



2022 Tony Stark's Buyer's Guide:

Best XR Gear, Tools, and Compatible Software

Viveka Devadas
Technical Account Specialist, AEC

Shaik Sadiq
Technical Account Specialist, M&E



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Viveka Devadas

Current Role:

- Architect, Intl Associate - AIA, COA
- 6 years at Autodesk, AEC industry experience
- TAS, Enterprise Support, VR/AR Research

Previous Role:

- Project Architect/ BIM Manager
- 3D Visualization Designer
- Architecture & Design, Technical Instructor

VR/AR Speaker/ Author:

- AU, Redshift blog, AWE

[Connect on LinkedIn](#)





Shaik Sadiq

Current Role:

I joined Autodesk about almost 6 years and have been working with Gaming and VFX industry teams.

Previous Role:

In my previous life I have had the privilege of being a part of VFX projects like “Life of Pi”, “Doctor Strange”, “The Passengers” and few others as well.



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Agenda



Immersive Technology

- Technological Advancements
- Use Cases



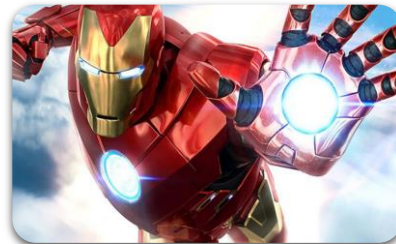
Compatible Software

- XR @Autodesk
- XR Apps



Exploration: Best XR Gear

- VR/AR Hardware
- XR Accessories



Tony Stark's Buyer's Guide

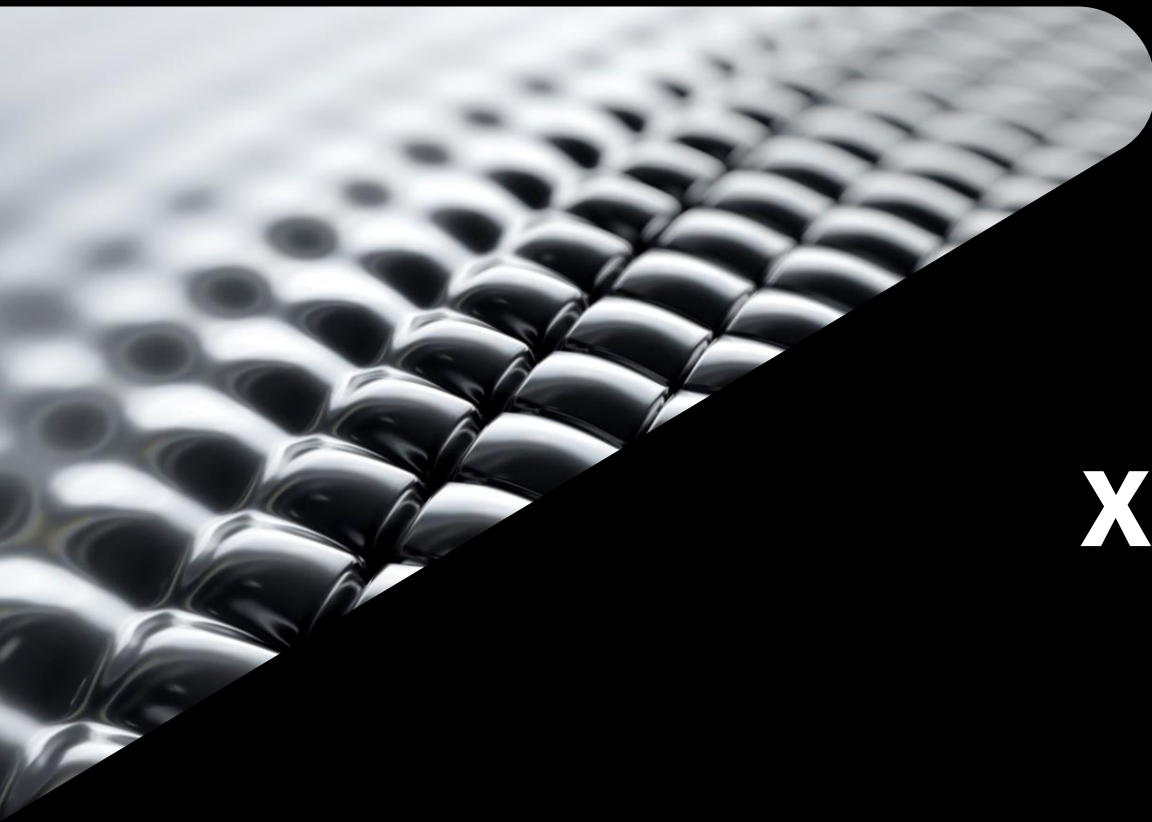
- Need vs Budget
- Custom Tool Box

What are today's common Design Challenges?



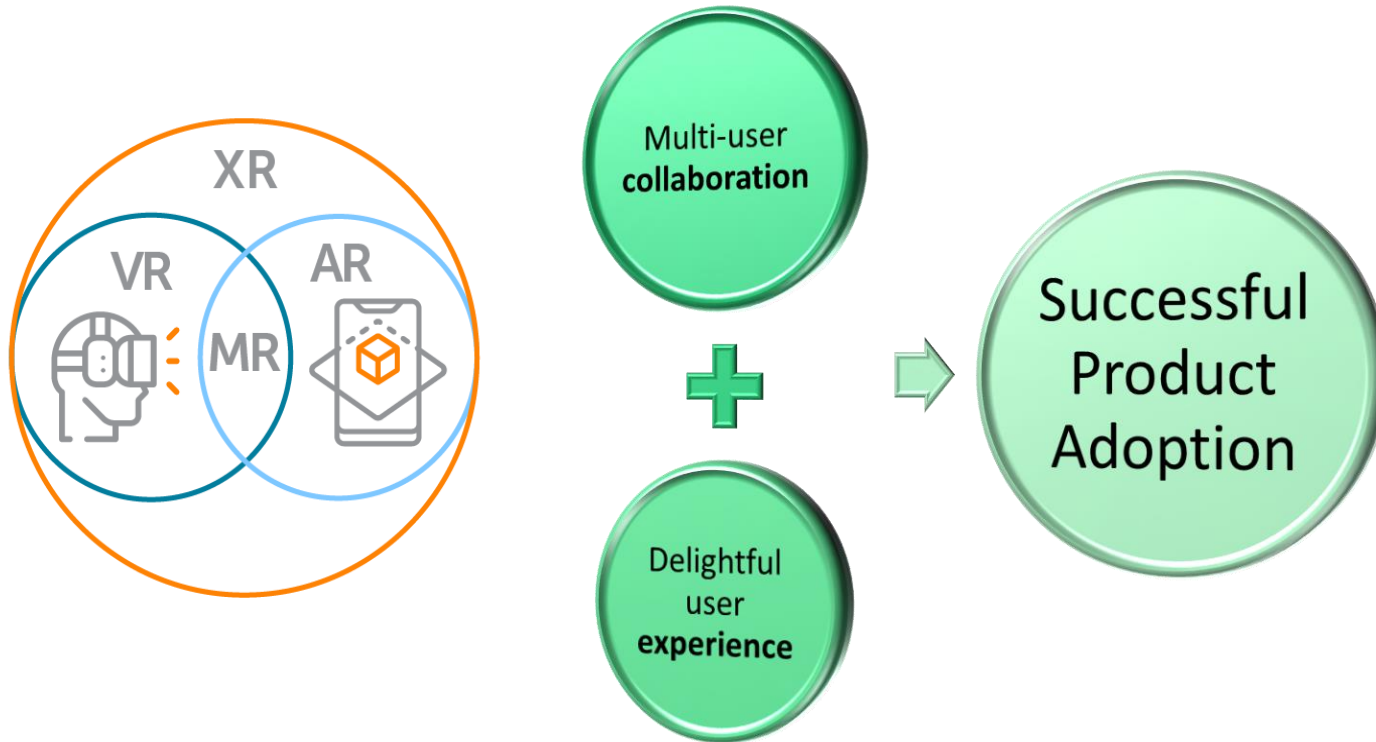
98% of megaprojects face cost overruns
or delays...

