VR Headset Research

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[**Categories of Comparison 1**](#_49gvaaq57hiq)

[**User Comfort Segment: 1**](#_cehzrio2qf7u)

[Weight and Weight Distribution: 1](#_mwx71simvrxo)

[Ergonomics and Comfort: 2](#_w2urjqqlu6ky)

[Battery Capacity, Expected Use Time, and Charge Time: 2](#_d813c298505j)

[Standalone or Additional Devices Required: 2](#_n4zimplq0lx3)

[Ease of Setup: 2](#_mpa8x7b4oqfx)

[Tracking Type with DOF: 2](#_8e3lz1bpo9td)

[**Development Segment: 2**](#_271o00j4mdeu)

[Operating System and Kernel: 2](#_1bkse513gv1)

[Native Language and Compatible Development Languages: 2](#_snneglw2xrzd)

[Software Used for Developing: 2](#_oqnxd5qcja2r)

[Frameworks and Development Kits: 2](#_p7qnbclckhzl)

[**Specs Segment: 2**](#_oy8dyloyl10)

[Retail Price and Add-on Cost: 2](#_m0yk9n8basjs)

[Display Specs: 2](#_n56oflo9m7so)

[Storage Space and RAM: 3](#_n341f9w699l6)

[**Headsets 3**](#_l6552xut3xzw)

[Apple Vision Pro 3](#_we8xf75y7jn9)

[Meta Quest 3 4](#_h8yunvoh7nal)

[Playstation VR 2 5](#_l3kakajzny5q)

[Pico 4 7](#_7px5qswr02g)

[HTC Vive Pro 2 8](#_e5dsv37c2rgw)

[Valve Index 9](#_7w11yzu7tqt2)

[Name of headset 10](#_u82hk2sspyz3)

[**USE THIS TEMPLATE 10**](#_ow9a1dzftw89)

# Categories of Comparison

## User Comfort Segment:

### Weight and Weight Distribution:

* + Headset Weight: [Headset weight in grams or pounds]
  + Controller Weight: [Controller weight in grams or pounds, if applicable]
  + Weight Distribution: [Describe how weight is distributed for comfort]

### Ergonomics and Comfort:

* + [Brief description of the ergonomic design and comfort features]

### Battery Capacity, Expected Use Time, and Charge Time:

* + Battery Capacity: [Headset battery capacity in mAh]
  + Expected Use Time: [Average use time per full charge]
  + Charge Time: [Time required to fully charge the headset]

### Standalone or Additional Devices Required:

* + [Specify whether the headset is standalone or if it requires additional devices]

### Ease of Setup:

* + [Describe the ease of setup process, including any notable features]

### Tracking Type with DOF:

* + Tracking Type: [Inside-out, outside-in, or hybrid]
  + Degrees of Freedom (DOF): [Specify the number of DOF for tracking]

## Development Segment:

### Operating System and Kernel:

* + Operating System: [e.g., Oculus OS, iOS, Android]
  + Kernel: [Specify the kernel version, if applicable]

### Native Language and Compatible Development Languages:

* + Native Language: [e.g., Swift, C++, Java]
  + Compatible Development Languages: [List languages supported for application development]

### Software Used for Developing:

* + Development Environment: [e.g., Xcode, Unity, Unreal Engine]
  + Notable Development Environments: [Any additional tools used for development]

### Frameworks and Development Kits:

* + Frameworks: [List any frameworks available for application development]
  + Development Kits: [Specify VR development kits available]

## Specs Segment:

### Retail Price and Add-on Cost:

* + Retail Price: [$XX.XX]
  + Add-on Cost: [Specify additional costs for accessories or optional features]

### Display Specs:

* + Resolution: [Headset resolution, e.g., 2160 x 1200]
  + FOV (Field of View): [Specify FOV in degrees]
  + Refresh Rate: [e.g., 90Hz]

### Storage Space and RAM:

* + Storage Space: [e.g., 64GB, 128GB]
  + RAM Space: [Specify RAM capacity]

