Decentralized Digital Identities in Mobility

Trust as the Key Concept in the Internet of Things

Peter Busch

Product Owner DLT Mobility

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The Bosch Group – Four Business Sectors
Key figures 2019*

BOSCH Group	▶ ~78 billion EUR in sales ▶ ~400.000 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

84% share of sales

Energy and Building Technology
▶ One of the leading manufacturers of energy-efficient heating products, security and communication technology

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

16% share of sales

* as of 12.19

Peter Busch, Project 'Economy of Things' | Sept 2020

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Expanding the Internet of Things Vision
Chances for BOSCH (and the Industry)

Current Product: ESP

We **connect** our products and their production
with the **Internet of Things (IoT)**

Sense

Act

Sensor

Brake

Artificial Intelligence (AI) enables
complex functionality based on data

Processor

IoT and **AI** are the basis for **intelligent Products**

Think

Bosch IoT Vision: *All electronic products* **connected** in **2020**

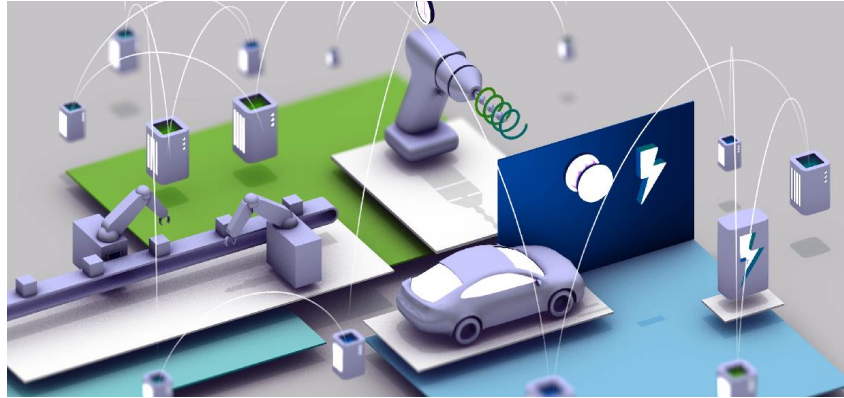*All products* either posses **AI** or are created by utilizing **AI** in **2025**

Peter Busch, Project 'Economy of Things' | Sept 2020

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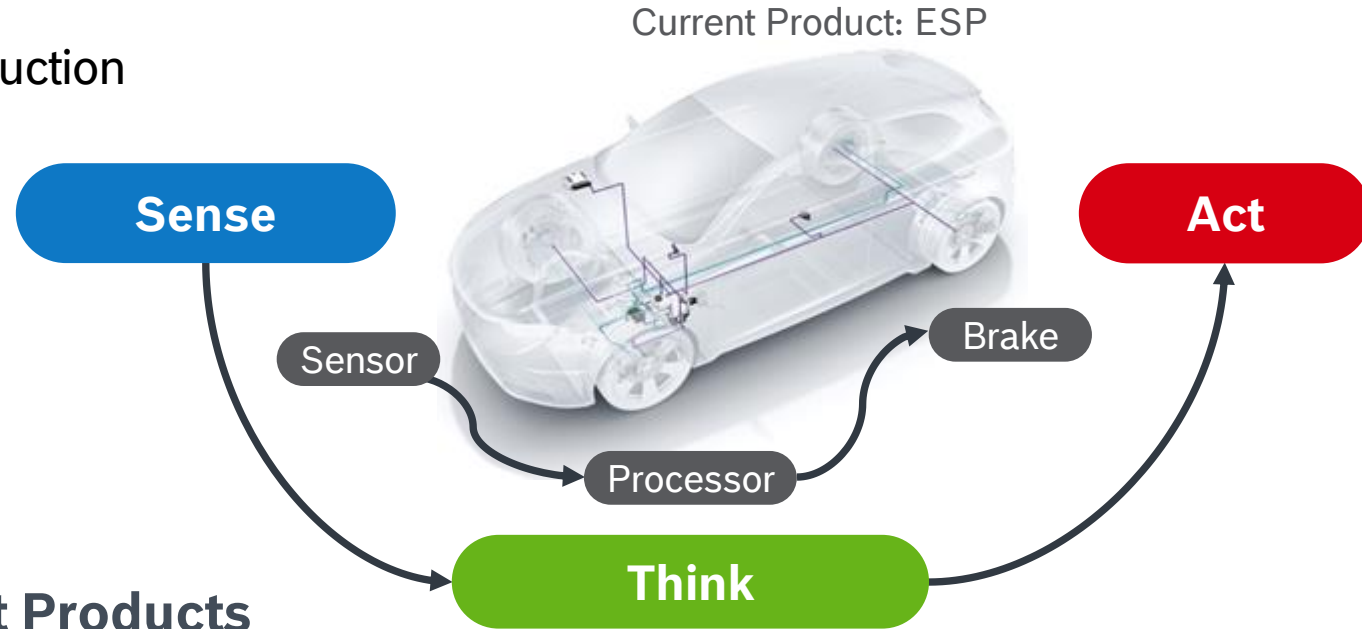
Distributed Ledger Technology - Project "Economy of Things"
An Alternative Approach to Centralized Platform Monopolies

