Blockchains:
Value Flows and Industry 4.0

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Discussion seminar slides

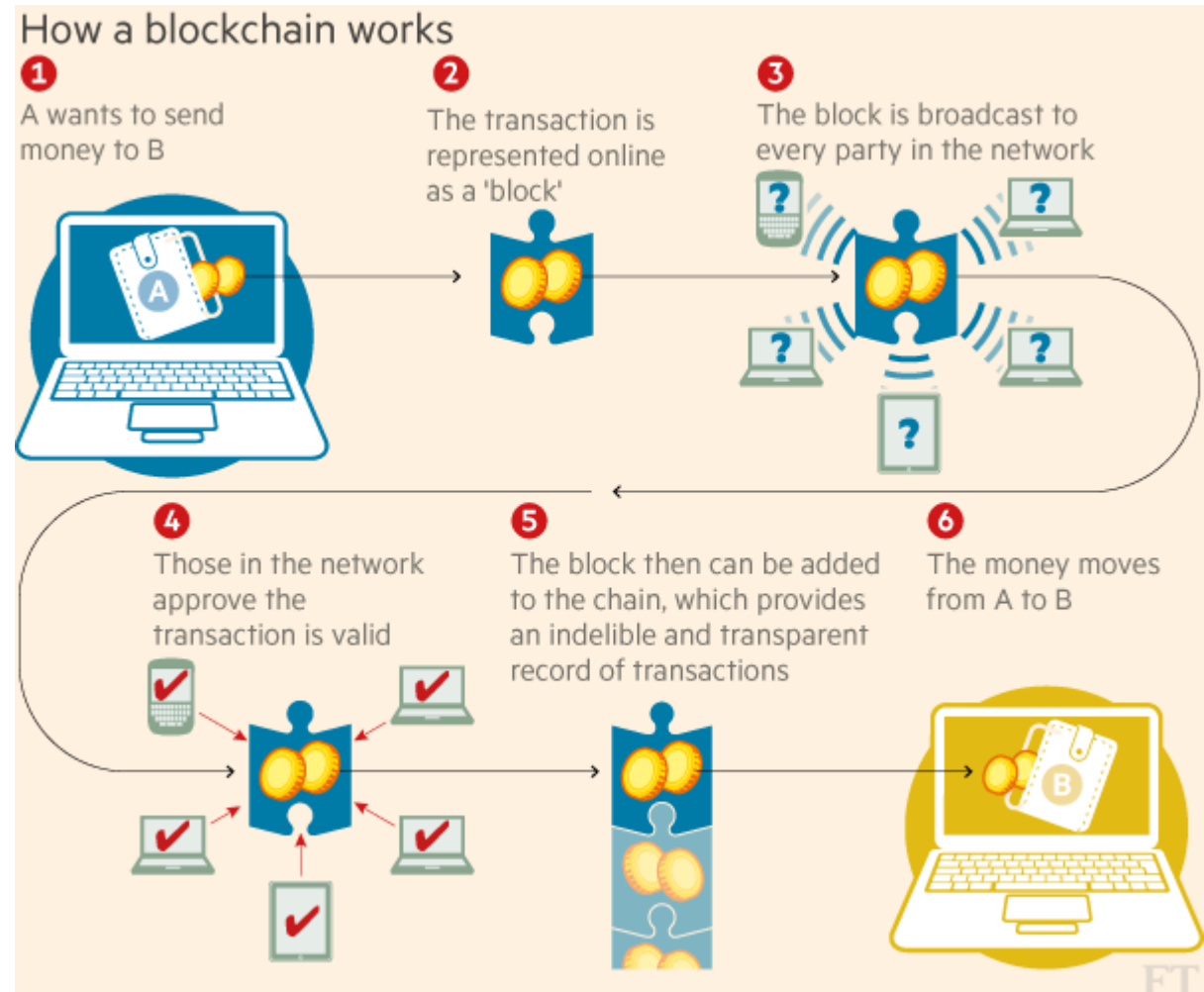September 22nd 2016

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What is a Blockchain?

