



*Open cooperative 5G experimentation  
platforms for the industrial sector NetApps*

[www.5g-induce.eu](http://www.5g-induce.eu)

## Infocom World Conference & Exhibition 2022

Online

29 Nov 2022

# Advancing I4.0 with 5G SA, AMRs, VR and ML, at Ford Motors Factory in Valencia (Spain)

Manuel Lorenzo

Ericsson Spain – 5G-Induce Project



# The 5G-Induce project – Helicopter View



## Valencia-Madrid, Spain

Ford factory in Valencia, Spain, interconnected through Ericsson's edge node technology to 5TONIC test-bed in Madrid



## Lavrio-Athens, Greece

Public Power Corporation industrial site in Lavrio, Greece, interconnected to OTE 5G laboratory infrastructures in Athens

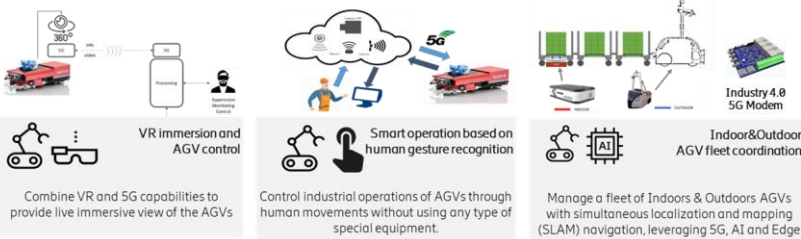


## Genoa-Biandronno, Italy

Whirlpool factory in Biandronno (Varese), Italy, interconnected to CNIT's lab infrastructure in Genoa through Wind3 network, serving also as the DevOps testbed for new NetApps

Case  
in focus for  
this session

# Industrial Priorities + Ecosystem = Innovation




**VR Immersion and AGV control**  
Combine VR and 5G capabilities to provide live immersive view of the AGVs

**Smart operation based on human gesture recognition**  
Control industrial operations of AGVs through human movements without using any type of special equipment.

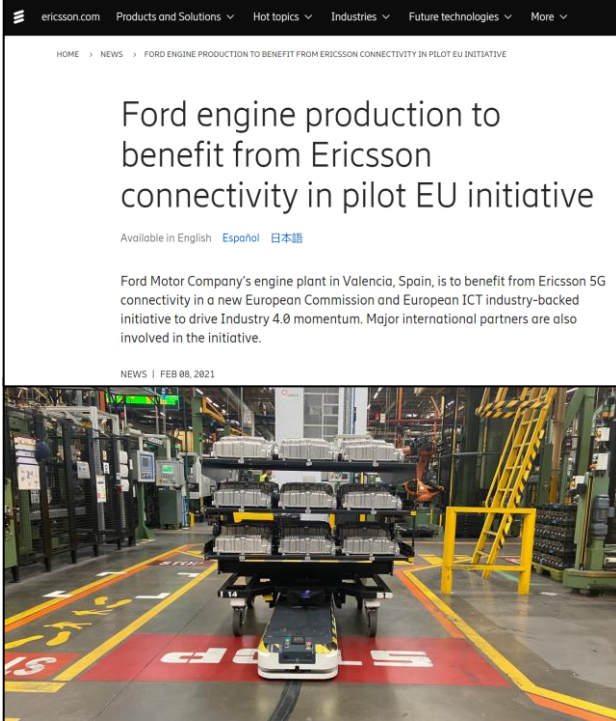
**Indoor&Outdoor AGV fleet coordination**  
Manage a fleet of Indoors & Outdoors AGVs with simultaneous localization and mapping (SLAM) navigation, leveraging 5G, AI and Edge

**Industry 4.0 5G Modem**



**Partners:** Ford, ASTI, Fivecomm, ybvr, intel, UNIVERSITAT POLITÈCNICA DE VALÈNCIA, UNIVERSIDAD DE BURGOS, gestcos, Telefónica