INTERNET OF THINGS

> All domains get connected

> Massive DATA gets created

> DATA enables new products

ECONOMY OF THINGS

> CONNECTED devices as ECONOMIC devices

> Devices do seamless BUSINESS

> Towards AUTONOMOUS, LEGAL entities

*DISTRIBUTED LEDGER TECH

> Foundation of crypto-currencies

> Decentralization and Trust

> Machine2Machine Value Exchange
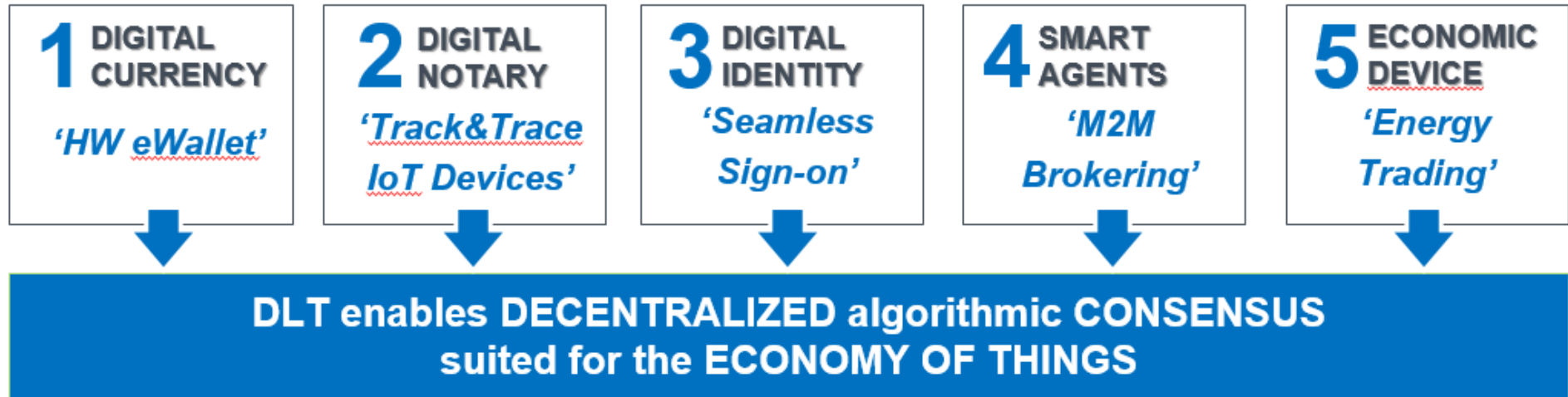
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Distributed Ledger Technology - Project "Economy of Things"
An Alternative Approach to GAFA* Platform Monopolies

DECENTRALIZATION

Distributed Ledger Technologies

IMMUTABILITY

TRUST

*GAFA: Google**A**mazon**F**acebook**A**pple
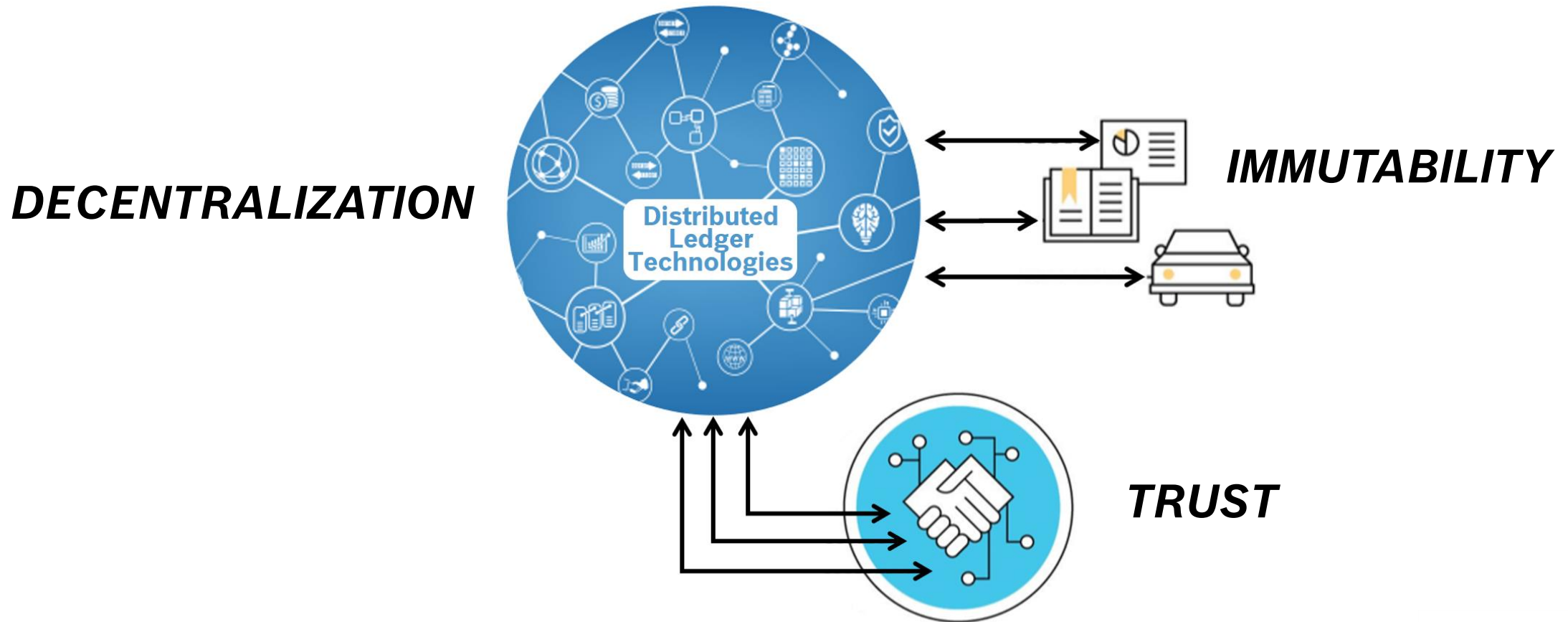
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Distributed Ledger Technology - Project "Economy of Things"
5-Steps Strategy of Bosch's DLT-Project

