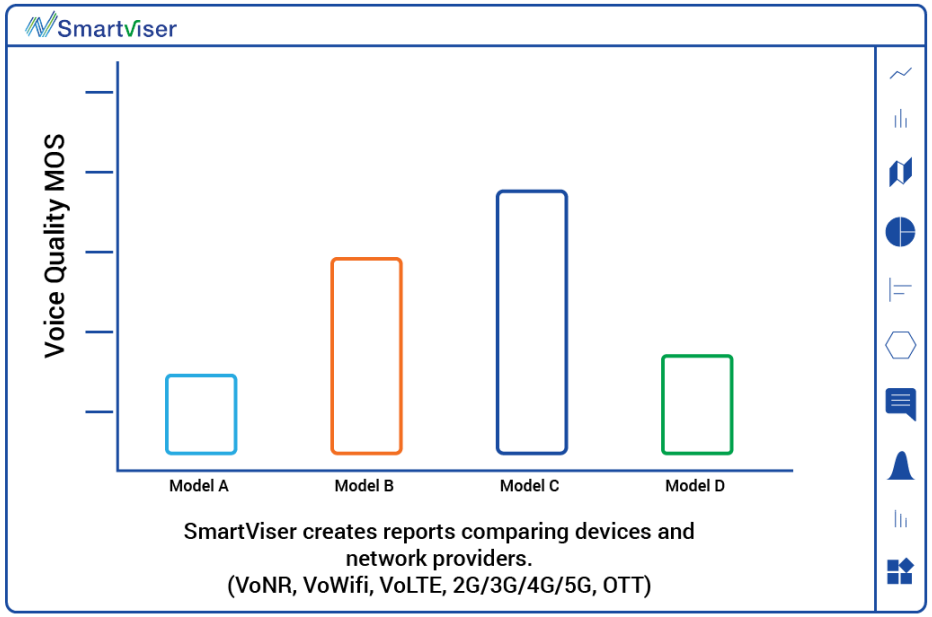
Voice Quality MOS Benchmark Report

Flagship Devices



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SmartViser
Testing innovation

Testing Configuration

Devices

All devices were commercially available and were purchased by SmartViser in France in order to conduct the testing. The devices have not been altered or modified in any way:

- Google Pixel 8
- Samsung S24
- Sony 5 IV
- Xiaomi 14
- Apple iPhone 15

Network and Technologies

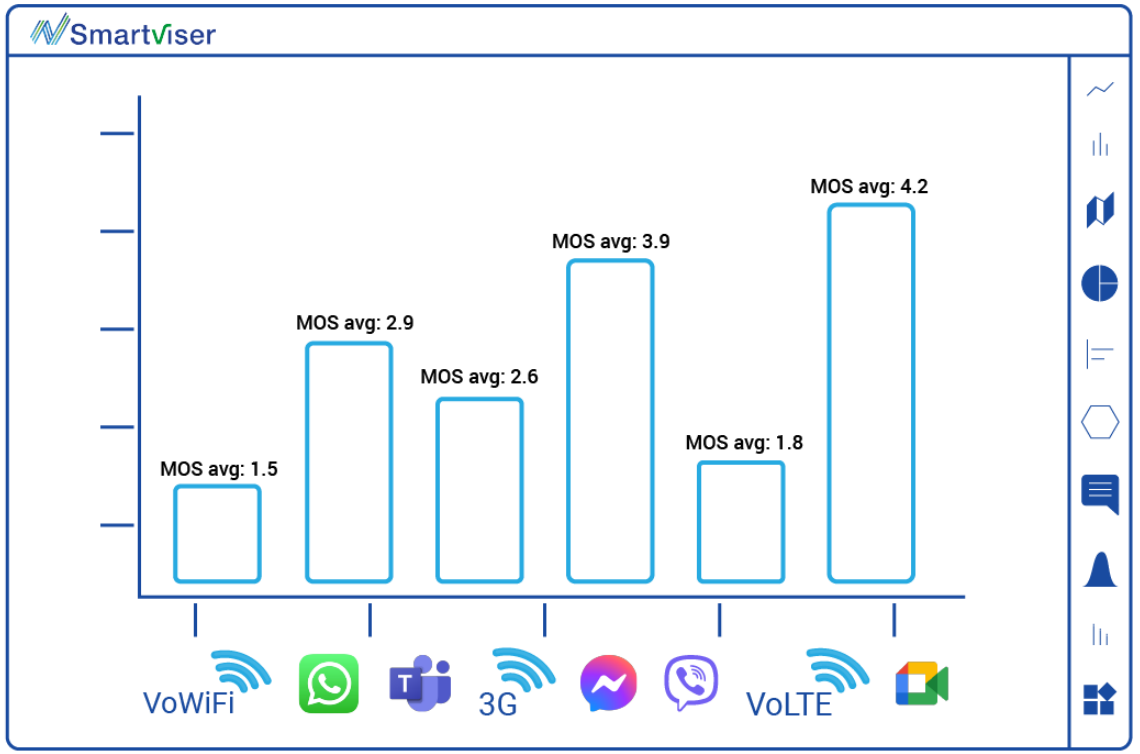
Network

Testing was performed against a Tier 1 French Mobile Network Operator for the Cellular calls. The devices were not forced to select a particular codec or technology in order to emulate a realistic user experience

