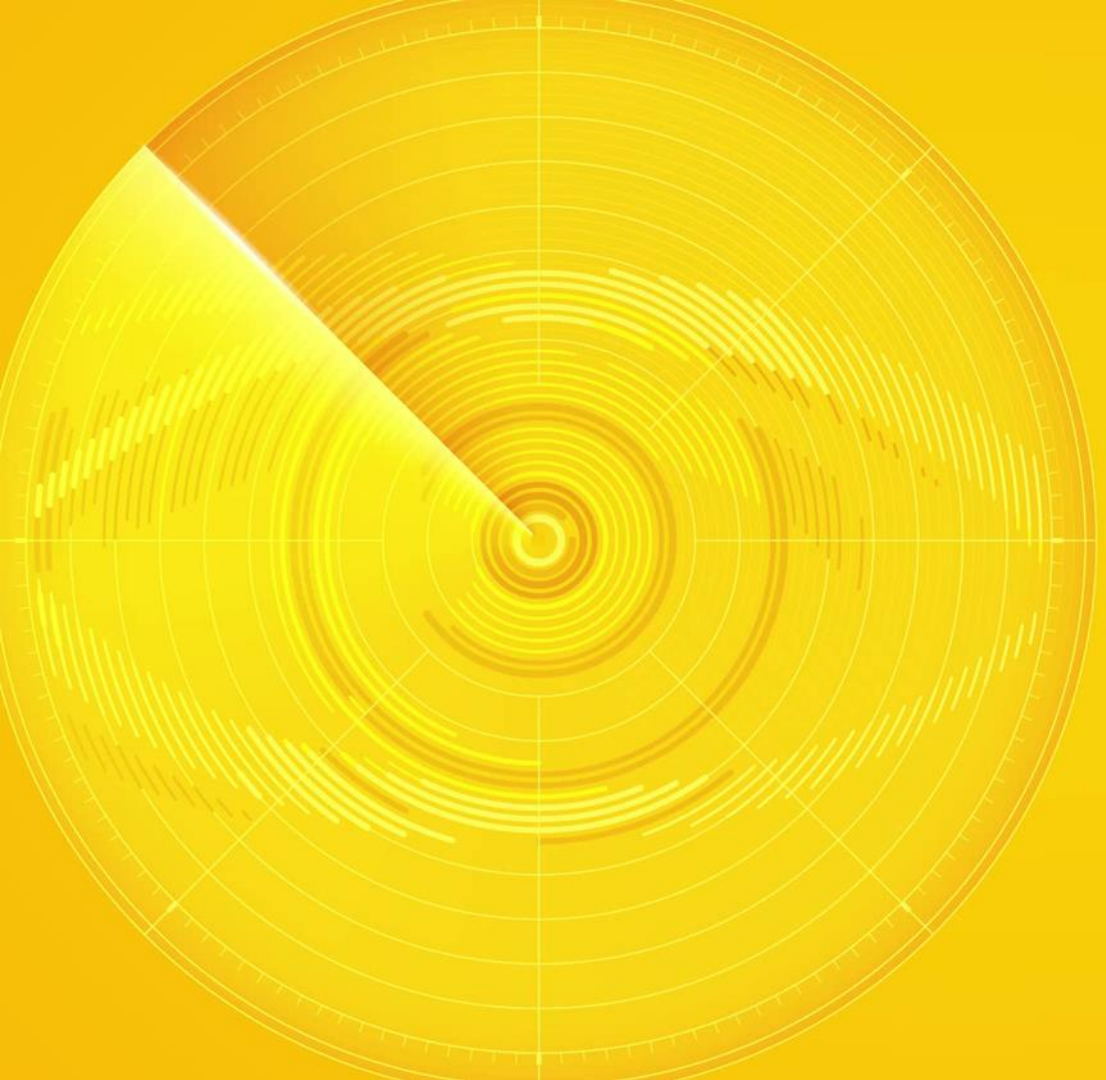
# DENIS NIEZGODA

Robotics Accelerator Lead
DHL Customer Solutions & Innovation

Smart & Digital Innovation

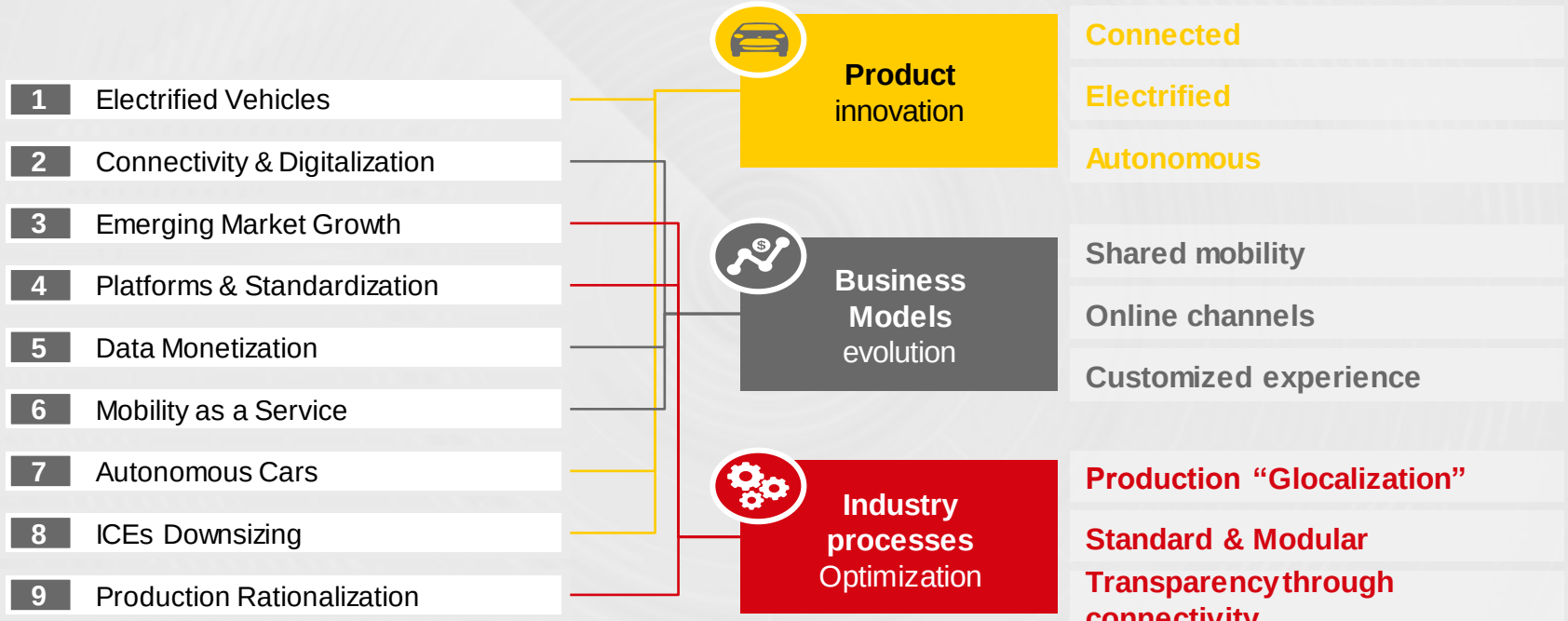


# Smart & Digital Innovations for the future of logistics

**Denis Niezgoda**
**DHL Customer Solutions & Innovation**

Powered by
DHL Trend Research

# Evolutions, revolutions and disruptions will come




**Source:** KPMG's Global Automotive Executive Survey 2017

# Supply chain opportunites recognized by the market

**Source:** CB Insights 2018

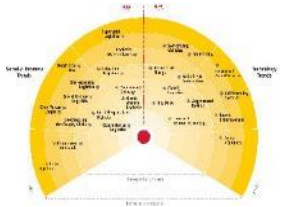
# Customer centric innovation successfully driven through the Innovation Centers & Trend Research Program

**Customer-centric Innovation**

**INSPIRE, CONNECT & ENGAGE**

**Innovation Centers**

**Trend Research**



**Goals:**

1. Strategic customer engagement driving new business
2. Thought leadership driving market perception & brand value
3. The first mover to provide innovative solutions to customers

HIGH
HIGH
HIGH: Creates new (potentially disruptive) ways of doing business
LOW: Provides incremental improvement opportunities
Social & Business Trends
Technology Trends
Supergrid Logistics
Self-driving Vehicles
Artificial Intelligence
3D Printing
NEW
Smart Containerization
Logistics Marketplaces
Robotics & Automation
Batch Size One
Green Energy Logistics
NEW
Digital Work
Internet of Things
Unmanned Aerial Vehicles
Sharing Economy
Cloud Logistics
NEW
Fair & Responsible Logistics
Omni-channel Logistics
Blockchain
Big Data Analytics
NEW
Servitization
NEW
Connected Life
Augmented Reality
NEW
Next-generation Wireless
NEW
Fresh Chain
Low-cost Sensor Solutions
Bionic Enhancement
Grey Power Logistics
NEW
Virtual Reality & Digital Twins
Tube Logistics
RELEVANT IN < 5 YEARS
2018/19
LOW
RELEVANT IN > 5 YEARS
LOW

