Virtueller Trust
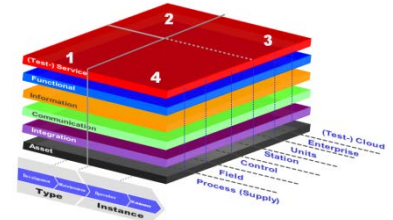
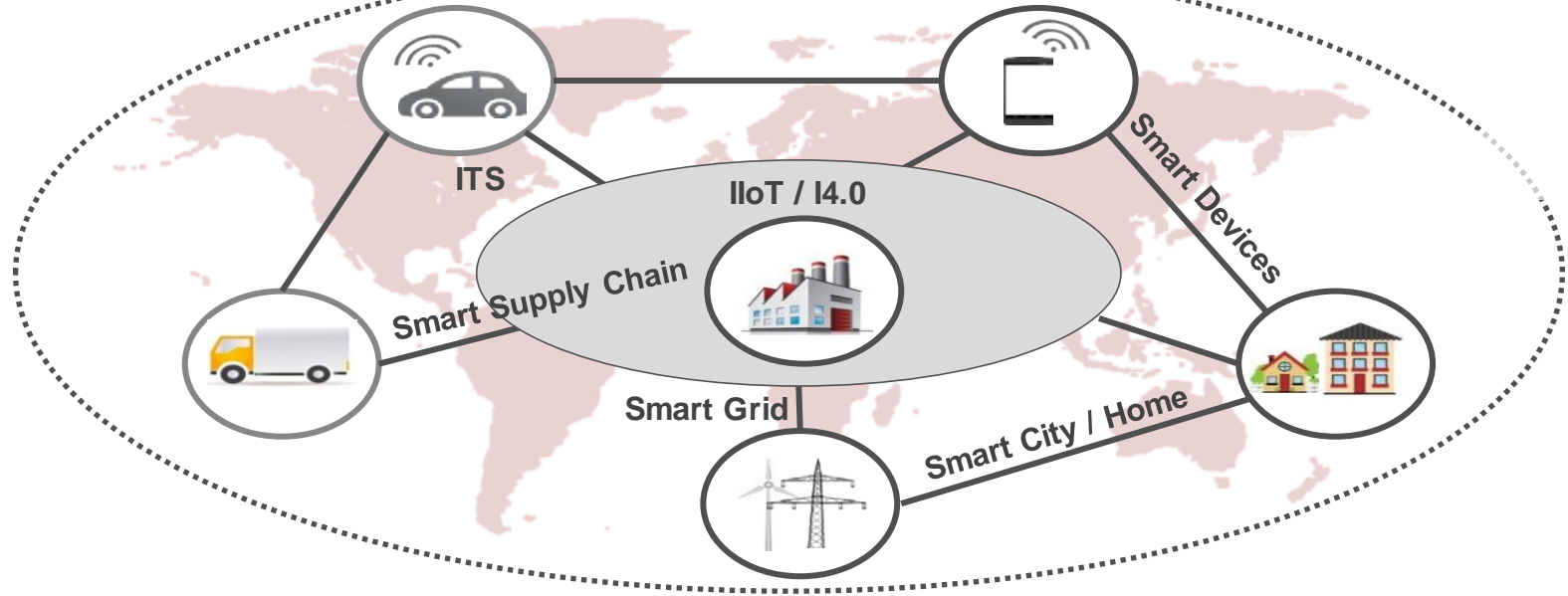**Die digitale Disruption in der Prüfwelt**

Markus Bartsch

Smart Service World

IoT and Smart Services
Localization of Func's

Smart Service

SIEMENS

BOSCH

·· T··

amazon.com

Google

BASF

BAYER

Beiersdorf

adidas

ebay

PUMA

IIoT / IoT

UI

Where are the Functionalities?

