Xona Partners at MWC 2015
Trends and Business Impact

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If there's a single theme to sum up this year's MWC, it is the acquisitions that were announced. A number were announced and many are yet to be announced: NXP's acquisition of Freescale ($11.8 bllion), HP of Aruba, Mitel of Mavenir, CommAgility of MIMOON are but a few examples. Consolidation is a natural outcome for an industry that transcends communications to offer multiple services including but not limited to entertainment, education, and financial services. So in a clear trend, we find more focus this year on how to enable mobile network operators (MNOs) generate more revenue as opposed to a focus on performance which is characteristics of past years. This represents a new level of maturity in a number of products and solutions that initially were brought upon as a mean to enhance performance but since have morphed into tools to generate revenue. It is also an acknowledgement that the status quo for MNOs characterized by eroding margins (EBITDA margins have dipped below 40% down from low 50% range a few years ago) has to change whereby data services are better monetized.

Additionally, a few other themes come through loud and clear at this year's event. Convergence, virtualization and immersion are key words. None is really new, with convergence and virtualization being hyped in the past. But together, they are charting a path to redefine telecommunications. As for immersion, the focus towards consumer experience requires greater integration, compatibility and interoperability that is lacking still, but when it happens, it will provide the consumer with an 'immersive' experience and MNOs a tool to better monetize data services.

With this foreground, we lunge into some of the highlights and attractions:

Market disruption with Wi-Fi aggregation. Neither small cells nor carrier Wi-Fi has seen the expected traction to date. But now operators can leverage Wi-Fi for a secondary downlink channel to boosts throughput. This solution was demonstrated by a number of vendor including Qualcomm, Alcatel-Lucent and Intel. Small cell vendors watch out! The business case for small cells is predicated on demand for scarce capacity. Wi-Fi aggregation un-taps large swaths of unlicensed spectrum using already deployed Wi-Fi access nodes through software upgrade. This is powerful and threats to stunt the small cell market by relegating it to a mainly coverage solution as residential femto cells are. This is a highly disruptive proposition.

5G Hype machine ramps up. What was just an acronym last year is now exhibited in simulated demos by some of the large infrastructure vendors such as Ericsson, Qualcomm, and Intel and operators such as KT. Companies are putting their versions of what 5G is and is not, and alliances are being formed (e.g. SKT and Nokia). The process of standardization awaits the industry to define what it wants from 5G and there's no shortage of opinions. Spectrum is yet to be defined, but will be on the agenda for WRC-15 later this year. As for requirements, the general consensus is on the need for scalability and power efficiency in addition to capacity which is not the sole driver. This is bound to force changes that will reverse some architectural decisions implemented in LTE to take advantage of technologies such as NFV and SDN. Nevertheless, from our vantage point in 2015 we ask: how will operators justify building 5G when OTTs continue to erode the margins of MNOs? And, what are the use cases that will generate the revenue streams that will pay for the massive investment 5G requires?

M2M sensors coming of age. The sensor market is growing with products being showcased across the board by various vendors. M2M gateways have come a long way. A small company Wyconn showed home gateway under $75 range with Wi-Fi uplink and industrial gateways in the $120-200 range with 4G uplink, and ability to configure a router remotely through the gateway.

This is a good step towards making price sensitive industrial M2M feasible.

Connected Health making inroads. Perhaps what best exemplified developments in Connected Health, was showcased at the Qualcomm Life event where a team from UK spoke about going beyond pilots, and how business models, technology and processes moved forward greatly over the last one year. Studies have now proved substantial decrease in unnecessary readmissions – going from more than 50% to zero and resulting in great savings in public health money. A team from Germany spoke about the deployments in that country and how nurses have been stonefly supportive of the connected health initiative, given that Germany will have a drop of 10,000 general practitioners over next 5 years.

Towards big data. Big data solutions are once again positioned as the enabler for new telecom operators business models. Telecom operators, who have attempted developing their own in-house big data solutions, have had a timid success. The solution providers of big data models (IBM, SAP, Oracle, etc.) are in direct competition with traditional telecom solution providers who are pitching their own offering (Cisco, Nokia, Huawei, Ericsson, etc.). Reality is that the mobile operators are yet to finalize the prerequisites for developing successful big data strategies, which includes re-architecting their IT backend, data collection models and re-organizing their internal processes to have the IT teams work in conjunction with their marketing and customer facing teams.

