GSMA Intelligence

Mobile World Congress 2015 wrap-up

March 2015

Executive summary

The 2015 edition of Mobile World Congress was busier than ever and set new records with more than 93,000 visitors convening in Barcelona over the four-day event to do business, share knowledge and set out a positive vision for the future.

The conference agenda and the exhibition both benefited from a huge increase in participation by the wider ecosystem. The event attracted executives from the world's largest and most influential mobile operators, internet and software companies, equipment providers, and companies from adjacent industry sectors such as automotive, finance, robotics and healthcare, as well as government delegations from across the globe.

Innovative technologies were also showcased by start-ups and entrepreneurs during the 'Four Years From Now' event (4YFN), while the rapidly increasing number of connected devices demoed shows the pace at which the industry is committed to making a fully connected lifestyle a reality - and continuously increasing the positive impact that mobile has on society.

The topics we have selected in this report are therefore focused on key announcements and trends spotted during Congress, with a view to highlight the changes and growth factors that industry players will be implementing over the coming years to lead the industry's transformation.

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Devices: High-end flagship smartphone frenzy

Almost all of the global handset manufacturers unveiled new flagship devices during this year's Mobile World Congress. While Mozilla's $25 smartphone made the headlines at last year's tradeshow, the stage at the 2015 event was largely occupied by high-end smartphones with advanced features and functionalities.

Key points

- Samsung unveiled two flagship devices featuring 'premium device aesthetics', its Galaxy S6 and Galaxy S6 Edge – a smartphone with a curved display on both sides. Both devices come with a 5.1-inch quad-HD screen, 16MP main and 5MP front-facing cameras and 32GB, 64GB or 128GB storage options
- HTC unveiled its One M9 flagship smartphone with a camera that features a single 20MP sensor with dual-LED two-tone flash
- Sony Mobile showcased its Xperia M4 Aqua - its first octacore 64-bit mass market smartphone - and also unveiled its Xperia Z4 tablet with a 10.1-inch 2K display
- Microsoft unveiled two new flagship devices, the Lumia 640 and 640 XL. The Lumia 640 comes with a 5-inch HD display, with dual-SIM capability in both 3G (€139) and 4G (€159). The 640 XL screen is 0.7-inches bigger with a 13MP camera and costs €189 for 3G and €219 for 4G
- Yezz, an American mobile device manufacturer, showcased a range of modules that will work with Ara, Google's project for modular smartphones currently being trialled in Puerto Rico and reportedly set for release this summer

Viewpoint: Making low-cost smartphones a reality

Last year's announcement by Mozilla of a $25 smartphone raised industry expectations regarding the development of low-cost smartphones and the socio-economic benefits these devices could trigger across low-income markets. However, our research pointed out that the mass introduction of these devices will take time, and as seen during this year's Congress, Mozilla remains a pioneer in making it happen.

Our research shows that while smartphone prices have declined since 2008 - by 30% in Asia, 25% in Latin America and 20% in Africa - the majority of smartphones in the developing world are priced above the $100 mark, whereas the 'sweet spot' for these regions is considered to be in the $25-$50 range.

During Congress this year, Mozilla announced a new category of Firefox OS phones to be launched in 2016 in partnership with KDDI, LG Uplus, Telefónica and Verizon Wireless. These devices will come in different form factors – flips, sliders and slates – in an attempt to balance basic phone requirements with the more advanced features of a smartphone, including apps, content, maps, camera, video, LTE, VoLTE, email and web browsing.

In addition, Orange announced its Orange Klif 3G smartphone, powered by Firefox and manufactured by Alcatel OneTouch. Orange will launch the dual-SIM device across 13 of its African and Middle Eastern markets in Q2 2015, with prices starting at $40 and with a view to taking mobile internet to those previously unaddressed.

Alcatel OneTouch set out ambitious plans during the show, aiming to become one of the world's top three handset players. The company expects "a bloody war on pricing" in the lower range of smartphones, while "the top-end of the market is slowing and we will face more competition as people step into the mid-range."

Devices: Breaking the operating system status quo

Developments in the smartphone operating system landscape largely centred around news from Microsoft and smaller players such as Ubuntu and Jolla. The latest flagship devices unveiled during the show were essentially running on Android. Security, privacy and Internet of Things are set to become the next key challenges that OS developments will have to adapt to.

