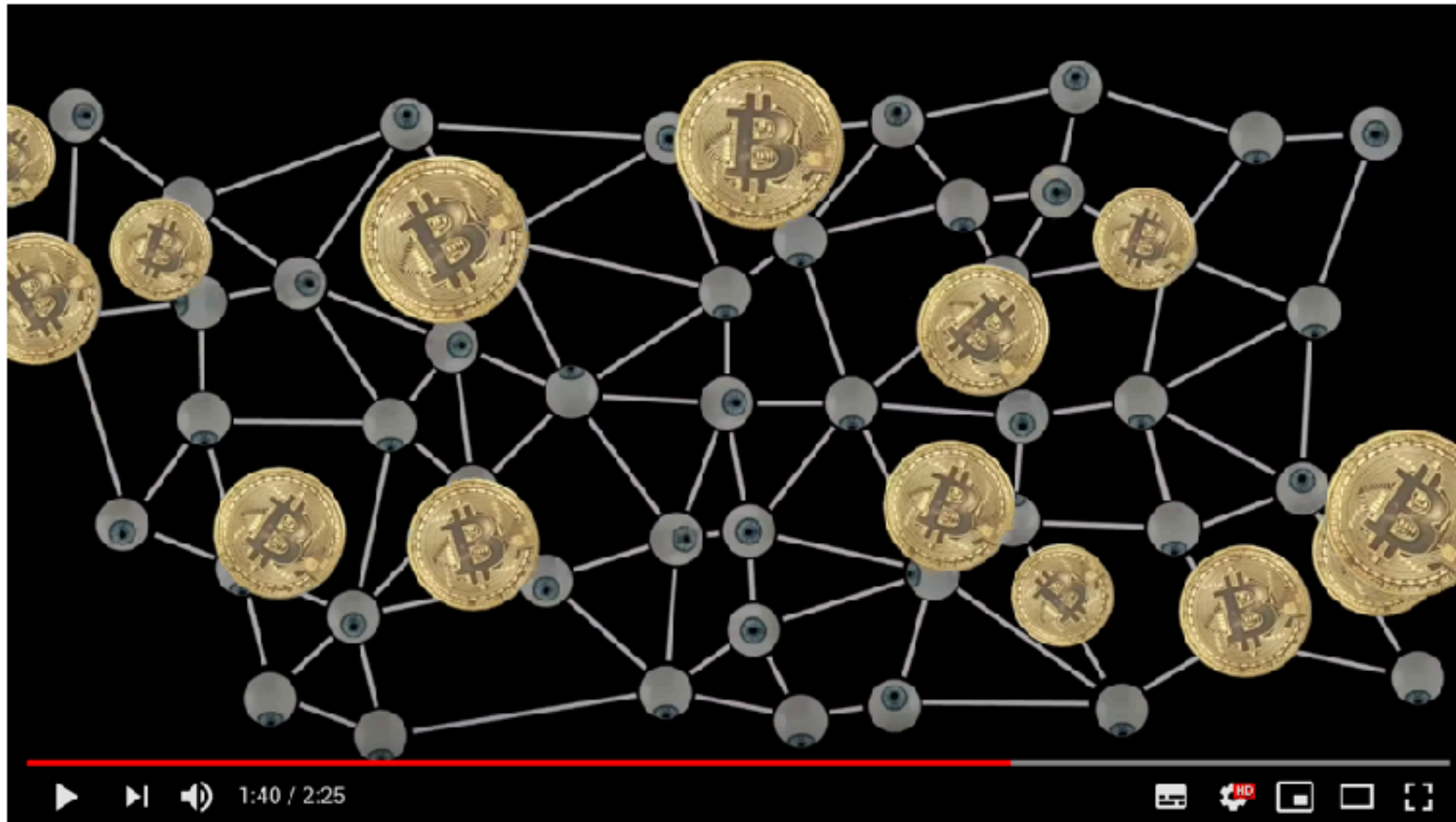
Date: 11/03/19

Author: Aaron Norman

What is the blockchain?

OVERVIEW

A **blockchain**, originally block chain, is a growing list of records, called blocks, which are linked using cryptography. ... It is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way".



Who is using it?

JP Morgon



OVERVIEW

J.P. Morgan has now become the first U.S. bank to create and successfully test a digital coin representing a fiat currency. The JPM Coin is based on blockchain-based technology enabling the instantaneous transfer of payments between institutional accounts.

The purpose of the coin is for their internal trading platform and will only be used in J.P Morgan, the benefit it provides to them will be in cross boarder payments and settlements. This will significantly reduce their costs as they are now handling there own trades with their currency.

The coin is pegged to USDT which is linked to the United States Dollar (USD). This means that their currency will not fluctuate in value as much as other cryptocurrencies. And they can also control the price to a degree as they control the supply of the currency.

If applying this concept to Tesco bank this could considerable save the costs of any transaction costs that happen throughout Tesco if you used your own currency to settle payments.



<https://www.jpmorgan.com/global/news/digital-coin-payments>

Facebook / Whats App



FACEBOOK IS BELIEVED TO BE BUILDING A DIGITAL CURRENCY FOR WHATSAPP

According to reports from Bloomberg and later The New York Times, Facebook is building a digital payments system for WhatsApp, its end-to-end encrypted messaging app. It would let users send and receive cash without having to pay fees.

Its it's reported to be a "stablecoin" — meaning the value of the coin is pegged to the value of a traditional currency. This means users don't have to worry about the value of their coins fluctuating wildly (unpegged cryptocurrencies like bitcoin are notorious for fluctuating wildly, making and breaking fortunes overnight). The New York Times reports that Facebook is planning to peg its value "to a basket of different foreign currencies, rather than just the dollar."

