OPERATIONAL EFFICIENCY FUELED BY HYPER-AUTOMATION

DIGI X AUTOMATION

#DIGIFRIDAYS

Deutsche Post DHL Group

#DIGIFRIDAYS

DIGI x ESG
June 2nd
@15.00 CEST

DIGI x E-commerce
June 16th
@15.00 CEST

DIGI x Automation
June 9th
@15.00 CEST

DIGI x CX
June 23rd
@15.00 CEST

DIGI x AUTOMATION #DIGIFRIDAYS

Deutsche Post DHL Group

Digi x Automation Operational Efficiency Fueled by Hyper-Automation

Thorsten Kranz
Head of Data Science Implementation
DPDHL Group

Robotics: Accelerated Digitalization Program at DSC

Sally Miller
Global Digital Transformation Officer &
Chief Information Officer North America
DHL Supply Chain

Group-Wide IoT (Internet of Things) solutions

Axel Wiebracht
VP, Head of IoT Center of Excellence
DPDHL Group

EVO and RAPTOR: Automation & AI at Road Freight

Stefano Arganese
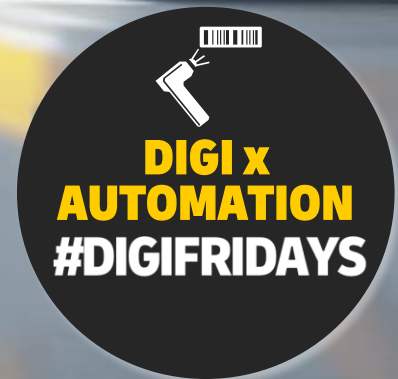Chief Transformation Officer
DHL Freight

Deutsche Post DHL Group

OPERATIONAL EFFICIENCY FUELED BY HYPER-AUTOMATION

DIGI X AUTOMATION

THORSTEN KRANZ
HEAD OF DATA SCIENCE IMPLEMENTATION
DPDHL GROUP

DIGI x AUTOMATION
#DIGIFRIDAYS

Digitalization and Automation are key enablers for logistics, as our profitable core

Physical Automation in our facilities

Asset Tracking for efficiency & resilience

Automated Routing for our transportations

Digital Touchpoints for End Customers

Artificial Intelligence in our backoffice processes
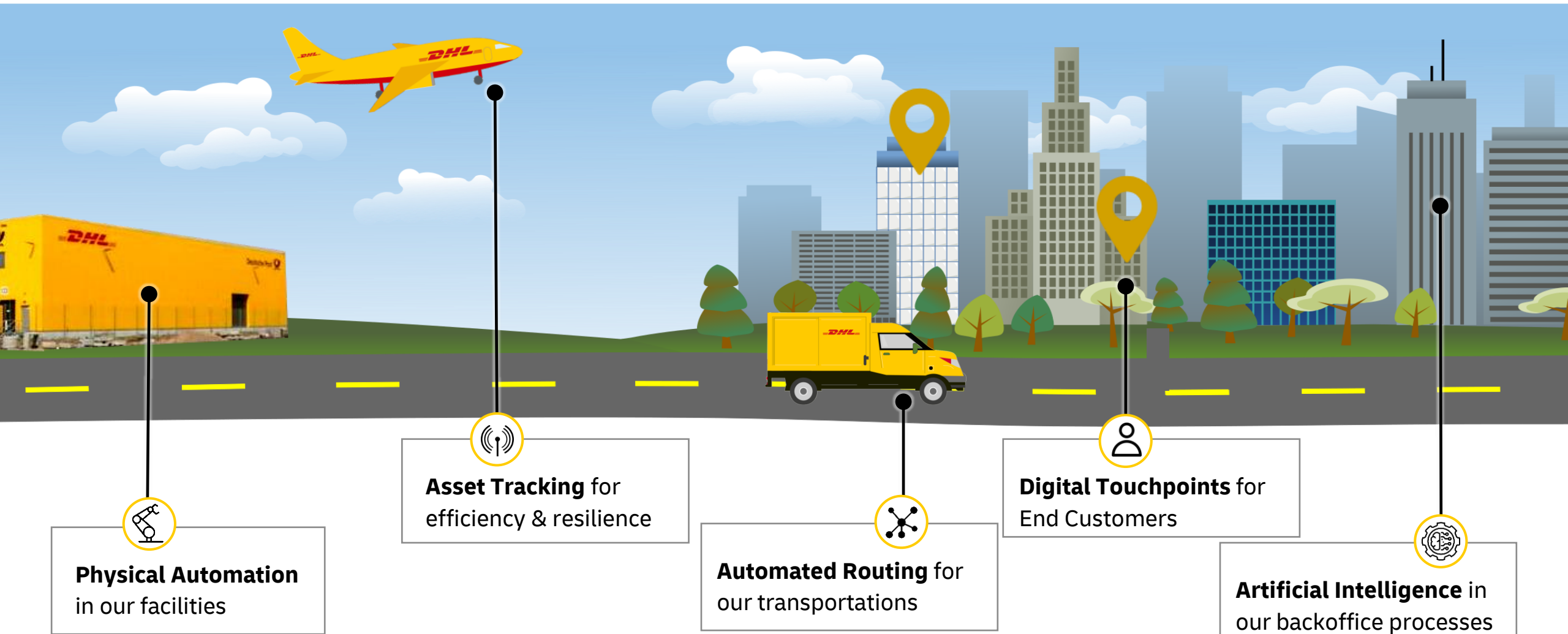
We incubate innovation in our Group Centers of Excellence

Data Analytics
Scalable Artificial Intelligence, Machine Learning (ML) and Optimization solutions for the Group
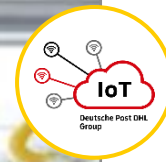
Data Solutions
Scalable Data & ML platforms to enable Advanced Analytics and Artificial Intelligence

APIs
Shared platform for internal and customer-facing APIs, e.g., for harmonized tracking and location finding

Internet of Things
X-divisional scalable core operations solutions for asset tracking, shipment tracking & condition monitoring

Blockchain
Multi-industry Blockchain platform for DPDHL as a backbone for functionalities and use cases

Automation of Operations
Support testing and integration of robotics and computer vision technology for our operations

in close practical interaction with our divisions

Advanced Analytics and Artificial Intelligence – taken to the next level

DHL Data & Analytics

- Transitioned from **Centers of Excellence** to a **Service Line** in Global Business Service

- **Constant growth** of footprint and headcount

- Implementing **high-impact AI Use Cases** with all divisions

- Providing **platforms** and **value add services** across the group

PCT	IOR	TREx
Product**C**lassification**T**ool	**I**nvoice**O**verdue**R**isk	**T**our**R**outingwith**Ex**perience

Advanced Analytics and Artificial Intelligence on a next level Product Classification Tool

Automating customs processes → AI-based prediction of commodity codes

691490
610910
851712

PCT
ProductClassificationTool

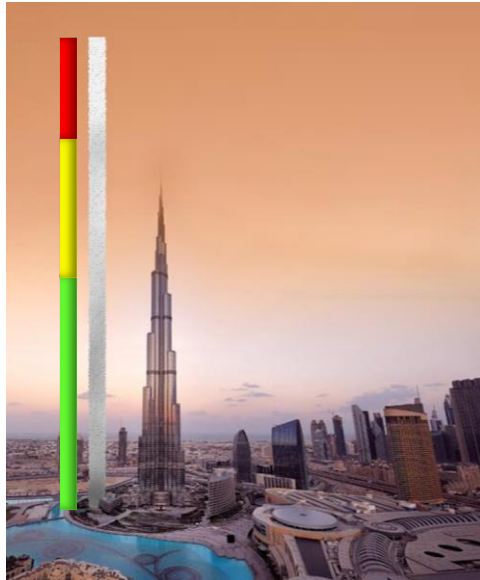**Acceleration of processes**

Supporting Customs Audit

Improve Master Data Quality

Advanced Analytics and Artificial Intelligence on a next level
Invoice Overdue Risk

