Combating mobile device theft with Blockchain

Raja Prasad Gupta, Solution Architect, SAP
Aseem Gaur, Vice President, Camelot ITLab
Stephan Westermeyr, Vice President of Order Management and Billing, Deutsche Telekom

Session ID 84010

About the Speakers

Raja Prasad Gupta

- Solution Architect, SAP
- Cloud and Blockchain specialist at SAP Labs India.
- Has spent around 10 years in the IT industry, leading various implementation projects in SAP Labs India.
- Living my childhood again with my 1 year old son

Aseem Gaur

- Vice President and Global Head, Camelot ITLab
- 15 years of international business experience
- Seasoned business executive with focus on strategic partnerships & innovations
- Dog lover

Stephan Westermeyr

- Vice President of Order Management, Billing & BI, Deutsche Telekom
- 20 years in IT in many different leadership roles in- and outside DT
- Experienced in agile development and driving innovation
- Loves motorcycling

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Key Outcomes/Objectives

1. Understand SAP's major offerings in Blockchain

2. Develop and run a blockchain application using Hyperledger Fabric in SAP Cloud Platform

3. Learn how Camelot ITLab is using SAP Blockchain to combat mobile theft

Agenda

- What is Blockchain?
- SAP Cloud Platform Blockchain Services
- How to develop and run a blockchain application using Hyperledger Fabric
- Deutsche Telekom
- Global IMEI Storage and Services Use Case
- Demo
- Q/A

What is Blockchain?

"An architectural concept that offers an **open**, **distributed ledger** that can record transactions between parties efficiently and in a **verifiable** and **permanent way**"

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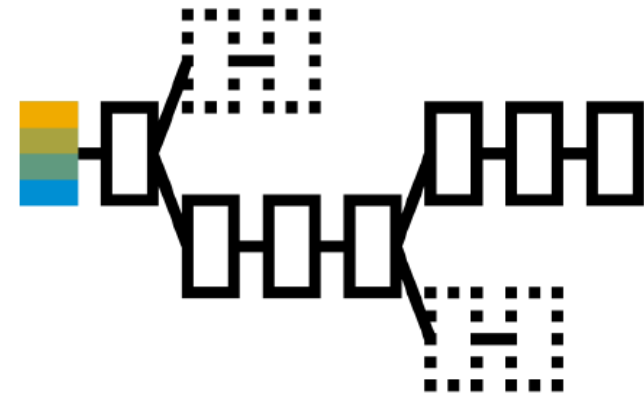
"Just because blockchains have been overhyped does not mean they are useless."

The Economist, Aug 2018, "Bitcoin and other cryptocurrencies are useless. For blockchains, the jury is still out"

Blockchain Value Drivers for Business
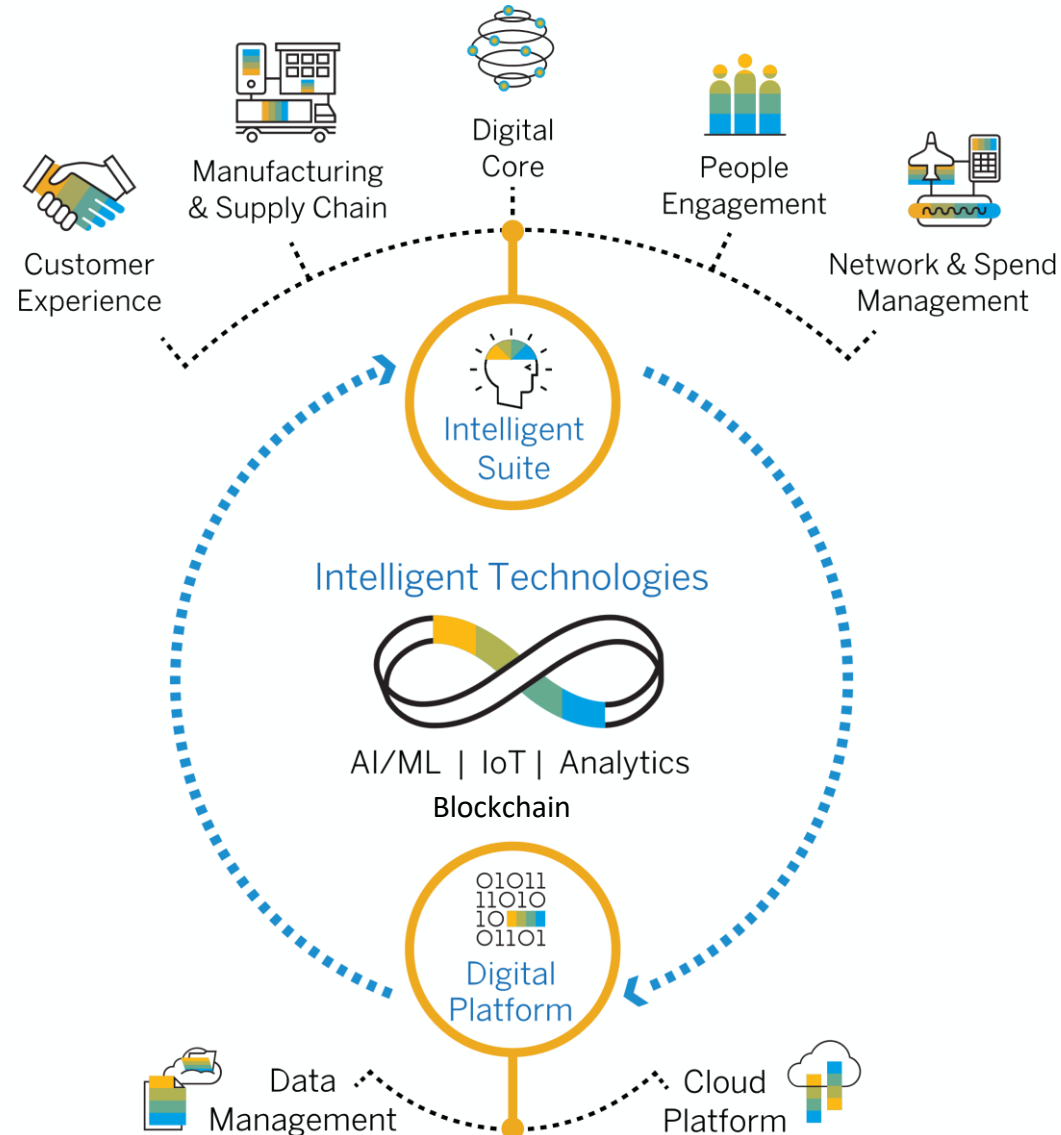
Process Optimization

