AI in mobility and transport: applications, opportunities and barriers

Organised by DG CNECT and DG MOVE

5 February 2025

Agenda

Time	Description
09:00	Welcome and introduction
09:10	Scene setting & policy context
09:25	**Session 1:** Leading use cases and their potential impact
10:05	Q&A
10:20	**Session 2:** Challenges in accessing the key factors for the development of AI in the mobility and transport sector
11:00	Q&A
11:15	*Coffee Break*
11:30	**Session 3:** The European ecosystem of AI in mobility and transport: global position, key players and scalable collaboration opportunities
12:00	Q&A
12:15	Closing remarks
12:30	*End*

Paving the way: **Apply AI** for mobility and transport

OBJECTIVES

- Strengthen the sector's competitiveness
- Enhance sustainability, safety, resilience
- Reinforce our position in the global AI race

CHALLENGES

- Competition from other regions
- Accessibility and quality of data
- Affordable computing power
- Skills gap
- Compliance with legislation
- Ethics, security, safety, privacy
- Environmental impact

KEY ENABLERS

Regulation	Single market for data (*Data Act*); Responsible AI (*AI Act*); Fair digital markets; Seamless transport services
Deployment	Data ecosystems (*EMDS*; *EDIC for Mobility and Logistics*); Testing facilities; Investments in skills
R&I	Digital enablers (*Digital Vehicle Initiative*); Development & piloting of sectoral applications (*GenAI4EU*)
Infrastructure	HPC (*AI Factories*); Cloud-edge-IoT; Connectivity; Smart transport infrastructure

ApplyAI

Setting the scene and policy context

Mariusz Bałdyga (CNECT A1, AI Excellence)
Kristof Almasy (CNECT E4, IoT, mobility)

EUROPEAN ARTIFICIAL INTELLIGENCE OFFICE

European Commission

Applying AI in the mobility sector: a political priority

*Europe is already leading the way on **making AI safer and more trustworthy**, and on tackling the risks stemming from its misuse.*

*We must now focus our efforts on becoming a **global leader in AI innovation***

*We will also develop with Member States, industry and civil society an **Apply AI Strategy** to boost new industrial uses of AI and to improve the delivery of a variety of public services.*

Political Guidelines
18 July 2024

Ensure that **digitalisation** continues to help modernise the transport system.

Make the most of **digital tools**, new tech and innovation.

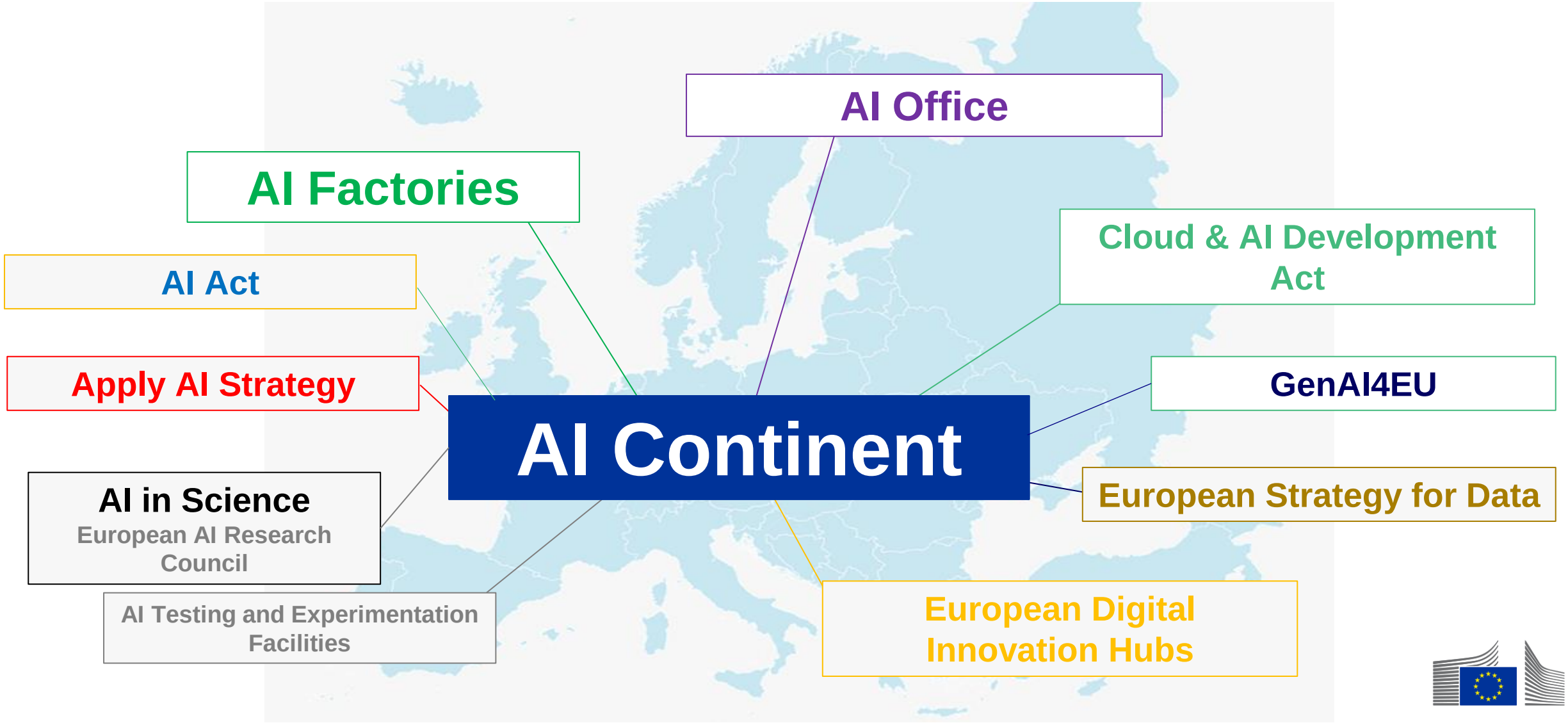
Mission Letter of A. Tzitzikostas,
Commissioner for Sustainable Transport and Tourism

Competitiveness Compass Communication

"Europe needs the **computing, cloud and data infrastructures** that AI leadership requires."

"**Integrating AI into strategic sectors** where Europe has traditionally been strong will be critical to maintaining their competitive edge"

The EU support instruments towards an AI Continent



Apply AI strategy: Our mandate

Towards an AI Continent

*"We will also develop with Member States, industry and civil society an **Apply AI Strategy** to **boost new industrial uses of AI and to improve the delivery of a variety of public services**."*

Selected priorities

Content stems directly from:

- President's **Political Guidelines 2024-2029**
- **Draghi Report**
- **Mission Letters** (notably letter to EVP for Tech Sovereignty, Security and Democracy)

Main objectives

Delivering an **overarching plan** to:

1. support the **development of world class AI models** in the EU and
2. foster the **integration of AI technologies into EU's most strategic sectors** with the aim of
3. **unlocking the potential of innovation** and **enabling European companies to be global front-runners**;
4. increase the **quality of services in the public sector**.

EUROPEAN ARTIFICIAL INTELLIGENCE OFFICE

GENAI4EU: fostering generative AI adoption in industrial ecosystems

€4Bn

STARTUPS

UNIVERSITIES

AgriFood

Aerospace

Sciences

Digital twins

Public sector

Robotics

Healthcare

Biotechnologies and chemicals

Materials and batteries

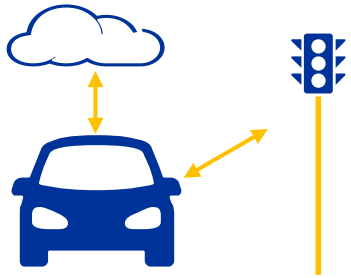
Manufacturing and engineering

Climate change and environment

Mobility

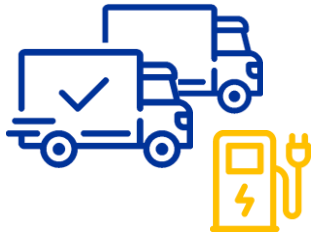
Cybersecurity

High-impact applications of (Gen)AI in mobility and transport



Autonomous vehicles integrated in intelligent transport systems, powered by distributed intelligence and V2X communication

Improved mobility services (e.g. public transport, shared mobility) through AI-based monitoring, prediction and recommendations



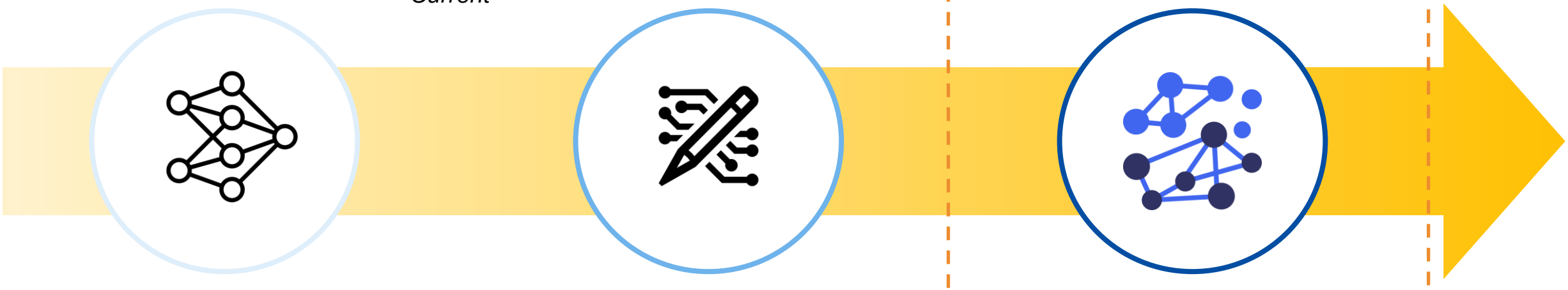
Optimised transport fleet management (e.g. routing, charging, maintenance) leveraging digital twins

Icons: xnimrodx, Freepik, aldo cervantes

Where EU opportunities lie: Sector-specific AI applications and large language models (LLMs) for value creation

Current

Future



Generalist LLMs

OpenAI Claude MISTRAL AI_

Generic LLMs (e.g., GPT 4.0; Claude 3.5) have **exhausted public training** data

They fail to represent complex, domain-specific industry needs

Expected commoditization

Detailed LLMs from AI/ML PaaS

Amazon SageMaker GCP Vertex AI Azure Machine Learning

Industrial users develop more detailed LLM models based on Hyperscaler **generic tooling** (test beds, model optimization, etc.) & **Generic PaaS** (databases, data lakes)

Key EU disadvantage vis-a-vis hyperscalers

Sector-specific LLMs

Domain-specific LLMs and other AI models trained on specific industry data

Models capture unique demands and needs of **distinct business domains**

Potential differentiator for EU industry who is data holder… if we are fast

European Single Market for Data

Data legislation

Data Act | Data Governance Act | Open Data Directive | GDPR | …

Common European data spaces

Health | Manufact. | Agriculture | Finance | **Mobility** | Green Deal | Energy | Public Admin. | Skills | EOSC | Tourism | Cultural heritage | Media | Language

High Value Datasets from public sector

European Data Innovation Board
prioritise cross-sectoral interoperability standards

Data Spaces Support Centre
Common blueprint and support

Technical infrastructure

Standards | Digital identity (eIDAS) | Smart Middleware solutions (Simpl) | Testing and Experimentation Facilities | High-Performance Computing | Cloud-edge-IoT infrastructure and services

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AI-empowered mobility

Mateusz Maj | November 2024

Workshop on AI in mobility and transport:
Applications, opportunities and barriers

Fleet energy transition

1. **Transport accounts for 25% of GHG**
   with 70% of city CO2 from road vehicles

2. **Strong regulatory pressure**
   Green Deal, CSRD, Clean Vehicle Directive

3. **Corporate/urban fleets are pivotal in zero-emission transportation**

4. **Important challenges ahead**
   high upfront costs, infrastructure development, and operational integration

Longstanding barriers

- Decreased productivity
- Capital risk
- Grid constrains
- Operational complexity

Temporary barriers

- Upfront cost
- Vehicle availability
- Charging availability
- Consumer concerns

Mateusz Maj, **mat@vivadrive.io**

AI-empowered fleet Digital Twin

Fleet electrification

- Transportation tasks analytics
- EV suitability
- EV infrastructure & strategy planning
- Financial plan & TCO
- Decarbonization strategy & deployment plan

Fleet management

- Holistic fleet analytics
- AI-enabled cost optimization
- Fleet process automation
- Driver communication & improvement
- EV fleet & charging management

Mateusz Maj, **mat@vivadrive.io**

VivaDrive

Better manage your low/zero-emission fleet

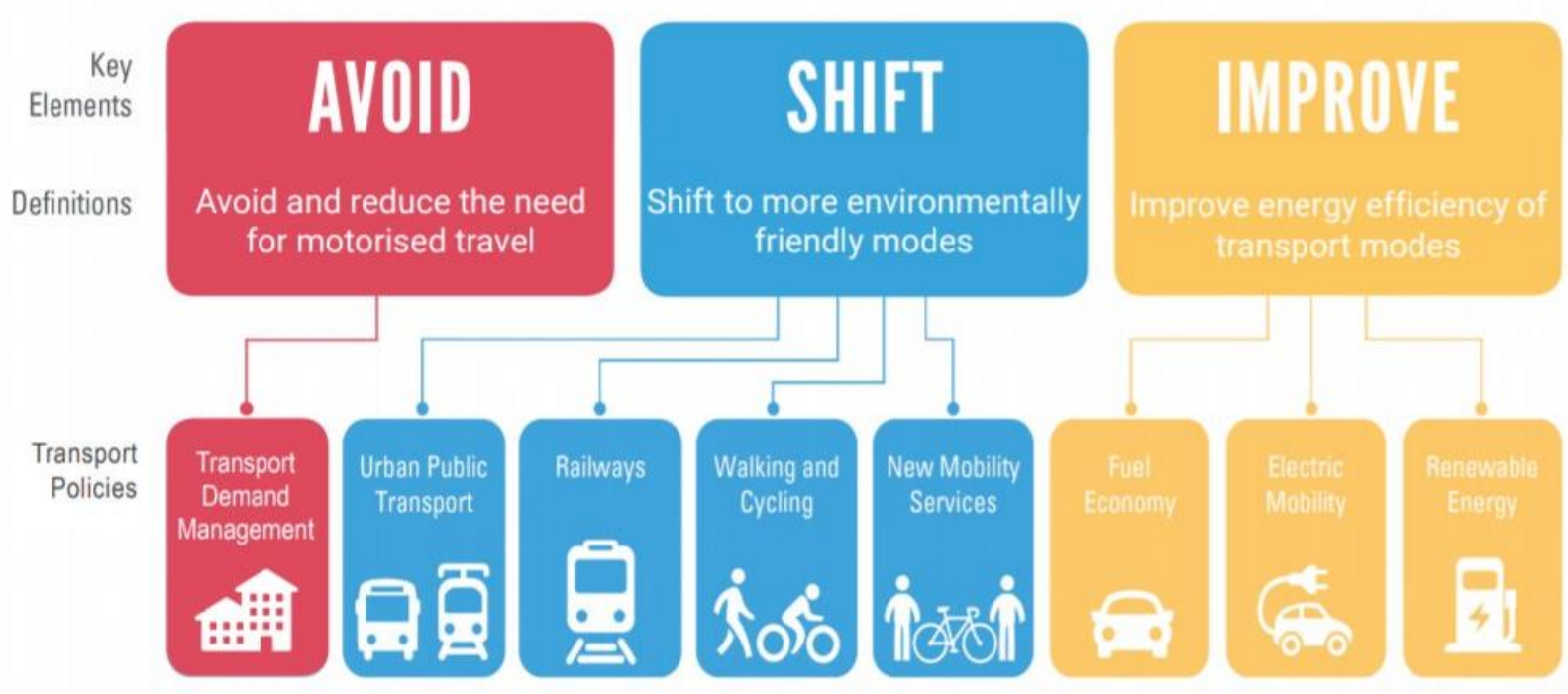
1. **40% Cost optimization**
   €1.000 annually per car

2. **100% emission reduction**
   600t CO2 annually for an average fleet

3. **Effective multimodality management**

4. **ESG reporting**

Step 1: Tactics for long-term results (A-S-I approach)



Example: fleet management (PL)

PZU iFlota | Powered by VivaDrive

The best fleet solution in Poland

1. Technology partner of PZU group in Poland, **the largest financial group in the CEE region** (2.5M cars insured)
2. **Problem:** offer digital services to customers that improve retention and reduce claims
3. **Joint projects** in fleet management (1) and fleet electrification (2)
4. **600 customers** and **100.000 vehicles** under management

(1) https://www.pzu.pl/_fileserver/item/1539536
(2) https://media.pzu.pl/informacje-prasowe/szczegoly/PZU_iFlota_EV

Example: fleet electrification (PL)

1. **Problem**: boost sales of own zero-emission solutions e.g. PV

2. Joint offer for customers that helps them **decarbonize their fleet** and and **introduce cost-effective energy flow**

3. Thanks to offering unique approach we offer effective way to attract new leads, boost the sales conversion rates

Case study: PKO BP

Bank Polski

Polish largest bank wanted to create a fleet electrification and mobility strategy for its entire fleet, including charging infrastructure and ESG reporting approach.

