Mobilizing Blockchain Technology for the Automotive Industry

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#EY_Automotive

Agenda

Blockchain 101: What They Do, How They Work

Blockchain Applications: Operations Ecosystems

Blockchain Applications: Smart Assets

Looking Past The Technology Hype

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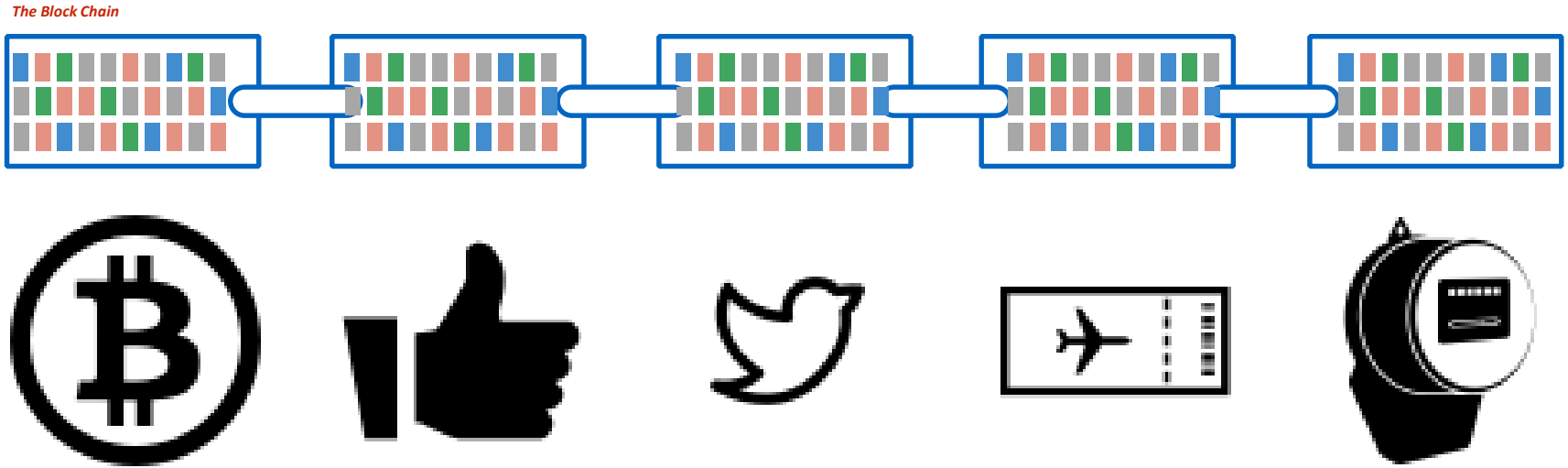
Technology Demonstration

Open Forum / Discussion

BitCoin, the first real implementation of Blockchain technology is in many ways not at all revolutionary

What bitcoin does is nothing special. How bitcoin works is revolutionary.

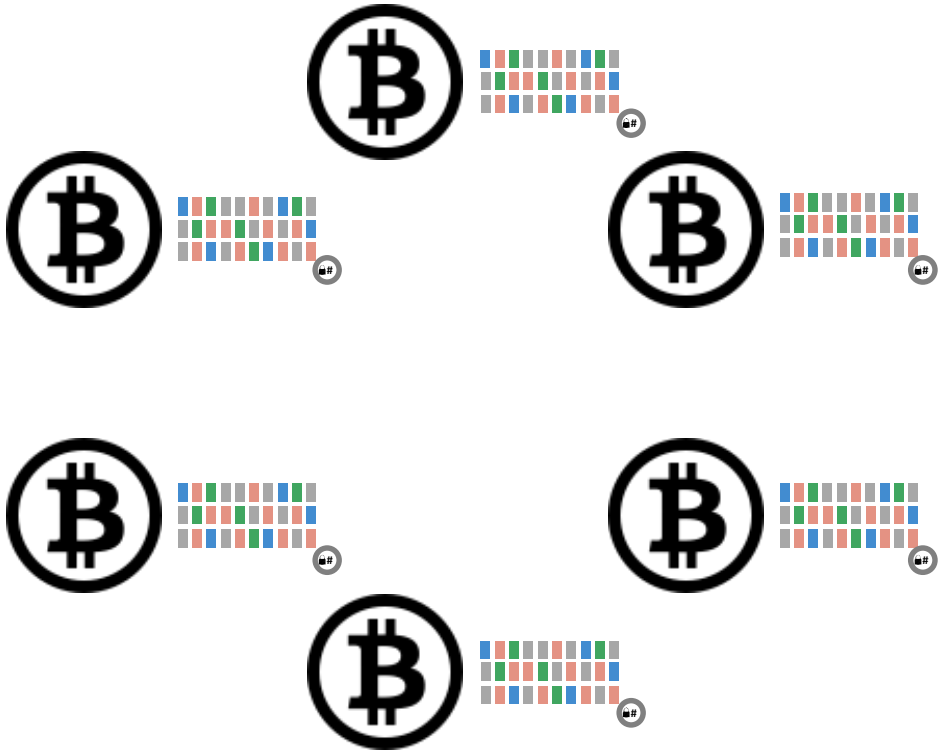
BitCoin is the re-invention of the most basic workload in the world of modern computing: transaction processing.



CICS in 1966

Congratulations. We just reinvented technology from 1966. What's the big deal?