Inspecting – Testing – Cheating
Mode Switching

New Legislative Framework (EC 765/2008)
What about IoT?
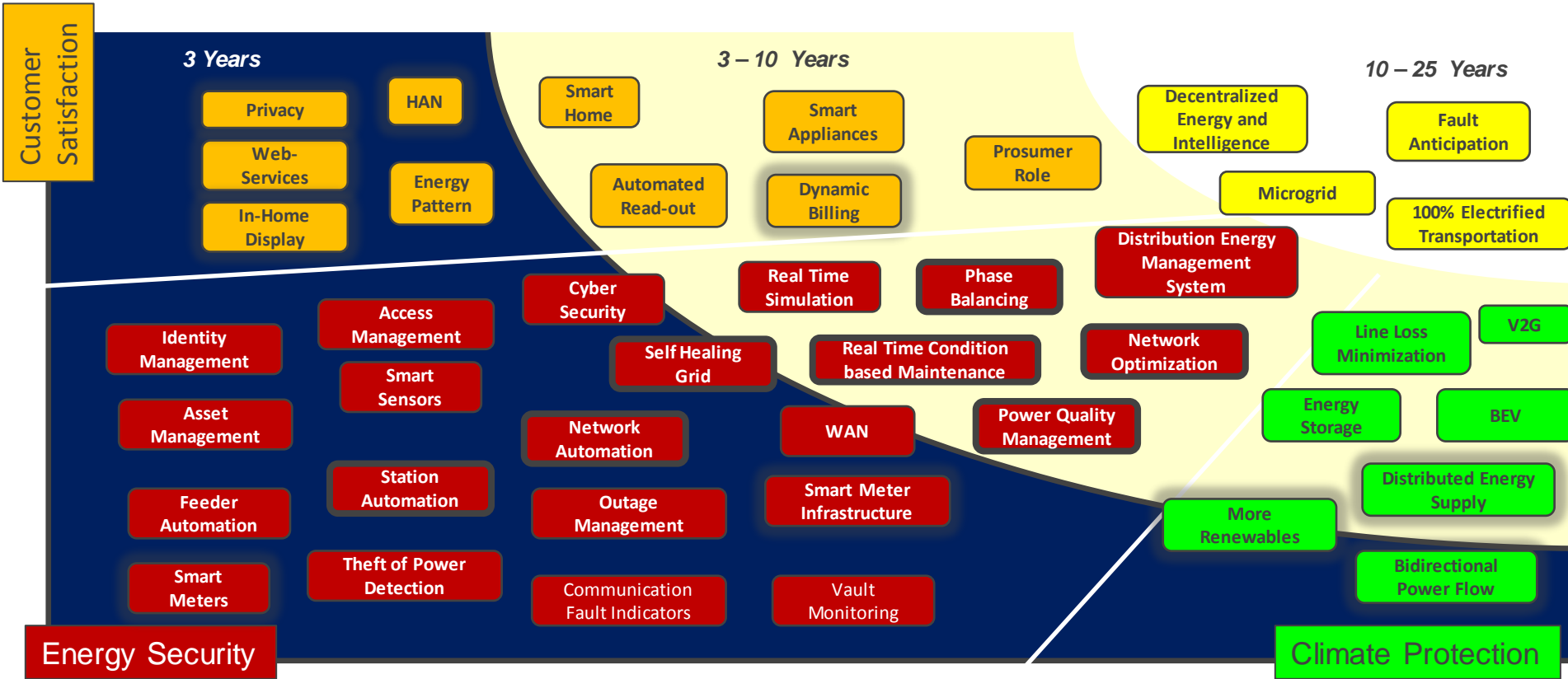
1. Toy Safety
2. Transportable pressure equipment
3. Restriction of Hazardous Substances in Electrical and Electronic Equipment
4. Construction products
5. Pyrotechnic Articles
6. Recreational craft and personal watercraft
7. Civil Explosives
8. Simple Pressure Vessels
9. Electromagnetic Compatibility
10. Non-automatic Weighing Instruments
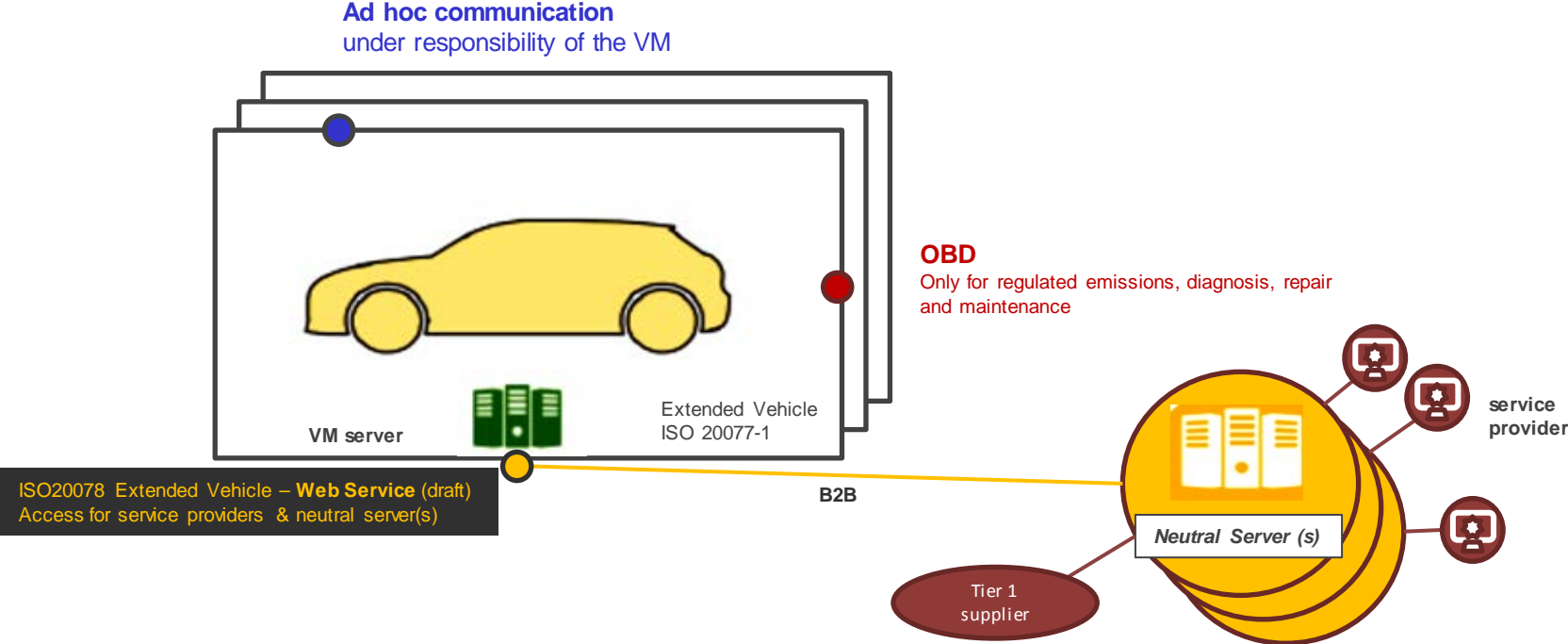11. Measuring Instruments
12. Lifts
13. ATEX
14. Radio Equipment
15. Low Voltage
16. Pressure Equipment
17. Marine Equipment
18. Cableway Installations
19. Personal Protective Equipment
20. Gas Appliances
21. Medical Devices
22. In Vitro Diagnostic (IVD) devices