Time & Cost Reduction

Transparency & Auditability

Risk & Fraud Minimization

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SAP Strategy – Deliver The Intelligent Enterprise

THE INTELLIGENT ENTERPRISE

features 3 KEY COMPONENTS:

Customer Experience

Manufacturing & Supply Chain

Digital Core

People Engagement

Network & Spend Management

Intelligent Suite

Intelligent Technologies

AI/ML | IoT | Analytics

Blockchain

Digital Platform

Data Management

Cloud Platform

1 Intelligent Suite

2 Digital Platform

3 Intelligent Technologies

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SAP Cloud Platform Blockchain Service

Combine **Distributed Ledger** with **Internet of Things** and **Machine Learning** capabilities on one platform

Integrate into existing **Blockchain Ecosystem**

Build Blockchain **industry and LoB process extensions** for SAP and Non-SAP

- **Hyperledger Fabric** on SAP Cloud Platform

- **MultiChain** on SAP Cloud Platform

- **Quorum** on SAP Cloud Platform

- Blockchain Application Enablement

- SAP HANA Blockchain service
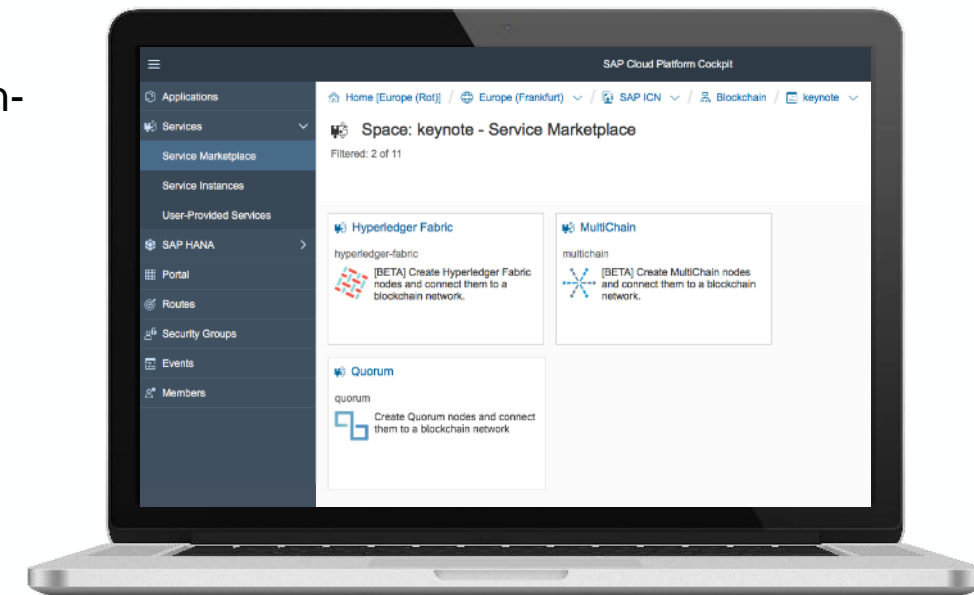
Hyperledger Fabric on SAP Cloud Platform

Hyperledger Fabric is a blockchain framework implementation hosted by The Linux Foundation, SAP is Premier Member
Our offering: Based on their scenario, customers can choose the corresponding plans.
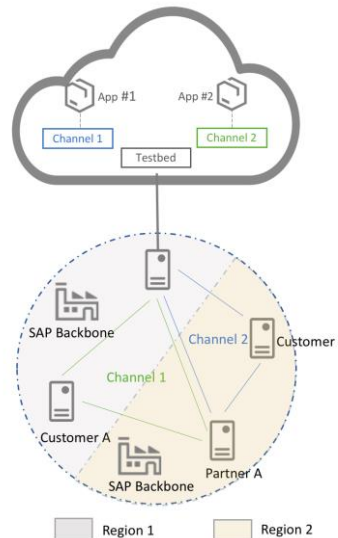
Developer Story