Though the results look similar to other systems, the way that BitCoin works is profoundly different



Distributed Ledger

Every participant in the network keeps a copy of all the transactions.

Transactions are secured by encryption to prevent tampering.

Change your transaction history, and your hash numbers will be out of sync with all others, exposing tampering.

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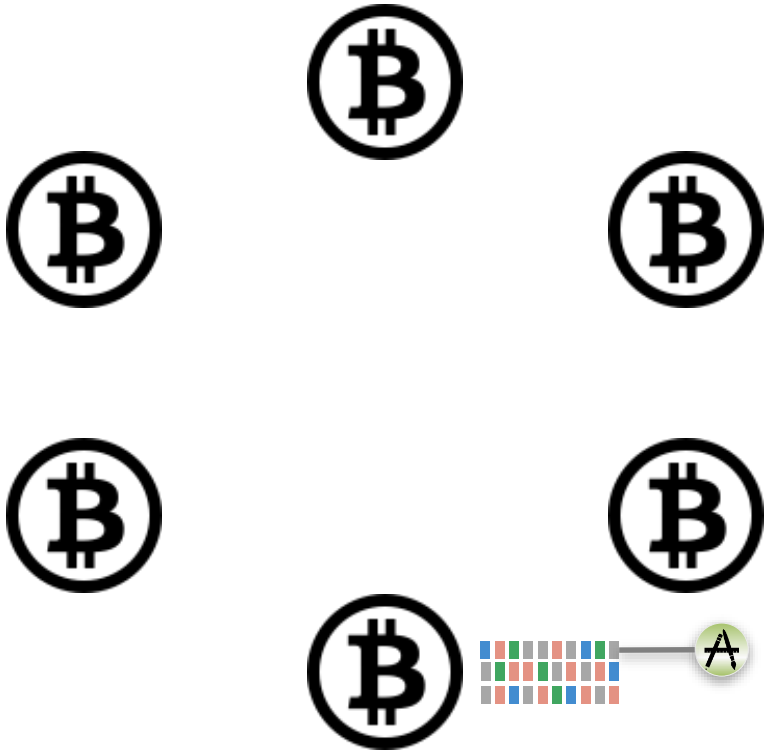

Programmable Ledger

Transactions can be sent with rules attached - small programs that govern when and how money is delivered.

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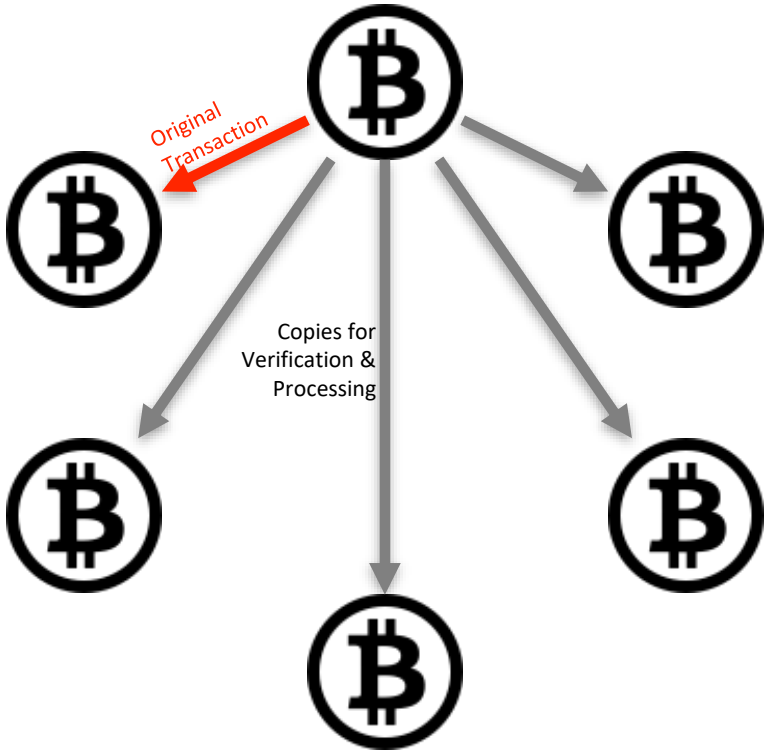


