



Oculus Quest

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Outline

- What is Oculus Quest?
- Technology analysis
- New feature
- Market analysis
- SWOT analysis
- Conclusion
- Reference



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- **What is Oculus Quest?**
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What is Oculus Quest?

- **VR headset developed by Oculus**

- 2019.5.21 Release
- Oculus Quest uses a Qualcomm Snapdragon 835 system-on-chip (SoC) with 4 GB of RAM.
- Pentile OLED display is used for each eye, with an individual resolution of 1440×1600 and a refresh rate of 72 Hz.





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Technology analysis – Quest Pro

META QUEST PRO	SPEC
Optics	Pancake lenses
IPD Range	55-75 mm hardware adjustable (manual)
Passthrough	Color
Display Type	2 x LCD binocular
Resolution	1800×1920 per-eye
Refresh Rate	90 Hz (72 Hz mode available)
Visible FoV	106° horizontal 96° diagonal
Weight	722 g with headstrap
Material	Plastic, foam facial interface
Headstrap	Hard padded retractable strap
Colors	Black
Tracking Type	6 DoF Inside-out via 5 integrated cameras
Ports	USB Type-C, charging contacts
Wired Video	USB Type-C Oculus Link
Wireless Video	WiFi streaming Virtual Desktop, AirLink
WiFi	WiFi 6E
Bluetooth	Bluetooth
Operating System	Android
CPU/Chip	Qualcomm Snapdragon XR2+
Memory	12 GB LPDDR5
Storage	256 GB
Battery Life	2 hours



X: Quest
2 Fresnel
lenses

Technology analysis

■ Display

	Oculus Quest	Oculus Quest 2	Quest Pro
Display Type	2 x OLED	Single Fast switch LCD	2 x LCD
Resolution	1440 x 1600	1832 x 1920	1800 x 1920
Refresh Rate	72 Hz	120 Hz	90 Hz
Visible FOV	93° horizontal 93° vertical	97° horizontal 93° vertical	106° horizontal 96° vertical





Technology analysis

■ Tracking

	Oculus Quest	Oculus Quest 2	Quest Pro
Tracking Type	6 DoF Inside-out via 4 integrated cameras	6 DoF Inside-out via 4 integrated cameras	6 DoF Inside-out via 5 integrated cameras
Eye Tracking	X	X	O
Face Tracking	X	X	O
Hand Tracking	O	O	O
Body Tracking	X	O	O



Technology analysis

■ System

	Oculus Quest	Oculus Quest 2	Quest Pro
Operating System	Android 10	Android 10	Android 10
Chipset	Qualcomm Snapdragon 835	Qualcomm Snapdragon XR2	Qualcomm Snapdragon XR2+
CPU	Octa-core Kryo 280 (4 x 2.45 GHz, 4 x 1.9 GHz)	Octa-core Kryo 585 (1 x 2.84 GHz, 3 x 2.42 GHz, 4 x 1.8 GHz)	Octa-core Kryo 585 (1 x 2.84 GHz, 3 x 2.42 GHz, 4 x 1.8 GHz)
GPU	Adreno 540 545 - 567 GFLOPS	Adreno 650 1.1 TFLOPS	Adreno 650 1.1 TFLOPS
DSP	Hexagon 685	Hexagon 698	Hexagon 698



Technology analysis

- Qualcomm Snapdragon XR2+
 - TSMC 7nm+ (XR1 use Samsung 10nm LPP)
 - Featuring 30% improved thermal performance
 - support for 8K 360° video
 - Support for more concurrent perception technologies including **3D reconstruction, head tracking, hand tracking, eye tracking**
 - True mixed reality



Snapdragon XR2+ Gen 1 Platform



Technology analysis

■ Storage

	Oculus Quest	Oculus Quest 2	Quest Pro
Memory	4 GB LPDDR4X	6 GB LPDDR4X	12 GB LPDDR5
Storage	64 GB	128 GB	256 GB

■ Battery Life

	Oculus Quest	Oculus Quest 2	Quest Pro
Battery Life	3 hours	3 hours	2 hours



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New Feature

■ Meta Quest Touch Pro

- translate instinctive hand gestures and detailed finger actions directly into VR with self-tracking cameras and precision controls
- Self-Trackable controllers, No tracking ring
- Qualcomm Snapdragon 665
- Each 319.99 USD (9764 TWD)