1 DIGITAL CURRENCY	**2** DIGITAL NOTARY	**3** DIGITAL IDENTITY	**4** SMART AGENTS	**5** ECONOMIC DEVICE
'HW eWallet'	'Track&Trace IoT Devices'	'Seamless Sign-on'	'M2M Brokering'	'Energy Trading'

DLT enables DECENTRALIZED algorithmic CONSENSUS suited for the ECONOMY OF THINGS

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Everybody wants to own the platform

plus

Nobody wants to be locked in on other platforms

results in

Small platforms without benefits of scaling networks

A new concept to break this deadlock

The Economy of Things

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Houston, we have a problem!
The Internet was built WITHOUT an Identity Layer

Problem

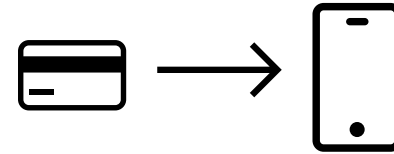▶ There isn't one identity provider that works for all

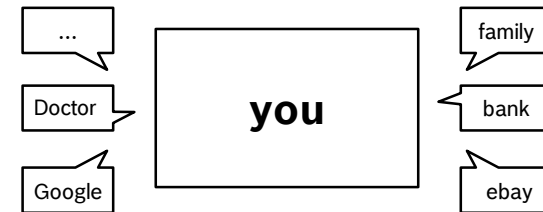▶ Growing threats to our internet privacy/security

Current model of Identity

Solution

▶ Decentralized Digital Identity: moving the physical Identity credentials to our digital devices

▶ The model that truly puts the Individual at the center

Self Sovereign Identity

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Self-Sovereign Identity
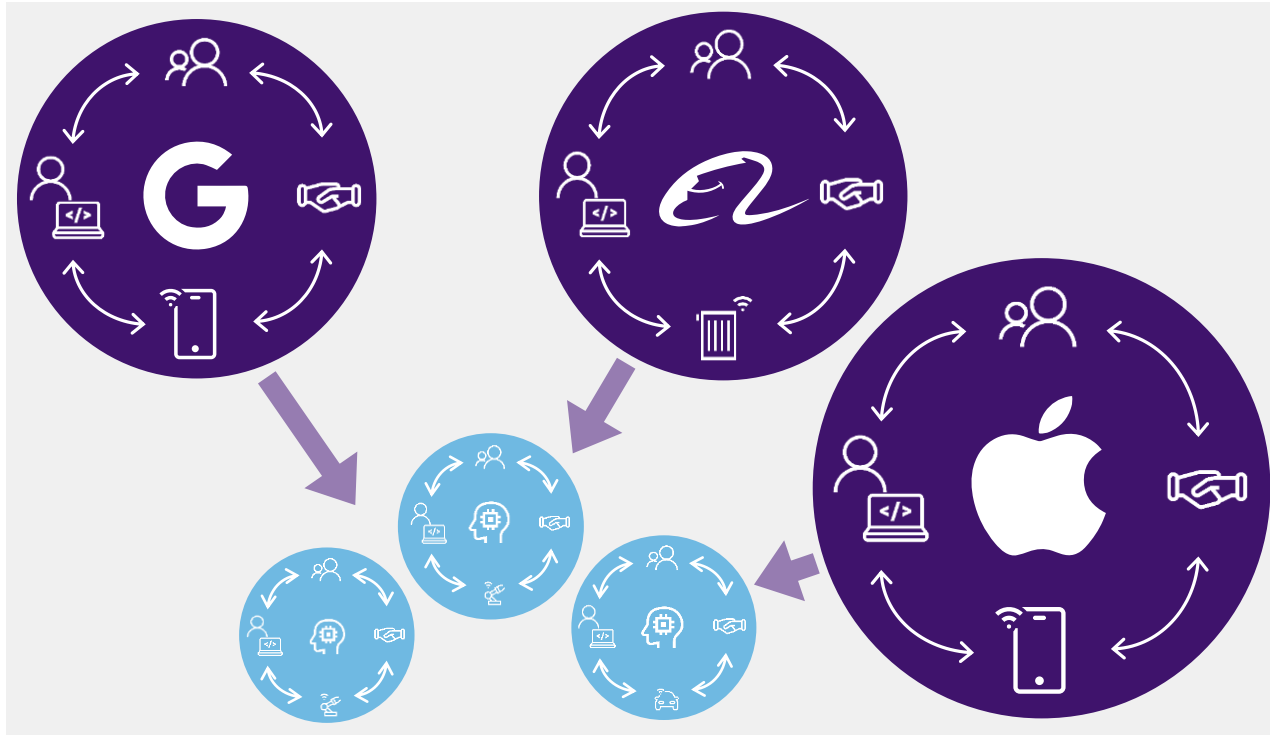## Status-quo: Rise of Monopolistic Platforms

