Photo by Marius Masalar on Unsplash

Ubiquitous Car

ICT-19-2019: Advanced 5G validation trials across multiple vertical industries

The call seeks to empower vertical industries through end-to-end 5G connectivity and development of innovative digital use cases involving cross industry partnerships

ICT-19-2019: Advanced 5G validation trials across multiple vertical industries

Scope

- 5G technology has to be coordinated on EU Level to ensure compatibility across Europe
- 5G technology needs to be validated by used cases in specific verticals
- 5G empowers vertical industries and connects industries as partners
- Identified clusters for 5G application are: smart city, consumer and professional services, industry, digital health and public safety
- 5G technology has to be shared among multiple verticals and applications

Expected impact

- Empowering vertical industries by deploying 5G

- Validate specific use cases and deployment scenarios from high to low density regions

- Viable business models for innovative digital use cases tested and validated across a multiplicity of industrial sectors

Call specifics

- Deadline: 14.11.2018 (Call Opening: 26.07.2018)

- Contribution from the EU per Project: € 10-15 Million

Ubiquitous car aims to create a system of multi-purpose, electric, 5G-connected autonomous vehicles which can be used across multiple industries

Project idea summary

Status quo

Currently vehicle **utilization rates are low** and **cross-industry vehicle sharing is non-existing**

- Most of the time, vehicles are **parked and unused**, making them **wasted assets**

- Private owners, delivery services and logistics companies **all use different fleets**

Technology trend

With 5G, vehicle connectivity could see a **technological breakthrough**

- More and more cars are equipped with **connectivity devices** each year

- 5G KPIs regarding bandwidth, latency and connected device numbers **enable multiple new use cases** and applications

*"How can **full vehicle connectivity** be used to **optimize efficiency** and **utilization** in mobility across industries?"*

Solution

Our goal is to create a **system of vehicles** which are…

multi-purpose   electric   5G-connected   autonomous

and serve use-cases in **multiple vertical industries.**

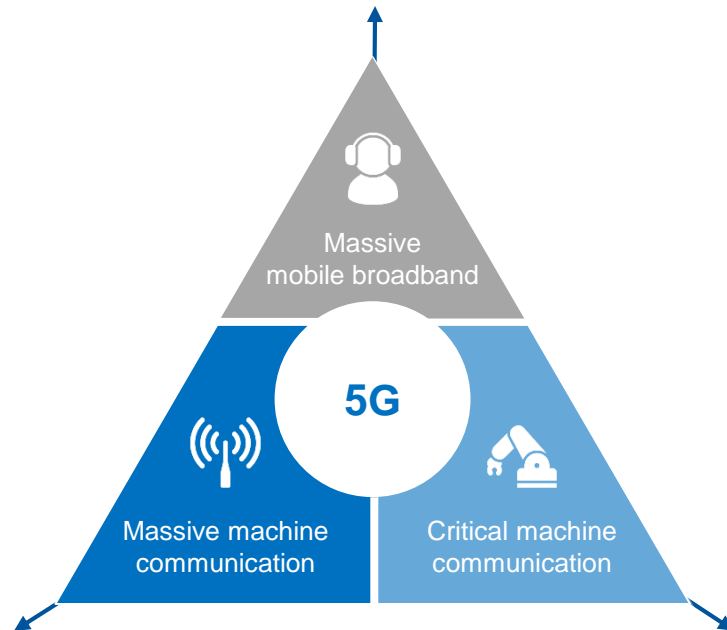**Urban mobility**   **Mail and parcel**   **Industrial logistics**

5G is not an evolutionary development of 4G – it is a completely new definition of the communication standard

Why 5G?

5G can be optimized in three different ways:

Massive mobile broadband

5G

Massive machine communication

Critical machine communication

5G contains new technology that enables:

◆ The creation of private, operator independent networks

◆ Divide the network into independent slices and distribute these individually

◆ Guarantee an agreed Quality of Service

◆ Support edge computing applications

04:00   **08:00**   **12:00**   **16:00**   **20:00**   **00:00**

Logistics Provider

The local supermarket books the car to bring fresh groceries from the nearby train station

Personal Transport

After work, the car drives me to the gym. It loaded up my pharmacy shopping before I got in

Commuter

The car brings me to the office. It picks up coffee on the way. Other commuters join the trip

Mail and Parcel

Deliverers use the car to serve customers in the area. On the way they pick up shopping from the supermarket

Industrial Logistics

The nearby factory needs parts delivered. The car picks them up from the supplier and delivers them

Night Taxi

After a fun night and a few drinks, I am brought home by the car. A few friends accompany me

04:00 **08:00** **12:00**

Logistics Provider

The local supermarket books the car to bring fresh groceries from the nearby train station

Commuter

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Mail and Parcel

Deliverers use the car to serve customers in the area. On the way they pick up shopping from the supermarket

Strong international partners will be required in each field

R&D

- Electric Vehicle OEM
- Platform Provider (Back-End)
- Front-End Development
- 5G Infrastructure Provider
- 5G Infrastructure Planning
- Data Analytics and Heuristic Optimizations