- A replicated, shared ledger (Gendal)
- An organizationally-decentralised database – no one organization can control it, but the entire point of the system is to build and maintain a logically-centralised outcome: a single copy of the ledger, which everybody agrees is the true single copy (Wenger)

How a blockchain works

1 A wants to send money to B

2 The transaction is represented online as a 'block'

3 The block is broadcast to every party in the network

4 Those in the network approve the transaction is valid

5 The block then can be added to the chain, which provides an indelible and transparent record of transactions

6 The money moves from A to B

Source: Wenger, http://continuations.com/post/105272022635/bitcoin-clarifying-the-foundational-innovation-of, . Accessed September 1st 2016
Gendal, https://gendal.me/2015/04/27/how-to-explain-the-value-of-replicated-shared-ledgers-from-first-principles/. Accessed September 1st 2016
FT.com and https://www.weforum.org/agenda/2015/11/how-will-blockchain-technology-transform-financial-services/, Accessed September 1st 2016

What are Smart contracts?

- Pieces of software that represent a business arrangement and execute themselves automatically under pre-determined circumstances (The Economist)

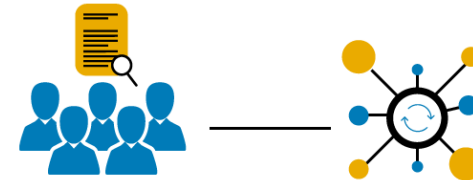- Smart contracts are executed in a replicated, shared ledger (Gendal)

An option contract between parties is written as code into the blockchain. The individuals involved are anonymous, but the contract is the public ledger.

A triggering event like an expiration date and strike price is hit and the contract executes itself according to the coded terms.

