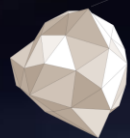# Transport Trends and Challenges Opportunities for Innovation

Mike Greenan
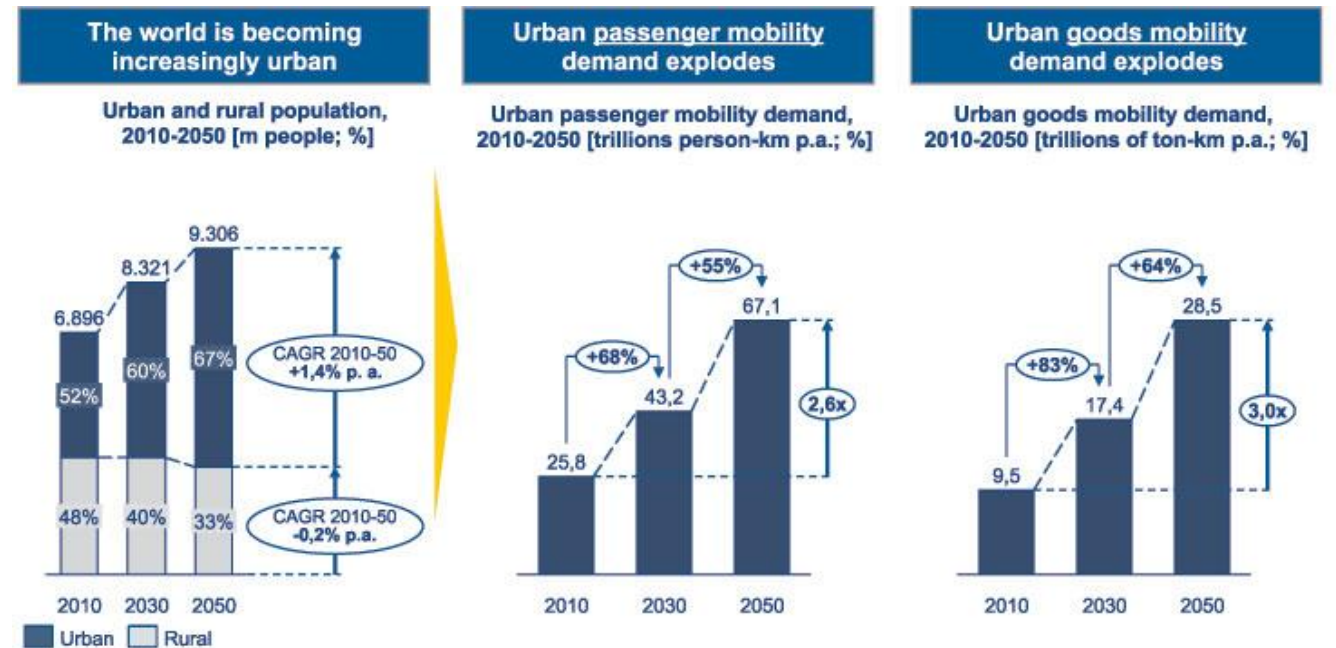Railway and Infrastructure Director / Altran

APDC 2015
Executive Breakfast – Tendências no sector dos Transportes

Table of Contents

- Transports Industry and Trends

- Data as an innovation opportunity

- Applications

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Global Trends

- Global population is increasing

- By 2050, 60% of the world's population will live in cities

- Passenger kilometres is increasing for rail, air and urban solutions

The world is becoming increasingly urban	Urban passenger mobility demand explodes	Urban goods mobility demand explodes
Urban and rural population, 2010-2050 [m people; %]	Urban passenger mobility demand, 2010-2050 [trillions person-km p.a.; %]	Urban goods mobility demand, 2010-2050 [trillions of ton-km p.a.; %]

Source: UN, Worldbank, OECD, ITF, Schäfer/ Victor 2000, Cosgrove/ Cargett 2007, Schäfer 2007, Arthur D. Little

