

# Metaverse Pulse Check

Tracking consumer hardware developments and possible killer applications

2024 Santeri Suominen

Metaverse Initiative Lead



A SUSTAINABLE  
FUTURE THROUGH  
DIGITALISATION

digital economies



intelligent world building



production



experience & intuition



## Metaverse – next generation spatial internet value chain

“Backend”

“Frontend”



Decentralization  
Blockchain  
Token-based economics

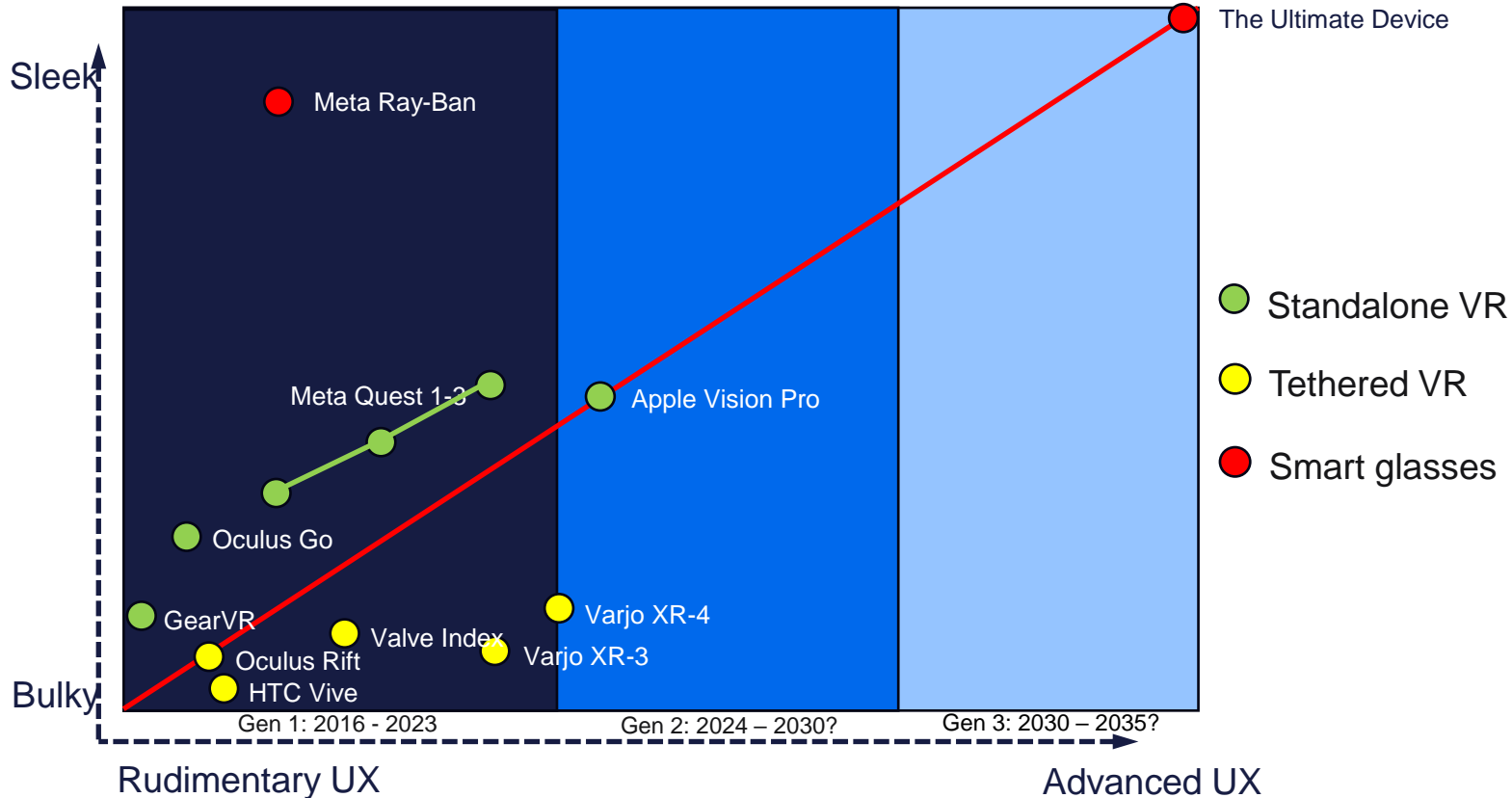
NeRF / GS  
Multimodal  
Text-to-3D

Unreal / Unity  
Web  
Universal Scene Description

Virtual Reality  
Mixed Reality  
Spatial Computing

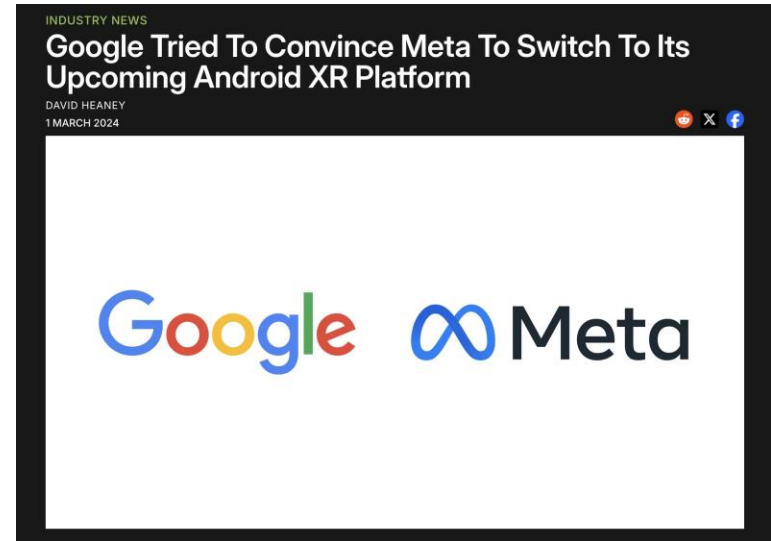


# Apple Vision Pro – dawn of Gen2 in XR hardware



# Re-intensifying XR competition after AVP launch

- Initial reception excited and favourable: Public perception of XR is changing from GearVR to Apple Vision Pro.
  - New companies founded to capitalize on software development opportunity.
  - AR eCommerce, marketing, entertainment (gaming, film, sports), enterprise productivity.
- VisionOS App store already full of applications, thanks to Apple's early release of developer tools and documentation.
- Hybrid rendering car eCommerce and Industrial Metaverse possibilities are very interesting.
- Which platform will be most appealing to users, developers, business applications?
  - Meta has been championing "openness" since AVP launched, but not a day before!
- Interesting alliances are forming: Meta & Microsoft (enterprise productivity), Meta & LG (headset screens), Apple & Google (genAI), Google & Meta (discussions on Android's XR app store)... it's like 18th century European diplomacy.
- genAI is the no.1 critical competition area, which has major implications to the XR race.



# Spatial computing vs. Gaming

- Contrast between the terminology in practice
  - Apple Vision Pro = utility & entertainment focused, non-ideal gaming device.
  - Meta Quest 3 = gaming focused VR-AR headset, underdeveloped utility device.
  - Spatial computing = everyday mobile computing paradigm like the iPhone?
- “Third screen” gaming becoming more popular?
  - Light AR glasses as your companion device. Easy to carry around, inconspicuous.
  - A spatial computing device can do this too.

# Three classes of glasses



## Features

- Immersive display with video see through AR
- High FOV, high resolution, spatial sound
- Full immersion entertainment + utility applications for remote office work
- **Full standalone computing device with XR streaming capabilities**

- Holographic display with optical see-through AR
- Smart Glasses features (some devices)
- Smart navigation, dialogue translation with face tracking, notifications (RayNeo X2 marketing)