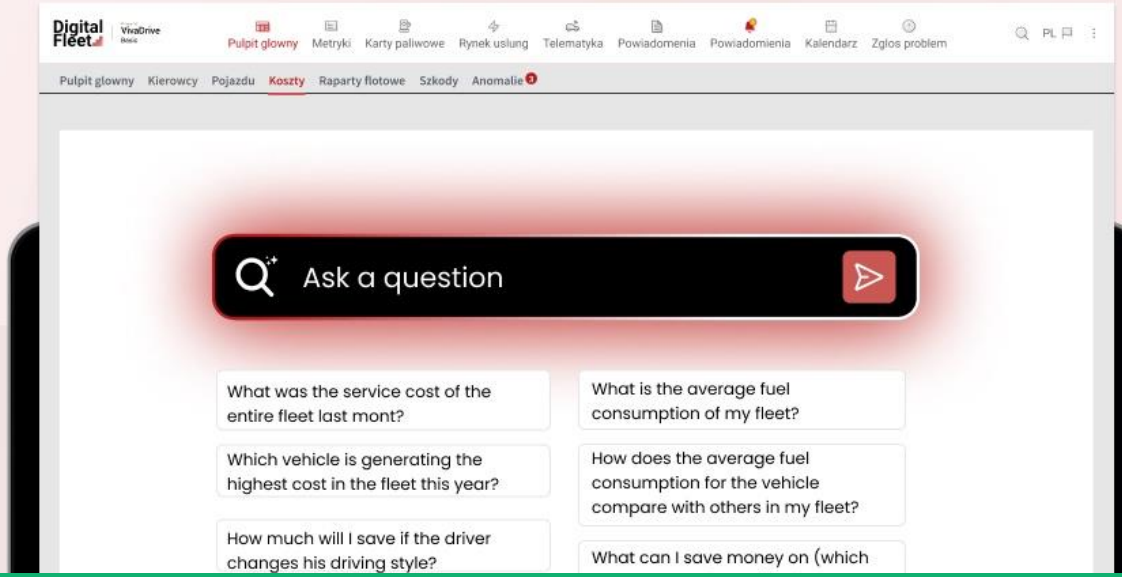
Results

- Fleet electrification strategy created
- Mobility approach created
- ESG reporting assessed including Scope 3
- Joint offer with e.on. for company charging infrastructure

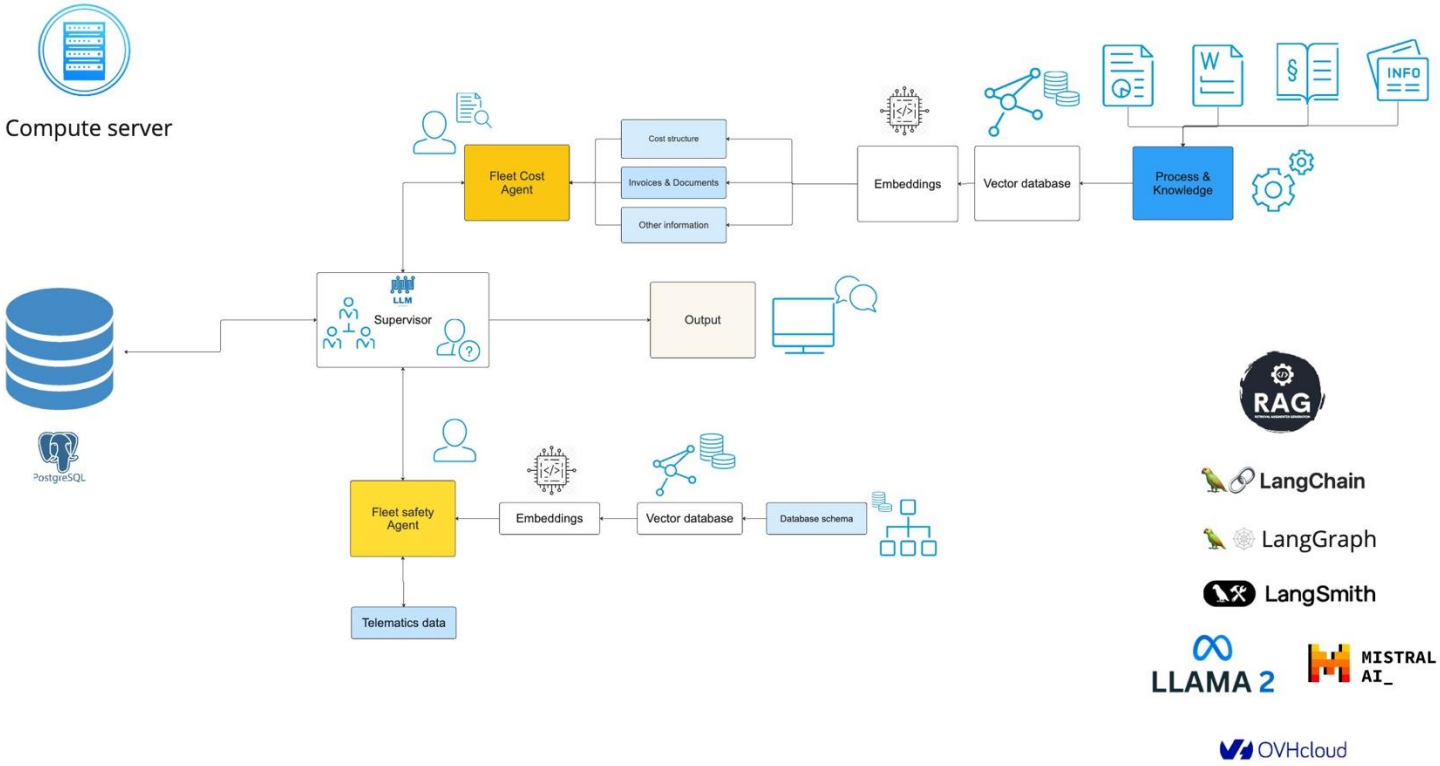
Example: AI-powered fleet assistant

Voted **the best AI solution in Fleet Management in Poland in 2024**, according to the Fleet Derby by the Fleet Magazine!

1. **Document and process automation**
2. **Saves time and money**
3. **Coming soon!**



Example: AI-powered fleet assistant



AI in action: examples from the market

Optimize logistic operations

Logistic companies are looking to optimize the logistics operations including truck loadings. This process provides actionable insights to dispatchers, reducing wasted space and emissions

Dynamic Route Optimization

Courier companies use GenAI to analyze real-time traffic, weather, and delivery priorities, dynamically recalculating routes. This reduces delivery costs by up to 50%, cuts fuel consumption, and minimizes delays

Administrative processes automation

Generative AI streamlines administrative workflows by automating document handling, data entry, and compliance checks. LLM prepares meeting summaries, classify legal contracts, and automate expense tracking, freeing teams for strategic task.

Autonomous Vehicles

AI enables self-driving cars to interpret sensor data, make real-time decisions, and navigate complex environments.

Companies like Wayve are expanding their testing to diverse geographies, such as California, to enhance their AI models' adaptability.

Predictive maintenance

LLM models predict vehicle and infrastructure maintenance needs, preventing breakdowns and extending lifespans. This application is crucial for fleet operators to maintain efficiency and safety.

Pricing systems for Logistic and Transportation

AI and LLMs are revolutionizing pricing strategies in logistics and transportation by enabling data-driven decision-making, operational efficiency, and dynamic adaptability. It includes demand forecasting dynamic rate adjustment or automated rate calculcation.

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European Union
European Structural and Investment Funds

Republic of Poland

Urban Mobility

European Funds Smart Growth

NCBR
National Centre for Research and Development

SPACE BRIDGE FUND

Why VivaDrive?

+100.000 vehicles under management

Scalable business model on a growing EV market with prestigious partners in Poland and Germany

Relevant solution for corporate and public players that are pivotal in energy transformation

International and experienced team

Internationally recognized i.e. the best cleantech startup in Poland, the best CEE startup according to OVH, MITEF CEE, among others

Enterprise Forum CEE

OVHcloud

Ministerstwo Rozwoju i Technologii

Polish Tech Day

GovTech Connect

Fraunhofer IML

Fraunhofer-Institut für Materialfluss und Logistik IML

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Intelligent Digital Logistics

AI transformation of logistics

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CV

- 2018-2023 Scientific Assistant in plasma-astrophysics at Center for Astronomy und Astrophysics, Technische Universität Berlin
- Since 2023 Scientific Consultant at Fraunhofer- Institute for Material Flow and Logistics, Dortmund, Department for Transportation Logistics

Research

- Modeling and optimization of networks
- Logistic network analysis
- Computer vision and machine learning in operations
- Predictive analytics and AI platform applications

Fraunhofer-Gesellschaft

30.000
Employees

76 institutes
and research facilities

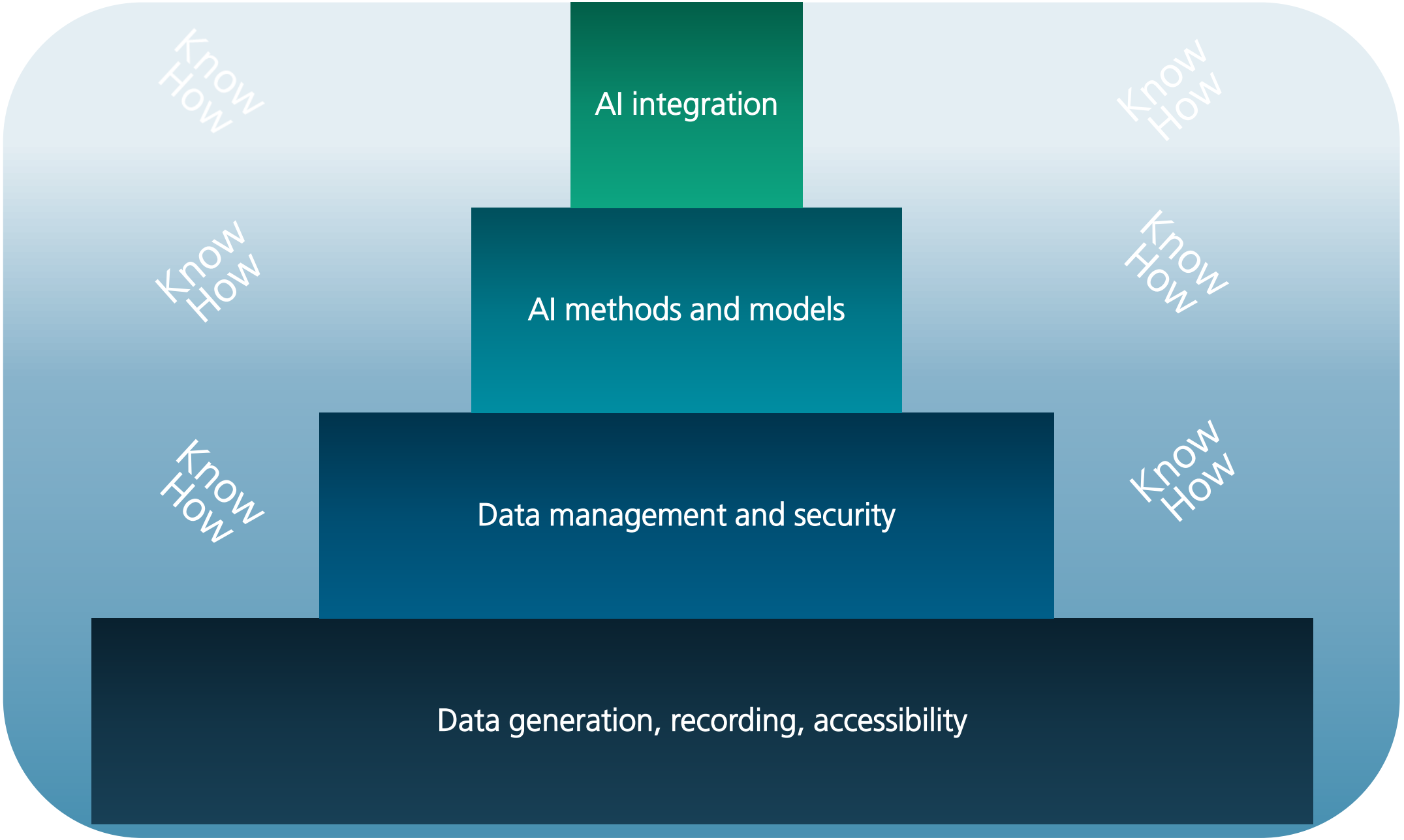
2.9 billion
Financial volume

Fraunhofer IML, Dortmund

> 400
Employees

> 300
Doctoral students and student assistants

> 50 million
Budget, of which 30% from business



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Use-cases: AI in logistics

1

Collecting Data & Predictive Analytics

Automated collection and preparation of data.
Monitoring logistic processes, predict and analyze.

2

Knowledge Management & Integration

Simplifying access to information and sustaining knowledge.
Accepted and integrated toolset and synergies with other technologies.

A

Intelligent Digital Twin

Synergies of data, predictive analytics and simulation.

B

Intelligent Digital Management

Smart digital assistant. Access, monitoring and controlling.

Intelligent Digital Twin

Synergy of AI and simulation

1 Predict & Model

Optimize and simulate future scenarios: Conduct testing in a cost-effective environment.

2 Sustainability

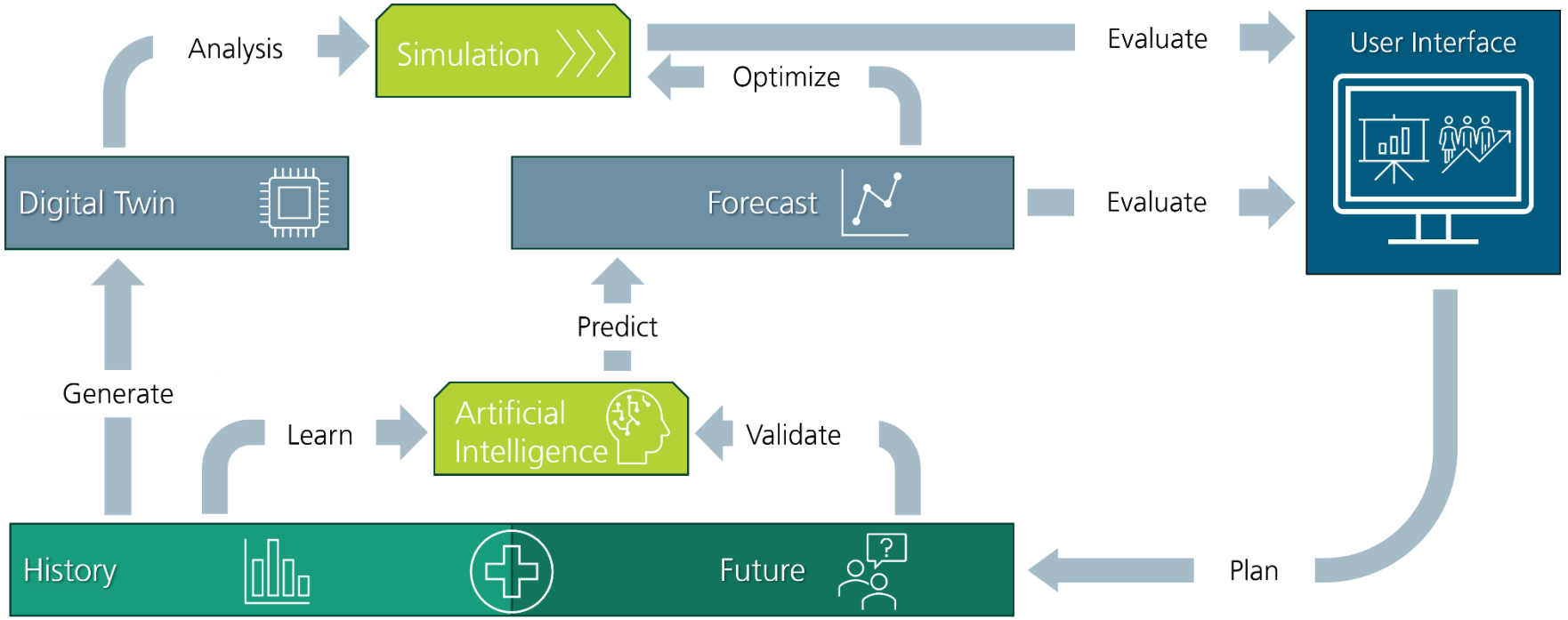
A versatile methodology designed for application across various processes through automated model generation.

3 Resilience

Enhance flexibility and adaptability to effectively respond to unforeseen disruptions.

4 Acceptance

Illuminate process interconnections to enhance understanding and acceptance of change.



Intelligent Digital Management

Omnistics: The omniscient AI platform for logistics

1 **Central Management & Controlling**

An intelligent digital assistant that integrates multiple data sources to provide precise information, facilitating intuitive and natural interactions, complemented by expert management of individual applications.

2 **Data quality & security**

Ensure data quality and consistency by generative AI models and secure cloud storage within Europe.