Regulators can use the blockchain to understand the activity in the market while maintaining the privacy of individual actors' positions.
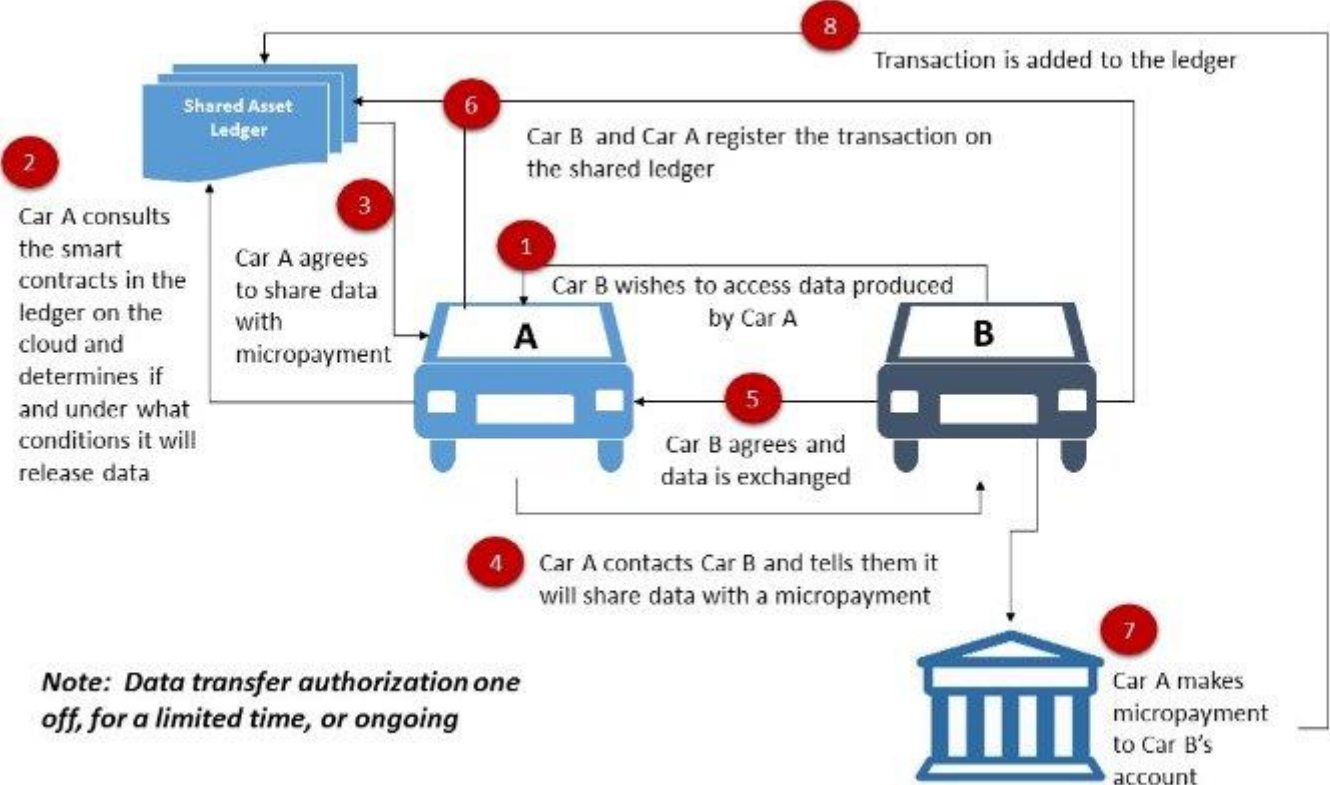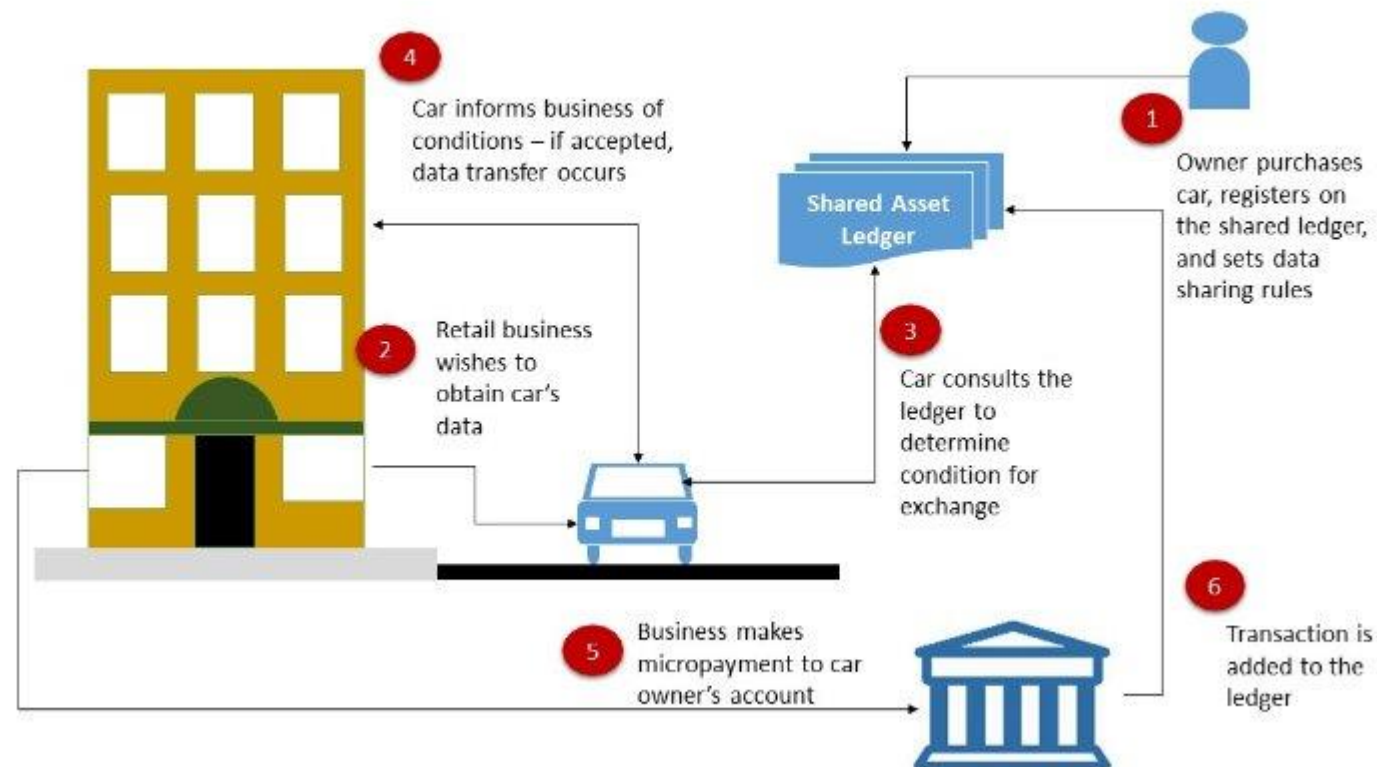
Source: Deloitte University Press, DUPress.com

Why are blockchains important in the auto industry?