# Headsets

## Apple Vision Pro

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 453-680g(Unconfirmed), battery pack: 200-300g (Unconfirmed)
   2. Controller Weight: no controller
   3. Weight Distribution: front heavy
2. Ergonomics and Comfort:
   1. Ease of Setup: It possesses a singular piece of 3-dimensionally formed laminated glass which curves to wrap the wearer’s face. Two headbands are also provided for cushioning, breathability, stretch, and a Fit Dial which makes it adjustable for the wearer’s head. The headbands also possess a pair of adjustable upper and lower straps for a precise fit. The headset also has a light seal which conforms to the wearer’s face and blocks out stray light. The battery can also be kept in your pocket.
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: 20,000mAh(74Wh)
      2. Expected Use Time: 2 Hours
      3. Charge Time: Unconfirmed
3. Standalone or Additional Devices Required:
   1. Standalone with detachable battery pack
   2. Ease of Setup: no other setup except for screen use as well as clear view and empty space around user
   3. Tracking Type with DOF:
      1. Tracking Type: Inside out with hand tracking, face tracking
      2. Degrees of Freedom (DOF): 6 DOF with 12 integrated cameras

Development Segment:

1. Operating System and Kernel:
   1. Operating System: Swift, via XCode
   2. Kernel: Hybrid XNU
2. Native Language and Compatible Development Languages:
   1. Native Language: Swift, C++
   2. Compatible Development Languages: Swift, C++, Java
3. Software Used for Developing:
   1. Development Environment: XCode, Unity
   2. Notable Development Environments: -NIL-
4. Frameworks and Development Kits:
   1. Frameworks: RealityKit, SwiftUI, ARKit
   2. Development Kits: RealityKit, ARKit

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: $3.499
   2. Add-on Cost: None
2. Display Specs:
   1. Resolution: 3800 x 3000
   2. FOV (Field of View): 100°
   3. Refresh Rate: 90Hz(Default) - 96Hz(Video Recording)
3. Storage Space and RAM:
   1. Storage Space: 1TB
   2. RAM Space: 24 GB

## Meta Quest 3

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 515g
   2. Controller Weight: 104g
   3. Weight Distribution: Front heavy
2. Ergonomics and Comfort:
   1. Hefty components shifted towards the front to put less strain on the neck. Headset has a customisable head strap and pancake lens, and the Touch Plus controllers are ring-free.
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: 4879 mAh
      2. Expected Use Time: 2 hours
      3. Charge Time: 1 hour 43 minutes
3. Standalone or Additional Devices Required:
   1. Standalone with 2 controllers as well as cord for PC access(not needed for casual use)
   2. Ease of Setup: It requires the Meta Quest mobile application to be downloaded for the initial setup and for the management of applications. However, it is not necessary for using the headset itself. The headset requires an internet connection for the setup.  
        
      Guide: <https://www.meta.com/help/quest/articles/getting-started/getting-started-with-quest-3/set-up-quest-3/>
   3. Tracking Type with DOF:
      1. Tracking Type: Inside-Out tracking (with positional tracking and depth sensor, uses Touch Plus controllers). Also has motion tracking, obstacle detection on the back, with head and hand tracking.
      2. Degrees of Freedom (DOF): 6 Degrees of freedom with 4 integrated cameras

Development Segment:

1. Operating System and Kernel:
   1. Operating System: Quest, Android Source
   2. Kernel: Monolithic (Linux Kernel) (From Android OS)
2. Native Language and Compatible Development Languages:
   1. Native Language: C++ (For the PC SDK)
   2. Compatible Development Languages: Java for Android Studio
3. Software Used for Developing:
   1. Development Environment: Unity, Unreal Engine, Android Studio
   2. Notable Development Environments: NIL
4. Frameworks and Development Kits:
   1. Frameworks: Unity AR Foundation
   2. Development Kits: PC SDK, Deprecated Mobile SDK, OpenXR Mobile SDK

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: US$499 for 128GB and US$649 for 512GB
   2. Add-on Cost: US$150 for 384GB increase
2. Display Specs:
   1. Resolution: 2064x2208 per eye / 4128 x 2208 both
   2. FOV (Field of View): 110 degrees horizontal, 96 degrees vertical
   3. Refresh Rate: 120Hz
3. Storage Space and RAM:
   1. Storage Space: 128GB with 512 GB version
   2. RAM Space: 8GB

## Playstation VR 2

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 560g
   2. Controller Weight: 168g
   3. Weight Distribution: Even distribution
2. Ergonomics and Comfort:
   1. 3D audio immersion with subtle haptic. Eye tracking to improve render quality around the focused eye line to reduce strain on the eye as well as improve immersion, air flow vents to reduce fogging and adjustable head straps
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. No integrated battery, plugged into Playstation 5
3. Standalone or Additional Devices Required:
   1. Must be plugged into the Playstation 5
   2. Ease of Setup: plug in the headset and controllers to pair them to the ps5, then use the ps5 console to navigate to the game needed before selecting it, or wear the headset and use the controllers to navigate the menus directly. Both methods are able to screen share directly due to the tethered headset, allowing for constant use without battery concerns. Downside of tether is that a player can get tangled or injure themselves which is not suitable for seniors.
   3. Tracking Type with DOF:
      1. Tracking Type: Inside-Out tracking
      2. Degrees of Freedom (DOF): 6 DOF with 6 integrated cameras