End User

- Test field for 5G
- Logistic Service Providers
- Food Delivery Service
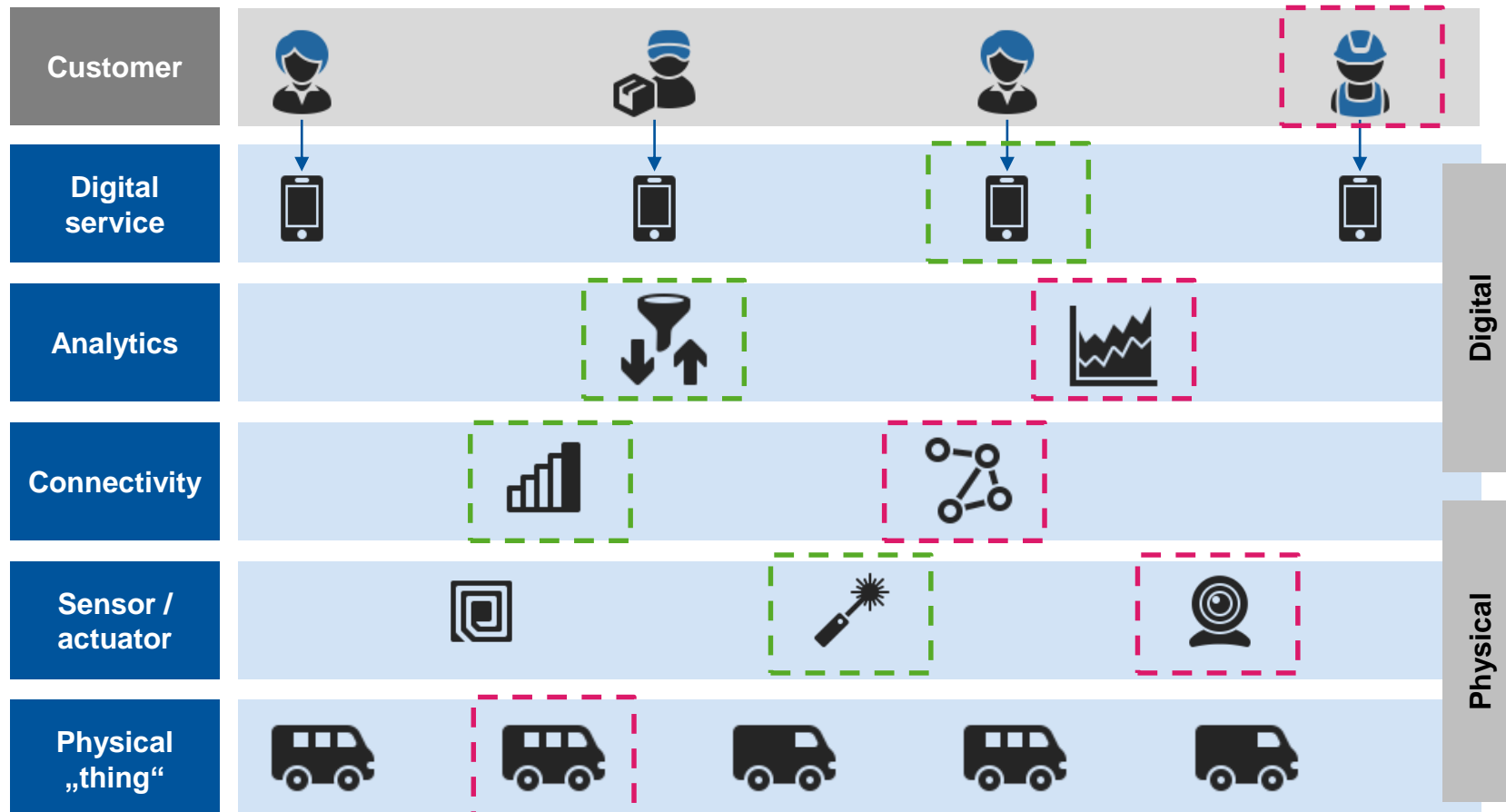- Industrial Companies
- Supermarket Chain

fir an der RWTH Aachen

The architecture of the project vision consists of five layers. Strong international partners, preferably 5G PPP members, will be required in every category

Project vision, key partners and internal competences

Value creation layers in an IoT application[1]

Key external partners

Key users: logistic service providers, food delivery service, supermarket chain

Analytics platform provider

Connectivity infrastructure

Sensor maker

(Electric) Vehicle OEM

Autonomy software provider

FIR competences

Technology concept

5G business models

Data analytics for logistics

Digital service engineering

Optional partners

Infrastructure: charging station operators, mobile network operators, electric grid operators

Regulation: Standardization organization

The FIR is a research institute with broad expertise in future logistics and smart mobility
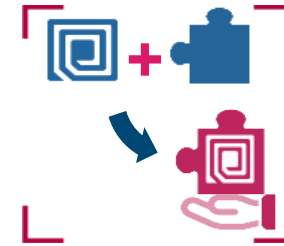
Our competences

The Institute for Industrial Management FIR is a **research institution at RWTH Aachen University** concerned with **business organization** and **corporate IT** with the aim to establish the organizational basis for the digitally integrated industrial company of the future.

Our activities focus on the application of research to industry verticals. Currently these include **Future Logistics, Smart Services, Smart Maintenance, Smart Commercial Buildings, and Smart Mobility**.

For the proposed project, the **FIR** contributes valuable expertise in…

Creating technology concepts

Designing 5G business models

Analytics and Optimization for logistic chains

Engineering digital services

Our competences and infrastructure

1 Transferring empirical findings of „5Gang" project: measuring 5G input to **industrial value chains**, comparing it to other technologies, economically and technologically. Utilizing and expanding the **IT-assessment knowledge** of our institute.

2 Utilizing the **unique infrastructure** on RWTH Aachen Campus and Cluster Smart Logistics: a demonstration factory, innovation labs, matriculated industrial partners, students and research teams

3 **Applied Research**: Bridging the gap between **lab-experiments** and **serial production**

4 Exploiting new business models by linking the **logistics-factory-consumer value-chain**

Get in touch with us for more details and a possible cooperation

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