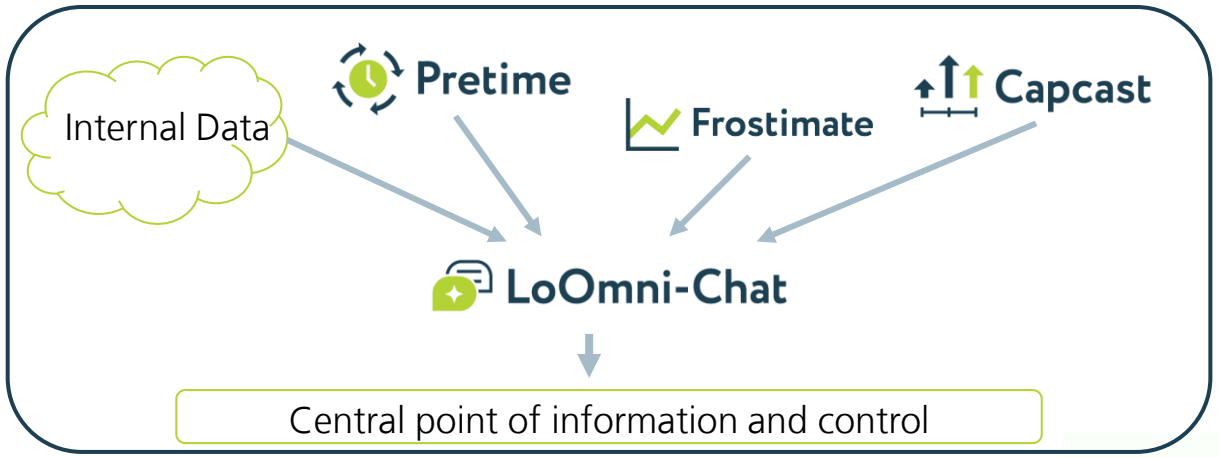
3 **Accessible SaaS Platform**

Centrally managed application by AI specialist ensuring a seamless and efficient user experience.

4 **Enhanced Efficiency & Minimization of Errors**

The integration of comprehensive data and generative reasoning AI significantly enhances workflow efficiency and minimizes error rates through continuous database validation.

Omnistics



Fraunhofer IML

Q & A: Intelligent Digital Logistics: AI Transformation of Logistics

Intelligent Digital Twin

Benefits, Impact, Risks and Challenges

Benefits

- **Enhanced Operational Efficiency:** Real-time monitoring and simulation of logistics processes
- **Predictive Maintenance:** Anticipation of equipment failures and maintenance needs, reduction of downtime and operational disruptions
- **Improved Decision-Making:** Data-driven insights for strategic planning. Better resource allocation and inventory management
- **Increased Agility and Flexibility:** Quick adaptation to changes in demand or supply chain disruptions. Scenario simulation to test different strategies
- **Cost Reduction:** Minimization of waste and excess resources. Lowered transportation and operational costs

Impact

- **Supply Chain Optimization:** Enhanced visibility across the supply chain, leading to more synchronized operations and reduced lead times.
- **Customer Satisfaction:** Improved service levels with accurate delivery predictions and faster response times to customer needs.
- **Sustainability:** More efficient route planning leads to reduced emissions and energy consumption.
- **Exponential applicability:** Self generating methods exponentially grow modelling areas

Risks and Challenges

- **Data Security and Privacy:** Potential vulnerabilities in data transmission and storage. Risk of unauthorized access to sensitive information.
- **High Implementation Costs:** Significant investment in technology and infrastructure. Ongoing costs for maintenance and updates.
- **Complexity and Integration:** Challenges in integrating digital twins with existing systems. Complexity in managing and analyzing large volumes of data.
- **Dependence on Accurate Data:** Accuracy of simulations relies heavily on quality and completeness of input data. Errors in data can lead to flawed insights and decision-making.
- **Skill Gaps:** Need for skilled personnel to manage and operate digital twins. Potential workforce resistance to adopting new technologies.

Intelligent Digital Management

Benefits, Impact, Risks and Challenges

Benefits

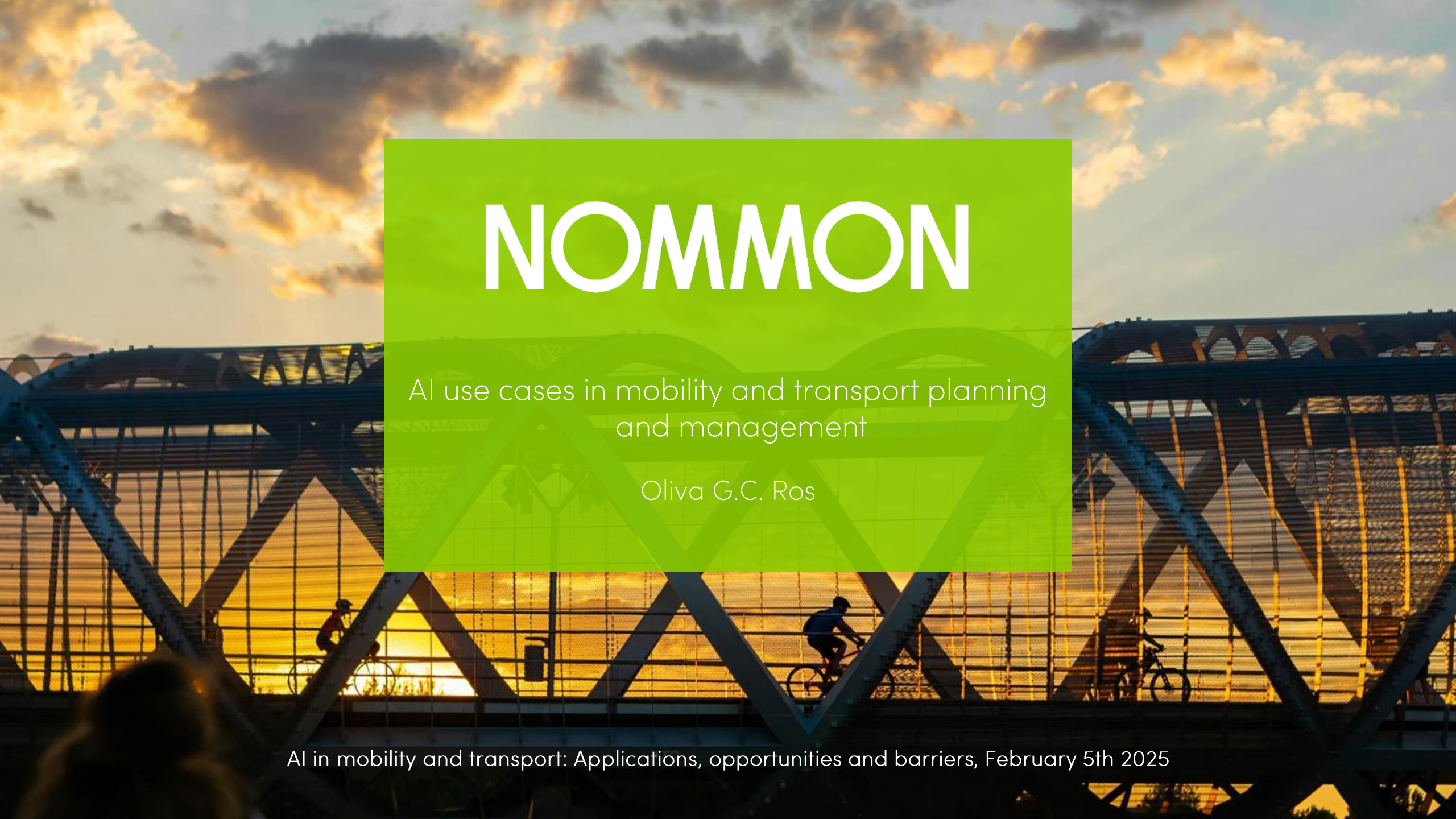
- **Efficiency Improvements:** Automated inventory management. Process automation for repetitive tasks.
- **Enhanced Decision-Making:** Data analytics for performance metrics. Predictive analytics for demand forecasting. Real-time data access for informed choices.
- **Automation of Tasks:** Chatbots for customer inquiries. Automated documentation and reporting. Robotic process automation (RPA) for logistics tasks.
- **Real-Time Tracking:** GPS and IoT integration for shipment visibility. Dynamic tracking dashboards. Alerts and notifications for shipment status.
- **Improved Customer Service:** Personalized communication strategies. AI-driven customer support systems. Feedback collection and analysis for service enhancement.

Impact

- **Cost Savings:** Reduction in fuel costs through optimized routes. Lower labor costs due to automation. Decreased overhead with efficient inventory management.
- **Supply Chain Transparency:** Enhanced visibility for all stakeholders. Tracking compliance and regulatory requirements. Sharing insights across the supply chain.
- **Market Responsiveness:** Agile supply chain adjustments based on real-time data. Quick adaptation to market changes and trends. Demand-supply alignment through predictive analytics.
- **Strategic Planning:** Long-term forecasting capabilities. Risk assessment and mitigation planning. Scenario analysis for strategic initiatives.
- **Collaboration Enhancement:** Shared platforms for stakeholders. Improved communication channels. Data sharing agreements to enhance teamwork.

Risks and Challenges

- **Technology Dependence:** System reliability and redundancy measures. Disaster recovery planning. Training on manual processes as a backup.
- **Regulatory Compliance:** Staying updated with AI regulations. Adapting to changes in logistics law. Ensuring ethical use of AI technologies.
- **System Integration:** Compatibility with existing logistics software. Data migration strategies. Customized solutions for unique business needs.
- **Ongoing Training:** Continuous learning for AI models. Employee training programs on new technologies. Regular updates to algorithms based on new data. Reducing employee resistance.
- **Data Quality Management:** Establishing data governance frameworks. Regular audits for data accuracy. Tools for data cleansing and validation.



NOMMON

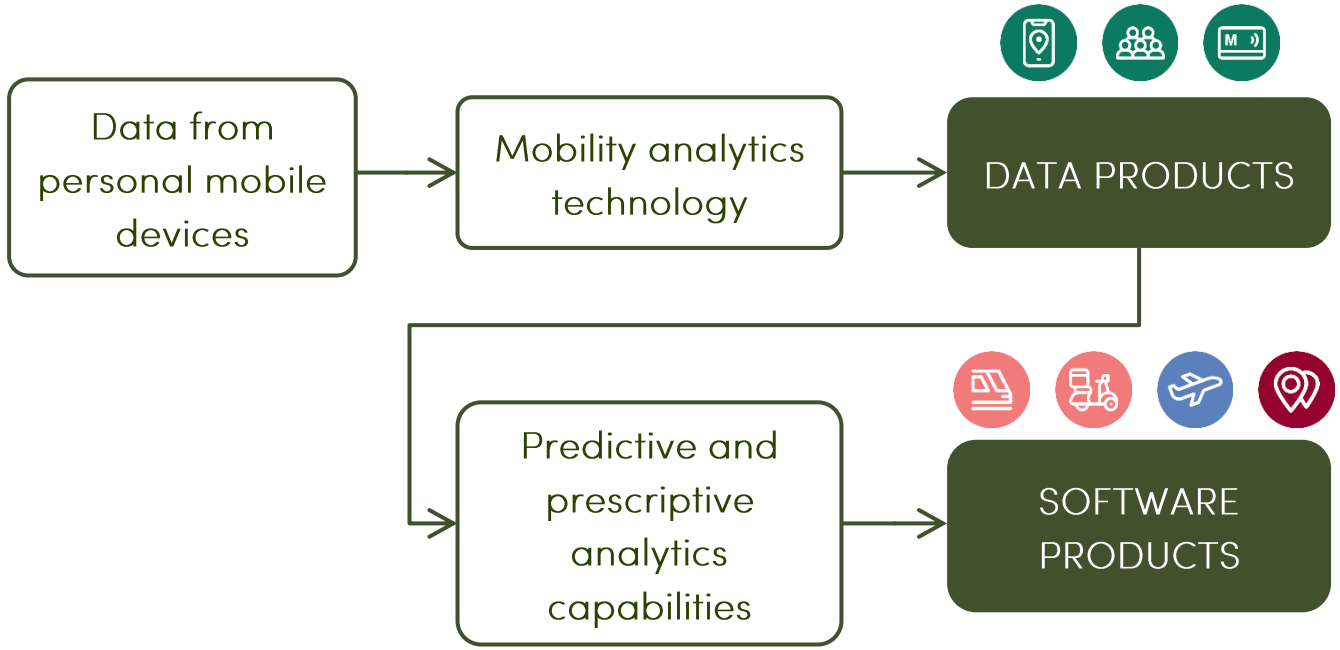
AI use cases in mobility and transport planning and management

Oliva G.C. Ros

AI in mobility and transport: Applications, opportunities and barriers, February 5th 2025

Who we are

Nommon develops **decision support tools** based on **big data and AI** by leveraging MND and other geolocation data sources



AI impact and expectations in mobility

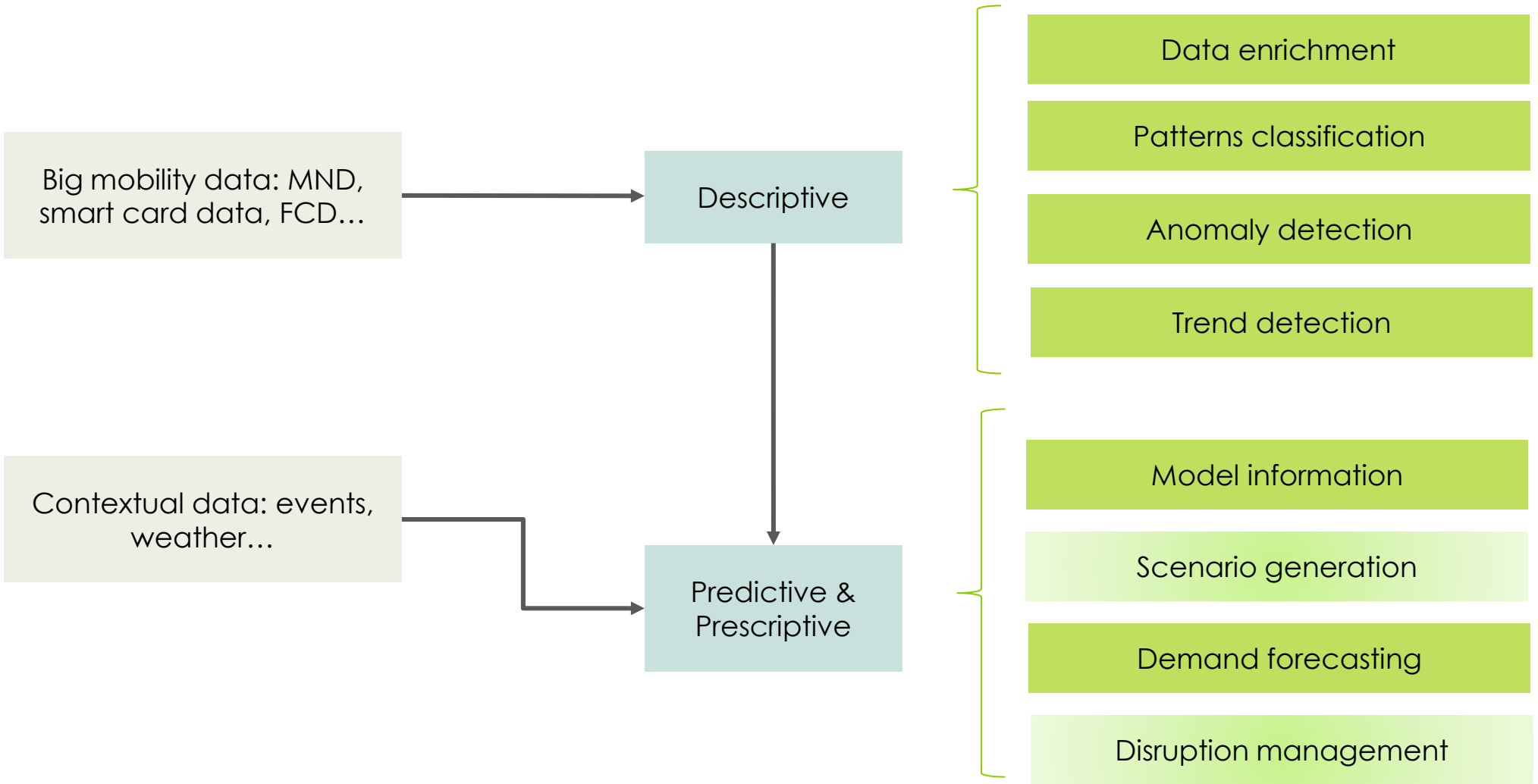
Artificial Intelligence (AI) —particularly generative AI (GenAI) game changer in mobility:

- Create new trends in mobility and challenges
- Brings new opportunities to understand, plan and manage mobility.

"enable autonomous vehicles, optimized traffic management, improved public transport, personalised travel, smarter urban logistics, and enhanced air quality"

" Support data-driven decision-making"

How can AI be of help?