Risks

▶ **Monopolistic platforms regulate** an increasing share of business models through control of:

  ▶ Distribution Channels,
  ▶ Revenue Streams,
  ▶ Customer Relationships

▶ **Hyperscalers compete with traditional companies** and leverage their power to attract new customers by subsidy of new business with traditional business

Monopolistic platforms and hyperscalers put competing market players and business models at risk.

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Self-Sovereign Identity
## Status-quo: Rise of Monopolistic Platforms

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Trust by Self-Sovereign Identity (SSI)
The Economy of Things needs a Trust Infrastructure

Service Platform

Decentralized Marketplace

Centralized Marketplace

Common trust infrastructure
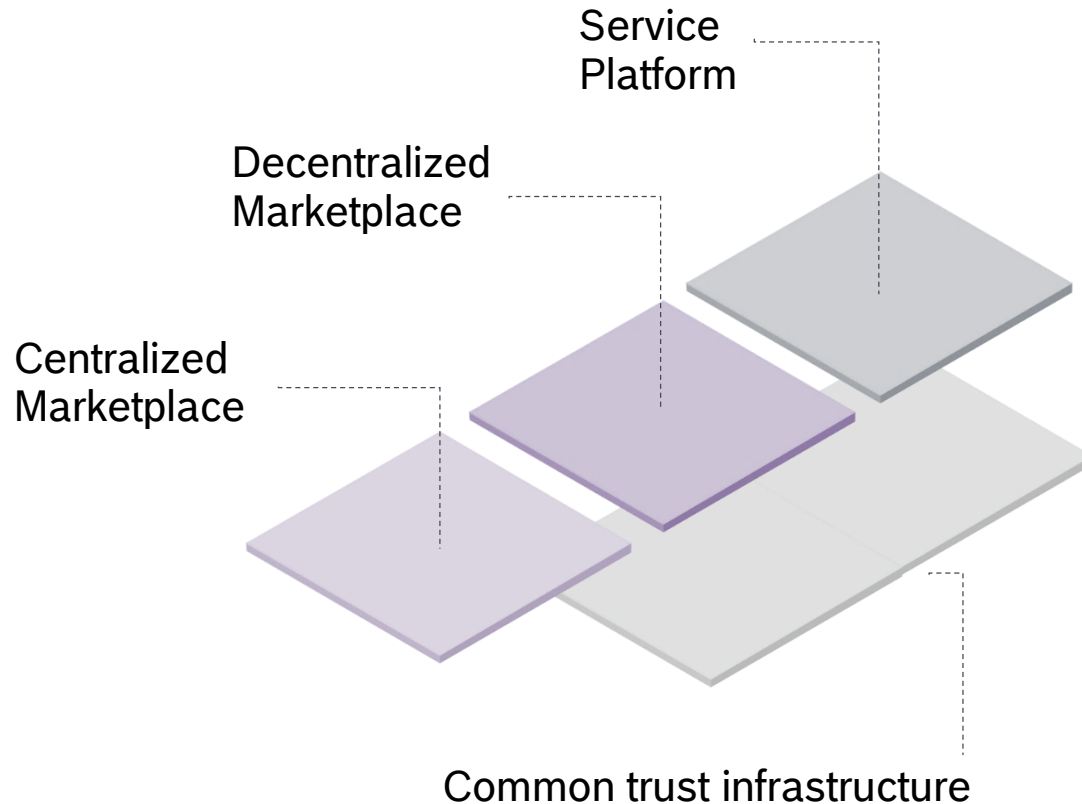
Decentralized Public Key Infrastructure (DPKI) (Distributed Ledger)

