

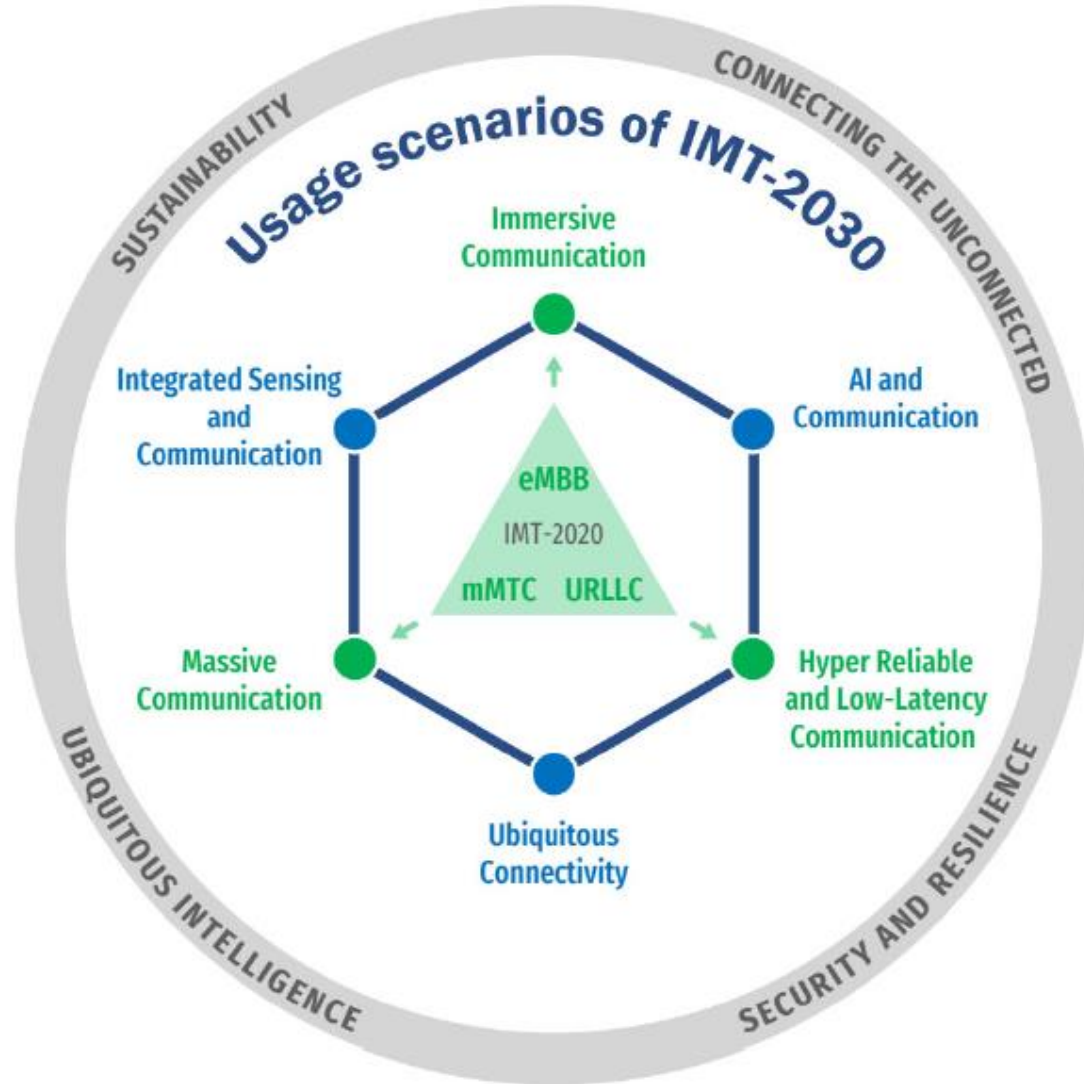


WILL AI FIND A CENTRAL ROLE IN 6G

