Highlights of the GSM Association's Mobile World Congress in Barcelona, 14 – 17 February 2011

This briefing note provides a personal account of selected highlights from attending the GSM Association's Mobile World Congress in Barcelona, Spain, 14 – 17 February 2011. While every effort has been made to ensure that the content is accurate, you should verify relevant facts for yourself before relying on the information contained herein.

Nokia-Microsoft

Much of the talk among the record-breaking number[1] of people attending this year's GSM Association's Mobile World Congress in Barcelona, was about the recently-announced tie-up between Nokia and Microsoft that will see Nokia abandoning its own Symbian operating system (and the MeeGo OS initiative that Nokia announced with Intel last year) in favour of adopting Microsoft's Windows Phone 7 operating system for a future range of Nokia smartphones.

For Microsoft, the deal with Nokia offers the prospect of Windows Phone 7 becoming one of the top few large-scale mobile operating systems, alongside Apple's iOS and Google's Android (as Nokia remains in first place[2] among mobile phone manufacturers, despite some recent decline).

For Nokia, the deal with Microsoft offers Windows Phone 7 OS, which has been favourably reviewed, despite appearing on only a few mobile phones so far[3], though it will take up to a year for the first Nokia Windows Phone 7-based smartphones to appear. The challenge for Nokia will be not only to launch a range of Windows Phone 7-based smartphones as soon as possible to halt further market share (and share price) declines, but to also come-up with compelling designs and features that prove to be competitive in the market in 2012.

Meanwhile, rival mobile phone manufacturers such as Samsung, Motorola and Sony Ericsson see the next year as an opportunity for them to fight back to regain market share, in particular in Europe and North America.

Apple In-App Subscription vs Google One Pass

Another major talking point at MWC 2011 was Apple's recent announcement of In-App Subscription terms which require App providers on Apple's iStore to make in-app content available on a subscription basis via Apple's iStore, with Apple taking a 30% cut of subscription revenues. While there is some concern about the high percentage cut that Apple is demanding, and its implications for the economics of some content delivery business models, it seems unlikely that many Apps providers will choose to leave Apple's iStore and cut themselves off from the lucrative Apple iPhone/iPad user base. Regulatory intervention has also been threatened, but it seems unlikely that Apple could be found to be abusing a dominant position, given the competition in mobile device platforms and app stores. More likely, is some eventual compromise on the percentage of Apple's cut of subscription revenues.

Meanwhile, Google countered by announcing Google One Pass as a one-stop subscription payment service for content sourced from multiple online stores, with Google taking just a 10% revenue cut to cover costs.

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1 ~60,000 people attending the GSMA's MWC in Barcelona in 2011 – Source: GSMA

2 Nokia had 37.6% market share by sales in 2010 – Source: Gartner

3 Other mobile manufacturers that have licensed Microsoft's Windows Phone 7 (such as Samsung, HTC Dell and LG) may now re-think their use of the platform in light of the Nokia-Microsoft deal.

Android

But the undoubted star of the show at MWC 2011 was Google's Android operating system, with almost all new tablet and smartphone devices launched by a range of manufacturers[4], being based upon Android: new smartphones were featuring Android Version 2.3 (Gingerbread), while new tablets were featuring Android Version 3.0 (Honeycomb).

As well as appearing on partner (apps developers, device manufacturers, semiconductor companies) stands, Android had its own dedicated stand area (serving excellent smoothies!) , which was a big draw at the show. Partners were able to adapt ('Androidify') the Android logo (above) to their own design, many of which were available as badges – collecting a full set of Android badges became a keenly-contested show pastime, with rare badges changing hands for serious money by the last day of the show!

New Tablets

A number of manufacturers launched new tablets at the show to compete with ***Apple's iPad***. Of particular note:

> ***Samsung*** launched the successor to the Galaxy Tab, the ***Galaxy Tab 10.1*** (the number referring to the screen size (in inches)), based on a dual-core 1GHz processor and Android Version 3.0 (Honeycomb), with 3G/HSPA+ (21Mbps downlink, 5.76Mbps uplink) and WiFi. Vodafone has been announced as the launch partner in 20 countries.
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> ***Motorola*** launched the ***Xoom***, also with a 10.1" screen, dual-core processors and Android 3.0 (Honeycomb), with 3G/HSDPA (7.2Mbps downlink) and WiFi. Motorola's Xoom will be launched in the US in Q1 2011, and in Europe in Q2 2011.
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> ***Blackberry*** launched the ***Playbook*** with a 7" screen and WiFi, with 3G/HSPA+ and LTE slated for H2 2011 – the Blackberry Playbook is likely to do well in businesses, with an optionally bigger screen and its office software capabilities.