Supporting **accounts receivable** processes

Predicting invoices with high risk of delayed payment

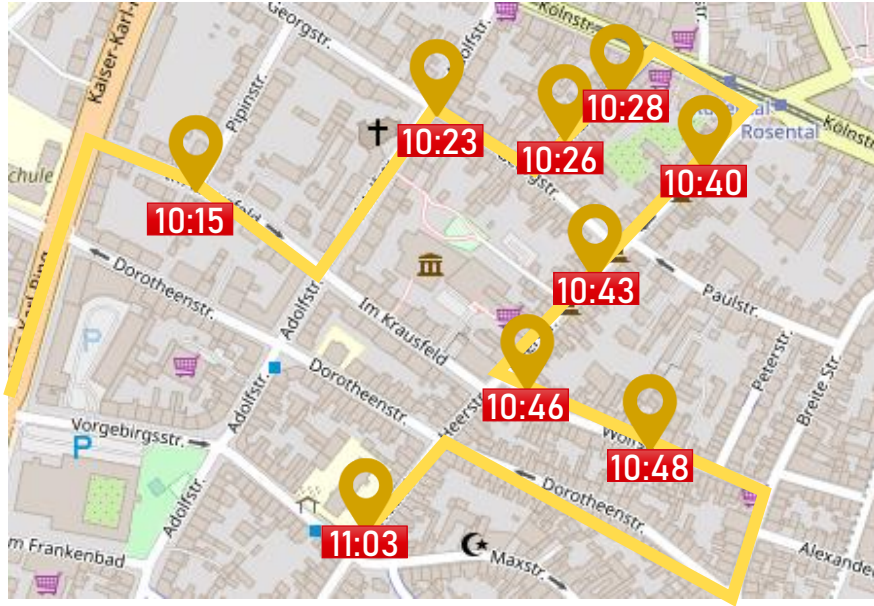**High impact on Free Cash Flow**

Increased AR efficiency

Improved interactions

IOR
Invoice**O**verdue**R**isk

Advanced Analytics and Artificial Intelligence on a next level

Tour Routing with Experience

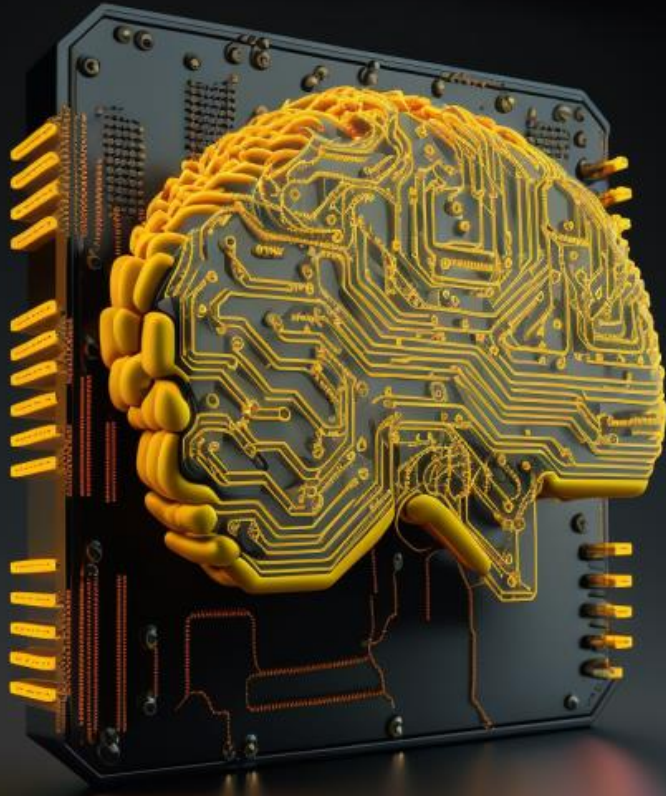**Learning from courier behaviour**

⌄⌄

Better tours with higher loyalty

Enabling digital features

Increasing efficiency

TREx
Tour**R**outingwith**Ex**perience

We are adopting Generative AI at Deutsche Post DHL Group

Cross-functional GAIA Squad established

✓ Providing secure access to Generative AI tools to our workforce

✓ Push awareness & enablement across the Group

✓ Driving Governance & Strategy for Generative AI

✓ Implementation of **high-impact** use cases, e.g.,

- Supporting digital customer touchpoints

- Automating text-centric processes

- Leveraging internal knowledge repositories via chatbots

Physical Automation

Robotics: Accelerated Digitalization Program at DSC
Sally Miller

Asset Tracking

Group-Wide IoT solutions
Axel Wiebracht

Automated Routing & Tasks

EVO & RAPTOR at DHL Freight
Stefano Arganese

ACCELERATED DIGITALIZATION @DSC

ALL IN ON INNOVATION.
FUTURE OF SUPPLY CHAIN
IS ALREADY HERE

SALLY MILLER
GLOBAL DIGITAL TRANSFORMATION OFFICER
CHIEF INFORMATION OFFICER NORTH AMERICA
DHL SUPPLY CHAIN

Deutsche Post DHL Group

ACCELERATED DIGITALIZATION

DIGI x AUTOMATION
#DIGIFRIDAYS

DHL Supply Chain

#1

contract logistics player worldwide

We are

>2x

the **size** of our closest competitors and the **only one** being able to **scale globally**

50+

countries covered worldwide

Contract logistics players (Market shares based on 2021[1])

6.0% 2.9% 1.9% 1.7% 1.6% 1.5% 1.5% 1.3% 1.2% 1.1%

DHL Supply chain | GXO | KUEHNE+NAGEL | UPS | CEVA LOGISTICS | Hitachi Transport System | GEODIS | DB SCHENKER | Ryder | DSV

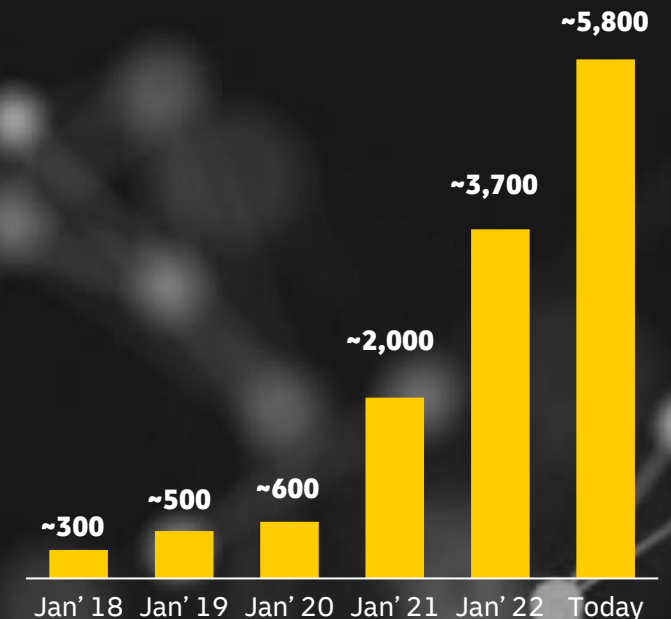1) market shares are calculated based on companies' respective contract logistics revenues. Source: DPDHL estimates.

Our unique ecosystem of integrated IT solutions, robotics and data analytics applications maximize value for us and our customers

12 Focus technologies
identified along entire logistics process

of digitalization projects live

Assisted Picking Robots	**(un)Loading Technologies**	**Intelligent Process Automation**
Goods-to-Person Robots	**Data Analytics**	**Sortation Technologies**
Packaging Technologies	**Smart Operations**	**Supporting Robots**
Indoor Robotic Transport	**Wearable Devices**	**Asset Tracking & Monitoring**

Chart — # of digitalization projects live:
- Jan' 18: ~300
- Jan' 19: ~500
- Jan' 20: ~600
- Jan' 21: ~2,000
- Jan' 22: ~3,700
- Today: ~5,800

90%+ of our sites implemented at least one focus technology already today
100% by end of the year

OUR DIGITAL JOURNEY STARTED YEARS AGO

IT IS FAR ADVANCED AND INDUSTRY-LEADING

ACCELERATED DIGITALIZATION

We bring key digital technologies to a wider number of operations through our focused digital funnel

