

# Logistics 4.0

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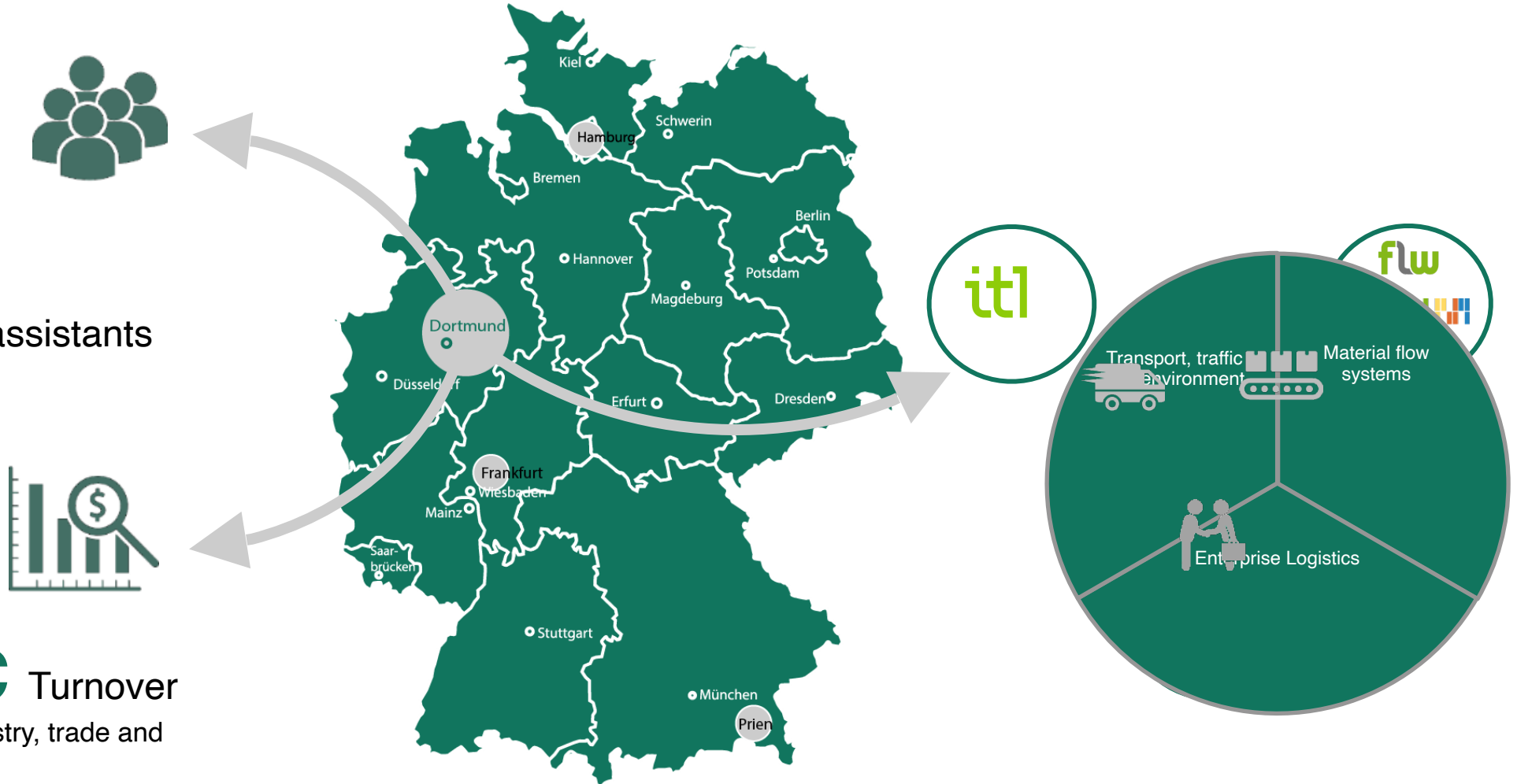


# Fraunhofer Institute for Material Flow and Logistics as well as Chair of Enterprise Logistics at TU Dortmund University