Where are the Func's?
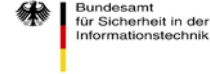**How to prevent mode switching?**

Example: Condition Monitoring - Energy

Example: Condition Monitoring – Automotive
Extended Vehicle / NEVADA

Ad hoc communication
under responsibility of the VM

OBD
Only for regulated emissions, diagnosis, repair
and maintenance

Extended Vehicle
ISO 20077-1

VM server

ISO20078 Extended Vehicle – **Web Service** (draft)
Access for service providers & neutral server(s)

B2B

service
provider

Neutral Server (s)
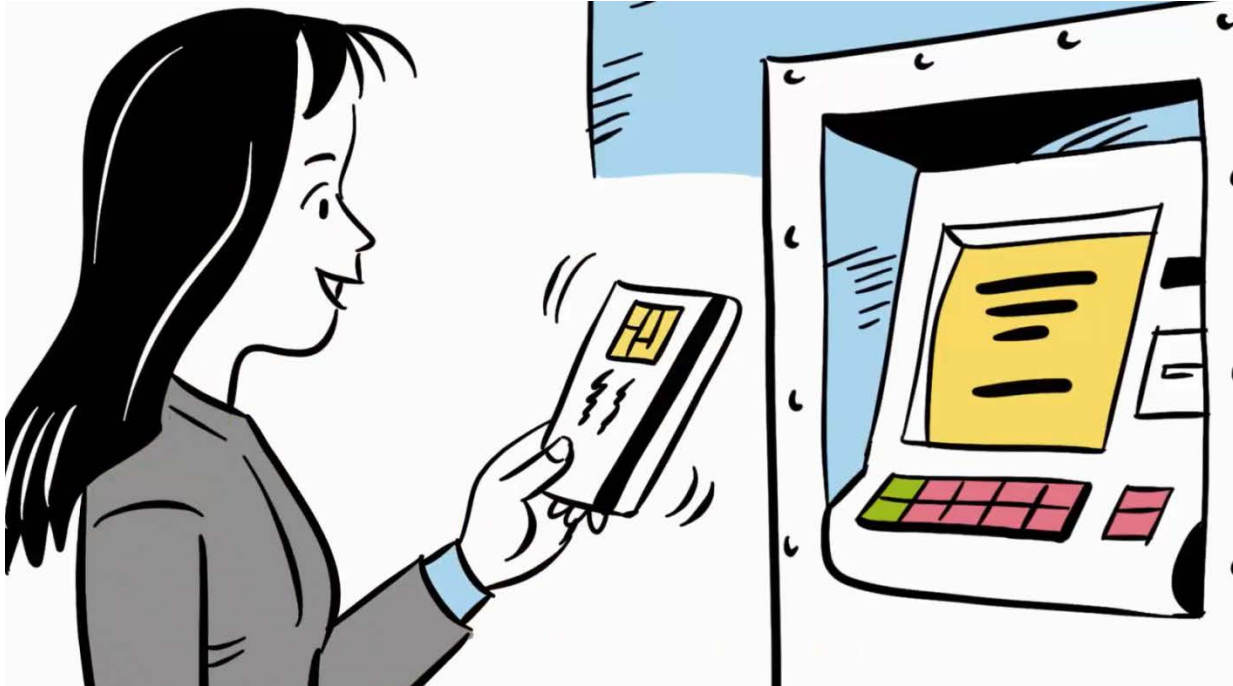
Tier 1
supplier

Solution: Energy
The German Smart Meter Gateway: The Calibration Log
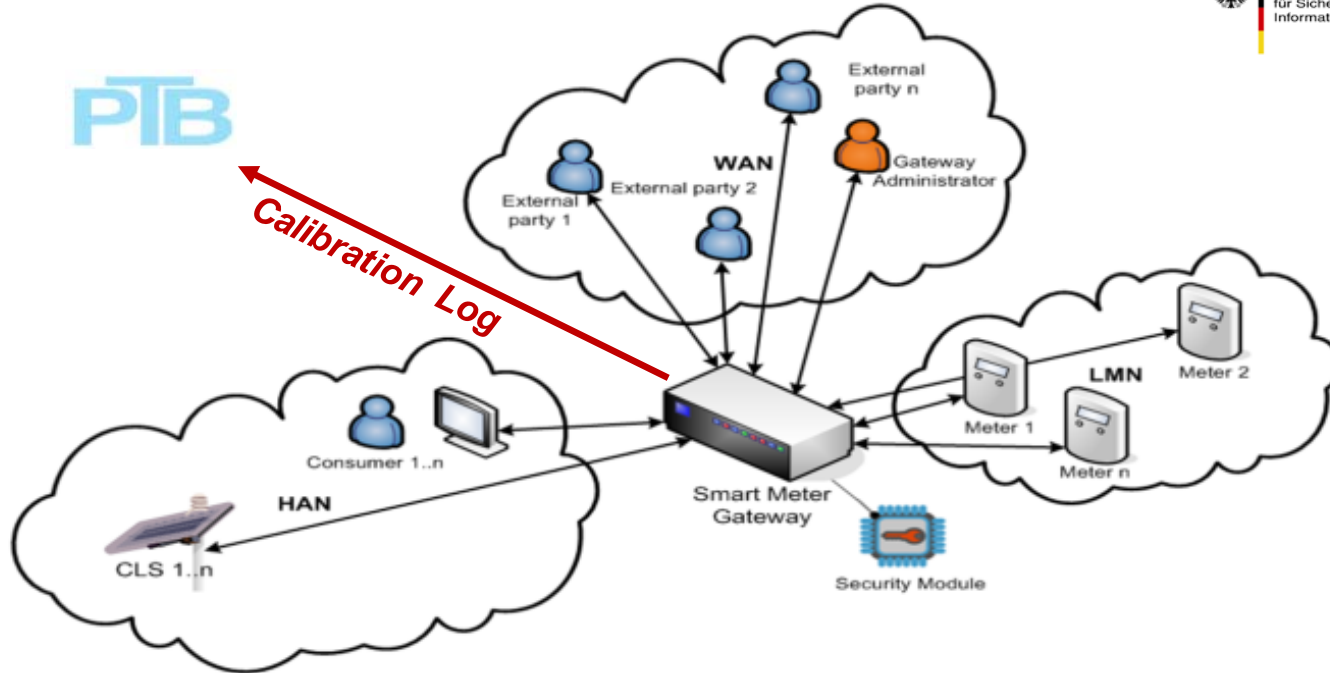
Solution: Banking

ATM: Clearing Process

Bank

Clearing

© TÜV Informationstechnik GmbH TÜV NORD GROUP
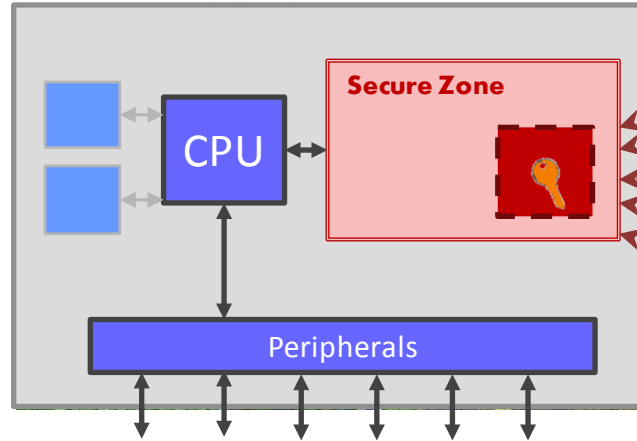
Possible Solution: Automotive
Automotive Platform
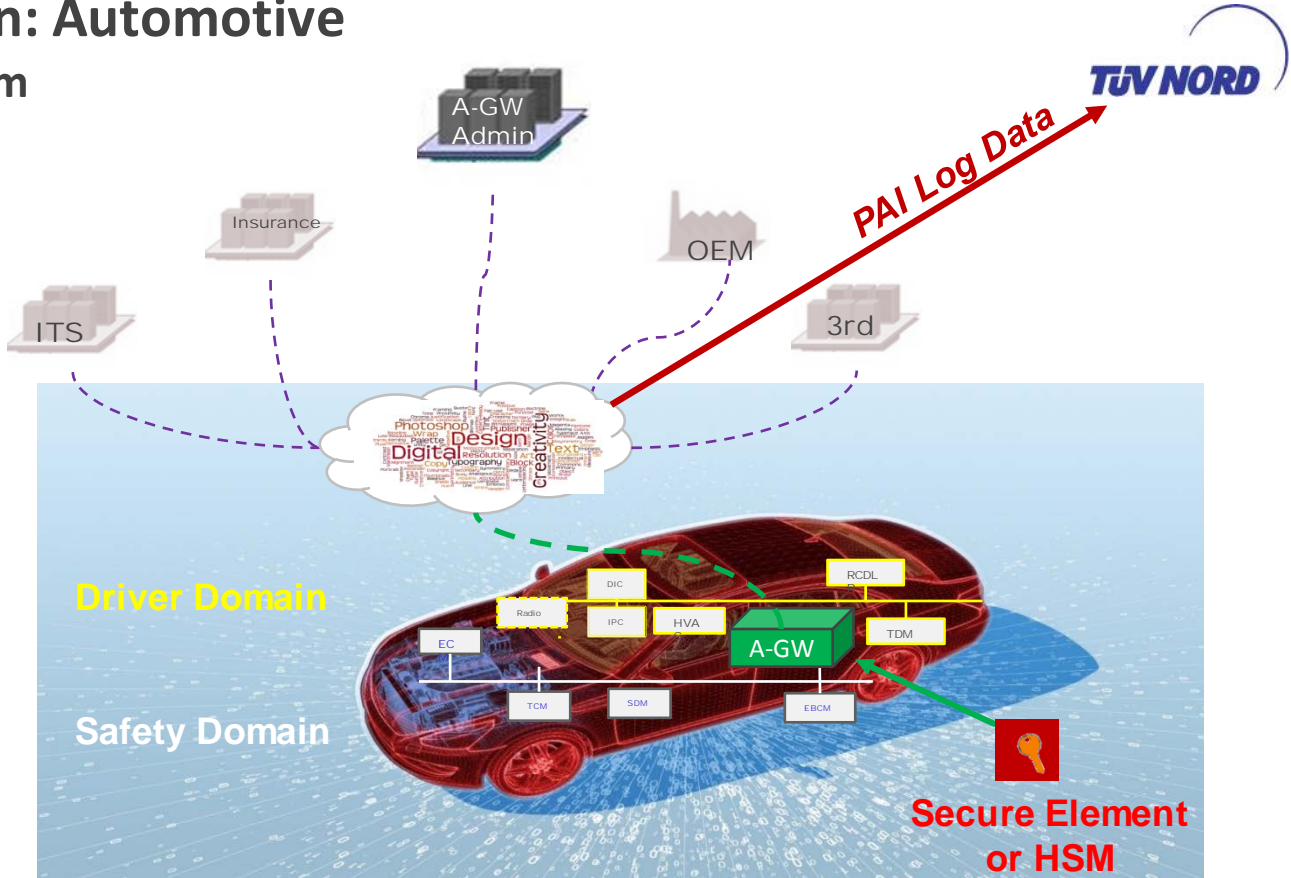
Secure Elements