Descriptive analytics: mobility monitoring

Knowledge of the current situation and system monitorisation

AI rol	Application	Use case in Nommon
Learn data structure	Identification and replacement of erroneous data	Data cleanning
Extract correlations between attributes	Annomally detectition	Quality monitoring in mobility indicators' continous extraction
Patterns recognition	Trend detection	Trip's informations enrrcihment combining attributes of different samples (e.g. mode identification in MND)
	Identification of typical mobility pattenrs of targetted group	Identification of profesional trips mobility in travel diaries from MND (estimation of logistic, taxi, demand)
		Alert on required model recalibration

Accurate and detailed information of the system state and timely identification of required interventions

Predictive and prescriptive mobility

Anticipate future scenarios and recommend management strategies

AI	Application	Use case in Nommon
Extract correlations between attributes	Privacy preserving data sharing	Sample generation for model training
Patterns recognition	Demand prediction	Demand prediction
Learn latent representations in data	Prediction of disruptions (e.g. bottle necks, congestion etc.)	Identification of typical mobility days
Predict future behaviour based on past events	Demand scenario generation	Identification of traveller's persona
Content generation	Detect deviations from long-term patterns	Generation of realistic synthetic individual data
	Suggest demand or traffic management strategies	

Efficient service planning and timely and optimal interventions

Case study: Travel demand monitoring in LAC cities

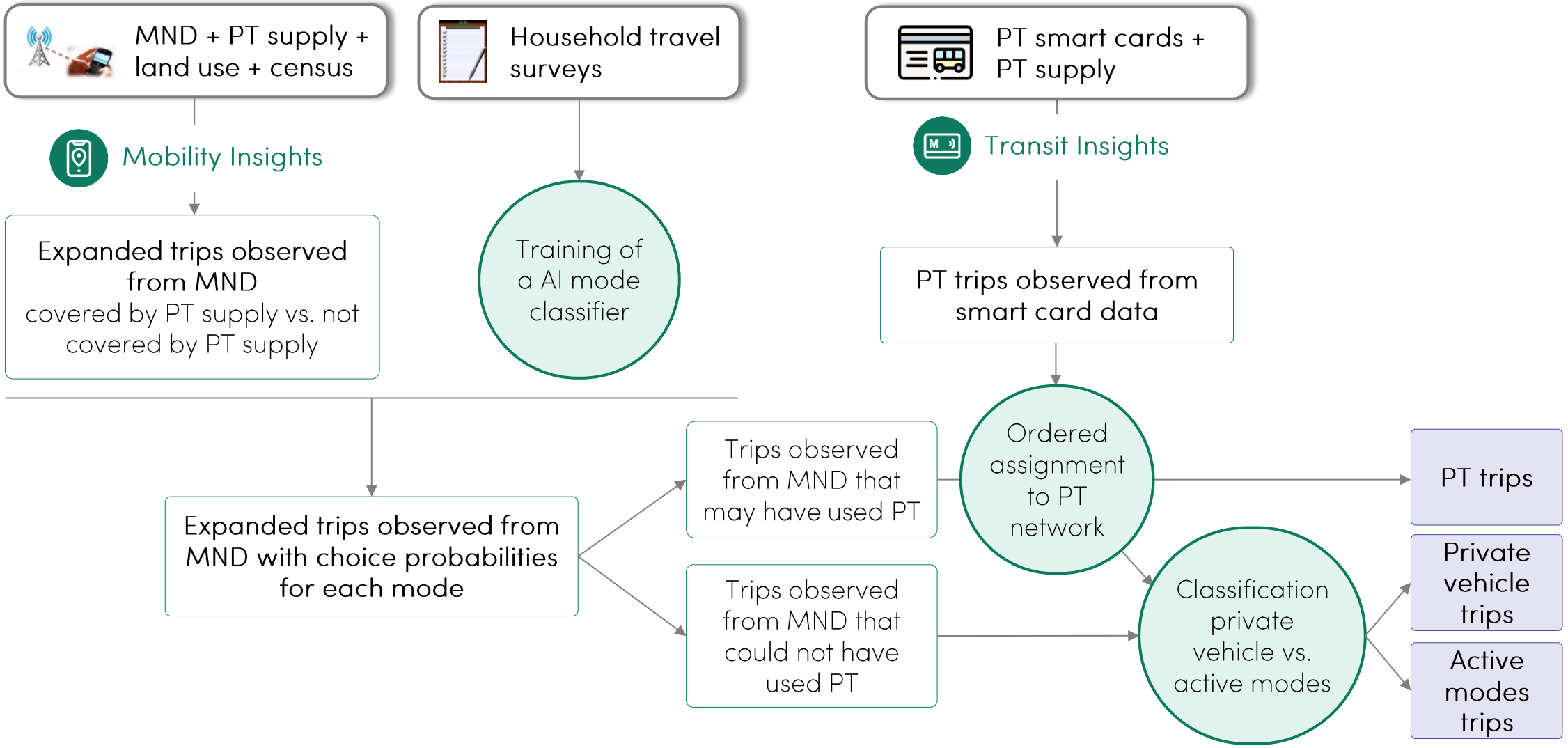
Goal: analyse the evolution of mobility patterns from 2019 through 2021 in different Latin American cities to identify the changes caused by the COVID-19 pandemic

Client: World Bank Group.

Provision of origin-destination matrices segmented by transport mode for the cities of Buenos Aires (Argentina), Bogotá (Colombia), Medellín (Colombia) and Asunción (Paraguay)

Data sources: MND + HTS + PT smart card data

Case study:Travel demand monitoring in LAC cities



Case study: Short-term rail demand forecasting

Goal: predicting demand of metro/suburban rail services and proposing schedule adjustments to optimise operations

Client: Siemens

AI-based demand prediction based on historical + real-time data: pre-tactical (24 hours) and tactical (90 minutes rolling forecast)

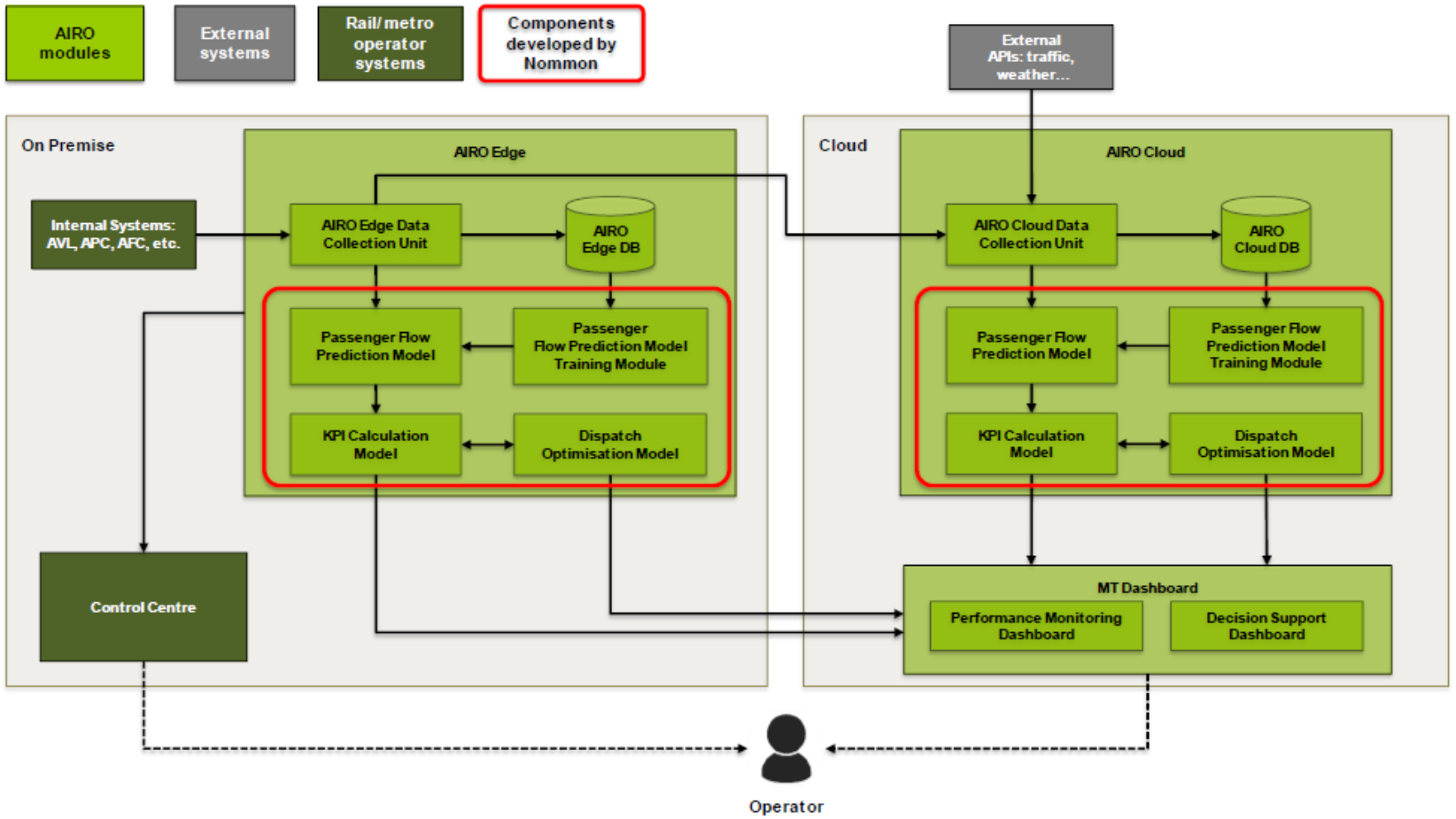
Explanatory variables: calendar, weather, events, traffic levels…

Calculation of an optimal timetable for the predicted demand: insert/remove vehicles, modify dwell times…

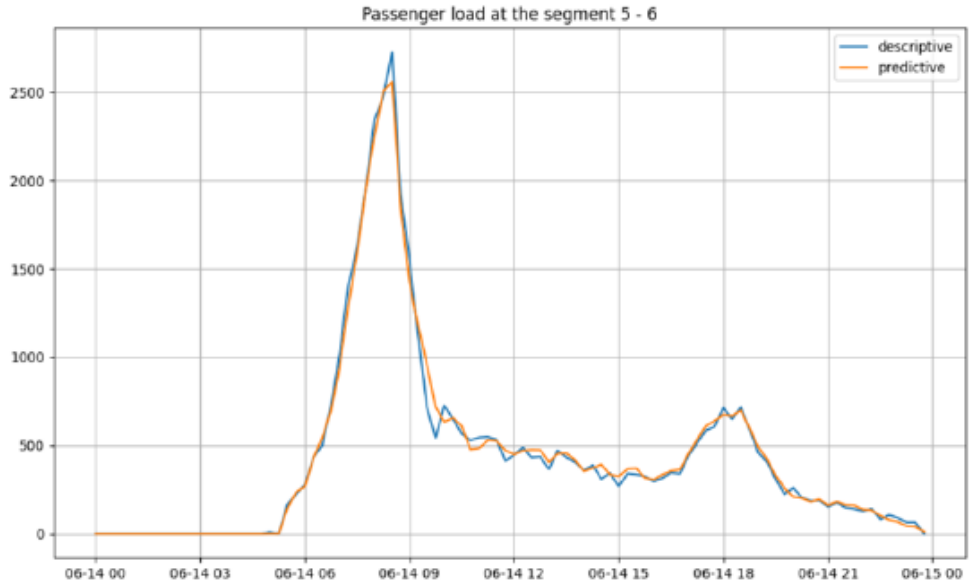
Flexible configuration of KPIs and restrictions (e.g., balance between vehicle occupancy levels and passenger waiting times: less congestion during peak hours, less km travelled during off-peak hours)

Integration into rail control centres

Case study: Short-term rail demand forecasting



Case study: Short-term rail demand forecasting



	Day	KPI	Descriptive Value	Optimised Value	Improved	Absolute Difference	Relative Difference
0	2021-08-02	Vehicle occupancy	0.22	0.28	Yes	0.05	23.82
1	2021-08-02	Platform occupancy	0.17	0.23	Yes	0.07	39.87
2	2021-08-02	Overcrowded vehicles time	0.00	0.00	No	0.00	0.00
3	2021-08-02	Overcrowded platforms time	0.00	0.10	No	0.10	NaN
4	2021-08-02	Oversized vehicles time	159.53	111.79	Yes	-47.74	-29.92
5	2021-08-02	Oversized platforms time	210.88	153.20	Yes	-57.68	-27.35
6	2021-08-02	Inter-station passenger load	73746.46	73268.88	-	-477.58	-0.65
7	2021-08-02	Platform passenger load	9056.48	9056.48	-	0.00	0.00
8	2021-08-02	Average waiting time	161.90	210.97	No	49.07	30.31
9	2021-08-02	Waiting time per passenger	136.39	169.26	No	33.00	24.10
10	2021-08-02	Number of active vehicles	19.97	16.99	Yes	-2.99	-14.95
11	2021-08-02	Total distance travelled	11608764.00	9620495.00	Yes	-1988269.00	-17.13

Warnings

AI is limited to extract behaviors that are present in the original data

Required, in some cases, integration with transportation and traffic models

Required continuous monitoring and retraining for relevant results

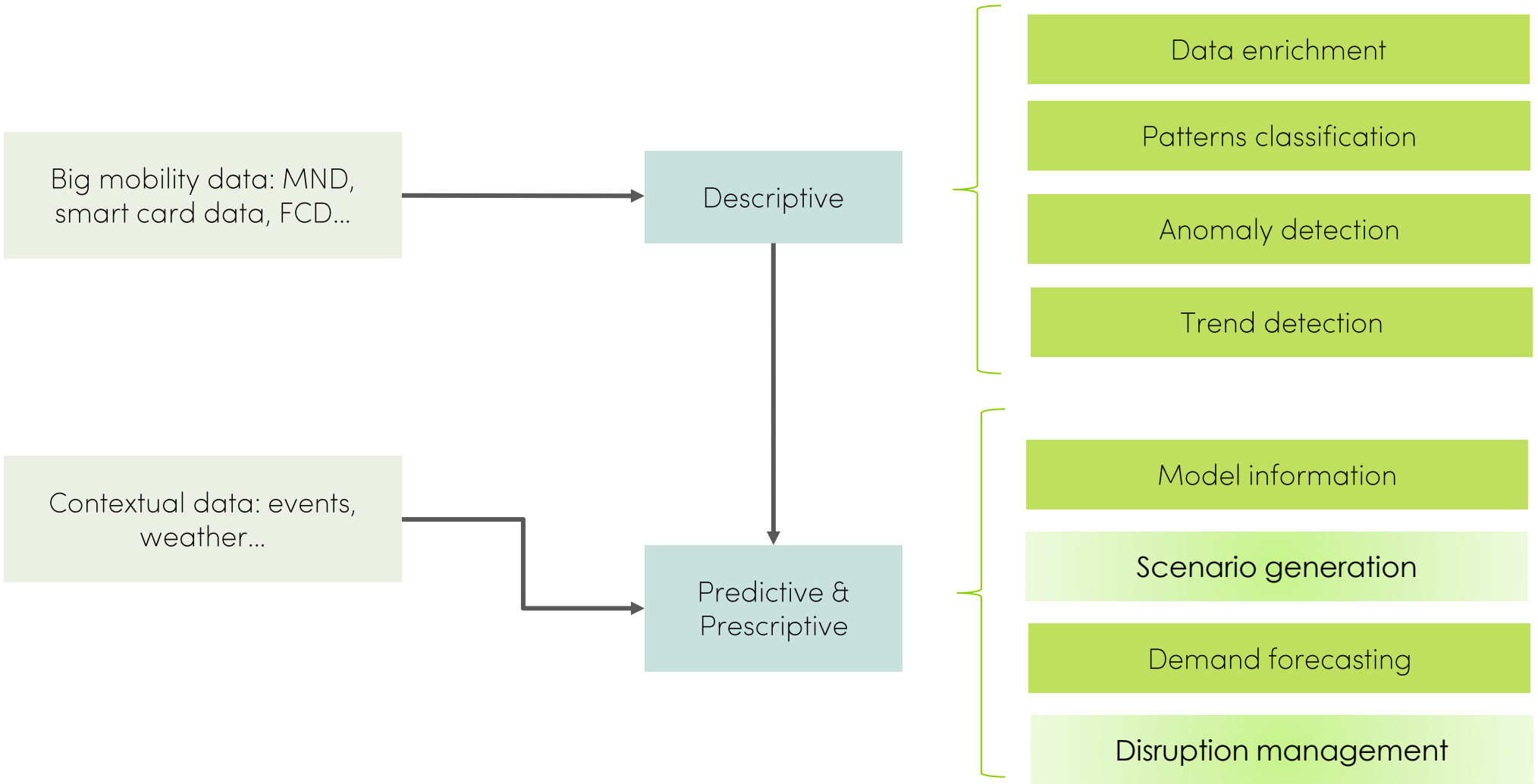
Required expert Judgment in interpretation (contextual information) and alignment

Be careful with black box models

Attention to AI feedback loops

Avoid over reliance on AI

How can AI be of help?