- Sandbox for chain code development and testing
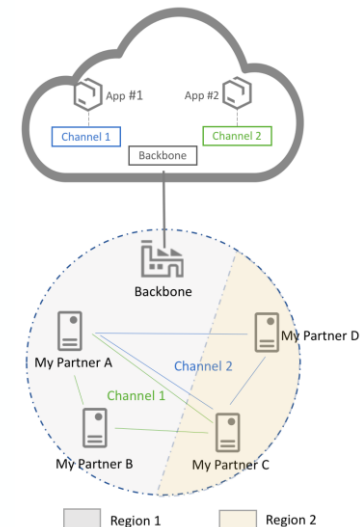- Ability to move to productive setup
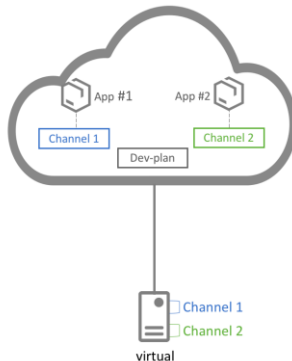
Try the Landscape Testnet

- Easy entry and low barrier to get started
- Explore business process between companies
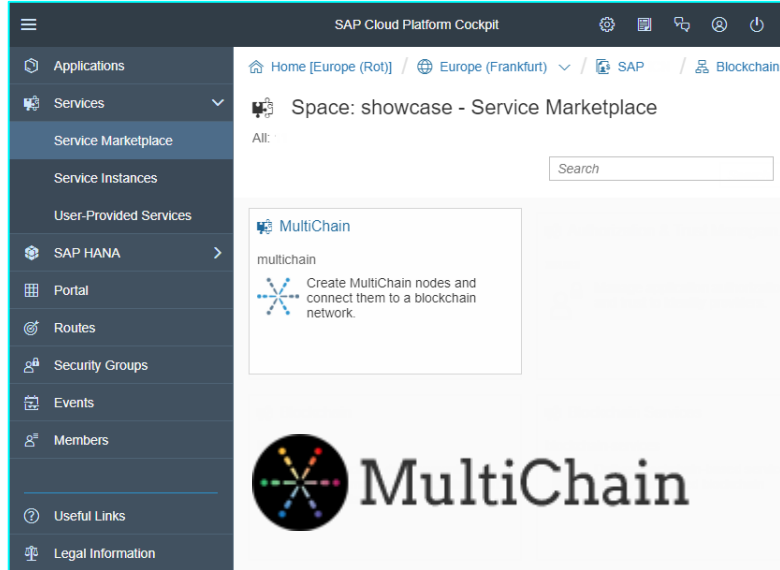- Cross-datacenter setup

Build Your Network

- Dedicated network for industry or process specific purposes
- Cross-datacenter setup

MultiChain on SAP Cloud Platform

MultiChain helps organizations to build and deploy blockchain applications with speed.

Developer friendly
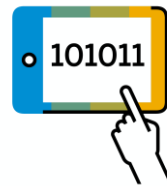
Designed to let developers build blockchains and applications with minimum hassle.

Customizable for Enterprise use

Full control over every aspect of the blockchain, such as permissioning.
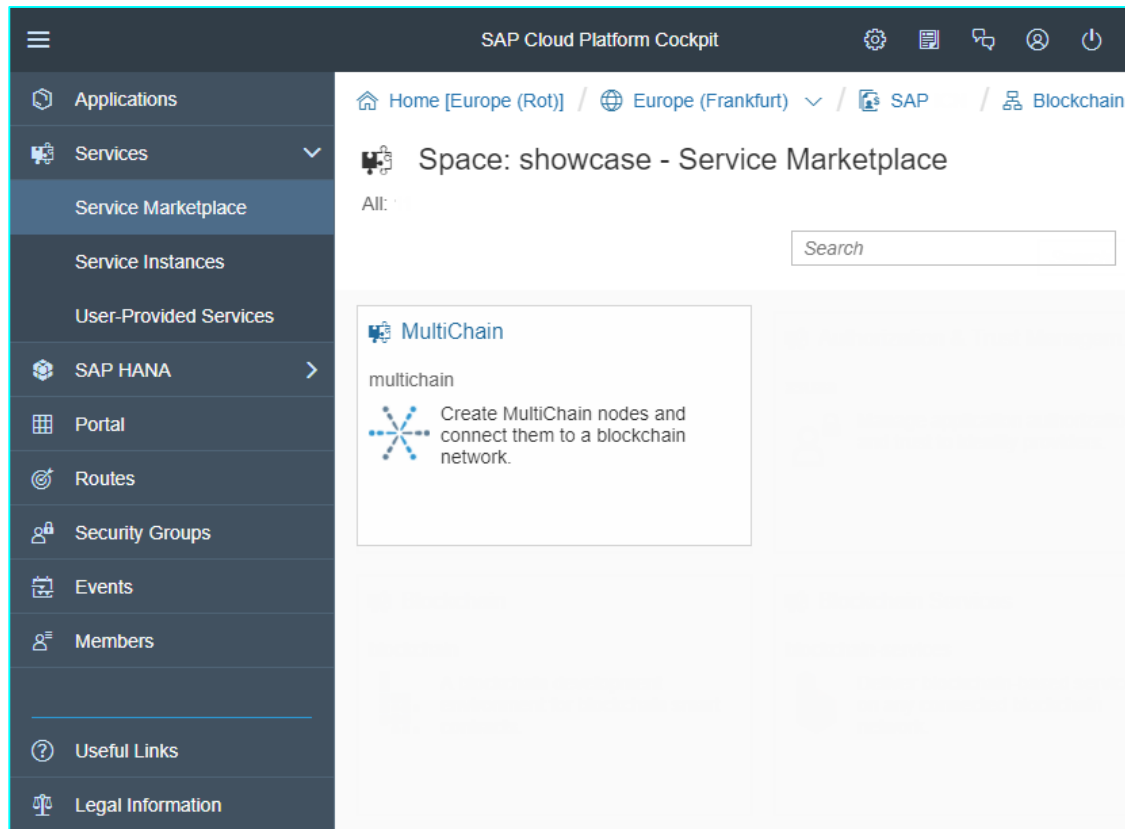
Flexible security

Supports multi signatures, external private keys and administrative consensus.