Attacks

Electrical Stimulation
Energy & Particle Exposure
Inspection & Reverse Engineering
Physical manipulation
Electro-Magnetic Interaction / Radiation
Electrical Measurement
Communication

Secure Zone

CPU

Peripherals

Embedded

Applikation

Operating System

Hardware

Secure Zone

Logical Modules
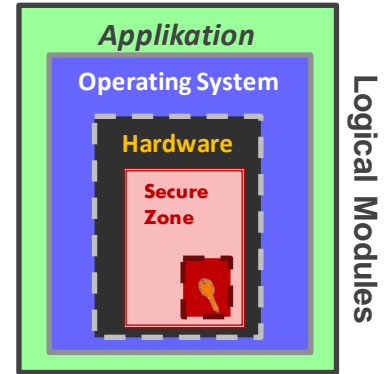
IoT and Smart Services
Smart Service → Condition Monitoring

IIoT / IoT

IoT-App

Gateway

Secure Element

https://youtu.be/hbYUhMabPFo
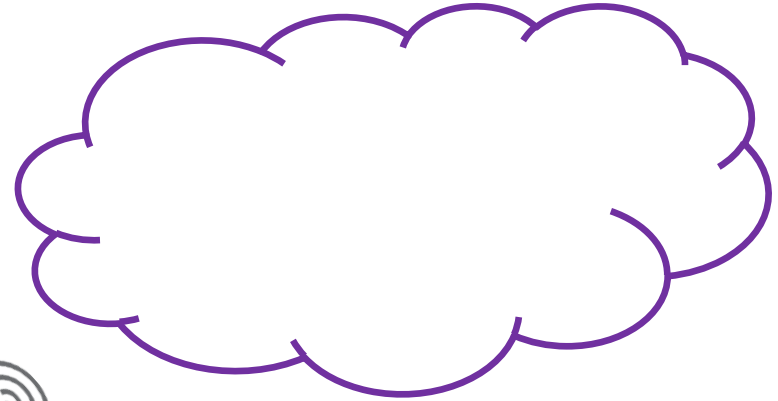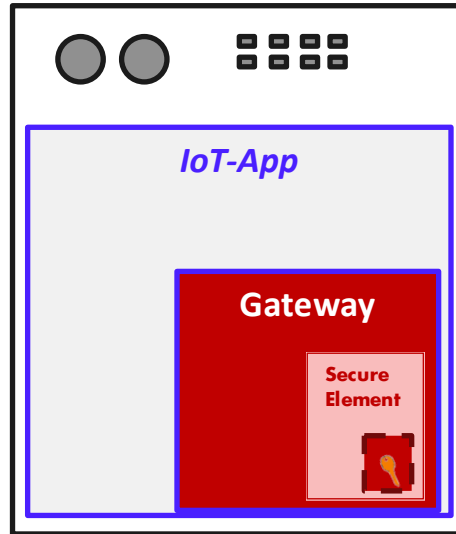
Persistent **A**utomated **I**nspection
Virtualized Inspections

- **ViT: V**irtual (*conformity*) **i**nspection and **T**rust Service for **IoT** / **IIoT** acc. to
    - Safety
    - Security
    - Quality

- „**Security-Verifier**":
    - Fully Automated Inspection (operated by Control Center)
    - Semi automated Inspection (Smartphone based)

Pre Condition: Rollout and Usage of **IT Security Technologies** (**Security Anchors**)

Persistent **A**utomated **I**nspection

Integration

Vendor
Service Provider

PAI Platform

IIoT / IoT

SecureElement
(Embedded)

UI

Monitor(-App)