There will be more Travellers

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# Transport Industry's Trends – in Response to Global trends

- High speed railway lines are connecting up all the world's big cities

- More frequent metros, trams and buses in cities

- Airlines and flights are increasing

- More airports and runways are coming

- There will always be lots of cars
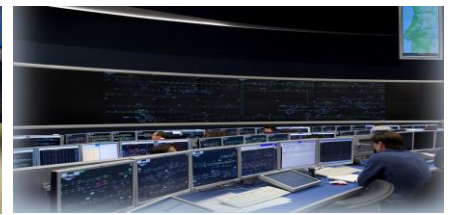
There will be enough capacity to move all the Travellers

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Supplier Trends

- Building more efficient physical 'Assets'

- Providing better connectivity of their 'Assets'

- Providing more data from their 'Assets'
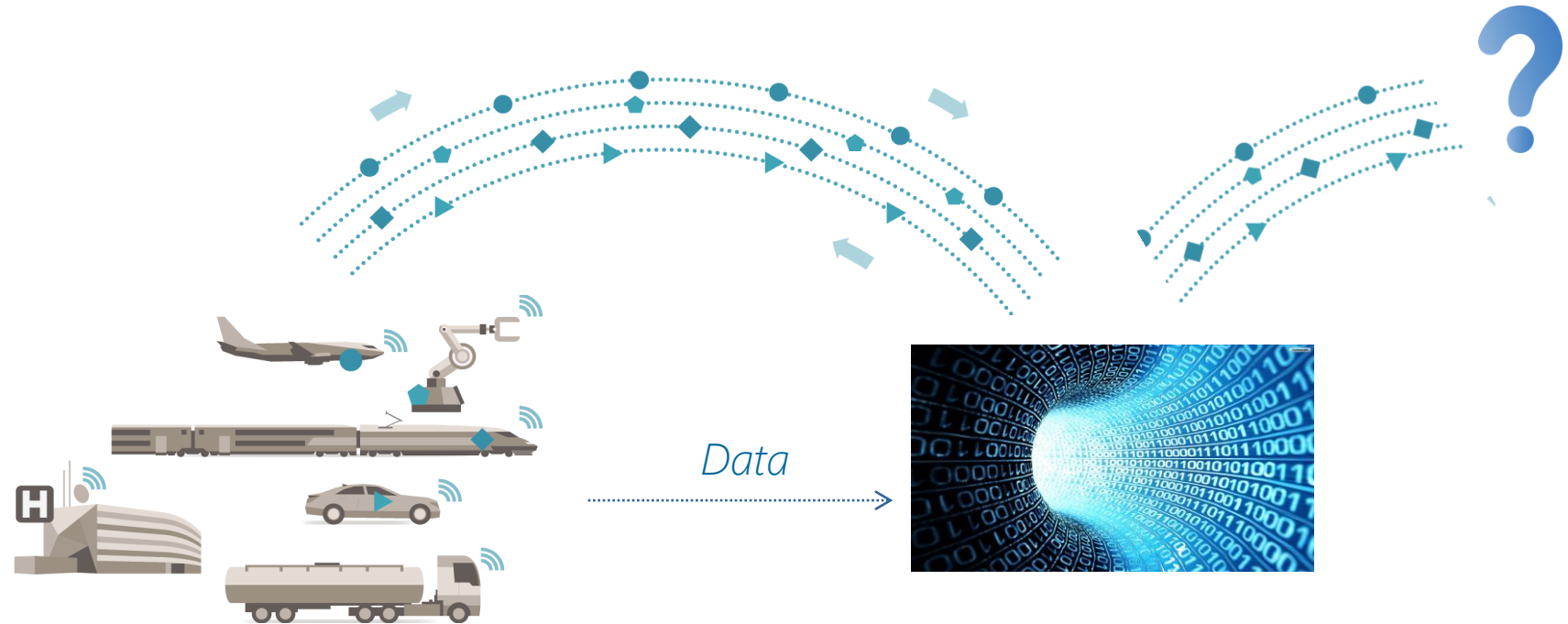
Data

Eventually we will have all the connectivity and all the Asset data we could ever want!

