

An abstract background featuring a dark blue field with a bright, glowing stream of particles or light streaks flowing diagonally from the top right towards the bottom left. The particles are small, bright blue dots that form a dense, luminous trail.

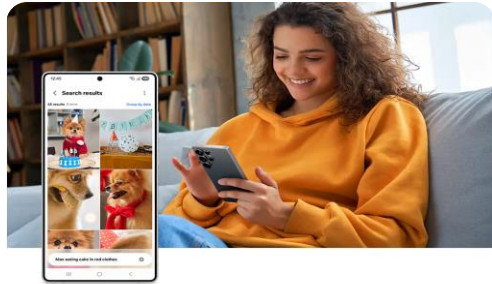
AI-powered networks for the 6G Era

Ratnakar Rao

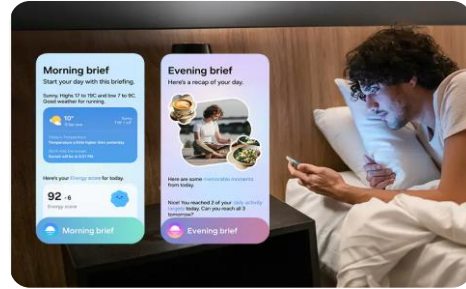
Samsung R&D India - Bangalore

18th March 2026

AI is real and is here



Gallery Search



Now Brief



Tactile Experience

Characteristics:

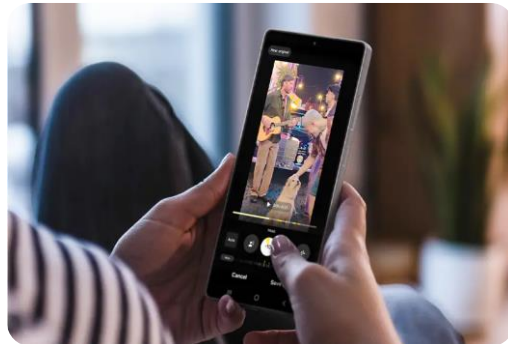
- AI traffic is Uplink heavy, Highly variable within same app
- On-device vs On-cloud trade-offs (Latency / security / privacy)

Characteristics:

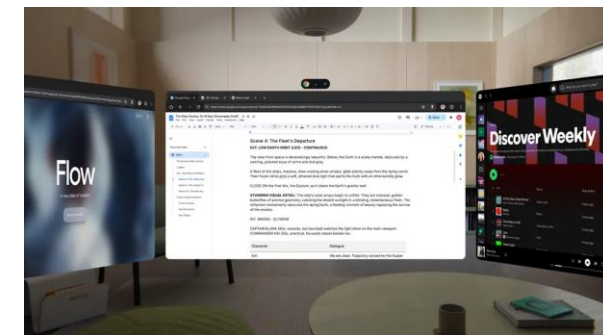
- Multi-Modality, Selectively Uplink else Downlink Heavy
- Low latency for sensory comfort (Very low for uplink)



Call Assist, Transcribe



Audio Eraser



Multi-Screen Operation

6G Considerations

- What will such use-cases need from future networks?
- What will be the needs of different categories of devices and different formfactors?
- What would be the impact on the user plane and control plane designs?

- AR glasses demand more UL coverage / UL NW capacity
- ISAC introduces new capability for RAN and motives higher spectral efficiency designs
- Advanced media (e.g., 3D interactive streaming) requires a few 100Mbps of DL data rates per user
- Gen-AI will add extra requirements to the existing network ... speed, latency, data traffic, etc.
- New spectrum is a key to accommodate the traffic demands
- Mobile operators to drive better end-user experiences → more monetization opportunities