TESCO BENEFIT:

If we were to implement something like this then the benefit to us a business would be huge as this would save us money on payments.



<https://www.businessinsider.com/facebook-cryptocurrency-whatsapp-reports-rumors-2019-2?r=US&IR=T>

Twitter & Square (Cash App)



OVERVIEW

A bitcoin scaling solution called the lightning network may soon come to Square's Cash App for mobile payments.

Twitter and Square CEO Jack Dorsey, an investor in the bitcoin-oriented startup [Lightning Labs](#), recently announced during an interview with podcaster Stephan Livera that there are plans to integrate the scaling technology with Square's mobile app.

"It's not an 'if,' it's more of a 'when,' and how do we make sure that we're getting the speed that we need and the efficiency," Dorsey [told Livera](#), adding:

"We don't think it stops at buying and selling [bitcoin]. We do want to help make happen the currency aspect."

Stepping back, in 2018 Cash App [reportedly](#) had 7 million monthly active users. On February 5, Dorsey joined a game called the [Lightning Torch](#) where each participant adds a little bitcoin to a payment, then passes it onto someone on Twitter that they trust. That Twitter conversation was how Livera invited Dorsey to appear as a guest on his podcast. Now [175 people](#) have participated in passing the digital torch.



Volkswagon



OVERVIEW

Volkswagen have partnered up with IOTA which is a cryptocurrency. This technology can allow vehicles and buildings to interact with one another, passing information through a network run on the blockchain. IOTA technology is slightly different as they use something called the Tangle, which allows scalability.

In the latest announcement by IOTA, they will be launching the Digital CarPass, which will see performance data tracked via IOTA, to ensure vehicle data collection is both reliable and secure. This is one of the latest 'real-world' integrations of IOTA, and is expected to be launched in 2019.



VOLKSWAGEN - PROOF OF CONCEPT

FIRMWARE / SOFTWARE UPDATE OVER THE AIR



By 2020 industry experts expect more than 250 million connected vehicles on the road. The need to perform frequent remote software updates of car components increases with the level of automation – especially with autonomous cars. IOTA envisions becoming the underlying protocol for car makers and suppliers to ensure secure updates and transparent access to audit trails.

THE CHALLENGES TODAY

Centralized ownership of data makes it difficult to ensure that the data are not tampered with. This lack of transparency leads to limited trust between parties and extensive documentation processes. Multipartner ecosystems create an in-transparent audit trail and proof of untampered data can't be ensured easily.

THE PROJECT GOALS

1. Documentation of over-the-air update (OTA) process steps on an immutable data storage medium and audit trail, where data integrity can be ensured.
2. Integration of IOTA technology into the existing legacy systems to prove interoperability and production readiness.

CORE BENEFITS FOR VOLKSWAGEN

- Establish transparency and digital trust with customers, authorities and third parties.
- Ability to provide an evidence to external parties.
- Handle product recalls efficiently.
- Ability to record high volume of (incremental) updates and different software versions.
- Tamper proof & transparent statistical recording

MORE OPPORTUNITIES

- **On Demand Features:** Request and configure car-related features
- **V2V and V2I Communications:** Exchange information, data and resources
- **Ecosystem:** Use secure and immutable data to customize services like usage-based insurance



Jonann Jungwirth, Chief Digital Officer of Volkswagen and member of the Supervisory Board of the IOTA Foundation

"Distributed Ledger Technologies (DLT) are crucial for the future of trusted transactions. IOTA has great potential to become a DLT leader with the Tangle approach."

VOLKSWAGEN

The Volkswagen Group is one of the world's leading automotive manufacturers. The Group maintains 120 production facilities in 31 countries, where it produces vehicles for customers in more than 150 countries. In 2017, the Volkswagen group delivered 10.741 million vehicles.



The IOTA Foundation was established in Germany as a formal, non-profit organization (Openminded.org Stiftung) in 2017. To learn more about IOTA visit iota.org or reach out to contact@iota.org

Renault



RENAULT



OVERVIEW

VeChain To Use Blockchain To Put An End To Car Clocking

VeChain, the world's leading blockchain-enabled product management platform, who recently announced a collaboration with Groupe Renault to provide the manufacturer with a digital car maintenance book has today revealed that blockchain technology is also capable of stopping the practice of "car clocking".

Car clocking is a growing international problem. In the UK alone, HPI Check, which checks mileages, said one in 16 cars that it ran checks on in 2016 had a discrepancy in its mileage, an increase from one in 20 two years earlier. The Times recently reported that more than half a million clocked vehicles were sold in the UK in 2016, with an estimated cost of £1 billion. While the practice of "clocking", also known as odometer fraud or "busting miles", is illegal in the United States, loopholes in EU legislation mean the practice is both legal and on the rise.

VeChain believes they can end car clocking by employing blockchain technology to create a distributed digital car logbook for each vehicle. Each log is a unique digital repository that contains all maintenance information together with the odometer readings that can be accessed and updated by the manufacturer, dealers, workshops and owners.

VeChain's platform assigns a unique digital identity to each vehicle, which is stored in the blockchain. Participants are assigned private keys with data viewing and/ or editing permissions, which can be interacted with via RFID tags, NFC chips or QR codes.

be launched in 2019.