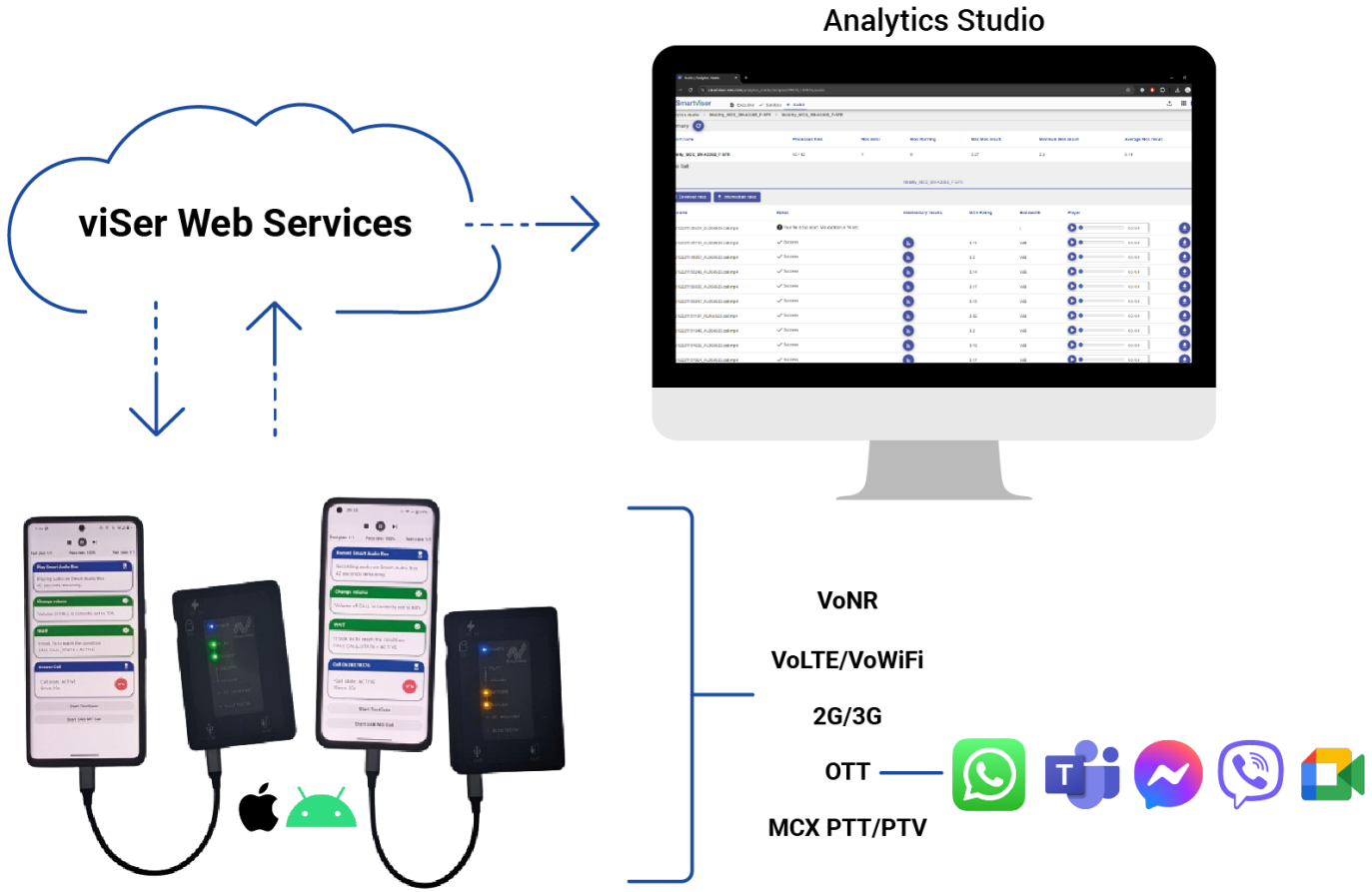
For the OTT test cases WiFi Network was used.

Technologies Tested

- 3G
- VoLTE
- VoWiFi
- Viber
- WhatsApp
- Microsoft Teams



Testing Setup



viSer and the Smart Audio Box in a USB-C setup
(jack-to-jack also available)

Testing Setup

viSer test automation was used to ensure reliability, and repeatability of the testing. Together with viSer test automation, the Smart Audio Box was used.

All the MOS scores processing were performed with the POLQA algorithm integrated in the SmartViser Solution.

viSer Test Automation – Overview

SmartViser
Testing innovation

TEST
- Devices
- New technology 5G, VoLTE
- Networks

MONITOR
- Network Performance
- Network Stability
- Device Performance

BENCHMARK
- Devices
- Networks
- Battery
- MNO/MVNO

TROUBLESHOOT
- Regression
- Devices bug investigation
- Network investigation

MEASURE
- QoE
- QoS
- UX

Any Test Cases / User Action

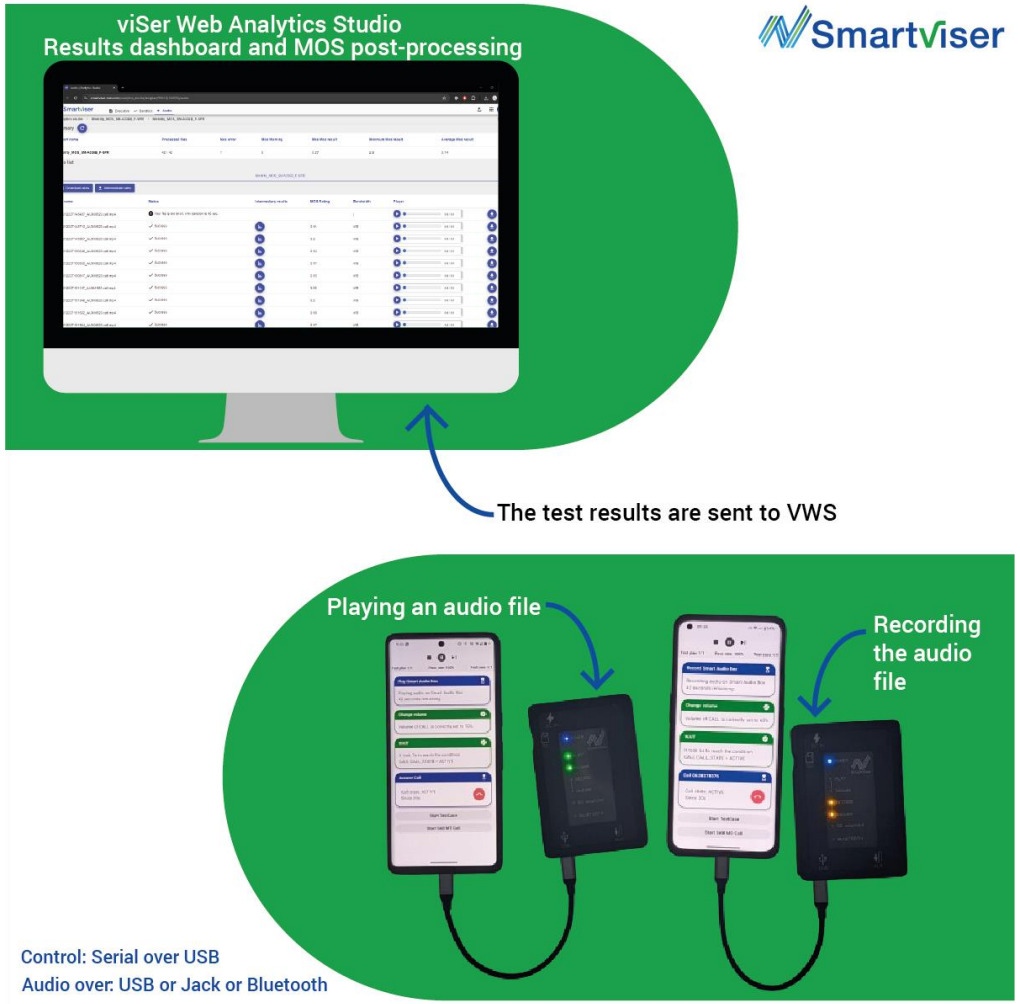
Any Technology

Testing Methodology

30 Calls were performed with 2min duration. The same device was used for all Mobile terminated Calls (MT) which was the Samsung Flip 5.