New Feature

■ Full color MR experience

- Full color Passthrough mode.
- Stereoscopic MR



New Feature

- https://www.youtube.com/watch?v=YaRastZmucQ&t=20s&ab_channel=MetaQuest



New Feature

- Full color MR experience

- APP Immersed on Quest Pro
- MR control panel ...etc



New Feature

■ Eye tracking

- provide valuable insight about visitor/customer preferences that surveys or other research methods can't always uncover.
- what visitors consciously focus on

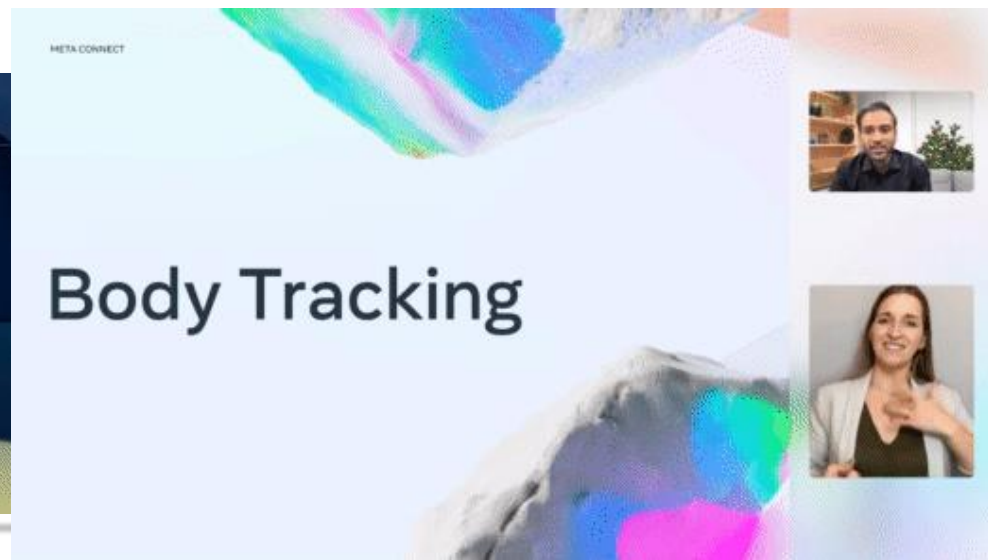
■ Face tracking



New Feature

■ Body tracking

- supported by the Meta Quest 2 and Meta Quest Pro
- Head tracking + hand tracking
- transfers the movement data to avatars in such a way that they look as natural as possible
- Used a large dataset of real human movements to correct for the errors that are common with inverse kinematics or IK-based approaches