MultiChain on SAP Cloud Platform

MultiChain is an established blockchain fork, based on the Bitcoin protocol. It primarily supports scenarios for Data Storage & Retrieval and Asset Transfer

Highlights

- Part of SAP Cloud Platform Blockchain offering
- 100% MultiChain scope supporting streams and assets
- Dedicated, networked nodes per service instance
- Explore network, collaboration and business process between companies
- Option to integrate 'cloud-to-cloud' and 'cloud-to-on premise'
- Cross-datacenter setup supported
- Explore the data on the MultiChain node/network using the SAP MultiChain Dashboard
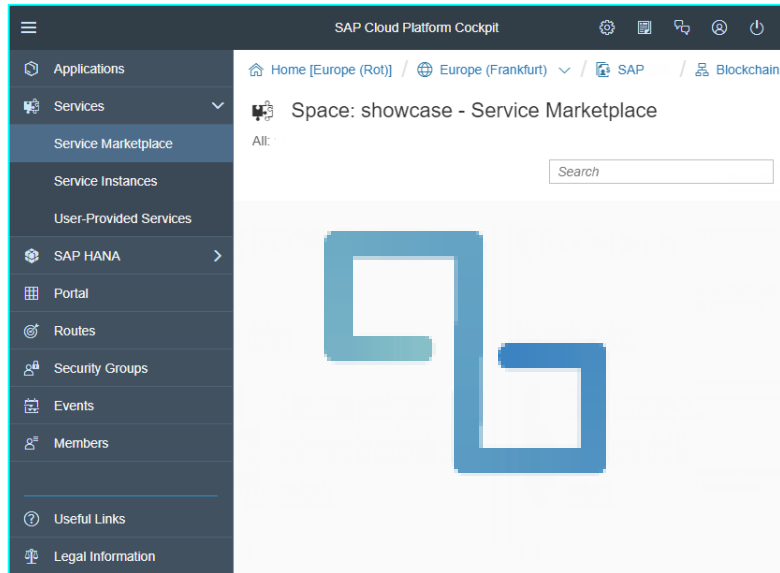
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Quorum on SAP Cloud Platform

Quorum is an enterprise-focused, open source version of the Ethereum distributed ledger and smart contract platform

Permissioned Setup

Speedy transactions with high throughput of private transaction within permissioned setups

Security

Allows for cryptographically assured, private settlement of digitized assets on Quorum.

Smart Contracts

Existing Ethereum smart contracts remain network-transparent on Quorum out of the box

Quorum on SAP Cloud Platform
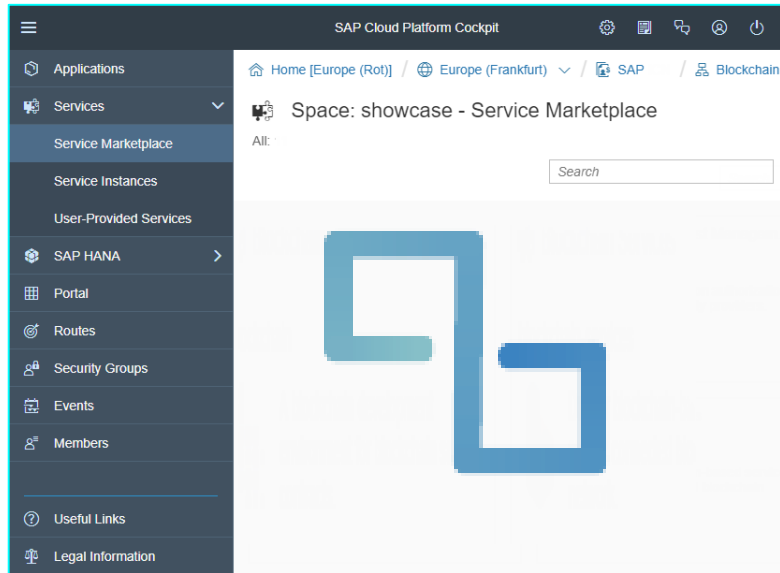
Quorum is an enterprise-focused, open source version of the Ethereum distributed ledger and smart contract platform

Developer Story

- Sandbox for smart contract development, deployments and testing
- Shared infrastructure to minimize budget requirements

Test network

- Provision your own node to become part of predefined network together with other participants
- Explore business process between companies and node interaction

Bring your own network

- Run blockchain technology on infrastructure of your choice
- Connect business processes and applications via SAP Cloud Platform

SAP HANA Blockchain service

Advanced analytics and transactions on business and blockchain data

Common SQL interface for database and blockchain data

Transparent real-time data synchronization between SAP HANA and blockchain ecosystems

Straightforward integration
with 3rd-party blockchain ecosystem
via SAP Cloud Platform