# How do we drive customer-centric innovation?

1

## TREND RADAR

2

## TREND REPORT

3

## INNOVATION CENTER

4

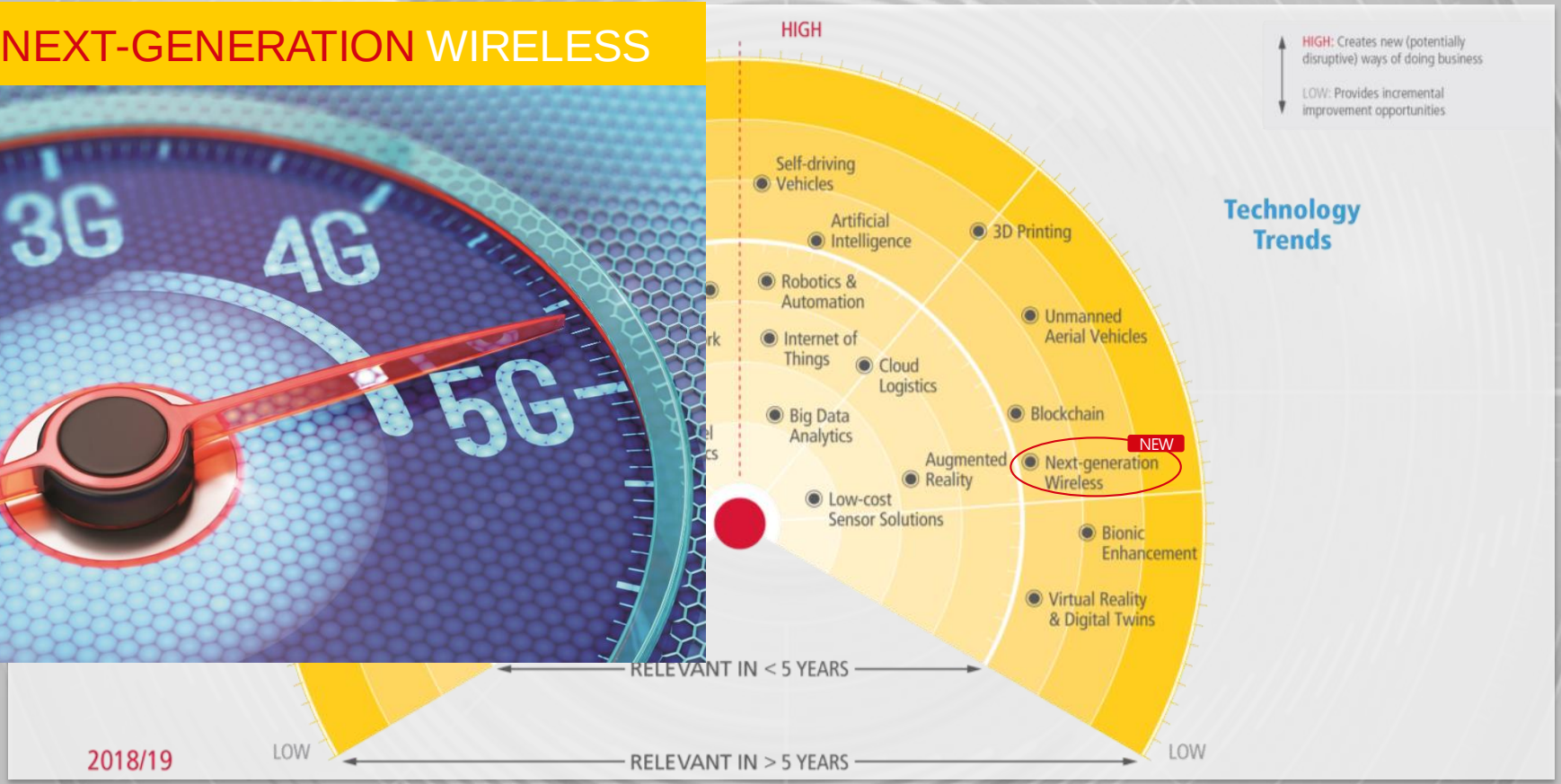
## PROOF OF CONCEPT

## COMMERCIALIZATION

## INITIATE GLOBAL ACCELERATORS

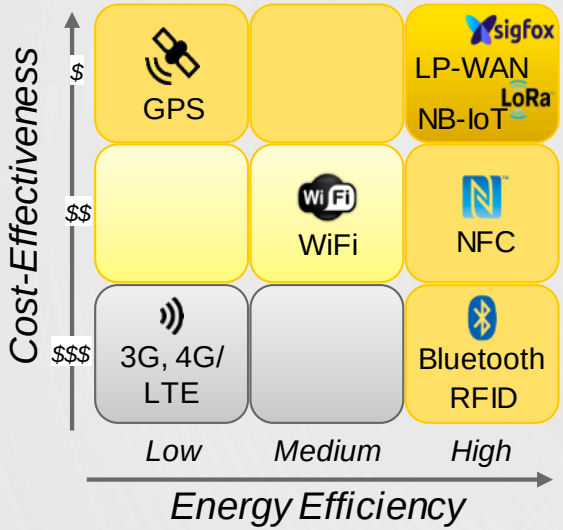
# NEXT-GENERATION WIRELESS



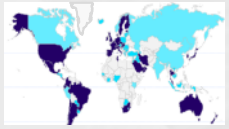



# NEXT-GENERATION WIRELESS

## Properties




## Availability



**Sigfox**
*Industrialized nations and (Air)Ports*

**LORA**
*Industrialized and emerging markets*

**NB-IoT**
*Europe, China and* ***South Africa***

**2G / 3G / LTE/4G**
*Global*

## Trends

- New emerging technologies while others shut down, e.g.
- LPWAN:
  - Low power
  - Long range
  - Low cost
- Cellular:
  - LTE Cat M
  - IEEE 802.15.4g*
  - 2G shutdown (JPN, CAN, ...)