POLQA™ MOS scores:

- Score 1: means that despite great effort, it is impossible to understand what is being said during the call (the call repeatedly cuts in and out)
- Score 2: means the quality is not good and a lot of effort is needed to understand
- Score 3: indicates an acceptable level of quality and fairly understandable conversation
- Score 4: is a good quality level, understandable with minor interference noise
- Score 5: is an excellent quality level, understandable discussion without interference noise



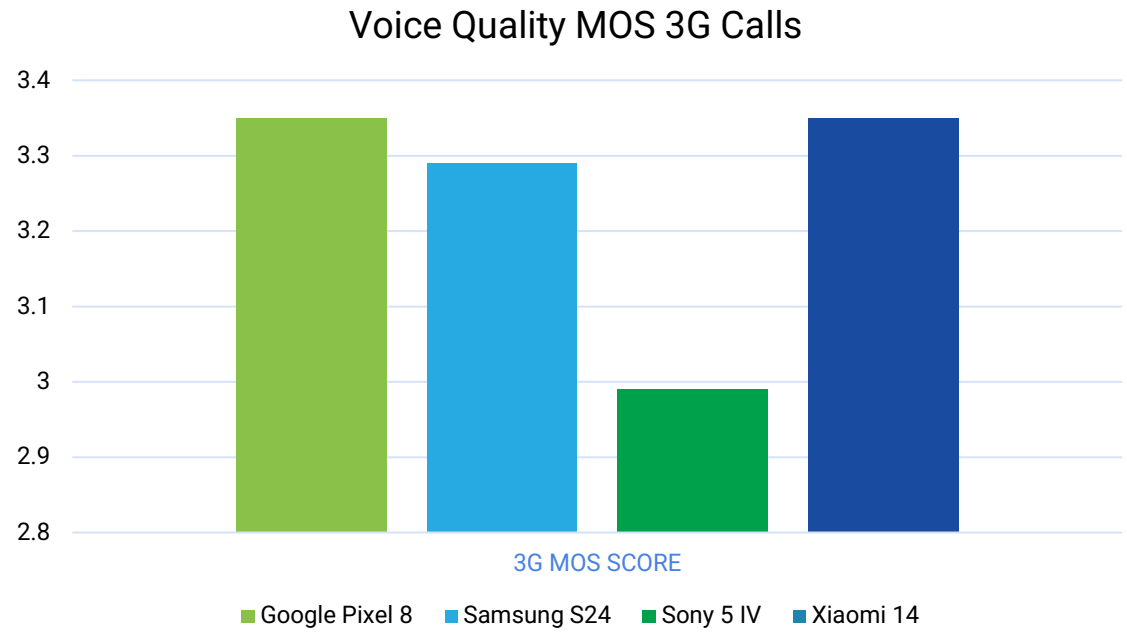
Results 3G Calls MOS Scores

Key Points 3G Audio MOS/ Voice Quality MOS:

Top Performers: The Google Pixel 8 and Xiaomi 14 are the top performers in this comparison, both achieving a MOS score of 3.35. Users can expect excellent voice quality on these devices under 3G conditions.

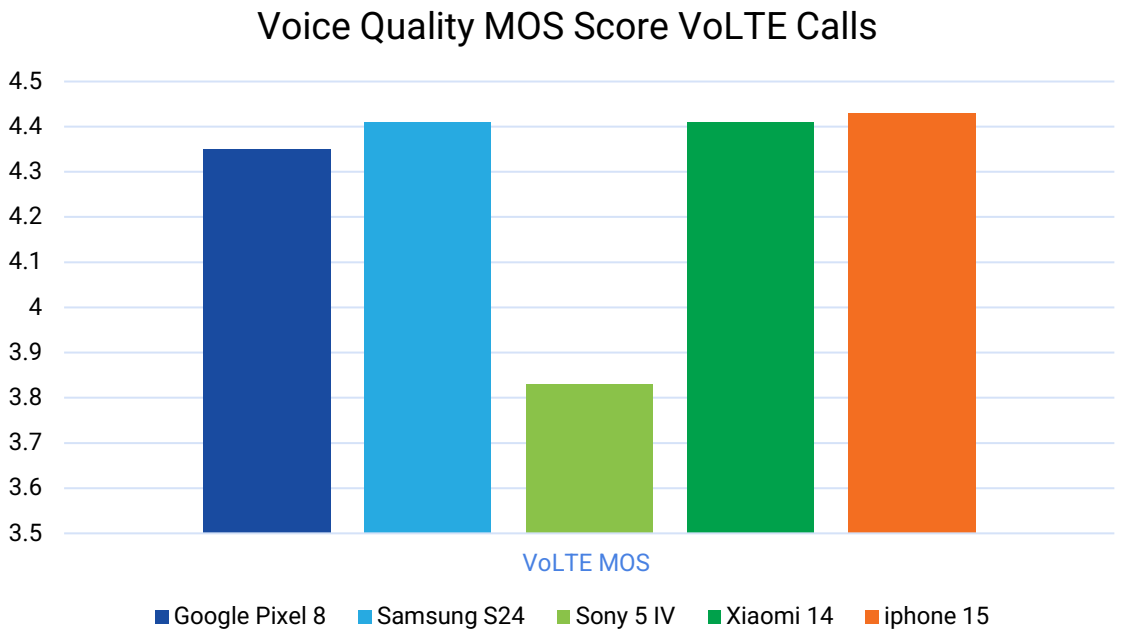
Moderate Performer: The Samsung S24, with a MOS score of 3.29, offers good voice quality, slightly below the top performers but still within a satisfactory range for most users.

Lowest Performer: The Sony 5 IV, with a MOS score of 2.99, provides the lowest voice quality among the devices tested. This score suggests that users may experience less clarity and overall voice quality compared to the other devices.



Model	3G Voice Quality MOS
Google Pixel 8	3.35
Samsung S24	3.29
Sony 5 IV	2.99
Xiaomi 14	3.35
iPhone 15	No Results Available

Results VoLTE MOS Scores



Model	VoLTE Voice Quality MOS
Google Pixel 8	4.35
Samsung S24	4.41
Sony 5 IV	3.83
Xiaomi 14	4.41
iPhone 15	4.43

Key Points VoLTE Audio MOS/ Voice Quality MOS:

Top Performer: The iPhone 15 is the top performer with the highest MOS score of 4.43, indicating superior voice quality under VoLTE conditions.

Excellent Performers: The Samsung S24 and Xiaomi 14, both with a MOS score of 4.41, offer excellent voice quality, almost on par with the iPhone 15.

Very Good Performer: The Google Pixel 8, with a MOS score of 4.35, provides very good voice quality, slightly below the Samsung S24 and Xiaomi 14.

Good Performer: The Sony 5 IV, with a MOS score of 3.83, provides good voice quality, though noticeably lower than the other devices.