Consensus Algorithm

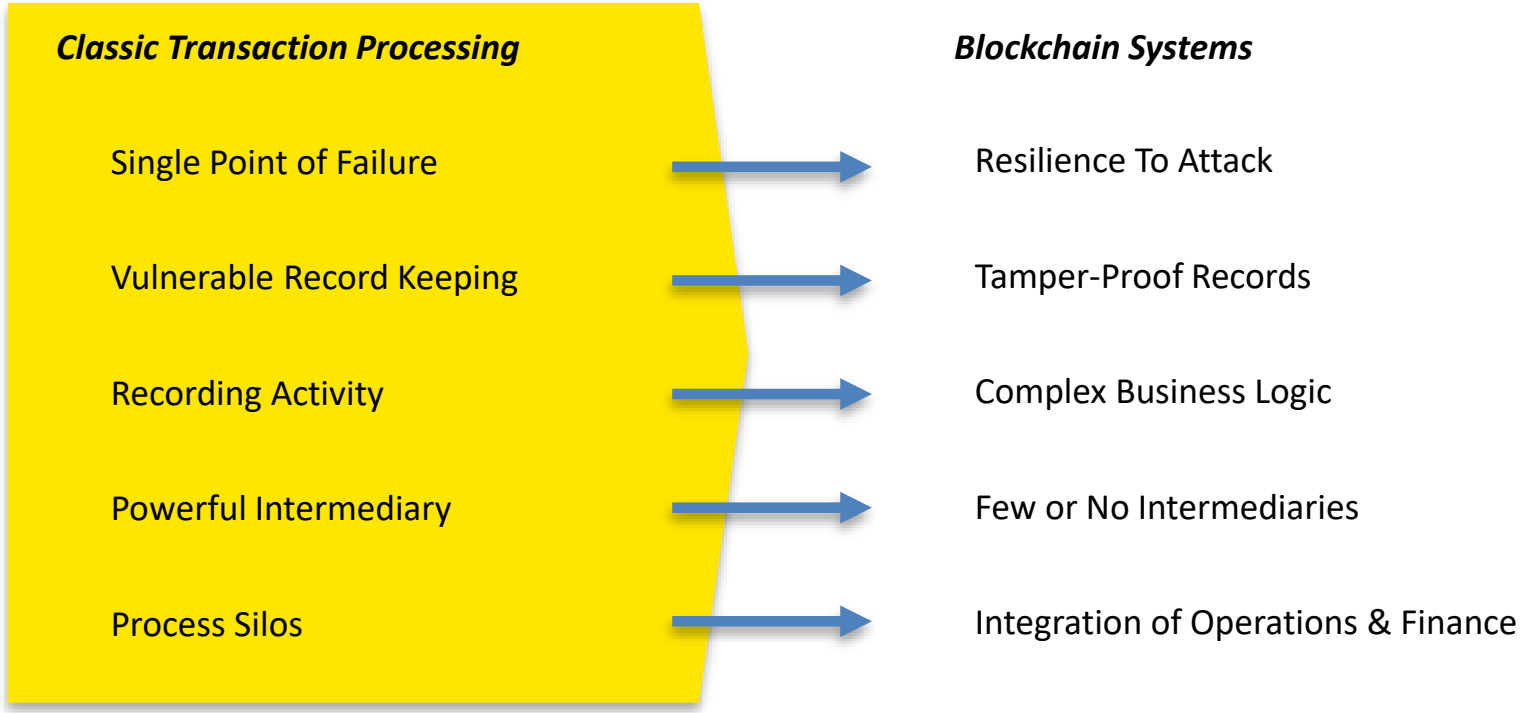
Every node in the network checks the work of other notes.

Confirming transactions involves solving a small math problem with random numbers. Multiple parties work on this simultaneously.

Transactions are confirmed by a kind of digital majority vote.

The result is that collusion to approve fraudulent transactions is difficult.

Blockchains bring integration and simplicity to collaborative transaction processing



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Blockchain Applications: Smart Assets

Looking Past The Technology Hype

Companies and their supply chains have changed dramatically in the last 30 years

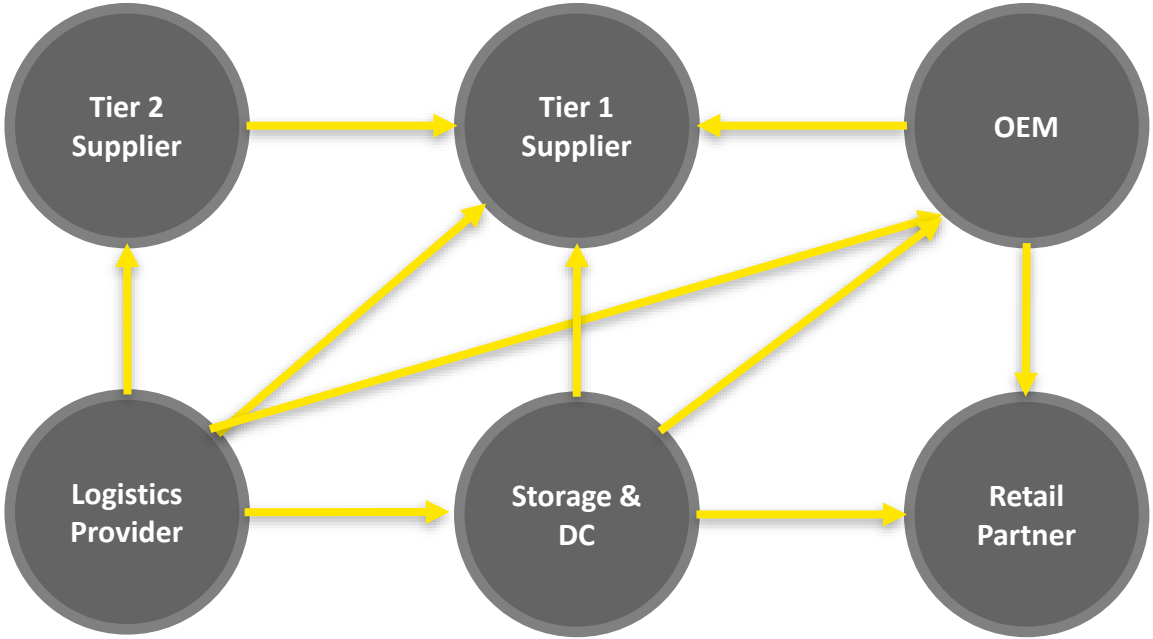
From Vertically Integrated

- *River Rouge plant for Ford*
- *Vertically integrated end-to-end car manufacturing*

To Ecosystem Partner

- *Foxconn's Shenzhen factory complex: assembly only, depending on a huge global network of suppliers*

Most collaboration today is done using point-to-point messaging and the results are both bad and expensive



The world of business operations is awash in a flood of just-out-of-sync and non-standard EDI and XML messages.

