How Blockchain May Disrupt the Automotive Industry – An Insider's View

- Data usage
- Market mechanics
- Cooperation models

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The Bosch Group – Four Business Sectors
Key figures 2017*

Bosch Group

- 78 billion EUR in sales
- 400.500 associates
- 280 plants in 60 countries

Mobility Solutions
- One of the world's largest suppliers of mobility solutions

Industrial Technology
- Leading in drive and control technology, packaging, and process technology

61% share of sales

Energy and Building Technology
- One of the leading manufacturers of energy-efficient heating products and hot-water solutions and leading in security and communication technology

Consumer Goods
- Leading supplier of power tools and accessories
- Leading supplier of household appliances

39% share of sales

* as of 12.17

BOSCH: SUSTAINABLE MOBILITY

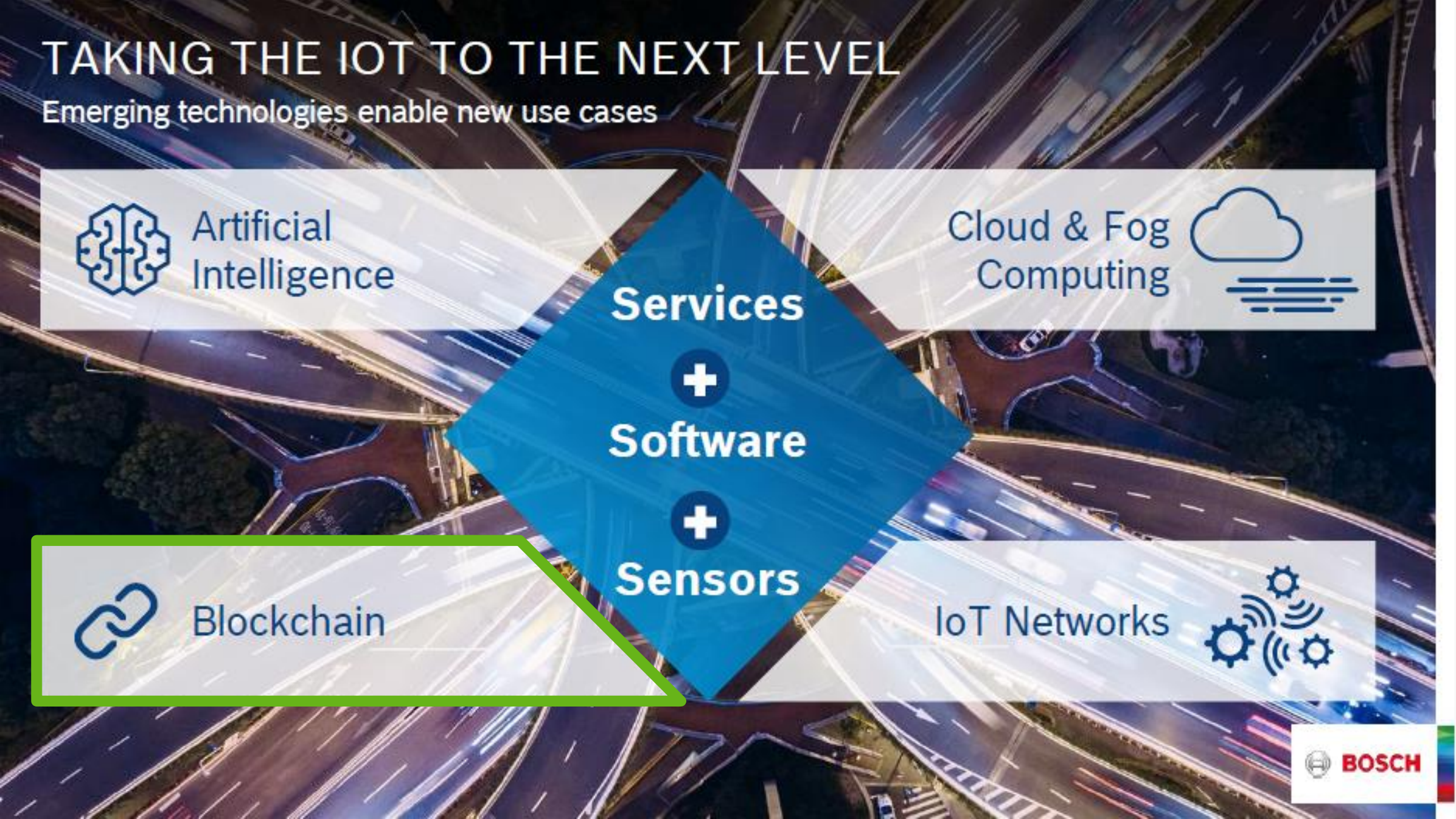
costs hybrid electric motor
roaming power electronics
e-bike **electrified** range
driving enjoyment charging infrastructure
market ramp-up battery
e-scooter smart charging plug-in