<https://www.youtube.com/watch?v=xg2OouRBbRw>

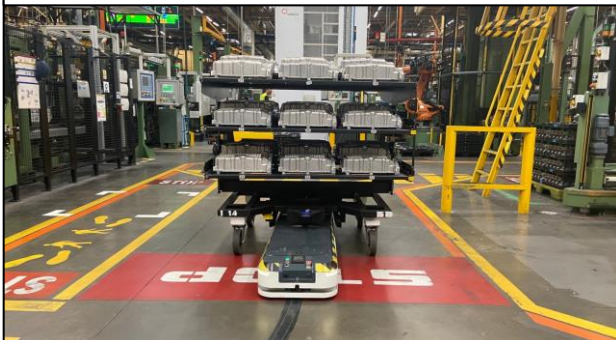


**Ford engine production to benefit from Ericsson connectivity in pilot EU initiative**

Available in English [Español](#) [日本語](#)

Ford Motor Company's engine plant in Valencia, Spain, is to benefit from Ericsson 5G connectivity in a new European Commission and European ICT industry-backed initiative to drive Industry 4.0 momentum. Major international partners are also involved in the initiative.

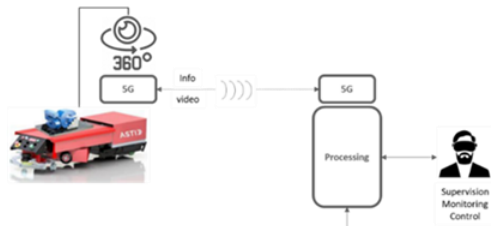
NEWS | FEB 08, 2021



<https://www.ericsson.com/en/news/2021/2/ford-engine-production-5g-dedicated-network>

# Use Cases in focus

## Augment the quality of monitoring with AR+5G



*VR immersion and  
AGV control*

Combine VR and 5G capabilities to provide live immersive view of the AGVs



## Simplify human-machine interaction with AI+5G

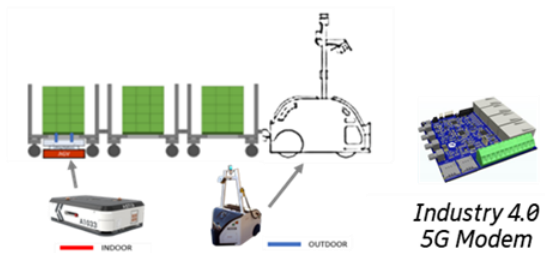


*Smart operation based on  
human gesture recognition*

Control industrial operations of AGVs through human movements without using any type of special equipment.

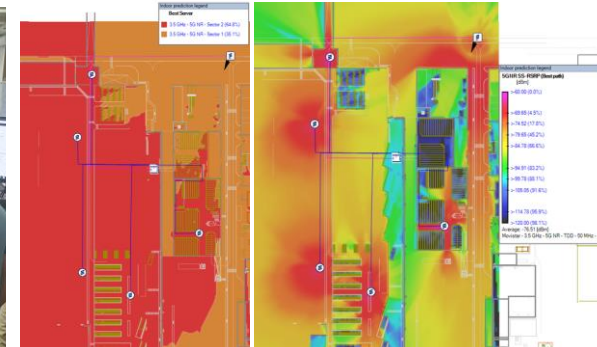


## Unify connectivity for Indoor+Outdoor with 5G



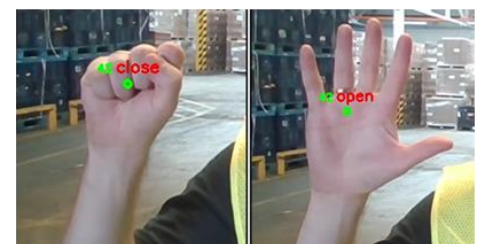
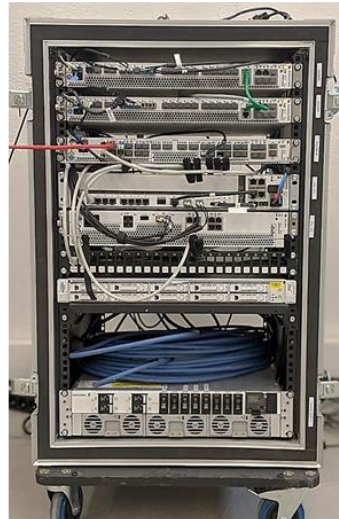
*Indoor&Outdoor  
AGV fleet coordination*