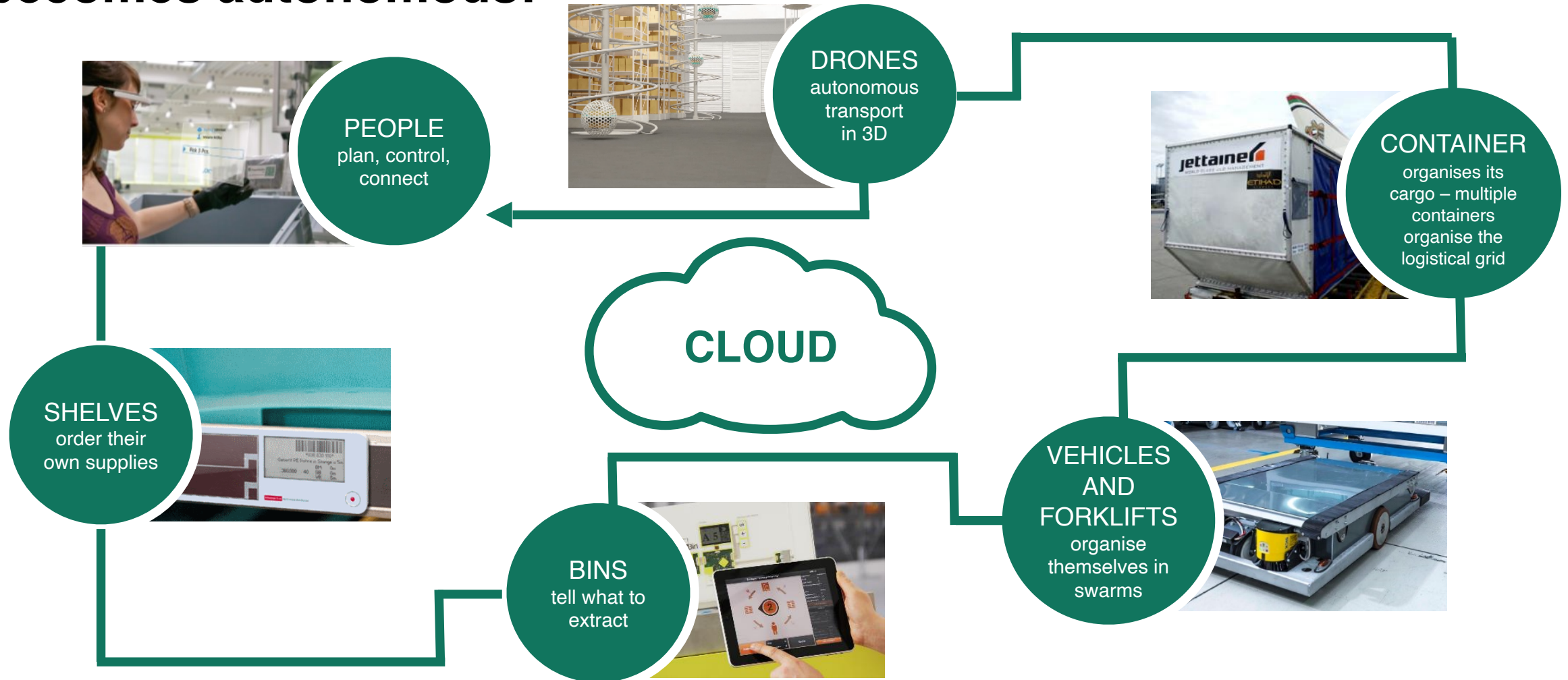
**320** Scientists

**250** Student assistants

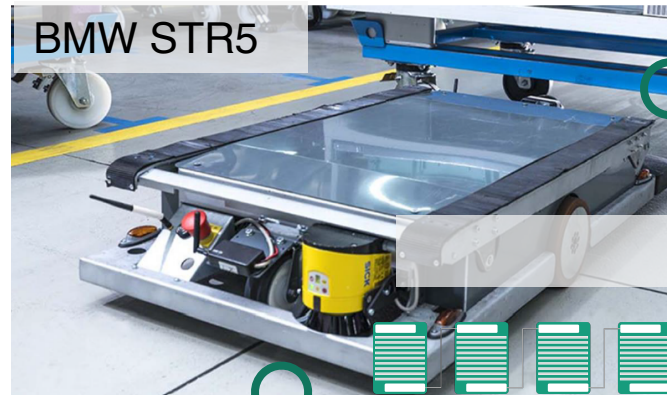
**35 Mio. €** Turnover  
(40% thereof from industry, trade and services)



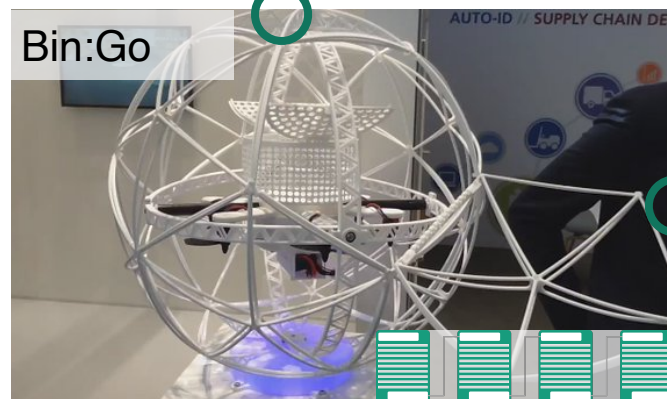
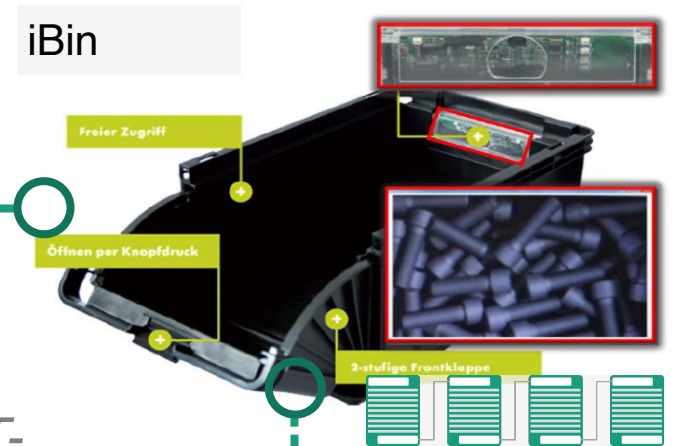
# Industrie 4.0 🕒 Internet of Things and Services 🕒 Everything becomes autonomous!