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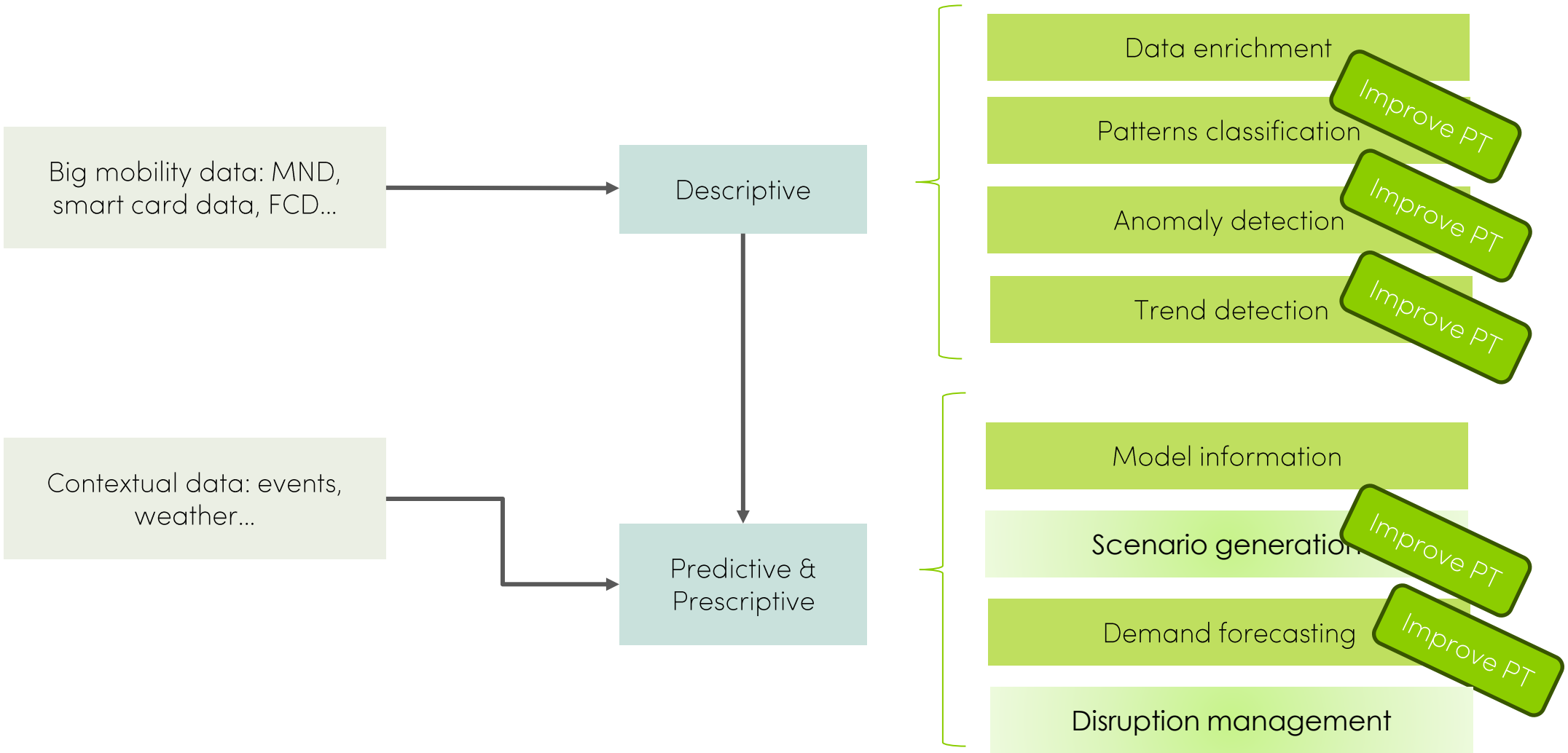

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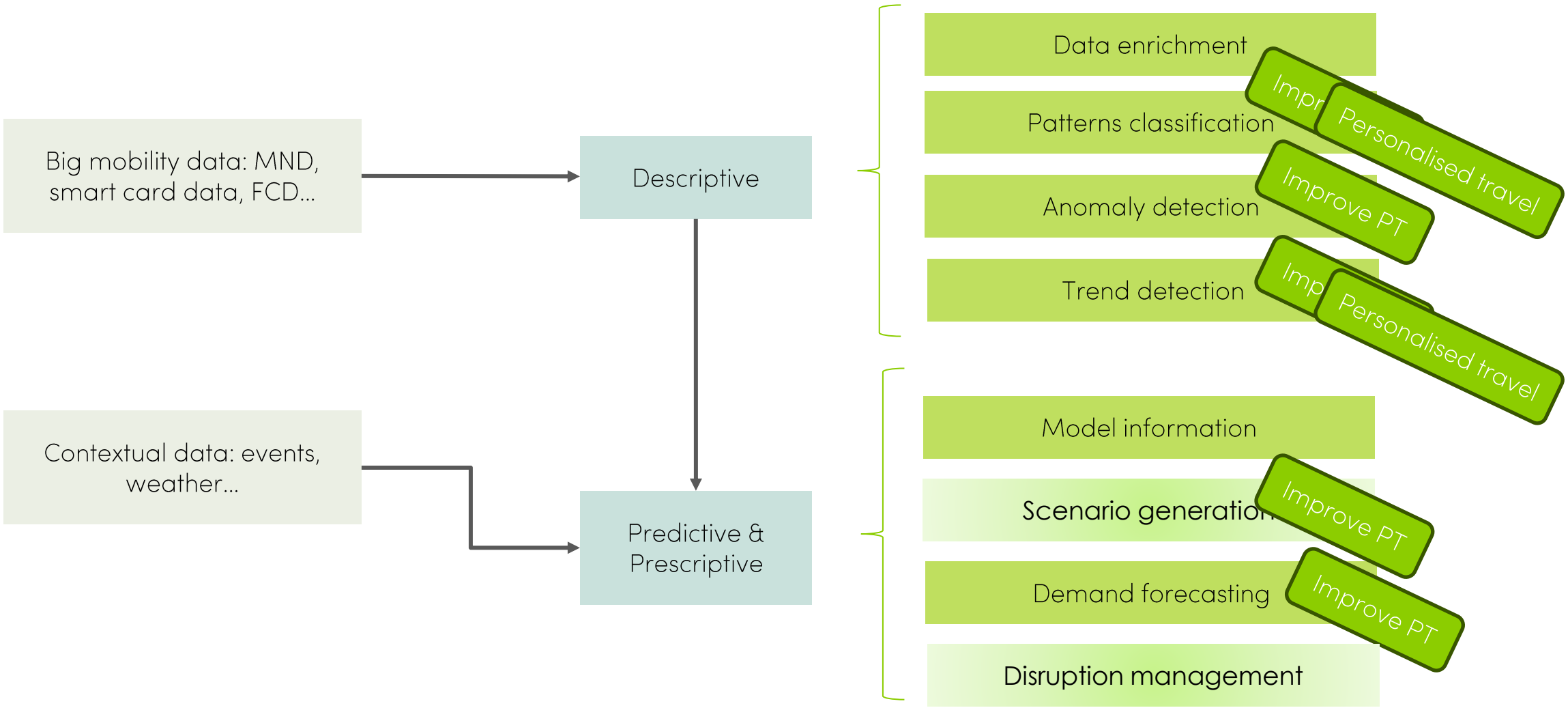
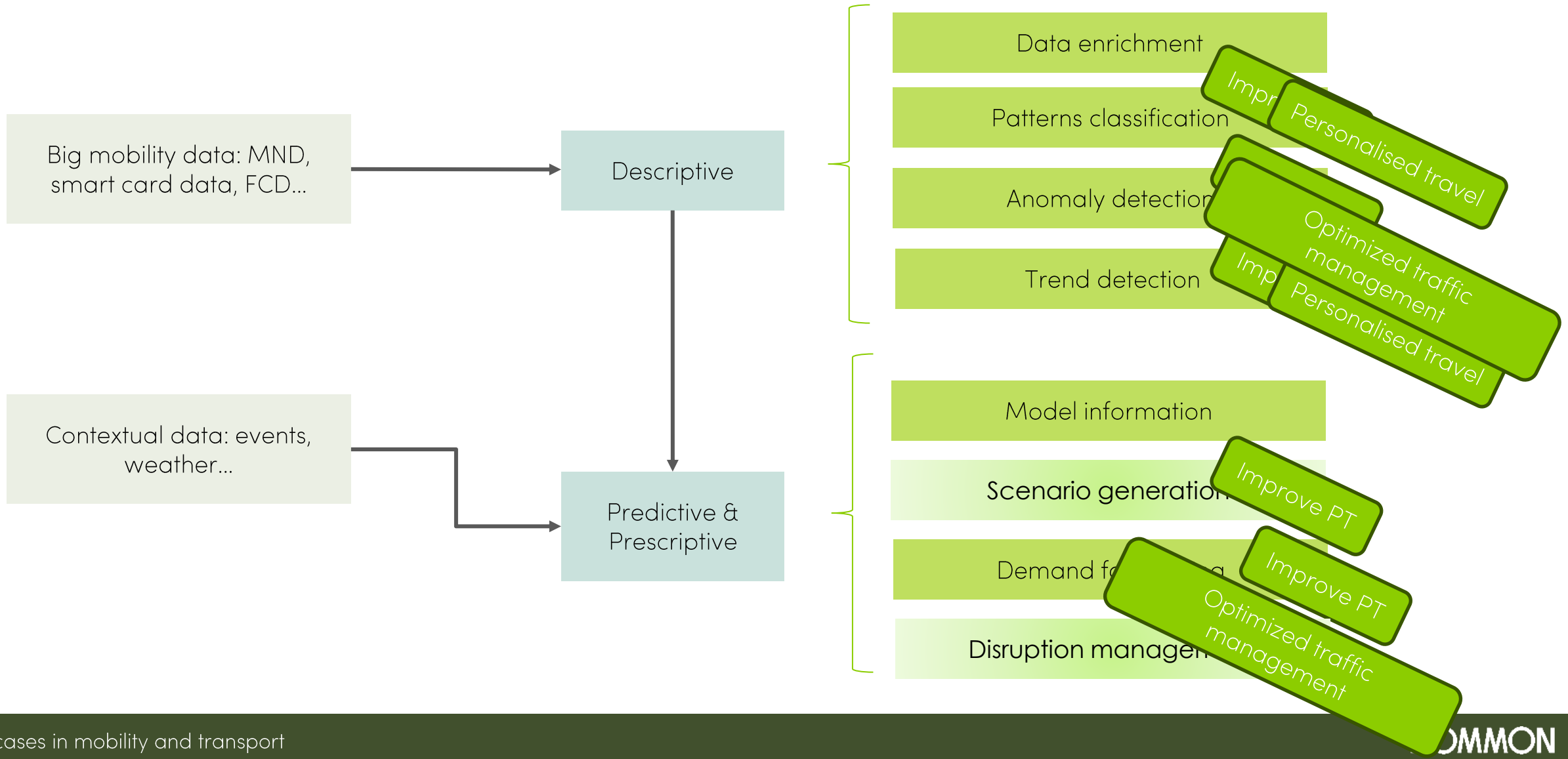
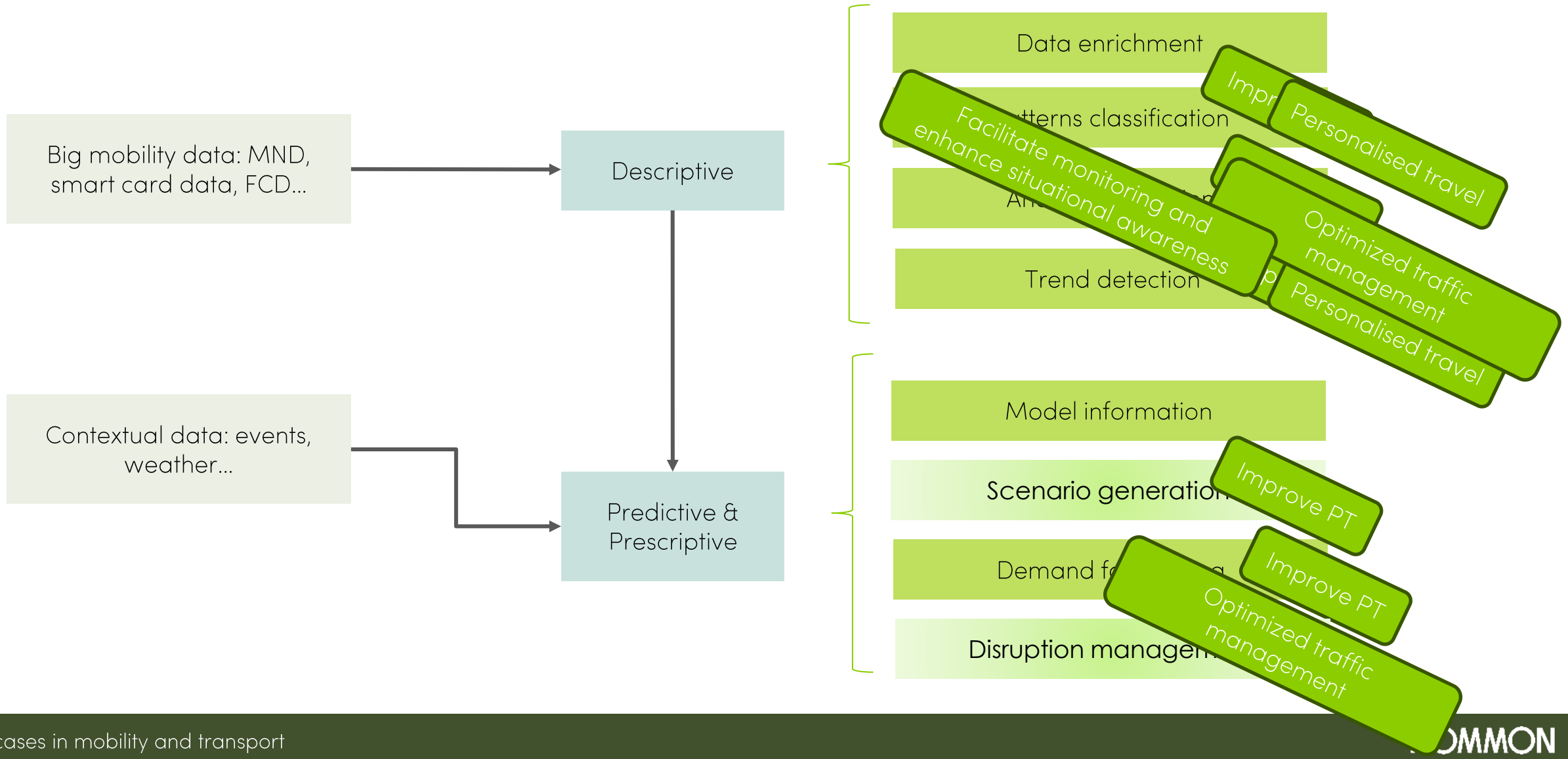


NOMMON

How can AI be of help?



How can AI be of help?



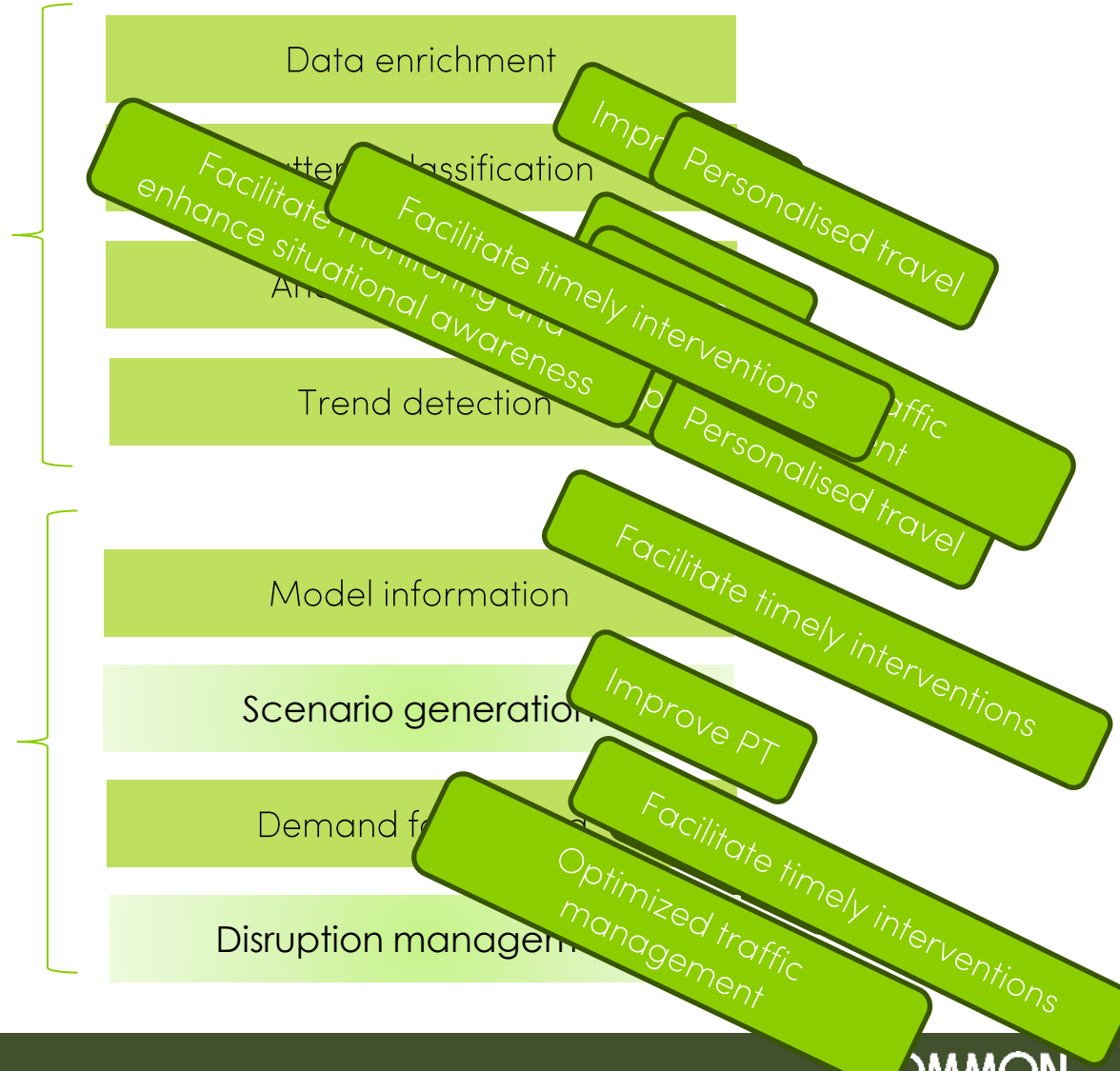
How can AI be of help?

