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# The next stage for Asia's mobile internet

As mobile data pipes get bigger and  
smarter, what new applications will take off?

## The next stage for Asia's mobile internet

*Asia leads the world in mobile internet access. The region's mobile data pipes are getting not just bigger but "smarter", so as to keep pace with growing smartphone and tablet populations. To recoup their investments in next generation, high-capacity mobile internet technologies such as 4G TD-LTE, Wi-Fi Hotspots and 3G TD-SCDMA in China, operators will need to sell innovative value-added services over these pipes. In this paper, Spire Research and Consulting argues that the key opportunity lies not just in streaming music and movies, but also in cloud applications for the workplace, high-quality VoIP and a whole host of niche applications like simultaneous language translation and healthcare applications for eldercare.*

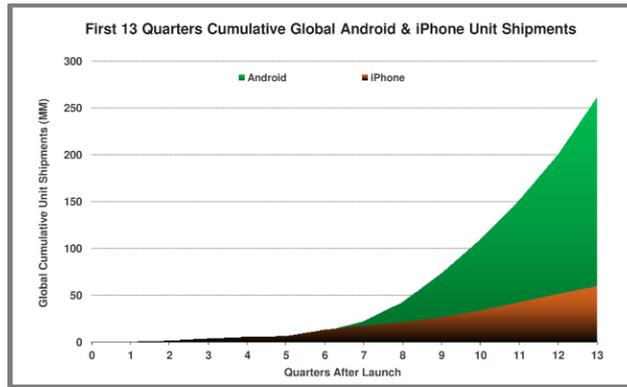
4G is starting to make its mark in the emerging world. Mr Xi Guohua, the chairman of the world's largest mobile operator, China Mobile, in his keynote address at the recent 2012 GSMA Mobile Expo Asia in Shanghai, shared that his company is committed to developing mobile networks using four technologies in China, namely; 2G GSM, 3G TD-SCDMA, WLAN (i.e. Wi-Fi hotspot) and the upcoming 4G<sup>1</sup> TD-LTE.

The impending launch of 4G TD-LTE has created much hype due to its amazing download speed. It can go as fast as 100Mbps – approximately four times faster than the current 3.5G HSPA+ access of 21Mbps.

This raises the question whether there will be demand for such mobile access. If so, what applications will drive it?

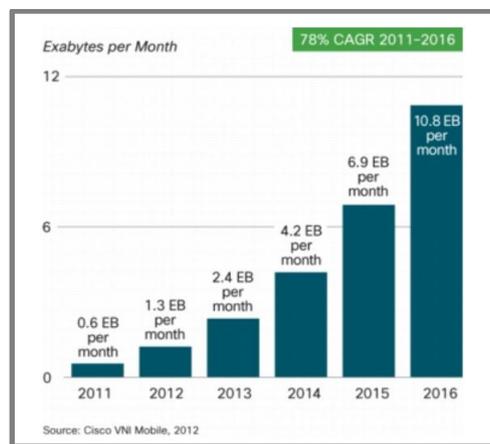
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<sup>1</sup> LTE-Advanced, 3GPP, Jeanette Wannstrom, May 2012



**Table 1: Smartphones Shipment Growth<sup>2</sup>**

Pervasive mobile internet users who use smartphones (e.g. Androids and iPhones) and tablets (e.g. iPads and Samsung Galaxy Tab) are raising mobile operator data network resources requirements at an alarming rate. As of Q4 2011, the unit shipments of smartphones have grown fourfold over the previous four quarters, from 75 million to over 250 million units (See Table 1: Smartphones Shipment Growth).



**Table 2: Global Mobile Data Growth<sup>3</sup>**

According to the 2012 Global Mobile Data forecast published by Cisco, monthly data usage in 2011 was recorded at 0.6 Exabytes (10<sup>18</sup> bytes) and will increase 18-fold to 10.8 Exabytes in 2016. 2011 – 2016 will thus witness a scorching compounded annual growth rate (CAGR) of 78% (see Table 2: Global Mobile Data Growth).