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The Challenge – an area for innovation

The Challenge;

- We need to keep our citizens moving
- We need to keep the assets moving
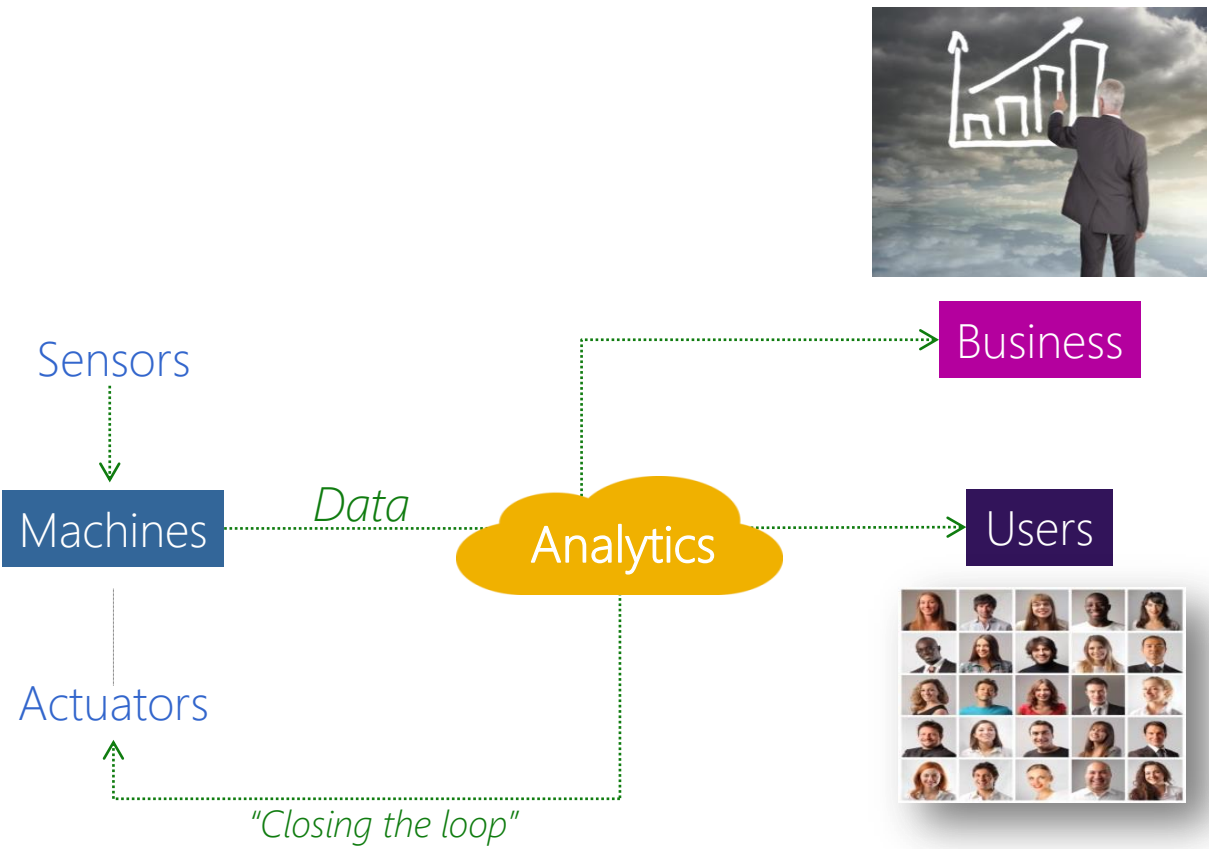
An Opportunity for Innovation;

- There will be plenty of data available from the 'assets', and from the passengers mobile devices

- We can take all this data, analyse it and convert it to information that can be then used to help drive an ultra efficient transport system

No time for breakdowns! But we can make more use of the data!