Manage a fleet of Indoors & Outdoors AGVs with simultaneous localization and mapping (SLAM) navigation, leveraging 5G, AI and Edge





# From Networks and Devices to Digital Apps



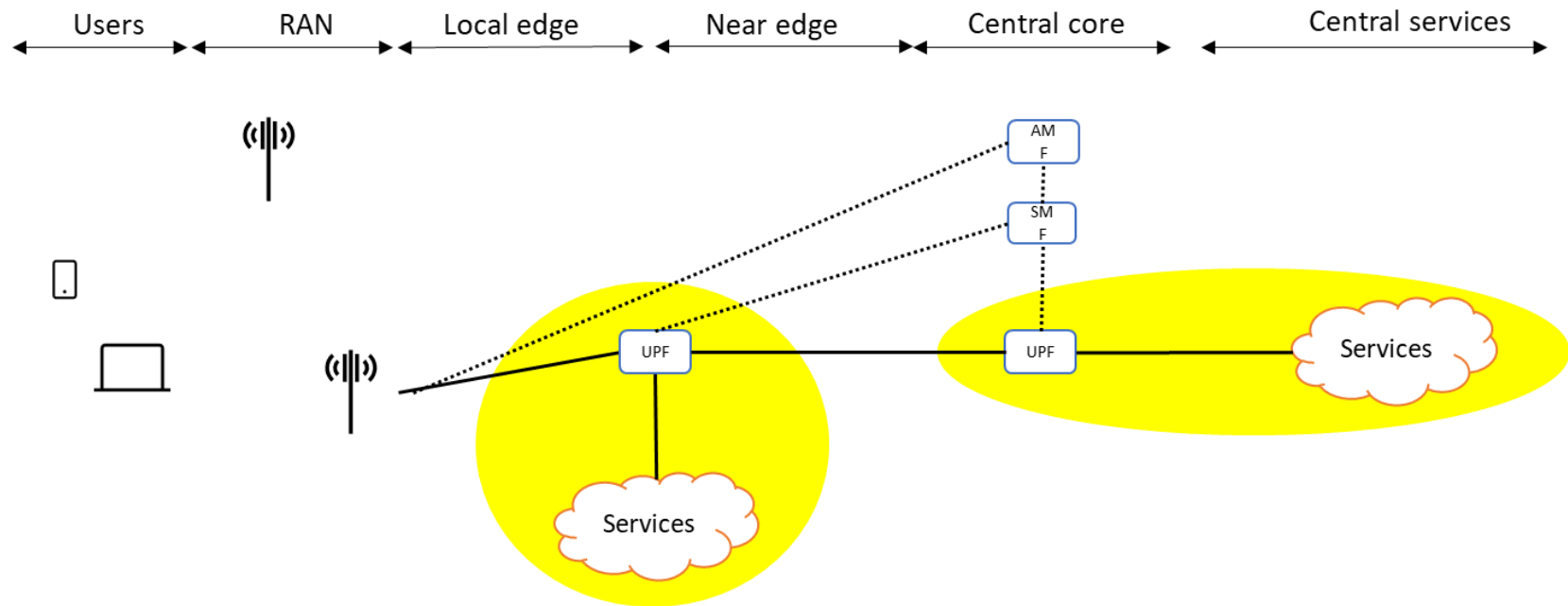