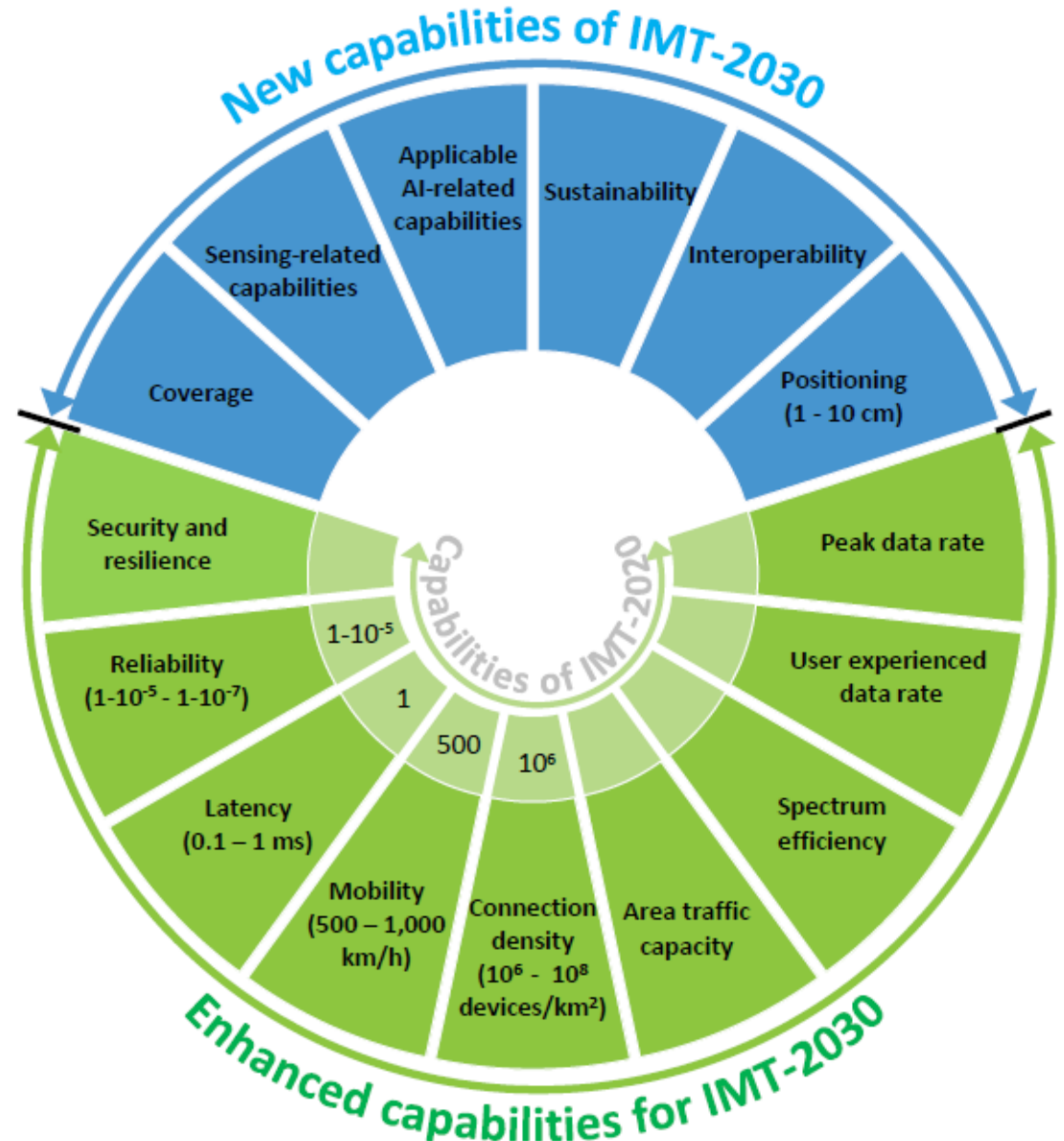
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VP, AltioStar