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Building a Solution

What is Machine-driven Big Data?

Sensors

Machines — *Data* — Analytics — Users

Actuators

"Closing the loop"

Business

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Building a Solution

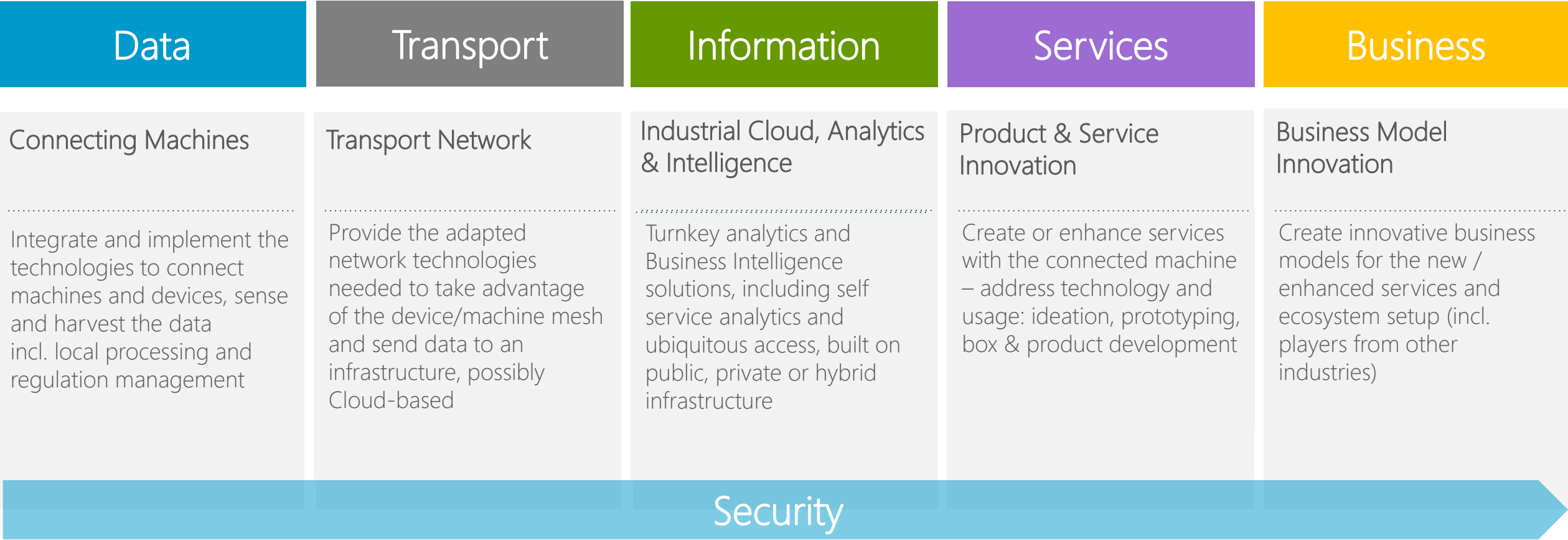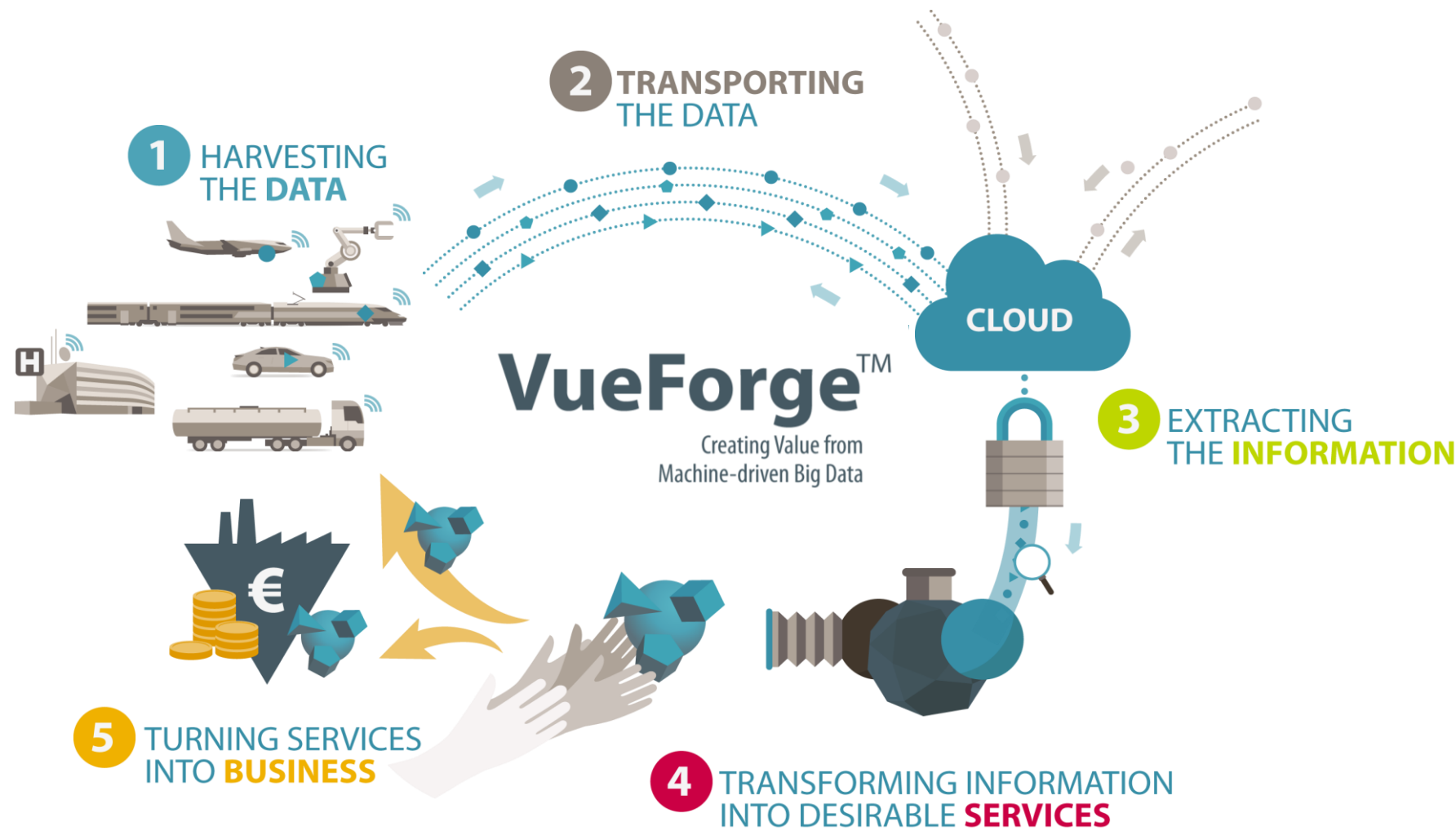| Data	Transport	Information	Services	Business
Connecting Machines	**Transport Network**	**Industrial Cloud, Analytics & Intelligence**	**Product & Service Innovation**	**Business Model Innovation**
Integrate and implement the technologies to connect machines and devices, sense and harvest the data incl. local processing and regulation management	Provide the adapted network technologies needed to take advantage of the device/machine mesh and send data to an infrastructure, possibly Cloud-based	Turnkey analytics and Business Intelligence solutions, including self service analytics and ubiquitous access, built on public, private or hybrid infrastructure	Create or enhance services with the connected machine – address technology and usage: ideation, prototyping, box & product development	Create innovative business models for the new / enhanced services and ecosystem setup (incl. players from other industries)