Results VoWiFi MOS Scores

Key Points VoLTE Audio MOS/ Voice Quality MOS:

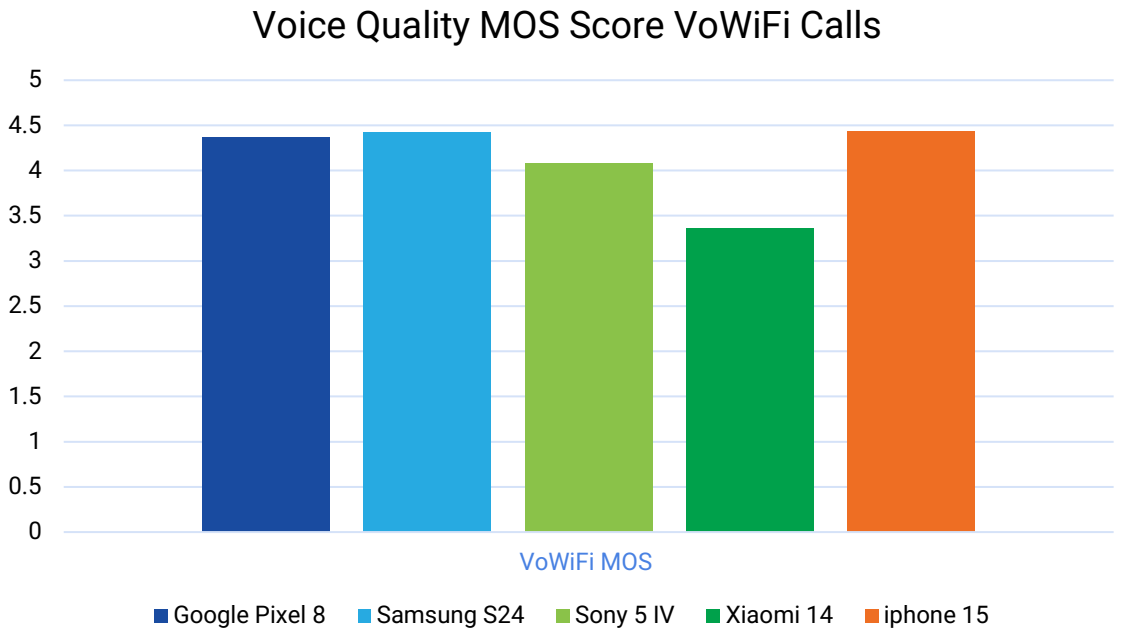
Top Performer: The iPhone 15 is the top performer with the highest MOS score of 4.43, indicating superior voice quality under VoWiFi conditions.

Excellent Performer: The Samsung S24, with a MOS score of 4.42, offers excellent voice quality, almost on par with the iPhone 15.

Very Good Performer: The Google Pixel 8, with a MOS score of 4.37, provides very good voice quality, slightly below the Samsung S24 and iPhone 15.

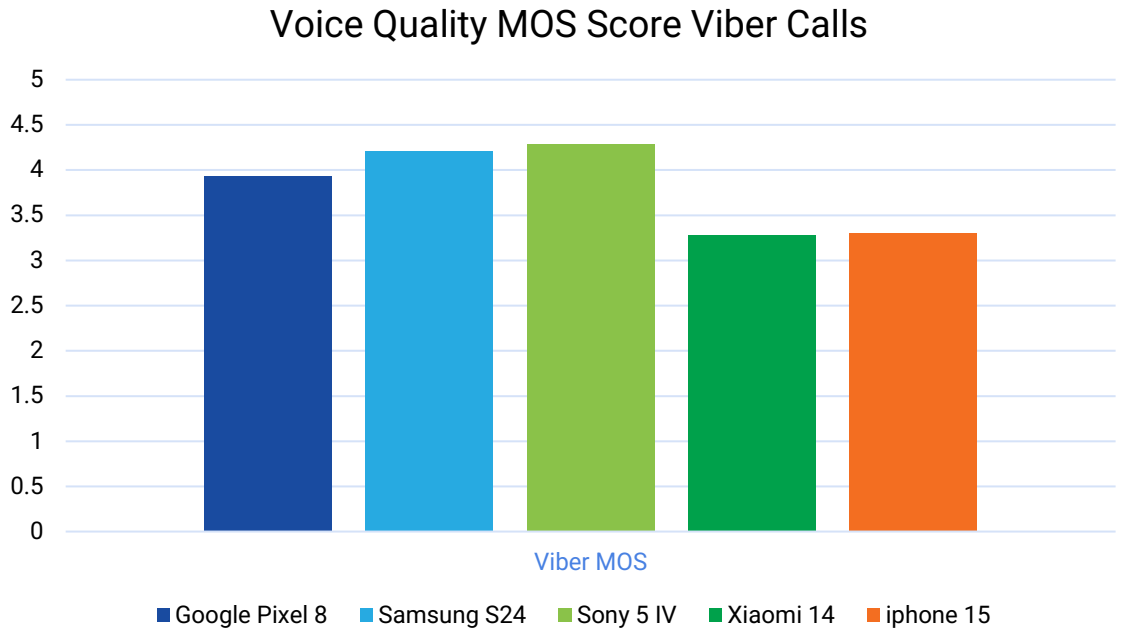
Good Performer: The Sony 5 IV, with a MOS score of 4.08, offers good voice quality but is not as high as the top three devices.

Moderate Performer: The Xiaomi 14, with a MOS score of 3.36, provides the lowest voice quality among the devices tested, indicating a significant drop compared to the others.



Model	VoWiFi Speech Quality MOS
Google Pixel 8	4.37
Samsung S24	4.42
Sony 5 IV	4.08
Xiaomi 14	3.36
iPhone 15	4.43

Results Viber MOS Scores



Model	Viber Speech Quality MOS
Google Pixel 8	3.93
Samsung S24	4.21
Sony 5 IV	4.29
Xiaomi 14	3.28
iPhone 15	3.3

Key Points Viber Audio MOS/ Voice Quality MOS:

Top Performer: The Sony 5 IV is the top performer with the highest MOS score of 4.29, indicating superior voice quality on Viber.

Excellent Performer: The Samsung S24, with a MOS score of 4.21, offers excellent voice quality, close to the Sony 5 IV.

Good Performer: The Google Pixel 8, with a MOS score of 3.93, provides good voice quality, though not as high as the top two devices.

Moderate Performers: The iPhone 15 and Xiaomi 14, with MOS scores of 3.30 and 3.28 respectively, provide the lowest voice quality among the devices tested, indicating significant room for improvement.