SAP
Cloud Platform
Blockchain service

SAP HANA

Business
Data
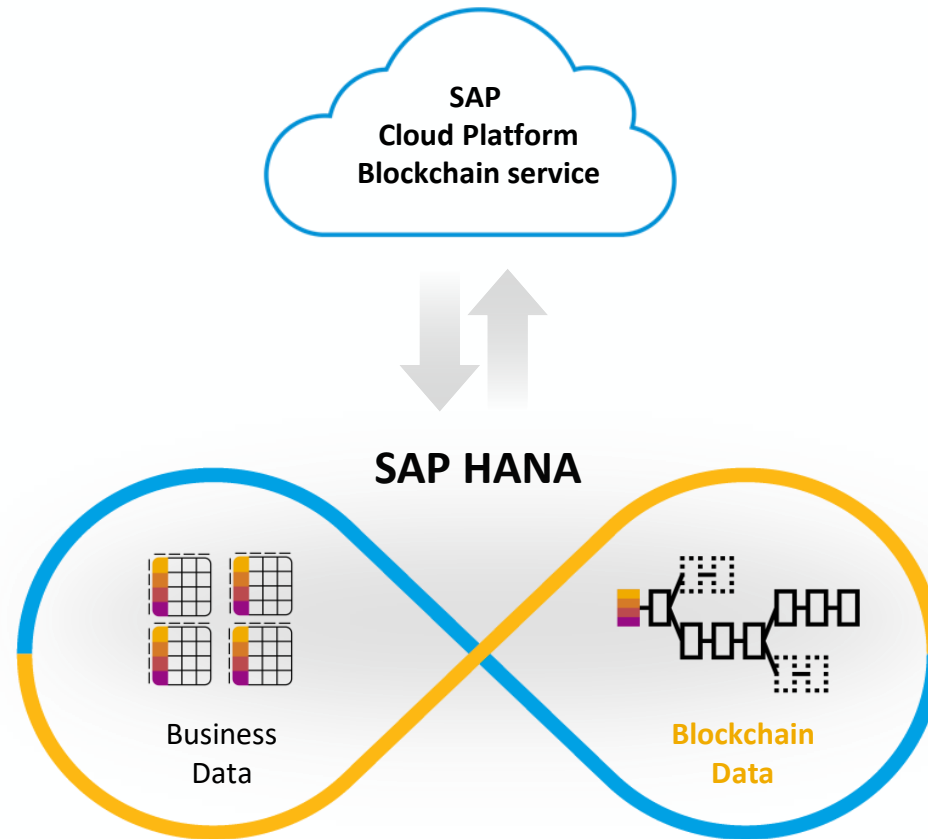
Blockchain
Data

Benefit

Establish trust, traceability, and transparency streamlining business processes across the entire business landscape

Remove the barriers to blockchain adoption and simplify multi-party transactions on one platform

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Blockchain application enablement services on SAP Cloud Platform

Integrated blockchain capabilities into business applications

Using these services, applications can be developed/adapted to integrate blockchain capabilities without using blockchain technology specific coding and thus isolate the business application from a specific blockchain technology.

Blockchain Technologies

HYPERLEDGER FABRIC
Channel

MultiChain
Stream

Other Technologies

Service instance | Service key

Blockchain Services

Service instance | Service key

Timestamp (hash values) | **proof-of-state** (object state) | **proof-of-history** (object history) | ...

Cloud Applications

Service binding

```
else if (data.action === 'write') {
    request.post({
        uri: baas_options.serviceUrl + "timestamps/" + data.key,
        json: true,
        headers: {
            Authorization: "Bearer " + access_token
        }
    }
```

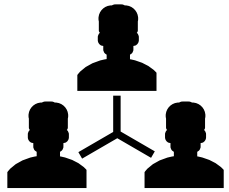# SAP Blockchain Co-Innovation Program – more than 90 participants

Deutsche Telekom Profile

CUSTOMERS & MARKETS

CUSTOMERS

- 168 mn mobile customers 28 mn fixed-network lines/ 19 mn broadband lines
- Approx. 7.4 m TV customers

MARKETS

- Present in > 50 countries
- Germany, Europe and the USA: with own infrastructure
- T-Systems: global presence & alliances via partners

FACTS & FIGURES
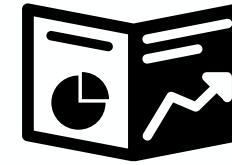
TELEKOM IN FIGURES, 2017

- Revenue € 74.9 bn
- Adjusted EBITDA € 22.2 bn
- Free Cash-Flow € 5.5 bn

EMPLOYEES & RESPONSIBILITY

- Employees worldwide: 217,349
- 6,559 trainees and cooperative degree students in Germany
- Pioneer of social issues (climate protection, data privacy, diversity, etc.)

Our AMBITION: LEADING EUROPEAN TELCO

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Mobile Device Theft On A Global Scale

Each year, global mobile device thefts number in the millions

▶ Mobile devices and the personal information stored on them are consistently among the highest priority targets for thieves throughout the world

▶ Studies estimate that by now, 1 in 10 smartphone owners in the US have been victims of phone theft in one form or another

▶ IDG Research:

▶ 68% of phone theft victims are willing to put themselves in some amount of danger to retrieve a stolen device

▶ 10% report loss of confidential company data

▶ 9% had their identity stolen

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Current Solution for Combating Device Theft

Common EIR

IMEI's
Black, white or grey list

Update of IMEI Status

IMEI check during the session (high signaling load) or at location update etc.