<sup>2</sup> 2012 Internet Trends, Kleiner Perkins Caufield & Byers, Mary Meeker and Liang Wu, May 2012

<sup>3</sup> Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2011–2016, Cisco Public, 14 February 2012

## China

China Mobile is bound by regulations to run a homegrown proprietary 3G network, TD-SCDMA, which is technologically different from the rest of the world. TD-SCDMA technology cannot be accessed by the majority of mobile devices running on market-dominant operating systems (OS); for instance Apple's iOS and Google's Android. As such, these devices will be incompatible with China Mobile's data network.

Fret not. Users can continue to use 2G voice and Short Message Service (SMS) services offered by China Mobile. However, should they want internet access on their smartphones and computer tablets, they can only do so by tapping Wi-Fi access.

The pressure to expand the data network fast, coupled with the high cost of deployment of TD-SCDMA base stations, has driven the mobile operator to attract and retain smartphone users by offering complementary Wi-Fi services. To provide WLAN access, the network operator had to build their own Wi-Fi hotspots to keep mobile internet users loyal.

## Wi-Fi hotspots

A similar trend can be seen across Asia, for different reasons.

	Country	Operator	Brand	Number of Wi-Fi Hotspot	Target
1	Hong Kong	PCCW	PCCW Wi-Fi	10,000	
2	China	China Mobile		60,000	1,000,000 by 2014
3	Thailand	TRUE Move	3G + Wi-Fi	40,000	100,000 end of 2011
4	Japan	KDDI	au Wi-Fi SPOT	10,000	100,000 1Q of 2012
5	Indonesia	Telkomsel	Mobile Wi-Fi Seamless	6,000	11,000 by 2012
6	South Korea	KT	olleh Wi-Fi zones	100,000	

**Table 3: 2011 Selected Mobile Operator Wi-Fi Hotspot Deployment in Asia<sup>4</sup>**

<sup>4</sup> KDDI Offloads Traffic on Cellular Network Through Wi-Fi, PCWorld, Nancy Gohring, 1 July 2011

Pengguna Telkomsel Flash Bisa WiFi Gratis, Detikcom, Susetyo Dwi Prihadi, 7 June 2012

KT nearing 8 mln broadband subs, Telecompaper, 17 June 2012

KT expands Wi-Fi coverage to all subways, The Korean Times, Kim Tong-hyung, 1 September 2010

PCCW mobile Becomes World's First Operator to Successfully Complete Commercial Next Generation Wi-Fi Hotspot Trial, Cisco, 29 February 2012

WBA Industry Report 2011: Global Developments in Public Wi-Fi, Informa UK Ltd, 2011

According to Cisco, Hong Kong PCCW mobile announced that it had successfully completed a commercial trial of the Next Generation Hotspot (NGH) in Hong Kong in end-2011; thus becoming the first operator in the world to have achieved this milestone.

PCCW currently has close to 10,000 hotspots throughout Hong Kong<sup>5</sup>. On the other hand, China Mobile has 60,000 hotspots across China and the number is expected to grow to 1 million in 2014. Indonesia's Telkomsel is also committed to increasing its current 6,000 Wi-Fi hotspots (figure as of June 2012) to 11,000 by the end of 2012 (See Table 3: 2011 Selected Mobile Operator Wi-Fi Hotspot Deployment in Asia).

These Wi-Fi hotspots deployment numbers are not small when compared with 3G and 4G base stations numbers (not shown here).

### **Will 3G, 3.5G, 4G and Wi-Fi hotspots take off?**

Spire believes that mobile internet usage will continue to grow fast. Mobile operators have to take a pro-active approach to protect and recoup their investments while rolling out these multiple-access technologies.

There is a compelling need for mobile operators to market these access technologies right. Today, users have the option of accessing mobile internet via the current 3G, 3.5G, Wi-Fi and soon 4G LTE networks. As such, device manufacturers, too, will need to equip future phones with multiple data access technologies.