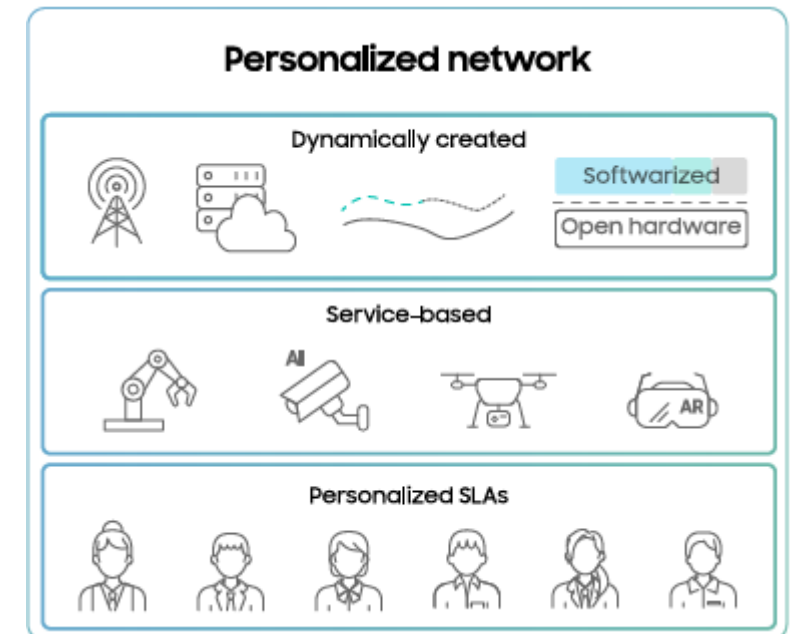
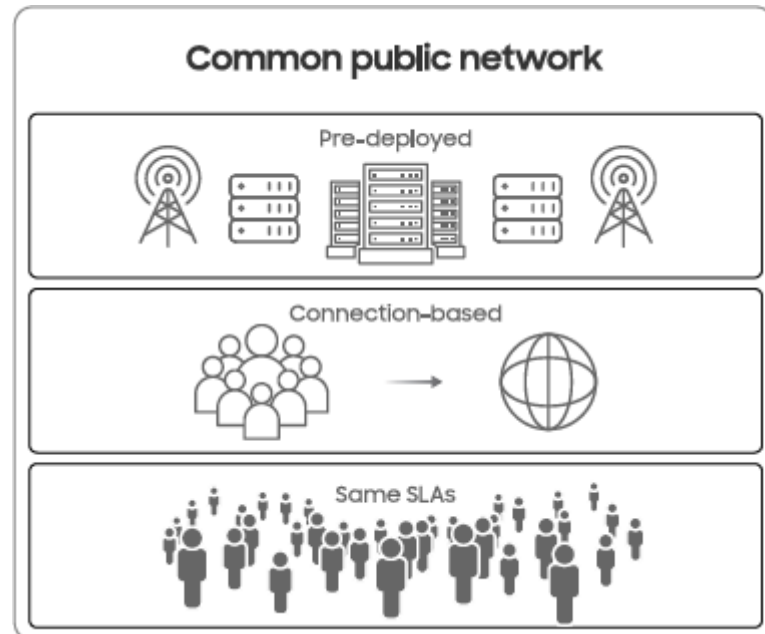
Current AR Glass Impacts

- AR generates less data traffic than a smartphone running the same app
- AR apps show higher signaling plane load
- As AR displays, Apps evolve, this will change

Application Awareness – Architectural Blueprint for Future Network

Principles:

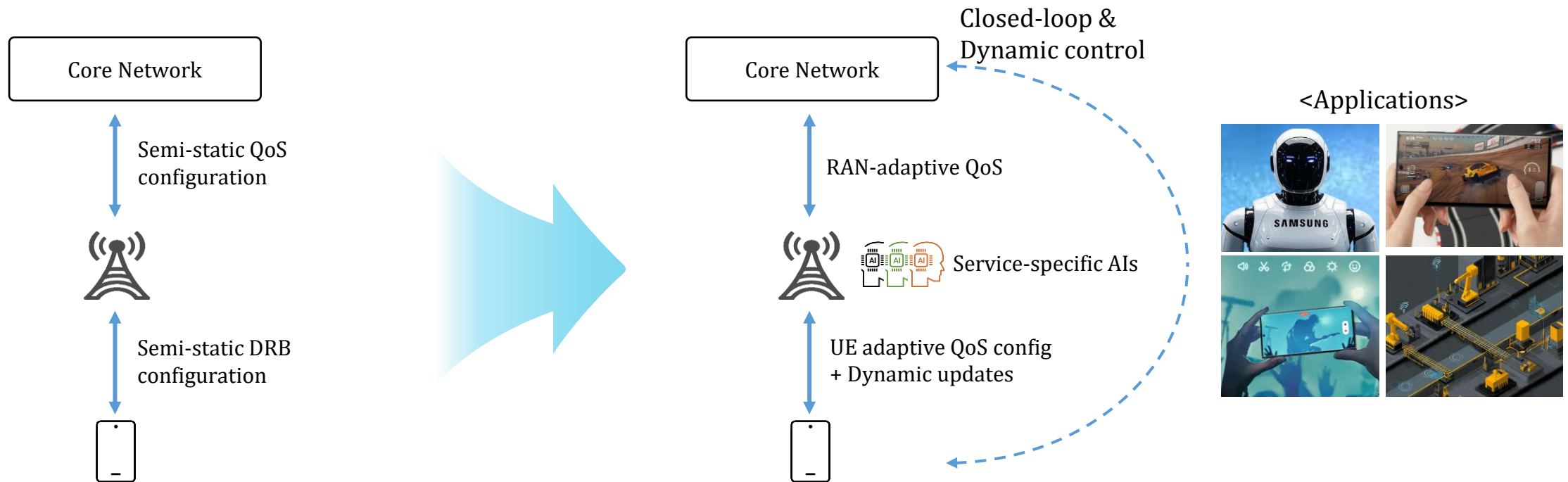
- **Two Sided Adaptations:** Networks becoming Application-aware, while applications are network aware
- **Joint optimization** across device, edge and cloud
- **QoS aware** functionalities, e.g.:- config, mobility etc.
- **Cross domain** → Unified control for multi-RAT and multi-Connectivity
- **Dynamic Reconfiguration** based on Context and Prediction



Service-aware RAN

Agentic AI Network to perceive service demands in real-time

Autonomous coordination across different network domains (RAN, Core, Edge)



5G : Static QoS, Service invisible at RAN

- 5G QoS framework is coarse
- Over provisioning vs Dynamism

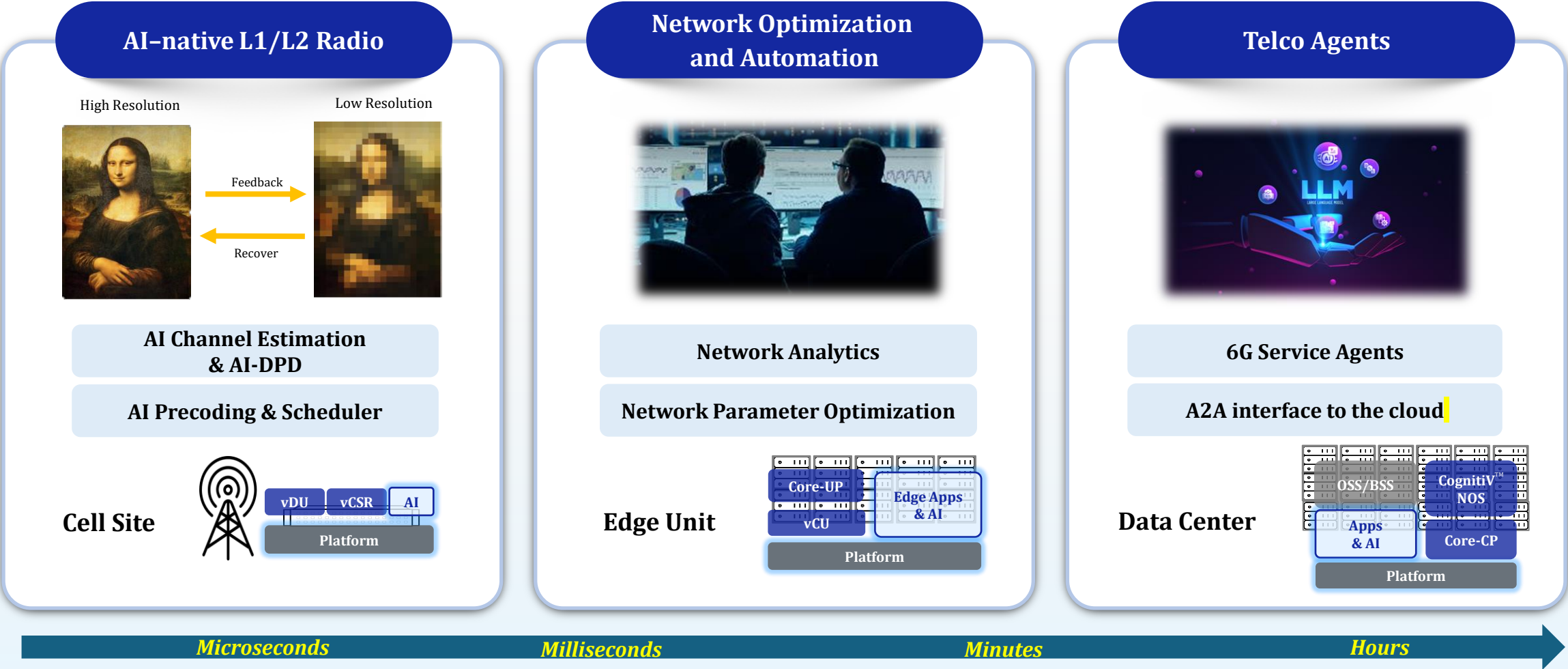
6G : Adaptive QoS, Service-specific optimization