legislation assistance systems
emergency braking assistant
automated auto pilot
highway pilot sensors
redundancy electric steering
valet parking digital environment

augmented reality electronic horizon
internet of things smartphone integration
connected
vehicle to vehicle cloud
vehicle to infrastructure
services fleet management
entertainment eCall

TAKING THE IOT TO THE NEXT LEVEL

Emerging technologies enable new use cases

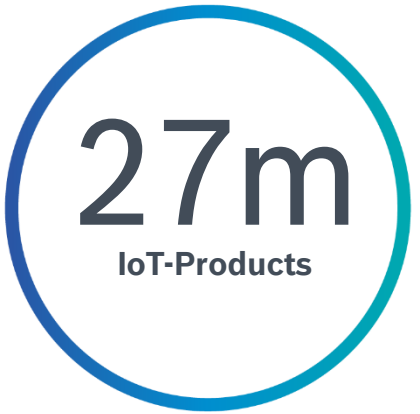


OMNIPRESENT – THE INTERNET OF THINGS

CONNECTED PRODUCTS

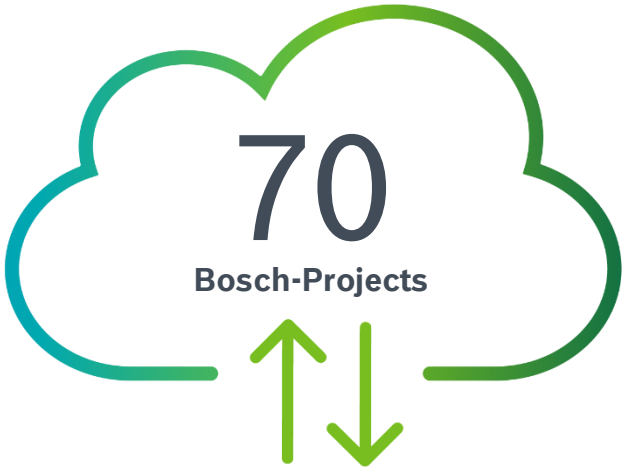
All electronic Bosch-product categories are IP-enabled

MARKET PRESENCE



Produced by Bosch in 2016

INNOVATIVE PLATFORM



Currently realized on Bosch-IoT-Cloud

Blockchain enables the Next Generation of the IoT

A INTERNET OF THINGS
CONNECTED DEVICES

> Connected devices generate and exchange data

> Data enables new products, services and business models

ECONOMY OF THINGS

> CONNECTED devices become ECONOMIC devices

> IoT devices with eWallet as a first step

> Toward AUTONOMOUS IoT devices, own legal entities

B BLOCKCHAIN TECHNOLOGIES
MDL* AND SMART CONTRACTS

> Blockchain as a foundation of crypto-currencies and an enabler of trust

> Infrastructure to exchange value between humans and machines (and consequently machine2machine!)

*MDL: Mutual Distributed Ledger

DISRUPTION I:

DATA USAGE

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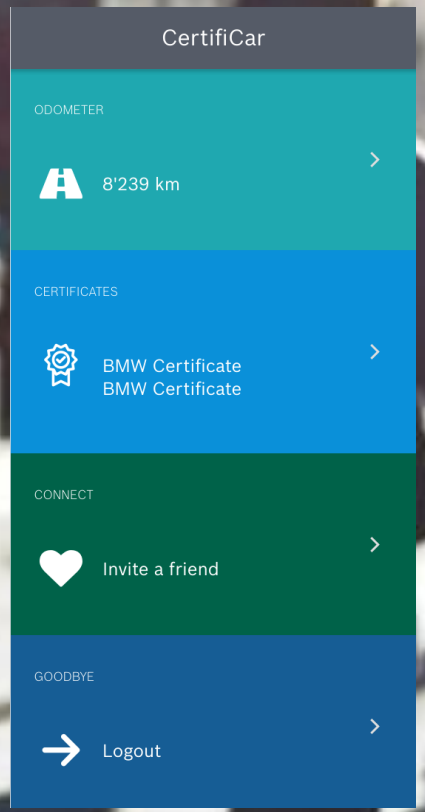
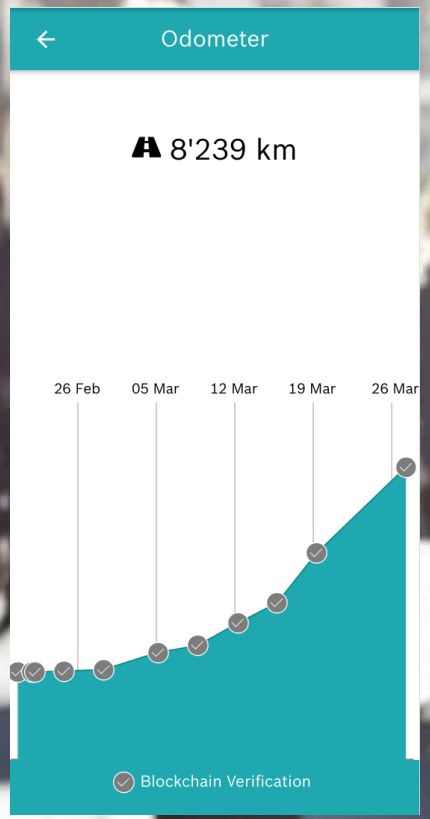
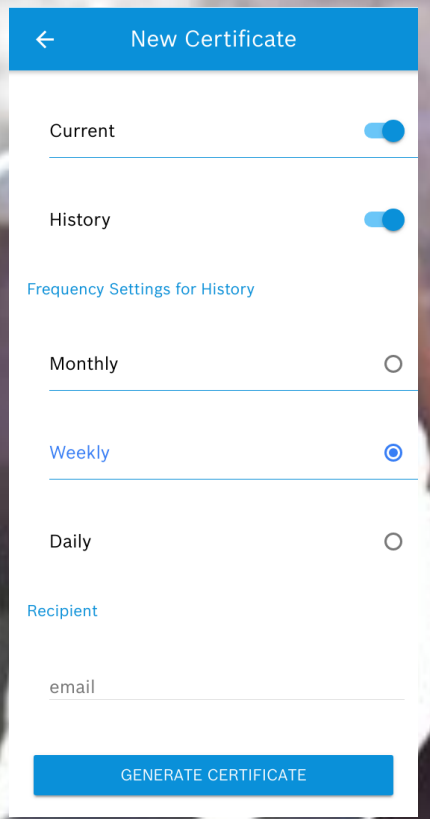
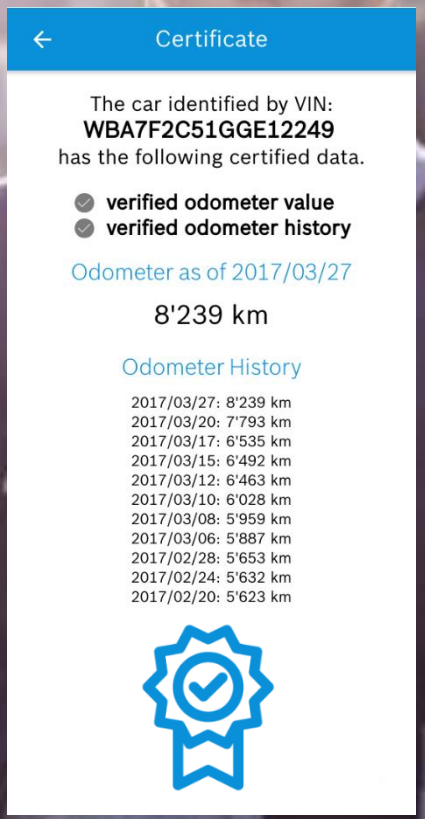
1: TÜV Rheinland study (2015), https://www.arvato.com/content/dam/arvato/documents/financial-solutions/PK_Tachomanipulation_T%C3%9CV_Rheinland.pdf