* Standard for local and metropolitan area networks

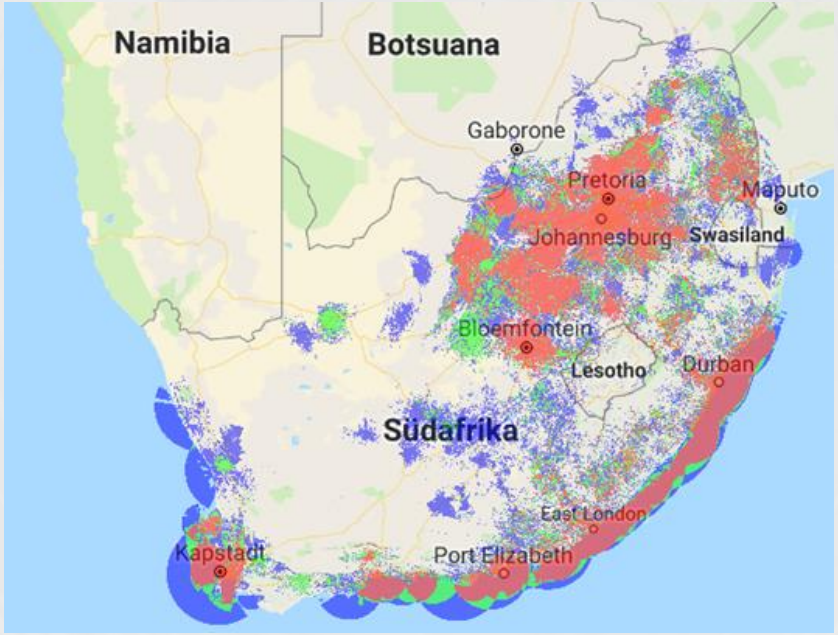
# NEXT-GENERATION WIRELESS

**Manhole Tampering Solution in South Africa – Sigfox**

- There are just under 2.2 million manholes in South Africa being used by telecommunications companies and municipalities
- Covers are often tampered with or stolen, resulting in a person dying from falling into a manhole, every four days
- Telecommunications companies and municipalities can detect tampering and theft, enabling them to mitigate the risk to citizens
- Sensors placed on the manholes are battery operated and batteries have a 10-year lifespan

Source: SqwidNET

# Sigfox Coverage



# NEXT-GENERATION WIRELESS

## Warehousing

**Inventory Management**

**Asset Utilization**

**Connected Warehouse**

**Energy Management**

## Transportation

**Condition Monitoring**

**Fleet / Asset Management**

**Predictive Maintenance**

**End-to-end SC Risk Mgmt.**

## Last Mile Delivery

**Mail / Parcel Collection**

**Automatic Replenishment**

**Flexible Deliver / Pick-Up**

**Next-Generation Visibility**

# DHLs active transmitting solution for visibility

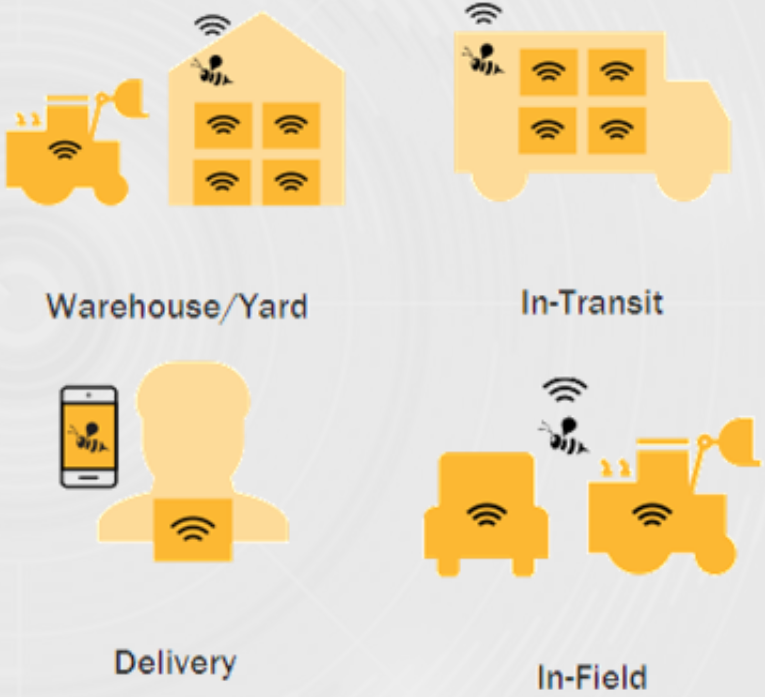
- Modern **tracking & tracing** by active device (3G, Wifi, BLE) with global coverage
- **Comprehensive set** of sensors included
- **Geofencing** & active steering options
- **Cost efficient,** scalable on-demand service
- **Plug-and-play** mobile solution
- **API** available
- **Visibililty-as-a-service**
- **Airline approvals** available and further in progress