Other manufacturers launching (mostly Android) tablets at the show included ***HTC, LG, Lenovo, Toshiba, Huawei, ZTE***. ***HP*** also launched the ***Touchpad***, a webOS (ex-Palm)-based tablet.

New Smartphones

A number of manufacturers also launched new smartphones at the show to compete with Apple's iPhone. Of particular note:

> ***Sony Ericsson*** launched the ***Xperia Play*** ('the Playstation phone'), a touchscreen phone based on Android Version 2.3 (Gingerbread) and a portable games machine in one, with a slide-out panel which has a pair of touchpad joysticks on the front and finger-operated triggers on the back, with three pre-loaded games and ~50 games to be ready for launch and available from a Playstation online store accessed via the Google-run Android Marketplace. The Sony Ericsson Xperia Play will launch in selected European and Asian markets next month, and a CDMA version will go on sale in the US with Verizon Wireless in the spring.

[4] Almost all new tablet and smartphones are also using chip designs produced by UK company ARM Holdings.

LG launched the ***Optimus 3D*** entertainment-oriented 4.3" smartphone (and 10.1" tablet) with a 3D display capability (without the need for special glasses). As well as watching commercially-available 3G content, users can generate their own with dual 5 megapixel digital cameras on the back of the handset.

Samsung launched the successor to the Galaxy S smartphone, the ***Galaxy S II***, with a high-definition, ultra-bright 4.27" screen with an 8 megapixel autofocus HD camera with video recording capabilities, plus a second front-facing camera for video conferencing, yet is slimmer than its predecessor at 8.49mm (vs 10mm). The Samsung Galaxy SII will go on sale in Europe and Asia later this month, and in the US later this year.

Motorola launched the ***Atrix 4G***, which Motorola claim is the most powerful smartphone in the world, with a dual-core processor, Android Version 2.3 (Gingerbread), and a qHD display with Adobe Flash. The Atrix 4G can be plugged into an optional 'Laptop dock' (priced at $499 in the US with the handset), which transforms the device into a laptop with full-size screen and keyboard. Motorola's Atrix 4G went on sale in the US through AT&T last week, and will be available in Europe shortly.

HTC launched a range of six new smartphones including touchscreen versions (a la iPhone etc), keyboard versions (a la Blackberry), and versions that feature ***Facebook*** prominently on the screen or accessed via a dedicated Facebook button on the keyboard (all based on Android Version 2.3 (Gingerbread)). Facebook Friends are integrated with contacts, Facebook Events are integrated with the phone's calendar, users can 'check-in' on Facebook Places, and the phones feature video and photo alerts when friends post messages and pictures on the Facebook site. ***INQ*** (who share Hutchison Whampoa as an investor with Facebook) also launched Facebook features on their ***Cloud*** smartphones.

…and lots more!

Research firms[5] are predicting that by 2015 more people in the US will own smartphones than PCs.

New Features

A number of new features are becoming common on the new tablets and smartphones launched at this year's show:

Adobe Flash Player 10.1 support (on 50+ devices to be launched during 2011).

Dual cameras (one on the back for HD video and still images, one on the front for videoconferencing).

HSPA+/LTE support (as well as 3G and WiFi) is included (or promised for later this year) which offers download speeds of 21Mbps (today) with 42Mbps later this year/next year. Tablets and smartphone devices with HSPA+/LTE capabilities will further fuel the explosive growth of mobile data volumes over operators' networks.

NFC (Near Field Communications) support for contactless payment services ('swiping' your mobile phone over a NFC reader at a point-of-sale).

[5] Source: Frost & Sullivan, Forrester.

Mobile 'apps' and 'app stores'

There are a rapidly expanding number of mobile applications ('apps') from a growing range of 'app stores', with many app stores claiming millions or tens of millions of registered users and tens of millions or hundreds of millions of 'app' downloads.

Following the early success of Apple's App Store, and Google's Android Market (which currently account for around two-thirds of all downloads[6]), Asian mobile operators are launching their own app stores (eg China Mobile's Mobile Market, Chine Unicom's WoStore, etc) offering apps designed to appeal to Asian customers: Asian social networking sites (such as China's SINA Mobile's Twitter-like micro-blogging service Weibo) are now dwarfing Twitter and Facebook in the region. App downloads are forecast to peak by 2013 following a surge in Asia (forecast 30% CAGR).

