

Opportunities in metaverse

- Use cases and network requirements

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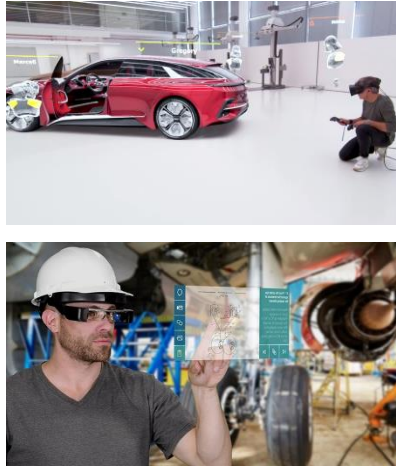
The Nokia logo is displayed in white, uppercase letters within a dark blue circular area. This circle is surrounded by a thick white ring, which is itself set against a larger, lighter green circular background. The entire graphic is positioned on the right side of the slide.

Metaverse is more than 3D immersive VR consumer experience



Metaverse Industry

- Private networks enabling I4.0
- Industrial automation
- Digital twin for production optimization
- 3D map for autonomous mobile robots



Metaverse Enterprise

- Digital and collaborative 3D design
- Augmented worker
- Immersive team collaboration
- Training and simulations



Metaverse Consumer

- Gaming & entertainment
- Social interactions
- Shopping
- Immersive social Virtual Reality
- Smart City augmentations