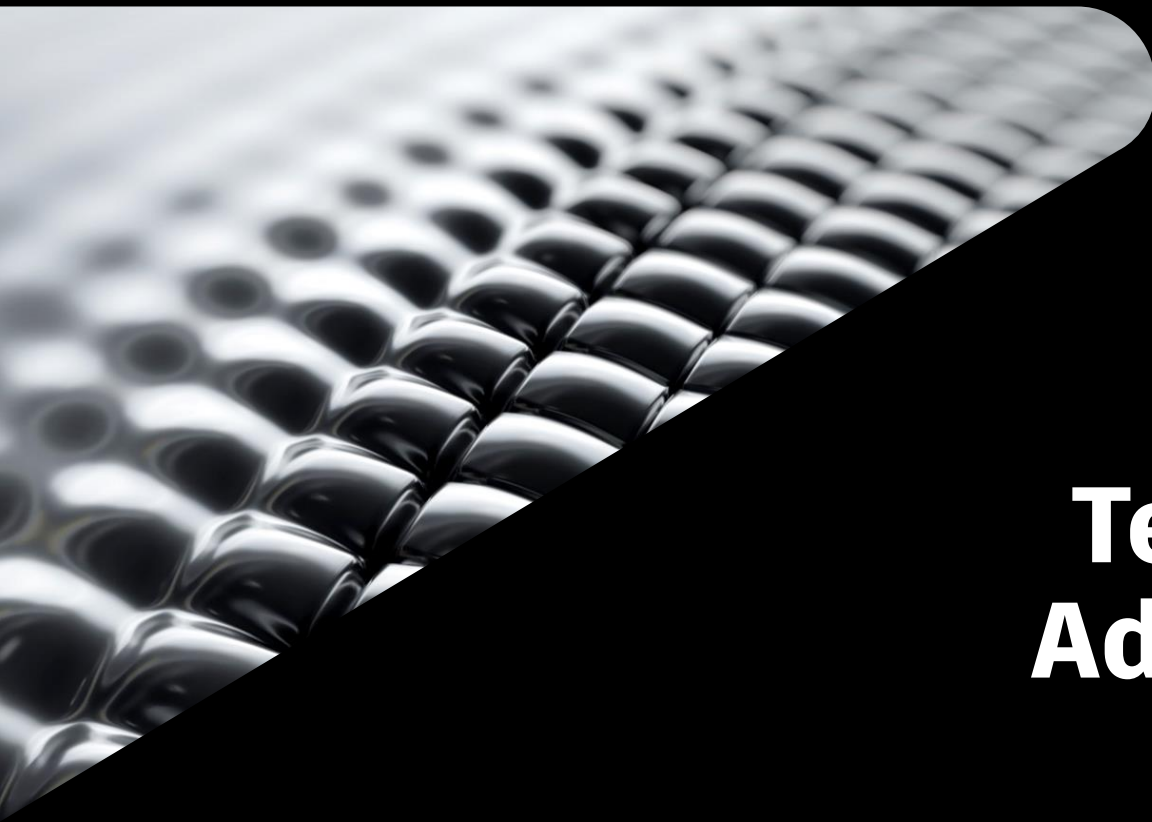




XR Technology

Why do we need XR experiences?