However, operators seem to be pursuing app store strategies that are open to third-party app stores as well as their own, while also supporting initiatives such as the Wholesale Applications Community (WAC) and OneAPI to enable developers to write applications that can be deployed across multiple platforms and operators, including tighter integration with operators' networks to support features such as location-enhanced presence, click-to-dial, public subscriber profile access, and integration of IM and SMS with desktop apps.

But, despite all the buzz around apps and app stores, analysts remain sceptical about their potential to contribute to operators' revenues (Gartner forecast up to 5% by 2015). It does seem that there is too little revenue being delivered to too few players across the value chain to justify the hype, valuations and resources currently being thrown at the 'apps' space.

Revenue trends

Mobile operators' revenues from voice and SMS services have been in decline caused by competitive pressures and regulatory interventions, as well as substitution by other forms of communications (email, social networking, VoIP, etc). Introductory flat-rate pricing for mobile data on smartphones and PC dongles has helped drive take-up, but is widely-recognised as unsustainable as exponential growth in mobile data usage demands more investment in increased capacity. Nevertheless, as mobile data has grown as a percentage of operators' revenues (for some operators mobile data is now 50% or more of total revenues), it has helped operators sustain average revenue per subscriber (ARPU) against declining voice/SMS revenues.

However, most operators now recognise the need to move away from flat-rate data tariffs towards tiered-pricing models based on volume and type of use and time of day. But tiered pricing requires operators to implement intelligent policy control (based on deep-packet inspection) within their networks, as well as more advanced billing systems. A number of exhibitors at the congress were promoting intelligent policy control appliances, including some specialist roaming charge optimisation solutions[7].

European operators have recently announced new flat-rate data roaming plans in an effort to head-off further regulatory intervention from the European Commission (currently, cross-border mobile roaming rates are ~€2.60 per MB, compared with ~5 cents per MB on home networks).

Growth of mobile data

The rapidly developing capabilities of mobile devices are driving growth in mobile data traffic of around 100% (ie doubling) per year, and that trend seems set to continue. Consensus forecasts suggest that mobile data

[6] Apple's App store now has 350,000+ apps, while Google's Android Marketplace now has 150,000+ apps.

[7] eg Roamware, MACH, Convergent Technologies.

volumes could grow by as much as 40 times over the next five years. There are warnings of an 'acute capacity crunch' in urban areas where smartphone density in the average city is set to grow from 400 devices per sq km today to 12,800 devices per sq km by 2015[8].

While some of the required increase in capacity will come from more radio spectrum (in particular, the 700/800MHz and 2.6GHz bands) and technology developments (4G/LTE is 3 times more spectrally-efficient than 3G), most will have to come from increased cell density/more cells, and from *offloading* data traffic onto WiFi (see below).

HSPA+

To cope with the growing demands of mobile data traffic, many 3G mobile operators have added High Speed Packet Access (HSPA) to their 3G networks to support mobile broadband at speeds of typically 7.2Mbps.

The HSPA technology evolution path is now enabling staged upgrades to HSPA+ using higher-order modulation (64QAM), dual carriers and MIMO technology to 21 - 28Mbps (3GPP R7[9]) and 42Mbps (3GPP R8), with future upgrades to 84Mbps (3GPP R9), 168Mbps (3GPP R10) and 336Mbs (3GPP R11).

As reported above, a number of tablet devices launched at the show already support HSPA+ at 21Mbps (3GPP R7), which has already been widely deployed in some countries (eg China Unicom announced last November that it had completed coverage of 335 cities in China with HSPA+).

Most vendors' existing HSPA base station equipment enables software-only upgrades to 42Mbps (3GPP R8). From 3GPP R9 (84Mbps+), some new hardware (MIMO) needs to be added, and the standards support aggregation of capacity across frequency bands, and also enable a TDD[10] carrier to supplement an FDD downlink to boost download speeds to the handset[11].

According to the GSMA, there are already 76 live deployments of HSPA+ offering download speeds up to 42Mbps, with a further 52 planned HSPA+ deployments in the pipeline.

LTE

While HSPA+ offers an evolution path for 3G networks to begin to support mobile data growth, many operators are already planning to implement fourth generation mobile technology known as Long Term Evolution (4G/LTE). So far, 156 LTE networks have been announced in 64 countries, with 55 LTE networks planned for deployment by the end of 2012, and with as many as 20 live commercial LTE services at the end of 2010[12]. LTE is forecast to account for 4% of all the world's mobile connections by 2015[13]. For the first time, it seems that the world is on course to adopt a single global standard for mobile communications[14].