© TÜV Informationstechnik GmbH TÜV NORD GROUP
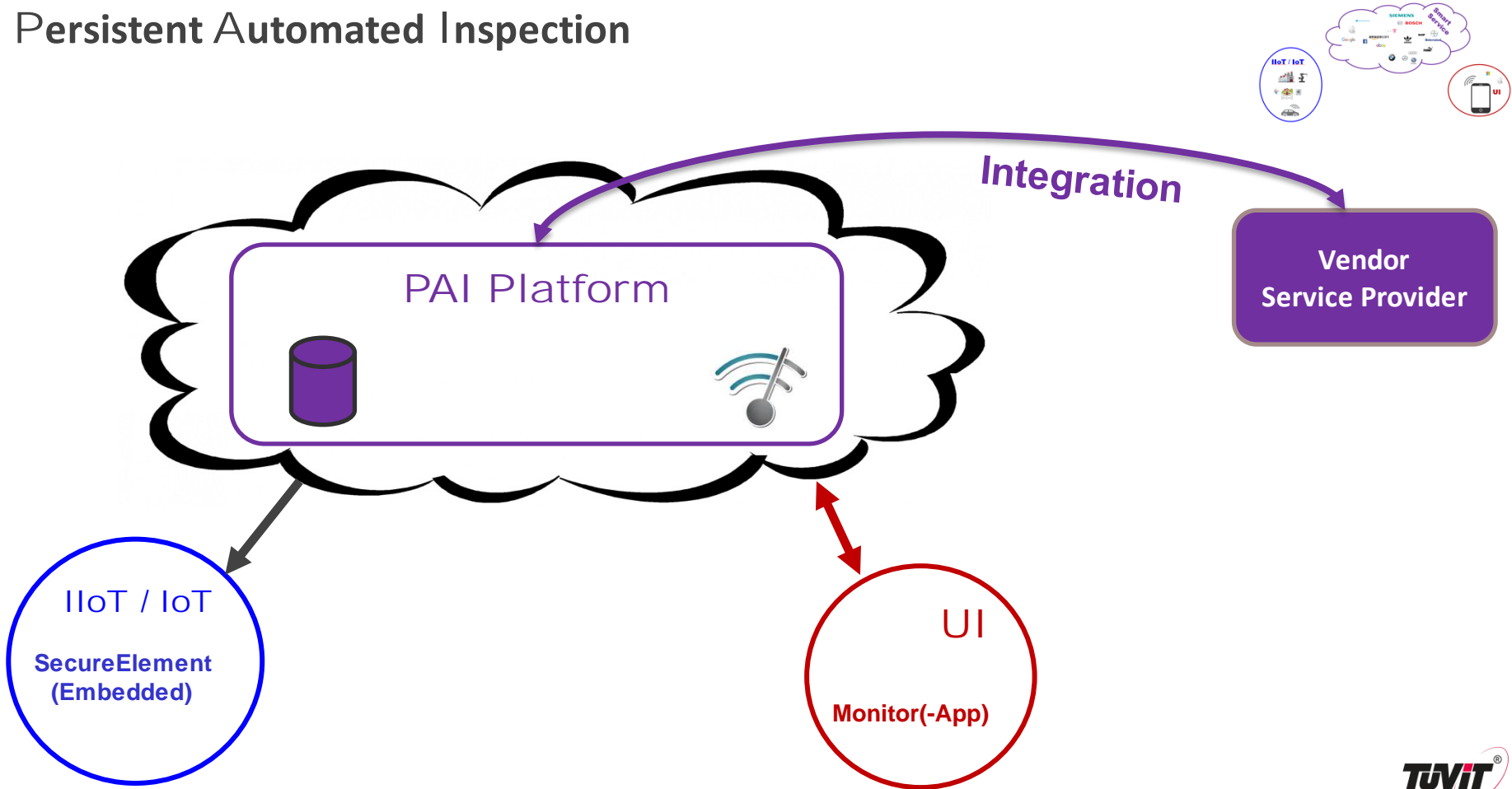
Persistent **A**utomated **I**nspection
real Example for PAI: Smart Meter Gateway