### **Where is the demand: Will mobile operators risk building a very fast dumb pipe?**

Mobile operators are vulnerable to becoming dumb pipes – meaning an operator's network is merely used for transferring bytes between the users'

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<sup>5</sup> PCCW-HKT DataCom Services Limited 2012, retrieved on 1 August 2012

devices and the Internet. Hence, mobile operators are under pressure to look into offering new value-added services (VAS).

Some examples of such services include the introduction of a brand new mode of payment with the new NFC technology, and the debatable over-the-top (OTT) services (internet applications consuming high data bandwidth) such as streaming television programs, music and content downloads.

All these considerations lead us to one burning question: Will 4G LTE (a network that offers 100Mbps download speed) be able to bring in more revenue in the future? Mobile operators clearly understand that being a very fast dumb pipe is not the path to profitability. They desire to be the "smart pipes" and stand out among the competition, so as to recoup their huge investments.

### **What could turn the tide?**

The LTE network, a very fast data pipe that addresses mobility, has unveiled opportunities for services that can be monetized as well. Should one need a real-time communication channel with high bandwidth and high mobility requirements, LTE will be the best option.

A tell-tale sign of the times from mobile technology leaders is that mobile operators today are branding as well as building their own VAS or supporting tool (or eco-system) <sup>6</sup>. Such R&D investments have encouraged the development of VAS, as they can now cater to the mass market by delivering premium and relevant high quality voice application (or content); and by offering the business segment cloud services and a niche market for M2M.

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<sup>6</sup> SK Planet Opens for Business, Targets Growing Enterprise Market Valued at KRW 5 Trillion by 2016, SK Planet, 11 October 2011

## **Spire's take on VAS that could successfully turn dumb pipes into smart pipes**

The examples below illustrate what Spire see as the early stage trends in value-added services that will become the next big things over LTE networks over the next few years.

### **🌐 Simultaneous Translation services over voice**

Could simultaneous translation over voice, a staple of science-fiction entertainment, ever become a reality? Japan DOCOMO has combined a voice service with its very own cloud<sup>7</sup> based service, Mobile Interpretation<sup>8</sup>, that automatically interprets voice calls. This application is unique to the Japanese market, as subscribers can apply mobile auto-interpretation (i.e. translating from Japanese to English and vice versa) in their daily and professional lives.

This is a novel move as this mobile interpretation application does not reside in the device. The spoken voice is first delivered across the operator's LTE to the backend network for translation. The translation is then sent back to the subscriber's device in real-time. Besides, as the subscriber may be on the move, only an optimized LTE network resource can support this real-time rich voice experience. This cloud based service will soon be extended to "Mobile Assistance" – providing recommendations in real-time in response to spoken keywords – as well as "Mobile Sharing" – sharing of content whilst talking.

Voice carried over mobile networks is subjected to delay and disruption due to wireless radio reflection, blocking, network congestion, etc. As such, any deterioration in the experience will nip the growth of this service in the bud.

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<sup>7</sup> Cloud-based Translator Phone, NTT DOCOMO Newsletter Mobility 36, 10 February 2012

<sup>8</sup> Translating smartphone is boon for DoCoMo, The Japan Times, Kazuaki Nagata, 12 June 2012

## **Ultra high-quality Voice over IP**

Conventional 3G VoIP has a strong fan base. But it also has its limitations in terms of coverage, quality and intermittence, as many users have discovered – and these limitations are not entirely predictable. The thirst for high-quality voice at low cost is undeniably huge.

Enter the next generation of mobile internet. Although LTE is purely a data network, the mobile standard forum 3GPP is equipped with a specification called voice over LTE (also known as VoLTE<sup>9</sup>) to support voice services. VoLTE<sup>10</sup> is a technology that allows users to make voice calls over an LTE network, while accessing high-speed mobile broadband services and rich communication services simultaneously. Moreover, as mobile operators have control over the data network, they can gain a competitive edge by offering high quality voice against OTT providers for VoIP (e.g. Skype and Viber).

SK Telecom has recently introduced high definition<sup>11</sup> voice over LTE that improves voice quality by 40% compared to that of 3G. It has also claimed that it is the first in the world to better audio quality with a 23.85 Kbps transmission bandwidth – 2.2 times wider than the bandwidth of a 3G voice call.

