MWC 2019

Intelligent Connectivity, 5G & the IoT ~ the Best of MWC 2019

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MWC19 Key Themes

Connectivity

Disruptive Innovation

AI

Digital Wellness

Industry 4.0

Digital Trust

Immersive Content

The Future

GSMA MWC19™ Barcelona

Key Stats:

32nd Annual MWC Event

Over 109,000 attendees, an increase from 2018

7,900 CEOs in attendance

Over 2,400 companies exhibiting

120,000 net square metres of exhibition space

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Key Takeaways from MWC 2019

- **'Intelligent Connectivity'** – This year's MWC Barcelona event focused on the connectivity around the blend of 5G, AI (Artificial Intelligence) and the IoT (Internet of Things) and the disruptive impact on a range of markets. Many of the announcements and demonstrations point to the development of future services that leverage these emerging technologies.

- **5G Network Launches Edge Closer** – As 5G networks near commercial launches, network operators and network vendors showcased their innovative 5G solutions. These will provide the future underlying connectivity for new IoT solutions and consumer devices, providing high bandwidth and ultra-low latency.

- **5G-enabled Devices Announced** – As network launches approach, a number of vendors have announced their first 5G-compatible smartphones, including Huawei, LG, Samsung, Xiaomi and ZTE. Other devices, such as 5G hubs, have also been announced as FWA (Fixed Wireless Access) services are enabled by 5G.

- **Foldable SmartphoneScreen Tech Demonstrated** – A number of smartphones with foldable screens were present in the event from vendors including Huawei (Mate X) and Samsung (Galaxy Fold). Impressively, some these units are due for commercial release later this year and are not simply proof-of-concept.

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Key Takeaways from MWC 2019 - Continued

- **RCS Messaging & Customer Engagement** – Development of the messaging technology has been steadily progressing and demonstrations this year show the potential of RCS (Rich Communications Suite) as a new rich media communication channel for brands and operators.

- **MaaS (Mobility-as-a-Service) Ecosystem Gains Traction** – Following increased focus on the automotive industry in previous MWC event, this year's event built on the partnership between Daimler and BMW to develop urban mobility solutions. The €1 billion ($1.13 billion) partnership will established 5 services including Reach Now (MaaS solution), Charge Now (EV charging), Free Now (ride hailing), Park Now (ticketless parking) and Share Now (ride sharing).

- **Progress of the Industrial IoT Accelerates** – Announcements from IoT solutions providers highlighted their ability to leverage emerging technologies, notably 5G networks. Demonstrations from vendors, including Ericsson, emphasised the impact emerging technologies will have on future IoT services.

5G Closes on Commercial Launches

Source: Sprint

Related Research: 5G Market Strategies: Consumer & Enterprise Opportunities & Forecasts 2018-2025

Related PR : *"5G Operator Billed Service Revenues to Reach $300 Billion by 2025, As Connections Near 1.5 Billion"*

- With a raft of 5G deployments looming in 2019, operators and network vendors were on hand to showcase their 5G credentials. Operators including Sprint, Verizon and O2 have all announced plans to begin offering 5G services by the end of this year.

- Operators in the US have all claimed a number of 5G 'firsts', however these do not meet the standards outlined by the GSMA. Sprint's announcement of a 5G launch in 4 US cities (Houston, Los Angeles, New York, Phoenix and Washington, DC) holds promise for the first true 5G launch in the country, with 5 further cities to follow.

Juniper's View: *Juniper anticipates that the number of 5G-capable devices will initially limit the uptake of 5G networks, however announcements of 5G smartphones from MWC 2019 have been encouraging.*

As expected the roll out of 5G networking infrastructure will be rooted in densely populated urban areas, which is well suited to small cells and the MIMO (Massive Input, Massive Output) antennas outlined in the 5G standard.

As the race to 5G network launches comes to a close, operators will shift their focus to securing a return on their 5G investment.

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New 5G Smartphones Announcements

Samsung Galaxy S10 5G

- Undisclosed price
- Available Q2 2019
- Embedded Fingerprint scanner
- 6.7-inch Quad HD+ Curved Dynamic AMOLED

ZTE Axon 10 Pro 5G

- Undisclosed price
- Unknown Release Date
- In-display Fingerprint scanner
- 6.47-inch AMOLED display

Given the impending launch of 5G networks, it is no surprise that announcements about launches of 5G-capable smartphones have been at the fore. Vendors including Samsung, ZTE, LG, Xiaomi and Huawei have announced the addition of 5G-capable devices to their product portfolio during MWC 2019.