Technological Advancements

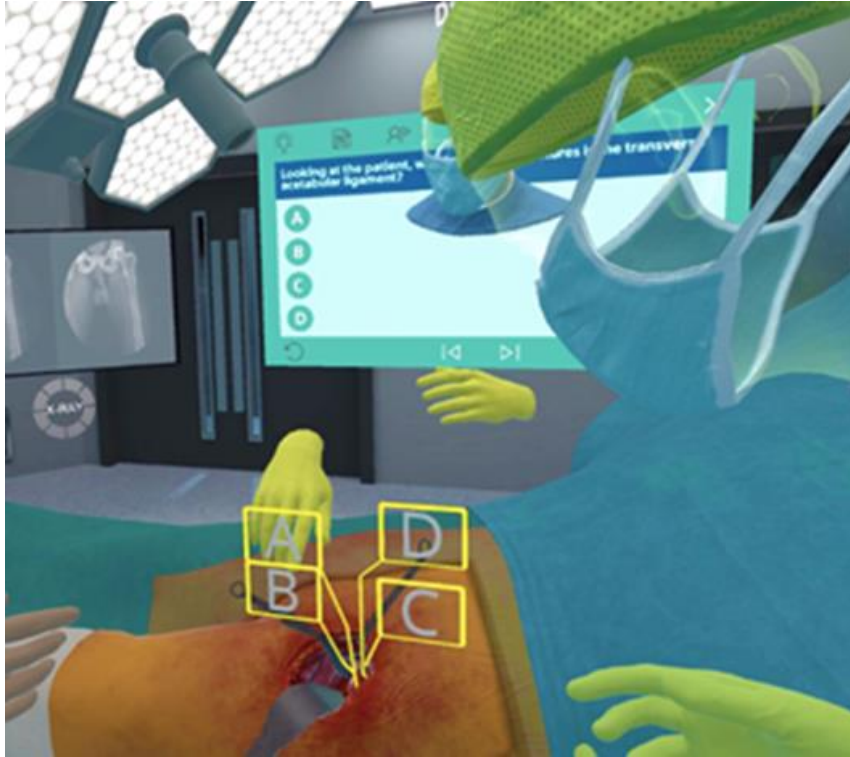
AEC

Historic restoration, Construction robots, gamification



Healthcare

Medical training, therapy, patient monitoring



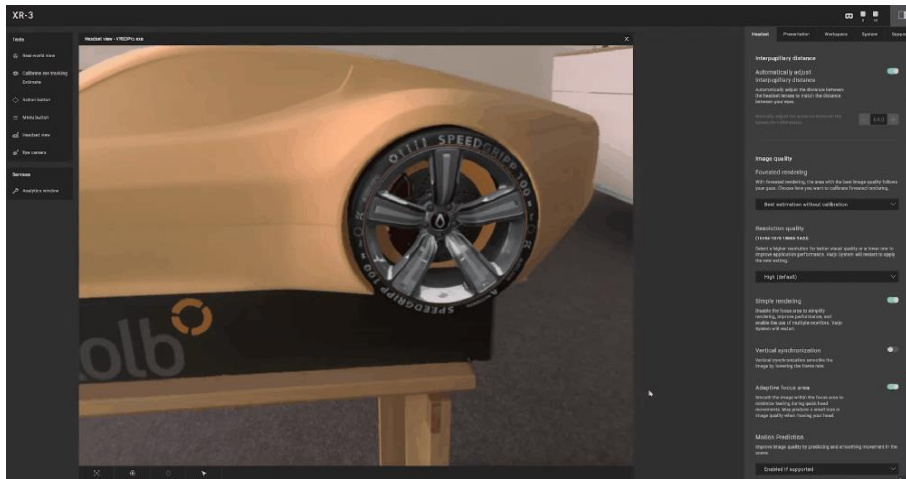
Infrastructure

Visual Inspection, Improve efficiency



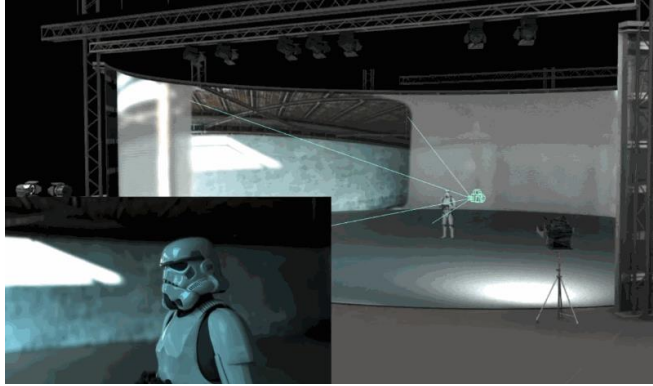
Automotive

Augmented reality



Media and Entertainment

Mandalorian





2. Compatible software

Industry Collections



Architecture, Engineering
& Construction Collection



Product Design &
Manufacturing Collection

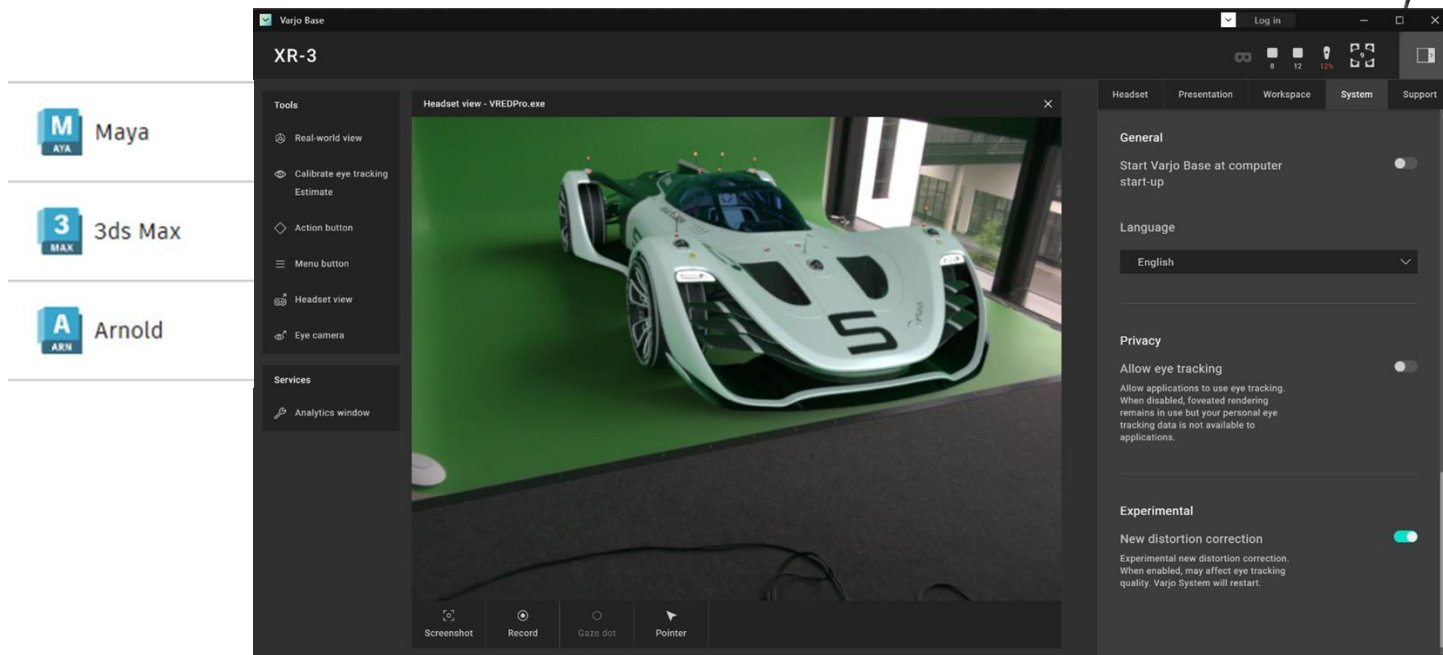


Media & Entertainment Collection



XR @Autodesk

Media and Entertainment Software



SEE ALL PRODUCTS IN THE M&E COLLECTION

XR @Autodesk

Architecture, Engineering, Construction Software



Revit



Civil 3D



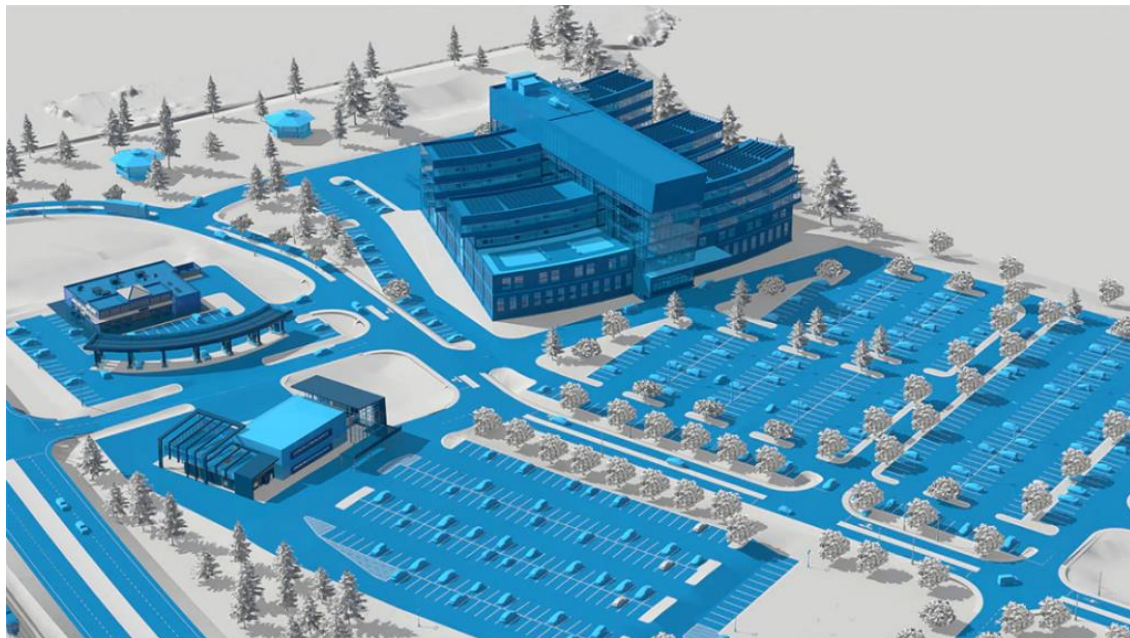
AutoCAD



InfraWorks

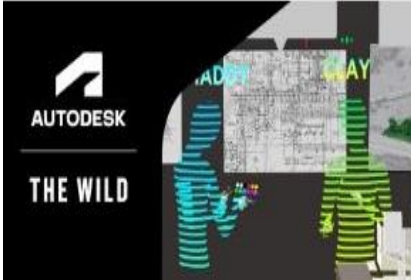


Navisworks Manage



[SEE ALL PRODUCTS IN THE AEC COLLECTION](#)

Extended reality (XR) @ Autodesk



Collaborate on
3D models

THE WILD



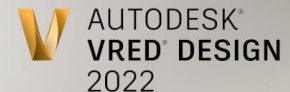
Design
naturally using
Create VR



Easily share
designs with
Fusion 360



Collaboratively
review with
VRED





Platforms and applications

XR Partners & Platforms



Developer platforms



RESOLVE



Partner applications

ARKit apps

Microsoft mesh

Google arvr

Meta

VR/AR Asset creation Applications



MAXON
A NEMETSCHEK COMPANY

VR/AR run time Engines



three.js



PLAYCANVAS

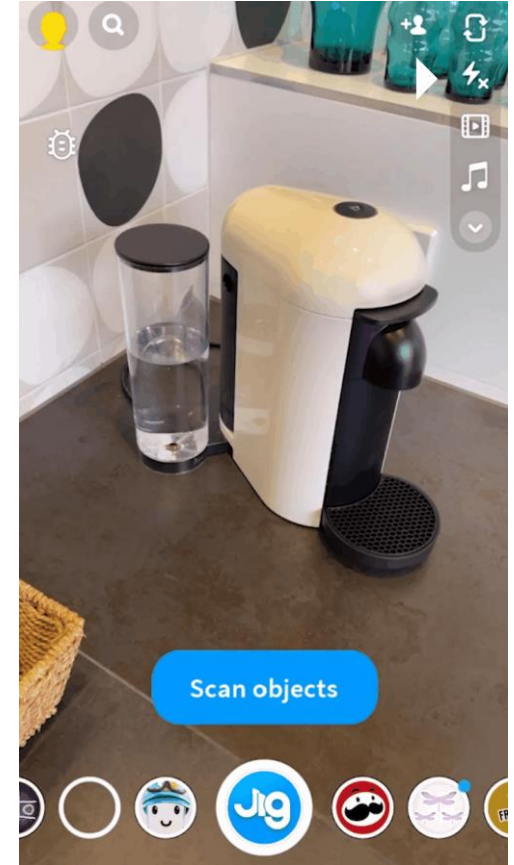


GODOT
Game engine



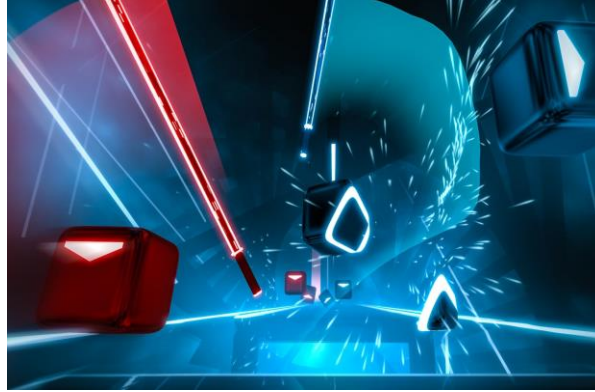
NVIDIA
OMNIVERSE

Top pick XR Apps (3rd party)