CertifiCar: A consumer centric solution

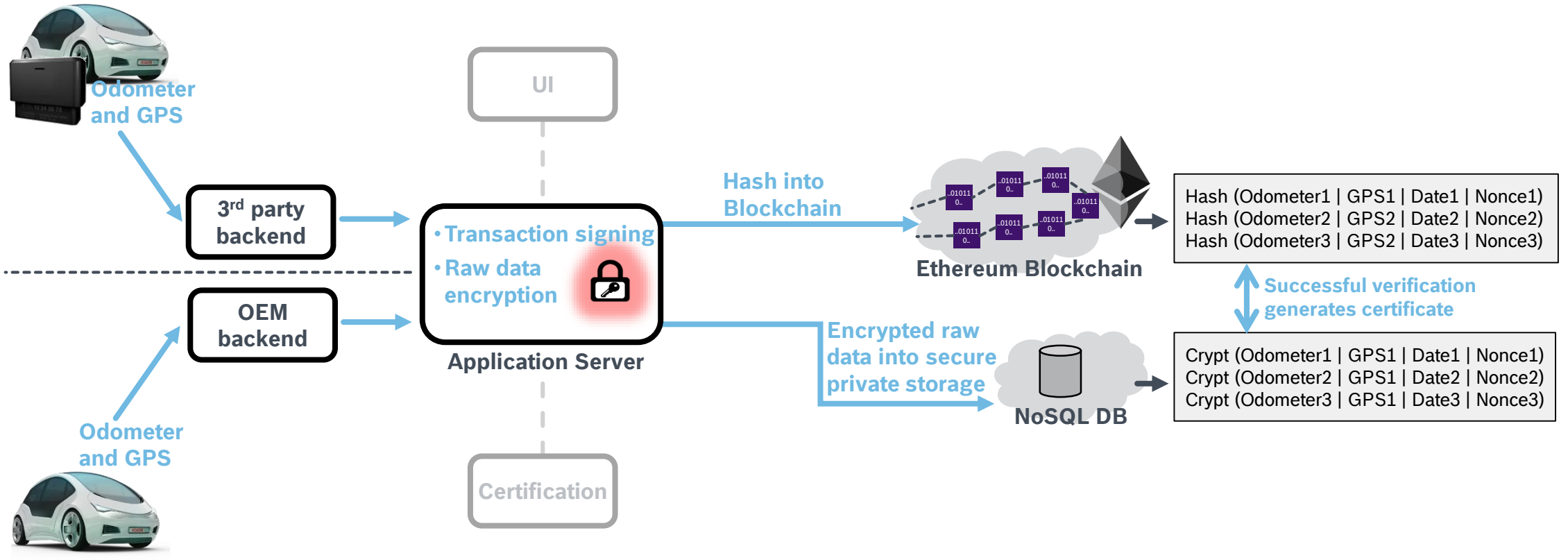








Blockchain-based system to certify car data



DISRUPTION II:

MARKET MECHANICS

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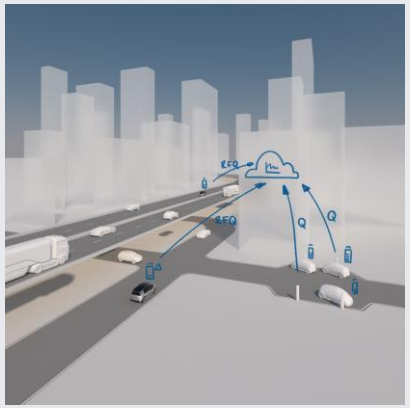
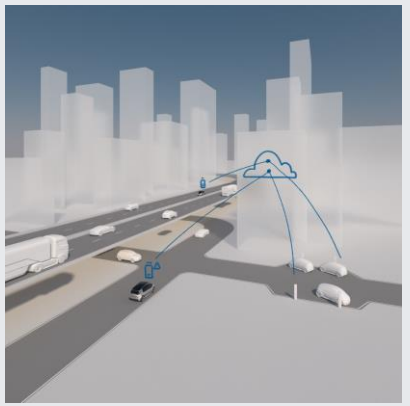
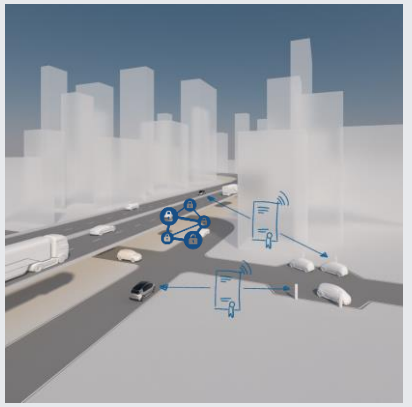
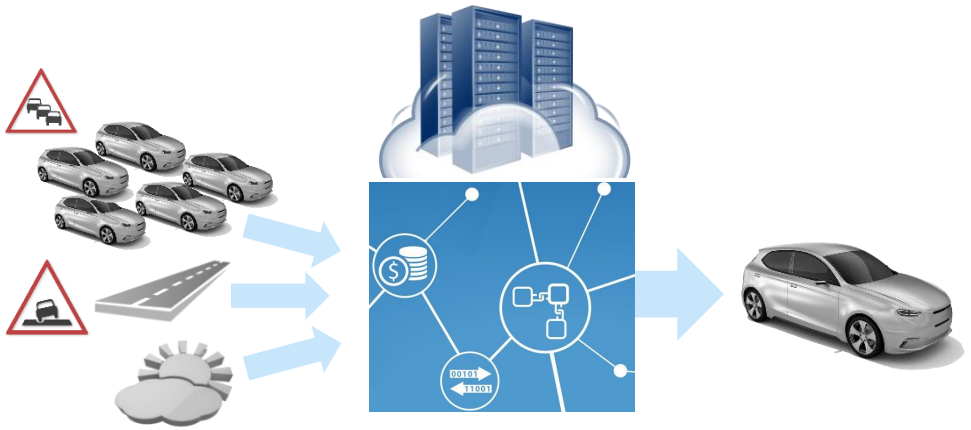
Disrupting Market Mechanisms
Example: Smart Cities / EV Charging

	Market Mechanics	Characteristics
Bundling	 All mechanisms for a functioning charging economy are bundled in the hand of one business entity • Search and Find • Contracting • Payment • **General Terms and Conditions**	• Platform Business entity as the “monarch” • Danger of Market-Stall: Fierce fights of incumbents over platform dominance • Very difficult to establish, but Winner-takes-it-all
Unbundling	Initiation  Contracting  Transaction 	• Division of power into at least three parties: Exchange, Contract, Execution • Potentially easy to establish • More price signals • Federated market structure • Enabled by Smart Contracts • Secured by Blockchain

Example: Hazard Spot Warning

*Afraid of **unforeseeable black-ice** or **upcoming hydroplaning** (or any other dangers)?*

Let all drivers collect hazard spots and let all the others know!



What difference would make Blockchain?

Incentive for cars to collect hazard spots to sell the data to the cloud (to buy other services)!

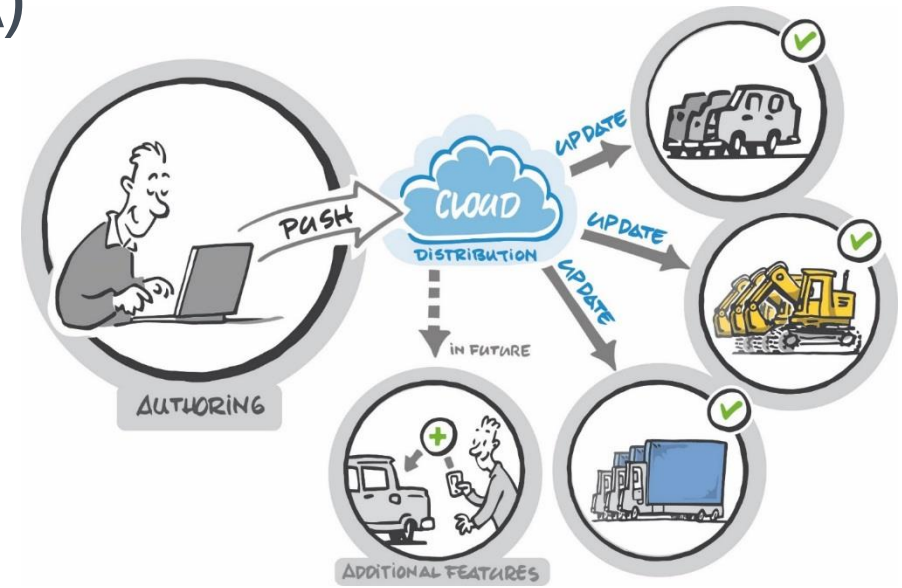
Depending on the value of the data, the market prices would be brokered by Smart Contracts