However, because LTE was envisaged as an all-IP mobile data network standard, there is no native support for voice communications. An initiative known as Voice over LTE has been launched to standardise support for voice over LTE by June 2011. While there were a number of demonstrations of Voice over LTE at the show, it is

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8 Source: Alcatel Lucent.

9 3GPP is an acronym for the 3rd Generation Partnership Programme, which sets standards for 3G, and the 'R' numbers that follow '3GPP' refer to the release number (eg R7) of 3GPP standards.

10 See below for a description of TDD and FDD.

11 A TDD carrier supplementing an FDD downlink was demonstrated by Qualcomm at MWC.

12 Source: GSM Association.

13 Source: Wireless Intelligence.

14 There were a number of competing technologies deployed in different regions/countries for 2G and 3G mobile.

clearly some way off from widespread commercial deployments[15], as for most operators using LTE to meet growing mobile data demands are the priority.

Mobile networks traditionally make use of the radio spectrum on a Frequency Division Duplex (FDD) basis (ie using separate frequencies for uplink and downlink channels) in order to support the requirements of voice communications. However, data communications can make use of the radio spectrum on a Time Division Duplex (TDD) basis (ie the uplink and downlink data are sent in different time slots on the same frequencies) – additional TDD spectrum bands are available in most countries, but have been little used to-date. In response to the development of rival (to LTE) TDD technologies (notably, WiMAX), a TDD variant of LTE has been standardised alongside FDD LTE.

At MWC 2011, a group of the world's largest mobile operators[16] announced the formation of the Global TD-LTE[17] Initiative (GTI) to promote the convergence of TDD-LTE and FDD-LTE standards. The operators are also promoting the need for mobile device manufacturers to develop LTE FDD/TDD dual-mode handsets, which will enable both types of spectrum assets (FDD and TDD) to be used. Semiconductor companies are already planning multi-mode (3G/HSPA+/LTE (TDD & FDD)) chipsets capable of operating in the 9 main mobile spectrum bands from 450MHz to 2.6GHz (however, the industry is likely to settle on just a few of the possible permutations of technology and frequency bands).

KDD, which won spectrum in Germany in last year's auction (including TDD spectrum at 2.6GHz) announced a development programme with ZTE to explore both TDD and FDD versions of LTE (LTE also announced that it had now secured 18 LTE contracts globally).

When 3G was first deployed, the delayed availability of fully-functioning and affordable 3G handsets severely delayed the take-up of 3G services. Industry is working hard to avoid repeating the same mistakes with LTE, with typical vendor timescales for LTE device availability being: LTE dongles in 2010, LTE mobile intelligent devices (MIDs) by 2011, and smartphones by 2012. Huawei announced the E398 USB dongle, the first mobile LTE device that operates in the 800MHz and 1800MHz/2.6GHz bands.

Single RAN

Despite the intuitive notion that the next generation of mobile technology will supersede the previous generation, the reality for most mobile operators is that they will continue to have to support 2G alongside 3G for the foreseeable future, while introducing 4G.

Many of the leading vendors have recognised the challenges facing the mobile operators in supporting multiple generations of mobile technology and competing standards in multiple frequency bands, as well as seamlessly evolving customers from (eg) 2G/3G to 4G/LTE, and have announced single integrated radio access network (RAN) solutions (using software defined radio (SDR)) to lower costs and maximise network efficiency (including Huawei's SingleRAN@Broad, ZTE's Uni RAN, Cisco's Unified RAN, etc).

However, combining 2G, 3G and LTE onto shared feeders and antennas can involve compromises on feeder loss, the use of tower-mounted amplifiers, capacity and capex. A number of vendors were exhibiting integrated base stations/antennas that help to alleviate the compromises, but the current versions appear rather large, bulky and expensive, which will benefit from some further development to reduce size and costs.