IDEAS

RESEARCH AND PROOF OF CONCEPT — **100+** PARTNERS ENGAGED

PRODUCTIZATION — **12** FOCUS TECHNOLOGIES DEFINED

COMMERCIALIZATION AND INDUSTRIALIZATION — **5800+** GO-LIVES
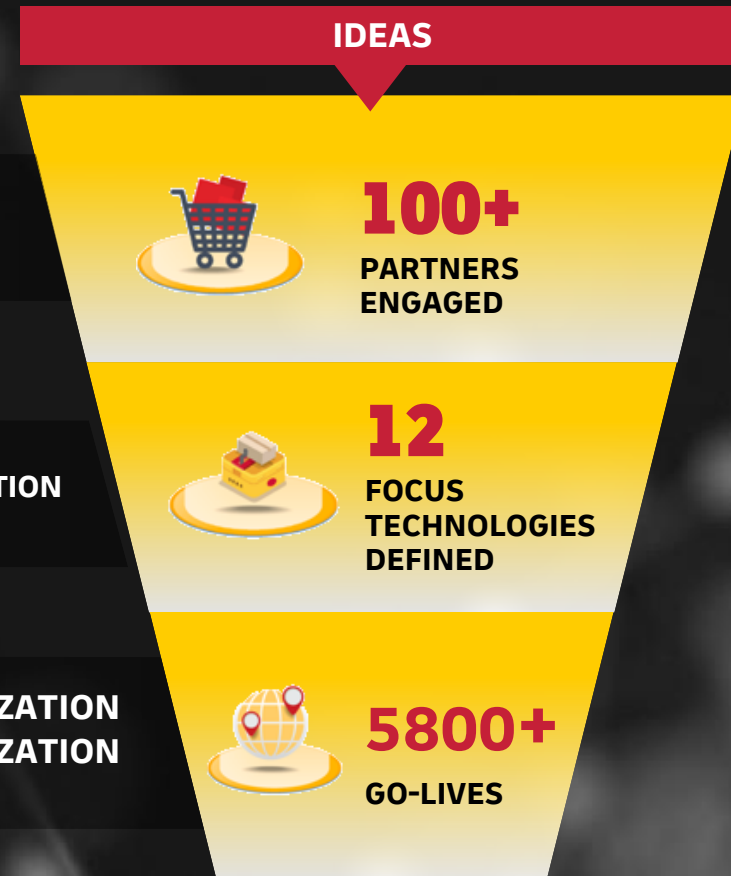
After successful PoCs and a first deployment, Boston Dynamics Stretch will soon be a product to scale across the globe
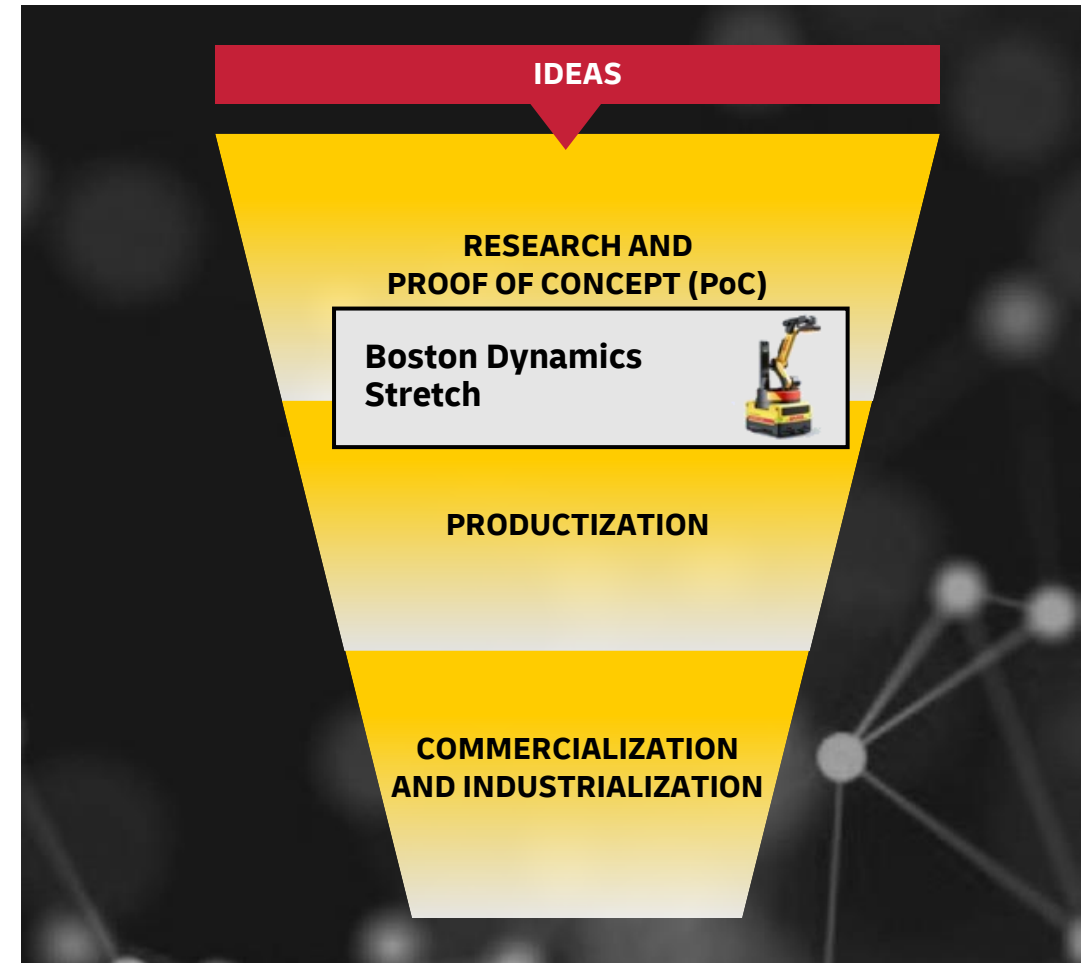

Case unloading
Use case

1
units live (06/23)

North America
Geographies covered

IDEAS

RESEARCH AND
PROOF OF CONCEPT (PoC)

Boston Dynamics
Stretch

PRODUCTIZATION

COMMERCIALIZATION
AND INDUSTRIALIZATION

20 Fox Robotics autonomous pallet unloaders;
We are partnering with Fox to bring pallet unloading to other regions

Pallet unloading
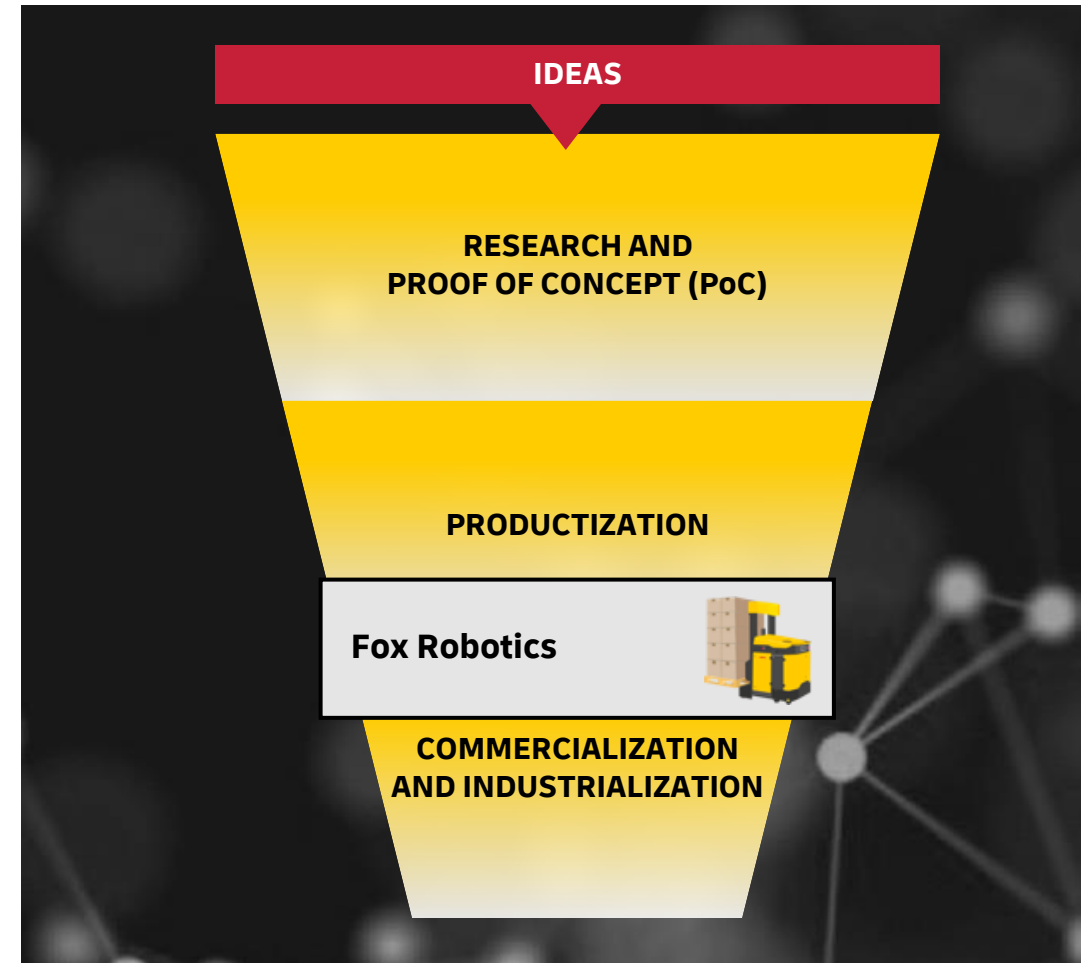Use case

20
units live (06/23)