Recreational apps

- Social
- Gaming
- Sports
- Events
- Music
- Concerts



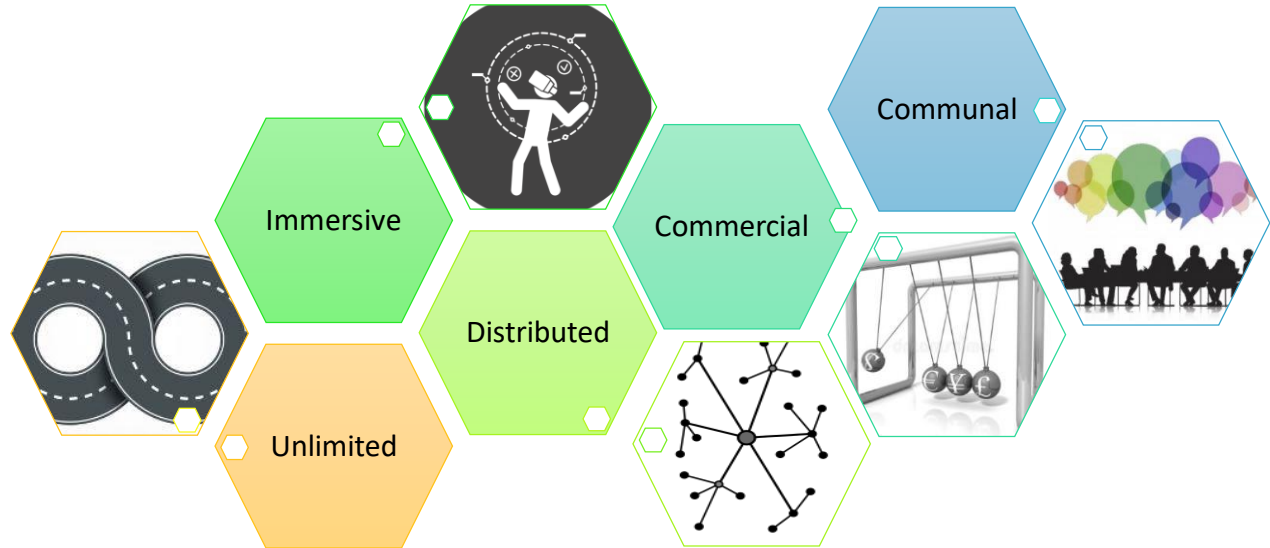
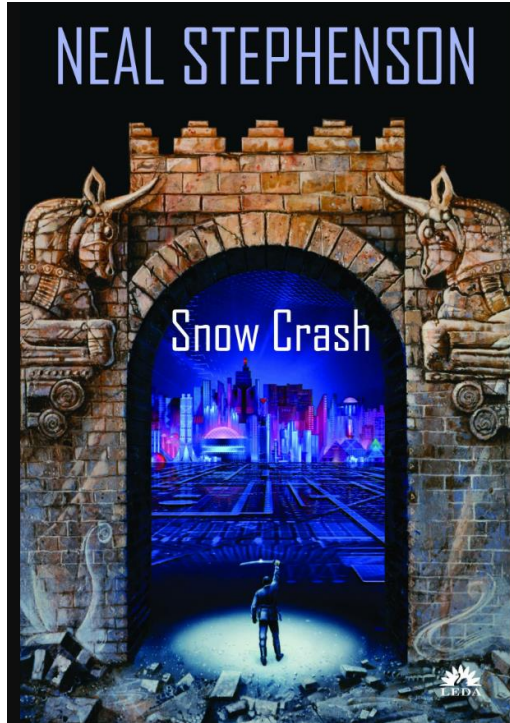
The background of the slide is a black field with a grid of dark, glossy, rounded squares that create a 3D effect. A diagonal line runs from the top-left towards the bottom-right, separating the grid pattern from the solid black area where the text is located.

Metaverse and Virtual identities

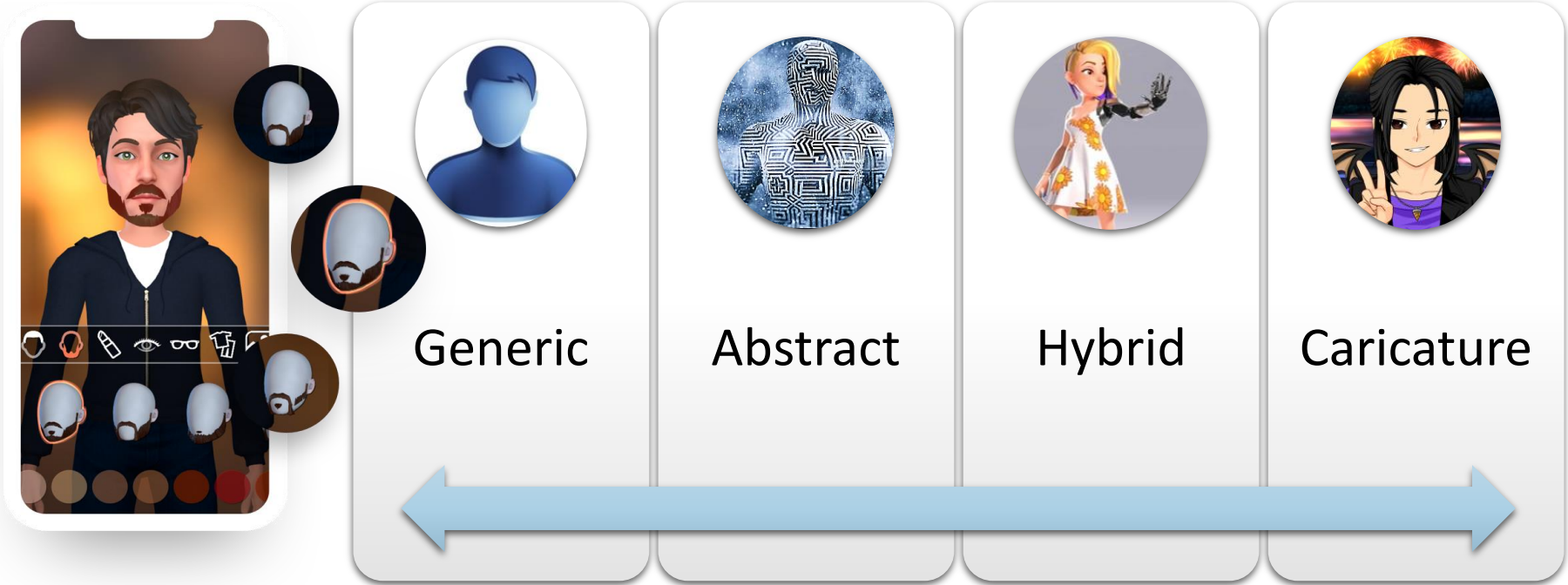


Metaverse received over **84,000**
mentions on social media in 2021

What is the Metaverse?



Virtual Identities



Virtual Identities



Did you know?!