The results are:

1. *Islands of information*
2. *Data that never propagates past one node in the network*
3. *Information that always slightly out of sync*

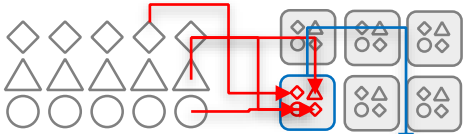
Blockchains allow for end to end information continuity across suppliers and geographies

Buy

- Purchase raw materials
- Create digital tokens to represent those assets

Make

- Integrate items together into manufacturing output
- New digital token incorporates the materials



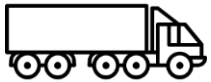
Raw materials are incorporated into the product

Finished product gets it's own new token.

Move

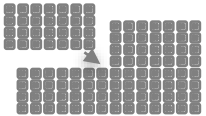
- Put finished in to an in-transit status

- In a container on a truck (also tokenized on a blockchain)



Store

- Move into warehouse with a distributor
- Unload container & truck



- And in a warehouse (also tokenized on a blockchain)

Sell

- Transfer to a retailer
- Transfer ownership first to retailer and then to end customer

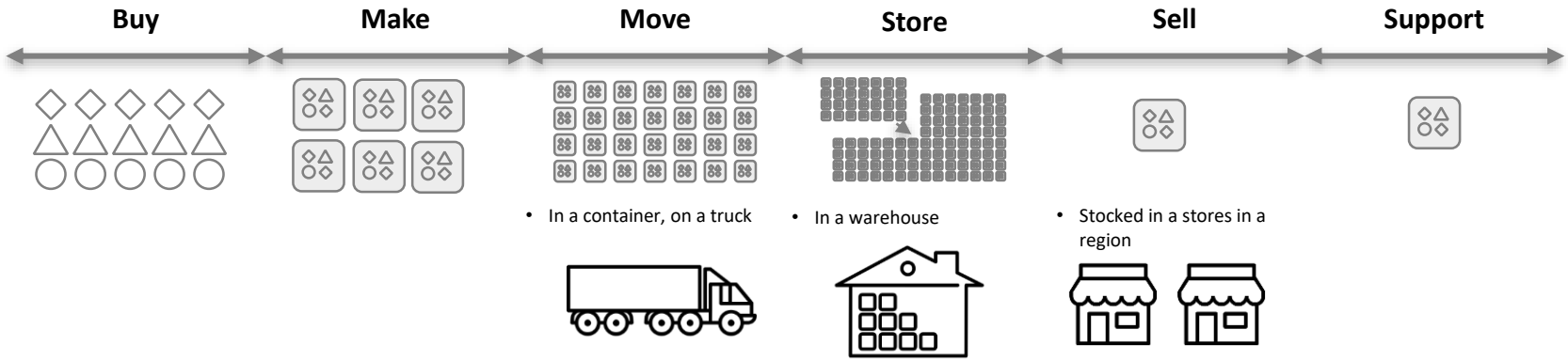
- Stocked in a stores in a region

Support

- Build true end-to-end traceability for product history

Accurate visibility, traceability, ownership and status end to end across the ecosystem
Automatically managed & synchronized with a blockchain

As inventory & assets move across the network, smart contracts can automate processes and payments



Vendor & Trade Finance

- Vendors can borrow against purchase orders
- Lenders are repaid automatically upon product delivery

Integrated Payments

- Payments can be triggered based on external data sources like proof of delivery

Automated Replenishment

- Warehouses can be smart assets that are equipped with machine learning or inventory management tools
- Warehouses can place their own replenishment orders

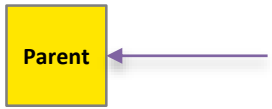
Promotions Planning

- Sales-out can trigger automatic tracking and payment for promotions
- Volume discounts and other rules can be written into digital sales contracts with retailers and partners

Fraud Prevention

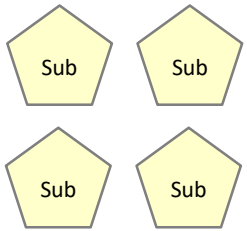
- End-to-end traceability makes it hard to insert new product surreptitiously in the supply chain as it has no digital history

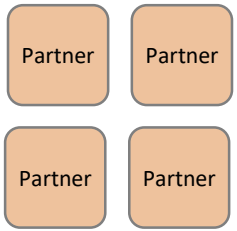
Case Example: companies are much better at negotiating global agreements that actually making use of them



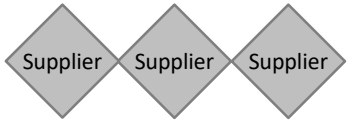
Negotiates global pricing agreements for key commodities.

- What is the current best available price based on our volume?
- How can I easily access globally negotiated agreements?
- How do we assure compliance with contract terms?





- What is the current price based on our volume discount?
- How can I know where the ecosystem is on volume without letting others see how much I am buying?
- How do I avoid nasty end-of-quarter surprises?