- Limited FOV, sufficient resolution (1080p)
- **Second screen + genAI smartphone / gaming console companion device**
- **When can they get to full AR UX in this form factor?**

- No display / simple HUD
- Capture images, videos, livestream (FB & IG / Snap)
- Voice commands to mobile + calling
- **GenAI + smartphone companion device**

## Weight (g)

650 + 353      503

~ 78

~ 50g

## Battery life

~ 2h      ~ 2h

~1.5h

~ 1,5 h + 36h with charging case

## Price

3.5k€ – 3.9k€      600€ - 750€

~400 - 500 €

~350€ - €400

# Killer apps with mobility in mind?

- **Multimodal GenAI in smart glasses (Enterprise & consumer)**
  - How to bridge physical and digital workflows with it?
  - Seamless integration into your daily routine – have to make life more convenient
  - Achievable with current networks. Latency comes from the AI models themselves.
- **Gaming on the go in light AR glasses (Consumer)**
  - Second screen for your mobile gaming console (Steam Deck or ROG Ally.)
  - Stream your home console anywhere.
  - Some latency and bandwidth challenges perhaps, but within obvious reach.
- **Spatial computing (Industrial, Enterprise, Consumer)**
  - Digital twin streaming to connect remote experts to factory floor.
  - eCommerce streaming of 3D assets in AR. Preferably dynamic fabric models.
  - Holographic / spatial calls: chat with your friend(s) virtually in person. Requires real-time, millisecond latency streaming of environment data, full body avatar animation data, voice.
  - Key: Hybrid rendering, combining on-device and cloud rendering.
  - Partly achievable, but for full experience, significant development is required to achieve required bandwidth and latency.

# Food for thought: Where are all the 5G glasses?

- Mobility challenge of XR: no current device is designed to work with 5G, because?
  - Form factor: most use cases happen within reach of Wifi, in controllable environments
  - Which use cases really rely on mobility + glasses?
  - Mobile AR device form factor denies capabilities that would be needed for utility.
    - Do we have to wait 5 or 10 years for maturity? Will heavier glasses find market fit before that?
- How to advance? Need for a public reference design for light AR glasses with:
  - 150-100 grams weight (not perfect but good enough with decent ergonomics)
  - Highest FOV optics possible.
  - Very light on-board computing for final rendering step.
  - Maximum battery life.
  - Smartphone as companion device, which sends and receives rendering over 5G, handles some computing.
  - Ultra fast wireless connection between phone and glasses.



*elisa*

**A SUSTAINABLE  
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DIGITALISATION**

Thank you!