Key points

- Microsoft announced plans to launch its Windows Phone 10 OS later this year, along with new devices in the 'flagship tier'. The company emphasised its change in focus from "mobility of devices" to "mobility of experience" through its new OS

- Ubuntu showed off their new BQ phones with a user interface different from the grid-style layouts of iOS and Android, instead aggregating information from various sources through 'Scopes'

- Firefox OS will be available from operators in more than 40 markets over the next 12 months on a total of 17 smartphones. Mozilla also plans to release a line of Firefox OS powered televisions in partnership with Panasonic

- Jolla presented Sailfish OS 2.0 via its tablet that won the 'Best Tablet of MWC 2015' award this year. The OS is intuitive and has gesture-heavy user interface

- Jolla also announced plans to launch Sailfish Secure, a new version of the niche mobile OS designed primarily for businesses and government, focussing on privacy of information

- Jolla set itself the ambitious target of forming the third mobile ecosystem after Android and iOS, ousting Windows Phone

- Marc Dillon, Jolla's COO, noted that "we are the only independent OS […] not dominated by one company's strategy." Dillon added that "we are not going to sell user data," pointing to openess, security and privacy as key success attributes

Viewpoint: Adaptability is the key rule for OS challengers

Over the past three years, Microsoft, Mozilla, Samsung, Ubuntu and Jolla have been challenging the iOS-Android duopoly during Mobile World Congress, but disruption is yet to arrive. Our research notably shows that Apple and Google are set to remain the dominant OS players for some time, thanks to the rich apps and content distributed on their platforms.

Breaking this status quo is a challenge for smaller OS players, one that can be tackled by differentiating through growing market requirements such as security and data privacy as well as wearables and other connected devices.

Online, music, gaming and video content is consumed across an ever increasing range of devices with different screen sizes, and both smartphones and tablets tend to be positioned as nodal control points. Delivering a seamless consumer experience across all devices under a unified platform is an ever-important differentiator for OS players.

With Windows Phone 10, Microsoft introduced its 'Unified app store', a single store for applications to be purchased and updated across all Microsoft devices. This proposition is a key requirement to remain relevant in the OS landscape, one that Firefox has also been emphasising. However, this proposition alone only serves to catch up with Apple's iOS, which continues to innovate and deliver a seamless and data rich experience across a wider range of connected devices — Apple's Watch is likely to be its first connected device to hit the market.

The rapidly changing technology and device landscapes call for innovation outside of the user interface box, notably to differentiate on growing segments such as data privacy and security as demoed by Jolla's Sailfish OS during Congress.

Devices: Wireless charging technologies come to the forefront

The release of the Samsung Galaxy S6 and S6 Edge smartphones has brought wireless charging technology in to the mainstream, with both devices able to be charged directly by a wireless pad without the requirement to fit a cover/backplate. With steady demand from consumers by virtue of convenience, we expect other device vendors to follow and for wireless charging technology to be commoditised over time, paving the way for further innovation in handset functionality.

Key points

- Samsung launched two flagship devices, the Galaxy S6 and S6 Edge, featuring wireless charging functionality for their embedded batteries; the smartphones also incorporate a fast charge feature offering four hours of battery usage from just ten minutes of (plugged in) charging

- Furniture retailer IKEA unveiled a range of furniture with built-in wireless charging spots that support the Qi standard used by Samsung

- Taiwanese chipset solution provider MediaTek launched the first multi-standard wireless charging solution supporting various devices including smartphones, wearables and tablets

- Huawei unveiled a new phablet, the MediaPad X2, featuring the reverse charging technology seen in earlier devices which allows it to charge other devices from its battery

- Microsoft showcased its Nokia DT-903 Wireless Charging Plate alongside its new Lumia 640 and 640 XL smartphones, with all three devices also supporting the Qi standard

Viewpoint: Goodbye charging cables?

Wireless charging has grown to be a major theme as handset vendors look to diversify themselves from their rivals. Many manufacturers, including Samsung, Nokia and Apple, have invested in this technology with a view to making power cords obsolete. While this functionality holds considerable promise for portable electronic devices, it has also attracted home appliance and car manufacturers looking to bring greater innovation to their mainstream products.

Wireless charging solutions have to overcome a critical challenge since the charging efficiency for wireless is typically lower than traditional wired charging. As mentioned earlier, the Samsung S6 and S6 Edge can provide four hours battery usage from only ten minutes charging on a wired connection, but this cannot be replicated wirelessly.

The industry is attempting to tackle this problem by reducing transfer losses and increasing the frequency at which power is transmitted, as customers begin to envision next generation smartphone designs without the burden of power ports.

So far, the mobile industry has seen the establishment of three competing standards for wireless charging: the Wireless Power Consortium (PWC) and its Qi standard, the Alliance for Wireless Power (A4WP) and the Power Matters Alliance (PMA). The latter two have agreed to join forces and collaborate on technologies, but have not yet decided how to combine their different standards into one.

Standardisation in this field is key as it will allow the wireless charging ecosystem to develop and mature rapidly, freeing consumers to carry different charging units. Meanwhile, we expect that 2015 will see further development in wireless charging driving its gradual penetration into other consumer device segments.