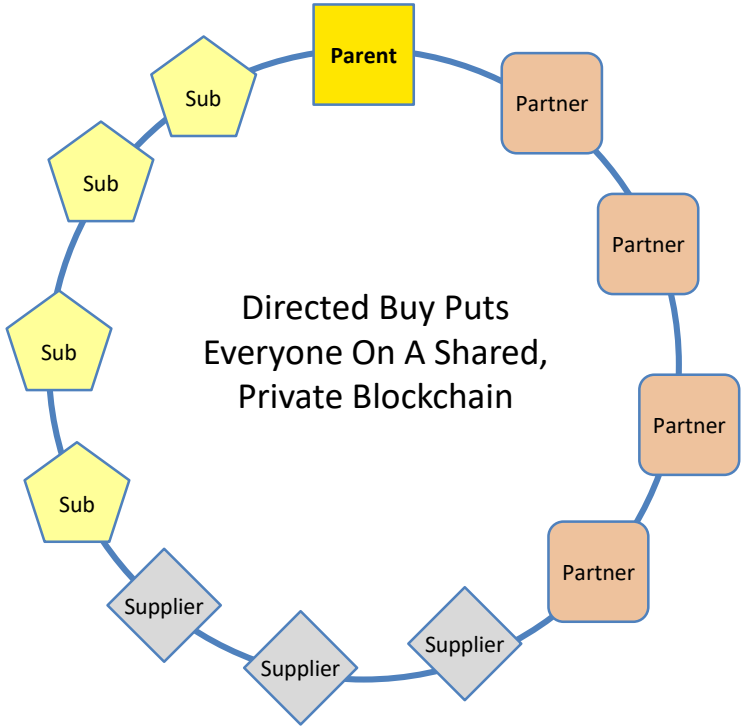


- How do we maximize our allowed revenue?
- How to avoid end of quarter true-up surprises?

EY OpsChain Directed Buy solves the network procurement problem using blockchain technology and smart contracts

Secure, Shared Procurement System

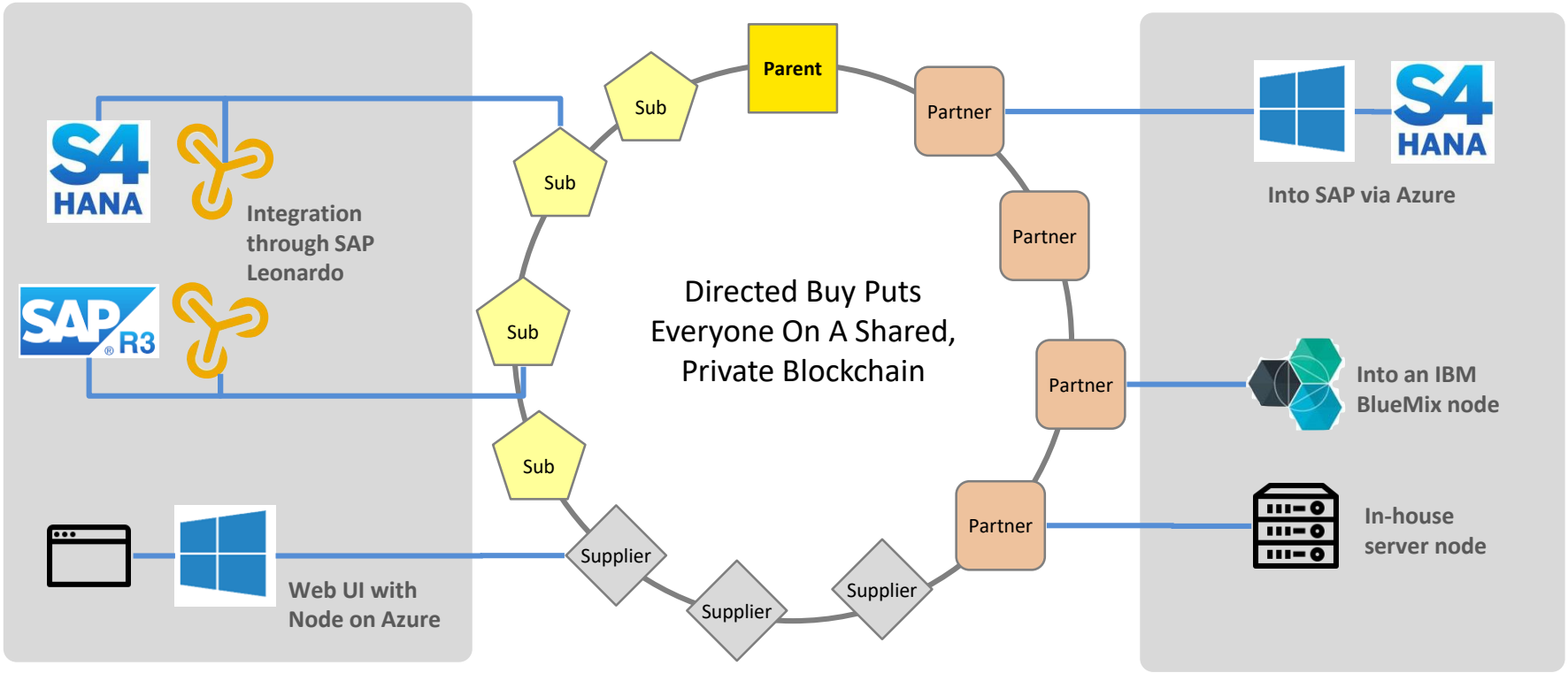
- Smart contracts automatically calculate the exact correct price each time a PO is issued
- The system tracks total purchased volume across all parties
- Contracts and invoices are presented through the blockchain and are always accurate
- Tamper-proof records exist for every transaction