## Technology Evolution pace

I4.0 embraces technologies like ML, VR/AR and 5G, in constant evolution

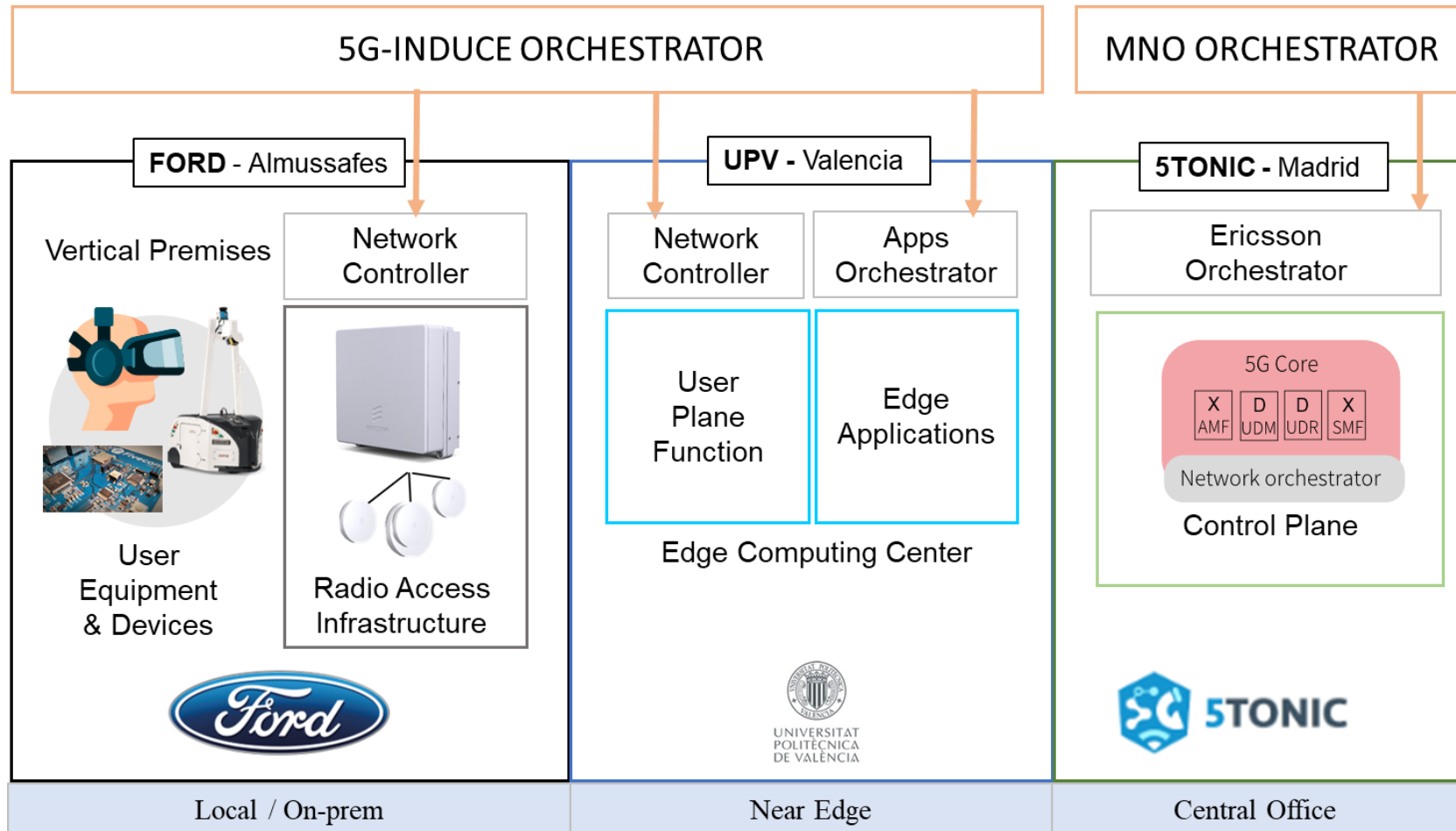
## Application Dynamics context

I4.0 attracts more and more innovative digital applications, with variable requirements on performance and deployment models