Security

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2 TRANSPORTING
THE DATA

1 HARVESTING
THE **DATA**

CLOUD

VueForge™

Creating Value from
Machine-driven Big Data

3 EXTRACTING
THE **INFORMATION**

5 TURNING SERVICES
INTO **BUSINESS**

4 TRANSFORMING INFORMATION
INTO DESIRABLE **SERVICES**

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Traveller management using VueForge™
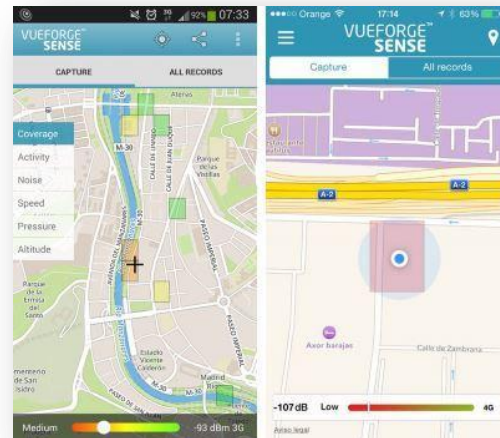
VueForge™ Sense

Intelligent Mobile SW to harvest data from Mobile phones. Extremely low–consumption, sensing technology designed to turn smartphones into complex sensors.
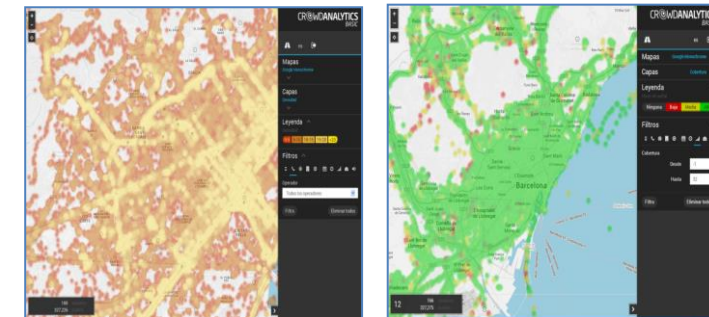
Use what (almost) everybody has !

...to harvest and use data!