Devices: Wearables setting greater expectations

Wearables were well represented this year, notably with headline launches from Huawei and LG. In total there were 53 wearables on display, the majority being smartwatches and fitness trackers. Of these ten have embedded SIMs and can be used independently, with the rest relying on a Bluetooth 4.0 connection to a handset. The key focus for vendors was how to maintain engagement with consumers and how to maintain relevancy in an increasingly crowded market.

Key points

- Huawei announced its entry into the wearable battle with its high-end Huawei Watch, a round faced classic design
- LG announced two new watches, the LG Urbane and the LG Urbane LTE, with the latter having SIM capabilities, unusual for a smartwatch in this category
- Pebble announced that its Pebble Time and Pebble Time Steel would include an additional port allowing third-party developers to design 'Smartstraps' that contain additional sensors, solar cells, blood glucose monitors and other functions
- Clothing by AIQ and First V1sion featuring embedded sensors and targeted at athletes was on display, representing an exciting but as yet undeveloped area in wearables

Viewpoint: The convergence from smartbands to smartwatches

Telefónica noted during Congress that a third of consumers tend to abandon their wearables within six months of purchase, pointing to the user engagement challenge indentified last year. Various solutions were mooted with gamification seen as a major trend, particularly for fitness trackers. In truth, as with smartphones, the success of wearables will be defined by the creativity of third-party app developers.

It is likely that any wearable operating independently of the dominant ecosystems (iOS and Android Wear) will struggle to maintain relevance in an already crowded market. Nevertheless, the number of apps available for Android Wear remains low; of the 1.6 million apps available in the Google Play store, less than 200 are designed for wearables. The potential for developers is enormous and we expect apps development to take off as more wearables come to market.

As competition in the wearables market grows fiercer, companies are squeezing more functionality into their products. One effect of this is to blur the distinction between fitness trackers and smartwatches, leaving a single category of wrist-based wearables. Both the Fitbit Surge and the HTC Grip, ostensibly fitness trackers, have watch faces that receive notifications while every high-end smartwatch has a pedometer and heart rate monitor built in.

It seems that the industry has settled on a single form factor with a defined set of standards and the fashion statement associated with it. With ubiquitous functionality it has become harder for brands to distinguish their products. Design could be one way to do this but even here there is considerable overlap - see the Pebble Time Steel and the Apple Watch. Another angle has been to target specific areas of the market with highly focused products such as the FILIP watch, designed for young children.

Time will tell which approach is more successful.

Devices: A fully connected lifestyle not far on the horizon

During the conference, keynote speakers explained that the concept of a fully connected lifestyle will take many forms, and likely sectors where interconnection will first take place include transport systems, B2B, B2C, tourism and within the home. As seen at the GSMA Innovation City, a wide number of devices and solutions are already here and rapidly building the bridge towards a digital life.

Key points

- Carlos Ghosn, chairman and CEO at Renault-Nissan Alliance, claimed that driverless cars may become a reality in the next ten years. In 2016, both companies will launch vehicles that will allow drivers stuck in traffic jams to switch to autonomous mode, take their hands off the wheel, and let the car handle navigation and driving, while by 2018, the car could be put on autopilot on highways

- AT&T announced that it is in trials to license its Digital Life home security and automation platform worldwide. The operator is partnering with several vendors to provide window shades and lighting controls, IP cameras, wearables, secure medical data and smart TVs

- AT&T also noted that it has invested in four "foundries" where they are developing ways to connect "things that have never been connected before" such as putting sensors in waste bins

- Telefónica and Bluesmart partnered to develop a 3G-enabled suitcase that includes features such as location tracking, while Oral-B continues to expand its range of connected electric toothbrushes and LG Uplus demoed its skin condition diagnosis application 'Magic Mirror'

- Samsung integrated Unikey's Kevo solution into its KNOX app. Kevo delivers a touch-to-open, keyless and cardless entry option for all doors

- BSH Home Appliances predicted during a keynote that next year will see the majority of new kitchen appliances enabled for connection, including connected fridges

Viewpoint: The connected home is fast becoming a reality

According to a recent study published by GSMA, consumers have a strong interest in connecting virtually everything in their homes including security systems, thermostats, smart meters, lighting and cars, as well as health monitors, washing machines, smartwatches, activity trackers, ovens and refrigerators.

The survey, conducted among 2,000 technology enthusiasts in Germany, Japan, the UK and the US, shows that 89% of respondents are interested in having all their household devices communicate constantly and seamlessly with one another to form a completely connected home or lifestyle. Today, the early adopter family has 6.8 connected devices in their household on average, led by US and UK families.

Interestingly, Chris Boross, Nest Labs' Product Marketing Manager, explained during a keynote that to remain relevant within the connected home landscape, operators will have to find new ways to interact with the things people care most about in their homes - things that help them stay comfortable, keep them safe and save energy. Boross noted that Thread - an IP-based wireless networking protocol developed by seven companies - can "securely connect more than 250 devices into a low-power, wireless mesh network that also includes direct internet and cloud access for every device."