▶ Open Standards, not one platform

▶ Cryptographically-controlled Identifiers

▶ Cryptographically-verifiable Claims

▶ Privacy by Design

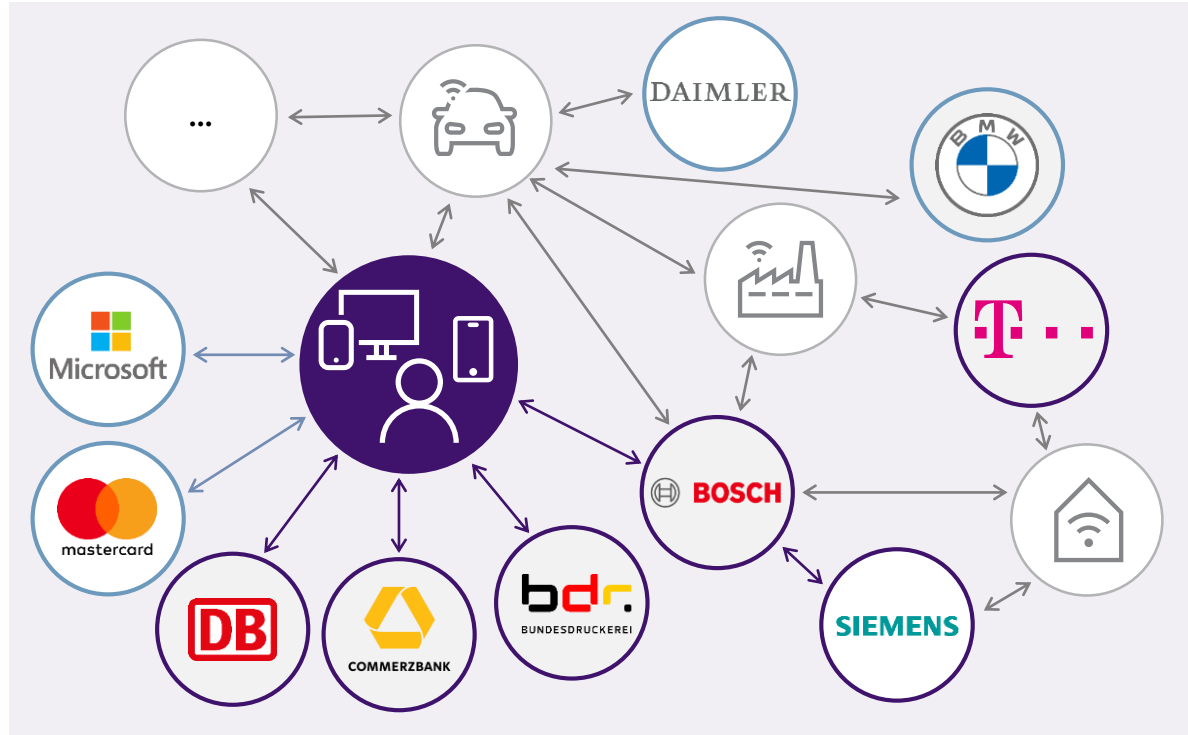**Emerging Open Standards for SSI**

Verifiable Credentials	W3C®
DID Auth	DIF / IETF
DKMS (Decentralized Key Management System)	OASIS
DID (Decentralized Identifier)	W3C®