Metaverse use cases



Products and Design engineering



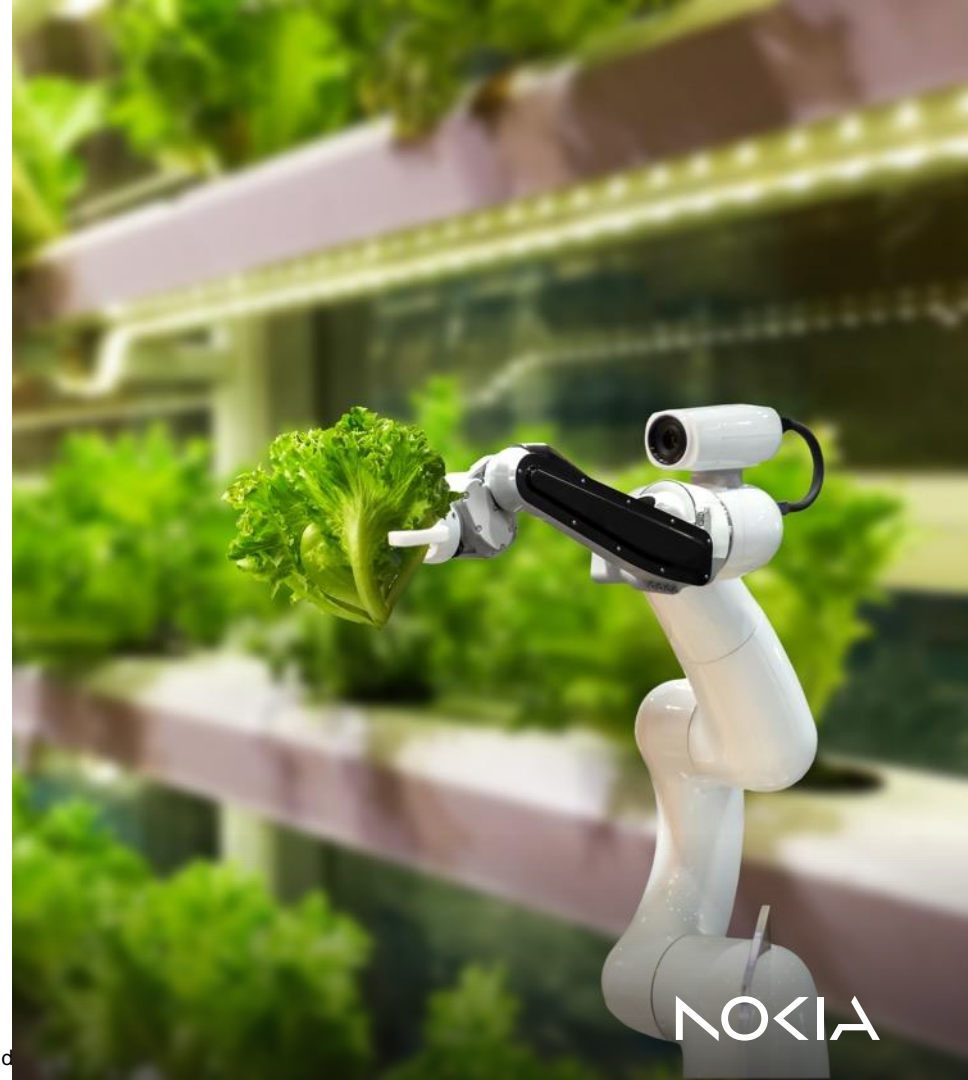
Hands on Training



Surgery Planning and Support

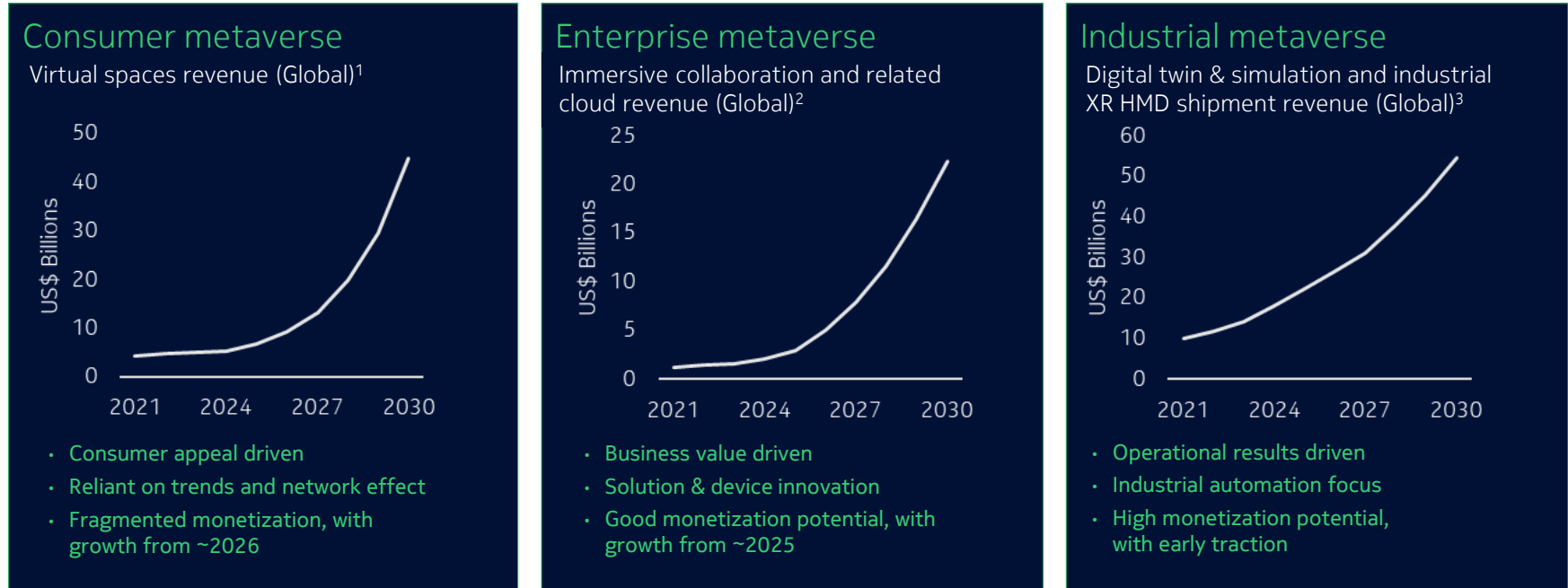


Virtual Services for hands-on work



NOKIA

Industry is expected to lead metaverse commercialization



1 ABI Research: 2022 Consumer Metaverse Market Update, June 2022

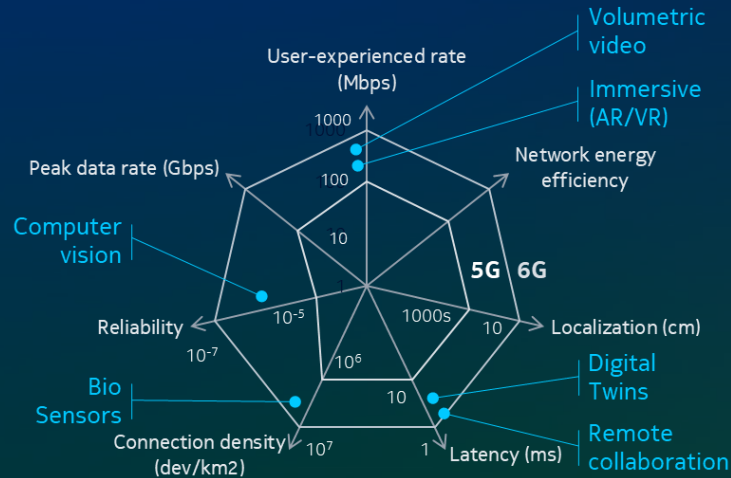
2 ABI Research: Enterprise Metaverse: Future of Work, March 2022

3 ABI Research: The Future of Work, Augmented and Mixed Reality, Virtual Reality Market Data, August 2022

Metaverse will significantly accelerate traffic growth

...network will be key to realizing these opportunities

New service needs



New network capabilities



Metaverse strands

VR metaverse

- Multi-user immersive interactive experiences in computer-generated 3D world, with VR Headset