# DHLs active transmitting solution for visibility

**BMW Shock monitoring Test – DHL Smart Sensor**

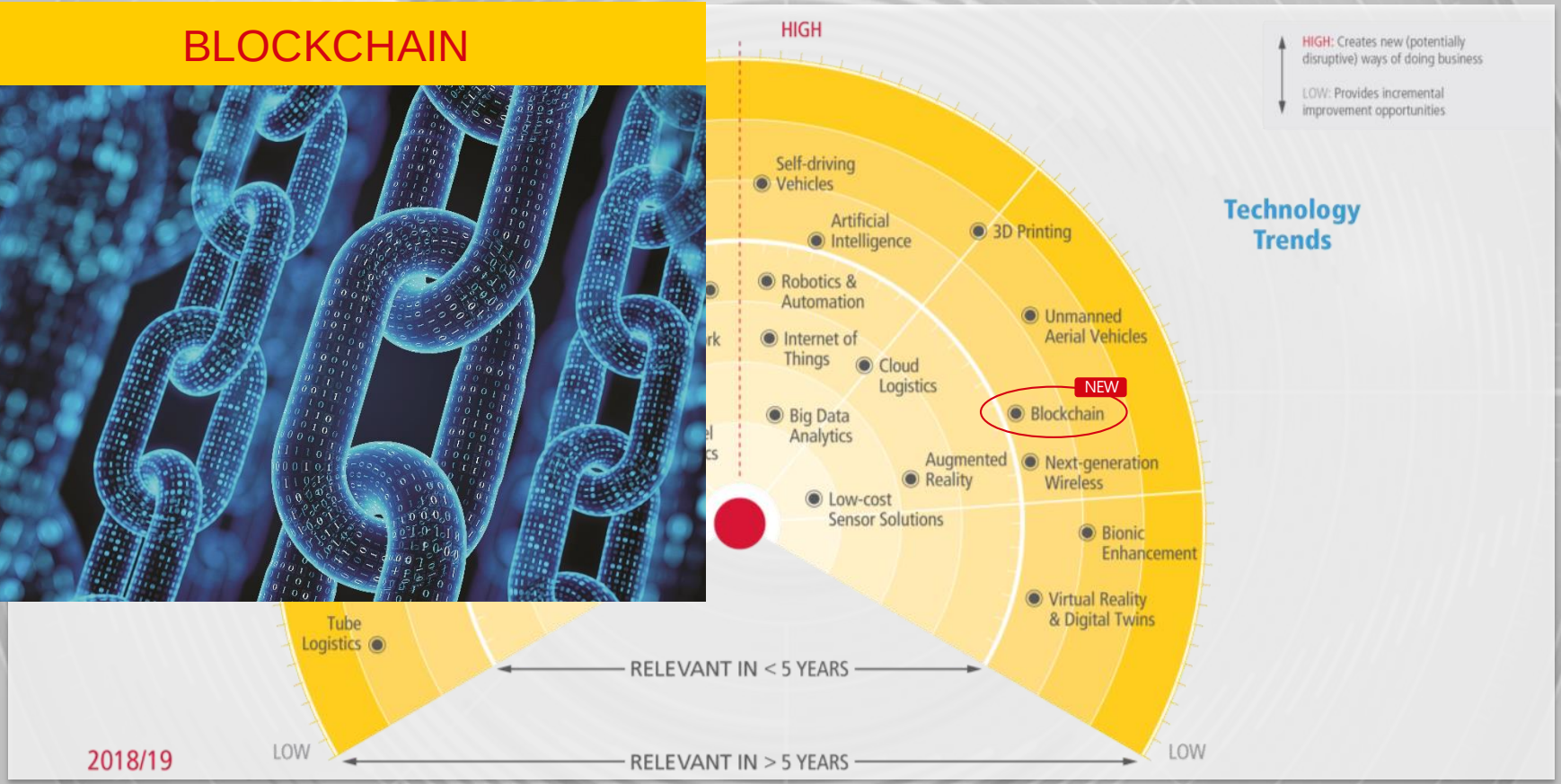
- Street conditions in Mexico lead to deformations and damages on sunroof modules during inbound shipments
- **DHL supports BMW** in **testing real conditions** before start of standard operations / production
- First test run show significant shock impacts on rack and module
    - Critical hotspots on street identified
    - Rack is buffering shocks only to limited extend (esp. on vertical axis)
- **Further tests** after readjustment of rack & definition of „slow speed sections“
    - No shocks on x-axis and y-axis