Source: Drummond Reed / Evernym

SSIMEETUP   SSIMeetup.org

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Trust by Self-Sovereign Identity (SSI)
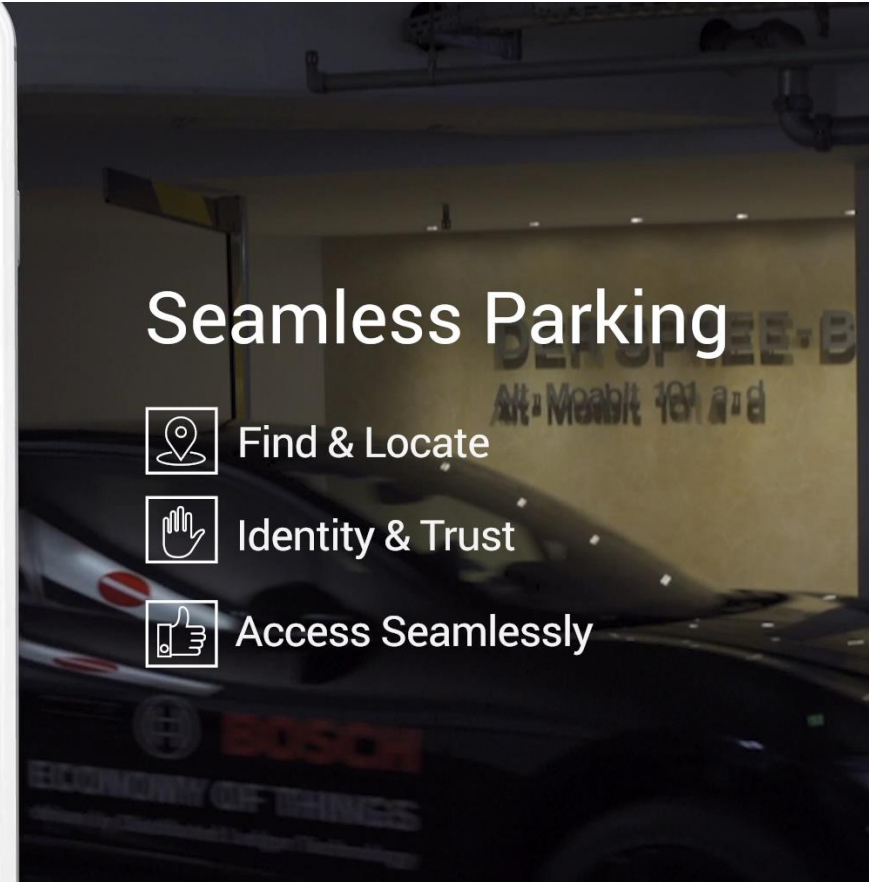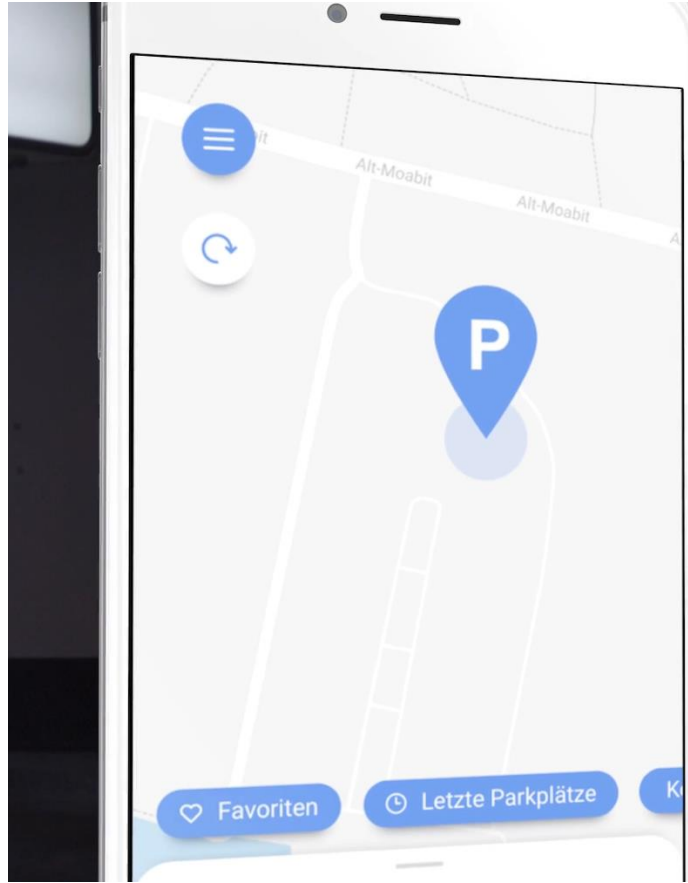## Opportunities of an SSI Ecosystem

Opportunities

▶ Trusted digital relationships
- ▶ Reduce risk of cybercrime by secure Authentication
- ▶ Verifiable Credentials empower Authorization decisions allowing more automation of business processes

▶ Guarantees data sovereignty (GDPR)
- ▶ Selective disclosure and consent management

▶ Cross-border Collaboration
- ▶ Enable easy on-boarding of different entities to existing/new digital services and ecosystems
- ▶ Supports different Solutions for different domains and entities (Organisation, Human, Machine)