Enormous Value Creation For All Parties

- Radically reduced cost to administer and audit a complex system
- 100% capture of negotiated discounts
- Greater revenue for suppliers through volume

Blockchain solutions can deployed in Leonardo and tied directly into your SAP ERP instance



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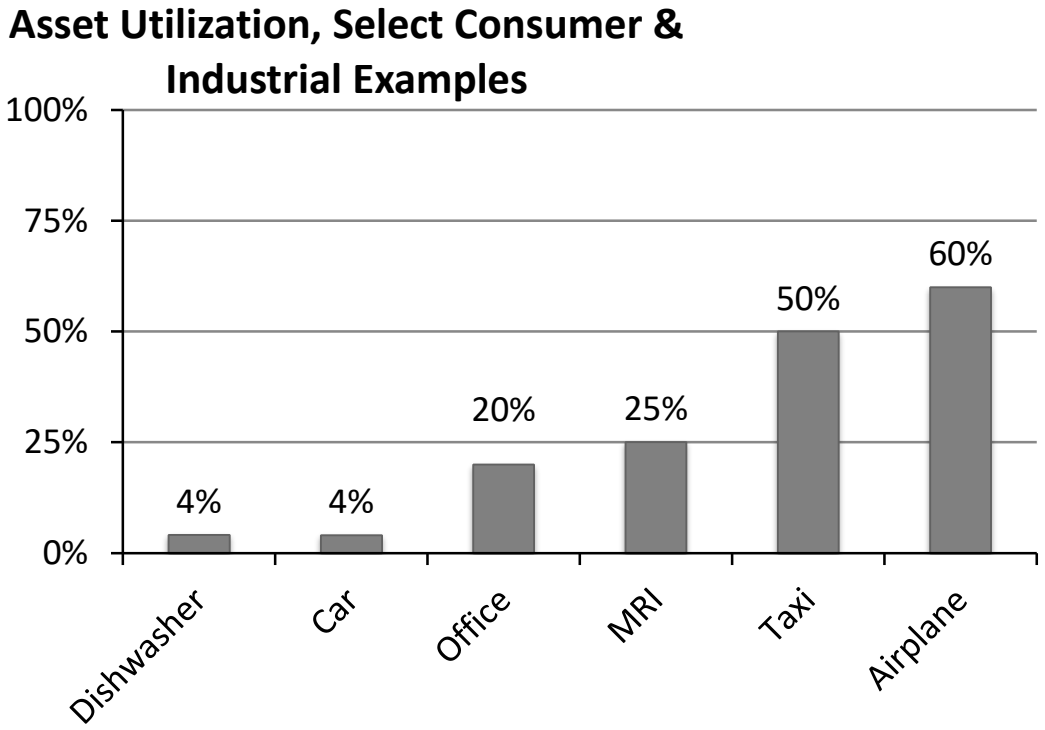
Looking Past The Technology Hype

Autonomous vehicles and changing consumer preferences are set to transform how we think about vehicle ownership

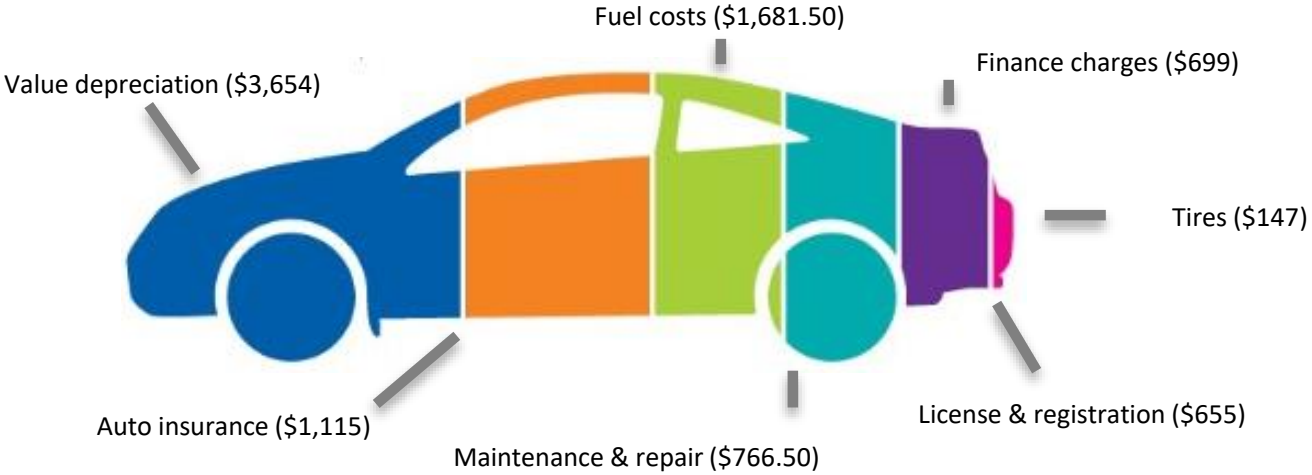


- It's not just vehicles: our whole society has an asset utilization problem
- The Internet of Things is already making cars more share-able
- Autonomous vehicles will complete that transition for a significant portion of the population