- Dynamic, context-driven resource allocation and service management
- Differentiated services: Fine-grained, Per-application Policies

AI for Future Telecom

Key Enabler in Designing, Operating, and Managing Networks

- AI plays a crucial role in the design, operation, and management of next-generation communication systems

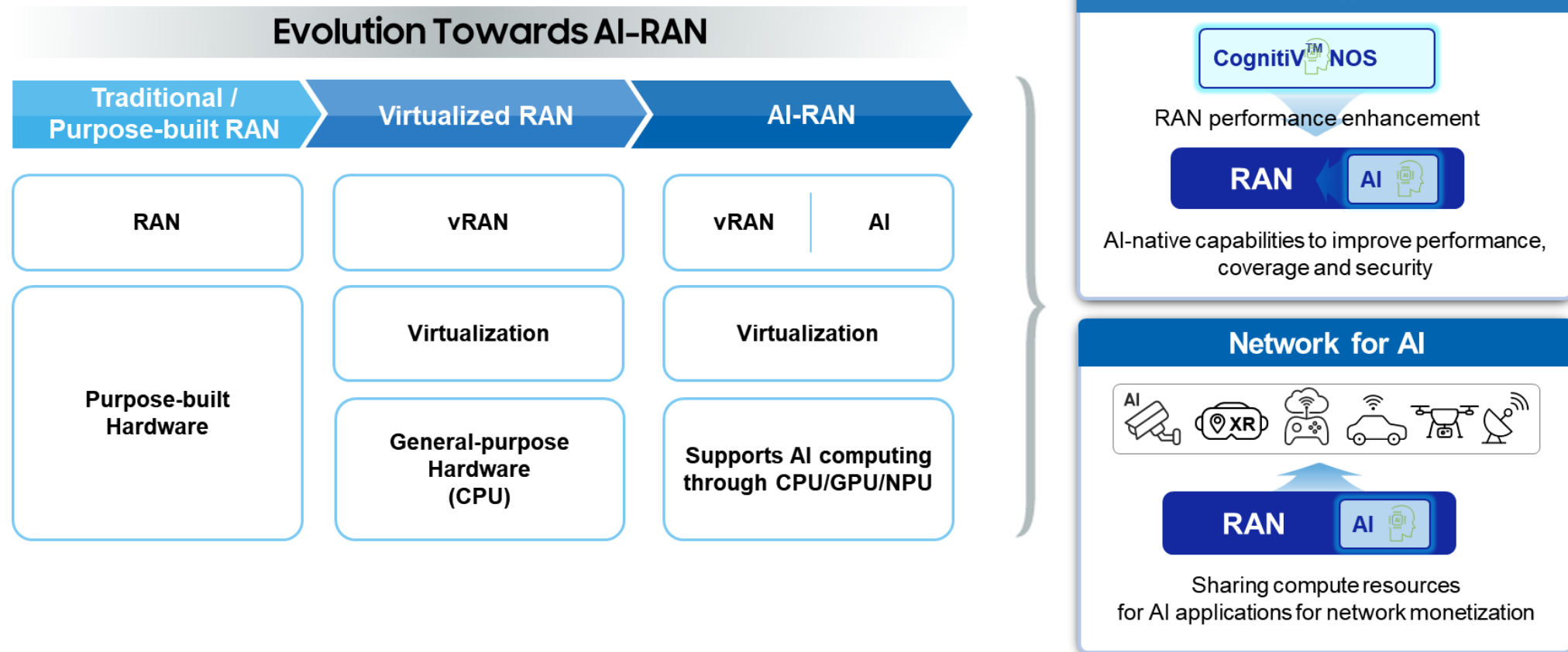


Telecom Network Evolution: vRAN and AI-RAN

Radio access network has been evolving from purpose-built RAN to virtualized RAN and to today's AI-RAN