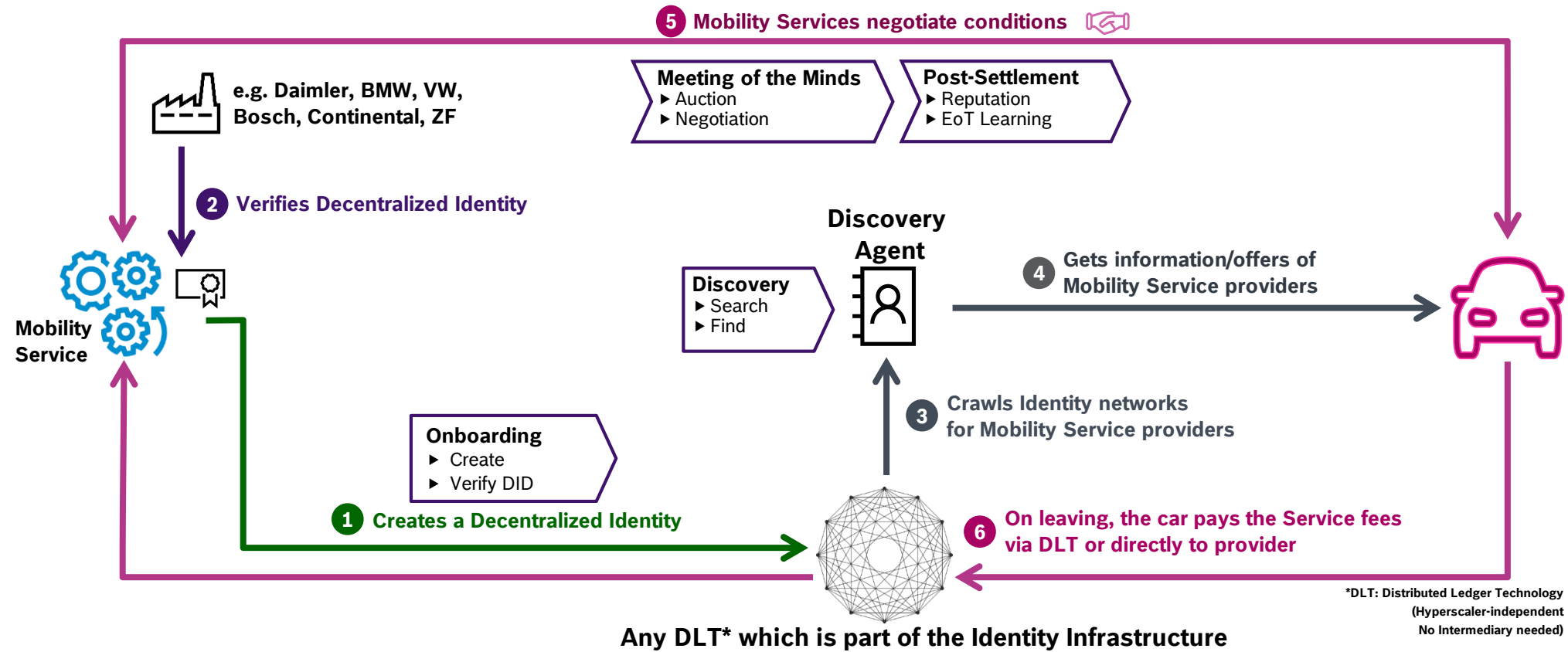**Protects business data sovereignty and supports cross-border collaboration.**

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Self-Sovereign Identity Mobility Use Case
Finding Spots you never would have expected...

Seamless Parking
- Find & Locate
- Identity & Trust
- Access Seamlessly

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Seamless Mobility Services with Self-Sovereign Identity
The Architecture…

⑤ Mobility Services negotiate conditions 🤝

e.g. Daimler, BMW, VW, Bosch, Continental, ZF

Meeting of the Minds
▶ Auction
▶ Negotiation

Post-Settlement
▶ Reputation
▶ EoT Learning

② Verifies Decentralized Identity

Discovery Agent

Discovery
▶ Search
▶ Find

④ Gets information/offers of Mobility Service providers

Mobility Service

③ Crawls Identity networks for Mobility Service providers

Onboarding
▶ Create
▶ Verify DID

① Creates a Decentralized Identity

⑥ On leaving, the car pays the Service fees via DLT or directly to provider

Any DLT* which is part of the Identity Infrastructure

*DLT: Distributed Ledger Technology
(Hyperscaler-independent
No Intermediary needed)

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# Distributed Digital Identities in Mobility
Conclusion and Summary