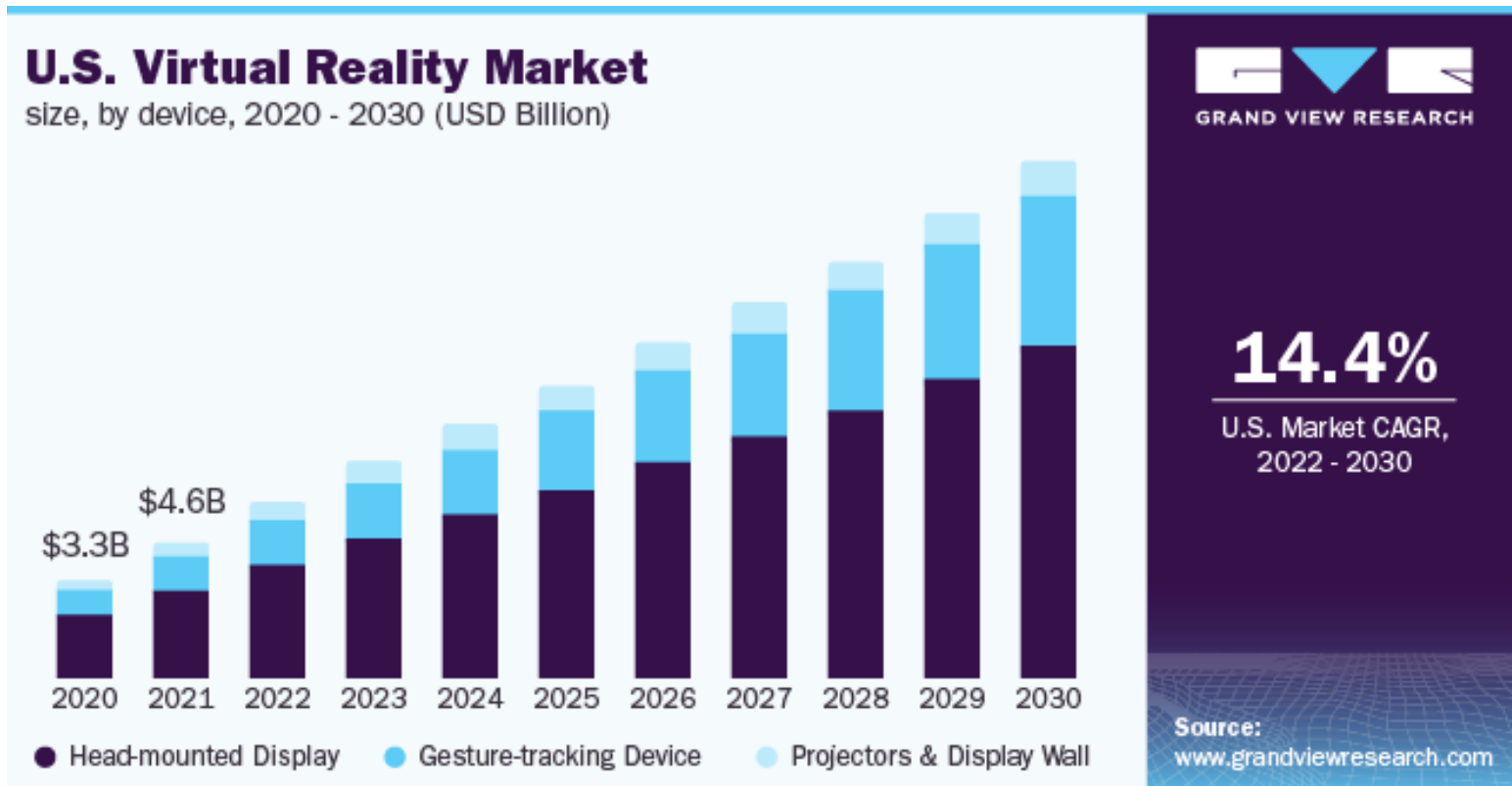


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