Ready Player Me has **3,000** avatar partners
with a database of **20,000** face scans

READY
PLAYER
ME

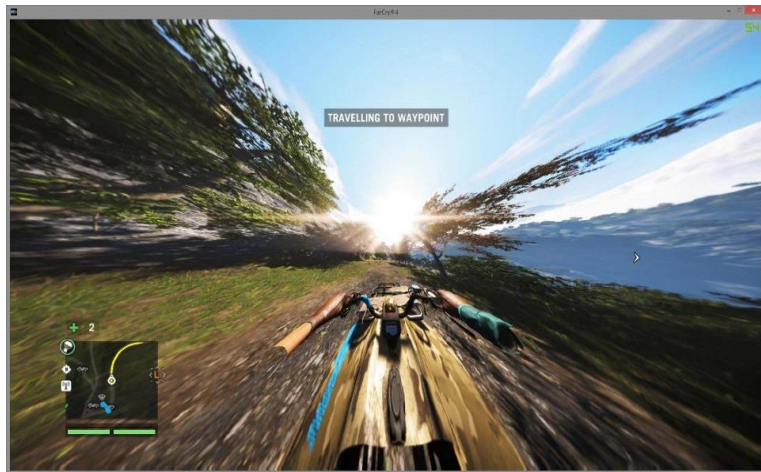


3. Explore XR gear

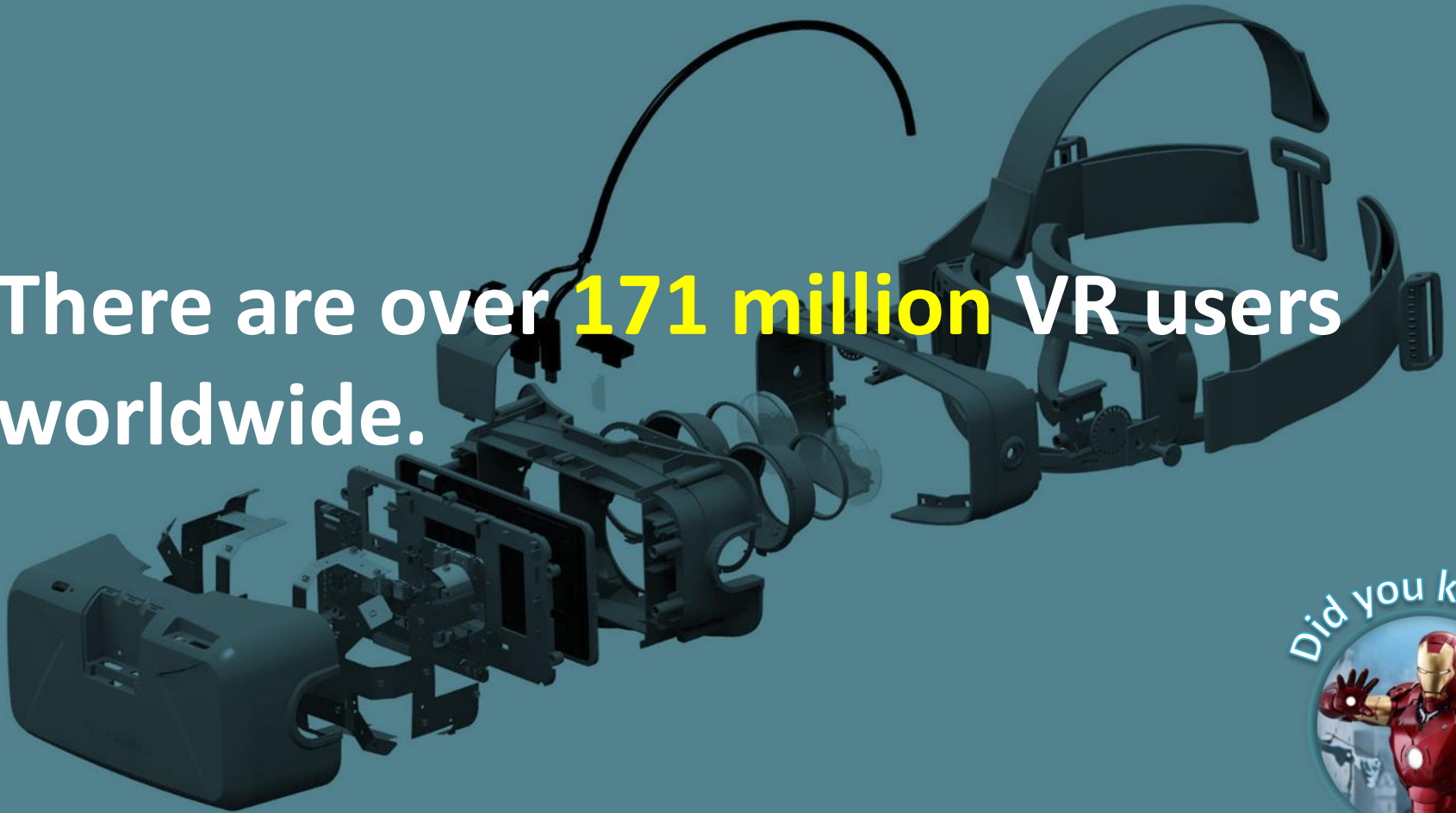


XR terms...

- heads up display (HUD)
- Full dive VR
- FOV (Field of View)
- DoF (3 DoF, 6 DoF) Degrees of freedom
- Mura effect (uneven displays)
- “screen-door” effect
- 360 video



There are over **171 million** VR users worldwide.



Top picks – VR headsets



Oculus Quest 2/Meta Quest 2



Sony PlayStation VR/VR2



Valve Index VR Kit

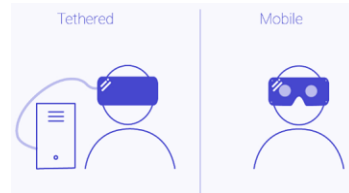


HTC Vive Pro 2



HP Reverb G2

Hear from our Autodesk VR power users!



*"I use both Valve Index and **Oculus Quest 2** pretty consistently. I highly recommend an upgrade on the base strap on Quest 2 for an improved VR fitness experience"*

Jonathan Zink

Software Engineer,
AEC Design



*"I have found that I like 'best' the **Meta/Oculus Quest 2**
This comes after trying:*

- Oculus Go
- Oculus Quest 1
- Oculus Rift S
- HTC Vive Pro"

Matthew Spremulli

Research Program
Manager, PSET



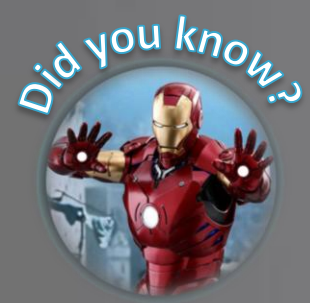
"Here's my list of favorite tools..."

- Microsoft Maquette on a tethered **Meta Quest 2** (with Link cable)
- Google Blocks on an Meta Quest 2 with Link cable
- ShapesXR on Quest 2
- Google Tilt Brush on Quest 2."

Michelangelo Capraro

Experience Design
Architect





Speculation bounds on AR glasses with
12 cameras, **8K** displays and price tag
around **\$2000...**

Top picks - AR glasses



Microsoft HoloLens



Google Glass



Lenovo Smart Glass



Vuzix Blade

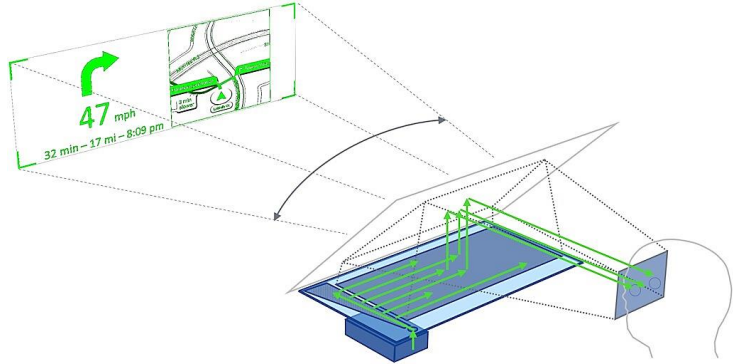


Magic Leap

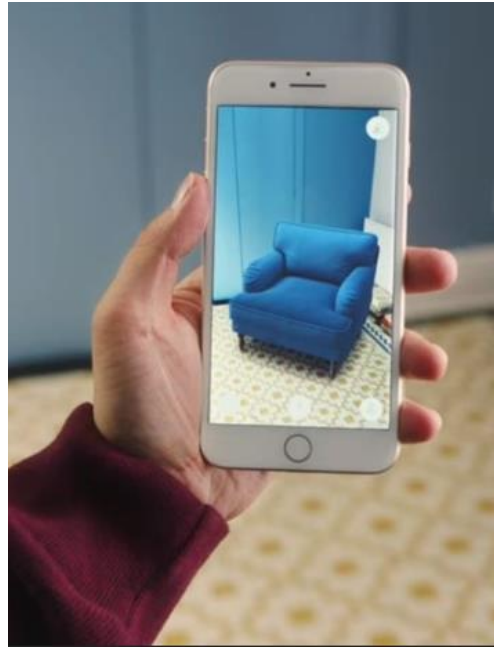
AR

HUDs and Handheld (iPhone, Tablets)

HUDs



Handheld



Hear from our Autodesk AR power users!