<https://www.coinspeaker.com/vechain-use-blockchain-put-end-car-clocking/>

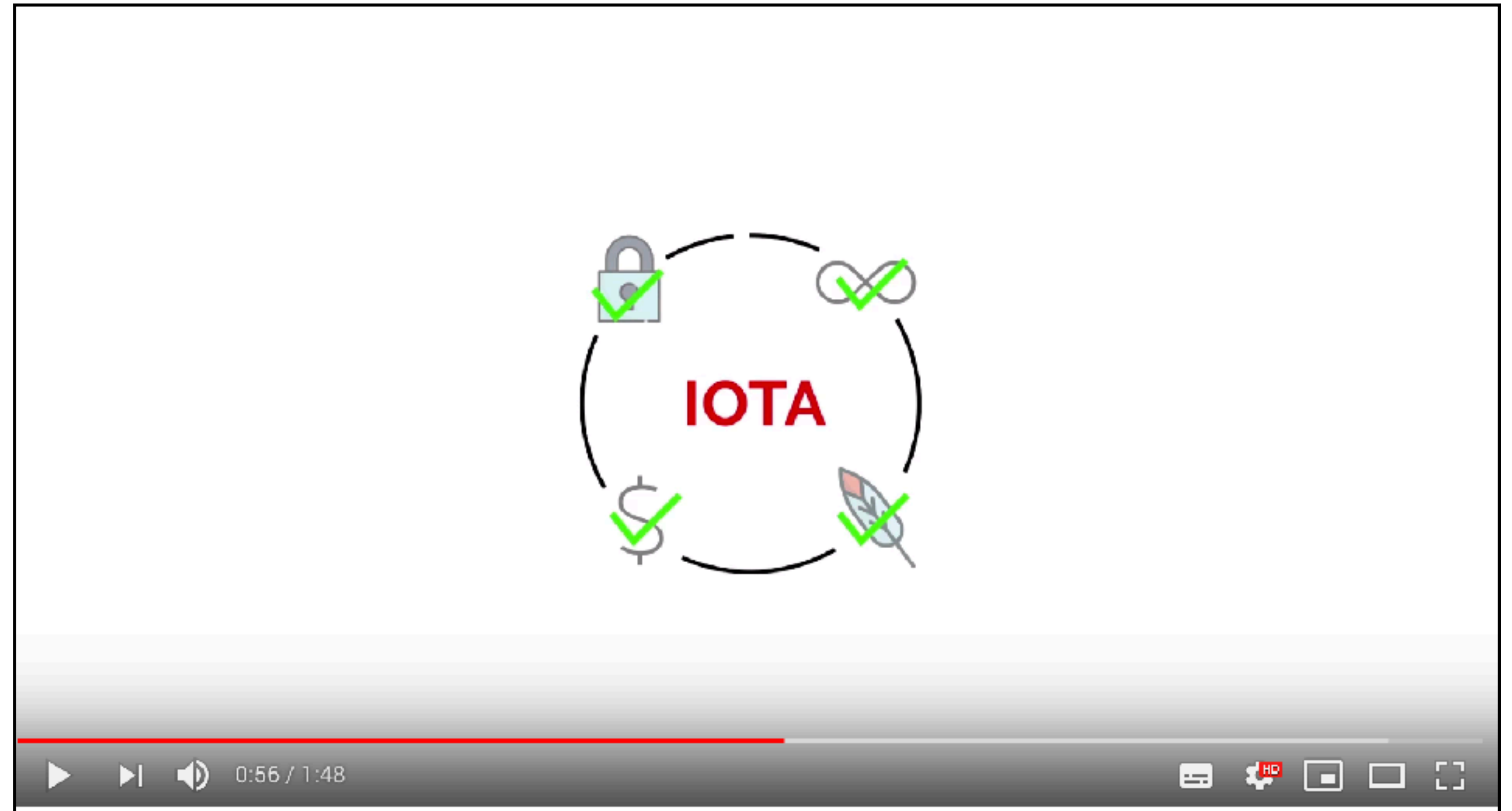
Bosch



OVERVIEW

The Bosch XDK (Cross Domain Development Kit) is a programmable sensor device and Internet of Things prototyping platform for any kind of use case you can imagine. Moreover, it can be used as a powerful sensor node solution. It combines state of the art MEMS sensor technology, WiFi, BLE, an SD Card Slot and ready-to-use software packages. This enables the implementation of almost any conceivable IoT application.

The XDK was developed for people of all levels of programming experience and the required information material is free for all users. In this context, it allows you to pursue different projects using the XDK as a starting point. Put simply: The Bosch XDK can be used to collect specific real-time data and sell it via the IOTA Data Marketplace.