Mobile Edge Compute makes an entrance. MEC is perhaps the way operators will leverage to generate additional revenues from data services. Placing applications closer to the user is an old idea, but now it has a formal name and activity effort to enable it in a structured way through the recently formed ETSI SIG dedicated to MEC. Intel, Nokia, Huawei, Alcatel-Lucent, NTT Docomo and many others are supportive and active in realizing this objective, of course by leveraging general purpose processors that can be flashed with specific applications suitable for the context of the market or area of deployment.

License Assisted Access taking shape. LAA made an entry with a few demonstrations by several of the major vendors. LAA enables operating a secondary LTE in the 5 GHz license exempt band. This provides performance boost in capacity when demand is greater than what the primary LTE channel operating over licensed spectrum can provide. LAA is emerging as a technology for small cells especially in market like the US where FCC rules allow its implementation. The technology has been favored some players like Verizon while others such as AT&T and Cisco had reservations. This emerging technology promises tighter integration with LTE than Wi-Fi aggregation which leverages more favorable commercial context due to the large number of deployed Wi-Fi access nodes.

Smart cities. Being the host city, Barcelona had the opportunity to showcase its smart city solutions with a direct tie-up to evolving IoT solutions. The Barcelona urban city laboratory demonstrates the depth and breadth of these solutions in areas as diverse as energy saving, transportation optimization, mobile health and education. Along with Barcelona, various cities have show-cased their progress in developing their own smart-city solutions. We expect that the next 2-3 years will see smart-city ecosystems becoming the central framework for developing a variety of IoT solutions with evolution towards a truly smart city being an incremental development that goes hand-in-hand with progress on the regulatory and policy frameworks.

Cloud RAN advances. Goodbye small cells and hello Cloud RAN! Over the last few years, operators

experimented with small cells and came across myriad of problems that are difficult to resolve. The main issue if the high capex and opex for small cells as well as performance problems. Cloud RAN offers a way to reduce capex and opex and provide enhanced performance. While this is too good to be true for many operators without their own fiber assets, those who do own fiber cannot ignore the benefits. It's no surprise then that ALU, Intel, China Mobile and Telefonica teamed up is a demo of Cloud RAN in addition to other demos by a few other vendors. We see other players getting in on the act this year, like silicon vendor Cavium with highly scalable processing to enable a form of Cloud RAN that also enables mobile-edge compute features. One thing for sure: vendors now have a much clearer idea on how they will implement Cloud RAN.

IoT in natural progression. The Internet of Things was at the peak of the hype cycle in 2014, so it can only be downhill from now, right? Absolutely not! We are clearly at the early stages of IoT 2.0. This was evident by the presence of IT solution and service companies looking to provide backend solutions and services that leverage connectivity of devices. Intelligence and security are the game here. Companies such as IBM, SAP, and many others are moving fast to adapt solutions for this nascent segment. On the other hand, alliances continue to emerging to tackle interoperability and compatibility in connectivity and management, a trend that we expect to accelerate with the industry titans like Apple, Samsung, Google, IBM, Intel and others fighting it out on different fronts. Aside, in an interesting note, this year and for the first time, a session was dedicated to IoT startups to pitch their wears and ideas. More to come on IoT!

Voice over Wi-Fi catching on. Interest in VoWiFi is on the rise and for good reasons. Wi-Fi is in every enterprise and if carriers can route voice calls over Wi-Fi, it kills many birds in a stone: offload macrocells and avoid capex related to small cells. The driver behind indoor small cell volumes is voice traffic as data can be offloaded to Wi-Fi anyway. With VoWiFi, the business case for small cells takes a step back.

Wireless fronthaul is maturing. More operators are looking to leverage existing real estate assets to reduce operational expenses. This requires the ability to transport CPRI over the air as fiber is not always available everywhere. A couple of years ago, Ericsson demoed CPRI over microwave for the first time. This year, there were multiple wireless fronthaul solutions commercially available or under test from companies such as E-Blink, DragonWave, Ceragon, Fujitsu and NEC. While we expect CPRI over wireless to be a niche market, backhaul vendors are looking for new ways to improve sales in a difficult market.

Mobile payment models. Mobile payment solutions are at a crossroad with the largest credit card vendors continuing to bring their solutions to market, the telcos slowly acknowledging that their efforts in this area haven't been conclusive, and the banks realizing that mass-market adoption will take much longer than thought. Partnering with the lead smartphone ecosystem providers (Apple, Samsung, etc.) is at the core of the strategy of these various players. The market is still very fragmented, with the smaller mobile payment players progressively disappearing. The various payment models and challenges to overcome are clearly distinct between the developed world, where the business case is around the creation of an integrated e-commerce solution and the developing world where the business case is around being a substitute to traditional banking models.