Development Segment:

1. Operating System and Kernel:
   1. Operating System: NO OS, runs on PS5’s Orbis OS
   2. Kernel: FreeBSD 11.0
2. Native Language and Compatible Development Languages:
   1. Native Language: C, C++
   2. Compatible Development Languages: -NIL-
3. Software Used for Developing:
   1. Development Environment: Visual Studios
   2. Notable Development Environments: Sony Development Kit, requires License
4. Frameworks and Development Kits:
   1. Frameworks: -NIL-
   2. Development Kits: -NIL-

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: $599($799 for PS5)
   2. Add-on Cost: [Specify additional costs for accessories or optional features]
2. Display Specs:
   1. Resolution: 2000x2040
   2. FOV (Field of View): 110
   3. Refresh Rate: 120Hz
3. Storage Space and RAM:
   1. Storage Space: Refer to PS5 Storage Space
   2. RAM Space: Refer to PS5 RAM

## Pico 4

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 586g
   2. Controller Weight:140g/184g
   3. Weight Distribution: Even weight distribution
2. Ergonomics and Comfort:
   1. Balanced weight, has cushions between headset and head. Attachment in box for face and nose piece. Personal use: comfort and easy to move around, back strap and top strap is adjustable.
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: 5300mAh
      2. Expected Use Time: 3 hours
      3. Charge Time: 2 hours
3. Standalone or Additional Devices Required:
   1. Complete Standalone
   2. Ease of Setup: plug headset into laptop or PC to upload needed games or use the in-set store to purchase and organize files stored on it. Then enter using the controllers.
   3. Tracking Type with DOF:
      1. Tracking Type: Inside Out Tracking
      2. Degrees of Freedom (DOF): 6 DOF

Development Segment:

1. Operating System and Kernel:
   1. Operating System: Pico OS 5.0(Android)
   2. Kernel: -NIL-
2. Native Language and Compatible Development Languages:
   1. Native Language: C++, Java
   2. Compatible Development Languages: -NIL-
3. Software Used for Developing:
   1. Development Environment: Unity, Unreal
   2. Notable Development Environments: -NIL-
4. Frameworks and Development Kits:
   1. Frameworks: PicoXR SDK
   2. Development Kits: -NIL-

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: $430
   2. Add-on Cost: -NIL-
2. Display Specs:
   1. Resolution: 2160x2160
   2. FOV (Field of View): 100 degrees
   3. Refresh Rate: 90 Hz
3. Storage Space and RAM:
   1. Storage Space: 128GB - 256GB
   2. RAM Space: 8GB LPDDR 4

## HTC Vive Pro 2

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 850g
   2. Controller Weight: 196g
   3. Weight Distribution: Even Distribution, embedded counterweights
2. Ergonomics and Comfort:
   1. Eye relief with lens distance adjustment, adjustable IPD from 57 to 70mm, adjustable headphones, and an adjustable head strap
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: 9750 mAh
      2. Expected Use Time: 2-3 hours
      3. Charge Time: 2-3 hours
3. Standalone or Additional Devices Required:
   1. Requires Tether to SteamVR 2.0 or Bluetooth with VIVE Wireless Adapter
   2. Ease of Setup: Requires the mounting of 2 base stations on walls, they must be aimed down at the user. It also requires a computer to be used, either through tethering or wirelessly with a VIVE Wireless Adapter.  
        
      Guide: [Setting up your VIVE Pro 2 (youtube.com)](https://www.youtube.com/watch?v=xzgyeu35PJ0)
   3. Tracking Type with DOF:
      1. Tracking Type: Hybrid Marker Based Tracking
      2. Degrees of Freedom (DOF): 6DOF

Development Segment:

1. Operating System and Kernel:
   1. Operating System: Windows 11/10
   2. Kernel: NIL
2. Native Language and Compatible Development Languages:
   1. Native Language: C++
   2. Compatible Development Languages: NIL
3. Software Used for Developing:
   1. Development Environment: Unity, Unreal Engine
   2. Notable Development Environments: NIL
4. Frameworks and Development Kits:
   1. Frameworks: NIL
   2. Development Kits: OpenVR SDK, VIVE Wave SDK