EIR = Equipment Identity Register

PLMN = public land mobile network

IMEI = International Mobile Equipment Identity
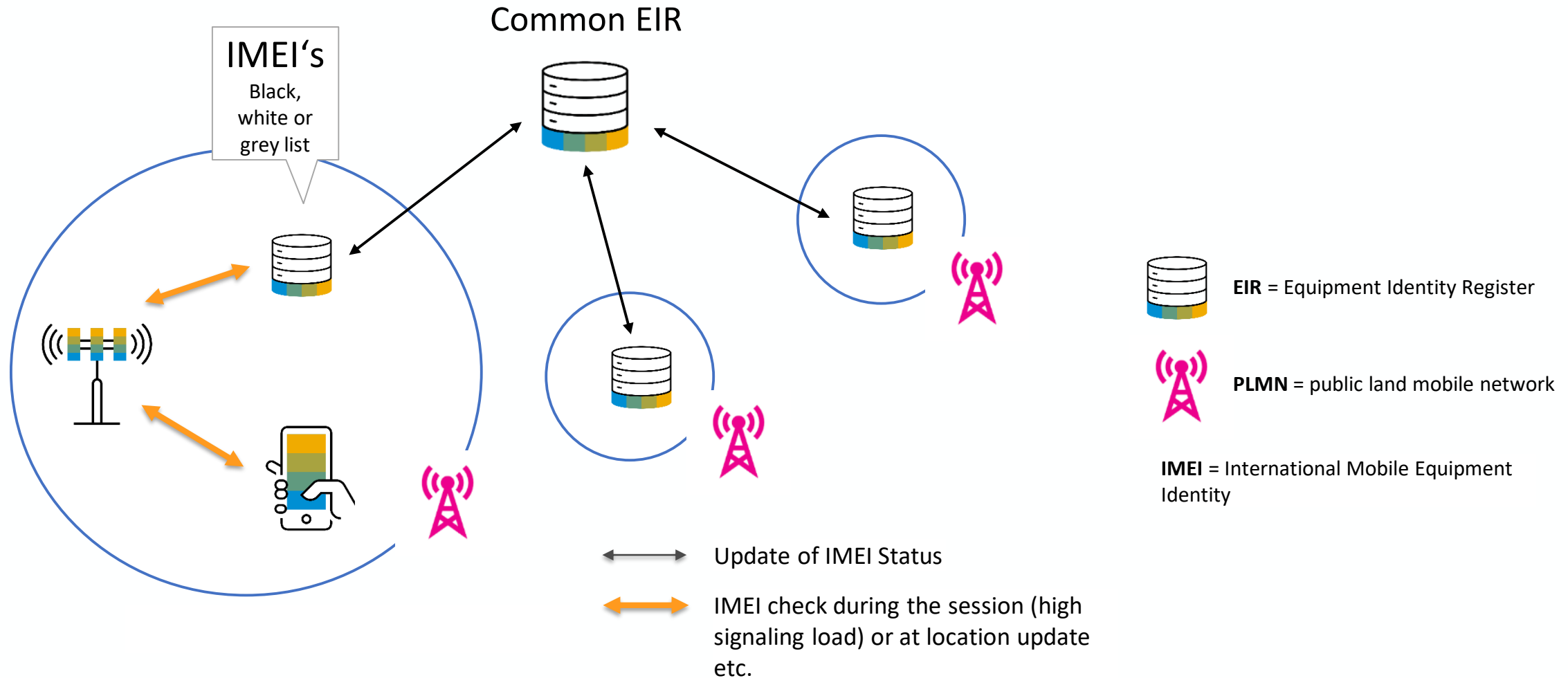
Benefits of IMEI Blacklisting