Car ownership is expensive, so fractional ownership will make sense for many consumers

Car owners are responsible for financing the purchase of their vehicles, along with the associated operating and maintenance costs

Total Annual Cost of Ownership: $8,698 per year*



http://newsroom.aaa.com/2015/04/annual-cost-operate-vehicle-falls-8698-finds-aaa-archive/

*Based on 15,000 miles

We have solutions for managing high value shared assets today, but they are expensive and paperwork intensive

Traditional Ownership Model

- Solely responsible for financing purchase
- Value Depreciation
- Annual Recurring Costs
- Operating Costs

Fractional Ownership Model (NetJets model)

- Co-op Model allows consumers to have fractional ownership of a vehicle
- Can pre-pay for blocks of vehicle hours/mileage
- Consumers reserve vehicles at will for a fee

$30 in paperwork is fine for a $30,000 flight on a $30 million dollar asset. For a $10 ride in a $30,000 car, we need a new solution.

Blockchains will allow for very low cost, decentralized administration of fractional ownership pools

Car Ownership Can Be Tokenized In A Blockchain

- Smart, connected cars can be linked to a vehicle identity on the blockchain
- You can own part of a car, all of a car, or a share in a pool of cars
- You can use your “share” of the car or sell it to others and get a return on your capital investment

We Can Decompose The Car Even Further

- Thanks to connectivity, we can decompose, track and manage all the different elements of a car

Battery usage on the grid when connected.

Insurance and maintenance spend

Borrow for or against the asset value.

Securitize the revenue stream from rentals

For Every Stream of Tokens, A Public Market

- A public, digital market
- Granular visibility to the detailed operating information from the car or pool of cars

EY launches Tesseract: a blockchain mobility platform

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Home » Newsroom » News - EY advancing future of transportation with launch of blockchain-based integrated mobility platform

EY advancing future of transportation with launch of blockchain-based integrated mobility platform

New York, 30 August 2017

Share

EY today announced the launch of Tesseract, an integrated mobility platform underpinned by blockchain technology. The platform facilitates fractional vehicle ownership, shared use and seamless multimodal transport and it will help lay the groundwork for how autonomous vehicle fleets can be owned in the future and provide access to a variety of on-demand mobility options.

EY's Tesseract solves core mobility issues such as how to share vehicle ownership with widespread shared-use and how a multitude of mobility options can be integrated. As participants on a single platform, multiple stakeholders such as OEMs, mobility and transport companies, and cities and infrastructure providers, among others, will have the opportunity to create new value and revenue streams. Along with shared ownership, consumer demands for expanded mobility services are met, giving them access to the right type of vehicle for their ideal journey, on demand.

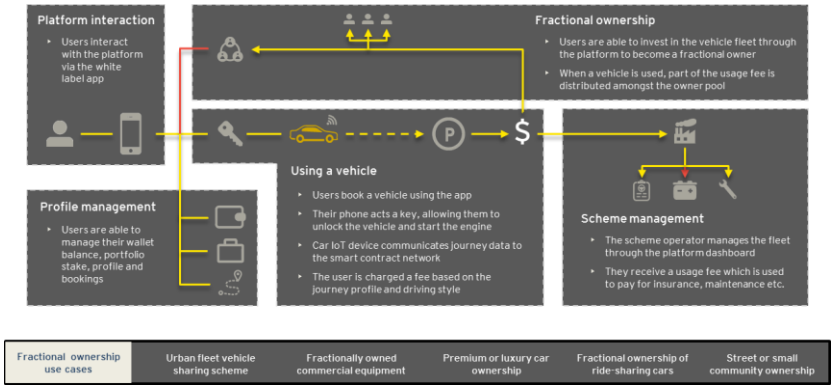
Randy Miller, EY Global Automotive & Transportation Leader, says:

"The future of the automotive and transportation industry will be integrated, on-demand, personalized and autonomous. Tesseract is a groundbreaking, innovative platform that benefits every stakeholder across the mobility ecosystem. We want Tesseract to break down barriers to entry for all stakeholders, provide the means for mobility as a service and facilitate a truly integrated ecosystem that puts consumers first in the future mobility marketplace."

With Tesseract, single vehicles, fleets and other transport services are available on the platform. Vehicles and trips are digitally [illegible] the blockchain, and transactions are

Newsroom

- News releases
- PR contacts
- PR activities
- Analyst relations
- Fact and figures