*"I prefer **Quest 2 for VR**. I have a HoloLens but haven't been using it much. For **mobile AR**, I do use my personal iPad."*

Ajay Menon

Senior Product Designer, XR



*"I am eagerly awaiting the release of the Quest Pro before I fully dive into AR. I have high hopes for **HD color passthrough** as a medium for AR.."*

David Lovell

Sr. Research Engineer, PSET

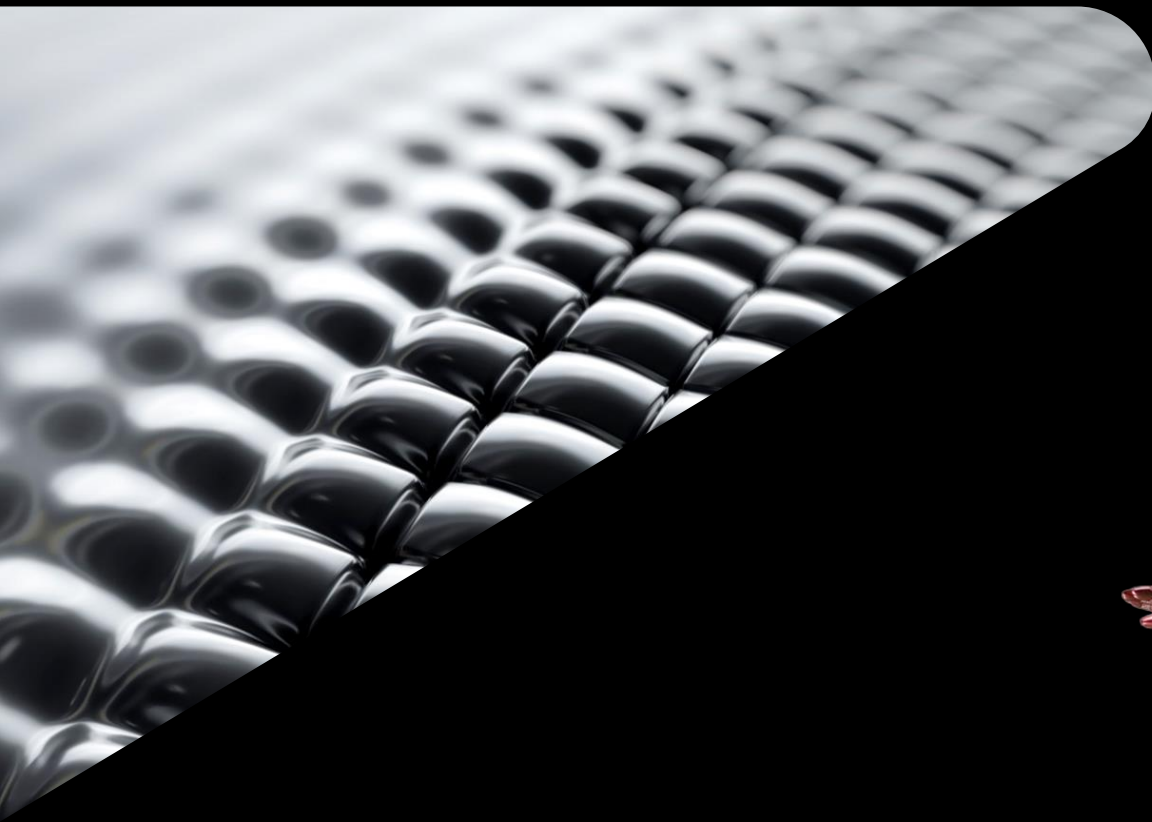


*"I firmly believe that **mobile based AR** regarding training/instructions will replace the mobile based YouTube "how to fix this/assemble that" in near future."*

Abhinav Singh

Senior Product Owner, PDMS



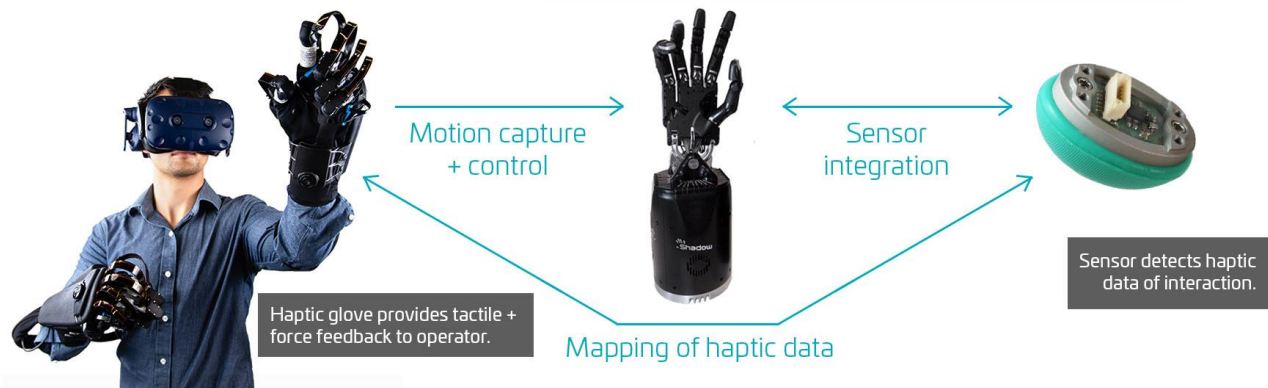
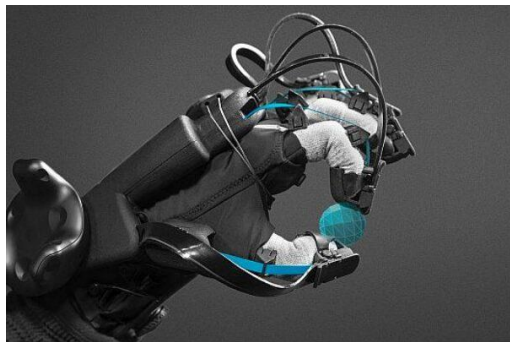


Unique XR Accessories



XR accessories

Haptic Gloves



contact ci

haptx®

Locomotion



Top Picks -3D cameras

Stereo and 360

Fujifilm FinePix Real 3D W3

Lenovo Mirage with Daydream

Nishika N8000

Intel RealSense D435

MYNT EYE

Vuze XR

Vuze Plus 3D 360

Insta360 ONE X

Insta360 ONE R

Kandao Qoocam



GoPro
GoPro MAX



Ricoh
Theta SC2 360° Camera



Kodak
PIXPRO SP360 4K
Premier Pack VR
Camera



Insta360
ONE X2 360 Degree
Waterproof Action
Camera



Insta360
ONE R 360 Edition



It's possible today to control robotic hands from **1000's of miles** away

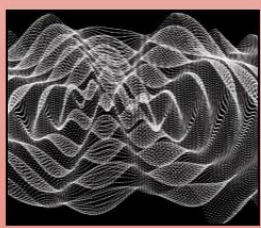


Cable Management

Pulley systems



How does XR engages with 5 senses?