North America
Geographies covered

IDEAS

RESEARCH AND
PROOF OF CONCEPT (PoC)

PRODUCTIZATION

Fox Robotics

COMMERCIALIZATION
AND INDUSTRIALIZATION

2,500+ assisted picking robots are deployed across all geographies; Continued focus on operational efficiency gains

Each picking
Use case
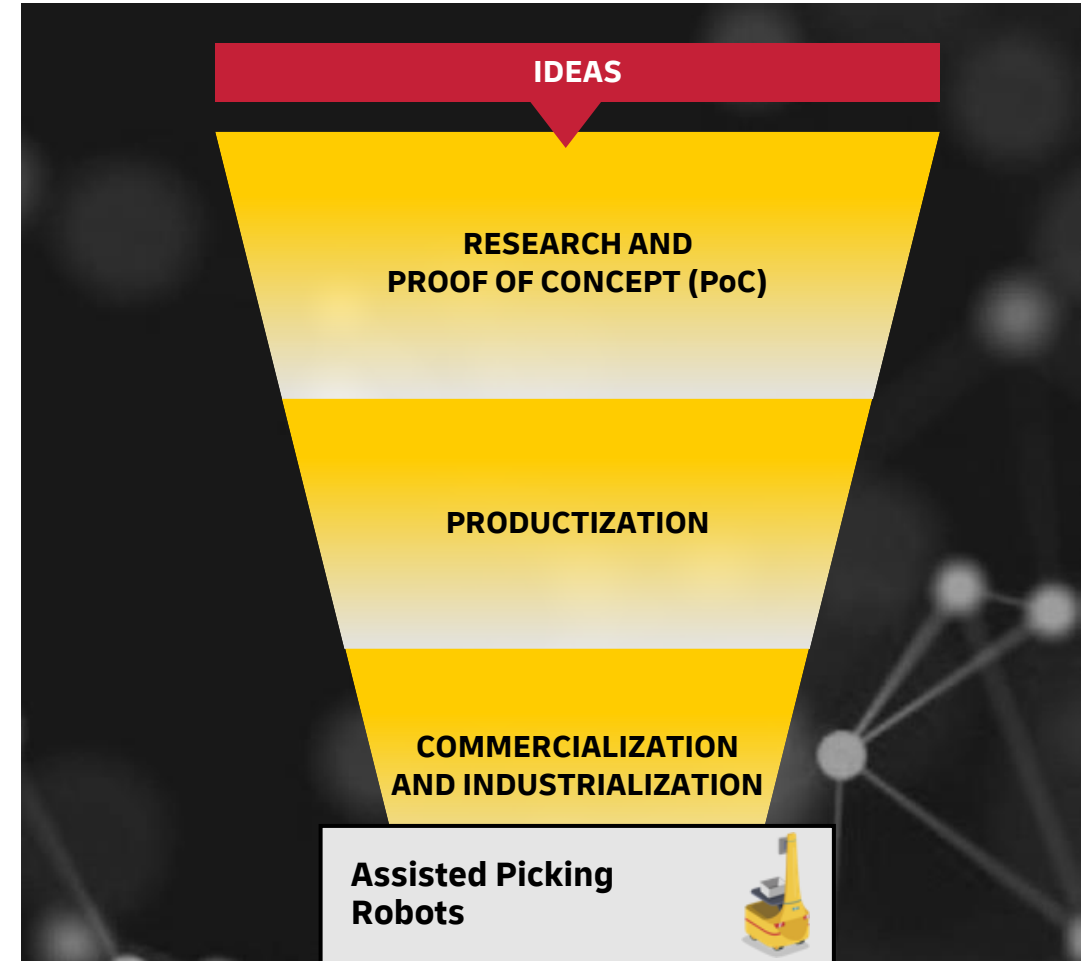
2,500+
units live (06/23)

Global
Geographies covered

IDEAS

RESEARCH AND
PROOF OF CONCEPT (PoC)

PRODUCTIZATION

COMMERCIALIZATION
AND INDUSTRIALIZATION

Assisted Picking Robots

Applying our funnel approach for data analytics / AI to maximize the impact of our scale advantage

2000+ facilities worldwide

1 unique logistics **data pool**

Warehousing and transport safety

Inventory accuracy

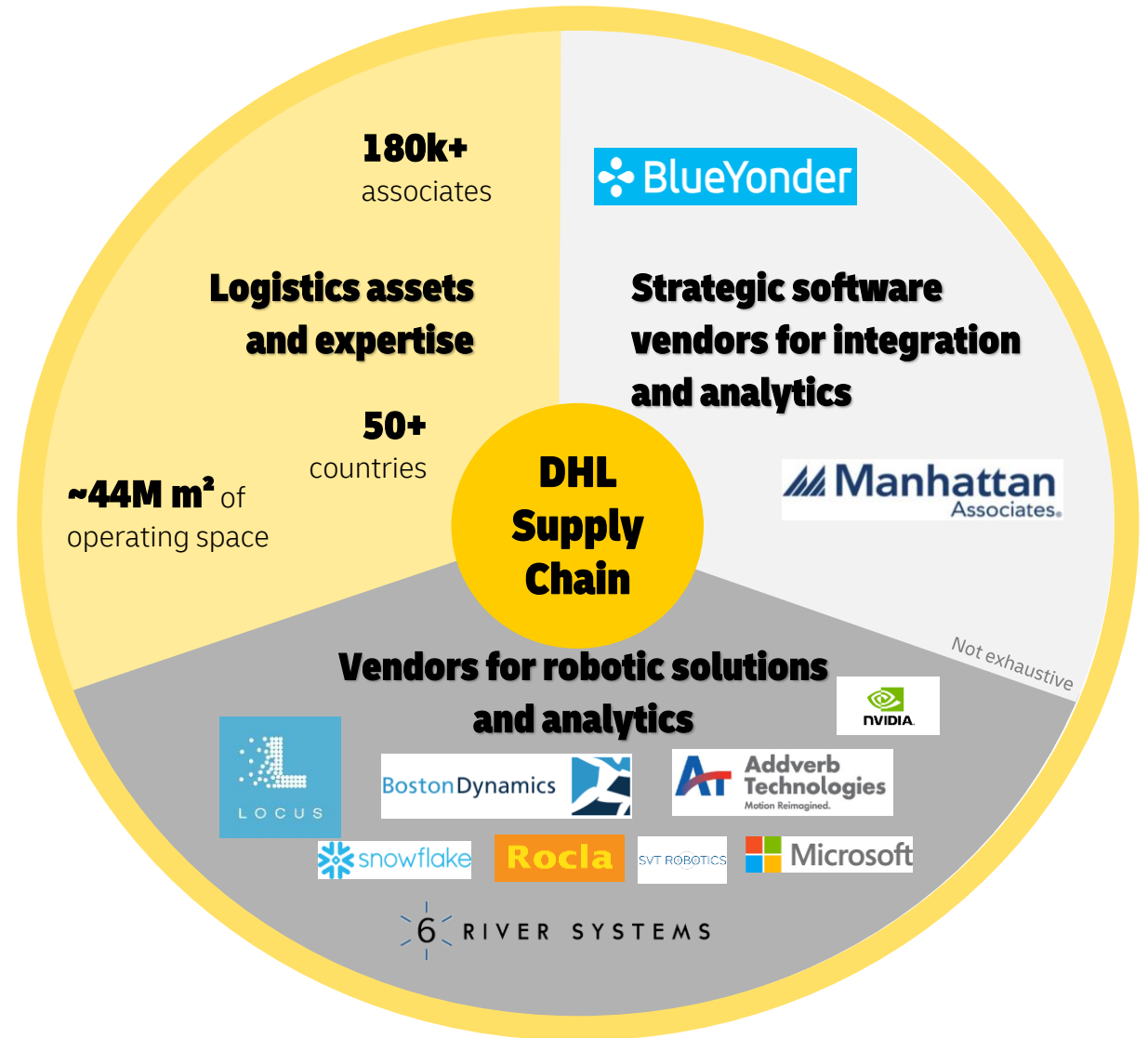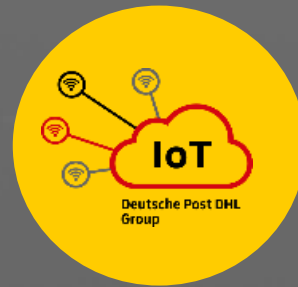**Generative AI for back-office tasks (and much more)**

Gen AI

Vision & sensing technology for robots

...and much more

We are best in **ORCHESTRATING** multiple vendors of IT solutions, robotics and AI/ analytics into our ecosystem

180k+ associates

Logistics assets and expertise

50+ countries

~44M m² of operating space

DHL Supply Chain

BlueYonder

Strategic software vendors for integration and analytics

Manhattan Associates®

Not exhaustive

Vendors for robotic solutions and analytics

LOCUS

Boston Dynamics

Addverb Technologies Motion Reimagined.