## **Downloadable music**

While downloadable music services to mobile devices is hardly a new concept, it is equally clear that the phenomenon still has tremendous room to grow in emerging markets, due to the immaturity of economies of scale, price and download speeds. SK Telecom's SK Planet<sup>12</sup>, a subsidiary company that manages MelOn, is one provider that offers innovative services. Korea's No.1 music service provider maintains 17

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<sup>9</sup> LG U+ launches Voice over LTE services with Ericsson, Thomson Reuters, 30 August 2012

<sup>10</sup> Current VoLTE Development and Deployment, Radio-Electronics, Ian Poole, 8 August 2011

<sup>11</sup> SK Telecom Launches Voice over LTE Service, LteWorld, Pankaj, 7 August 2012

<sup>12</sup> SK Planet unveils global ambitions, The Korea Times, Yoon Ja-young, 11 October 2011

million customers and over 2.5 million music contents. T Store, an online market place for smartphone applications, has an average of 45 million downloads per month with KRW8.6 billion in monthly transactions. Through other applications like, T Map (a location-based navigation service), Hoppin (a location-based social media platform) and 11th Street (an online auction and shopping platform), SK Planet is aiming for KRW3.5 trillion in sales by 2016. It has already extended this service to Indonesia via a joint venture.

### **G-Cloud by SingTel**

Cloud services accessed in the workplace are a huge area for potential growth in the next generation of mobile internet technologies. The demand for such productivity-enhancing solutions would be felt among SMEs, enterprises and government.

The Information-communications Development Authority of Singapore recently awarded SingTel a project called G-Cloud<sup>13</sup>, which aims to create a cloud based government network by the end of 2012. This system will allow civil servants to work using smartphones and tablets while on the move. There is a huge potential in G-cloud service, as some 124,000 civil servants<sup>14</sup> and the public will be able to access information and applications anytime, anywhere.

### **NFC technology by Gemalto**

Mobile payment has seen its fair share of false starts over the past 10 years or so. But this time, it seems that the various players in the market eco-system are ready to seriously push out this service to displace conventional card and other forms of payment.

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<sup>13</sup> Singapore pours cash into gov.cloud, The Register, Natalie Apostolou, 31 May 2012

<sup>14</sup> The Singapore Public Service, GTI Media, retrieved on 11 September 2012

On the mobile payment front, NFC<sup>15</sup> was launched in Singapore in August 2012. Led by Gemalto, the consortium comprising Citibank, DBS, EZ-Link, M1, SingTel and StarHub, is set to launch NFC services nationwide. Three types of payment modes, namely credit, prepaid and stored-value, will be introduced through NFC-enabled mobile phones and can be used at 30,000 retail points. With the established connectivity among merchants, financial institutions and mobile operators, cross-advertising and cross-selling will be further introduced to the subscribers. This consortium will then have the potential to target and market the services to the subscribers individually.

### **M2M by US Verizon Wireless and Verizon**

Though it is less publicized, M2M (machine-to-machine) applications have the potential to address niche markets in integrating telecommunications with specific industries. This is where Spire believes that some of the most interesting opportunities will lie.

US Verizon Wireless<sup>16</sup> supports more than 8.1 million M2M customers spanning across industries from automotive to healthcare, striving to improve M2M offerings.

Verizon<sup>17</sup> has also acquired Telematics Inc. to broaden their M2M offering. Telematics sells embedded security and infotainment services to companies such as Mercedes Benz and Volkswagen. It has also designed the technology behind State Farm Insurance's Drive Safe & Save program; wherein it allows the insurance company to monitor its customers' driving behavior in order to adjust their premiums accordingly.