Results WhatsApp MOS Scores

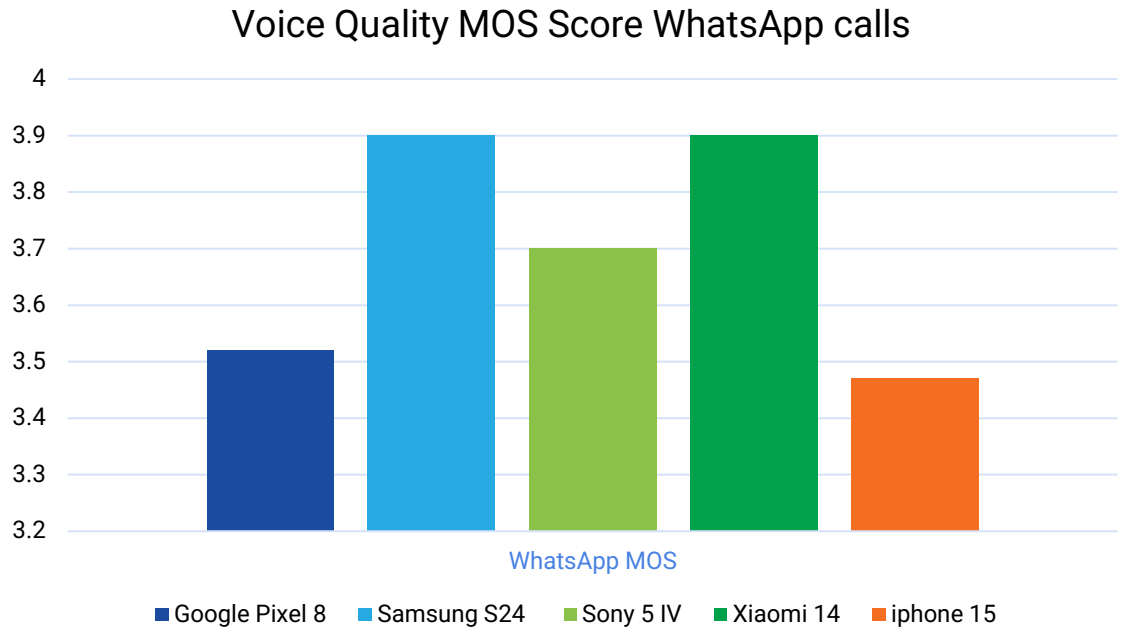
Analysis of MOS Results for WhatsApp Calls :

Top Performers: The Samsung S24 and Xiaomi 14 are the top performers with the highest MOS score of 3.90, indicating superior voice quality on WhatsApp.

Good Performer: The Sony 5 IV, with a MOS score of 3.70, offers good voice quality, although not as high as the top performers.

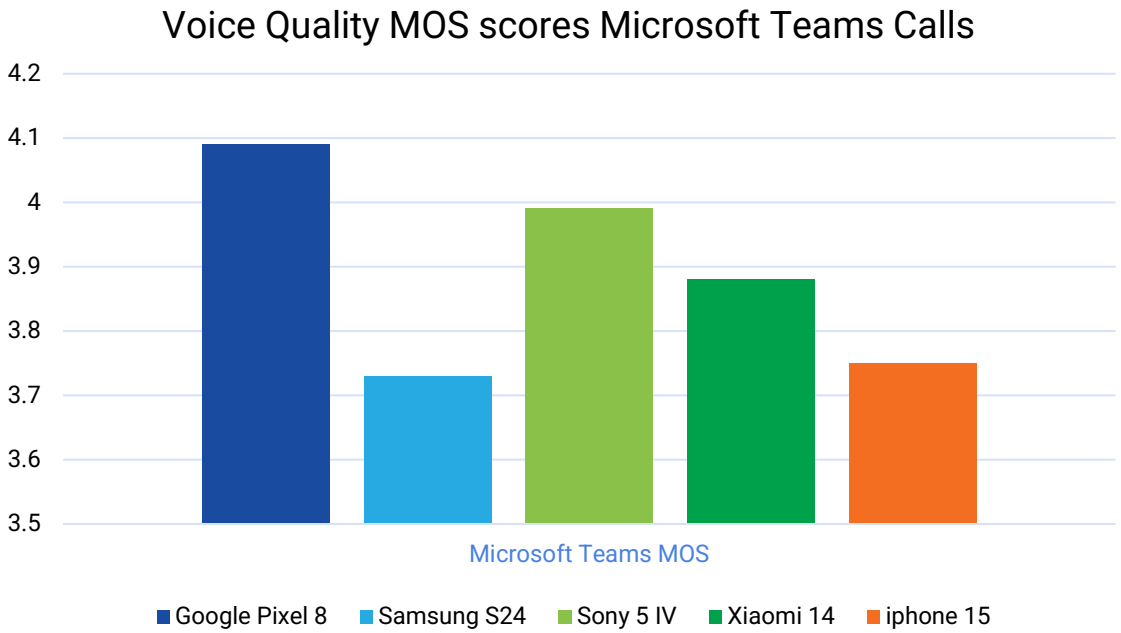
Moderate Performer: The Google Pixel 8, with a MOS score of 3.52, provides moderate voice quality, suggesting room for improvement.

Lowest Performer: The iPhone 15, with a MOS score of 3.47, has the lowest perceived voice quality among the devices tested on WhatsApp.



Model	WhatsApp Speech Quality MOS
Google Pixel 8	3.52
Samsung S24	3.9
Sony 5 IV	3.7
Xiaomi 14	3.9
iPhone 15	3.47

Results Microsoft Teams MOS Scores



Model	Microsoft Teams Speech Quality MOS
Google Pixel 8	4.09
Samsung S24	3.73
Sony 5 IV	3.99
Xiaomi 14	3.88
iPhone 15	3.75

Analysis of MOS Results for Microsoft Teams Calls:

Top Performer: The Google Pixel 8 is the top performer with the highest MOS score of 4.09, indicating superior voice quality on Microsoft Teams.

Excellent Performer: The Sony 5 IV, with a MOS score of 3.99, offers excellent voice quality, close to the Google Pixel 8.

Good Performer: The Xiaomi 14, with a MOS score of 3.88, provides good voice quality, though not as high as the top two devices.

Moderate Performers: The iPhone 15 and Samsung S24, with MOS scores of 3.75 and 3.73 respectively, have the lowest perceived voice quality among the devices tested on Microsoft Teams.