NVIDIA

snowflake

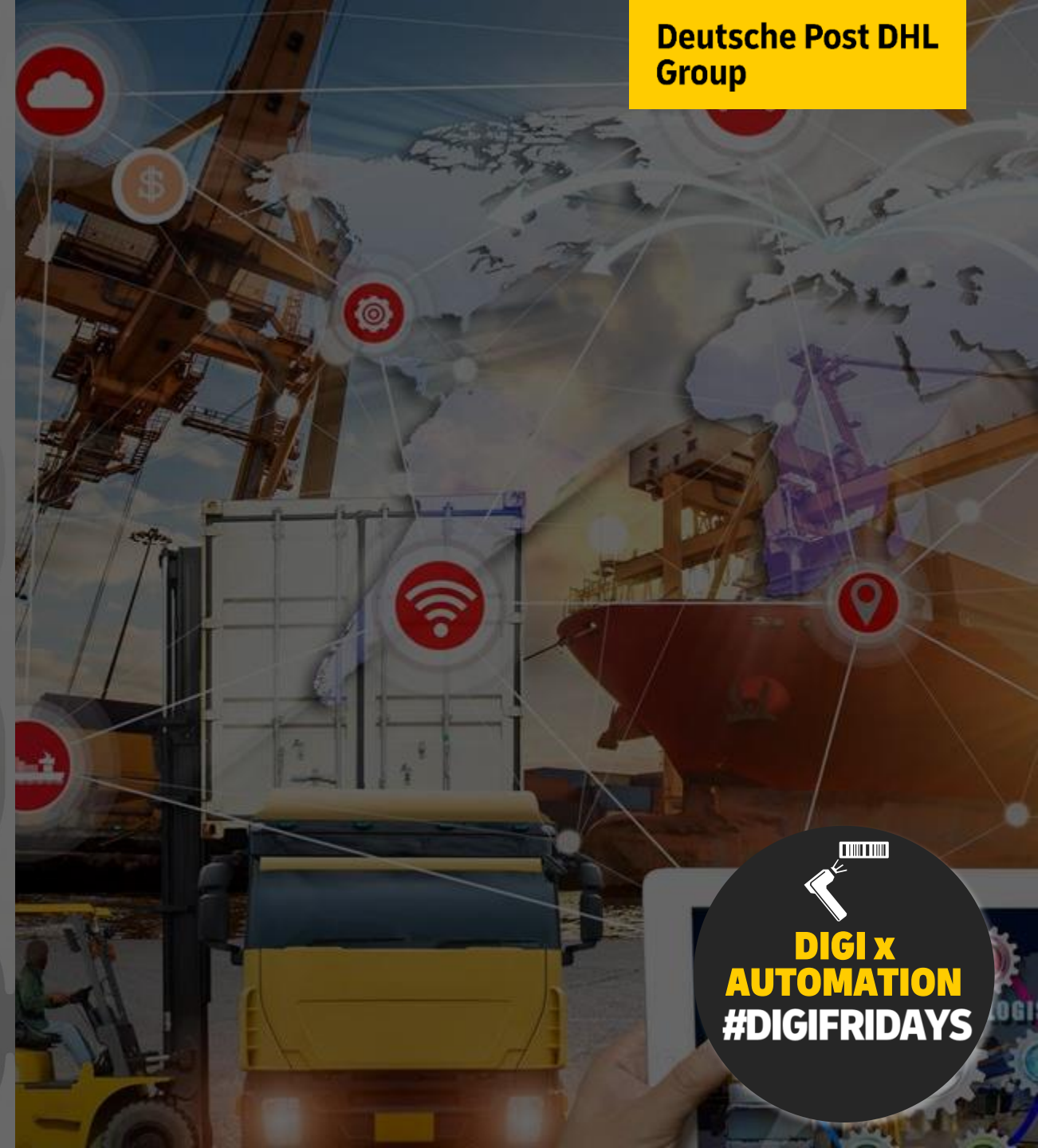Rocla

SVT ROBOTICS

Microsoft

6 RIVER SYSTEMS

Deutsche Post DHL Group

EXPERIENCE IOT @DPDHL

DIGITAL TRACKING OF PHYSICAL ASSETS

AXEL WIEBRACHT
VP, HEAD OF IOT CENTER OF EXCELLENCE
DPDHL GROUP

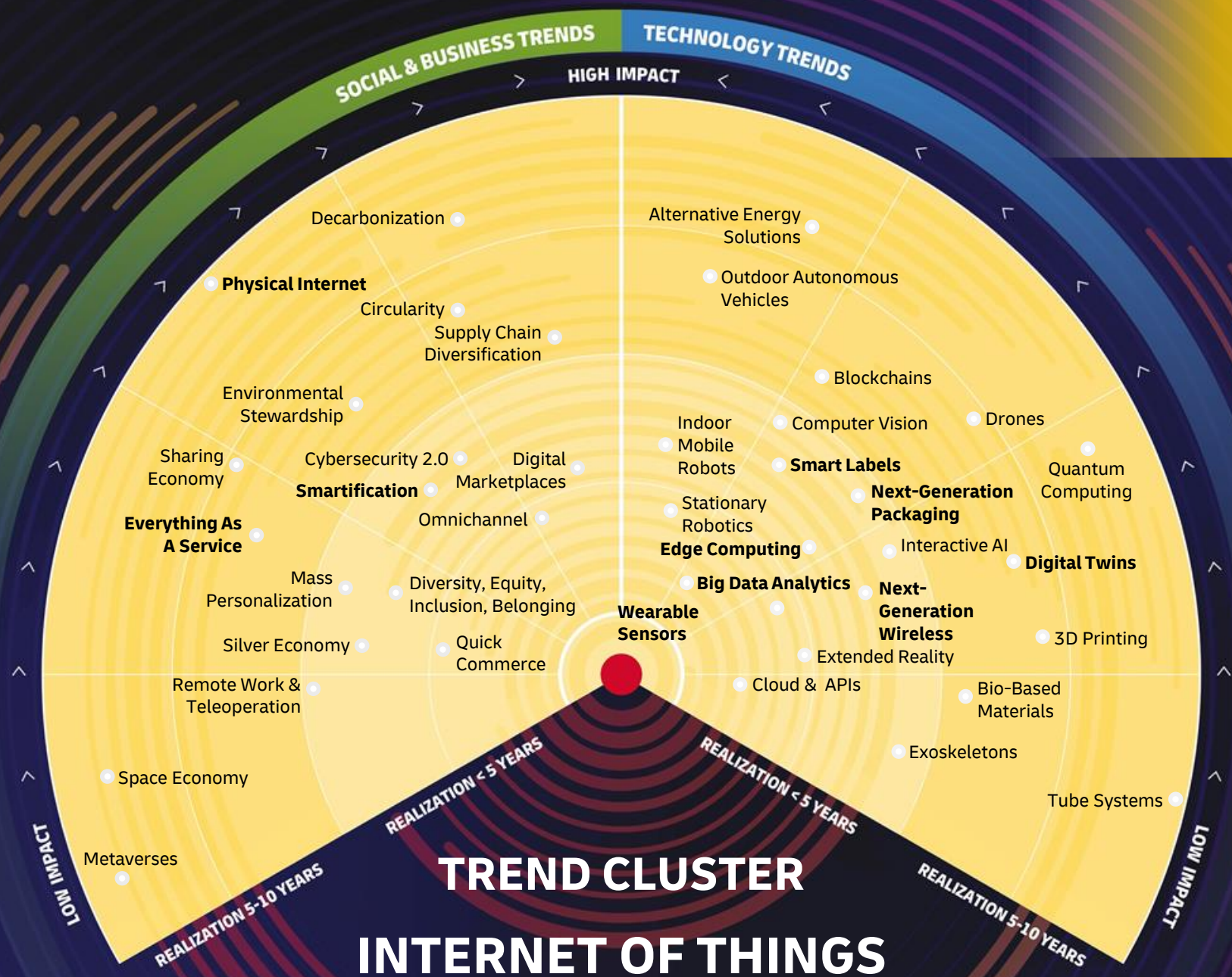# THE LOGISTICS TREND RADAR 6.0

Delivering insight today, creating value tomorrow.