# We connect Blockchain and IoT



*Blockchains integrate different IoT-applications and ensure a smart object management*







# Blockchain & Blockchain Europe

Picture by Gerd Altmann on Pixabay



blockchain  
europe.nrw

# Our Domains:

## Logistics & Supply Chain Management



### Supply Chain for battery-production



**USA**

Preparation of lithium for use in automotive batteries

**EU**

Assembly to battery modules and installation in vehicles



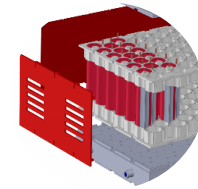
**SA**

Lithium mining

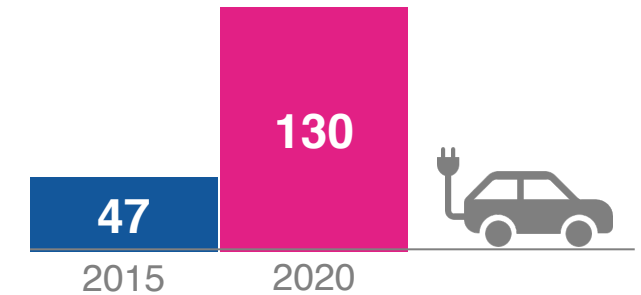


**CHN**

Battery unit production



### Electric car models worldwide



### Challenges

- ❖ **New global Supply Chains (SC) with new players**
- ❖ **SCs are often not transparent**
- ❖ **SCs lack of trust**

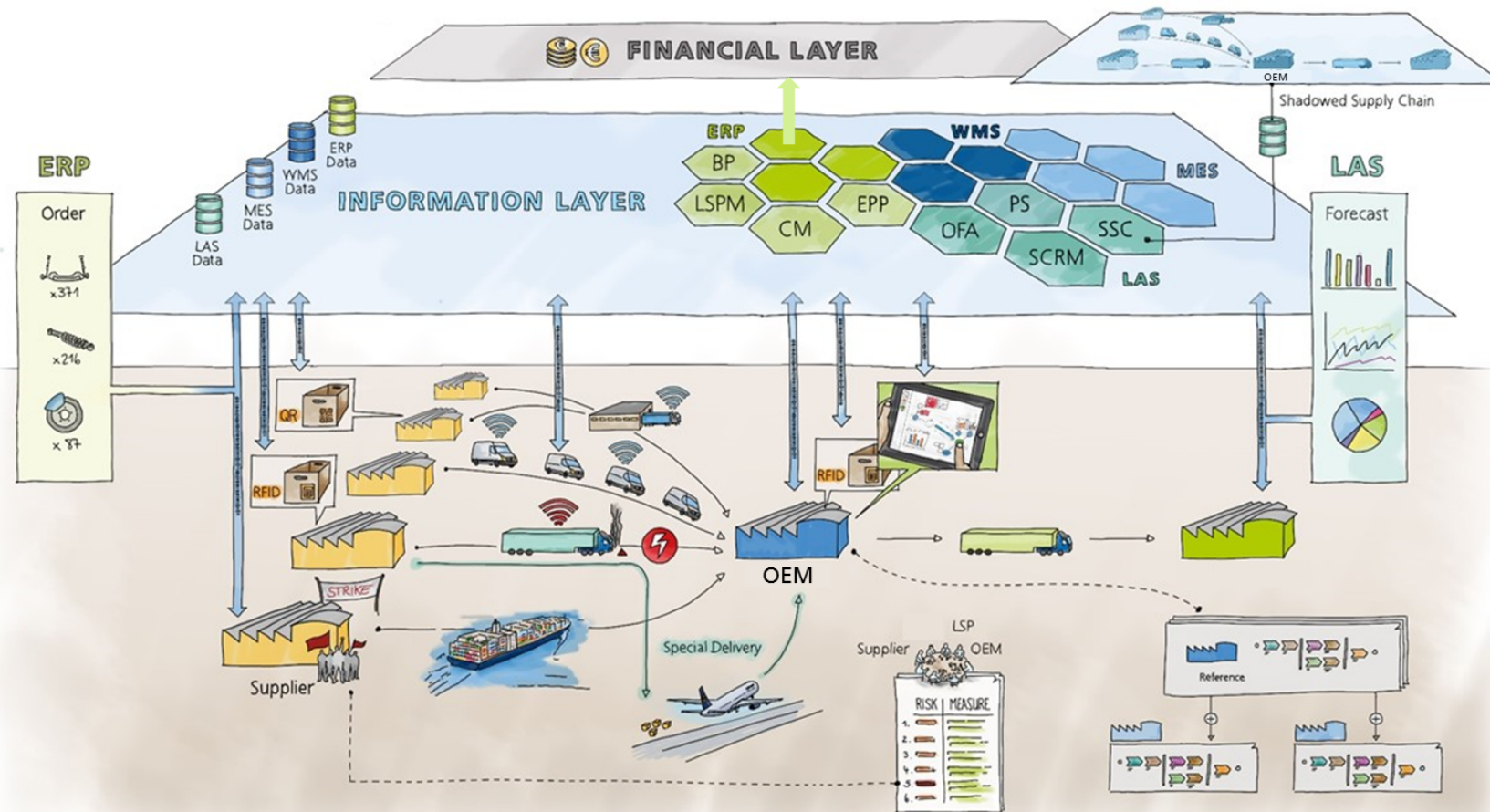
**Supply Chain Management is the integrated planning and control of material, information and financial flows in value-added networks.**