Big mobility data: MND, smart card data, FCD...

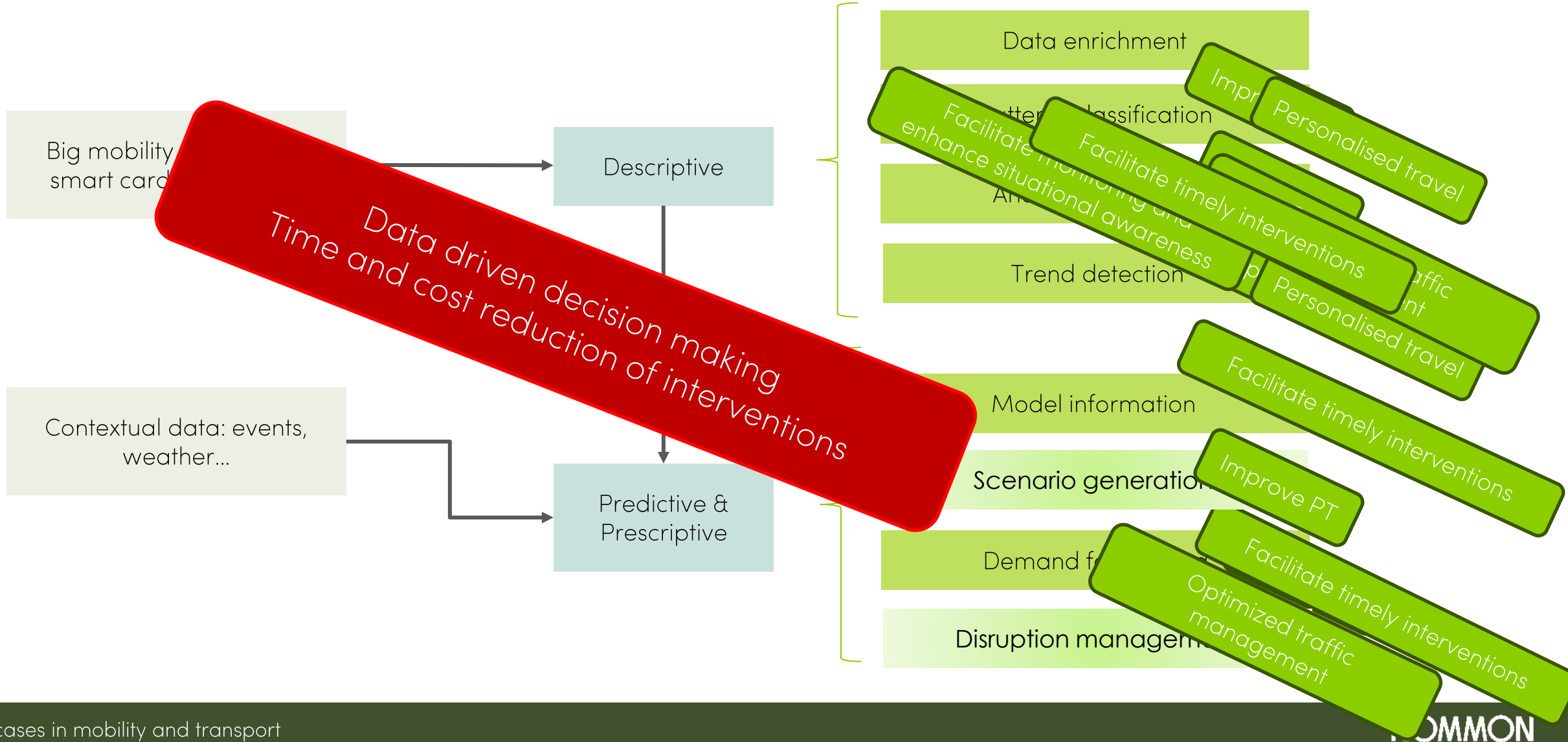
Contextual data: events, weather...

Descriptive

Predictive & Prescriptive



How can AI be of help?



Take aways

AI based solutions require data

There is a variety of UC for AI in mobility, from monitoring, to planning and management.

Relevance of AI based solutions require performance monitoring and re-training.

Keeping human in the loop is essential and needed for the success of AI based solutions

Attention to potential negative effects on Human-AI feedback loop is advisable

AI is another (very relevant) tool, but use all the tools in your toolset.

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How data spaces can accelerate and facilitate the deployment of AI in European mobility and transport

EC Workshop: AI in mobility and transport: Applications, opportunities and barriers

Laure de Cock (laure.decock@imec.be)

Innovation specialist mobility, IMEC

Jim Ahtes (jim.ahtes@i2cat.net)

Head of Data Space Innovation, i2CAT Foundation

5 February 2025

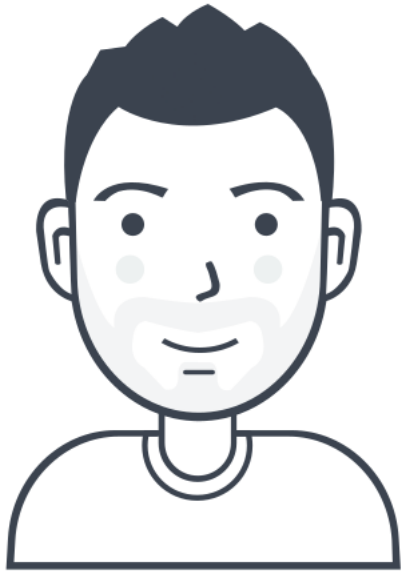
Co-funded by the European Union

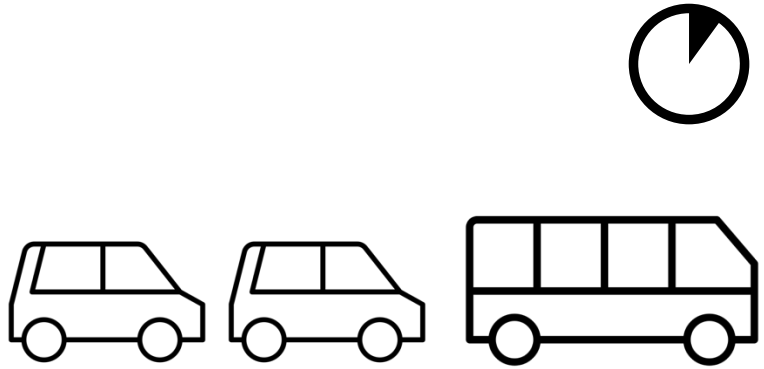
AI in mobility and transport

- A true account -

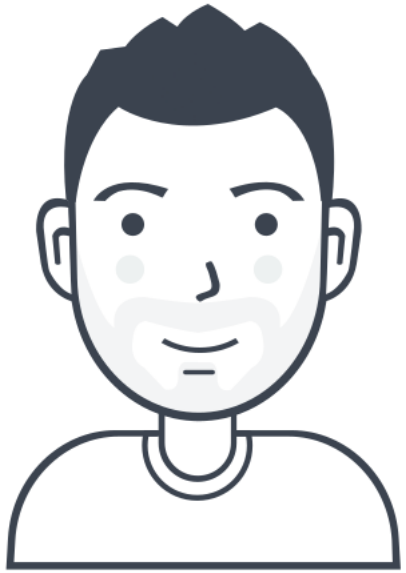
The case of traffic predictions

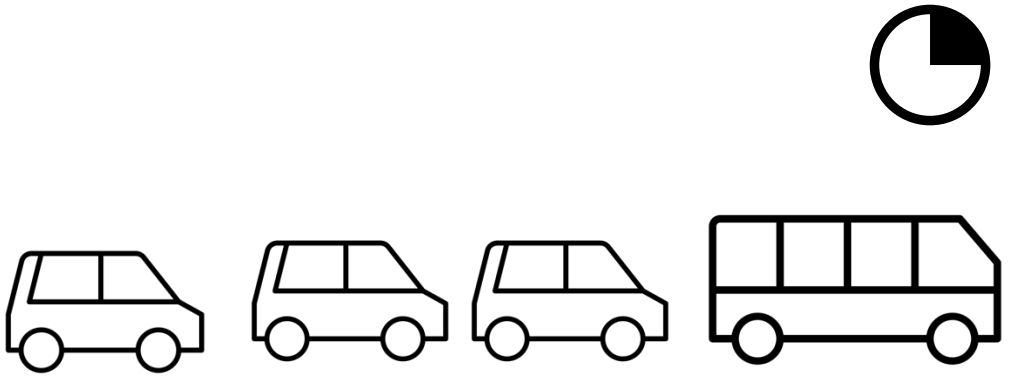
Bob





The case of traffic predictions





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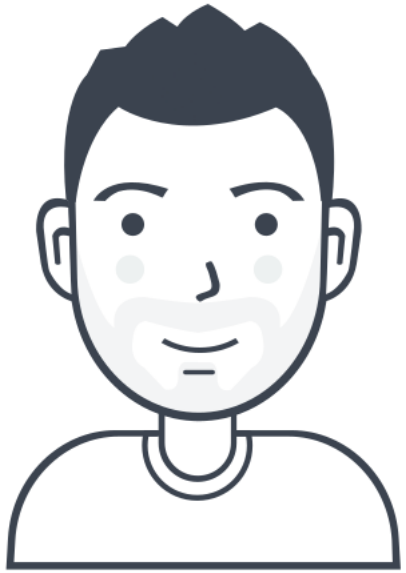

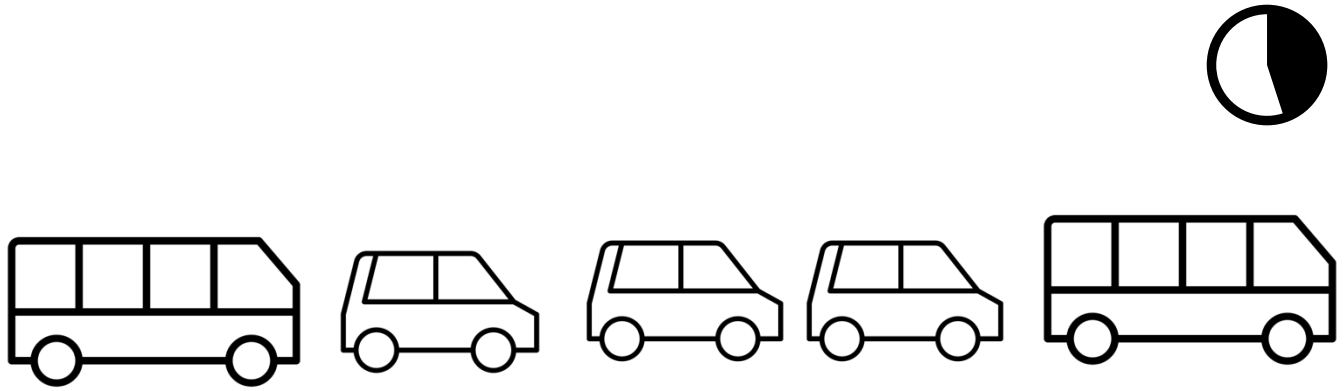

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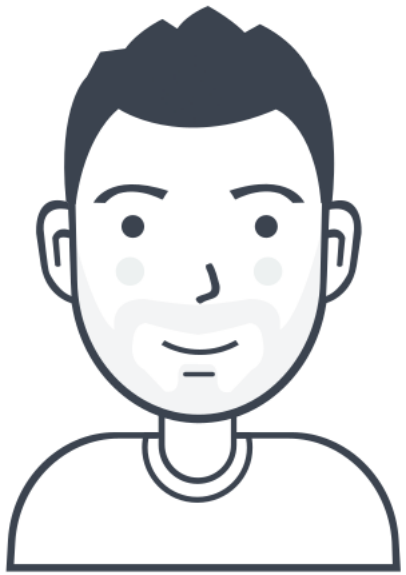
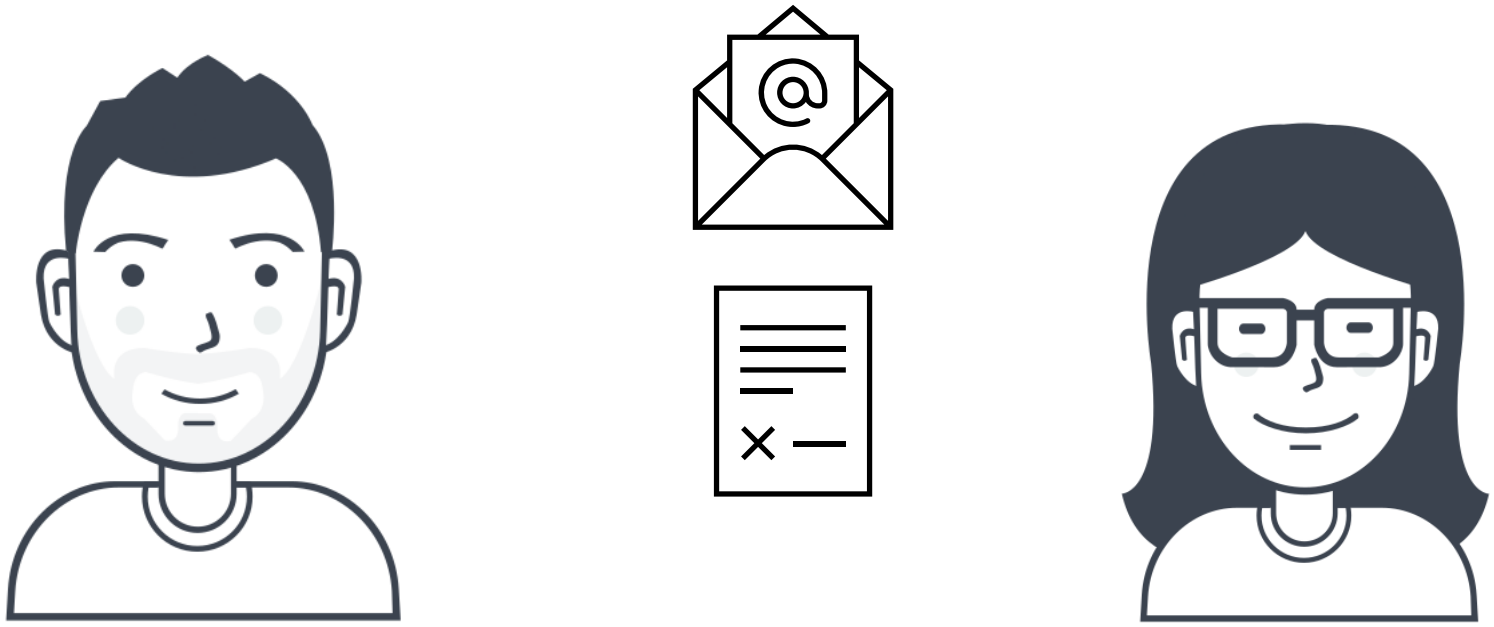


Mechelen

Alice

The case of traffic predictions



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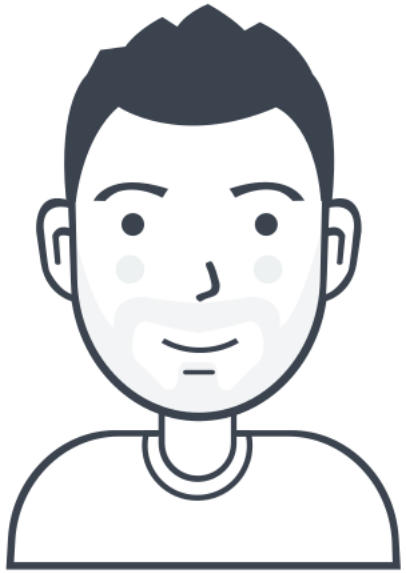

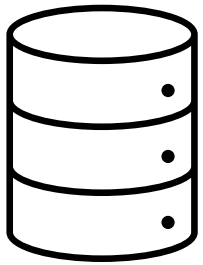

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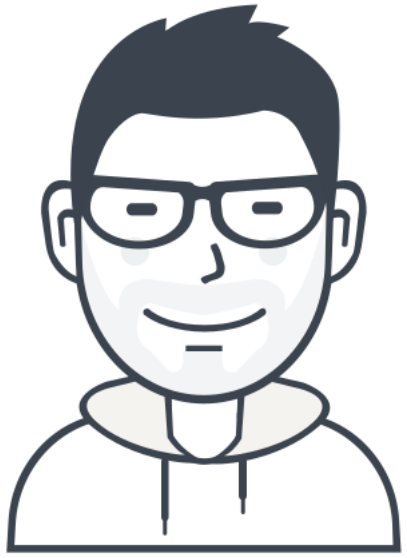