Use case: Connected Cars (M2M payments)

Use case: Sales and Marketing

Order-to-Cash Process
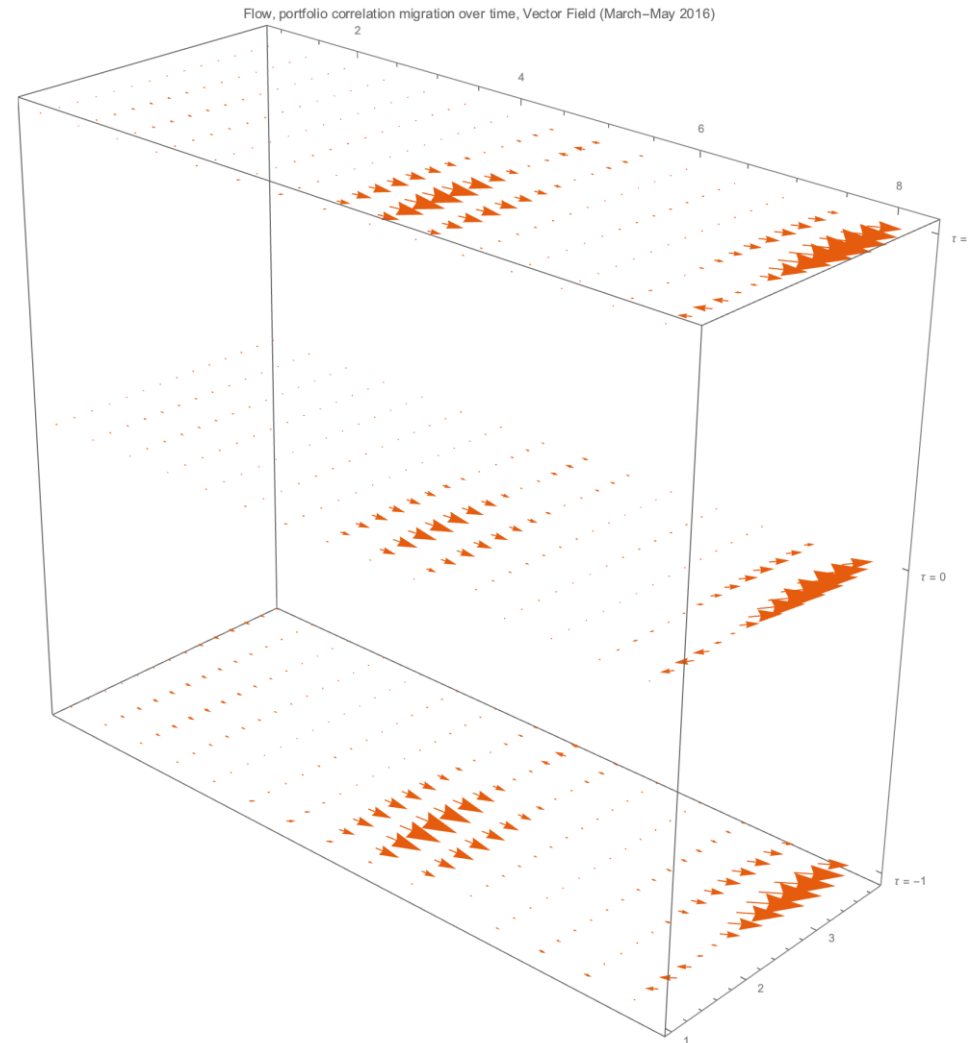# with Smart Contracts (ERP, R&D, …)

Use case: Supply Chain

- The use of block chains in finished vehicle logistics would start with the OEM (original equipment manufacturer), adding each new VIN (vehicle identification number) into the block chain together with other relevant data, such as the vehicle´s color and model, as well as runtime data such as position, status and ownership/responsibility for the VIN. The OEM, as the party in charge, would be allowed to grant access rights to the vehicle's information to the various supply chain partners. The OEM would, for example, transfer the rights to the releasing agent at the factory compound. Further, each eligible party would then inform the register of new status updates. For instance, by updating the status to "ready for transport", the OEM grants further access to the vehicle to the carrier. Once the vehicle leaves the factory compound, the releasing agent loses the possibility to further track the vehicle.

- Compared to the present information exchange procedures in finished vehicle logistics, block chain technology could improve the current inefficient data management. With block chains, all participating parties would use the same platform to communicate about logistical processes. Besides reduced time spent and costs, unified procedures could simplify communication and coordination between different responsible supply chain levels. Key for the acceptance of the **VIN ledger** would be the fact of a secure, neutral and non-central block chain, governed, like the internet, by a neutral international organization.

Fields Finance

Changes in value flows
(and the signals of
uncertainty
revealed by those changes)
can be quantified and
visualized.

Flow, portfolio correlation migration over time, Vector Field (March–May 2016)

Questions and answers