There is a clear need to establish standards and interoperability between different connected products or services. As such the GSMA is facilitating interoperability between solutions from different vendors and service providers, enabling industry collaboration, encouraging appropriate regulation and helping mobile operators to optimise their networks. The GSMA Embedded SIM Specification notably enables the remote provisioning of secure connectivity.

Networks: Defining 5G requirements and expectations

5G mobile networks were inevitably one of the major talking points at Mobile World Congress, and with the presentation of the Next Generation Mobile Networks Alliance (NGMN) 5G White Paper, discussions around the standards expected for the next generation of mobile networks were increasingly concrete. IoT applications were frequently cited as the major use cases which would define the requirements for new standards, but a broad range of other criteria, including improved coverage and lower rollout costs, were also frequently referenced.

Key points

- The NGMN Alliance announced its white paper on 5G, which examined the anticipated requirements of 5G and gave a range of standards recommendations

- The recommendations cover a broad range of requirements, including up to 1Gbps downlink and 10ms latency, with 1ms available for specific applications

- Some vendors and operators were keen to stress the ongoing advancements in 4G, rather than rushing ahead with 5G before capitalising on the investment made in the current generation

- Steve Mollenkopf, CEO of Qualcomm, commented that "we don't need to make a huge technology jump when LTE is providing some of this already"

- Infrastructure vendors such as Nokia, Huawei and Ericsson all demonstrated "5G" technologies, including data transfer speeds of over 2Gbps

- The virtual and augmented reality applications on display the the show will bring requirements for high bandwidth and extremely low latency if they are to be connected to cellular

- While in Europe the industry is working with the EU to deliver 5G via the 5G Public-Private Partnership (5G-PPP), there was agreement that a common global standard would be key to success

Viewpoint: Enabling the Internet of Things a key target of 5G

In spite of the broad range of criteria included under the umbrella of 5G and the lack of consensus on how this technology is to be realised, on one point there was relative consensus: commercial rollout is set to begin in 2020. South Korea Telecom's aim of an initial trial rollout at the 2018 Winter Olympics demonstrates the ambitious targets for introducing the next generation, with other operators such as NTT Docomo confirming their plans for commercial availability in 2020.

The criteria laid out by the NGMN and frequently discussed in the keynotes during Congress were clearly framed by the anticipated use cases for 5G, which included ever-increasing data usage from applications such as video, but were clearly focused in large part on enabling the emergence of Internet of Things applications.

It was clear from the keynote speeches that the operators saw 5G as vital to enabling their role within this broader ecosystem of connected devices; Stéphane Richard, the CEO of Orange, commented that 5G "must be launched at the perfect time in order to ignite the Internet of Things."

In particular connected cars were frequently referenced – particularly to highlight the requirements for sub-1ms latency connections – while a broad range of other applications such as industrial early warning systems and eHealth were mentioned in the context of reliability requirements. In addition, a number of virtual reality and augmented reality applications were being demoed during the show, stressing the need for greater download speeds and lower latency to support these use cases.

With the World Radio Conference 2015 expected to be key in providing the required spectrum for next-generation infrastructure investment, it is clear that 2015 will be a critical year in defining both what 5G will be, and how great the challenge will be in rolling it out.

Networks: Combining LTE, Wi-Fi and unlicensed spectrum

A number of emerging LTE solutions were announced and showcased during Congress, mostly driven by plans to operate LTE networks in unlicensed spectrum. These solutions aim at increasing data speeds and network capacity - setting even greater expectations with regards to 5G.

Key points

- Licenced Assisted Access (LAA) is taking shape as several vendors announced that they are enabling the extension of LTE to unlicensed spectrum; as a variant of LTE-Advanced, LAA will function similarly to carrier aggregation technology but making use of unlicensed spectrum bands

- A number of vendors including Alcatel-Lucent, Intel and Qualcomm demonstrated LTE/Wi-Fi during Congress - another variant of LTE

- On the second day of the show, Nokia's President and CEO Rajeev Suri and KT CEO Dr Chang-Gyu Hwang signed a two-year MoU regarding the establishment of an IoT lab and LTE-M (an LTE solution for M2M applications) test site at KT's premises

- Nokia and KT also demonstrated the world's first LTE-M network for interconnection of sensors – a prototype for M2M communication that links together a large number of wearables, cars and smart-grid elements running as a variant of LTE optimised for ultra-low power IoT

- During Congress, Huawei explained the technology behind its first '4.5G' smartband, launched earlier this month and powered by LTE-M connectivity

Viewpoint: Using unlicensed spectrum for LTE

While the DNA of 5G was being debated during Congress, operators stressed the need to make a return on 4G investment while network vendors showcased LTE variants. Interestingly, Qualcomm's CTO noted that "we have engineering teams working on LTE and 5G. Each time the 5G team unveil a new performance leap, the LTE engineers respond by matching it."