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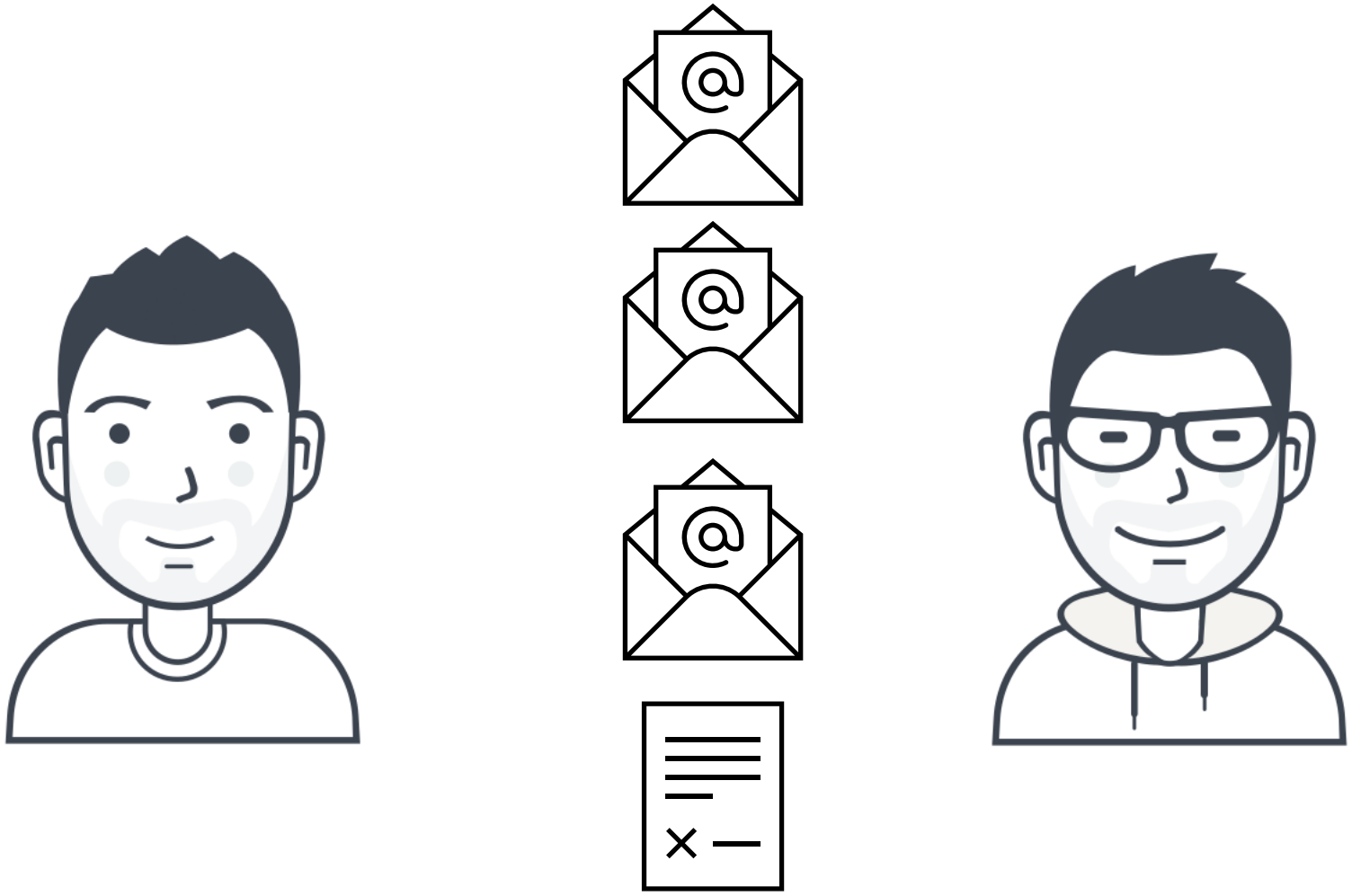

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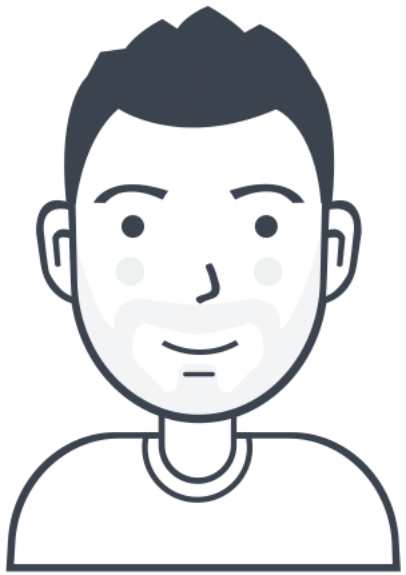

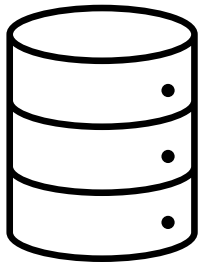

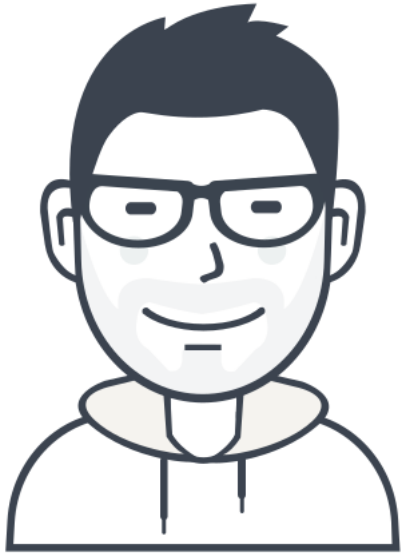

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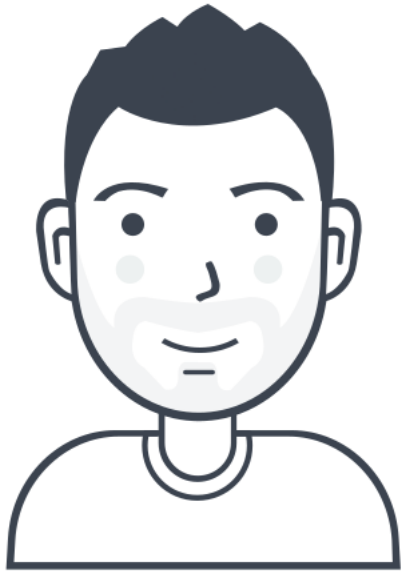

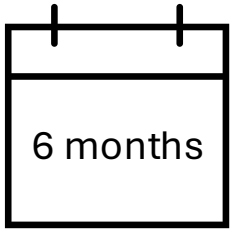

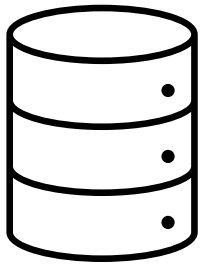

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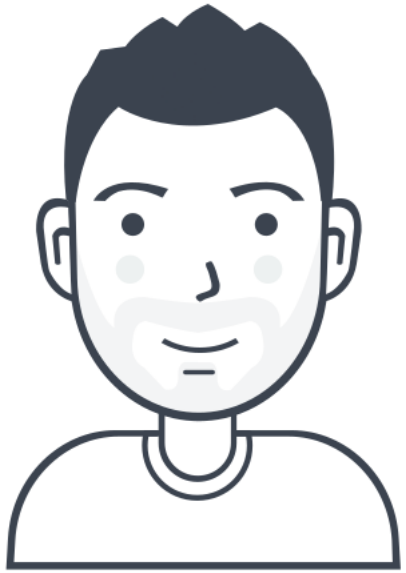

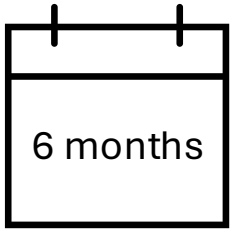

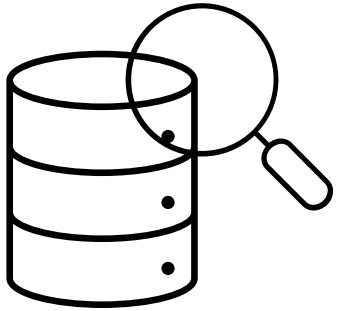

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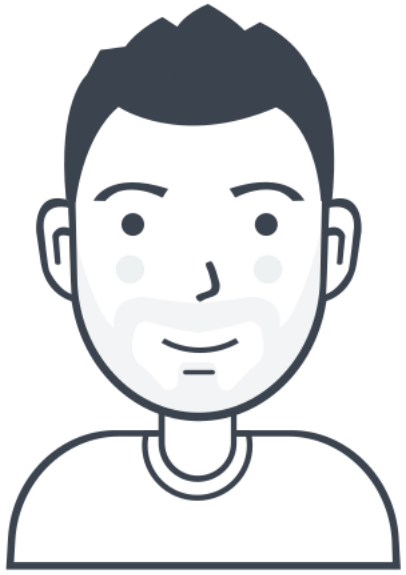
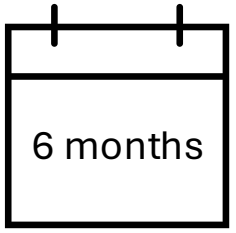
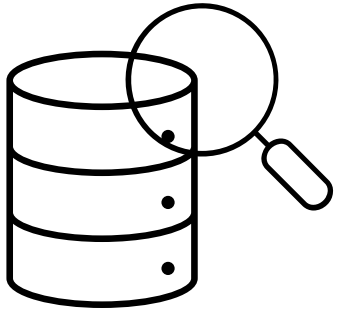




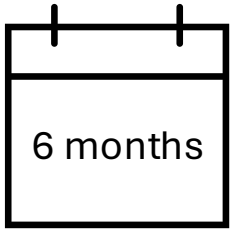


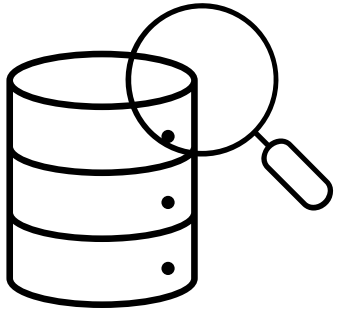
Timestamp	bicycle	person	vehicle
2023-12-01 10:17:20	0	0	0
2023-12-01 10:17:25	0	0	0
2023-12-01 10:17:30	0	0	0
2023-12-01 10:17:35	0	0	0
2023-12-01 10:17:40	0	0	0

timestamp	bus	car	cyclist	motorcyclist	pedestrian	truck
2023-12-01 10:24:00+00:00	0	0	0	0	0	0
2023-12-01 10:24:30+00:00	0	0	0	0	0	0
2023-12-01 10:25:00+00:00	0	0	0	0	2	0
2023-12-01 10:25:30+00:00	0	0	0	0	0	0
2023-12-01 10:26:00+00:00	0	0	0	0	0	0

Timestamp	count
2023-06-22 00:15:00+02:00	3.82
2023-06-22 00:30:00+02:00	6.31
2023-06-22 00:45:00+02:00	1.05
2023-06-22 01:00:00+02:00	1.47
2023-06-22 01:15:00+02:00	8.53

The case of traffic predictions





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2023-12-01 10:17:30	0	0	0
2023-12-01 10:17:35	0	0	0
2023-12-01 10:17:40	0	0	0

timestamp	bus	car	cyclist	motorcyclist	pedestrian	truck
2023-12-01 10:24:00+00:00	0	0	0	0	0	0
2023-12-01 10:24:30+00:00	0	0	0	0	0	0
2023-12-01 10:25:00+00:00	0	0	0	0	2	0
2023-12-01 10:25:30+00:00	0	0	0	0	0	0
2023-12-01 10:26:00+00:00	0	0	0	0	0	0

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2023-06-22 01:00:00+02:00	1.47
2023-06-22 01:15:00+02:00	8.53

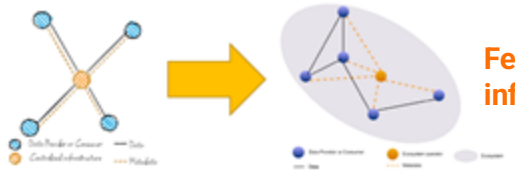
The case of traffic predictions

- No transparency
- No clear data governance, access and usage policies
- No clear procedure for data exchange
- No interoperability, data standards and models
- No metadata

Data Spaces: accelerating data ecosystems to accelerate AI

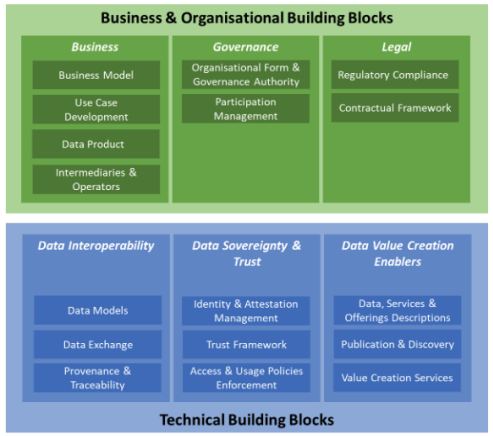
> An ecosystem of public and private entities that enables voluntary, sovereign, and secure data sharing through a decentralized infrastructure, following common governance and standards, with the aim of creating business and strategic value for participants.

Centralized infrastructure



Federated infrastructure

- Facilitate discovery and access of data
- Data usage control (sovereignty)
- Secure transmission and trust guarantees
- Accelerate data sharing with technical, organizational and legal interoperability
- Common rules and standards (large and small companies and administrations alike)
- Compliance path for new European data regulations
- Ecosystems that promote data standards



DATA SPACES SUPPORT CENTRE

Who is advancing this vision in Europe?

European Commission · International Data Spaces Association · gaia-x · BDV Big Data Value Association · FIWARE Foundation

i2cat

deployEMDS: Trustworthy, accessible and interoperable data sharing for mobility and transport

Data sovereignty and trust

Retaining authority and control over data.

Accessibility

Discoverability and availability of mobility data.

Data interoperability

Sharing and exchanging data in a standardised way.

16 use cases in 9 cities & regions

Mobilising Europe through interlinked data sharing ecosystems

Flanders

Sofia

Barcelona

Tampere

Île-de-France region

Focus:

- multi-modal travel information
- real-time traffic information
- Sustainable Urban Mobility Indicators

Budapest

Milan

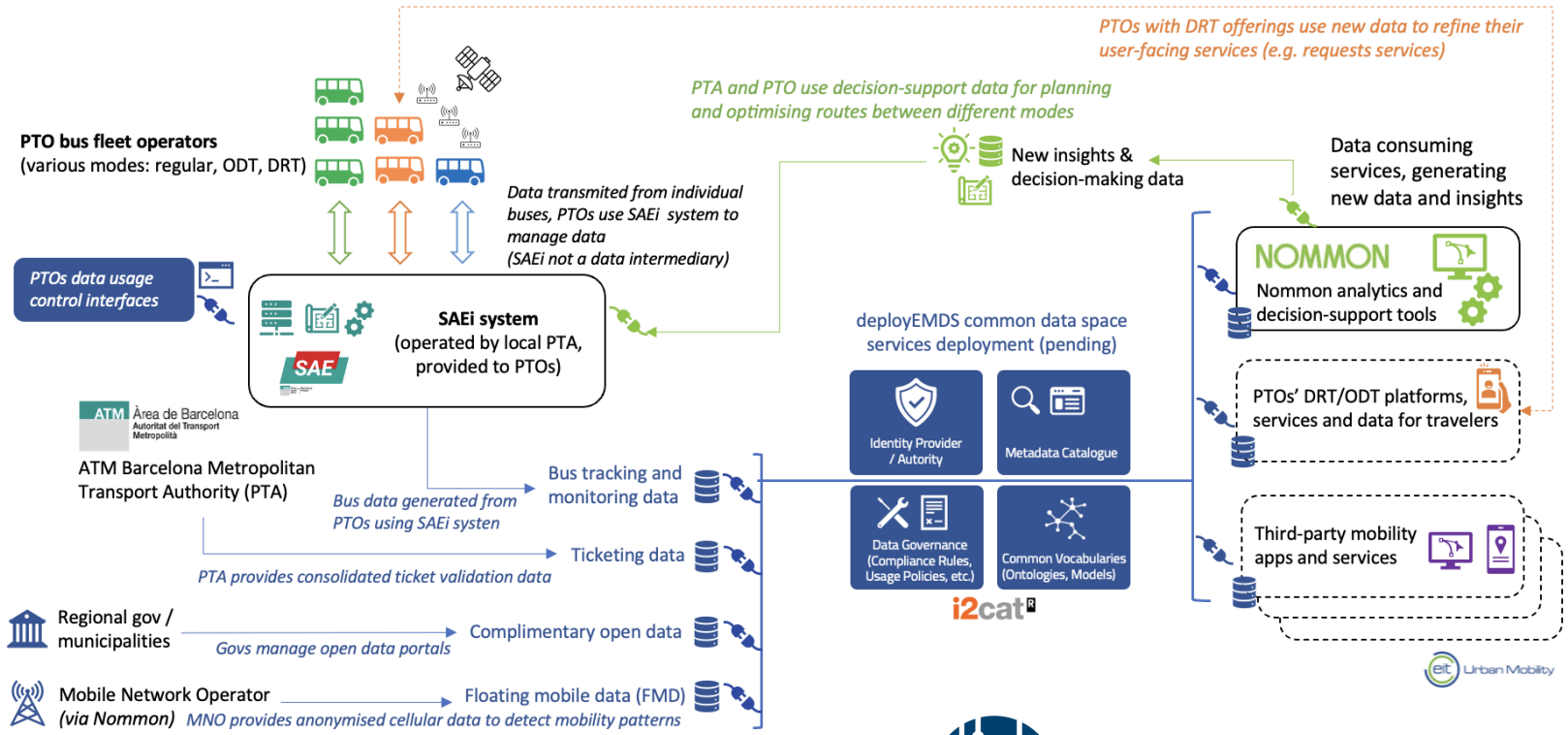
Lisbon

Stockholm

deployEMDS.eu/deployment/

Multi-operator data space ecosystem for bus fleets and on-demand transport

Pilot collaboration between ATM Barcelona, Nommon, i2CAT and onboarded PTO in deployEMDS



Public Transport Operator (PTO) service benefits

- Improve planning and operations between regular, on-demand and demand-response transit (DRT) through AI-powered predictive analytics
- Improve the user experience and PTO operations (vehicles, capacity, frequency, etc.)