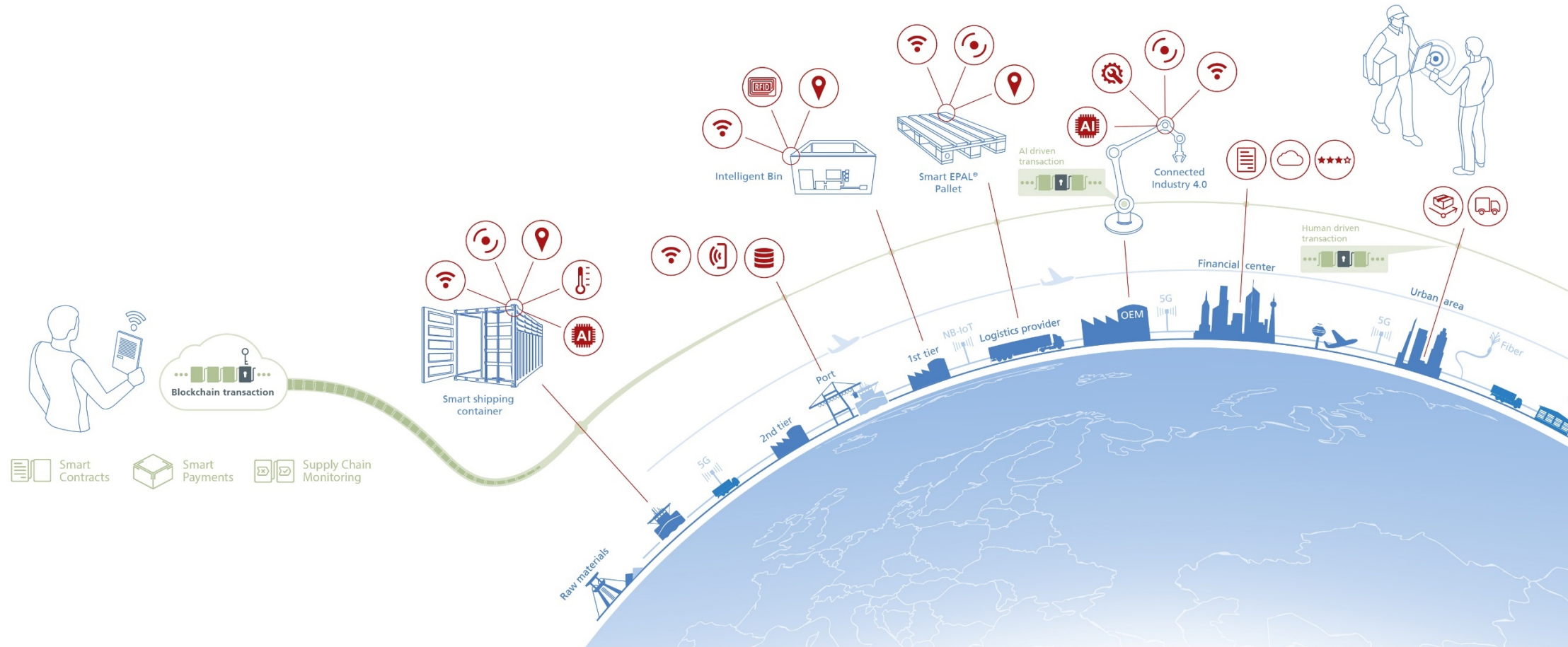


# Information Flow & Financial Flow

## Growing importance...



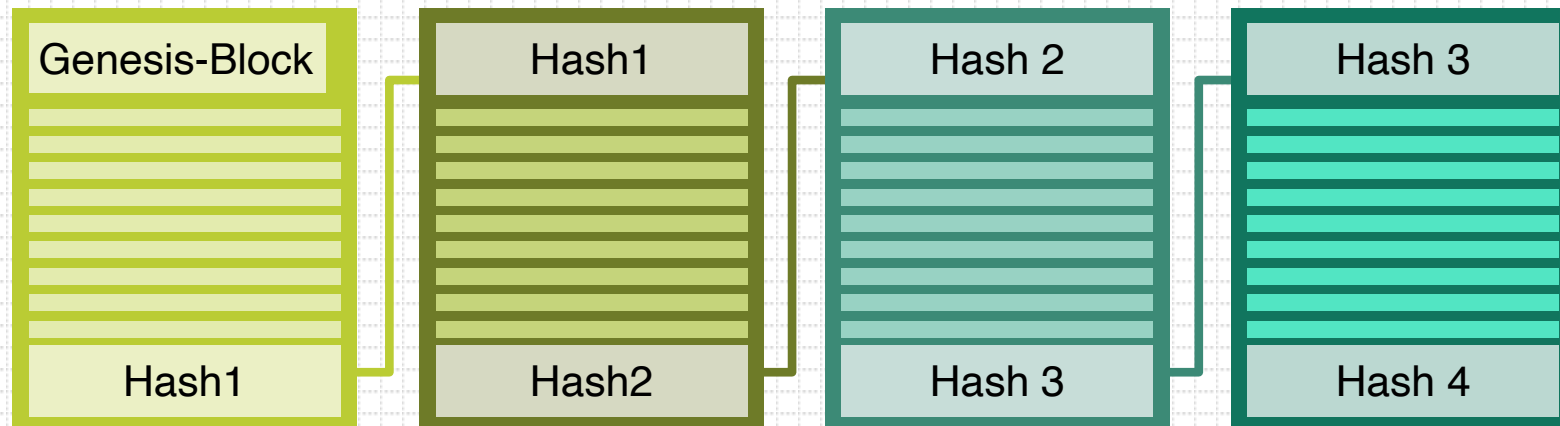
# How does Automation & Autonomization work?





# Blockchain Technology

A Blockchain is a decentralized, distributed, tamper-proof, cooperatively used data memory. It enables secure data exchange between nodes of peer-to-peer networks.