Integration

PAI Platform

**Vendor
Service Provider**

IIoT / IoT

**SecureElement
(Embedded)**

UI

Monitor(-App)
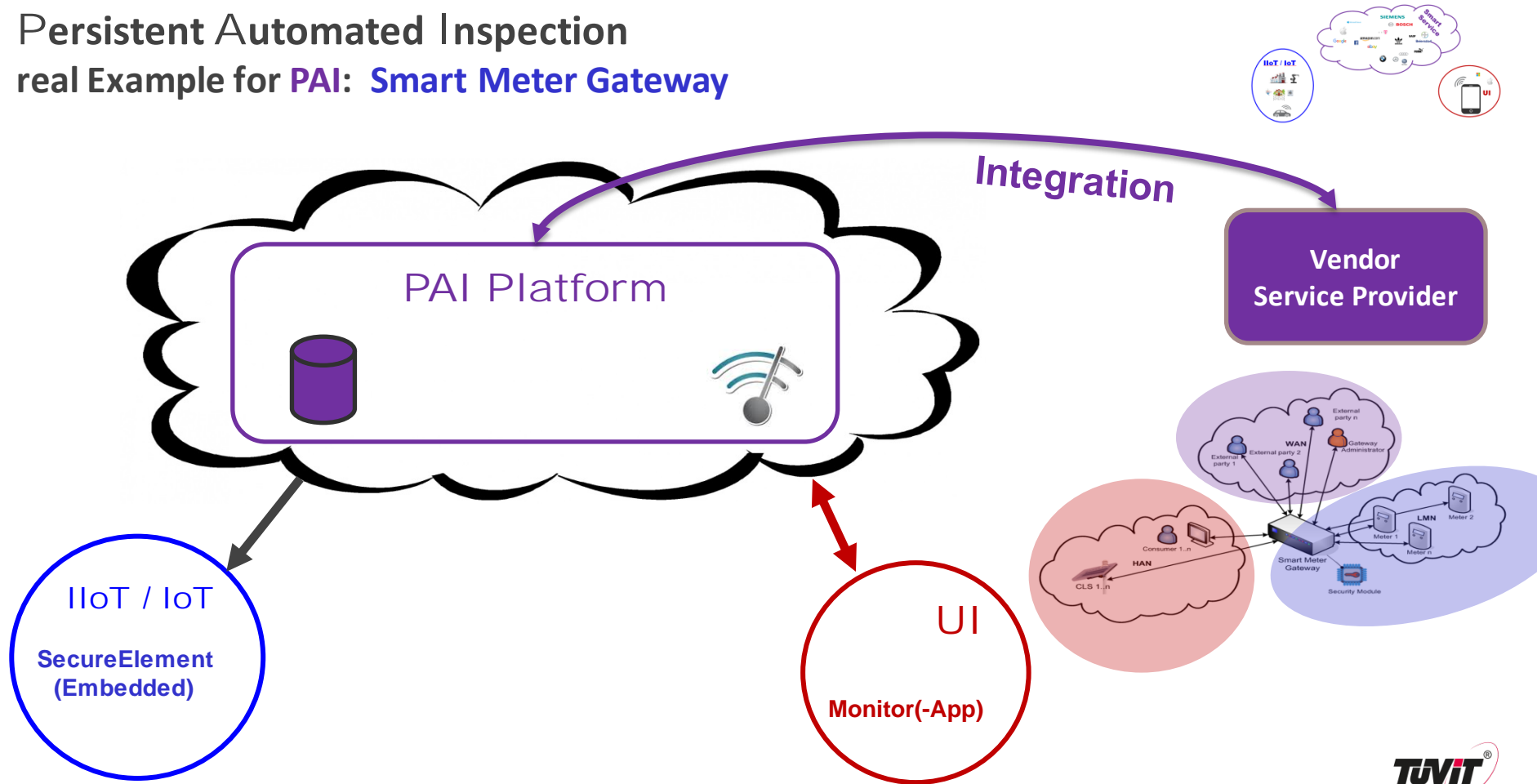
Persistent Automated Inspection
possible Example for PAI: Automotive Platform

Integration

PAI Platform

**Vendor
Service Provider**

IIoT / IoT

**SecureElement
(Embedded)**

UI

Monitor(-App)
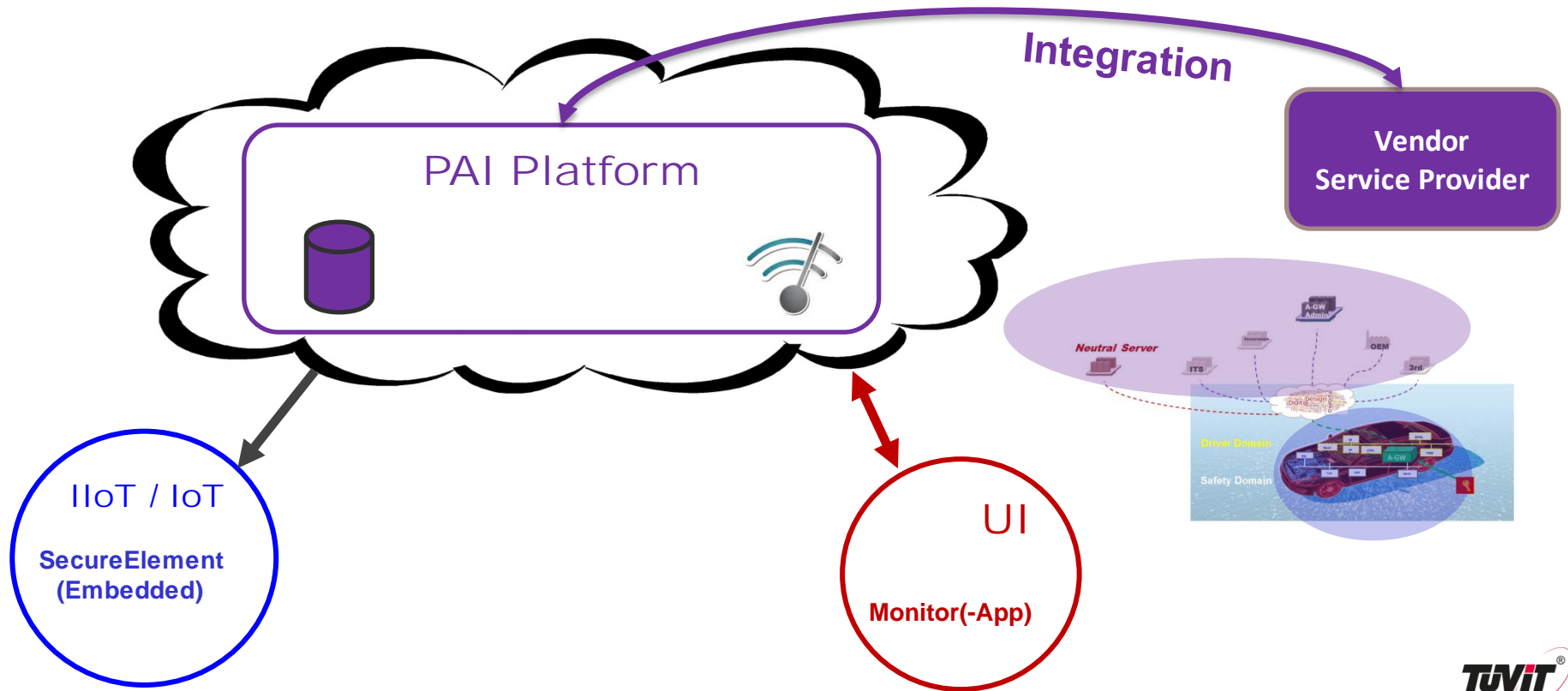
PAI: Architecture
Overview