The early stages of 5G networks will be hindered by non-ubiquitous coverage, given the staggered roll out of network equipment. As a result, these units include connectivity for previous wireless technologies, such as LTE.

Juniper's View: *Operators will be encouraged by the announcements. 5G-capable smartphones will be the channel through which operators garner the majority of their 5G service revenues. Therefore the availability of these phones is important to increasing the number of 5G subscriptions.*

Pricing for these units is yet to be announced. However if this has an excessive premium over LTE smartphones, it will hinder the adoption of 5G-capable smartphones and thus diminish the potential addressable user base of 5G connections in 2019 and 2020.

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5G IoT Devices Demonstrated

HTC 5G Hub

- Price undisclosed
- Released Q2 2019
- 5 inch display (1280x720)
- Qualcomm Snapdragon 855
- Enables the connection of up to 20 devices via Wi-Fi
- Android 9 Pie operating system
- nano-SIM input
- Bluetooth 5 connectivity

- 5G will have a significant disruptive impact on the IoT, enabling higher bandwidth and lower latency for connections. However these changes are likely to go largely unnoticed by the majority of those who have interaction with nodes on an IoT network.

- A notable announcement this year was that of HTC's 5G Hub, a device that acts as 5G FWA router and home hub. The device runs on Android 9 Pie, enabling other apps to be installed on the device.

Juniper's View: *Whilst a number of 5G FWA devices have been announced, HTC's 5G Hub is the most comprehensive consumer device. Juniper Research believes that the development of the HTC 5G Hub has been firmly focused on a commercial unit, rather than a proof-of-concept unit for marketing purposes.*

Related Research: The Internet of Things: Consumer, Industrial & Public Services 2018-2023

Related PR : *"IoT Connections to Grow 140% to Hit 50 Billion By 2022, As Edge Computing Accelerates ROI"*

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Mobility-as-a-Service Solution Announcements

Copyright BMW Group and Daimler AG, 02/2019

Source: Daimler

2.3 billion
Total Number of Private Urban Car Journeys Replaced by MaaS Solutions by 2023

Related Research: Mobility-as-a-Service: Emerging Opportunities, Vendor Strategies & Market Forecasts 2018-2023

**Related PR** : *"Mobility-as-a-Service to Replace 2.3 Billion Private Car Journeys Annually by 2023"*

• Building on the recent announcement that Daimler and BMW have partnered to combine their urban mobility solutions, other partnerships have been announced.

• SEAT and IBM have partnered to connect SEAT's urban mobility app, Mobility Advisor, to the IBM's Watson AI platform. As a result, the app will detect the best method of multimodal transport

Juniper's View: *Automotive OEMs are devising new business models that provide revenue streams beyond the sale of the vehicle itself. Cellular connectivity is enabling OEMs to play a larger role in the management and maintenance of the vehicle.*

Juniper Research believes that 5G networks will enable automotive OEMs to create urban mobility solutions through the provision of MaaS platforms.

Over the next 5 years, Juniper Research anticipates that automotive OEMs will continue to form partnerships and make acquisitions to develop comprehensive MaaS solutions. 5G will play a key role in this.

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RCS Demonstrations Show Potential
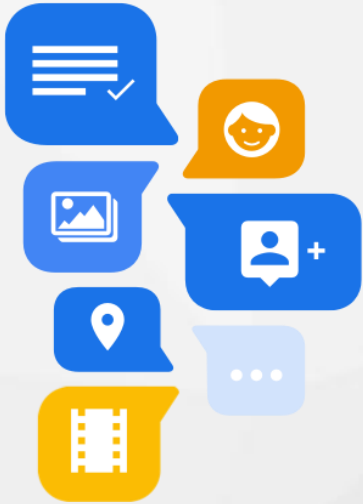
Source: Google

56 billion

Global Number of RCS Business Messages by 2023

Related Research: A2P Messaging: SMS, RCS & OTT Business Messaging 2019-2023

Related PR : *"A2P Business Messages to Reach 3.5 Trillion by 2023, As RCS & OTT Technologies Gain Traction"*

- RCS business messaging solutions will leverage RCS messaging technologies through the native messaging client on the smartphone.

- During the event, there were demonstrations of RCS capabilities from messaging service providers including Infobip, IMIMobile and Interop Technologies. Companies such as these will be vital to encouraging the use of RCS as a communication tool. Indeed, the rich media functionality of these platforms necessitate the adoption of messaging platforms for campaign management.