**Fraunhofer**  
IML

■ WHITEPAPER

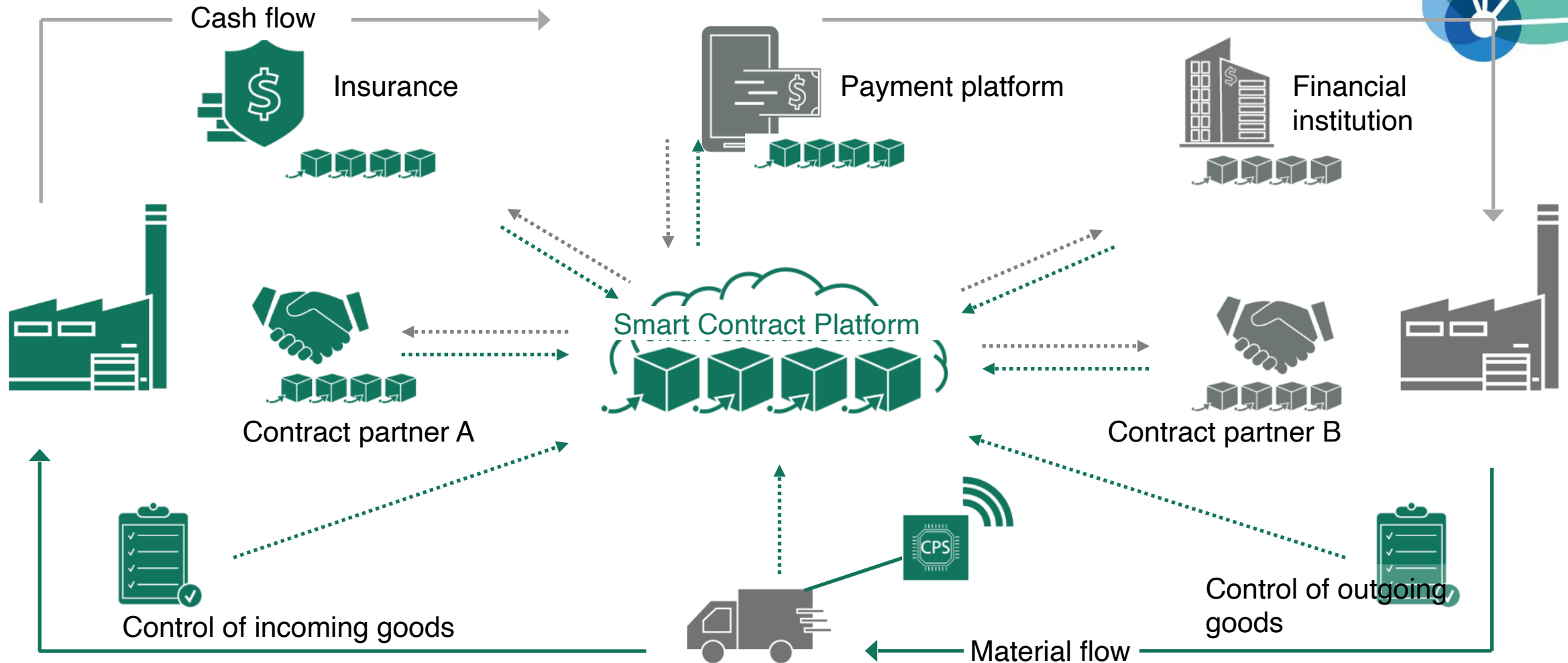
Future Challenges in Logistics and Supply Chain Management

## BLOCKCHAIN UND SMART CONTRACTS: EFFIZIENTE UND SICHERE WERTSCHÖPFUNGS- NETZWERKE



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# What will the future look like...