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: $799
   2. Add-on Cost: $1399(controllers, base stations), US$349 for VIVE Wireless Adapter
2. Display Specs:
   1. Resolution: 2448x2448
   2. FOV (Field of View): 120 degrees
   3. Refresh Rate: 120Hz
3. Storage Space and RAM:
   1. Storage Space: NIL (Requires computer ??? Does it need a computer? I am confused to hell)
   2. RAM Space: 8GB

## Valve Index

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: 809 g with head strap
   2. Controller Weight: 196g per controller
   3. Weight Distribution: Even distribution
2. Ergonomics and Comfort:
   1. The Valve Index still relies on the older Fresnel technology for its lenses. The headset's adjustable head strap and face gasket ensure a secure and snug fit for various head sizes and shapes, allowing for extended play sessions without causing discomfort.
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: Wired
      2. Expected Use Time: Wired
      3. Charge Time: Wired
3. Standalone or Additional Devices Required:
   1. Uses a power adapter, 2-4 base stations
   2. Ease of Setup: [Guide](https://help.steampowered.com/en/faqs/view/7F7D-77FB-8CAA-4329)
   3. Tracking Type with DOF:
      1. Tracking Type: Outside-In
      2. Degrees of Freedom (DOF): 6 DoF

Development Segment:

1. Operating System and Kernel:
   1. Operating System: Windows 10. Processor: Dual Core with Hyper-Threading. Memory: 8 GB RAM.
   2. Kernel: NIL
2. Native Language and Compatible Development Languages:
   1. Native Language: C , C++
   2. Compatible Development Languages: NIL
3. Software Used for Developing:
   1. Development Environment: UNITY
   2. Notable Development Environments: [Any additional tools used for development]
4. Frameworks and Development Kits:
   1. Frameworks: NIL
   2. Development Kits: NIL

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: $*999 headset & controllers*
   2. Add-on Cost: $749 base station
2. Display Specs:
   1. Resolution: 1440x1600
   2. FOV (Field of View): 130 degrees
   3. Refresh Rate: 144Hz
3. Storage Space and RAM:
   1. Storage Space: NIL
   2. RAM Space: 8GB

## Name of headset

Specs

# USE THIS TEMPLATE

User Comfort Segment:

1. Weight and Weight Distribution:
   1. Headset Weight: [Headset weight in grams or pounds]
   2. Controller Weight: [Controller weight in grams or pounds, if applicable]
   3. Weight Distribution: [Describe how weight is distributed for comfort]
2. Ergonomics and Comfort:
   1. [Brief description of the ergonomic design and comfort features]
   2. Battery Capacity, Expected Use Time, and Charge Time:
      1. Battery Capacity: [Headset battery capacity in mAh]
      2. Expected Use Time: [Average use time per full charge]
      3. Charge Time: [Time required to fully charge the headset]
3. Standalone or Additional Devices Required:
   1. [Specify whether the headset is standalone or if it requires additional devices]
   2. Ease of Setup: [Describe the ease of setup process, including any notable features]
   3. Tracking Type with DOF:
      1. Tracking Type: [Inside-out, outside-in, or hybrid]
      2. Degrees of Freedom (DOF): [Specify the number of DOF for tracking]

Development Segment:

1. Operating System and Kernel:
   1. Operating System: [e.g., Oculus OS, iOS, Android]
   2. Kernel: [Specify the kernel version, if applicable]
2. Native Language and Compatible Development Languages:
   1. Native Language: [e.g., Swift, C++, Java]
   2. Compatible Development Languages: [List languages supported for application development]
3. Software Used for Developing:
   1. Development Environment: [e.g., Xcode, Unity, Unreal Engine]
   2. Notable Development Environments: [Any additional tools used for development]
4. Frameworks and Development Kits:
   1. Frameworks: [List any frameworks available for application development]
   2. Development Kits: [Specify VR development kits available]

Specs Segment:

1. Retail Price and Add-on Cost:
   1. Retail Price: [$XX.XX]
   2. Add-on Cost: [Specify additional costs for accessories or optional features]
2. Display Specs:
   1. Resolution: [Headset resolution, e.g., 2160 x 1200]
   2. FOV (Field of View): [Specify FOV in degrees]
   3. Refresh Rate: [e.g., 90Hz]
3. Storage Space and RAM:
   1. Storage Space: [e.g., 64GB, 128GB]
   2. RAM Space: [Specify RAM capacity]