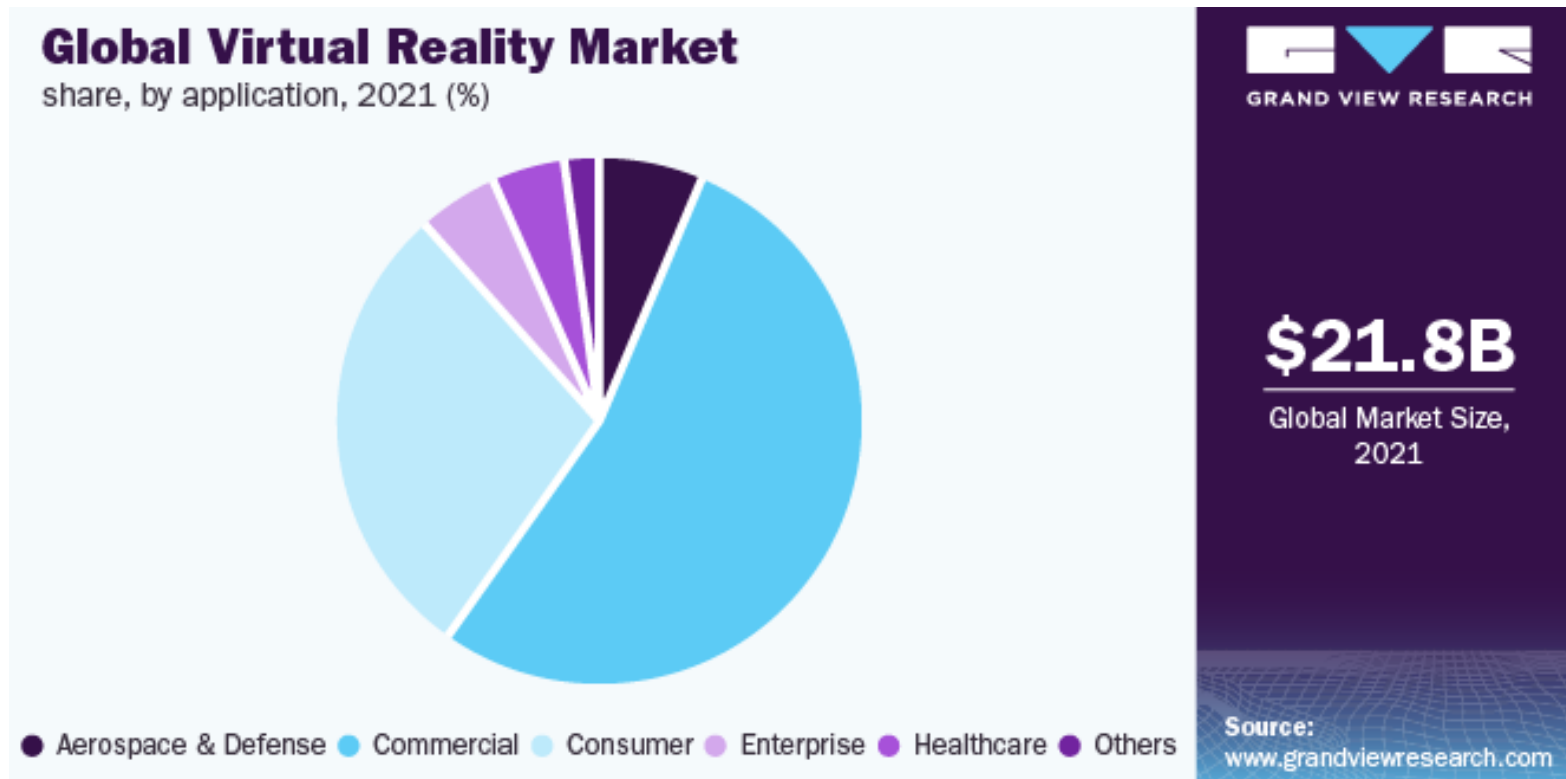
Market analysis