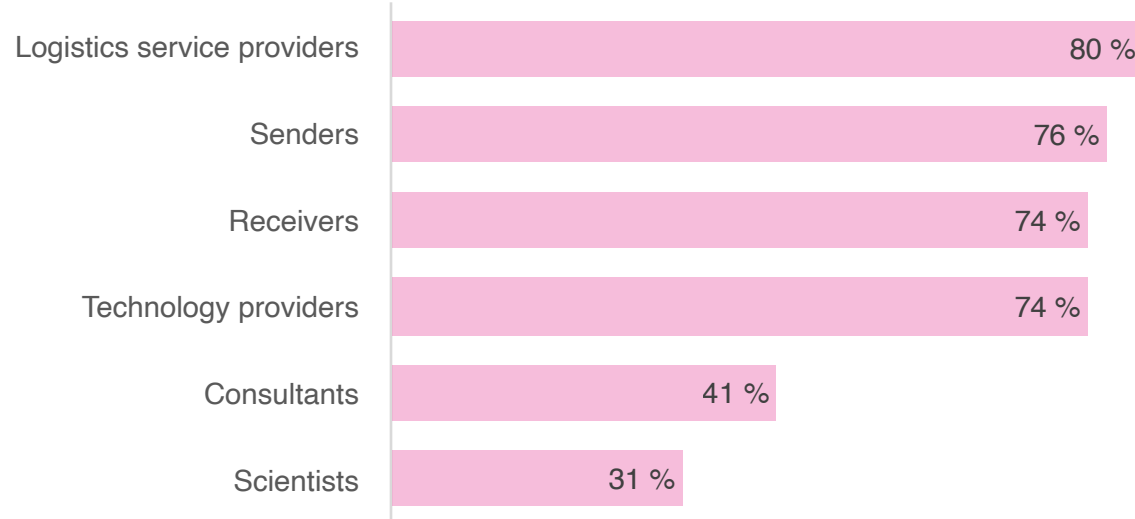


# Blockchain Technology

## Benefits and challenges in logistics

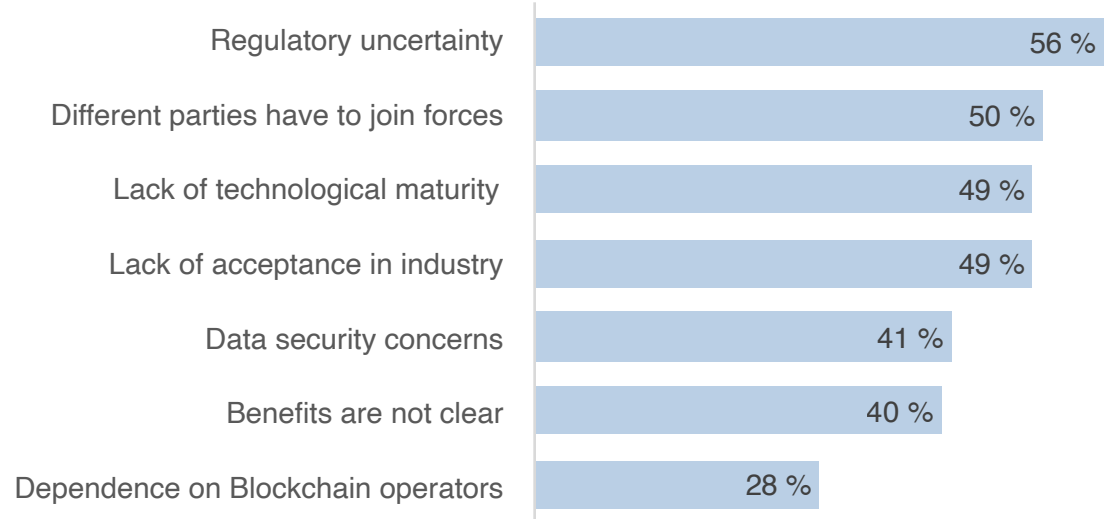


Who will benefit from Blockchain in the logistics context?



Multiple answers possible  
n= 152; total

What are likely barriers for Blockchain adoption in the logistics industry?



# WE ARE BLOCKCHAIN EUROPE

RESEARCH | APPLICATION | NETWORK

## Shaping Blockchain in NRW, Germany and Europe together!

**LFD**  
UNTERNEHMENSLOGISTIK

**Fraunhofer**  
IML

**Fraunhofer**  
ISST

**flw** Lehrstuhl für  
Förder- und Lagerwesen

**#DWRW** Digitale  
Wirtschaft

Sponsored by the  
Ministry of Economic  
Affairs, Innovation,  
Digitalization and  
Energy of the State of  
North Rhine-Westphalia