DHL INNOVATION CENTER

SOCIAL & BUSINESS TRENDS | **TECHNOLOGY TRENDS**

HIGH IMPACT

High Impact
Revolutionary applications that are potentially disruptive.

Low Impact
Evolutionary changes with incremental improvements.

Realization
The common way of operating and doing business in logistics.

- Decarbonization
- Alternative Energy Solutions
- Outdoor Autonomous Vehicles
- **Physical Internet**
- Circularity
- Supply Chain Diversification
- Blockchains
- Environmental Stewardship
- Indoor Mobile Robots
- Computer Vision
- Drones
- Sharing Economy
- Cybersecurity 2.0
- Digital Marketplaces
- **Smart Labels**
- Quantum Computing
- **Smartification**
- **Next-Generation Packaging**
- Stationary Robotics
- **Everything As A Service**
- Omnichannel
- Interactive AI
- **Edge Computing**
- **Digital Twins**
- Mass Personalization
- Diversity, Equity, Inclusion, Belonging
- **Big Data Analytics**
- **Next-Generation Wireless**
- **Wearable Sensors**
- 3D Printing
- Silver Economy
- Quick Commerce
- Extended Reality
- Remote Work & Teleoperation
- Cloud & APIs
- Bio-Based Materials
- Space Economy
- Exoskeletons
- Metaverses
- Tube Systems

REALIZATION < 5 YEARS | REALIZATION < 5 YEARS

REALIZATION 5-10 YEARS | REALIZATION 5-10 YEARS

LOW IMPACT | LOW IMPACT

TREND CLUSTER
INTERNET OF THINGS

Deutsche Post DHL Group

Where do we use IoT in Logistics?
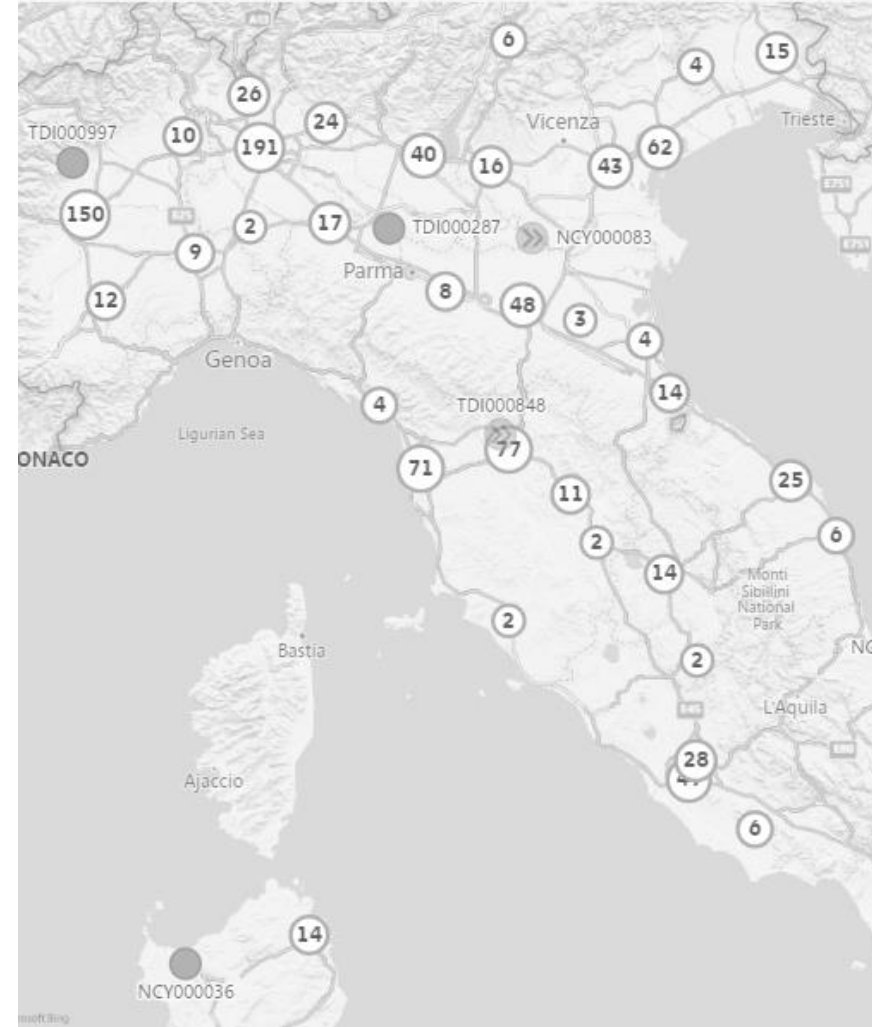
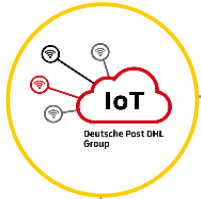**SMART OPERATIONS**

SHIPMENTS & CUSTOMER INTERACTION

DIGITALIZATION OF OPERATIONAL ASSETS

Digitalization of Assets – Real-time tracking of critical assets improves asset utilization and increases operational efficiency

Returnable Transport Units, Support Equipment, Containers

IoT-enabled trackers at DHL Express Hub Leipzig

Trackers for Ground Support Equipment (GSE)

GSE is constantly in motion and can thus be challenging to track & locate

I'm loaded!

I'm loaded!

I'm reserved!

I'm busy!

I'm busy!

I'm reserved!

I'm free!

I'm free!

IoT-enabled GPS tracker help us to find available GSE for loading and unloading an aircraft

Sensors then sent to Group IoT platform

The DHL IoT Platform provides real-time transparency on critical assets, equipment and shipments across all use cases