<https://www.bosch-connectivity.com/newsroom/blog/xdk2mam/>

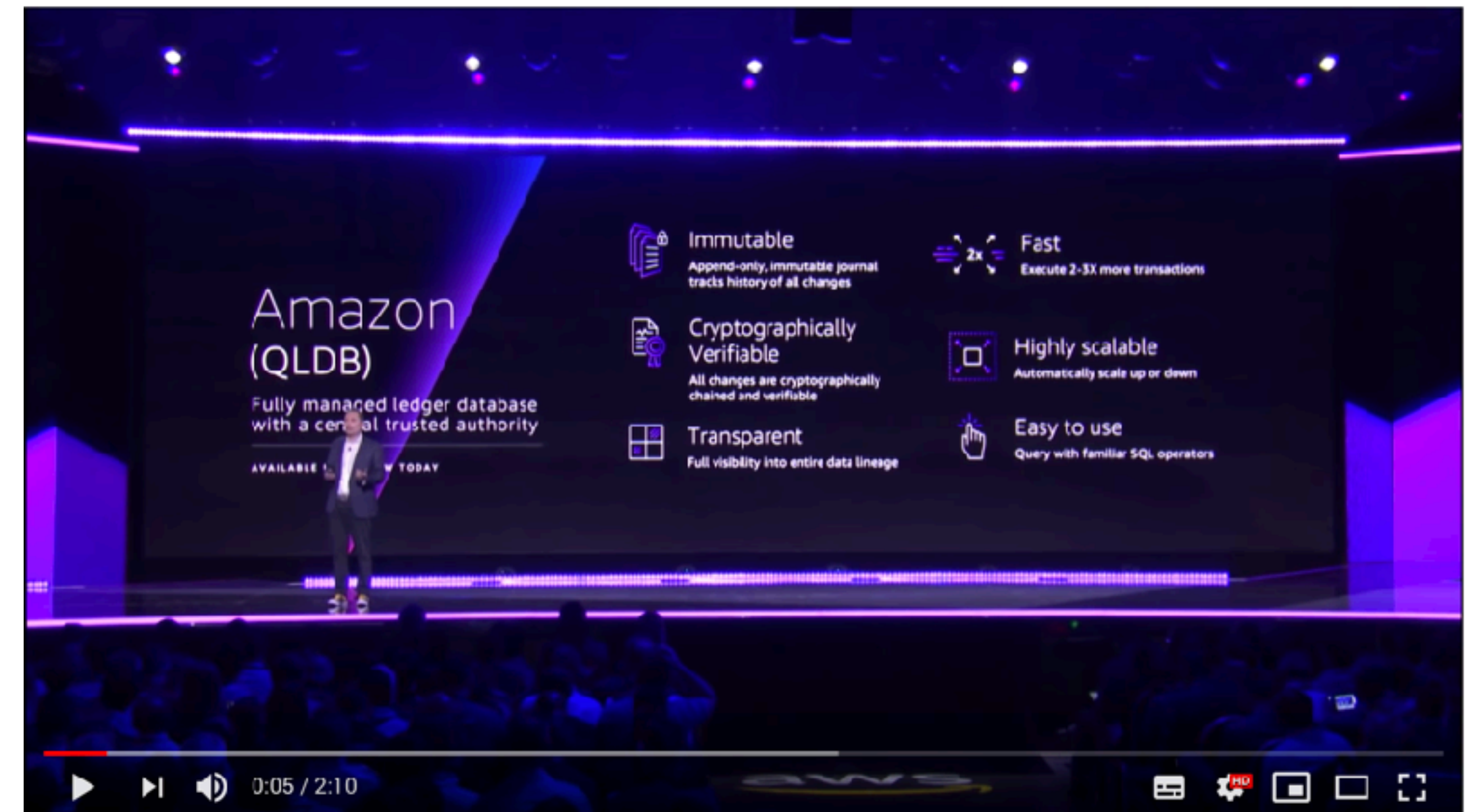
Amazon



OVERVIEW

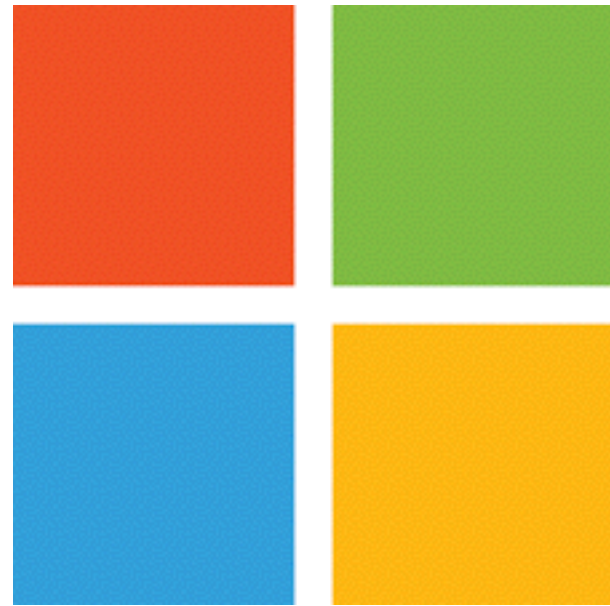
.Amazon Managed Blockchain is a fully managed service that makes it easy to create and manage scalable blockchain networks using the popular open source frameworks Hyperledger Fabric and Ethereum*.

Blockchain makes it possible to build applications where multiple parties can execute transactions without the need for a trusted, central authority. Today, building a scalable blockchain network with existing technologies is complex to set up and hard to manage. To create a blockchain network, each network member needs to manually provision hardware, install software, create and manage certificates for access control, and configure networking components. Once the blockchain network is running, you need to continuously monitor the infrastructure and adapt to changes, such as an increase in transaction requests, or new members joining or leaving the network.



<https://aws.amazon.com/managed-blockchain/>

Microsoft



OVERVIEW

Three years ago, Microsoft Azure was the first to bring blockchain to the cloud. Now it's connecting the technology to just about everything else.

The software giant has quietly been building bridges between its blockchain services and other, widely used infrastructure and platforms, such as Office 365 Outlook, SharePoint Online, Salesforce, Dynamics 365 CRM Online, SAP, and even Twitter, according to Matt Kerner, the general manager of Microsoft Azure. The idea is to allow Microsoft customers to port their data from these platforms into the cloud, and from there onto a blockchain.

Why? In addition to the usually touted blockchain efficiencies, one of the less-discussed benefits of distributed ledger technology (DLT) in a cloud environment like Azure, according to Microsoft, is that it amasses data from multiple companies in a standardized format at scale. The potential to mine data for all sorts of insights then becomes limitless, the company reckons.