Operators such as Orange stressed that 4G is a success and the industry should not rush into 5G. The two LTE solutions showcased by vendors reflect the possibilities for development behind LTE.

Alcatel-Lucent promoted its LTE/Wi-Fi solution that combines the attributes of both technologies to double mobile broadband download speeds while boosting the uplink capacity by up to 50 times. This move towards combining LTE and Wi-Fi would require a software upgrade, and a deeper integration building on LWA (LTE Wi-Fi aggregation), which could then be combined with LTE-U.

LTE-U enables the operation of a secondary LTE channel in the 5GHz unlicensed spectrum band. Ericsson explained that the licensed spectrum provides an anchor to ensure a seamless user experience with full mobility, while the unlicensed band provides incremental capacity and enables faster data speeds.

While discussions on the prospects of operating LTE networks in unlicensed spectrum were driven by vendors with timelines for deployments already in place for 2016, Edgar Figueroa, the president and CEO of the Wi-Fi Alliance, speaking to Mobile World Live, restated its warning that early deployment of the technology involves risks as well as opportunities. He stressed that pre-standard systems deployed ahead of coexistence work being done in the industry could negatively impact billions of users who rely on Wi-Fi in the 5 GHz spectrum band for connectivity.

Networks: Network virtualisation is gaining momentum

The trend in Network Function Virtualisation (NFV) and Software-Defined Networking (SDN) gathered steam this year at Congress, with a series of demos and the announcements of trials and partnerships from a number of network equipment providers. While still at an early stage in its development, the promise of increased network and service agility coupled with headlines of the potential cost savings will see this topic continue to take centre stage over the next few years.

Key points

- Telefónica and Alcatel-Lucent demonstrated LTE video streaming and video calling services over an end-to-end virtualised network, while the vendor, in collaboration with Intel, China Mobile and Telefónica, also showcased its virtualised RAN which will be commercialised in 2016
- Nokia Networks announced the launch of iSON Manager, a centralised Self-Organising Networks solution, and highlighted the results from a trial with KT which showed a 40% reduction in the operator's LTE radio network energy consumption
- Telefónica and Ericsson announced an extension of their network virtualisation partnership, which will include the finalisation of a network virtualisation total cost of ownership study and an NFV roadmap to prepare the first migration steps
- Ericsson also announced a partnership with Telstra to jointly develop and execute trials of NFV and SDN solutions
- NTT DoCoMo selected Ericsson as a solution partner to provide its network virtualisation platform and cloud management for the commercial deployment of a complete virtualised evolved packet core network
- Openet and Procera collaborated with Amartus, Red Hat and Intel to showcase real-time OSS/BSS running on a virtualised environment, to demonstrate how NFV concepts can be applied to operators' IT stacks

Viewpoint: NFV/SDN to accelerate network operator transformation

Mobile World Congress 2015 saw the growing crystallisation of vendor and operator plans for Network Function Virtualisation and Software-Defined Networking (NFV/SDN). Network operators have been at the forefront of this trend to date, driving the development of these two concepts, and a number of large operator groups including AT&T, Telefónica and Deutsche Telekom re-iterated their plans for the softwarisation of their networks and IT stacks.

The drivers for this trend are clear and compelling – virtualising networks will enable operators to massively speed up business processes such as provisioning and the deployment of new services. In theory this will provide them with process agility akin to that of software-based players, allowing them to compete more effectively. In addition, network virtualisation promises lower network total cost of ownership (TCO) and the ability to extract economies of scale, which, set alongside their need to manage capital spend, forms a compelling argument for CTOs. The business imperative for NFV/SDN should also be set in the context of the overall evolution of operator's networks and services, as it will no doubt constitute a pre-requisite for the support of IoT.

This trend forms another plank in the ongoing transformation of network operators, away from their traditional network roots to become software-driven companies. However, as with previous transformation programmes, the scale of change should not be underestimated as both operators and vendors emphasised the challenges ahead. Alongside re-iterating a desire to move 75% of its network to a cloud architecture by 2020, AT&T highlighted its work in transforming its workforce and supply chain to match this new way of working. The importance of educating and training staff for a "significant organisational shift" was also echoed by Telekom Austria, who recently announced the world's first fully virtualised LTE stack.

Services: Championing trust through mobile security

Identity, trust, privacy and security all remained central themes at Mobile World Congress 2015. Based on an AVG survey, 90% of people are worried about safety and security online but only 25% will do anything about it due to the complexity of current systems. Demand to address this issue is contributing to the momentum behind the GSMA's 'Mobile Connect' identity and authentication solution. Launched at Barcelona last year, Mobile Connect is growing, with 17 mobile operators having launched services across 13 countries.