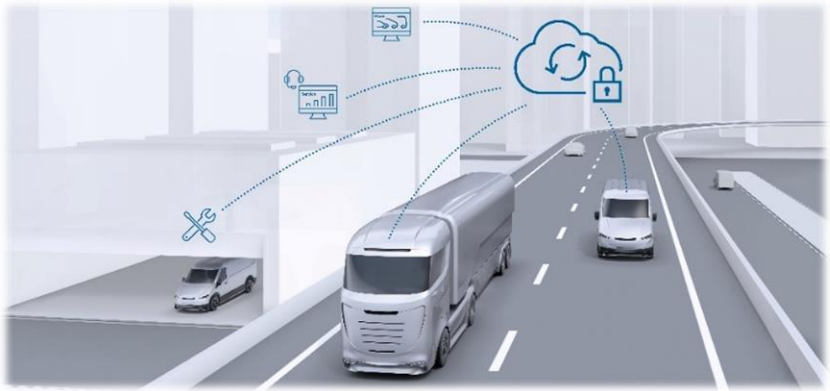
Example: Firmware-Over-The-Air (FOTA)

Warranty claims significantly reduce the profit margin.

BOSCH FOTA allows for a ***remote update of the vehicle's Soft- and Firmware***

FOTA ***saves approx. 50 Euros*** *per vehicle compared to a field action.*





What difference would make Blockchain?

Tamper-proof documentation of the vehicles components and software in distributed Ledgers

Additional features and services bought from the market place via Smart Contracts

DISRUPTION III:

COOPERATION MODELS

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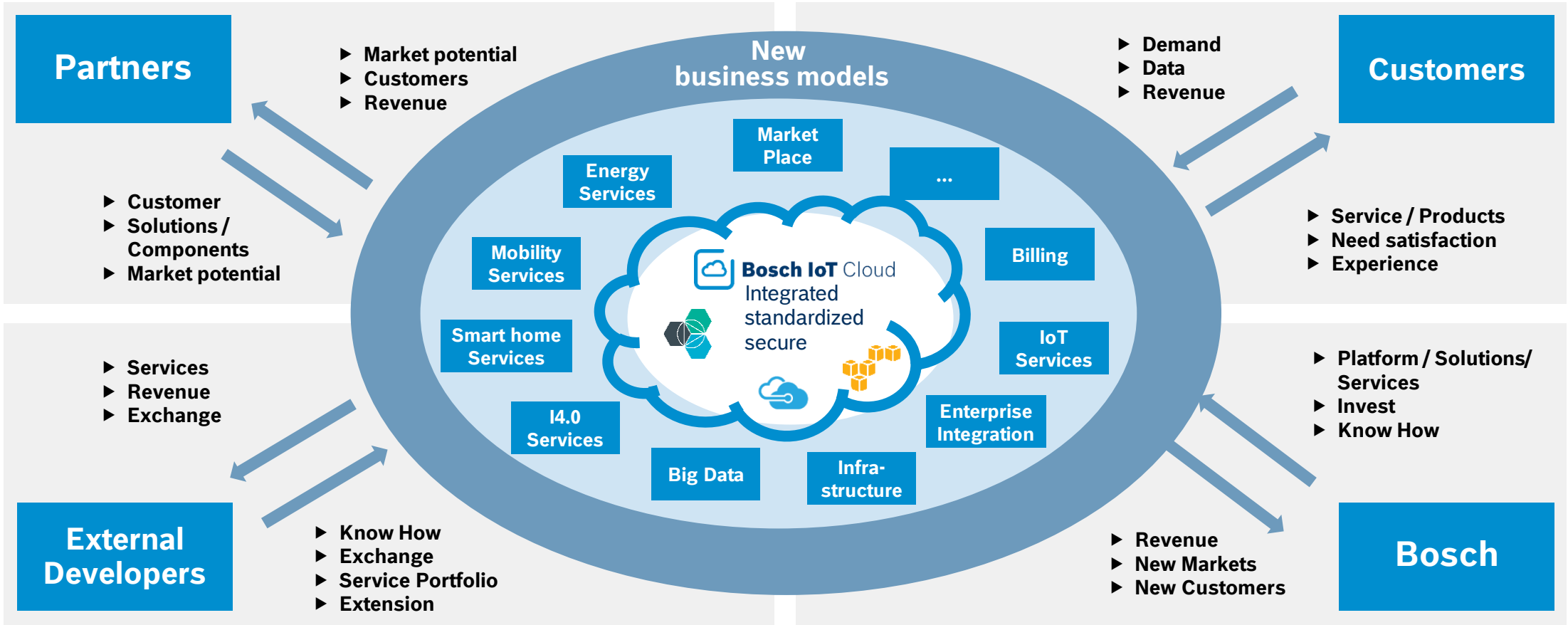
What's next: From an Automotive to an IoT Ecosystem