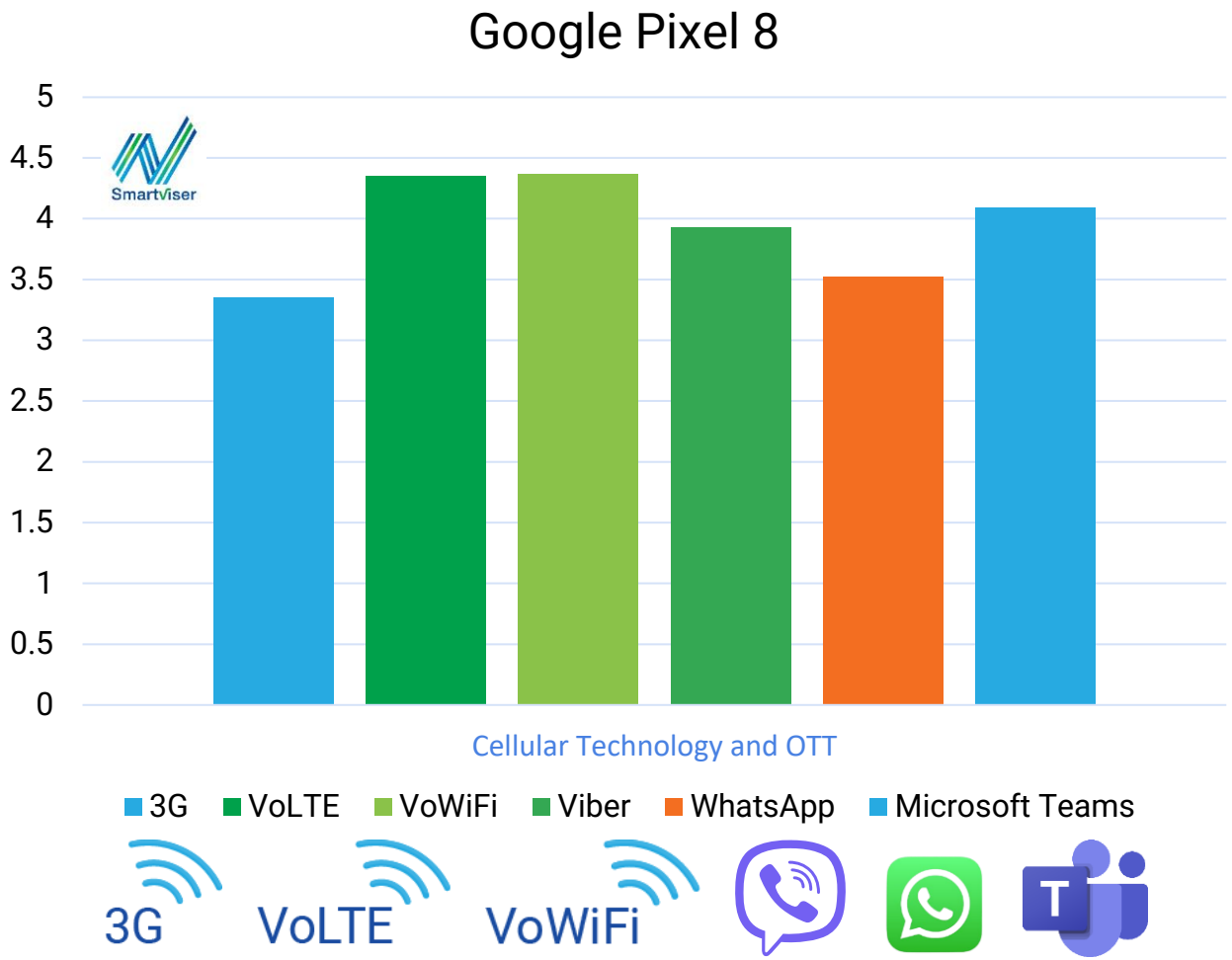
Summary Google Pixel 8

Google Pixel 8:

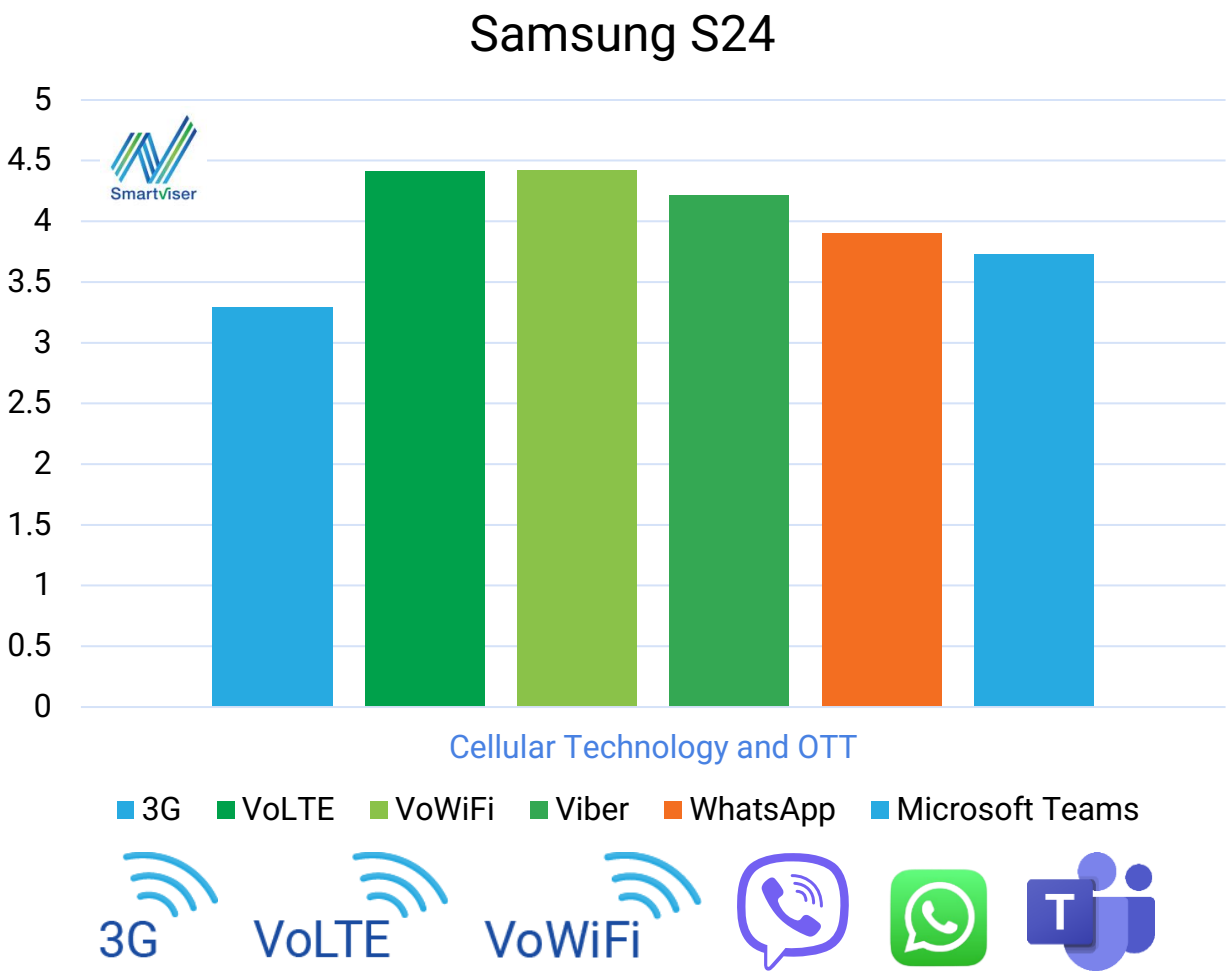
Highest Performance: VoLTE (4.35) and VoWiFi (4.37)

Lowest Performance: 3G (3.35) and WhatsApp (3.52)

Consistently performs well in VoLTE and VoWiFi, indicating strong performance in newer technologies.