DHL IOT Platform

3rd party IoT sensor portfolio
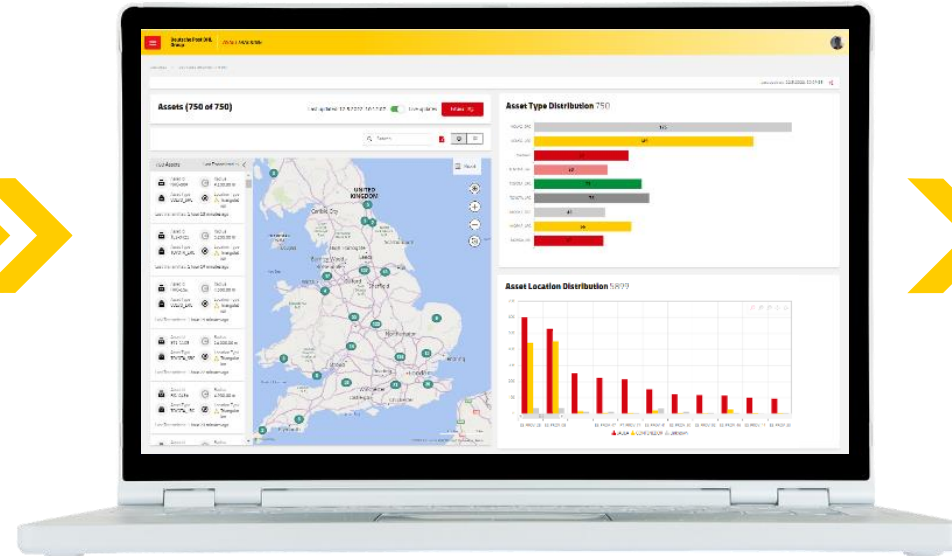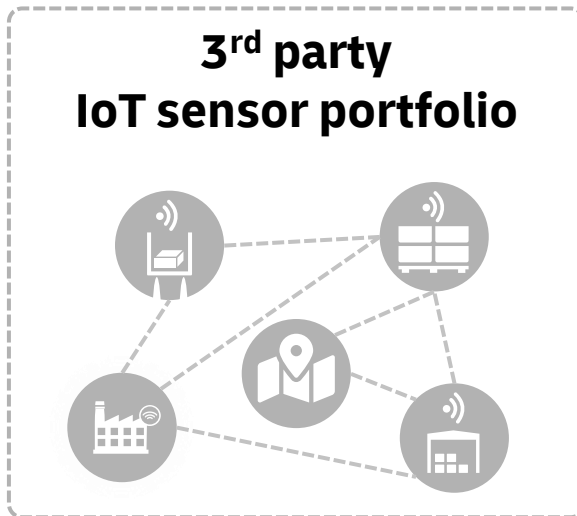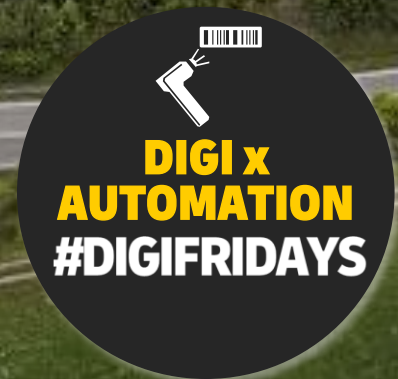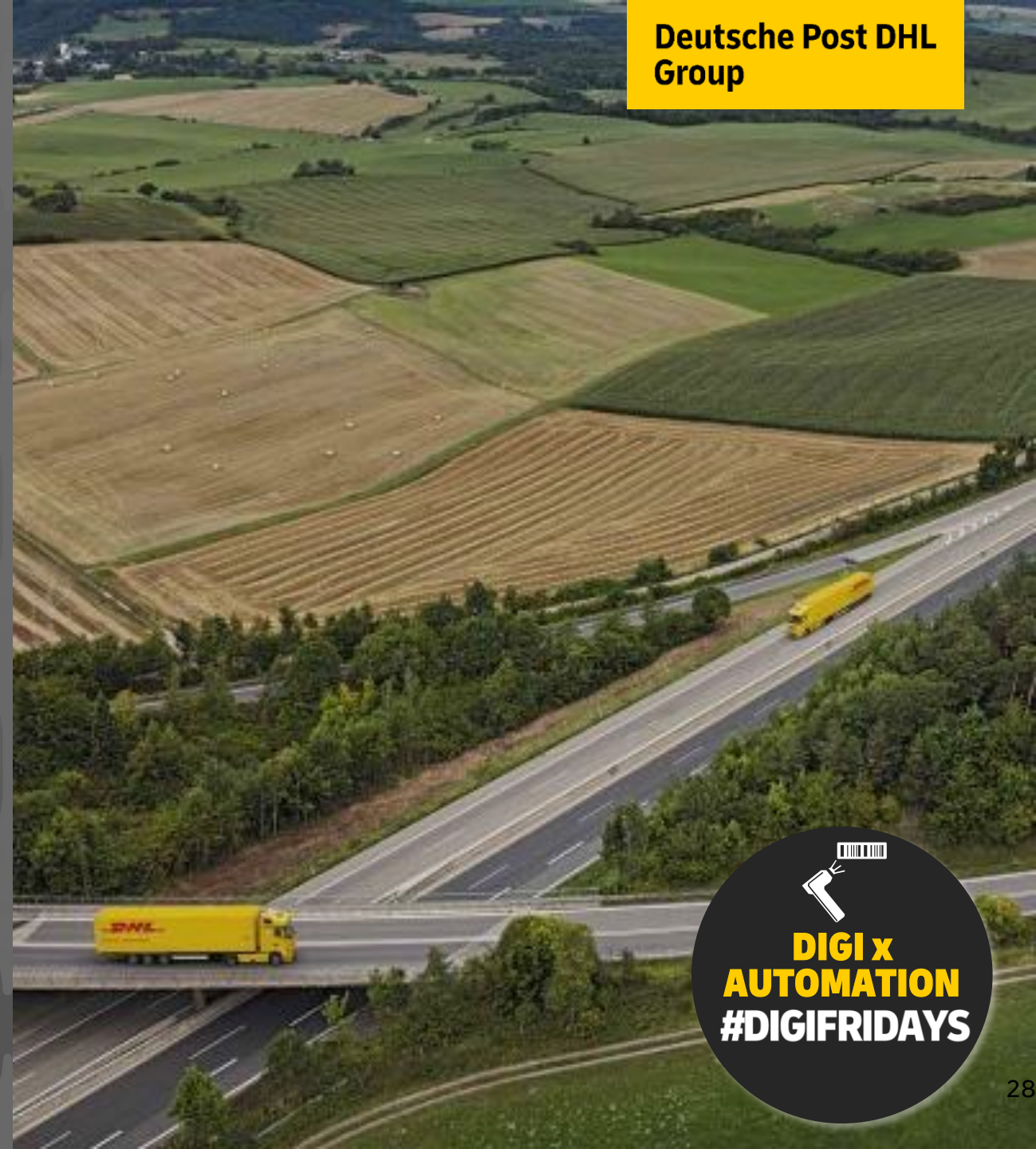
DHL customer facing portals

DHL internal operations

GET TO KNOW EVO AND RAPTOR

HOW AUTOMATION AND ARTIFICIAL INTELLIGENCE DRIVE OPERATIONAL EFFICIENCIES AT DHL FREIGHT

STEFANO ARGANESE
Chief Transformation Officer
DHL FREIGHT

DIGI x AUTOMATION #DIGIFRIDAYS

Automation and AI at DHL Freight, our leading asset-light road freight business

Automation Key Aspects

Today's Automation Showcases

- Harmonized Process
- Unified Data
- Rules & Algorithm

"EVO" creates a harmonize data basis and enables automation of multiple tasks in our value chain

**DHL FREIGHT
TRANSPORT MANAGEMENT SYSTEM**

29	**5 K**	**14 M**
Countries	Users	Orders

One system, one database, full transparency

Automation speeds up operational tasks & reduces administrative tasks

By DHL Freight, for DHL Freight
A specific road freight solution fitting our business

With EVO we see very positive results and are targeting to finish the rollout next year

Quality
Less mistakes

Automated invoicing
~27%p increase

%EDI* auto-confirmed
~10%p increase

DSO
reduced

*EDI: Electronic Data Interchange

Fully on EVO

Partly on EVO
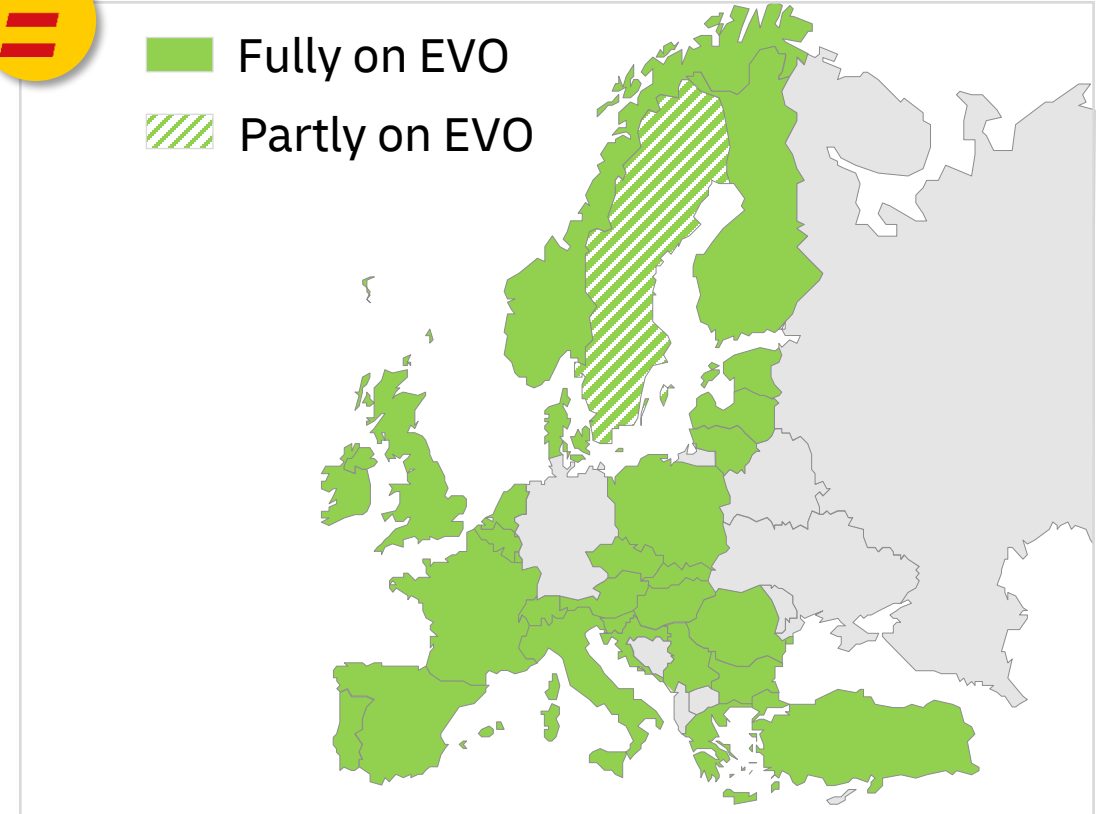
Complete roll-out expected in 2024