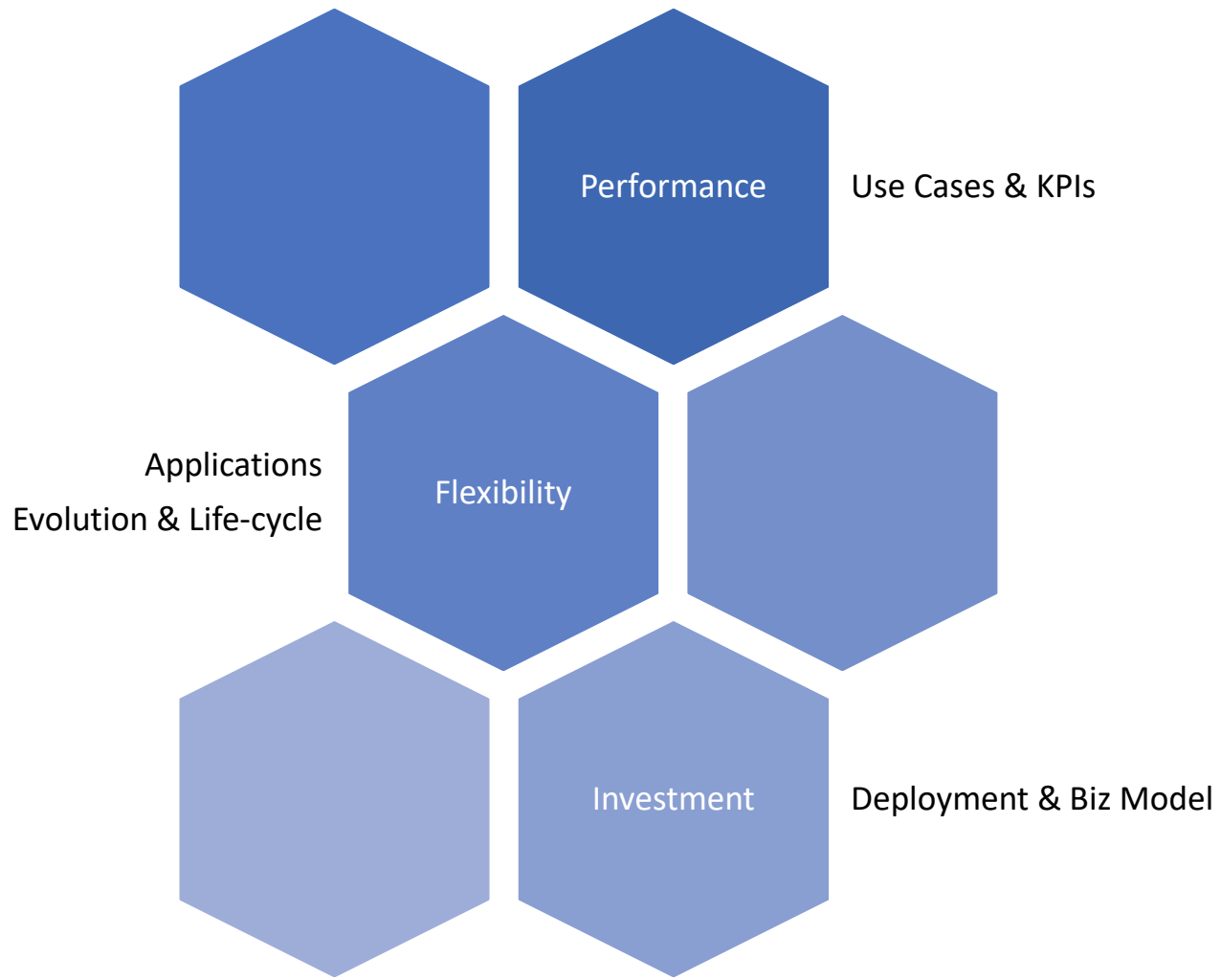
# Standard 5G SA model for UP & Services



# Creating+Validating Architectures for NPN



# Dealing with NPN: Putting it all together





# Wrap-up & Invitation

- Unlocking **5G NPN** concepts and architectures into e2e solutions for its technical and business validation is our day-to-day work in 5G-PPP projects like **5G-Induce**
- **5G SA** is, itself, a great platform to innovate upon, enabling the integration and hybridation of transformational technologies such as **VR/AR** and **ML** with **Edge and Cloud**, for creating brand-new **I4.0** applications
- **We welcome new partners** to experiment and explore new synergies of I4.0 apps with 5G SA, VR/AR and ML



THANK YOU!

Manuel Lorenzo

Ericsson Spain, 5G-Induce - WP6 Leader



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 101016941