Summary Samsung S24



Samsung S24:

Highest Performance: VoWiFi (4.42) and Viber (4.21)

Lowest Performance: 3G (3.29) and Teams (3.73)

Shows excellent performance in VoWiFi and Viber, with moderate performance in older technology like 3G.

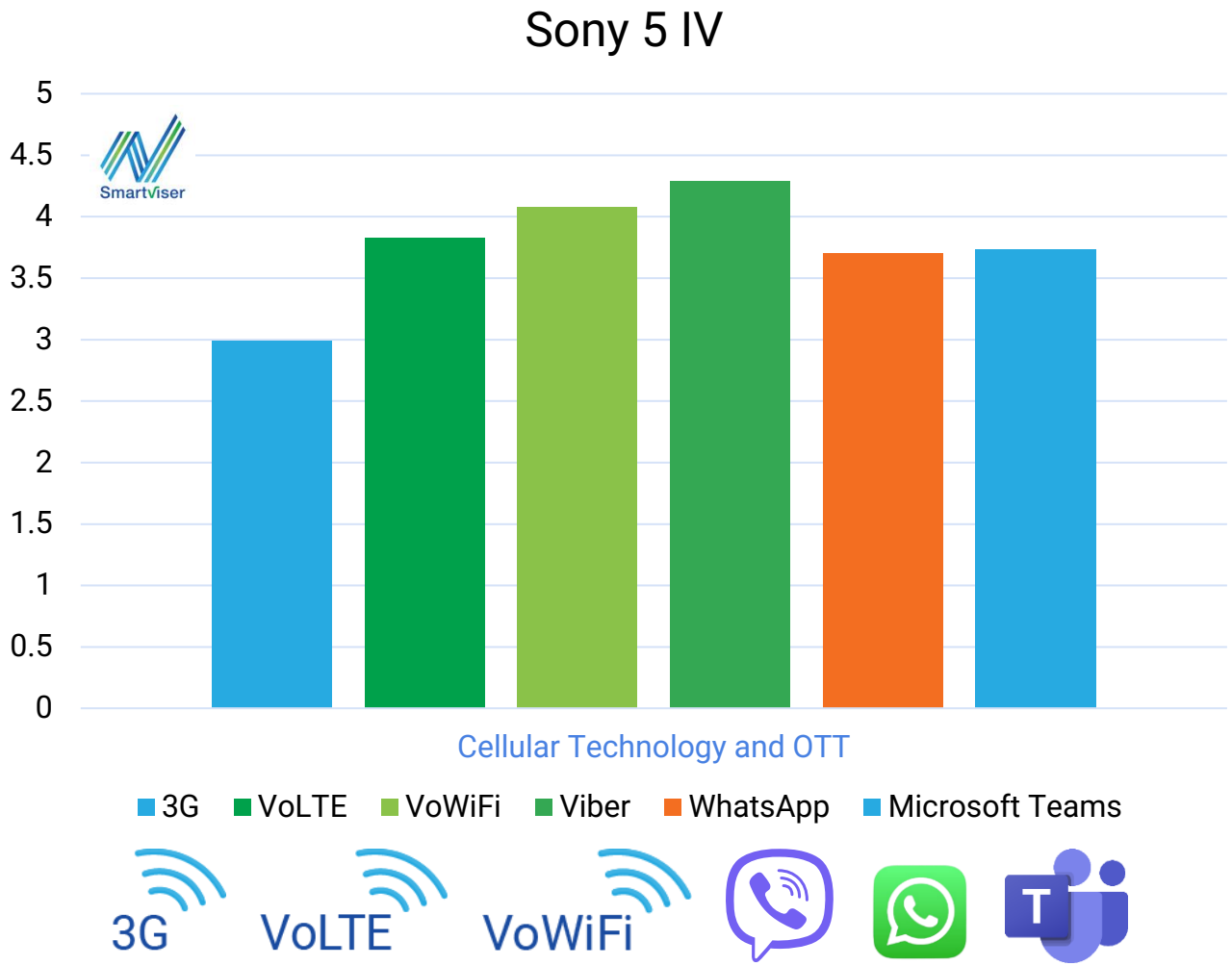
Summary Sony 5 IV

Sony 5 IV:

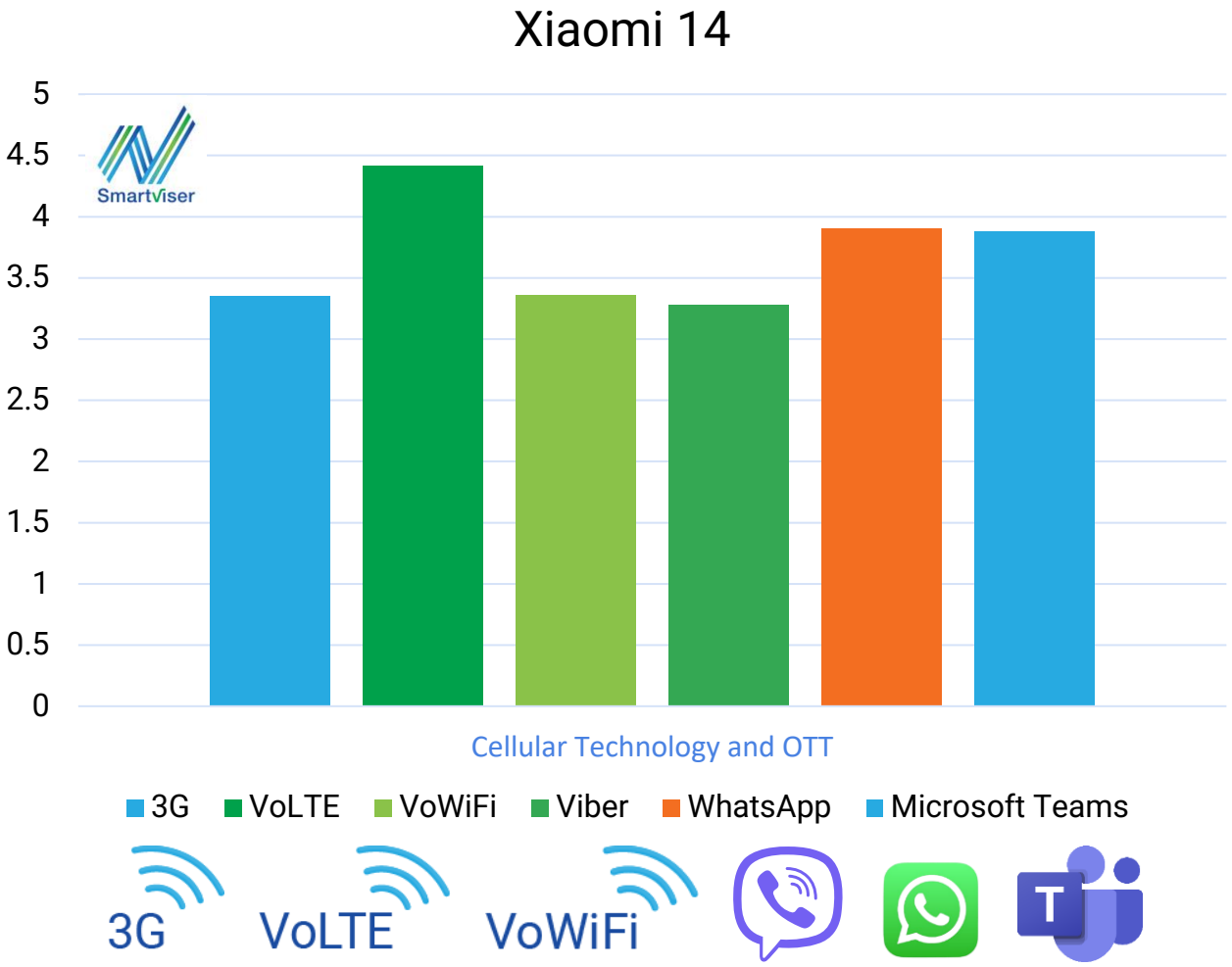
Highest Performance: Viber (4.29) and VoWiFi (4.08)