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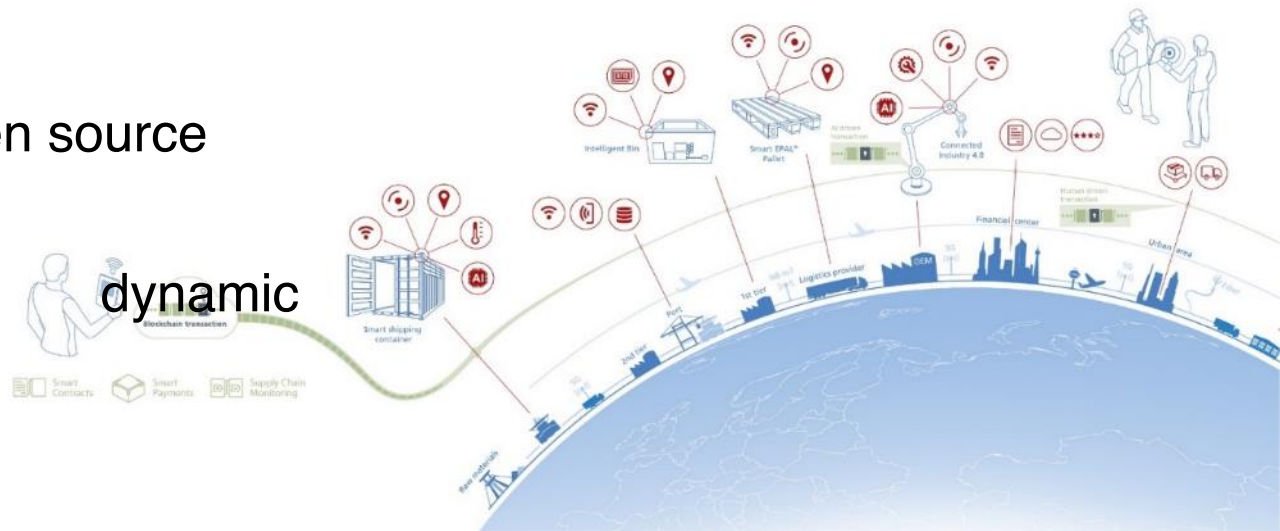
# Blockchain Europe



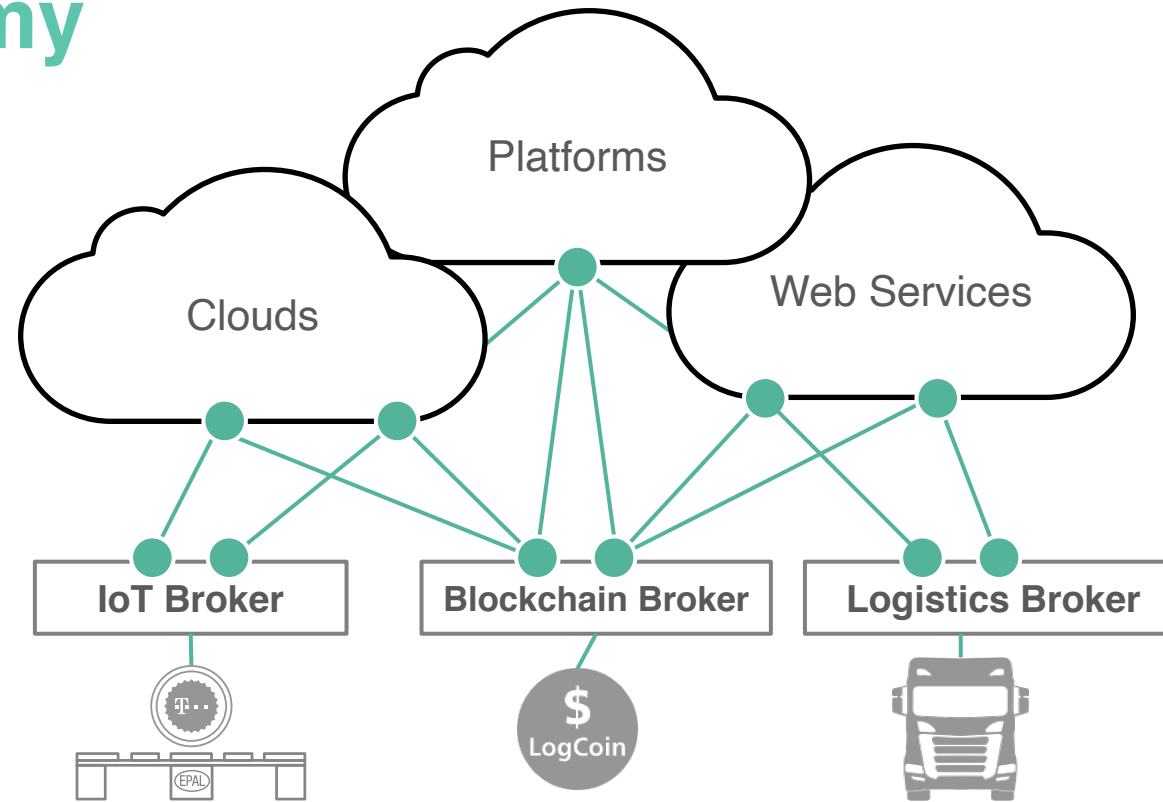
... the project to establish the European Blockchain Institute in NRW

... is a unique place,

- which makes the blockchain technology experienceable
- enables joint innovation through an open source community
- science and economy united in a ecosystem