# DHLs active transmitting solution for visibility



# BLOCKCHAIN

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Self-driving Vehicles
Artificial Intelligence
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Robotics & Automation
Unmanned Aerial Vehicles
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Bionic Enhancement
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RELEVANT IN < 5 YEARS
RELEVANT IN > 5 YEARS
LOW
LOW
2018/19

WHERE SHOULD WE FOCUS THIS YEAR?
"BLOCKCHAIN"
IT WILL CHANGE EVERYTHING.
EVERYBODY IS TALKING ABOUT IT.
THE POTENTIAL APPLICATIONS ARE ENDLESS.
WE DON'T WANT TO BE LEFT BEHIND.
WHAT EXACTLY IS BLOCKCHAIN?
ALSO, "ARTIFICIAL INTELLIGENCE"
TOM FISH BURNE
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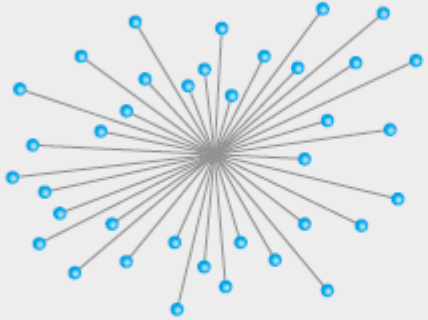
# Distributed Ledger Technology



CENTRALIZED

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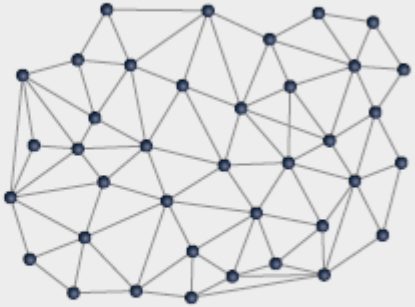


DISTRIBUTED

# Blockchain in logistics

Faster & leaner logistics in global trade

Improving transparency & traceability in supply chains

Automating commercial processes in logistics with smart contracts

# Blockchain in logistics

1. 90% of world trade is carried out by > 50,000 merchant ships every year
2. A simple shipment of refrigerated goods from East Africa to Europe can go through nearly 30 people and organizations with more than 200 interactions and communications among these parties
3. Solutions that reduce supply chain barriers to trade could increase global gross domestic product by near 5% and global trade by 15% (WEF)

# Track & Trace: DHL + Accenture

SERIALIZED — AGGREGATION/DISAGGREGATION — AUTHENTICITY CHECK

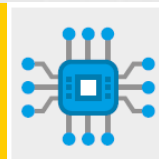
| 1 MANUFACTURER | 2 WAREHOUSE "RECEIPT" | 3 WAREHOUSE "PICK & PACK" | 4 WAREHOUSE "SHIP" | 5 DESTINATION |
|---|---|---|---|---|
| ■ Confirmation goods (units) dispatched to DHL | ■ Confirmation goods have arrived at DHL<br>■ Confirmation of authenticity<br>■ Update new aggregated information (from serialization) | ■ Update which unit has been picked from which carton<br>■ Update the box that the unit has been packed into<br>■ Update new aggregated information (from serialization) | ■ Confirmation that the box has dispatched | ■ Confirmation of delivery<br>■ Confirmation of authenticity |