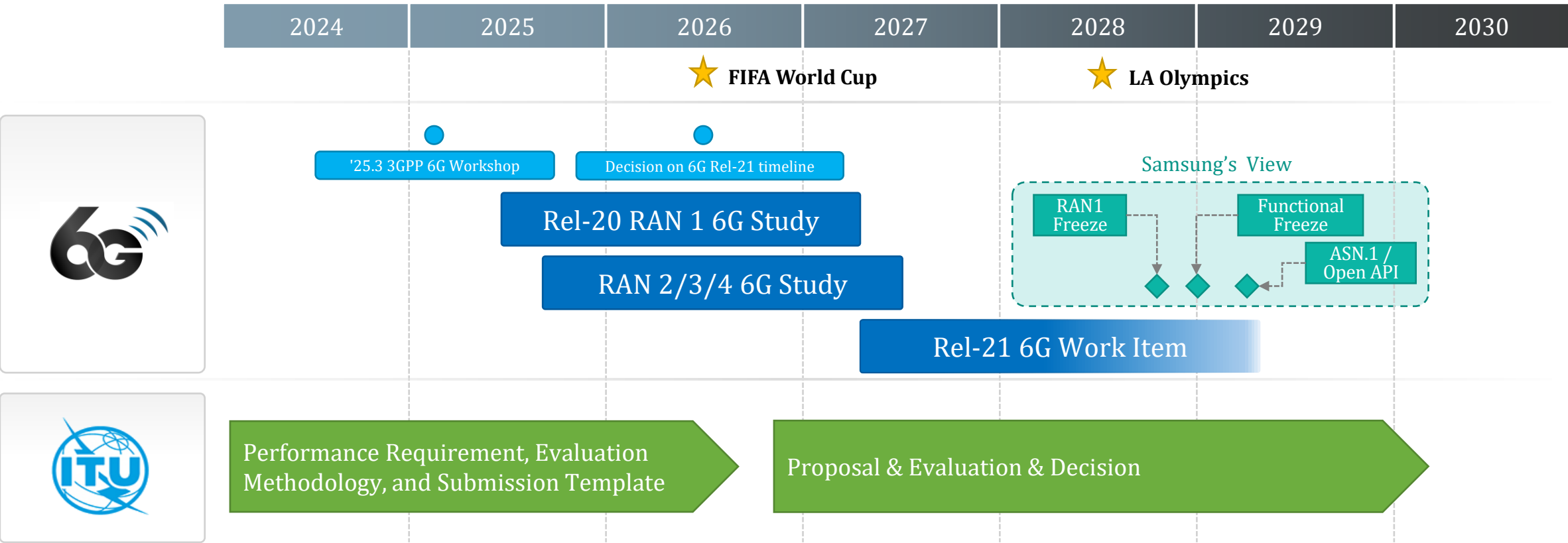
AI-RAN enable AI-native communication as well as edge AI applications for network monetization

3GPP considering optimizing 6G network infra through resource exposure



6G Standardization - Timeline

3GPP kicked off 6G study in WGs with the pending timeline for its 1st specifications (Rel-21)



Global Standards

3GPP Commits to Develop
6G Specifications



Regional Strength

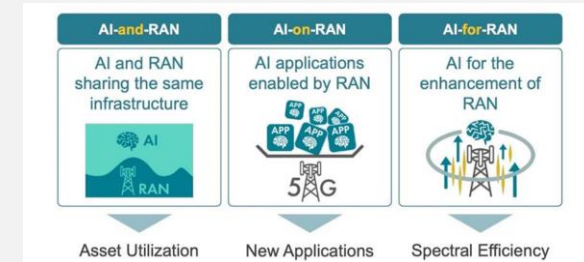
Bharat6G
Alliance

tsdsi



Let us together
co-create 6G

Communication & Computing



New Devices & Experiences



Thank you

SAMSUNG



**AI-Native & Sustainable
Communication**

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