Single vehicle, multiple owners

Many vehicles, many owners

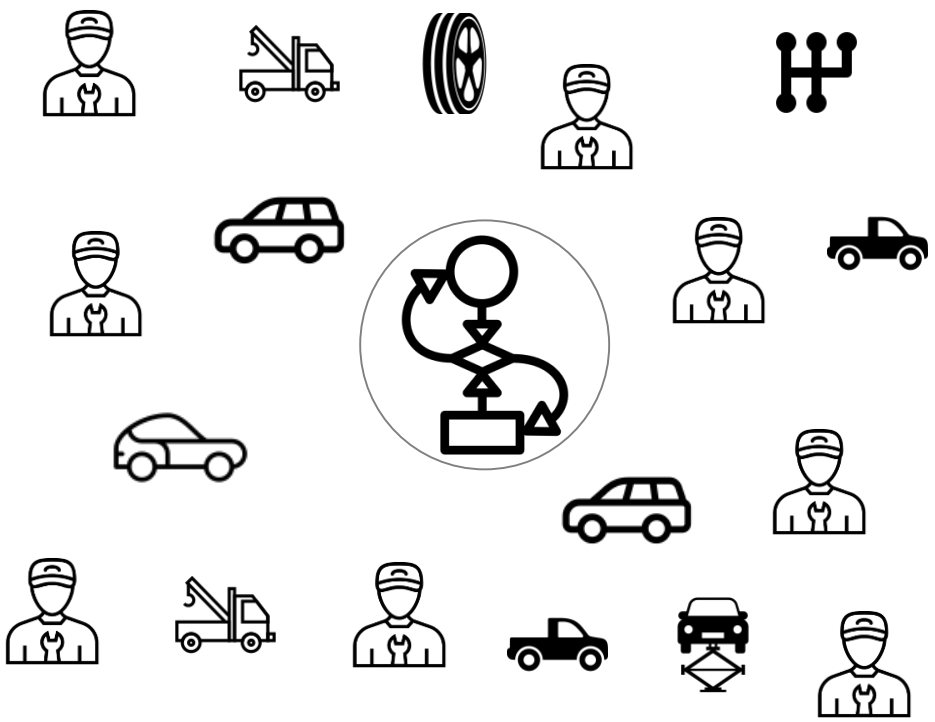
Asset disaggregation

Infrastructure funding

Mobility wallet

Journey orchestration

Smart Contracts mean that cars can autonomously manage their own operational services as well



- Marketplace models allow everyone to manage their own preferences and requirements
- Incentives and goals shape the behavior of the participants and help drive them towards the same overall productivity targets
- Marketplace models also allow enterprises to smoothly blend internal and external resources
- Some participants are machines, some are people. Some are based on rules some are based on AI.

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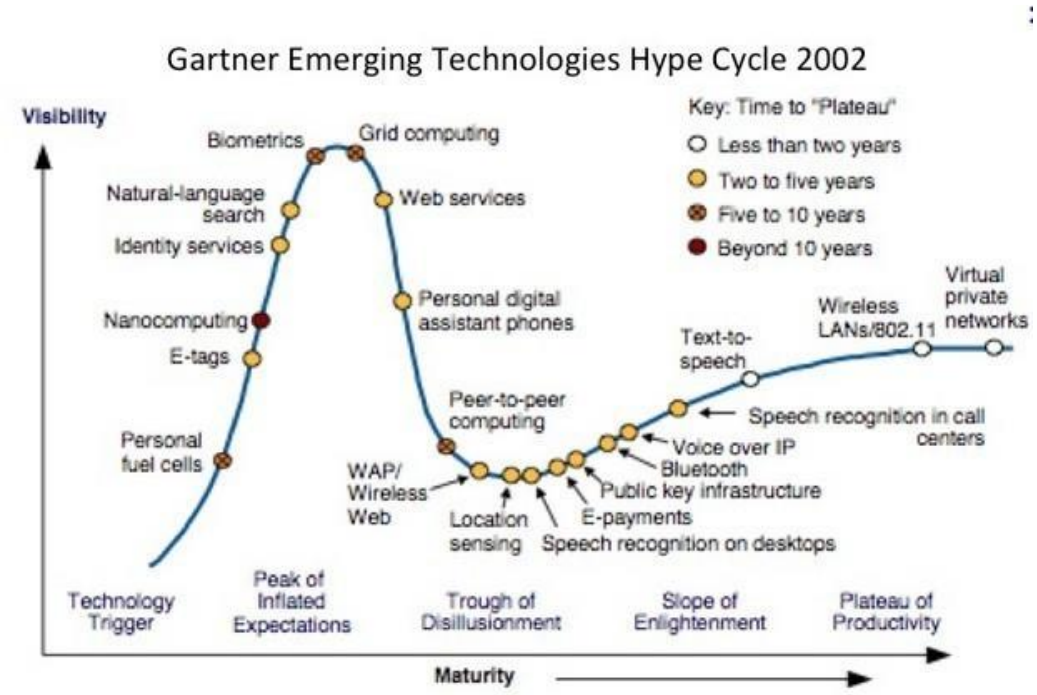
Looking Past The Technology Hype

Don’t confuse hype with impact. Blockchains are over-hyped. They are still revolutionary.



Blockchains represent a revolution in software technology.

Hype comes and goes, but has little to do with long-term implementation value.

Blockchains aren't for everyone and they aren't for every solution. We have a five point test.

1	**Are there multiple parties in this ecosystem?**	• Blockchains get more secure with more parties in the network. One participant networks are not especially secure.
2	**Is establishing trust between all the parties an issue?**	• Blockchains improve trust between participants by having multiple points of verification
3	**Is it critical to have a tamper-proof permanent record of transactions?**	• Blockchains create permanent records that cannot edited or deleted.
4	**Are we securing the ownership or management of a finite resource?**	• Core logic in the system is designed to prevent double counting of assets and record ownership and transfers.
5	**Does this ecosystem benefit from improved transparency?**	• Blockchains are transparent by design – where ownership or control of assets is public and transparent by design.

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