# Blockchain challenges that need to be overcome

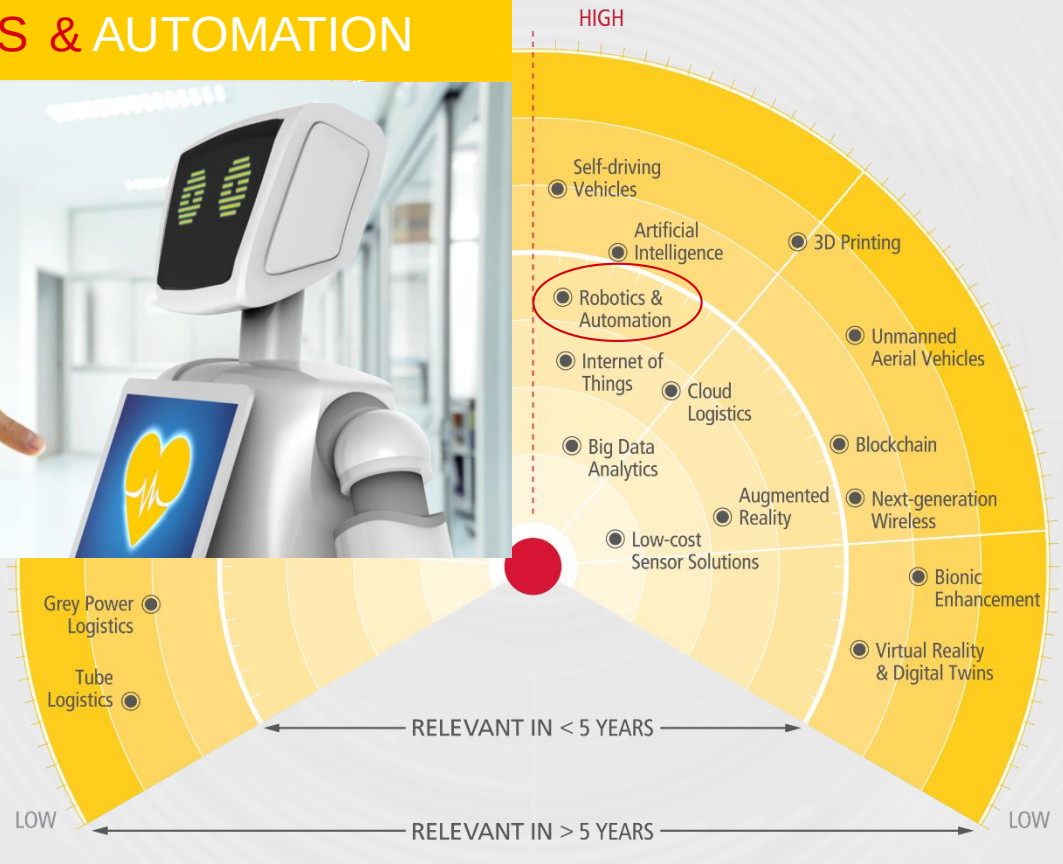
r3.

BiTA
BLOCKCHAIN
IN TRUCKING ALLIANCE

B3i

- Industry adoption
- Technology 
- Organization and culture

# ROBOTICS & AUTOMATION




2018/19

# Technology Examples

## Stationary Automation

## Indoor Vehicles & Robots

## Outdoor Vehicles & Robots

# Technology Examples

## Stationary Automation

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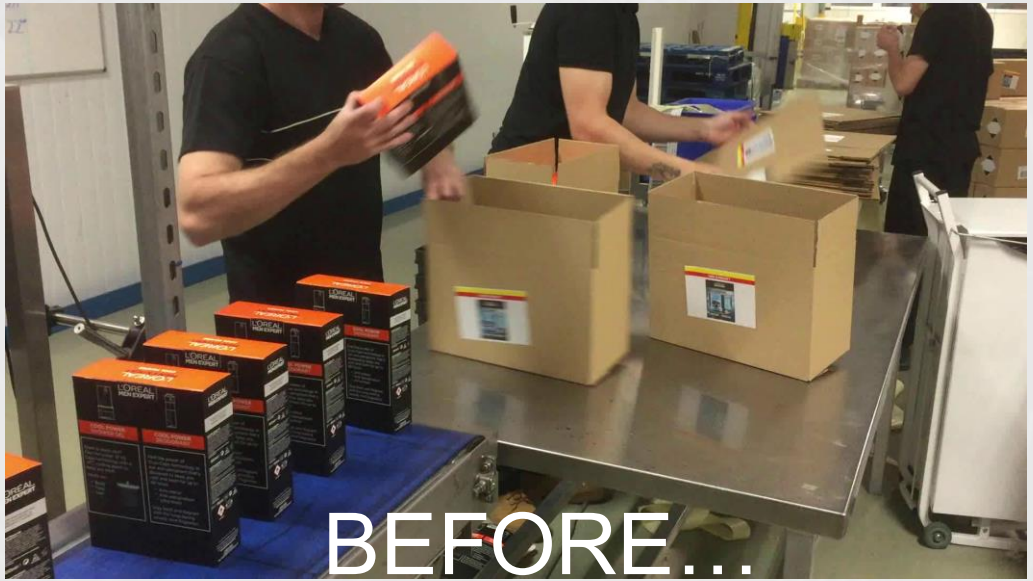
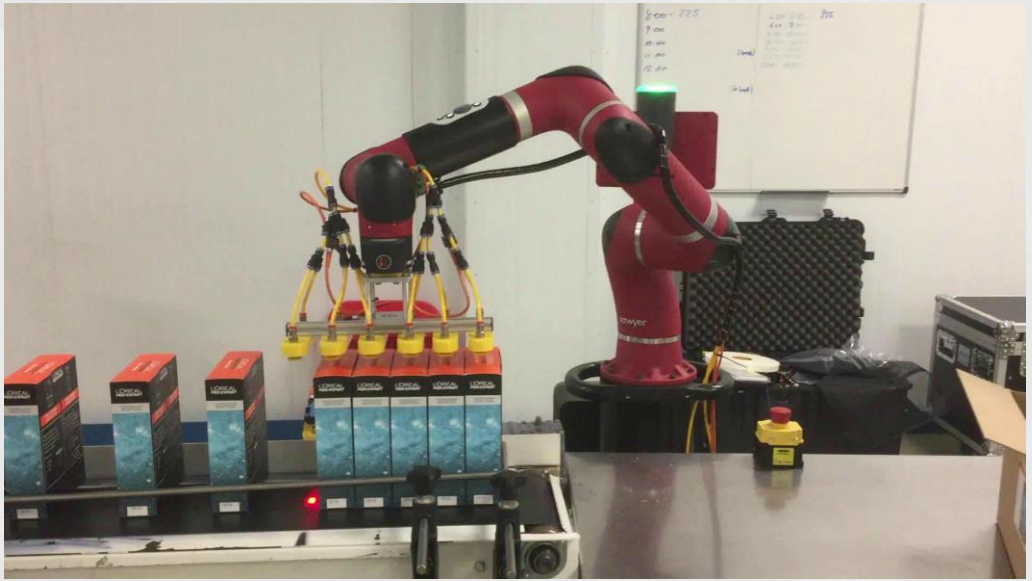
# Technology Examples