# Blockchain as an elementary component of the Silicon Economy



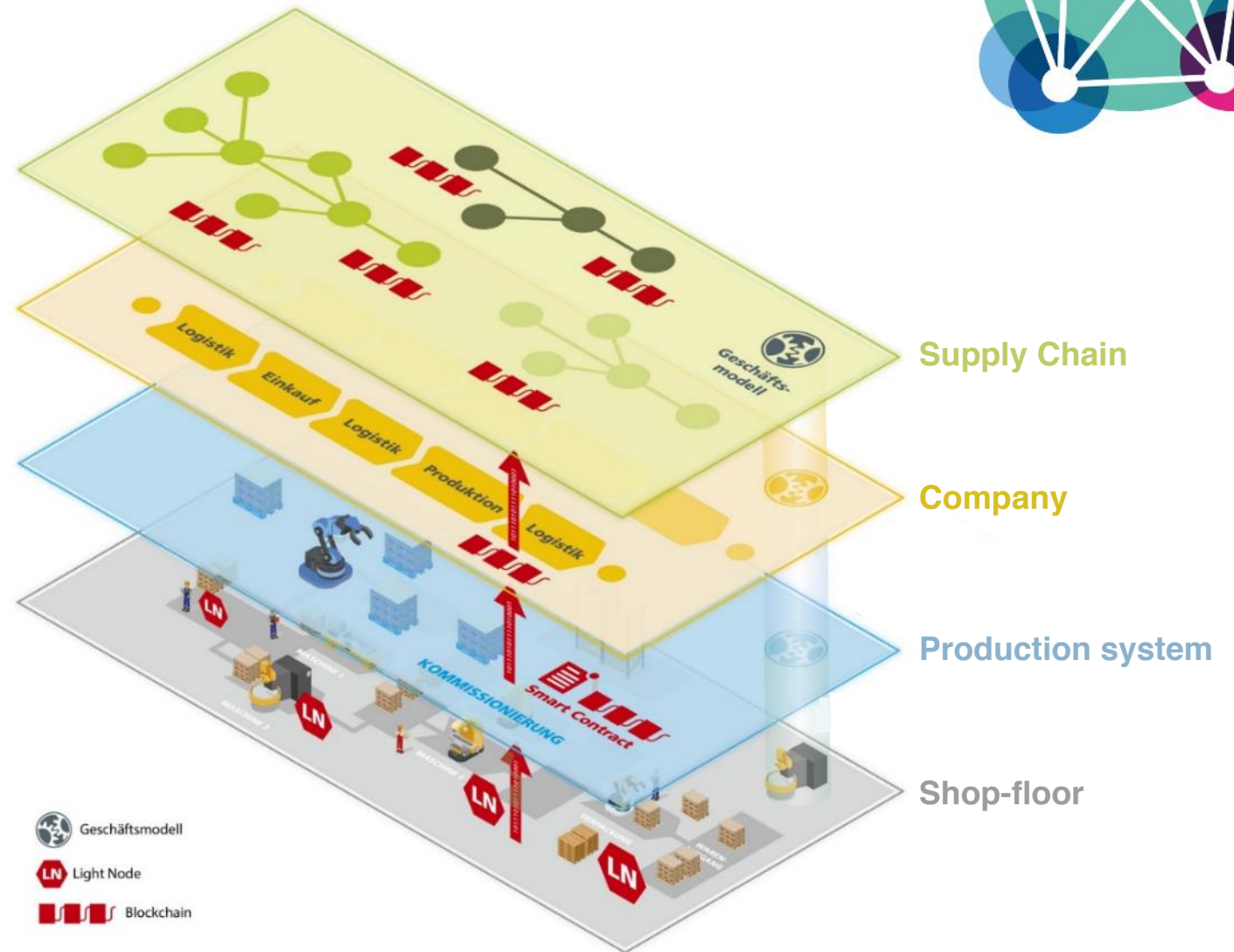
➤ Supply chains become connected and autonomous supply chain ecosystems ◀



# Blockchain on all levels

## Holistic view and application of blockchain technology:

- Shop-floor
- Production system
- Company
- Supply Chain



# Blockchain-ready IoT Device



- Pioneering prototype for monitoring temperature-sensitive goods such as food, medicines or vaccines along global supply chains
- Real-time data logging and autonomous real-time control of supply chains
- Further development of the first prototype into a series of blockchain devices
- Negotiate actively via smart contract, trigger transactions and post payments





# Planned products and solutions



**E-wallet**  
for representing  
corporate assets  
using tokens

**Blockchain Devices**  
for the integration of  
material, information  
and financial flow

**Guidelines & concepts** from  
concrete use cases  
(customs &  
dangerous goods)

**Smart Contract  
library** for process  
automation

**Open source  
components**  
as a blueprint for  
enterprise blockchain  
applications

**BLOCKCHAIN  
EUROPE**

**Business models**  
based on blockchain  
technology

Picture by Gerd Altmann on Pixabay





**“no blockchain, no business”**



# Let's stay in touch



[www.blockchain-europe.nrw](http://www.blockchain-europe.nrw)



[twitter.com/blockchain1\\_eu](https://twitter.com/blockchain1_eu)



[Blockchain-europe.nrw/#newsletter](mailto:Blockchain-europe.nrw/#newsletter)



[linkedin.com/showcase/blockchain-europe/](https://linkedin.com/showcase/blockchain-europe/)



# Contact



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