Anchor Security Partner

Anchor

DB

Backend

Analytics

Vendor Service Provider

Frontend

Usage

Public

Toolbox

App   Control Center

Security-Anchor / Virtualization as Key Technology

- **Highly secured (Device-) Identities**
- **Trustworthy** *end2end* **Communication**
- **Signed Information (non repudiation)**

→ **Virtualization** (*usage of same Hardware*)

- **Usage of Vendor Hardware**
- **Own Hardware not neccessary**

Platform

- **Connectivity of Smart Services**
- **Modularized / agile Architecture**
- **Online**

→ **Trust**: Trustworthy	**Test Results**
→ **Report**: Reported	**Test Results**
→ **Repeat**: Reproducible	**Test Results**
→ **no Fraud**: Fraud resistant	**Test Results**
→ **Persistent**: permanent and stable	**Test Results**
→ **Agile**: flexible	*Test Service*
→ **Module**: Modular	*Test Service*
→ **Chain**: combinable	*Test Service*

TÜViT®

Security-Anchor / Virtualization as Key Technology

- Highly secured (Device-) Identities
- Trustworthy *end2end* Communication
- Signed Information (non repudiation)

→ Virtualization (*usage of same Hardware*)
  - Usage of Vendor Hardware
  - Own Hardware not neccessary

Platform

- Connectivity of Smart Services
- Modularized / agile Architecture
- Online

→ Trust: Trustworthy   Test Results
→ Report: Reported   Test Results
→ Repeat: Reproducible   Test Results
→ no Fraud: Fraud resistant   Test Results
→ Persistent: permanent and stable   Test Results
→ Agile: flexible   Test Service
→ Module: Modular   Test Service
→ Chain: combinable   Test Service

Where are the Func's? **– not important**
How to prevent mode switching? **– direct control and reaction**

New Legislative Framework (EC 765/2008)

1. Toy Safety
2. Transportable pressure equipment
3. Restriction of Hazardous Substances in Electrical and Electronic Equipment
4. Construction products
5. Pyrotechnic Articles
6. Recreational craft and personal watercraft
7. Civil Explosives
8. Simple Pressure Vessels
9. Electromagnetic Compatibility
10. Non-automatic Weighing Instruments
11. Measuring Instruments

12. Lifts
13. ATEX
14. Radio Equipment
15. Low Voltage
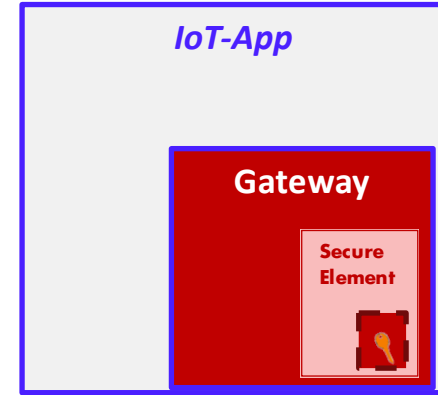16. Pressure Equipment
17. Marine Equipment
18. Cableway Installations
19. Personal Protective Equipment
20. Gas Appliances
21. Medical Devices
22. In Vitro Diagnostic (IVD) devices

New Legislative Framework (EC 765/2008)
IoT: Security

1. **Toy Safety**
2. **Transportable pressure equipment**
3. Restriction of Hazardous Substances in Electrical and Electronic Equipment
4. Construction products
5. Pyrotechnic Articles
6. Recreational craft and personal watercraft
7. Civil Explosives
8. Simple Pressure Vessels
9. Electromagnetic Compatibility
10. Non-automatic Weighing Instruments
11. **Measuring Instruments**

12. **Lifts**
13. ATEX
14. Radio Equipment
15. Low Voltage
16. **Pressure Equipment**
17. **Marine Equipment**
18. **Cableway Installations**
19. **Personal Protective Equipment**
20. **Gas Appliances**
21. **Medical Devices**
22. **In Vitro Diagnostic (IVD) devices**

IoT-App

Gateway

Secure Element

Persistent Automated Inspection
ViⁱⁱT

Persistent **A**utomated **I**nspection
Vi^iiT

Persistent Automated Inspection
ViⁱT – Virtual Inspections → Trust

Modularized:
ONE Platform
ONE Solution
for all inspections

Permanent Inspection
- Based on Source Data
- Highly secured
- Conform to GDPR

TÜV Informationstechnik GmbH

Member of TÜV NORD Group

Markus Bartsch
IT Security

Langemarckstrasse 20
45141 Essen, Germany

URL: www.tuvit.net

TÜViT®
TÜV NORD GROUP