sound



touch



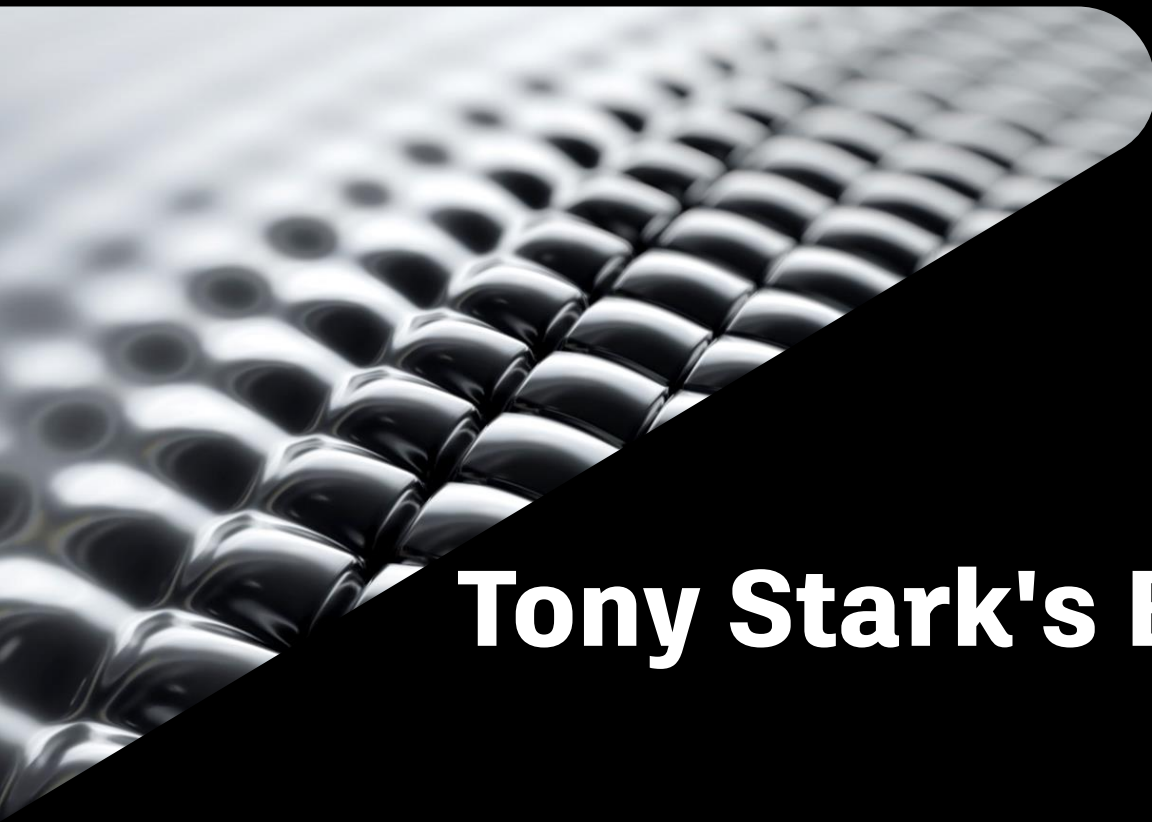
vision



smell



taste



Tony Stark's Buyer's Guide

Where do you start?



Identify details/
(needs?)



Define main
idea/ (outcome?)



Make XR
decisions

**Who is the Target
Persona?**

1

**What are the Jobs
to be done?**

2

Match Five C's

3

Who is the Target Persona?

"I can make quicker design decisions and validate requirements during several phases."

- General Contractor,
Tishman construction




"I can get real-time analyses to optimize building performance."

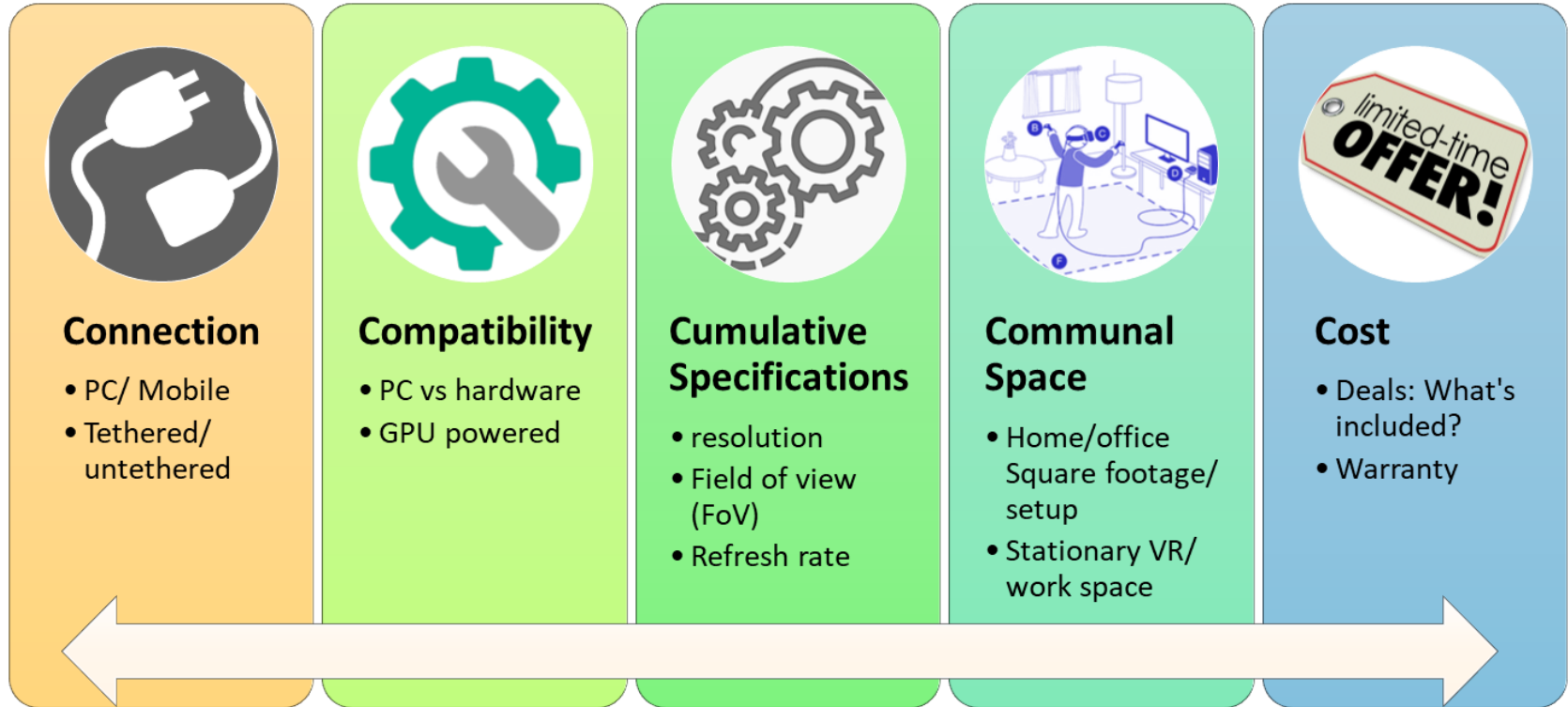
- Building management vendor, Schneider electric