- Starts NOW (viable consumer VR Headsets)
- Next-gen console+PC, indoor usage



AR metaverse

- Multi-user interactive experiences with virtual objects and people seamlessly inserted in real-world environment
- Limited now with smartphones, with AR Headset from 2025
- Next-gen smartphone, ubiquitous usage



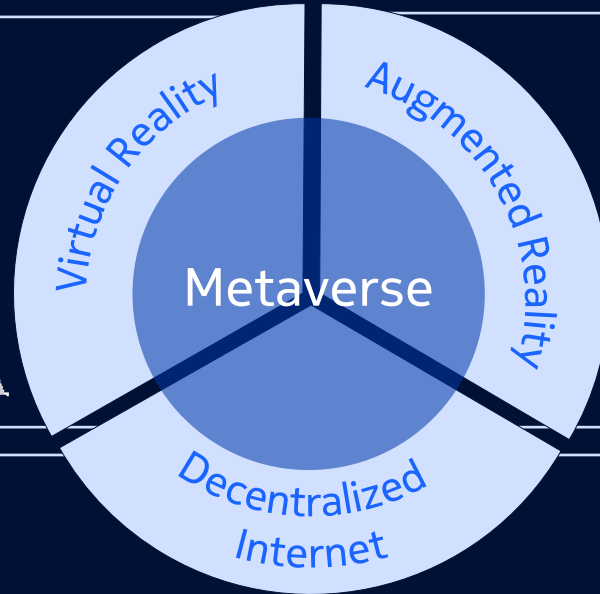
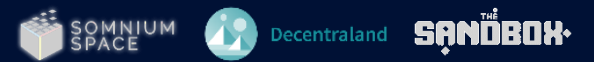
Open metaverse

- Single, standards-based, interoperable, hardware-independent Metaverse not controlled by few companies
- Spatial Web, with W3C WebXR standards



Web3 Crypto

- NFT's for ownership of digital assets
- Token economics for incentivization of metaverse adoption
- Token-based community governance





The metaverse will never move
beyond our living rooms without
a powerful network”

- Nishant Batra, CSTO of Nokia

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