Hence, the company is integrating tools such as Microsoft Flow and Logic Apps – which offer hundreds of connectors to thousands of applications – into Azure Blockchain Workbench, a service it [launched in May](#) to make the creation of blockchain apps easier (Workbench currently has ethereum Proof of Authority configured as the consensus protocol).

Azure Blockchain
AMA

March 15, 2017
9am - 10am PST

Microsoft

The slide features a blue background with the Microsoft logo and the text 'Azure Blockchain AMA'. Below the text is a laptop displaying a blockchain network diagram with colorful blocks and a cloud icon. The date and time 'March 15, 2017 9am - 10am PST' are also present.

<https://www.coindesk.com/microsoft-is-slowly-but-surely-connecting-blockchain-to-major-products>

Samsung



OVERVIEW

Samsung Electronics has just revealed the cryptocurrency wallet for its just launched flagship phone, the Galaxy S10. According to a [report](#) from CoinDesk Korea published Sunday, the Samsung Blockchain Wallet is currently compatible only with ether (ETH) and ethereum-based ERC20 tokens. Bitcoin is not yet supported, despite the logo appearing on earlier pre-release presentation images.

The wallet also supports four decentralized apps (dapps) at launch: crypto gaming platform Enjin, beauty community Cosmee, crypto collectibles platform CryptoKitties and merchant payments service CoinDuck.

The wallet app can be downloaded only on Galaxy S10 phones from the Samsung Galaxy Store. The firm said it plans to expand the service to more devices and cryptocurrencies in the future.

The news comes just weeks after Samsung gave the first [confirmation](#) that it would offer private cryptocurrency key storage on the S10 range. Soon after, the firm [revealed the first details](#) of the storage solution, the “Blockchain Keystore,” which appears to have three broad features: payments to merchants, digital signatures and cryptocurrency storage and transfers.

Samsung Blockchain Wallet will be used in conjunction with Blockchain Keystore and is designed to simplify the transactions process for newcomers to the technology, according to CoinDesk Korea. Through the supported CoinDuck dapp, users can also make [payments to merchants](#), CoinDesk Korea said in another [report](#) on Monday.

In the dapp, users can enter the amount to be paid, scan a QR code providing the online or offline merchant’s wallet address, press the “accept” button, and the payment will be made through the Samsung wallet. CoinDuck currently supports only ether (ETH).



<https://www.coindesk.com/samsung-unveils-cryptocurrency-wallet-dapps-for-galaxy-s10-phone>

Alibaba



OVERVIEW

1. Promotion of Waltonchain blockchain technology to achieve the municipal and commercial IoT coverage.
2. Establishment of new smart cities in Xiong'an and Yuhang.
3. Construction of smart city schemes and their application; resource allocation optimization and achievement of smart resource allocation through the blockchain + IoT technology.

The partnership of the Xiamen ZhongChuan IoT Industry Research Institute and Alibaba Cloud will provide Alibaba Cloud with multiple IoT application solutions designed by the ZhongChuan IoT and help establish an artificial intelligence hub for urban management and promote the smart city development.

In the future, ZhongChuan IoT and Alibaba Cloud will cooperate to jointly develop more advanced blockchain + IoT solutions that will bring maximum convenience to urban life and management to bring about tremendous and far-reaching changes to the city's modes of production, lifestyles, public services, government policies, municipal management, social welfare, etc. At the same time, it will also have a positive impact on the three-dimensional integration of the Internet of Things, the Internet, big data and the blockchain in promoting the development of smart city applications.



<https://waltonchain.tech/new-significant-partnership-alibaba-wtc-smart-cities/>

Binance



OVERVIEW

Binance has been the number 1 cryptocurrency exchange for a few months now in terms of both **transaction volume** and in the **number of active users**. The popularity of the exchange is immense, indicated by multiple parameters, such as the **240,000 new users within one hour** after Binance had closed new registrations due to the fact that they simply couldn't hire enough servers to support the traffic coming through the exchange.

BNB Token Economics

All the previously described events for the Binance exchange are reasons why the demand for BNB could increase, but this wouldn't be worth much if the **token economic model** behind BNB wasn't strong, which it fortunately is.

First of all, there is the previously mentioned trading discount when trading through BNB. BNB is paired with most of the substantially sized market cap coins such as Bitcoin, Ethereum, and Cardano, but also include smaller tokens such as AdEx, SingularityNET and Nexus, just to name a few. [Click here](#) for a full overview.

The basic foundation of prices are demand and supply — and also on the supply side, BNB has an interesting dynamic. Binance has committed to a quarterly token burn based on 20% of the trading fee profits of the preceding financial quarter with the ultimate goal to burn the 100 million BNB tokens sold during the ICO.