Juniper's View: RCS will have a large impact on operators' future messaging revenues and will eventually become the first point of interaction for RCS users on mobile devices. There is already significant interest in RCS business messaging from brands, but its appeal is limited due to the current reach of the service for brands compared toSMS.

Juniper believes that the number of RCS-capable subscribers will continue to grow as smartphone are upgraded and more vendors include RCS support. Despite RCS being heralded as instigating the demise of SMS, Juniper Research does not believe this will hold true until RCS is truly ubiquitous.

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Foldable Smartphones on Show

Huawei Mate X

$2,600 RRP

6.6 inch front display

8 inch interior display

Fingerprint reader

Samsung Galaxy Fold

$2,000 RRP

4.5 inch front display

7.3 inch interior display

- One of the surprise successes of MWC 2019 was the announcements of foldable smartphones. Huawei, Samsung and Oppo all demonstrated their first units during the event.

  a) Despite Samsung's demonstration of their latest flagship model, the S10, much of the attention has focused on Huawei mate X.

- Release dates for these models are not yet definite, but pricing for the US and Europe has been confirmed in many instances.

Juniper's View: *Whilst Juniper believes the technology is encouraging, the announced cost is likely to price out the vast majority of users in 2019 and 2020.*

If the technology is to become commonplace, then it is imperative that these prices decrease within 3 years or risk becoming a 'flash in the pan', such as 3D television and HD DVDs.

Additionally, the cultivation of new use cases, including media viewing and streaming via larger screens, will increase the value of these devices. This will be done through OS support and developing foldable phone specific mobile apps.

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Flagship Smartphone Models Announced

Samsung Galaxy S10

- OS: Android 9 Pie
- Screen size: 6.1 inch
- Resolution: QHD+
- CPU: Octa-core chipset
- RAM: 8GB
- Rear camera: 16MP + 12MP + 12MP
- Front camera: 10MP

• MWC also provides smartphone vendors an opportunity to market their new flagship phones and this year was no different. Aside from foldable phones and new 5G-capable phones, there were a number of announcements.

• Samsung displayed the next iterations of its S series (shown to the left), the S10 and S10 Plus, along with the new Infinity-O screen technology. The model includes an under-screen fingerprint scanner and a pinhole front camera.

• Nokia also announced the 9 PureView, a phone available for pre-order in the US for $699. The multi-camera set up on the back of the phone enables the depth mapping of photos.

Juniper's View: *With 5G fast approaching, smartphone technologies unrelated to 5G have fallen under the radar this year.*

Samsung's integration of pinhole cameras is a stark contrast to the notches that have been included in previous phones. Additionally, the under-screen fingerprint scanner has removed the need for the input on the back of the phone.

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AI Becoming more Accessible

Azure Kinect

Source: Windows Connect

There have been a number of small announcements regarding the use of AI in new services. These include:

- Microsoft unveiled its new SDK for it Azure Kinect. This device uses AI for sensory vision and orientation. The SDK will be integrated into Azure Cognitive Services, allowing their products to benefit from the platform's machine learning capabilities.

- Orange unveiled demonstrations about the implementation of AI into cybersecurity into its DILAN (Data Intelligence for LAN) project. AI will be used to monitor the flow of traffic over mobile networks.

Juniper's View: *As AI progresses, the use cases will expand. Microsoft's SDK will enable the average user to leverage Microsoft's machine learning capabilities, and is applicable to industries such as training, healthcare and education.*

As AI's applicability to a number of sectors increases, the availability of SDKs that leverage AI and machine learning are vital to achieving mass implementation of the technology.

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AR Takes a Back Seat This Year

Microsoft HoloLens 2

- Price of $3,500
- Currently limited to enterprise users
- Only available in 10 counties
- Snapdragon 850 processor
- 8MP camera, capable of 1080p video at 30fps
- Accelerometer, gyroscope and magnetometer
- Bluetooth 5.0 and 802.11ac Wi-Fi connectivity