REDUCING PHONE THEFT

DRYING OUT THE BLACK MARKET

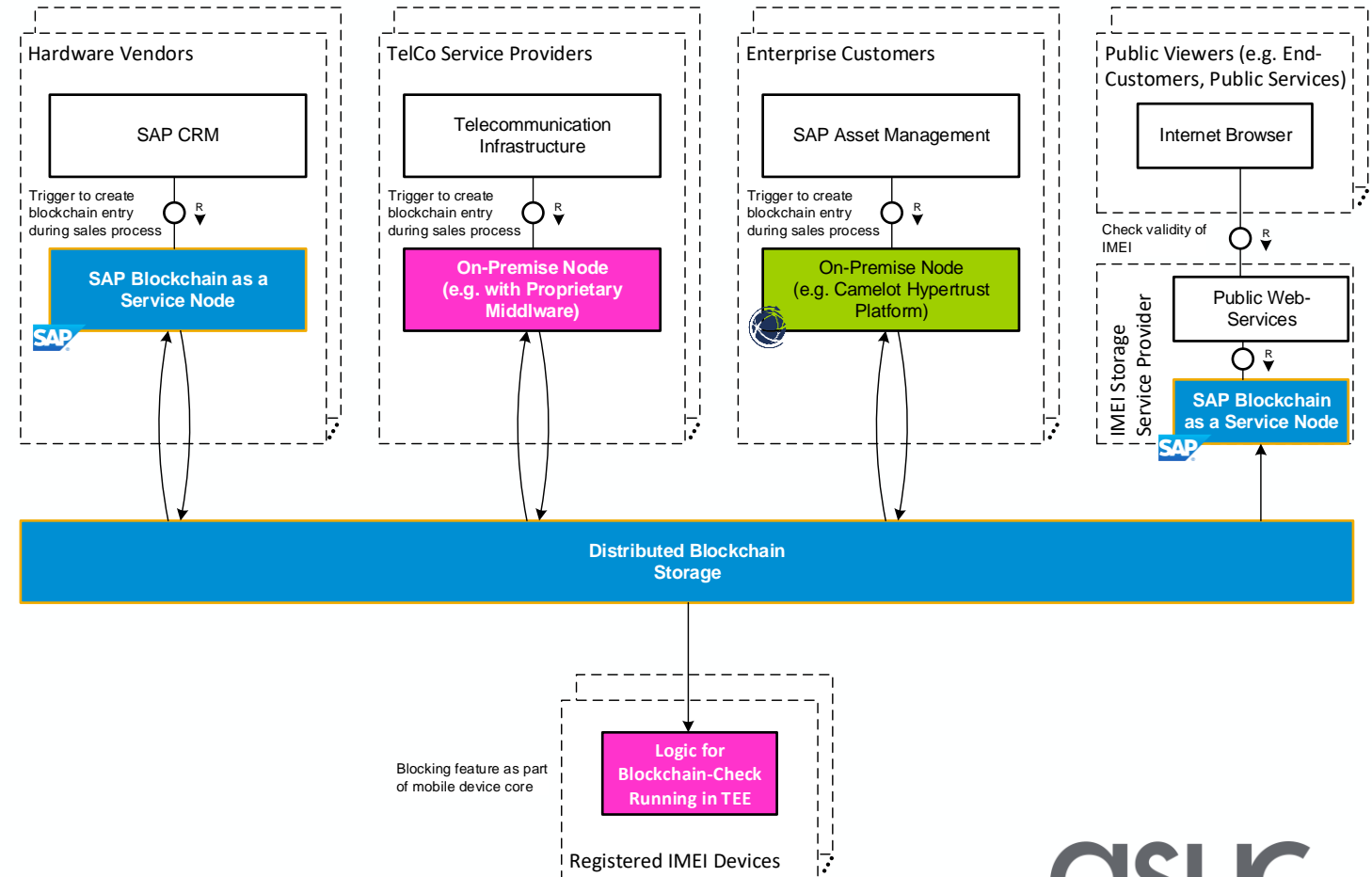**SECURING PERSONAL INFORMATION**

COMBATING IDENTITY AND INSURANCE FRAUD
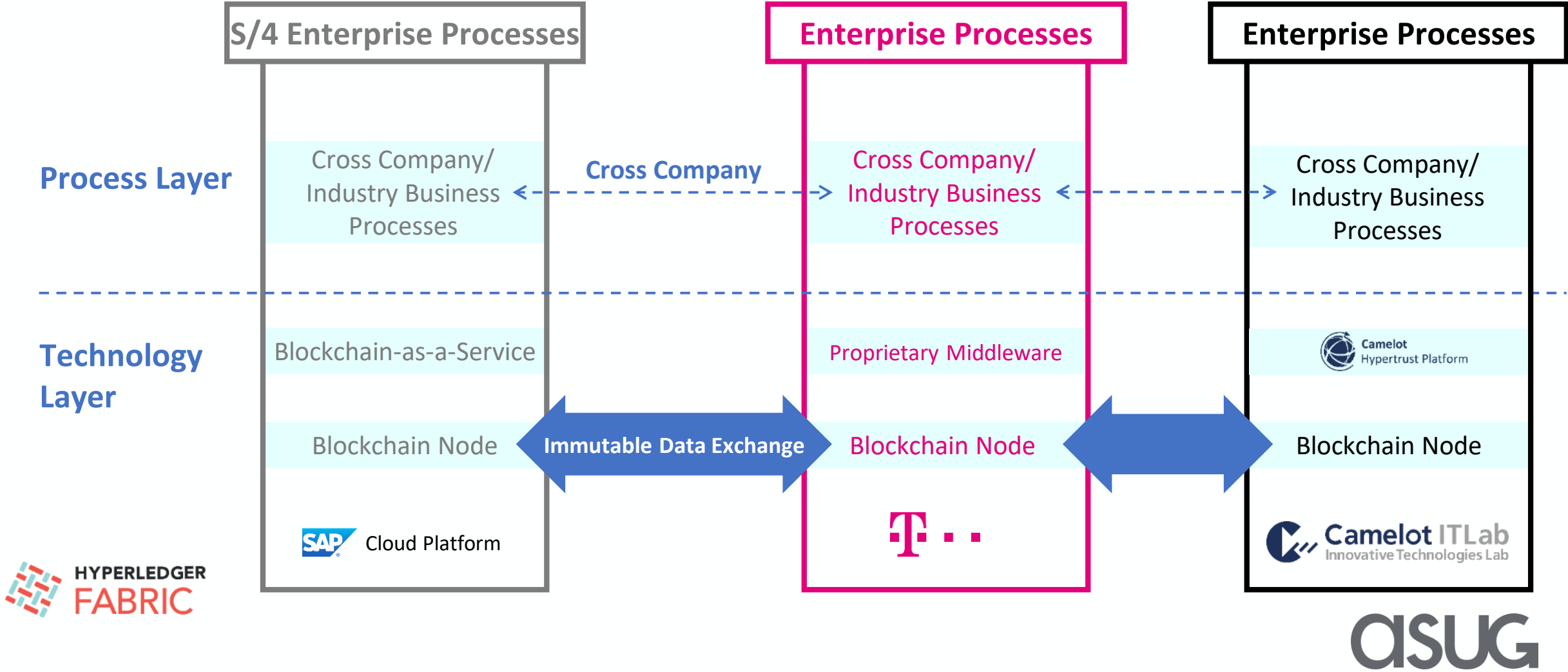
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Deutsche Telekom High Level Use Case