ITU-T IMT-2030 VISION, CAPABILITIES AND USE CASES



Wheel Diagram



Palette Diagram

SCALE OF 6G COMPARED TO 5G

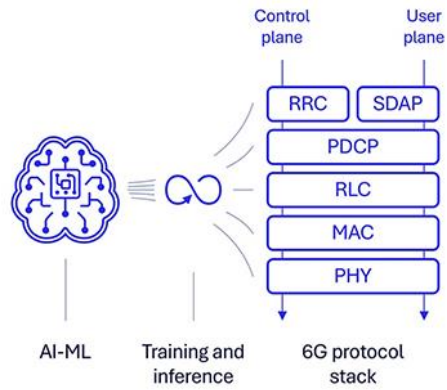
KPIs	5G	6G	Scale
Peak Data Rate	20 Gb/s	1 Tb/s	50 x
User Experienced Data Rate	100 Mbps	10 Gbps	100 x
Latency	1 ms	0.1 ms	10 x
Spectral Efficiency	30 bps/Hz	100 bps/Hz	> 3 x
Energy Efficiency	10^7 bit/J	10^9 bit/J	100 x
Connection Density	10^6 devices/km ²	10^8 devices/km ²	100 x
Coverage Percent	0.7	> 0.99	> 1.3 x
Positioning Precision	1 m	10 cm	10 x
Reliability	0.999	0.99999	≥100 x
Maximum Bandwidth	1 GHz	100 GHz	100 x
Area Traffic Capacity	10 Mb/s/m ²	1 Gb/s/m ²	100 x
Jitter	N/A	1 us	N/A
Mobility	500 Km/h	1000 Km/h	2 x

AI-NATIVE BLUEPRINT: INTELLIGENCE ACROSS EVERY LAYER, IN STAGES



- AI for Network : Network optimization for resources, traffic, energy efficiency
- Network for AI: Powerful platform for AI that provides massive data inputs, processing power, low latency infrastructure connectivity for Advanced AI.
- AI as a Service (AlaaS): AI functionality as a service, to Intelligent Industrial Robots to seamless immersive communication.

AI-NATIVE 6G



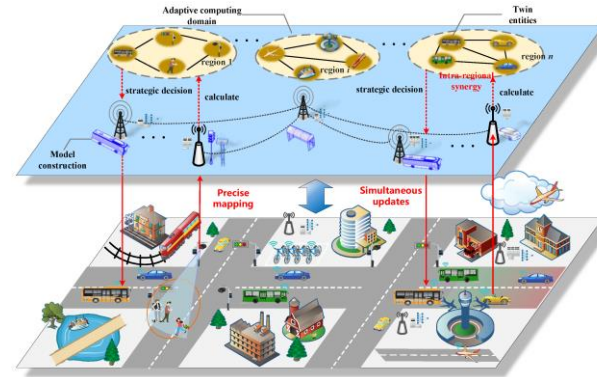
AI-Native Air Interface

Dynamically learn and adapt
Precise Beamforming
Seamless Connectivity



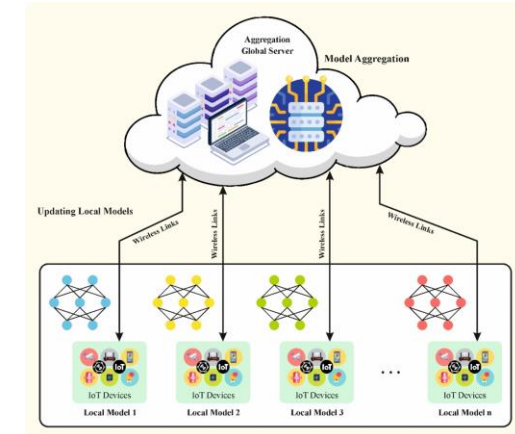
Integrated Sensing and Communication (ISAC)