Key points

- Silent Circle launched a smartphone and tablet, the Blackphone2 and Blackphone+ respectively, with the primary focus of securing the user's privacy, while Sikur unveiled its privacy-centric smartphone, the GranitePhone

- Samsung upgraded its secure mobile platform, KNOX, offering "defence-grade features for real-time protection from potential malicious attacks," while AVG showcased its Invisibility Glasses, a wearable designed to thwart facial recognition software

- ZTE's flagship smartphone, Grand S3, unveiled during Congress uses eye biometric authentication to unlock the device, while Qualcomm introduced a 3D fingerprint authentication platform based on ultrasonic technology that also eliminates the need for passwords - a typical consumer has 26 online user names and 5 different passwords

- Ericsson and Intel Security have announced a partnership deal to create a solution targeting mobile operators' network security. It will provide them with a data centre and software to manage all aspects of the cloud, and also allows non-cloud providers to compete against the biggest names in the industry by providing them with a competitive edge

- BAe Systems' financial crime unit explained that Big data techniques can help to model fraud threats and fine-tune detection algorithms to secure IoT

Viewpoint: Trust is the new currency

Security, privacy and identity are now a major focus of the mobile industry. Yet collaboration among mobile operators - notably to back Mobile Connect - is imperative to success this year, to avoid losing momentum and missing the opportunity.

Following a string of high profile security breaches, it is clear that mobile users are becoming increasingly conscious of mobile security, privacy and identity. The focus and level of discussion of these topics in Barcelona demonstrates the extent to which the wider mobile ecosystem is now making major moves to respond.

The event showcased security, privacy and identity-related initiatives in a range of different areas from devices and handsets to end-user software and cloud security. Likewise various service providers in other verticals (e.g. banking) spoke of a focus on security and identity, and showcased various individual efforts to tackle these issues within their digital businesses. Meanwhile operators demonstrated a growing number of Mobile Connect deployments.

In this context, one operator commented that security, privacy and identity "should not be used as a differentiator." The implication is that while separate and isolated efforts may be an important part of the solution, and will result in more options for end users, these must be paired with an overarching collaborative effort in order to address issues of security, privacy, and identity at a macro level, and at scale. The opportunity for the mobile industry is arguably not simply to solve specific privacy and security problems for end users, but to reposition the entire industry as the guardian of personal data and build universal 'trust equity' as an intangible but real asset that every party in the ecosystem can leverage and benefit from in future. More than one speaker commented that "trust is the new currency." What remains to be seen is whether the mobile industry has the appetite to fully own it.

Services: Mobile devices at the heart of contactless payment

Mobile commerce and mobile money were hot topics at this year's Congress - all players are gearing up their strategies, and operators are no exception. New mobile payment initiatives were introduced by Samsung, Google and PayPal, while wearables looks set to become an increasingly compelling mobile payment companion.

Key points

- Samsung announced its Samsung Pay solution, enabled by both NFC and the magstripe-based MST technology meaning that in the US it will be compatible with more than 90% of PoS terminals
- Optus announced that its mobile payment solution, Cash by Optus, is compatible with a new smartwatch which features an NFC antenna and a payWave chip
- Google announced Android Pay, a platform for developers that enables them to integrate mobile payments into their apps with an API layer
- PayPal, which in 2014 processed $168 billion of payments, is increasingly active in contactless payments, and unveiled its NFC-enabled PayPal Here Chip and PIN reader at the show
- Visa and Bharti Airtel have struck a deal that will introduce new digital payment services to the operator's existing money subscribers in seven of the 17 African markets where it has a presence
- MasterCard and the Egyptian government unveiled a partnership to create and introduce a digital ID programme that links citizens' national IDs to an existing interoperable national mobile money platform
- According to the GSMA's Mobile Money State of Industry report, Mobile money services are available in 61% of developing markets with more than 100 million active accounts in 2014

Viewpoint: From collaboration to interoperability, the road to growth

Much of the talk at Congress centred on the further development of digitalised monetary solutions for the unbanked. According to Ajay Banga, President and CEO of MasterCard, there are 2.5 billion people in the world today without any sort of bank account and many more account holders not using their bank. Yet, while mobile money solutions have been implemented to address this, a main barrier to their success is a lack of interoperability.

As most mobile money vendor systems do not work with other mobile money systems or traditional banking structures, users risk "becoming an island" where they can bank with each other but are excluded from the wider world.

Tine Wolebekk, Head of Financial Services at Telenor, noted that market leaders should not be afraid to give away position by working with other businesses, comparing most current systems to a bank where users cannot transfer money to other banks. Despite this, Easypaisa, a Telenor-owned mobile money operation in Pakistan, is interoperable with traditional banking and has the ability to serve users of other operator networks.