BLOCKCHAIN-BASED IMEI BLACKLIST AVAILABLE TO ALL PARTICIPANTS

- ▶ Shared reality through the use of a distributed database
- ▶ Transparent and reliable transactions between participants
- ▶ Stream-lined and scalable blacklisting process

Hardware Vendors

SAP CRM

Trigger to create blockchain entry during sales process — R

SAP Blockchain as a Service Node

TelCo Service Providers

Telecommunication Infrastructure

Trigger to create blockchain entry during sales process — R

On-Premise Node (e.g. with Proprietary Middlware)

Enterprise Customers

SAP Asset Management

Trigger to create blockchain entry during sales process — R

On-Premise Node (e.g. Camelot Hypertrust Platform)

Public Viewers (e.g. End-Customers, Public Services)

Internet Browser

Check validity of IMEI — R

IMEI Storage Service Provider

Public Web-Services — R

SAP Blockchain as a Service Node

Distributed Blockchain Storage

Blocking feature as part of mobile device core

Logic for Blockchain-Check Running in TEE

Registered IMEI Devices

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Global IMEI Storage and Services High Level Architecture

Use Case

MANUFACTURER

Fidelity Devices

TELCO COMPANY

Camelot Telephonica

CUSTOMER

Max Mustermann

Max loses phone

CUSTOMER

Max Mustermann
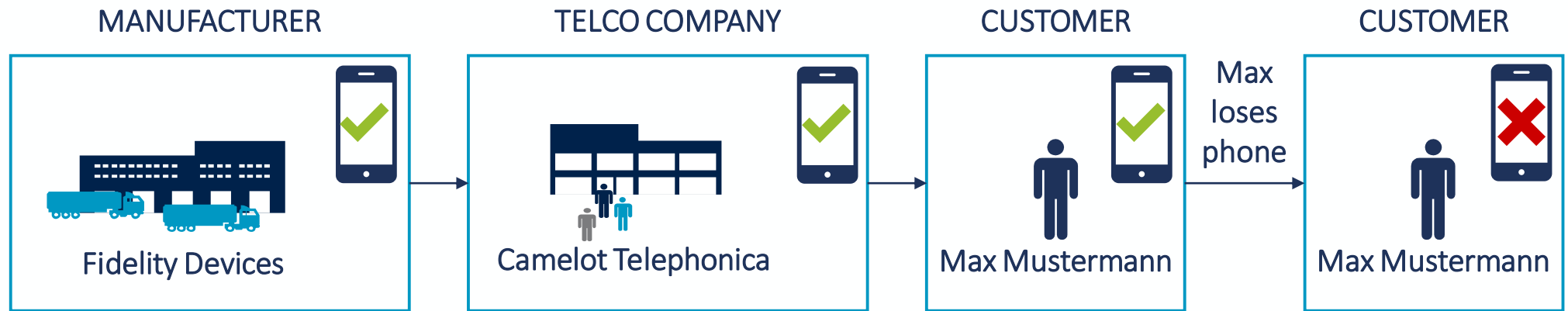
Blockchain

Status

demo@camelot-itlab.com

Password

Logon

Camelot Blockchain Accelerator for Mobile Device Management

AUTHENTICATION OF DEVICES VIA BLOCKCHAIN

The accelerator provides the solution to end re-use of lost, stolen or invalid mobile devices: A blockchain based list of serial numbers and their owners, that is accessible to all manufactures, operators, OEM's and other players to increase trust and data security for all stakeholders.

INDUSTRY OPERATION

▸ Sharing blacklist across operators, manufacturers and other agencies

▸ Access control of business customers via SAP system

▸ One stop SAP blockchain solution for tracking devices (lost/stolen)

▸ Device validation before and after the booting process

BUSINESS CHALLENGE

▸ Information on stolen devices is kept in local database of a given Mobile Network Operator (MNO)

▸ Limited & expensive information exchange between various stakeholders

▸ No available solution to protect property of mobile equipment vendors within their supply chain or prior to sale of the device to the end customer by a given MNO

▸ In case a device is lost or stolen separate interaction with each MNO is required

IMEI identified device

Regularly checks status information on Blockchain

Can be easily marked as stolen or invalid by stakeholders like mobile network operators, vendors, enterprise customers or private users

Business Benefits

Loyalty & Trust
▸ Only information which needs to be shared by the parties is shared in the blockchain
▸ Local storage of information

Data Protection in Case of Theft
▸ Block/Kill switch to protect the data on the device in case of loss or theft
▸ In case a device is lost or stolen, the customer has to interact with each MNO separately

Customer Satisfaction
▸ Value added services for enhanced customer experience
▸ Mobile device check on eCommerce platforms
▸ Protection of credit card information and other sensitive data in case a mobile device got lost or stolen

Transparency & Security
▸ Information on blockchain is inalterable
▸ Storage of ownership information for mobile devices – for mobile phones connected to IMEI (International Mobile Equipment Identity) as well as for devices in context of IoT

Ease of Tracking Information
▸ Sharing a blockchain based blacklist across operators, manufacturers and other stakeholders
▸ Simplify identification of stolen devices
▸ Possibility of ending their usage – safely and in real-time

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Presentation Materials

Access the slides from 2019 ASUG Annual Conference here:
http://info.asug.com/2019-ac-slides

Q&A

For questions after this session, contact us at
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