15 Though Verizon claimed to have made the first successful call over a commercial LTE network last week.

16 Including US WiMAX operator Clearwaire.

17 TD-LTE and TDD LTE are alternative names.

Mobile network evolution strategies

Each operator will need to decide its own strategy for the evolution of its network from 2G/3G (HSPA) to 4G LTE/LTE Advanced – some may opt for an early move to 4G/LTE, while others will exploit the further evolution of HSPA+ before moving to 4G/LTE later. Relevant factors to take into account will include the future pattern of demand for voice and data services, the availability of spectrum (new spectrum at 700/800MHz and 2.6GHz), and the re-farming of existing 2G spectrum at 900MHz/1800MHz and 3G spectrum at 2.1GHz), technology maturity, availability and cost – both for network equipment and devices, the need to modernise and reduce the operating cost of their existing 2G/3G networks, and the risks and costs of alternative evolution paths.

An operator's existing, and likely future, spectrum holdings could be a key determinant of their network evolution strategy. 3G/HSPA+ uses fixed 5MHz spectrum channels in spectrum auctioned/awarded for 3G use (eg 2.1GHz in Europe), or in 2G spectrum subsequently liberalised for 3G use (such as the 900MHz band in Europe). While LTE is capable of operating in a range of channel widths[18], its use for mobile data is best suited to spectrum where wide frequency bands (ie 10MHz, 15MHz, or ideally 20MHz) are available: this is likely to be the case in new spectrum awarded for mobile broadband at 700MHz/800MHz (providing wide-area coverage) and 2.6GHz (providing additional capacity in dense areas), but also in the current 2G 1800MHz band if some or all of it is re-farmed for LTE.

For example, Telstra's (Australia) very high 3G take-up (82%) means that it has sufficient 2G capacity headroom to re-farm its 1800MHz spectrum from 2G to LTE. Telstra announced a deal with Ericsson[19] to deploy the world's first HSPA+ dual-carrier network (offering up to 42Mbps) to all Australian cities by the end of 2011[20]. Sierra Wireless will provide multi-mode, multi-band dongles for the launch.

Meanwhile, Deutsche Telecom announced that T-Mobile's mobile broadband strategy in both the US and Europe involves combining HSPA+, LTE and WiFi (on WiFi, and its UK JV, T-Mobile is partnering with France Telecom/Orange).

The introduction of low-end smartphones[21] during the next year or so could further drive both smartphone penetration (currently typically 35%+) and 3G penetration (currently typically 65%+) to the point when many operators consider the previously-unthinkable strategy of turning-off 2G networks, or at least significantly cutting-back on the spectrum resources reserved for 2G, in favour of 3G/HSPA+ and/or LTE (Single RAN solutions make such progressive re-balancing of spectrum resources increasingly practicable).

Some concerns were expressed about delays in the full liberalisation of 2G spectrum in some regions/countries (including the UK), the release of 3G spectrum in a number of Asian countries, as well as the need for the timely release of spectrum for 4G/LTE (at 700/800MHz and 2.6GHz) around the world. While most operators have sufficient spectrum to meet present levels of demand, there is a risk that regulatory uncertainty and/or delay could create a 'planning blight' on future operator investment in higher-speed mobile networks.

However, Germany is the first country in Europe to auction 'Digital Dividend' spectrum at 800MHz. The auction, completed in May 2010, also included spectrum at 1.8GHz, 2GHz and 2.6GHz, and all the mobile

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18 LTE can use spectrum in frequency band widths of 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz or 20MHz.

19 Ericsson announced that the Telstra deal was Ericsson's 17th global LTE contract.

20 1800Mhz is one of nine frequency bands that operators have already requested be brought within the Global Certification Forum's LTE Certification Scheme.

21 Competitive provisioning of smartphones, particularly by Asian suppliers using (free) Android is likely to start to commoditise the market. Also, Apple are reported to have a low-end smartphone under development for launch later this year.

operators in Germany are now deploying or trialling LTE. Early availability of 800MHz LTE equipment has benefited from the strong push on 700MHz LTE for the US market. O2 in Germany announced at MWC 2011 that they had selected Nokia Siemens Networks and Huawei to roll-out LTE at 800MHz and 2.6GHz (in the north and south of Germany, respectively).

In comparison, the UK risks being left behind!

Offloading

Many operators are seeking to offload mobile data traffic from their mobile networks using WiFi, while a few are also looking to use TDD spectrum (TDD LTE or WiMAX) for offloading (eg Japan's KDDI). One operator (South Korean KT) noted that two-thirds of mobile data traffic was generated indoors, a significant proportion of that in hot-spot areas. By building their own WiFi networks, or partnering with other existing WiFi networks, mobile operators are looking to offer their customers a seamless mobility experience between their own wide-area mobile networks and WiFi (sometimes called 'Carrier WiFi Offloading'), while avoiding the potential risk of independent WiFi networks cannibalising mobile operators' revenues (sometimes called 'Free WiFi Offloading'). By embracing WiFi, operators are able to reduce the capex and opex costs of more capacity in their wide-area mobile networks.