<https://www.investinblockchain.com/invest-binance-coin/>

Tokencard



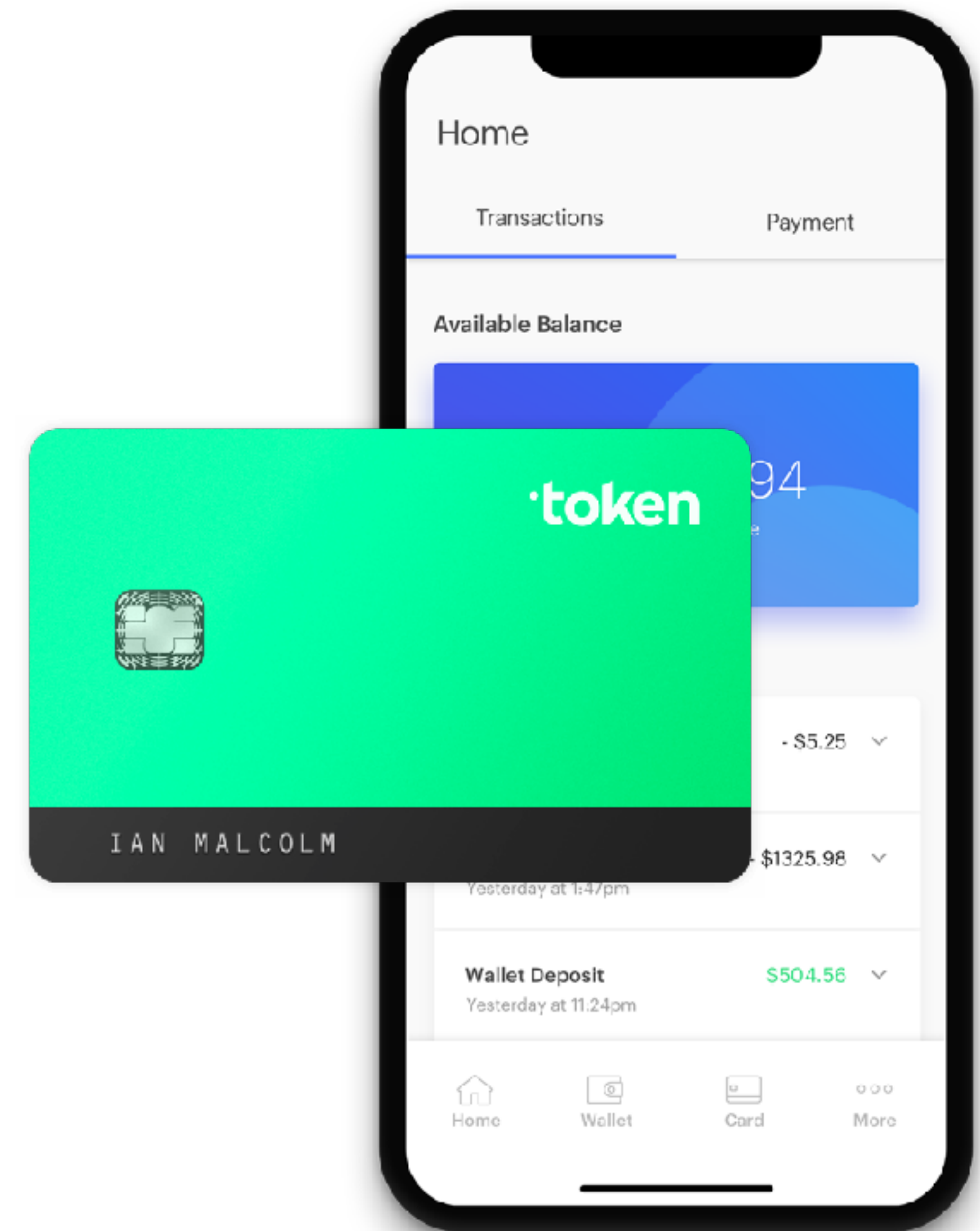
OVERVIEW

Meet self-sovereign banking. Token is a decentralised service built for you to take total control and ownership of your financial world. Allowing you to spend your coins / tokens in real life.

Manage your digital assets in our secure, decentralised wallet. Spend them freely with your card.

TESCO BENEFIT:

By creating your own token / coin and using it for club card points. This would allow users to spend their points and would give clubcard points and actual value.



Power Ledger



POWER LEDGER



OVERVIEW

Power Ledger is a platform where businesses and consumers can trade energy peer-to-peer. The platform primarily caters to clean energy, such as wind and solar energy, that can be produced by individuals and businesses and then shared on an energy grid. Blockchain technology is leveraged as a ledger and settlement mechanism for the energy trades, and thus is secure, transparent, and low-cost.

How it works

Power Ledger is a software-based transactive layer that communicates with an existing grid through smart meters and an intermediary acting as an Application Host. A smart meter is an electronic device that records consumption of electricity and communicates the data to the electricity supplier for functions such as monitoring and billing. The Application Host refers to the energy provider who controls the distribution infrastructure and power supply for the grid that the specific platform is operating on, for example a utility company. The Power Ledger platform is a layer that will be permitted through the Application Host to permeate a network, upon which everyone on the network can utilize the platform.

NOTE: Richard Branson is one of the Investors in this company



<https://medium.com/trivial-co/power-ledger-powr-analysis-of-the-token-and-business-model-7bee0ca1908a>

Regulation / Stability

Regulation

LEGAL, REGISTRATION REQUIREMENTS WITH FCA

The United Kingdom's approach to cryptocurrency regulations has been measured: although the UK has no specific cryptocurrency laws, cryptocurrencies are not considered legal tender and exchanges have registration requirements. HMRC has issued a brief on the [tax treatment of cryptocurrencies](#), stating that their "unique identity" means they can't be compared to conventional investments or payments, and their "taxability" depends on the activities and parties involved. Gains or losses on cryptocurrencies are, however, subject to capital gains tax.

HM REVENUE & CUSTOMS

This paper sets out HMRC's view - based on the law as it stands at the date of publication – about how individuals who have cryptoassets are taxed. It does not explicitly consider the tax treatment of cryptoassets held for the purposes of a business carried on by an individual.