## Indoor Vehicles & Robots



# Technology Examples

## Indoor Vehicles & Robots



# Technology Examples

## Indoor Vehicles & Robots

# Technology Examples

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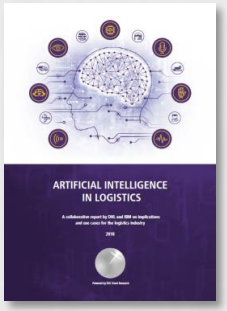
## Indoor Vehicles & Robots

# Technology Examples

## Outdoor Vehicles & Robots

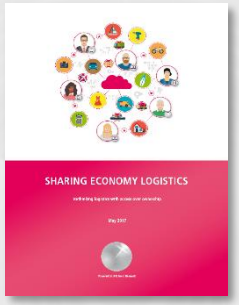
# Other projects

www.dhl.com/trendradar

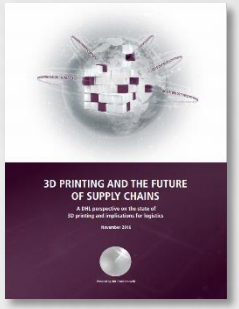



www.dhl.com/ai

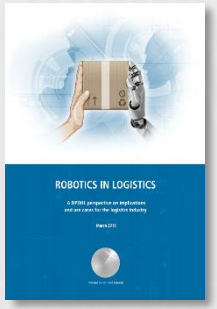
www.logistics.dhl/blockchain



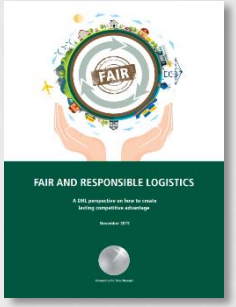

www.dhl.com/sharingeconomy




www.dhl.com/3dprinting



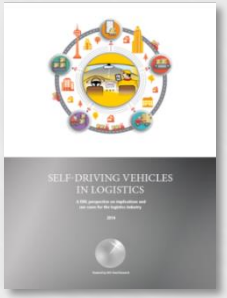

www.dhl.com/robots



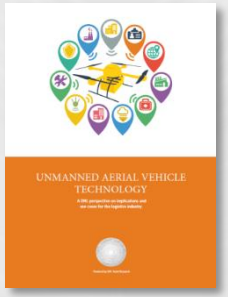

www.dhl.com/fairresponsible

www.dhl.com/IOT

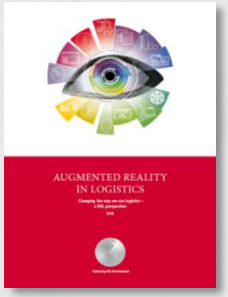
www.dhl.com/omnichannel




www.dhl.com/selfdriving

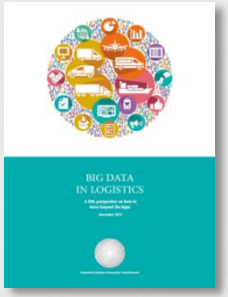



www.dhl.com/uav




www.dhl.com/augmentedreality

www.dhl.com/lcst




www.dhl.com/bigdata

# Come and visit us at one of our Innovation Centers

**Global Flagship DHL Innovation Center**

***Near DPDHL headquarter, Germany***
***Built in 2007, re-opened in 2015***

**DHL Asia Pacific Innovation Center**

***Singapore***
***Built in 2015***

**DHL Americas Innovation Center**

***Chicago***
***Building in 2018***

THE FUTURE STARTS TODAY ! Engage with us at our Innovation Booth

# LET‘S SHAPE IT TOGETHER !

# Thank you!

Denis Niezgoda
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DHL Customer Solutions & Innovation

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