Vast distributed sensor arrays
High Precision Positioning, Object mapping



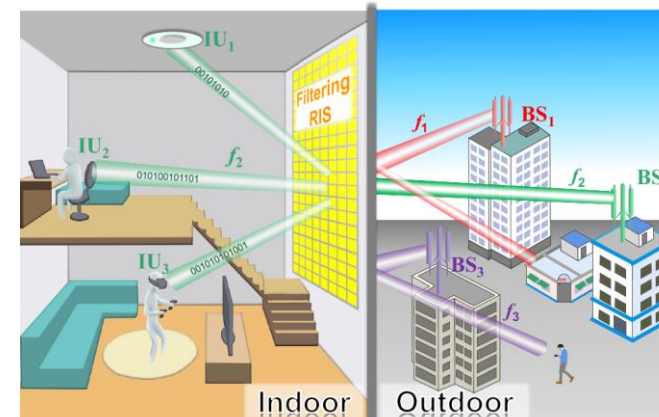
Network Digital Twins (NDTs)

Sandbox, Scenario testing
RF Planning, Optimization



Federated Learning

Train on Local Devices
Centralized Model Update



Reconfigurable Intelligent Surfaces (RIS)

Dynamically control radio wave propagation
Improve Network Coverage & Signal strength
Spectral efficiency

CHALLENGES AHEAD & COMMITMENT NEEDED



Technical Hurdles

- Computational Complexity & Energy Consumption
- Quality Data Accessibility
- Testing & Validation
- Interoperability & Standardization

Ethical & Societal Implications

- Privacy & Surveillance
- Algorithmic Bias & Discrimination
- Digital Divide
- AI Exploitation

Ethical & Responsible, Standardized AI Development and Deployment

- Standardization of interfaces, lifecycle tools, metrics
- Global Collaboration of data sets, simulators
- Dynamically programmable RAN, Platform, Core
- Explainable AI (X-AI) & Trust frameworks



CLOSING REMARK

Will this pervasive AI-Native 6G be our greatest opportunity for global inclusion and human flourishing, or will it present our greatest challenge in maintaining control, privacy, and equity across our interconnected world

REFERENCES

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KEY ASPECTS OF 6G VS 4G/5G

Aspect	4G (LTE)	5G	6G
Peak Speed	~100 Mbps to 1 Gbps	~10 Gbps	>100 Gbps to 1 Tbps
Latency	~30–50 ms	~1 ms	~0.1 ms (sub-millisecond)
Frequency Bands	Below 6 GHz (mainly)	Sub-6 GHz and mmWave (24–100 GHz)	Sub-THz and THz bands (100 GHz–10 THz)
Coverage Focus	Urban and rural mobile broadband	Enhanced mobile broadband, IoT, and ultra-reliable low-latency	Global coverage including oceans, sky (satellites, UAVs)
Network Type	Primarily terrestrial	Terrestrial with some satellite support	Integrated terrestrial, satellite, airborne (3D networks)
AI/ML Role	Limited (mainly optimization)	Early adoption (network management)	Native AI/ML for network control, prediction, self-healing
Main Use Cases	Mobile internet, video streaming	IoT, smart cities, VR/AR, autonomous vehicles	Holographic communication, Digital twins, Metaverse, BCI (brain-computer interfaces)
Reliability	Moderate	High (for mission-critical)	Ultra-high (99.99999%)
Energy Efficiency	Improved over 3G	Better, with network slicing and power optimization	Extreme focus on green communications, sustainable systems
Security & Privacy	Improved encryption	End-to-end security models	Native distributed security (blockchain, quantum-safe encryption)
Connectivity Density	~100,000 devices/km ²	~1 million devices/km ²	~10 million devices/km ²
Human-Machine Interaction	Smartphone-centric	Multi-device (wearables, AR/VR)	Direct brain–machine interaction, tactile internet

KEY CONCEPTS OF 6G COMPARED TO 4G/5G

4G/5G

6G



Peak Data Rate



>1 Tbps



Latency



~0,1 ms



Frequency Bands



sub-THz



Coverage



Global



Networks



3D



AI Integration



Native



Use Cases



and beyond