The give-and-take in an Ecosystem



Consortial Collaboration: Trusted IoT Alliance

Founders Meeting – May 18th, 19th@CISCO in Santa Clara

FOUNDING MEMBERS

BNY MELLON

BOSCH

CISCO

FOXCONN

gemalto

bITSE

CHRONICLED

FILAMENT

slock.it

skuchain

CONSENSYS

Ledger

BOSCH

Consortial Collaboration
Current Members as of December 2017

TrustedIoTAlliance

Enterprise Companies

BNY MELLON
HCM INTERNATIONAL COMPANY
BOSCH
CISCO
usbank
gemalto
T-LABS BLOCKCHAIN GROUP
UBS

Blockchain Technology Companies

CONSENSYS
bitse
CHRONICLED
O-tum
AERO TOKEN
modum
Ledger
slock.it
skuchain
BIGCHAIN DB
FOAM
Global Blockchain
OAKEN INNOVATIONS
streamr
IOTA
Riddle & Code
clause
vechain
monetha
rivetz

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Trusted IoT Alliance: Long Term Goals

To create an ecosystem with security, interoperability, scalability, and performance

TrustedIoTAlliance

Compete & Collaborate

Application / Service Layer	**Proprietary solutions** *We compete!*
IoT Protocol Layer Register, Verify, Ledger, Transfer, Wallet	**Industry standard & Open Source** *We collaborate!*
Blockchain Layer	**Public data utility** *We share!*

Compete & Collaborate | Intellectual Property

Applications

Proprietary technology from Alliance Members

Smart Contracts

Open Source "Fat Protocols" created by the Trusted IoT Alliance

Blockchain

Open Source from Hyperledger, Enterprise Ethereum Alliance, Public Chains

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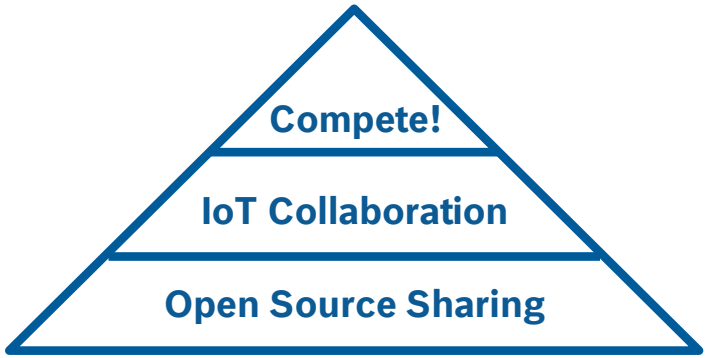
Conclusion from an Automotive Insider
Blockchain Will Disrupt the Automotive Industry!

- **Data usage**

- **Market mechanics**

- **Cooperation models**



Thank YOU!

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