▶ IoT will be the future of most industries

▶ Trust is the crucial concept of the IoT

▶ BUT: The Internet was built

WITHOUT an Identity Layer

▶ Decentralization is inevitable for Trust

▶ SSI may be one element of the Trust Infrastructure

for the IoT and Ecomony of Things

▶ We are starting to implement it in our IoT Vision
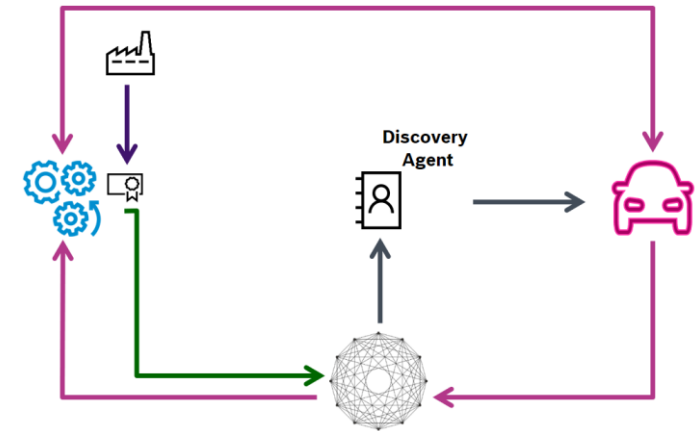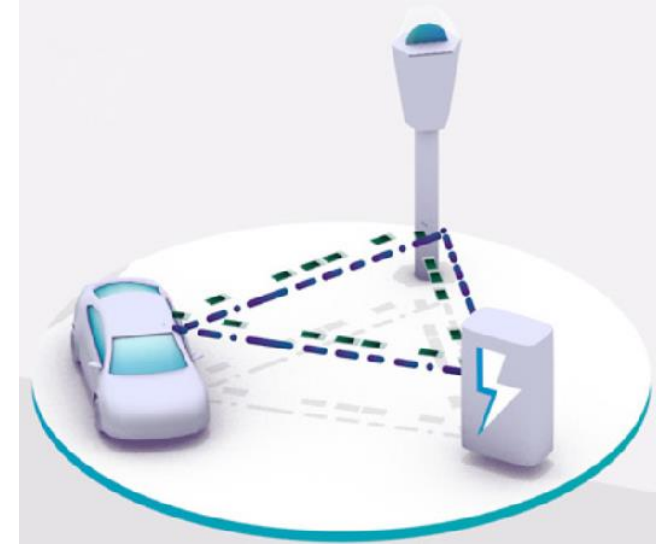
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Thank YOU!
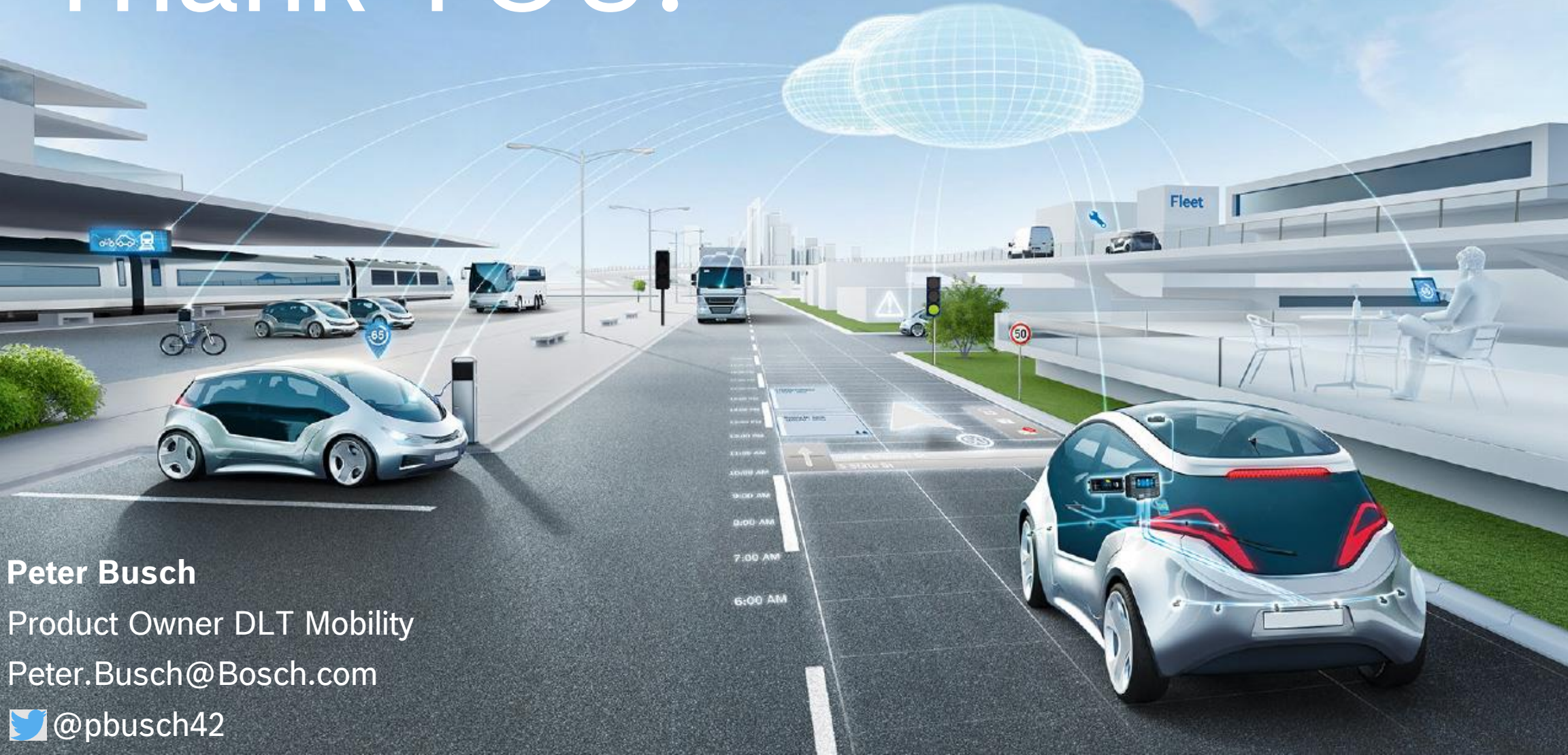
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