This year, AR (Augmented Reality) did not have as prominent role as it has done in previous years. However, Microsoft's announcement of the HoloLens 2 highlights the company's view on the direction of AR.
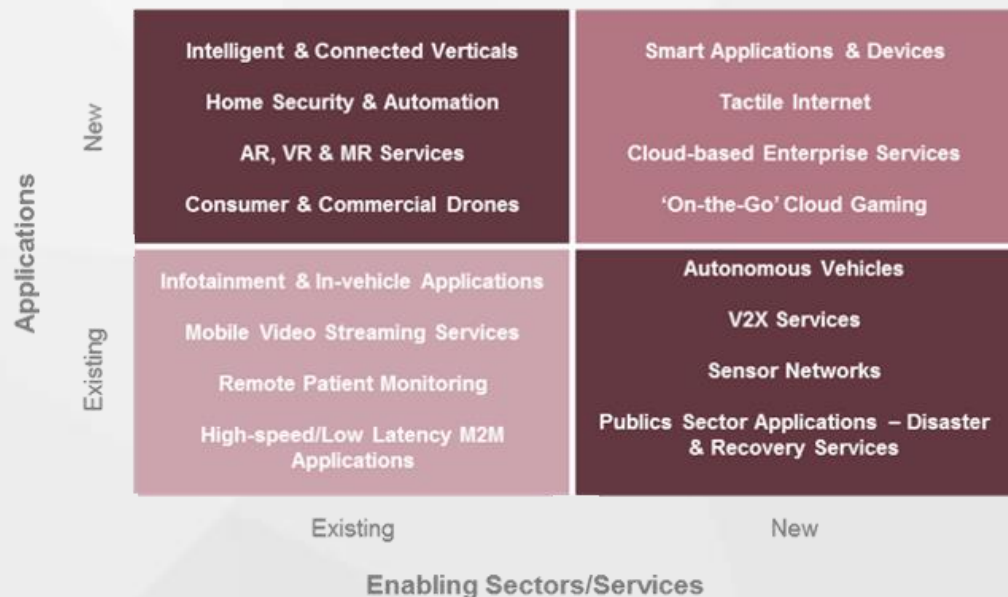
- The company is firmly rooting its future AR business in the enterprise sector. Indeed, the high price of the unit is likely to price out average consumers for home use.

- The unit is also equipped with wireless connectivity, including Bluetooth 5.0 and Wi-Fi. This is to enable the remote nature of many potential enterprise users if the correct networking signal is available.

Juniper's View: *A lack of AR and VR announcements at the event itself highlights how these technologies are likely to find more success in the enterprise space. Notably, the unit has no cellular connection. Juniper Research believes the inclusion of cellular connectivity is crucial for the remote nature of many future use cases, such as the most isolated working environments.*

Related Research: Augmented & Mixed Reality: Innovation, Disruption & Future Prospects 2018-2022

Related PR : *'"Enterprise Mixed Reality Applications to Approach 40 Million by 2022, as App Revenues Near $6 Billion"*

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Industrial IoT: Exploration to Realisation

	Existing	New
New	Intelligent & Connected Verticals Home Security & Automation AR, VR & MR Services Consumer & Commercial Drones	Smart Applications & Devices Tactile Internet Cloud-based Enterprise Services 'On-the-Go' Cloud Gaming
Existing	Infotainment & In-vehicle Applications Mobile Video Streaming Services Remote Patient Monitoring High-speed/Low Latency M2M Applications	Autonomous Vehicles V2X Services Sensor Networks Publics Sector Applications – Disaster & Recovery Services

Applications (vertical axis) / *Enabling Sectors/Services* (horizontal axis)

Source: Juniper Research

- Announcements regarding new IoT solutions targeted the industrial side of the IoT. These include:

  a) Ericsson's announcement its Einride project; a solution which leverages 5G networks to enable those at the exhibit to remotely drive an electric truck in Sweden.

  b) SAP announced SAP Leonardo Internet of Things, a platform for the industrial IoT. It will include cloud-to-cloud interoperability with Microsoft Azure IoT Hub.

Juniper's View: *Technologies including 5G, LPWAN and IoT platforms will all work together to enable monitoring and control of IoT devices.*

Juniper Research believes that the most promising of these is Ericsson's demonstration of a remotely-controlled electric vehicle using 5G networks. This will have wider impacts on other IoT sectors that require the ultra-low latency of the technology.

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Juniper specialises in identifying and appraising new high growth market sectors within the digital ecosystem. Market sizing and forecasting are the cornerstones of our offering, together with competitive analysis, strategic assessment and business modelling in the research areas listed below. Please click on each research stream for more information, or contact us at jon.king@juniperresearch.com.

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SMART DEVICES

Juniper offers a broad range of reports, and interactive spreadsheets, covering the current and future smart devices markets including smartphones and wearables markets; alongside emerging sectors including Digital Assistants, Smart Audio and Smart Toys.

INNOVATION & DISRUPTION

The prospect of super-fast 5G networks and emerging AR & VR services offer a tantalising future for the industry. In this programme we investigate the markets such as 5G, 4G LTE, VR, AR and mobile sensors.

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