- Head-mounted Display (HMD)
- Gesture-tracking Device



Market analysis

- Fully immersive > non immersive
- Hardware > software





Market analysis

■ Regional Insights

- Asia Pacific accounted for the largest revenue share of over 40.0% in 2021
- Europe is estimated to emerge as the fastest-growing regional market with a CAGR of 16.6% over the forecast period

■ Key Companies

- Meta
- HTC Corporation
- Microsoft
- Samsung

Market analysis

■ Who are the key players in the VR market?

- Some key players operating in the VR market include Barco; CyberGlove Systems, Inc.; Oculus VR, LLC; Alphabet, Inc.; HTC Corporation; Leap Motion, Inc.; Microsoft Corporation; Samsung Electronics Co. Ltd.; Sensics, Inc.; and Sixense Entertainment, Inc.

■ What are the Key factors

- driving the virtual reality market growth include evolving solicitations in the entertainment & medical sectors, technological advancements, and growing VR penetration in the consumer electronics industry.



Supply chain analysis

■ Chipset

- MediaTek Inc.
- Qualcomm -> Oculus(XR2+,XR2), PICO4 (XR2)
- Intel (for HMD)
- NVIDIA (for HMD)
- AMD (for HMD)

· VR 虛擬實境產品

頭戴式VR



Oculus Rift CV1



Oculus



PlayStation VR

SONY



Vive

htc



HoloLens

Microsoft

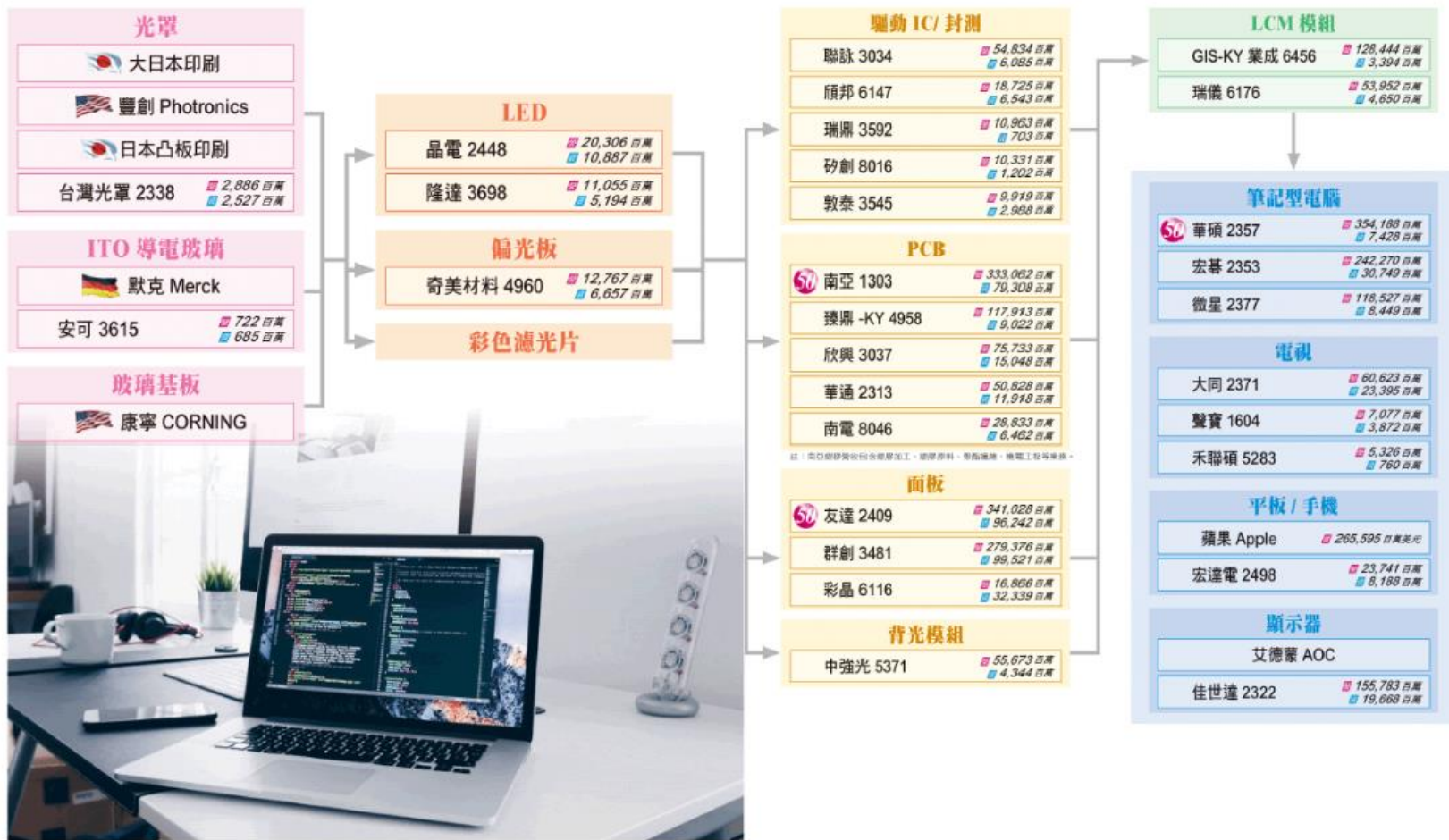
Supply chain analysis

optical lens



Supply chain analysis

■ LCD/LED





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SWOT analysis - Oculus

Strength	Weaknesses
<ul style="list-style-type: none">• Financially Backed by Meta• Standard for VR gaming• Great interaction with community	<ul style="list-style-type: none">• People don't trust Meta• Troubleshooting required• VR is not for everyone yet
Opportunities	Threats
<ul style="list-style-type: none">• Body tracking Suits, Sensors• Potential unexplored markets• Astronauts, Soldiers, Doctors, Students	<ul style="list-style-type: none">• Other VR devices• Sony : PSVR• Google : Cardboard• Apple : xrOS?• HTC : HTC Vive• Pico : Pico 4