Steps to better access AI services

- Standardise of interfaces and exchange protocols across data providers (various PTOs and PTA)
- Promote standardisation and semantic interoperability between traditional and dynamic modes of bus transport (ODT, DRT)

Ecosystem benefits

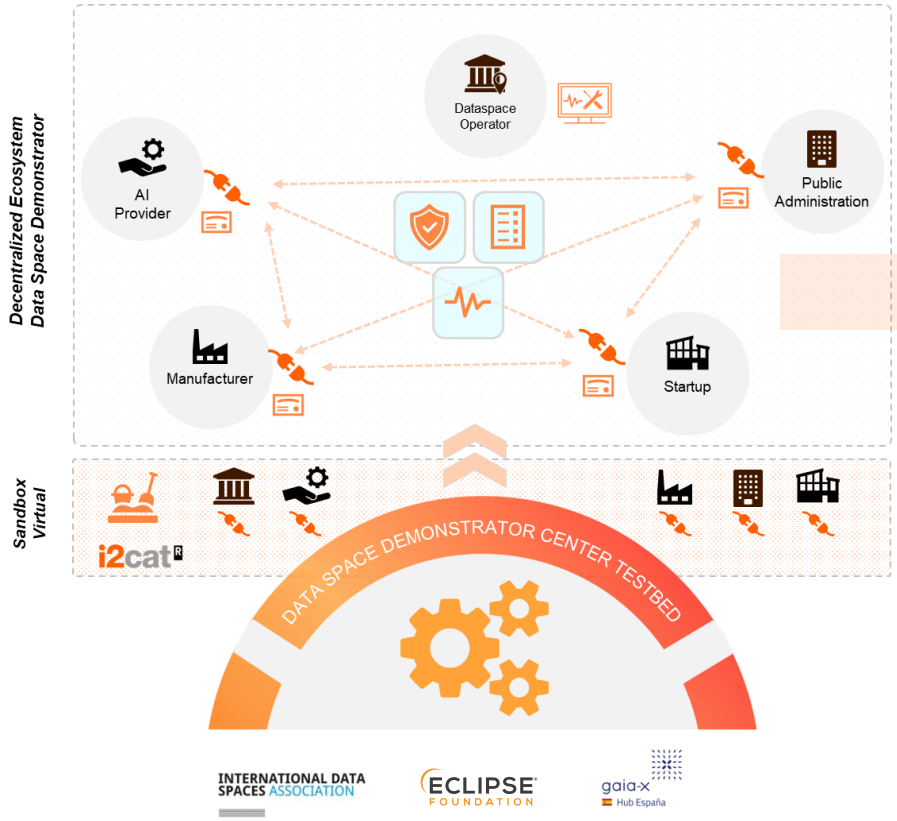
- Facilitate access to an ecosystem of digital service providers (e.g. AI predictive models) while PTOs maintain control over the use of data
- Provide a scalable public-private governance model of the ecosystem between various profiles in the value chain

i2cat

Data Space Demonstration Centre of Catalonia

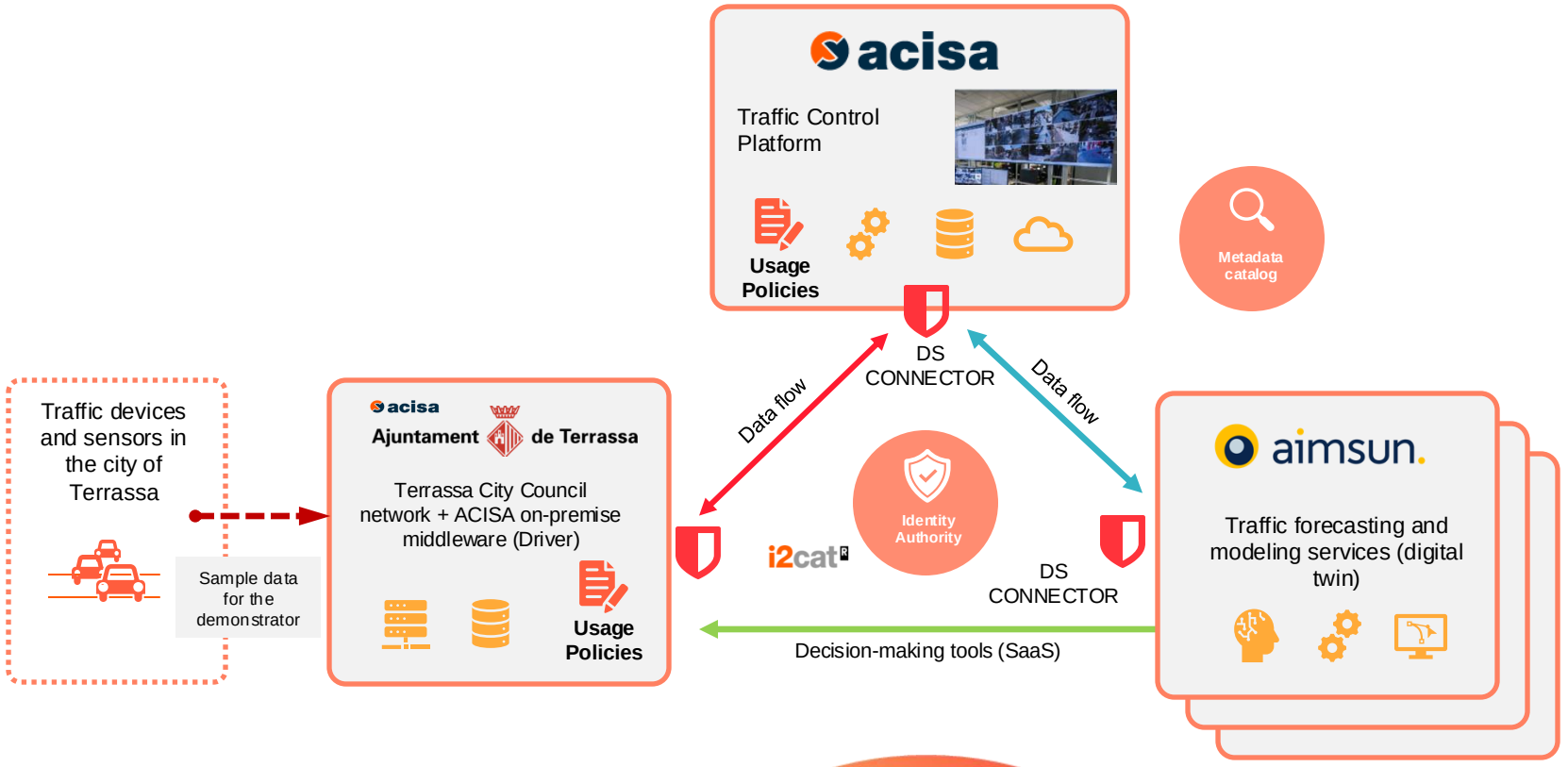
Local initiative, European standards: a regional incubator for data space development, experimentation and piloting.

- Deploys testbed infrastructure for building a data space MVP pilot, with trusted repository, sandbox, and governance services.
- Reduces time and cost in iterative data space development.
- Ensures local data infrastructure investment aligns with European standards, interoperability frameworks and regulations.
- Provides the tools and environment to teach private and public sector partners to become data space participants and operators
- Co-finances use case development and demonstrations.



Optimizing traffic through a public-private data ecosystem of sensors and digital services

Pilot collaboration between Terrassa City Council, Acisa, Aimsun and i2CAT in the Data Space Demonstration Centre of Catalonia



City traffic benefits

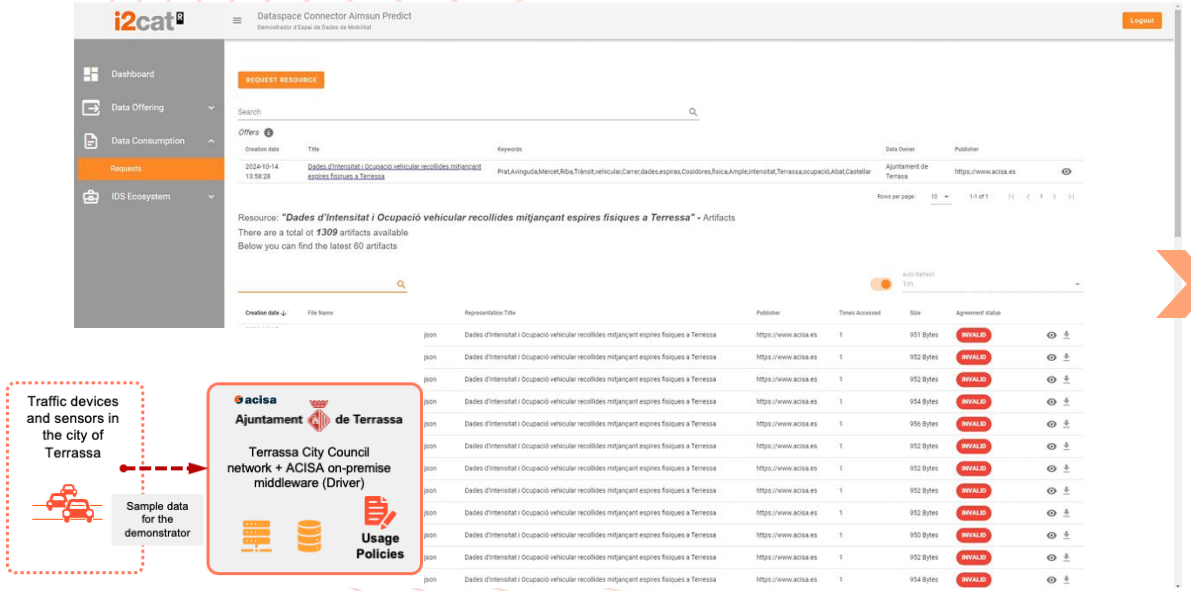
- Access to AI-powered predictive forecasts for traffic planning and operations, resolving common urban mobility challenges.
- Maintain data sovereignty and traceability in a public-private value chain of sensors, platforms and AI services.

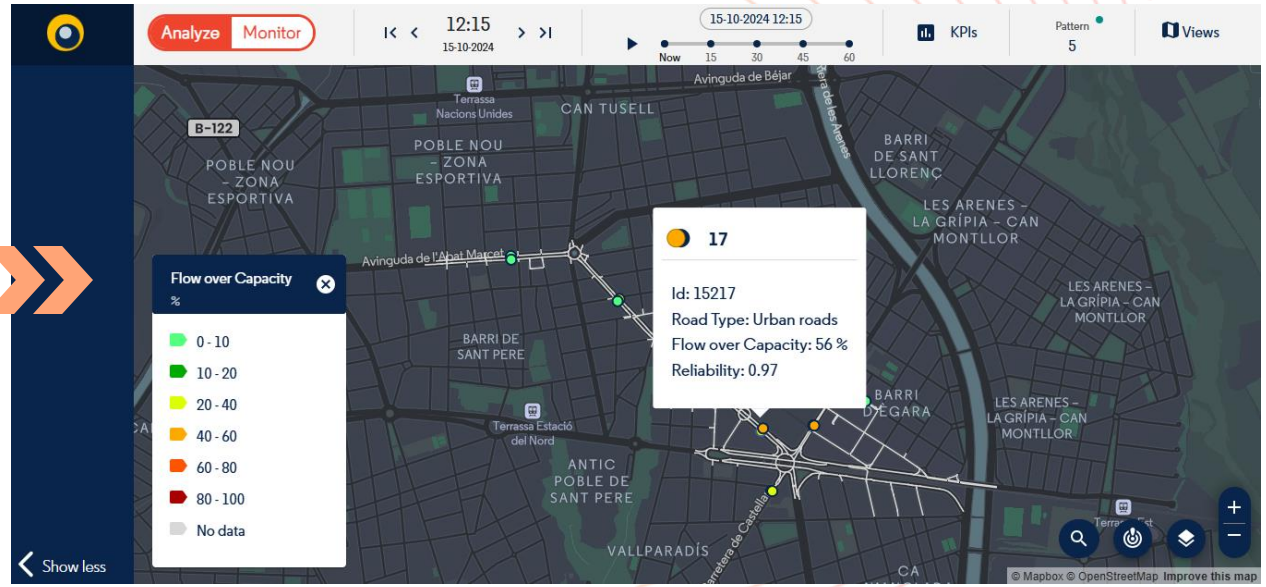
Steps to better access AI services

- Provide trust mechanisms (e.g. data usage policies and verifiable credentials), lowering barriers for public administrations to share their data to Europe's AI market.

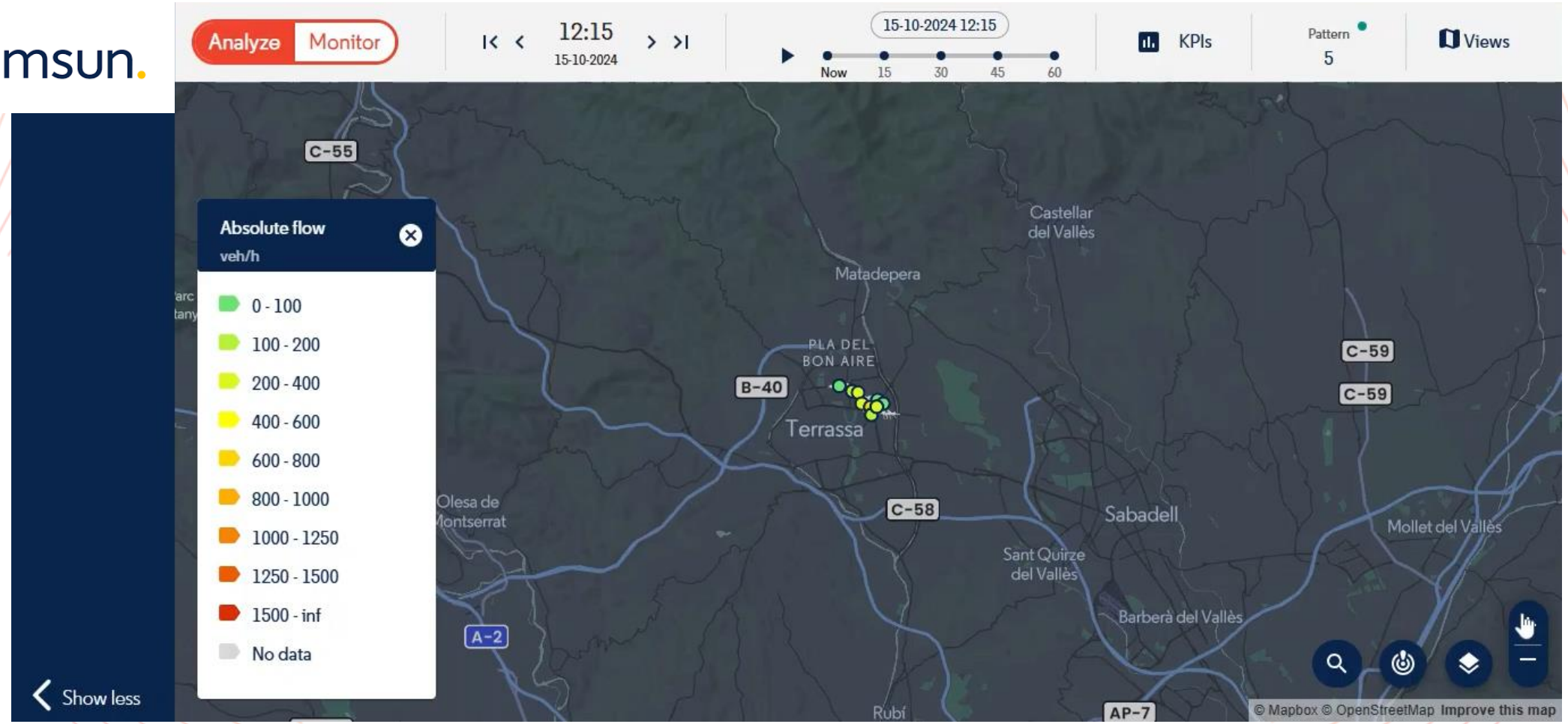
Ecosystem benefits

- Connect the traffic operator with a scalable ecosystem of third-party service providers in a trusted environment.
- Win-win: providing value to administrations, and access to high-quality data for SME developers of AI solutions.





1. A secure **endpoint** has been integrated to access data from **Acisa's Saturno API**.
2. The data provider Dataspace Connector **catalog** starts with descriptive **metadata** and **usage policies** regarding the data sources
3. The data space connector **accesses the API endpoints** and provides the data to the secure data space.
4. The Terrassa City Council can **manage data usage policies** through the UI.
5. i2CAT's identity provider **issues and verifies digital certificates**.
6. Data is shared directly from the source to Aimsun in **compliance with usage policies**.
7. The **data reaches the Aimsun server**, where it is used in the predictive analytics solution, Aimsun Predict.



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Data spaces are a Swiss army knife, not a silver bullet