6G-VERSUS

6G-VERSUS showcases the profound sustainable, economic, and societal impact of 6G technology driving the transition toward a more prosperous and sustainable future. Through six cutting-edge 6G vertical pilots on 6G testbeds 6G-VERSUS demonstrates real-life use cases for 5 verticals.

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Concept

6G-VERSUS introduces a novel methodology, in which the project will transform existing use cases into 6G applications by integrating:

- **Vertical Apps (V-App)**,
- **Network Apps (N-App)**,
- **AI-assisted Apps (AI-App)**.

The uniqueness of the proposed triplet above lies in redefining a typical use case as a 6G Application composed of distributed yet fully interacting software components with clearly defined roles and interfaces, that together enable an AI-assisted vertical service and an optimisation in the use of 6G resources under dynamic conditions. In particular, the triplet enables network resources to be monitored, allocated, and reconfigured in line with the vertical application needs (V-App → N-App), while also allowing the application to adapt its behaviour and service placement based on network state and constraints (N-App → V-App).

By embedding the AI-App as an intrinsic part of the triplet, the approach natively supports both network intelligence and application intelligence, enabling closed-loop optimisation, prediction, and policy decisions across connectivity and service layers. This well-defined triplet structure facilitates full integration of the three application types in a consistent manner, reducing integration effort and improving repeatability across pilots and trials.

Pilots

Bulgarian Pilot:
Utilizes AI to monitor and control distributed renewable energy sources, optimizing energy production and distribution.

French Pilot:
Implements data-driven strategies for water and waste management in critical infrastructures, enhancing efficiency and reducing environmental footprint.

Greek Pilot:
Employs collaborative robotics for Search and Rescue (SaR) operations, improving response times and safety of disaster response efforts, minimizing human risk and environmental impact.

Portuguese Pilot:
Focuses on creating sustainable and safe port infrastructures, contributing to economic growth and environmental conservation.

Spanish Pilot:
Develops immersive telepresence actuators for field operations, reducing the need for physical travel and its associated carbon emissions.

Finnish Pilot:
Innovates with a self-sustainable 5G base station, paving the way for energy-autonomous communication networks.

Architecture

The 6G-VERSUS reference architecture is multi-layered, with the infrastructure layer at its foundation comprising six testbeds spanning the Edge-to-Cloud continuum, hosting computational resources, measurement tools, and end-user devices. Above, the Network Functions (NFs) and Network Applications (N-Apps) are interconnected via a Common API Framework (CAPIF). On top, the Data Fabric Layer, powered by ML-Ops, processes network data and integrates user-driven insights for AI-driven optimisation and adaptive decision-making. This architecture supports 6G Applications as app triplets of a (vertical) V-App, an (AI-assisted) AI-App, and a (network) N-App.

View the details of the 6G-VERSUS architecture: ***6g-versus.eu/architecture***

Consortium

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6G Vertical Trials for **Sus**tainability
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