Open source and mobile operators. Open source providers are making big headways in the telecom space with a focus on cloud and big data solutions. Specifically, players like Ubuntu and Cloudera have in a short lapse of time defined mobile operator-specific offering with a focus on the creation of the appropriate ecosystems within the telco environments. With this in mind, various discussions with telecom operators demonstrate that, here again, there will be a slower path in adopting these solutions, with the risk of being bypassed by the emergence of a large number of dedicated managed services providers that would be offering such services in partnerships with telcos, as opposed to the telcos offering them directly.

An SDN/NFV world. It was pretty hard to find any telecom vendor that didn't pitch their own SDN and NFV solutions. At the same time, it was pretty hard to find customers that had moved into large-scale commercial NFV/SDN deployments as soon as one moves away from the data center. A close look at vendors' solutions shows that most SDN pitches are a repositioning of their own EMS/NMS solutions with augmented automation and a very limited support for inter-vendor support. NFV offerings are for now limited to what we see within the data center in terms of switching/routing and to some extent security firewalls and load balancing, with the same for SDN solutions as demonstrated by Cisco, Juniper, Brocade, NEC and few others. Along with this, the mobile operators are still in the process of working out the appropriate business models to take advantage of SDN/NFV in the RAN and the EPC packet core, with most models centered on the rollout of advanced MVNO services (IoT-based, OTT-based, consumer brands wholesale-based, etc.). Google pitching their own data-centric solutions, the same way various other players are attempting to develop (in Japan specifically) may provide additional incentives to deploying such SDN/NFV models in the core of the mobile networks.

App universe expanding but remains the same. Compared to last year, many application providers were on hand as innovative marketing approaches were demonstrated. Yet, the market is still dominated by the established players. It is evident by looking at the exhibitors in the in the 'app planet' that it is easy to enter this highly competitive segment, but it is extremely difficult to live up to expectations and generate significant RoI. Nevertheless, mobile marketing is growing at a rapid pace by leveraging larger devices and screens to provide exciting customer engagement services such video streaming and interactivity plugged directly into a mobile commerce ecosystem along with mobile payment. While Apple Pay generated a lot of attention, many players have already build a strong presence and local awareness. In particular markets such as Korea and Japan have sophisticated services with increasing customer acceptance. Apple, watch out! It will not be all Apple Store!

Country / city stands. As it was the case at MWC 2014, it was very refreshing to wonder by the various country pavilions as they hosted a lot of their startups. Canada, Sweden, Japan, Israel, Korea, Romania, Turkey among others were fairly impressive in terms of innovation. Also, it was interesting to see various startups working in an environment that mimics and adapts some of the well know Silicon Valley models especially those related to engineering development models and go-to-market approach.

Notable mentions. There were some interesting outdoor small cell backhaul systems such as the one from Interdigital that uses a Peraso 60 GHz 802.11ad solution and features an adaptive array antenna that makes significantly reduces deployment effort. Nevertheless, our outlook on the outdoor small cell market is tempered with developments on the macro cell site where six sectored macro-cells will see greater traction (Asian operators taking the lead in such advances

with Docomo in this case moving to such architecture).

While the above points are far from being comprehensive of the entire event and industry, they do represent a glimpse of the market pulse. MWC remains an invigorating event where ideas can be exchanged and relationships are built that will help in driving future developments. As to what these developments will be, a keen eye for current developments coupled with a good understanding of the evolution of the industry can help in predicting, while leaving room for disruptions that occur occasionally.

Finally, congratulations to Barcelona and GSMA for hosting a top-notch event. See you at MWC 2016 Barcelona!

Acronyms

5G	Fifth generation
CPRI	Common public radio interface
EBITDA	Earnings before interest tax depreciation and amortization
EMS	Element management system
EPC	Enhanced packet core
FCC	Federal Communication Commission
IoT	Internet of Things
LAA	License assisted access
LPWA	Low power wide area
LTE	Long Term Evolution
MNO	Mobile network operator
MVNO	Mobile virtual network operator
MWC	Mobile World Congress
NFV	Network function virtualization
NMS	Network management system
OTT	Over the top
RAN	Radio access network
RoI	Return on investment
SDN	Software defined network
VoWiFi	Voice over Wi-Fi

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