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<sup>15</sup> Singapore NFC services to finally go live, ZDNet, Liao Yun Qing, 3 August 2012

<sup>16</sup> Wholesale Machine To Machine (M2M) Solutions, Verizon Wireless, retrieved on 10 September 2012

<sup>17</sup> Verizon buys Hugh Telematics to target connected car, Gigaom, Kevin Fitchard, 1 June 2012

## **Electrocardiogram by Malaysia Maxis, Pantai Hospital Kuala Lumpur and Heartronics**

In healthcare, Malaysia Maxis Berhad, Pantai Hospital Kuala Lumpur (PHKL) and Heartronics Sdn Bhd have partnered to officially launch EPI Life – the world's first Electrocardiogram (ECG) monitoring device that incorporates ECG capabilities onto a mobile phone.

The above examples illustrate that today's mobile operator possesses the capability to provide real-time communication, a high bandwidth mobile network and innovative cloud services. It is a matter of time before these value-added services will justify their value and start to reap profits.

### **Spire's take on VAS that most probably will not take off**

Will all VAS take off? Only if they are well thought through and marketed in the right way.

## **What are the competitive success factors for M2M?**

The mobile network for M2M must be available in real-time. Its coverage and accessibility are of the utmost importance too. For instance, a hospital which is monitoring a heart patient's condition using ECG in real-time cannot afford to lose the network connectivity or worse encounter a network coverage disruption.

However, will M2M still work when the patient travels cross-border? Spire believes that mobile operators are looking into implementing cross-border M2M. One good example would be the recent collaboration of seven world mobile operators (KPN, NTT DOCOMO, INC., Rogers, SingTel, Telefónica, through its Telefónica Digital unit, Telstra and Vimpelcom)<sup>18</sup> in the M2M business in July 2012. This partnership aims to stimulate the sale

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<sup>18</sup> KPN, NTT DOCOMO, ROGERS, SINGTEL, TELEFÓNICA, TELSTRA and VIMPELCOM to Cooperate Globally in M2M Business, NTT DOCOMO, VimpelCom, retrieved on 3 August 2012

of M2M communications across distinct high-potential industries; emphasising real-time, connectivity and coverage.

### **What will work in cloud-based applications?**

Convenience, simplicity and accessibility are the fundamentals that users are seeking in cloud-based applications. Take the “Mobile Interpretation” by Japan DOCOMO, as an example. Should a user be only able to receive 3G network coverage, will the application still work? Spire believes that DOCOMO has already considered such isolated cases, and will be addressing them soon.

### **Back to the drawing board!**

En route to being a “smart pipe”, mobile operators must first study the market to figure out how to monetize the right opportunities from mobile internet users.

Spire understands that every mobile operator's situation is different and changes very quickly as the competitive game changes. In this context, customized research is king.

To conduct effective market research, here are the typical factors that Spire takes into consideration when assessing the market:

1. What is the geographical spread of the users (urban, sub-urban, rural)?
2. What is the demographic profile of the users (age, sex, occupation, interest, usage behavior)?
3. What is the product usage behavior of users (access awareness, seamless sign-on, username & password versus single sign-on, ease to use, multi-device usability)?
4. What are the devices in the market (Smartphones, Android, iPhones, tablets, iPads, ultrabooks)? What products are available and at what channels and price-points?

5. What are the usage & attitude of users (willingness to pay, price sensitivity test, perception and association)?
6. What are the possible underlying services/opportunities in this dynamic industry (entertainment, banking, telemetry, telehealth, etc.)?

Unlike traditional research agencies, Spire would go the extra mile to customize the right plan for customer research that is properly based upon competitor, channel and regulatory research.

The time to revisit the pervasive mobile internet user is now.

## Appendix 1 – Glossary

Acronyms	Meaning
<b>GSMA</b>	Global System for Mobile Communications Association
<b>GSM</b>	Global System for Mobile Communications
<b>TD-SCDMA</b>	Time Division Synchronous Code Division Multiple Access
<b>WLAN</b>	Wireless Local Area Network
<b>TD-LTE</b>	Time-Division Long Term Evolution
<b>HSPA+</b>	Evolved High-Speed Packet Access
<b>iOS</b>	iPhone Operating System
<b>LTE</b>	Long Term Evolution
<b>NFC</b>	Near Field Communication  A close proximity communication between two devices for the purpose of payment, transaction and information exchange