Tomasz Smilowicz, MD and Global Head of Mobile Solutions at Citi Transaction Services, also believes in an interoperable system between providers, claiming that regulation is an obstacle to the development of solutions for the international market - with demand particularly acute in high migration markets like Malaysia.

The GSMA's priorities focus on scale (which requires close cooperation between operators and the banking industry) and is supporting in-market implementation projects, engaging with card schemes with compelling propositions including mobile identity, in order to leverage their digitalisation/tokenisation platforms.

Services: Google expands mobile strategy with MVNO deal

Rumours that had been circulating since January were substantiated when Sundar Pichai, Google's SVP of Products, confirmed that the company is planning an MVNO service in the US. Pichai stressed that Google does not "intend to be a network operator at scale," but rather that its "goal here is to drive a set of innovations" in the operator business. He compared the approach to its Nexus smartphone programme, where Google has achieved "enough scale to make an impact" in terms of showcasing the company's mobile products and services, while leaving more established device vendors to serve the mass market.

Key points

- Pichai stated that Google is looking at "hardware, software and connectivity together" to drive innovation and demonstrate what is possible, "so if operators see good ideas they can adopt them"
- Specifically, the company is "thinking how Wi-fi and cellular networks work together" and "how can you make that experience seamless", suggesting a 'Wi-Fi first' business model (similar to e.g. Republic Wireless in the US) for voice and data switching to the cellular network when the user moves out of Wi-fi range
- A potential key feature of the service could be where "two people are making phone calls and your call drops, maybe you can connect it back automatically"
- Google is "working with carrier partners" rumoured to be Sprint and T-Mobile, however this remains to be confirmed
- Allowing users to switch between two operator networks and Wi-fi will require new software in the radio antennae of devices, suggesting that Google's service will initially only be compatible with certain handsets, e.g. a specially-configured version of one of their own-brand models such as the Nexus 6

Viewpoint: The potential for a 'Wi-Fi first' operator model

The US MVNO market is overcrowded, with 113 live MVNOs as of March 2015, and does not generate high ARPU levels. Furthermore, a network that will reportedly only be compatible with one handset is unlikely to gain traction quickly, so it is clear that this move is part of a wider strategy by Google - the ultimate goals of which are making mobile data services more widely affordable and driving increased usage of its internet applications.

It seems likely that Google will follow the model of another MVNO, Republic Wireless, and modify Android in order to operate on a 'Wi-fi first' basis, handing off seamlessly to the cellular network only when Wi-fi is unavailable. A multi-operator MVNO using Sprint and T-Mobile's networks combined with Wi-fi could provide better coverage than any other MVNO or indeed MNO, and the prospect of automatically reconnecting dropped calls will appeal to potential customers.

Meanwhile, offloading a large proportion of voice and data traffic from the cellular network to Wi-fi could significantly lower operator costs. Thus there is the potential for Google to offer connectivity at very low prices, which could also be combined with zero-rated access to its internet services such as YouTube and Google Maps.

This type of tariffing approach would attract customers and allow the MVNO to gain scale, and with sufficient innovation on the software side could increase Google's presence in the app-based world of mobile (where services such as Search are less relevant).

Despite Pichai's comments about scale, there remains the potential for mobile connectivity to become an important standalone business for Google over time. This appears to be a possibility considered by Sprint, which has reportedly reserved the right to renegotiate its contract with Google if connections reach a certain level.

Services: Partnerships continue to drive M2M/IoT opportunities

This year's Congress saw a flurry of collaborative announcements involving players from different segments of the M2M and IoT ecosystem.

These partnerships include, but are not limited to, mobile operators partnering with companies in adjacent industries to expand into new segments. Other key announcements incorporate wider adoption of SIM specifications, platform providers expanding geographic reach and partnerships between operators – reducing the risk of fragmentation as the IoT and M2M markets develop.

As multiple industries come together to bring IoT to reality, the partnerships and alliances highlighted below represent a cross-section of the announcements made at Mobile World Congress:

Key points

- Leading M2M operator alliances backed the GSMA Embedded SIM Specification
- Jasper announced partnerships with Salesforce, SAP and China Unicom extending device and geographic reach
- Telefónica and KT have partnered to promote the FIWARE platform for IoT. The FIWARE platform provides a set of APIs that "ease the development of Smart Applications in multiple vertical sectors"
- Tele2 and HCL announced a strategic partnership focussing on healthcare applications
- Huawei and Jawbone struck a deal that will see Jawbone's health and fitness app integrated into a wide range of Huawei wearable devices and selected handsets
- LG Uplus has partnered with Ooredoo on home IoT starting with Mom Car 2, a video-based home monitoring platform

Viewpoint: Partnerships are key to maximising the potential of IoT

The GSMA announced that the operator members of the Global M2M Alliance and the M2M World Alliance will deploy solutions services using the GSMA Embedded SIM Specification for remote over-the-air provisioning of M2M. This means that nearly 65% of M2M connections are now serviced by operators deployed or committed to the GSMA solution, helping to reduce the risk of fragmentation.