Mobile operator interest in WiFi Offloading is growing. For example, in the UK, O2 has announced a plan to build-out 15,000 WiFi hot-spots to offload data traffic from smartphones, tablets, etc in dense locations, while BSkyB recently bought 'The Cloud' WiFi hot-spot network.

A number of vendors at MWC 2011 were offering mobile operator solutions for WiFi offloading[22].

Femtocells

Femtocells[23] are often thought of as a form of 'offloading', but WiFi is already established as the default wireless data connection in almost all homes and offices, so femtocells are more about providing better indoor coverage for voice calls, rather than a solution for mobile data offload.

Mobile operators views on femtocells seem to be mixed, with 19 operators already offering femtocells (typically free to high monthly tariff contract customers) with another 34 operators announced and others expected soon, while other operators are discounting femtocells (eg Telstra in Australia). Meanwhile, a number of vendors are offering femtocell products, and some are now starting to offer integrated femtocells with WiFi to give mobile operators more control over the local wireless environment in the home/office etc.

Core/Backhaul Network Evolution

As mobile data becomes an increasing percentage of total mobile operator traffic, many operators are planning to move to an all-IP evolved packet core (EPC) network, with Gigabit Ethernet backhaul over fibre or microwave radio links (in rural areas) . These EPC core networks offer much higher capacity while simplifying the network and lowering costs. However, the full benefits of an EPC core network will only really be achieved when voice traffic can be carried over them as just another mobile data application, eliminating the legacy network and supporting systems used to support voice communications in 2G/3G.

[22] Bridgewater, IntelliNet, Motorola, etc.

[23] Femtocells are small base stations, located in a home or office, connected into the mobile operator's network by the customer's fixed broadband connection, onto which the users' mobile phones 'roam' within the home/office.

This shift in the nature of mobile networks (from circuit-switched voice to packet-switched data) is creating new opportunities for non-traditional vendors from the data world to win a larger share of mobile operators' capex.

Ericsson announced an interesting partnership with Akamai to bring content delivery to mobile networks.

Future Growth Opportunities

A number of opportunities for future revenue growth were explored during MWC 2011, including:

The Internet of Things – as the mobile penetration of the world's human population approaches saturation over the next decade, the next source of growth in the number of mobile devices is 'The Internet of Things' (or objects), also often referred to as machine-to-machine (M2M). These mobile-enabled things or objects will be sensors reporting real-world data to network-based applications, which will then offer human users value-added services based on aggregating and interpreting the real world data. Estimates suggest that there could be around 180 million mobile-enabled devices by the end of 2012, with as many as 50 billion such devices by 2020. Standards for embedded SIMs are currently being developed for M2M devices.

Cloud Computing – the hype around Cloud Computing continues to grow, though the basic concept of mobile devices interacting with network-embedded applications to deliver value-added services isn't a new idea. However, the hype may be starting to become more real as smartphone device capability and mobile network capacity reach levels where cloud services begin to offer real advantages. One interesting observation is that as well as 4G/LTE offering ~10 times the speed of 3G, 4G/LTE also offers much reduced latency compared with 3G (about one-third), which suggests that 4G/LTE could become a catalyst for cloud-based services.

Other growth opportunities at the show included: ***mHealth, mMoney, mAdvertising, mPublishing, mGovernment***… and much more!

Summary

As the record level of attendance at this year's MWC, and the range of new developments announced, both clearly demonstrate, the worst of the global financial recession seem to be over, and there is cautious optimism about the future of this dynamic and exciting industry.

However, on a less-positive note there were noisey demonstrations outside MWC 2011 from unions protesting about job losses at Telefonica Movistar and lobby groups concerned about the impact on Africa of the extraction of rare minerals used in mobile devices, with reports of violence/mugging of MWC attendees all too frequent!

After 6 years of MWC in Barcelona, the location of MWC for 2013 – 2017 is out to tender. From an initial list of more than 30 cities, the final short list of four is: Barcelona, Milan, Munich and Paris – a decision will be announced later in the year. Meanwhile, MWC 2012 will be in Barcelona.

Eur Ing **Peter Ingram** BSc(Hons), CEng, FIET
Managing Director

www.touchstoneconsultinglimited.com