<https://complyadvantage.com/knowledgebase/crypto-regulations/cryptocurrency-regulations-uk-united-kingdom/>

<https://www.gov.uk/government/publications/tax-on-cryptoassets/cryptoassets-for-individuals>

Stability

USING A STABLE COIN

A “stable coin” is a cryptocurrency that is pegged to another stable asset, like gold or the U.S. dollar. It’s a currency that is global, but is not tied to a central bank and has low volatility. This allows for practical usage of using cryptocurrency like paying for things every single day.

Coins like Bitcoin and Ethereum are highly volatile. On any given day, it is common to see an increase of 10-20% or even a decrease. That makes using most cryptocurrencies for daily transactions inconvenient. Imagine paying \$5 for your flat white (my coffee of choice) today and finding out tomorrow that it should have been \$4. Price changes like that are shocking for a consumer. The adoption of stable coins will be a catalyst to the new decentralized internet becoming mainstream.

USING A NON-STABLE COIN

Although you might think that using a non-stable coin would be a bad idea from after viewing the recent crypto crash, that is not necessarily the case. By having a non-stable currency, you can potentially make considerable profits as the value can increase exponentially. For example, when the currency Binance coin (BNB) first released, it was valued at 0.15 cents, and has an all-time high value of \$24, showing a potential gain in value of 15900%. And seeing as Tesco will own the supply of the currency, this will significantly increase the value for Tesco and investors.



<https://www.forbes.com/sites/shermanlee/2018/03/12/explaining-stable-coins-the-holy-grail-of-cryptocurrency/#558dcb964fc6>

What can Tesco do?

Introducing Tesco Coin

By adding creating a Tesco coin this would open many of the possibilities that blockchain technology can provide, as you can see from the previous research there are a good range of user cases for this. This is the opportunity to bring Tesco up to the Technical revolution become an early adopter in some of the best technology innovations since the internet.



How can it benefit Tesco?

Clubcard points

CLUBCARD POINTS CAN NOW BE USED IN OTHER SHOPS OUTSIDE TESCO

By creating your own coin / token you can potentially create a card which allows you to pay with clubcard points inside and outside of Tesco.

By giving Clubcard points and actual value it will allow people to spend it like any other currency, if we look at the example of Token card where the app / technology has an exchange incorporated at Point of sale, meaning that on the time of payment the pound (£) value gets exchanged to the Crypto currency value in this case (Clubcard coin).

An example user case for this could be in 'Round up' for example if you buy the Clubcard coin in your round up you will potentially be earning a stake in the Tesco currency, this acts more of an investment like MoneyBox. Giving customers a sense of loyalty with the brand and keeping the constant investment in the coin going.



Value

WE NOW HAVE A TANGIBLE VALUE

By adding a value to clubcard points you have now create a digital asset associated with points which will now have an actual asset value, giving clubcard points a backbone which they never had. This will now be able to classified as a asset on accounts and brings value to Tesco.

COIN VALUE & LOYALTY

Depending on how you create the currency you can have this as a currency it can go up and down in value, If we included this into club-card, it would act as an investment in Tesco so the more people who use the currency the more it goes up in value. This would entice people to use the currency if they know it could be a good investment. A great example of this is Binance coin as shown in the above research. This also correlates with the business model of John Lewis where everyone is a partner. This way we can make anyone who uses Tesco coin feel as a partner and make them feel as if they have an invested interest in Tesco

INVESTORS

By creating a coin this can also mean great scope to get new investors involved. This could potentially mean huge investment in the coin. For example EOS raised a staggering \$4.1 billion dollars with their ICO (initial coin offering) this was a 1 year ICO. As you can see the potential for Tesco is huge and can generate a huge amount of money if marketed to investors the right way.

<https://www.bitcoinmarketjournal.com/biggest-icos/>



	Amount Raised	ICO Dates	Project
EOS	\$4.1 billion	6/26/17 - 6/18/18	Smart Contracts
Telegram	\$1.7 billion	01/18-02/18	Encrypted Messaging & Blockchain Ecosystem
Dragon	\$320 million	02/15/18 - 03/15/2018	Decentralized Currency for Casinos
Huobi	\$300 million	01/24/18 - 02/28/18	Cryptocurrency Exchange

Supply chain

HOW CAN WE USE IT IN TESCO?

By using blockchain technology in our supply chain it would allow us to track exactly where items are and give us a secure source of truth by incorporating IOT / RFID technology with this the data can talk to each other on a blockchain. This could then help identify if there are any issues with deliveries or specific products though the store. Companies that use this technology currently are Walton chain, Vechain and Wabi which are shown in the above research.

Examples of there this technology can be used in stores are:

1. Fridges could be used to communicate with each other to control temperature along the supply chain. If food is tagged or scanned Fridges would automatically know what temperature to change to.
2. Tills could communicate with one another and products helping with security and loss of goods.
3. Products can be identified if their sell by date is expiring and can automatically be logged up to be removed.
4. Products can be tracked exactly so that we get the data required from transportation, store front and sale.