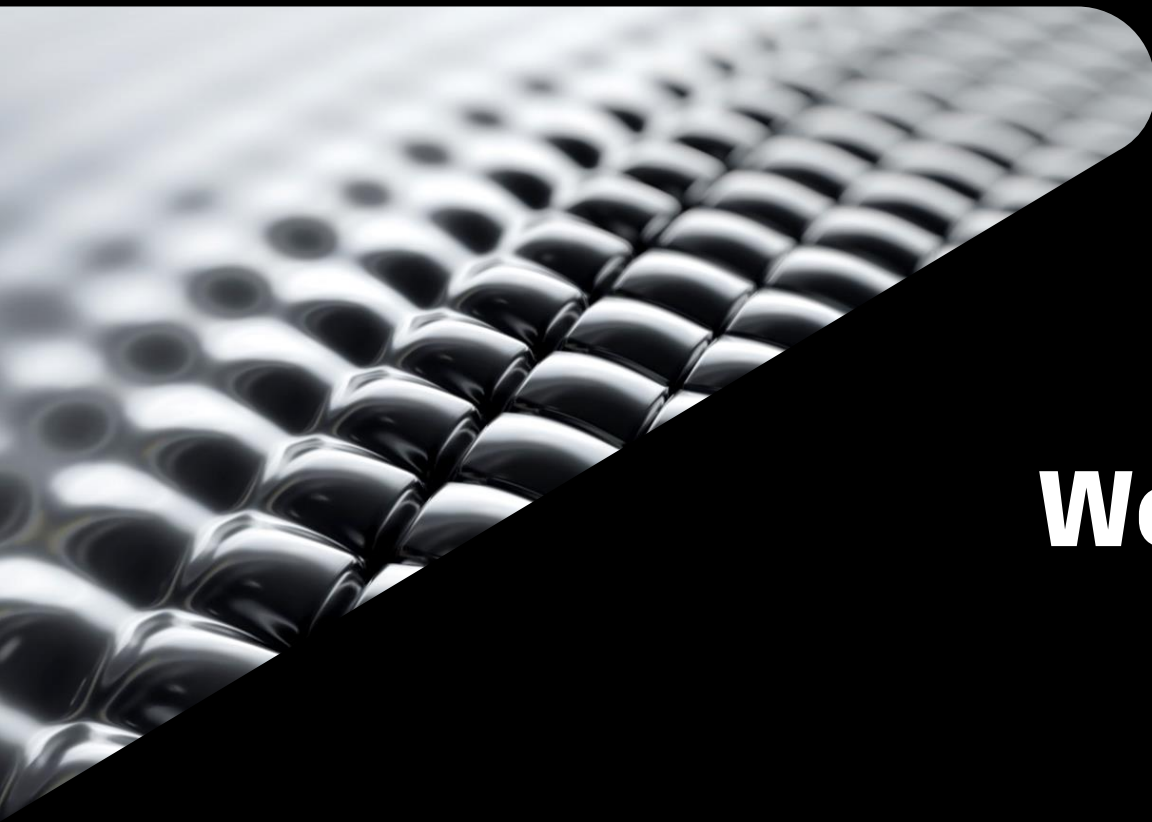


What are the jobs to be done? AEC

| SITUATION | MOTIVATION | EXPECTED OUTCOME | TARGET PERSONAS |
|--|--|--|---|
| When I need to work on multiple software to create advanced visualization client design reviews | I want to be able to automate the process of creating visualizations whenever I need them | So I can generate illustrations to print or use for quick immersive visualizations to collaborate with team |  |

Make XR decisions based on 5C's





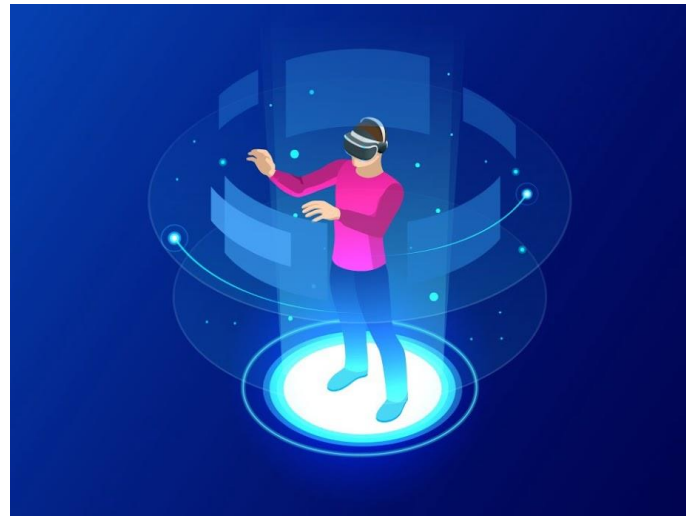
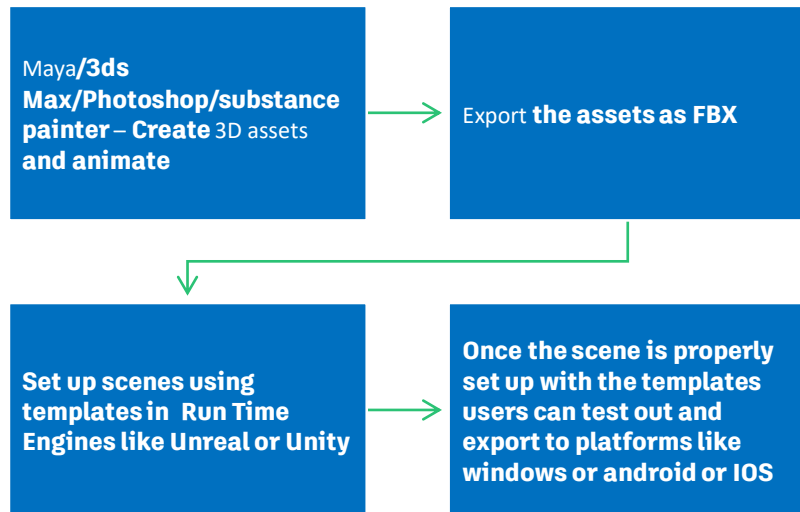
Workflows

Demos



Workflow – M&E

Film producer, director



Maya VR Demo







Maya 3d Artists



Revit, WILD VR



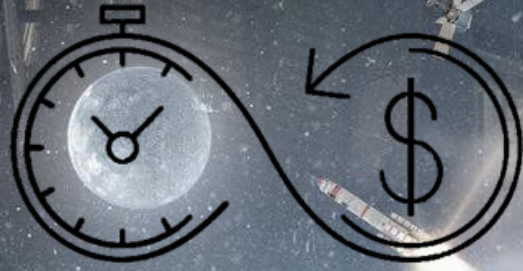
2022 Business VR Headset Comparison Chart (Q1)

| | Meta Quest 2 | Pico Neo 3 | HP Reverb G2 | Valve Index | Vive Pro 2 | Vive Pro |
|------------------------------|--|--|--|---|---|---|
| |  |  |  |  |  |  |
| Official Support in The Wild | ✓ | ✓ | ✓ | □ | □ | ✓ |
| Resolution / Eye | 1832 x 1920 | 1832 x 1920 | 2160x2160 | 1440x1600 | 2448 x 2448 | 1440x1600 |
| Refresh Rate (HZ) | 90/120 | 90 | 90 | 144 | 120 | 90 |
| Field of View | 100° | 98° | 114° | 130° | 120° | 110° |
| Weight | 503g | 620g | 544g | 570g | 850g | 563g |
| Tracking | Inside-out | Inside-out | Inside-out | Base Stations (more equipment = more precise hand tracking) | Base Stations (more equipment = more precise hand tracking) | Base Stations (more equipment = more precise hand tracking) |
| Type | Standalone (no wires, less powerful processor) + option to wirelessly stream or tether to a PC with a cable | Standalone (no wires, less powerful processor) + option to wirelessly stream to a PC | Tethered (wired to your PC, more powerful, can run larger models) | Tethered (wired to your PC, more powerful, can run larger models) | Tethered (wired to your PC, more powerful, can run larger models) | Tethered (wired to your PC, more powerful, can run larger models) |
| Price | \$299 | 👛 \$699 | \$599 | \$999 | \$1399 👛 \$1599 | \$1199 👛 \$1399 |
| Summary | A great standalone headset for personal or business use. What you lose in processing power you gain in easy setup and freedom of movement. AirLink and the Link cable makes this a great option for running larger models as well. | A fantastic Enterprise standalone (or optional PC-streaming) headset focused on privacy and control, with ability to deploy software through Multiple Device Managers. | An affordable, high-res, tethered headset for running large models from your PC. | A top-of-the-line gaming headset. Base stations and wires require more setup and configuration, but create a smooth and powerful experience in-headset. | A top-of-the-line gaming headset. Base stations and wires require more setup and configuration, but create a smooth and powerful experience in-headset. | An older but still powerful gaming headset. Base stations and wires require more setup and configuration, but create a smooth and powerful experience in-headset. |

AEC - XR

Twinmotion – Epic Games





Value vs Price

Need vs Wants



Sometimes you gotta run before you can walk
with your toolbox ...



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