Platform and software partnership announcements from Jasper and Telefónica (among others) highlight the drive to ensure compatibility across solutions, lowering manufacturing and deployment costs. Mobile operators are also cooperating to provide leading services across wider geographic areas – reducing development costs.

Vertical partnerships remain key to creating seamless user experiences. The announcements made at Congress are only a small indicator of the partnerships that exist between mobile operators and companies with adjacent industry expertise. The combination of these assets will ensure consumers in various industry segments can enjoy the benefit of connectivity without any loss of functionality.

Continued development of partnerships and alliances between and across the vertical and horizontal segments are key to preventing fragmentation in M2M and IoT.

GSMA Intelligence has recently highlighted the key growth levers that are needed to drive M2M above our current forecast of one billion connections in 2020 to a possible high growth scenario of two billion connections by that time. The creation of meaningful partnerships incorporating leading players from diverse industries will be one of the key elements in realising the maximum potential in this space, and we expect that many more partnerships will be announced over the coming months.

Services: Broadening the game from M2M to IoT

M2M and IoT solutions featured heavily during Mobile World Congress. This is not surprising given the projected size of the IoT market, which industry estimates are putting at between 20 and 50 billion connected devices by 2020. The IoT theme permeated the entire event, with multiple stands exhibiting products and services, including wearables and connected cars. An adjacent IoT showroom, entitled 4YFN (4 Years from Now), was held at Fira Montjuïc, where start-ups showcased their IoT applications.

Key points

- M2M is an integral part of the Internet of Things (IoT), which describes the coordination of various machines, devices and appliances connected to the internet through multiple networks
- Telefónica Open Future, China Unicom and THTI launched a joint global call to to detect and accelerate innovative start-ups in the IoT space
- At the GSMA Innovation City, the European Union's Sunseed research project demoed the use of a SIM card that can support remote provisioning (eUICC). Regardless of access type communication (mobile, wireline, PLC), the eUICC assures secure authentication and information transport. In this scenario, the operator acts as a 'trust manager' and enables the remote management of the credentials stored in the device
- Some operators are already looking beyond IoT. Lee Sang-chul, LG Uplus' Vice Chairman said that "a war is about to break out in this new market called IoT [...] Not too far in the future, we will experience the age of the Internet of the Brain, when machines and software will be able to predict what people need and want"

Viewpoint: Security is key for the Internet of Things

Increasingly, operators' and vendors' rhetoric is moving away from M2M towards IoT and the difference between both becomes blurred. A number of operators we have spoken to now refer to IoT as what was once defined as M2M. For example, Verizon defines IoT as M2M technology enabled by secure network connectivity and cloud infrastructure, to reliably transform data into useful information for people, businesses, and institutions.

During a keynote, Ralph De La Vega, AT&T's President and CEO, showcased AT&T's vision of the connected lifestyle where home, cities and cars are connected by a smartphone - a "remote control of life." He added that "security is the number one priority." This point was also raised by Telefónica, noting that the "cost of security is increasing rapidly with IoT," due to the use of multiple technologies and involvement of various parties, including start-ups.

This creates a new challenge and potentially raises a need for a role of a trust manager. Mobile operators are well positioned to play this role, as Greg Roberts, iControl Networks, noted: "Operators are trusted with data privacy/security, which is a big issue of concern for consumers."

The IoT space, which spans both the public and private sectors, is attracting new players to the mobile ecosystem. As they develop specialist devices and solutions, these players may be unaware what threats they face. In some deployments, security and privacy are not always considered at the design stage and the resulting solutions may need to be modernised.

Many of the technical requirements that have to be implemented to create secure M2M and IoT devices and services already exist within the documentation that operators have created for mobile handsets and cloud services. Repurposing this work for the IoT market is an important phase to consider.

About GSMA Intelligence

GSMA Intelligence is the definitive source of mobile operator data, analysis and forecasts, delivering the most accurate and complete set of industry metrics available.

Relied on by a customer base of over 800 of the world's leading mobile operators, device vendors, equipment manufacturers and financial and consultancy firms, the data set is the most scrutinised in the industry.

With over 13 million individual data points (updated daily), the service provides coverage of the performance of all 1,140 operators and 1,153 MVNOs across 3,505 networks, 65 groups and 236 countries worldwide.

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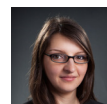
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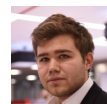
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