



PIONEERS-6G:

Platform and Device Innovations for Energy-Efficient, Resilient, and Secure 6G-IoT Systems

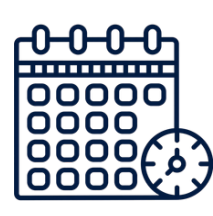


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the European Union

6G SNS



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Duration
36 months



EU contribution
€2.9 million



Coordinator
Karlstad University (KAU)

CONSORTIUM



Project vision

Design, Implement, and Validate **Omni-IoT**, a 6G-compliant platform for globally scalable, energy-efficient, resilient, and secure IoT applications and services

Project Objectives

- Application-centric methodology to deliver technical solutions with tangible Key Performance Indicator (KPI) and Key Value Indicator (KVI) improvements across diverse 6G-IoT applications.
- Intelligent, energy-efficient, and secure solutions for 6G-IoT device operations.
- Resilient and accurate solutions for 6G-IoT connectivity, sensing, and positioning.
- Transformation of the 5G Service Based Architecture into a resilient and autonomous IoT connectivity platform architecture.
- Wide uptake of PIONEERS-6G results within the 6G-IoT ecosystem.

Targeted solutions in the Omni-IoT platform

USER EQUIPMENT (UE)



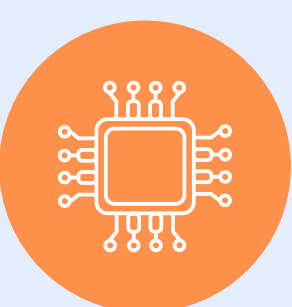
- AI/ML-native UE operation modes
- On-UE efficient AI/ML execution
- On-UE security mechanisms

RADIO ACCESS NETWORK (RAN)



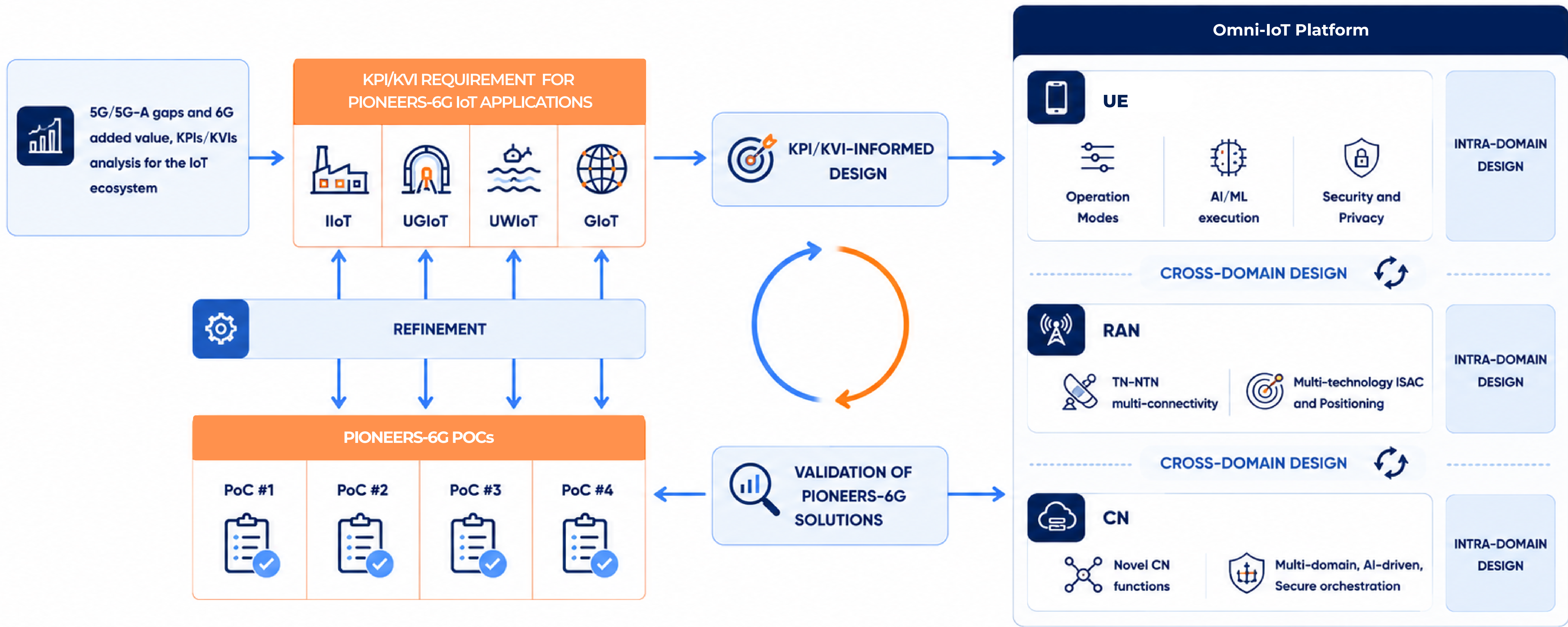
- AI/ML-driven multi-connectivity between Terrestrial and Non-Terrestrial Networks
- AI/ML-based multi-technology Integrated Sensing and Communication (ISAC) and Positioning

CORE NETWORK (CN)



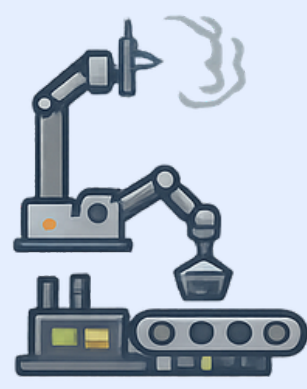
- AI/ML-driven, multi-domain CN and service orchestration
- Novel CN functions for globally secure interoperability

METHODOLOGICAL APPROACH



PROOFS OF CONCEPT AND VALIDATION LABS

INDUSTRIAL IoT



Optimization of industrial processes in indoor/outdoor factories where mobile IoT devices communicate while sensing.

CNIT WILAB
Mulini Lab

UNDERGROUND IoT



Enhancement of workers' safety in tunnels and mining sites where mobile IoT devices exchange data on environmental conditions.

Holman's Test Mine (through Rinicom)
Mulini Lab

UNDERWATER IoT



Seamless integration of underwater IoT devices, connected through acoustic/optical modems to the surface segment, e.g., a gateway on a surface buoy.

Glasson Dock (through Rinicom)
Mulini Lab

GLOBAL IoT



Intelligent, automated, and scalable management of IoT devices and network functions across operators' and hyperscalers' jurisdictional domains.

Telefonica TheThingX Lab
Mulini Lab



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