Routing **A**lgorithm for **P**lanning **T**ransp**or**tation

RAPTOR

Help dispatchers assigning hundreds of orders to delivery vehicles daily using AI

Integration into dispatcher's standard work environment

Close feedback loops continuously improving results

PLANNING PROBLEM

Operational

Tactical

Strategic

Dispatching

Fleet sizing
Cost simulation

Network design analysis
(number and location of hubs)

RAPTOR DECISION SUPPORT SYSTEM

Load capacities

~1000 shipments daily

Driving regulations

Varying size & weight

3 Transportation modes

# of locations

# of vehicles

Dispatcher

RaptOR request

Instant delivery schedules

RaptOR Algorithm
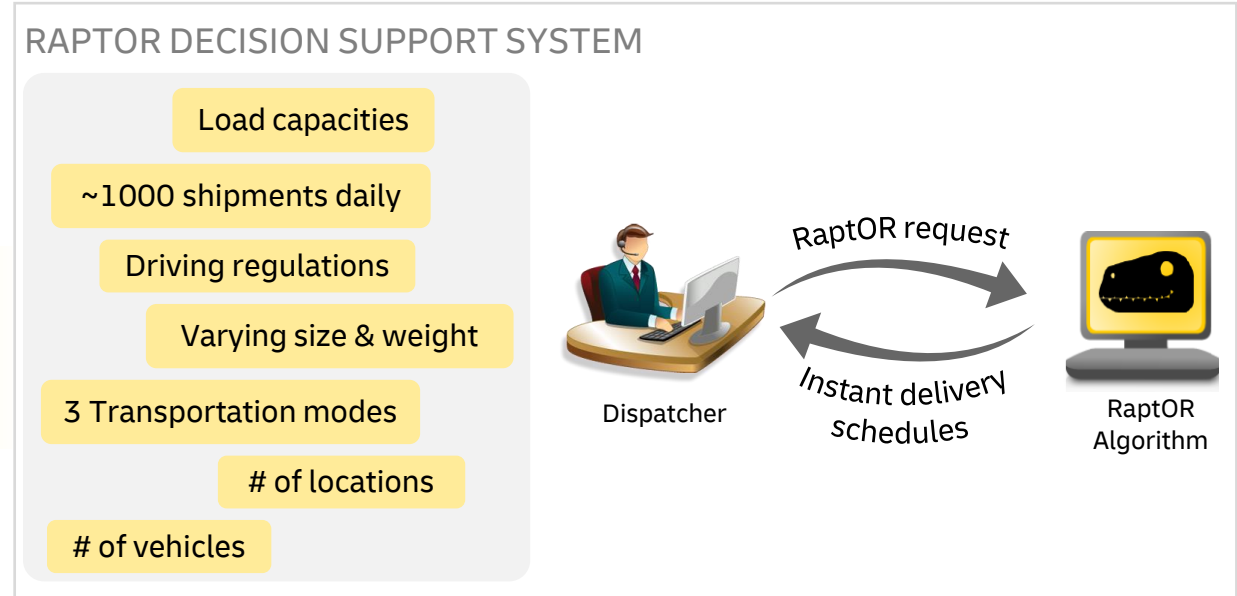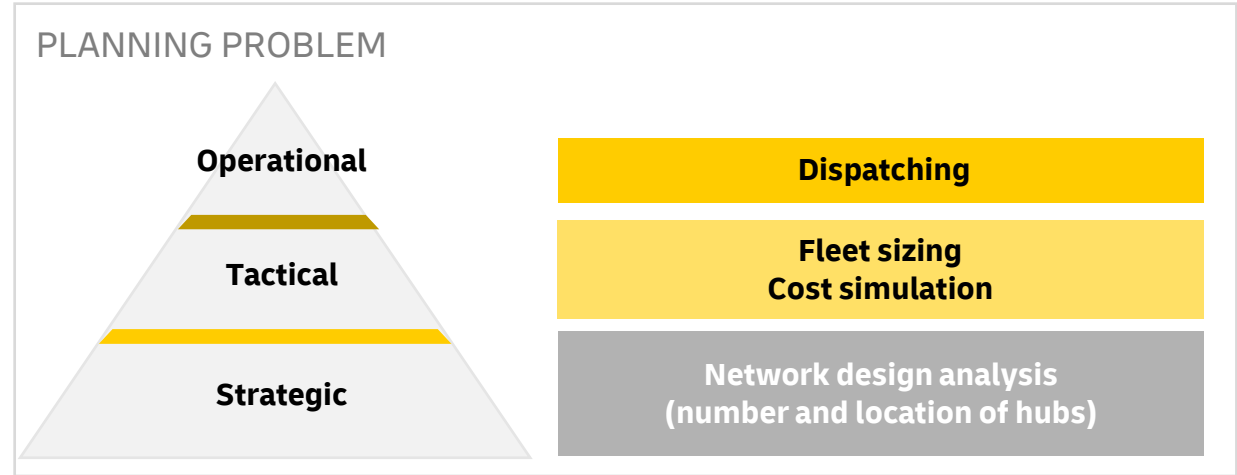
Routing Algorithm for Planning Transportation
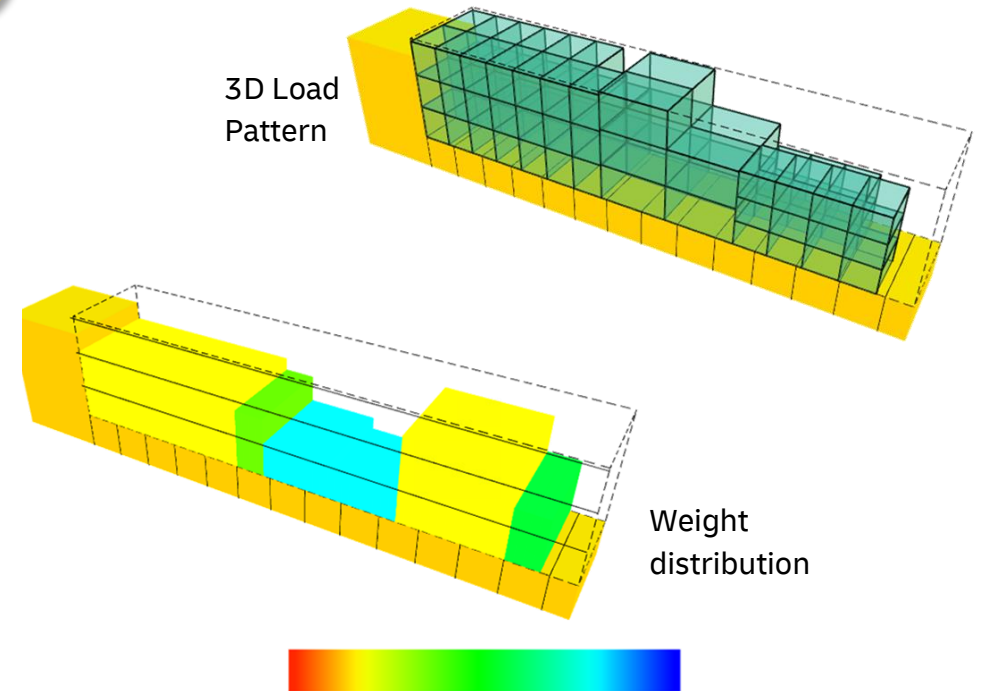## Achieving cost reductions and operational efficiencies via AI
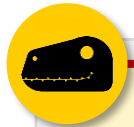
-92%
Less time spend for dispatching

Driving Distance
decreased

Load Factor
optimized

-8%
Reduced CO2 emission

3D Load Pattern

Weight distribution

OPERATIONAL EFFICIENCY FUELED BY HYPER-AUTOMATION

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