<https://www.uk.sogeti.com/content-hub/blog/iot-security-using-blockchain/>

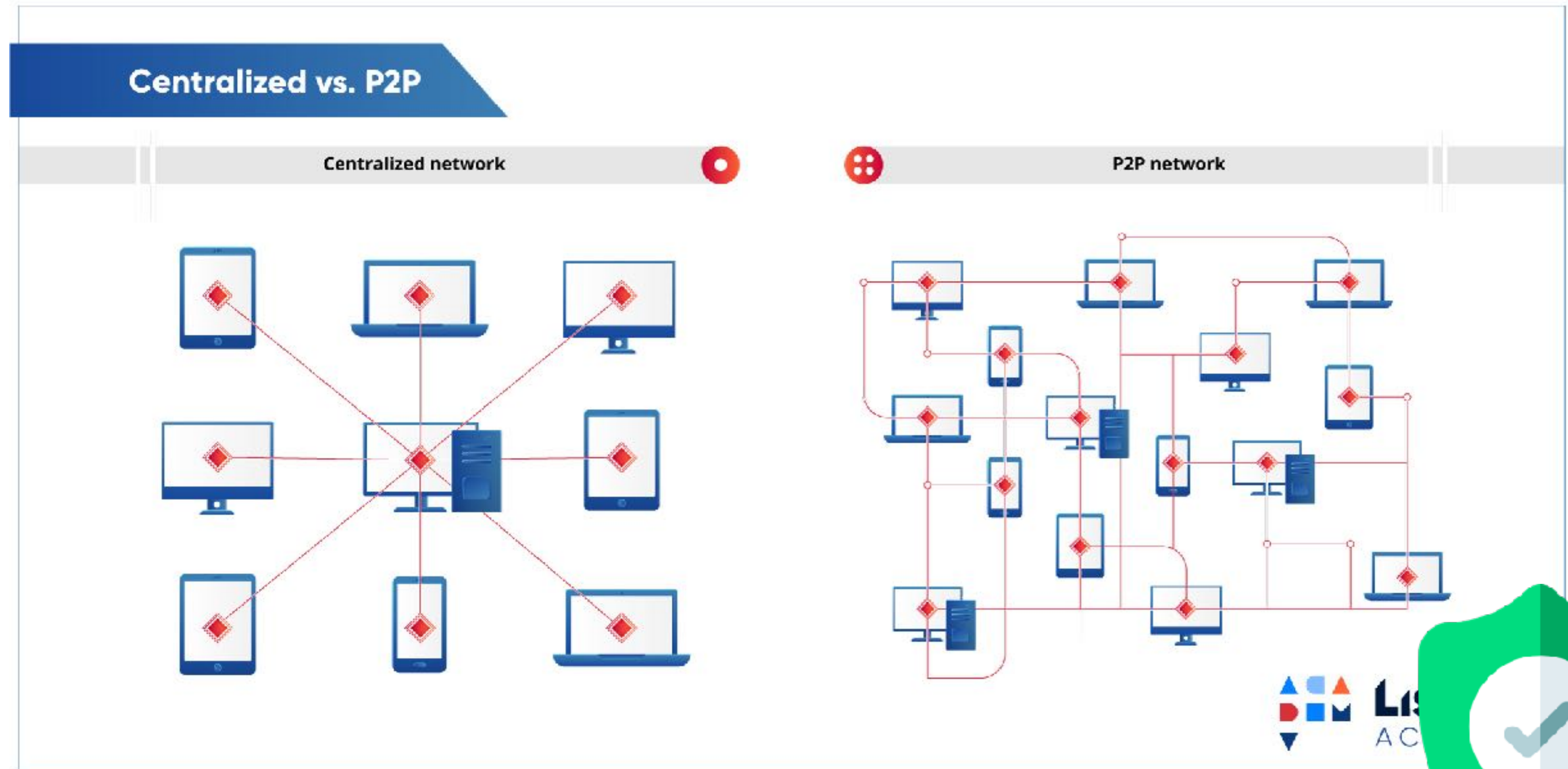
Security

HOW IS IT MORE SECURE

It can be used to create secured mesh network that will allow IoT devices to connect securely and reliably avoiding the threats of device spoofing and impersonation.

Every IoT node can be registered in the blockchain and will have a blockchain id which will uniquely identify a device in the universal namespace. For a device to connect another device, one will use the blockchain id as URL and will use its local blockchain wallet to raise an identity request. The wallet will create a digitally signed request and send to the target device which will use blockchain services to validate the signature using the public key of the sender. In this way, M2M authentication can take place without the need of any centralised arbitrator or service.

So too summarise this it can be used to send information securely though the blockchain network. In terms of storing data it can be secured by every node on a network and not just one central place, creating a decentralise network that is much more secure.



World Currency

USE IT ANYWHERE

Cryptocurrency is a world wide currency meaning that it can be used anywhere that will except it. If we accept Tesco coin at all branches this means that if we had a Tesco coin you could use this in any of the stores world wide.

This would also save us money if we needed to do any cross boarder payments or transfers into other currencies.

This could be used for suppliers as well and customers, suppliers could use the Tesco coin to handle Supply and demand with their products, give us the control with the commerce economy.



Key Points to take forward.

OBSERVATIONS

- Huge corporations are getting involved
- There are multiple user cases
- We could have a Tesco currency
- It can add value to the customer
- It can add investment opportunities into Tesco
- We can use the currency to pay anywhere.
- Have a worldwide currency
- Could have a stable coin
- Coins have a coin that fluctuates in value but can make significant profit
- Could be used for the supply chain
- Can be used throughout the stores
- Could be used for Tesco Clubcard points
- It can increase the value of Tesco
- Improve security

SUMMARY

After looking into this space for a while I can see a clear user case with club-card points and cryptocurrency. Where this could add significant value to the company. This value would be gained through the business, from customers, investors, manufactures, suppliers and so on.

By embracing this technology we would be giving our selves a step up into the technical revolution giving us an advantage against our competitors.

This technology solves many issues that Tesco currently have such as being able to pay anywhere with club-card points and many more.

Thank you.