Fire & Forget - 24x7

VueForge™ Think

Build passenger journey information by data-fusion (data in this case coming from the smartphone data).
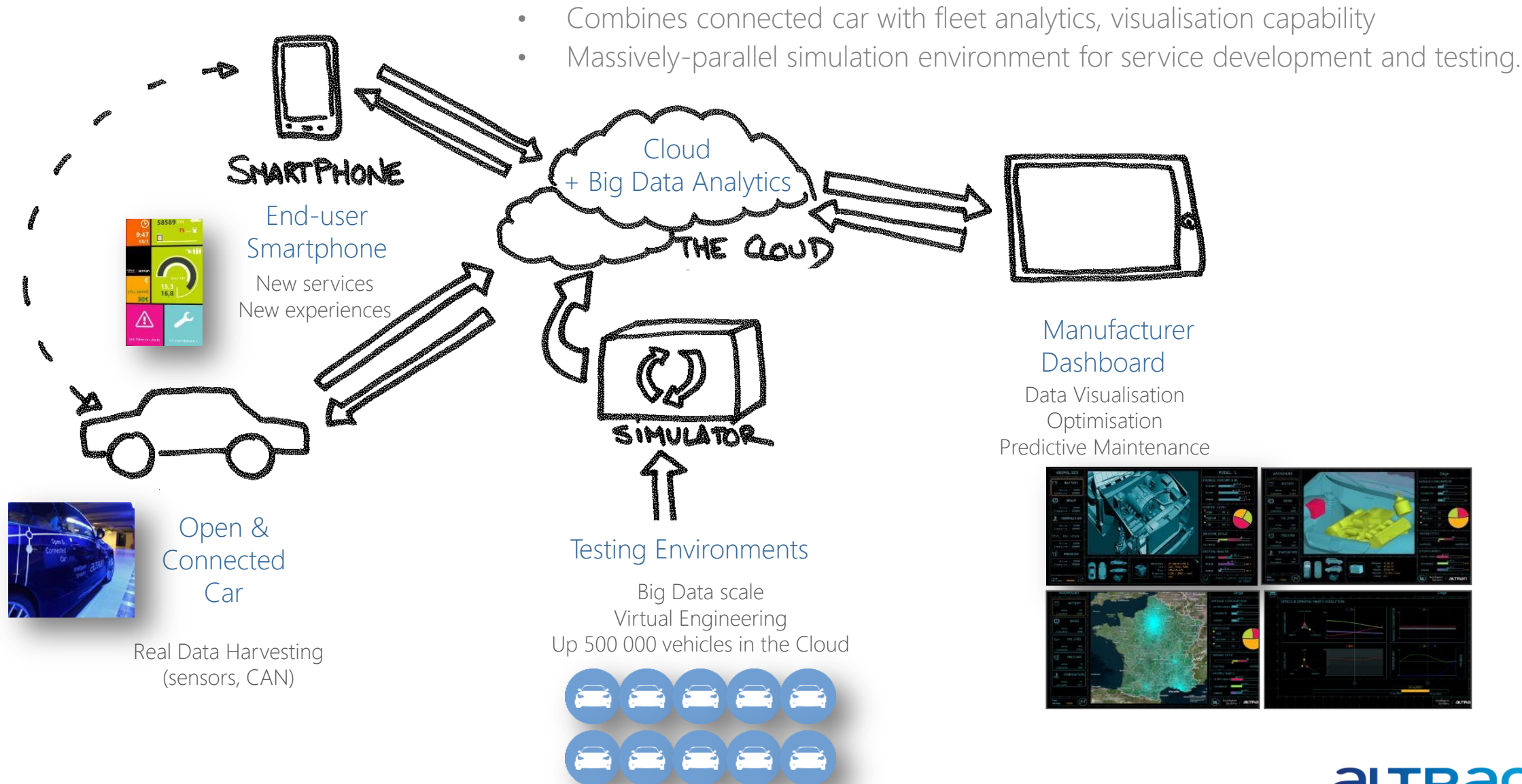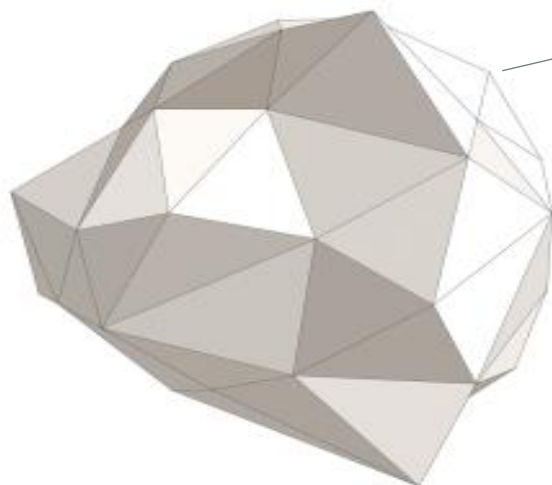
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Asset Management

Predictive maintenance

- Projects in several sectors

- Retrieving data from sensors

- Back-end data analytics

- Providing information to drive maintenance plan

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Asset Management using VueForge™

- Combines connected car with fleet analytics, visualisation capability
- Massively-parallel simulation environment for service development and testing.

SMARTPHONE

End-user Smartphone

New services
New experiences

THE CLOUD

Cloud
+ Big Data Analytics

SIMULATOR

Manufacturer Dashboard

Data Visualisation
Optimisation
Predictive Maintenance

Open & Connected Car

Real Data Harvesting
(sensors, CAN)

Testing Environments

Big Data scale
Virtual Engineering
Up 500 000 vehicles in the Cloud

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INNOVATION MAKERS

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