SWOT analysis - VR

<p>Strengths</p> <ul style="list-style-type: none"> ● Enhanced Ecological Validity ● Stimulus Control and Consistency ● Real-Time Performance Feedback ● Cuing Stimuli to Support “Error-Free Learning” ● Self-Guided Exploration and Independent Practice ● Interface Modification Contingent on User’s Impairments ● Complete Naturalistic Performance Record ● Safe Testing and Training Environment ● Gaming Factors to Enhance Motivation ● Low-Cost Environments That Can be Duplicated and Distributed 	<p>Weaknesses</p> <ul style="list-style-type: none"> ● The Interface Challenge 1: Interaction Methods ● The Interface Challenge 2: Wires and Displays ● Immature Engineering Process ● Platform Compatibility ● Front-End Flexibility ● Back-End Data Extraction, Management, Analysis, Visualization ● Side Effects
<p>Opportunities</p> <ul style="list-style-type: none"> ● Emerging Tech 1: Processing Power and Graphics/Video Integration ● Emerging Tech 2: Devices and Wires ● Emerging Tech 3: Real-Time Data Analysis and Intelligence ● Gaming-Industry Drivers ● VR Rehabilitation with Widespread Intuitive Appeal to the Public ● Academic and Professional Acceptance ● Close-Knit VR Rehabilitation Scientific and Clinical Community ● Integration of VR with Physiological Monitoring and Brain Imaging ● Telerehabilitation 	<p>Threats</p> <ul style="list-style-type: none"> ● Too Few Cost/Benefit Proofs Could Impact VR Rehabilitation Adoption ● Aftereffects Lawsuit Potential ● Ethical Challenges ● The Perception That VR Will Eliminate the Need for the Clinician ● Limited Awareness/Unrealistic Expectations

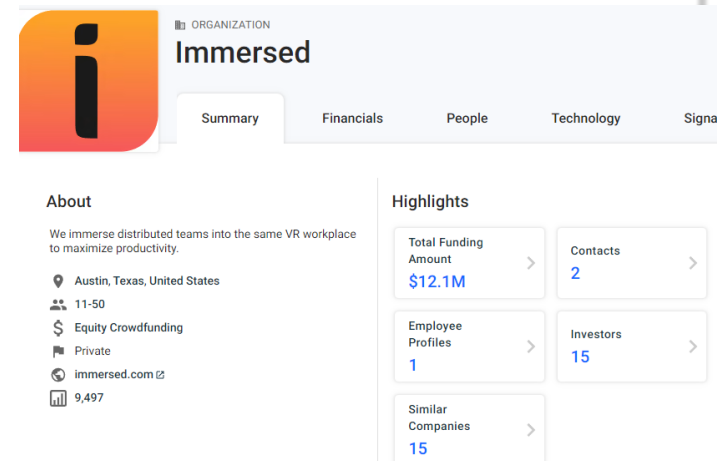


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Conclusion

- Oculus Quest2 is the best device for new VR user
- Oculus Quest Pro is for specific user.
- Oculus Quest Store support many App.
 - Software application is a big market and opportunity
- VR device's hardware component is the chance
- VR device's APP is suit for start-up company
 - Ex: Immersed



The screenshot shows the profile of the company 'Immersed'. The header includes the company logo (a stylized 'i' in an orange square) and the name 'Immersed'. Below the header is a navigation bar with tabs: Summary, Financials, People, Technology, and Signa. The main content area is divided into two columns. The left column is titled 'About' and contains the following information: 'We immerse distributed teams into the same VR workplace to maximize productivity.', 'Austin, Texas, United States', '11-50', 'Equity Crowdfunding', 'Private', 'immersed.com', and '9,497'. The right column is titled 'Highlights' and contains three boxes: 'Total Funding Amount \$12.1M', 'Contacts 2', and 'Employee Profiles 1'. Below these are 'Investors 15' and 'Similar Companies 15'.

Section	Item	Value
Highlights	Total Funding Amount	\$12.1M
	Contacts	2
	Employee Profiles	1
Investors	Investors	15
	Similar Companies	15



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- <https://news.nweon.com/85282>
- <https://news.nweon.com/100601>
- <https://developer.oculus.com/documentation/unity/unity-handtracking/>
- <https://www.youtube.com/c/MetaQuestVR/videos>
- <https://developer.oculus.com/blog/presence-platforms-hand-tracking-api-gets-an-upgrade/>
- <https://chinese.engadget.com/meta-reality-labs-display-systems-research-vr-prototypes-140039371.html>
- <https://tech.fb.com/ar-vr/>



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■ Technology analysis

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- https://en.wikipedia.org/wiki/List_of_Qualcomm_Snapdragon_processors#Snapdragon_XR1_and_XR2
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Reference

■ New features

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- <https://www.qualcomm.com/products/application/xr-vr-ar/snapdragon-xr2-plus-gen-1-platform>
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■ Market analysis

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- <https://www.grandviewresearch.com/industry-analysis/virtual-reality-vr-market>



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■ SWOT Analysis

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- <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.563474/full>

■ Conclusion

- <https://www.crunchbase.com/organization/immersedteam>
- <https://immersed.com/>



Thank you for listening