Lowest Performance: 3G (2.99) and WhatsApp (3.70)

Performs best with Viber but struggles with older technologies like 3G.



Summary Xiaomi 14



Xiaomi 14:

Highest Performance: VoLTE (4.41) and Viber (3.28)

Lowest Performance: Viber (3.28) and VoWiFi (3.36)

Shows strong performance in VoLTE but weaker in Viber and VoWiFi.

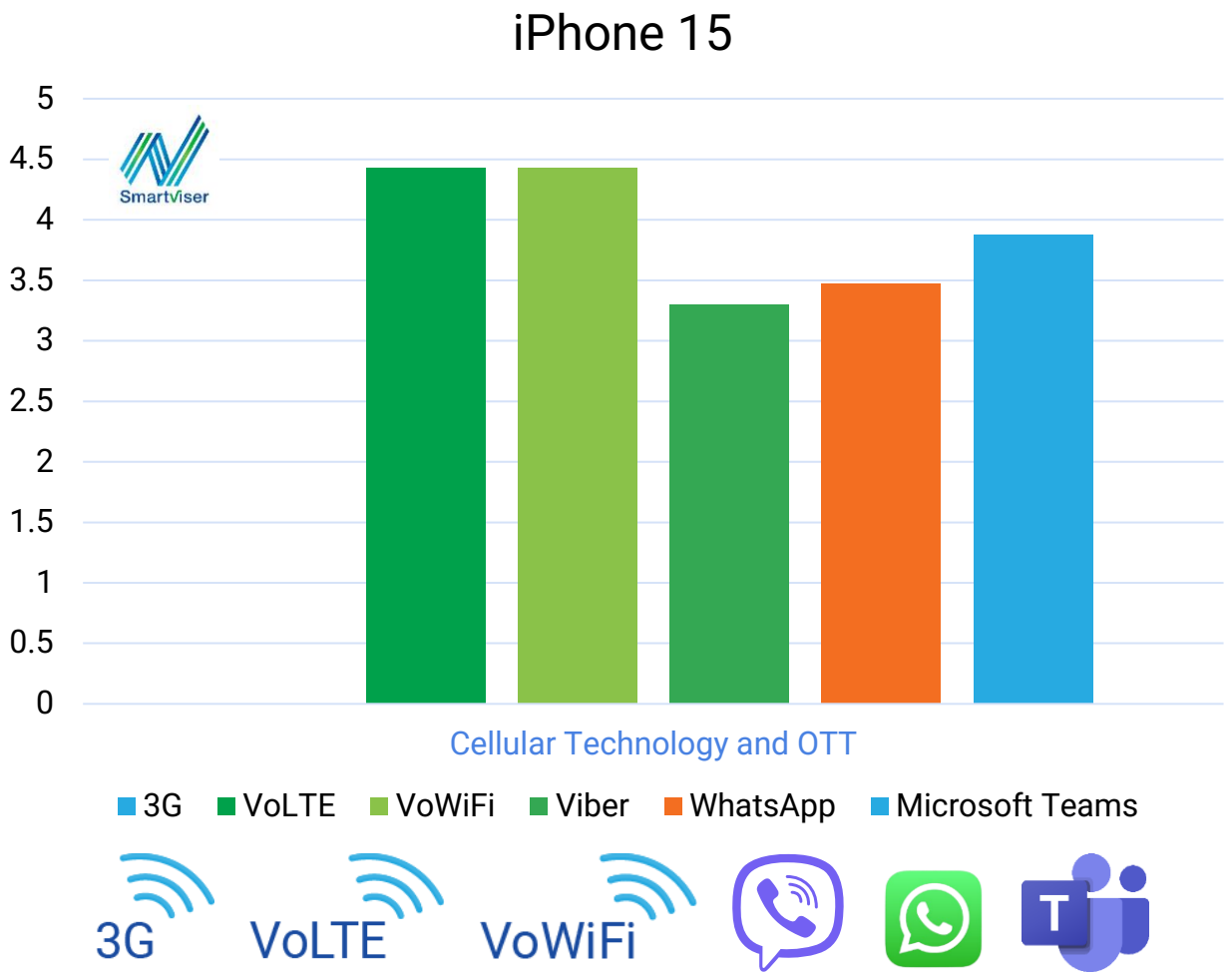
Summary iPhone 15

iPhone 15:

Highest Performance: VoWiFi (4.43) and VoLTE (4.43)

Lowest Performance: Viber (3.30) and WhatsApp (3.47)

Excels in VoWiFi and VoLTE, indicating robust performance in newer technologies.



Conclusion

Testing was performed on a live network and results will vary if testing is performed with different network and software versions in the devices.

Top Performers in New Technologies: The iPhone 15 and Google Pixel 8 consistently show high performance in VoWiFi and VoLTE, making them ideal for environments with newer communication technologies.

Consistent Performers: The Samsung S24 is a strong all-rounder, performing well across most types, especially in VoWiFi and Viber.

Specialized Performance: The Sony 5 IV excels in Viber, suggesting a possible optimization for this platform, but has room for improvement in older technologies like 3G but as main market Japan the device is fully geared towards that market.

Room for Improvement: The Xiaomi 14, while strong in VoLTE, needs enhancements in its VoWiFi and Viber performance.

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