

XONNA PARTNERS

ASIAN TELECOM MARKET

2013 REVISED

Key events and trends in the
Asia Telecom Space

Rolf Lumpe

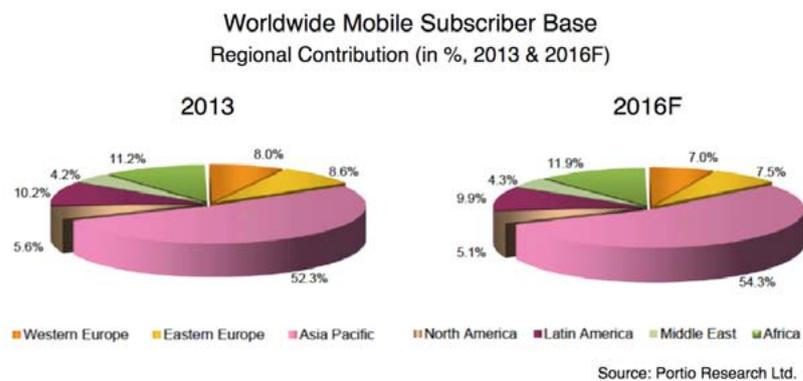
February 2014

Asian mobile markets led by Korea and Japan are adopting rapidly Long Term Evolution (LTE) and have been leading the APAC region in terms of technology, service differentiation and content.

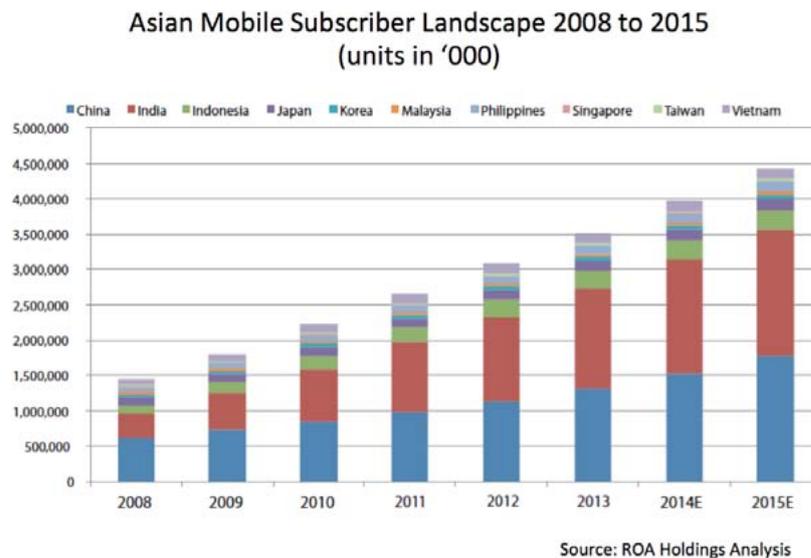
While Mobile Network Operators (MNOs) in certain markets experiencing saturation many countries in Asia are still catching up becoming the center of growth in Asia.

1 APAC TELECOM MARKET OVERVIEW

Over 51% by end of 2013 and to increase to over 55% by 2015 of world's mobile subscribers are in Asia and when it comes to the development of broadband Internet Asia makes an even stronger claim to being the world's mobile technology and service leader.



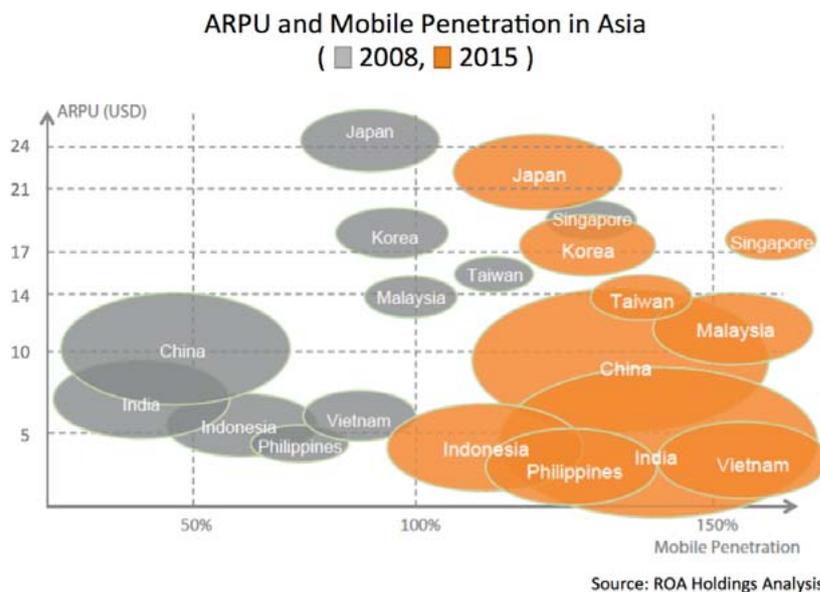
By the beginning of 2012 there were around 2.7 billion mobile subscribers in the Asian region, with annual growth of nearly 15%. By the end of 2013 this number exceeded 3.5 billion. As some Asian markets are saturating and with the impact of the shaky global economy the growth rate in 2013 has slowed, following a period where annual subscriber growth rates in the region were over 50%.



By the beginning of 2013 regional mobile penetration had reached 72%, an impressive statistic considering the total Asian population is around 4.2 billion with further growth expected. While in markets where mobile penetration is in excess of 100%, and even over 200% in some cases, operator business strategies are shifting towards value added services and mobile broadband according to BubbeComm.

Due to severe competition by 3rd party operators such as Over The Top (OTT) player and content providers entering into each market in Asia we see a steep decrease in Average Revenue Per User (ARPU). The chart below shows the movement of each countries (ARPU) and mobile penetration from 2008 to 2015. Each size of the circle represents roughly the relative amount of subscribers. As an example India, Philippines and Vietnam enjoyed in 2008 an ARPU of 5+ USD while in 2015 the ARPU decreased to 3-4 USD.

With OTT players such as Skype, Line, WhatApps and Viber expanding rapidly across the region it is expected that the ARPU will further decrease sharply unless MNOs are able to build new revenue sources.



LTE will continue to grow rapidly and it is expected for over 63% of all mobile connections in the developed APAC region by 2017 according to Research and Markets. Asian operators in these countries have been providing LTE services for several years already and experiencing substantial revenue growth in data revenue which almost offsets the declining revenue in traditional services. Furthermore MNOs are exploring new business opportunities brought through mobile broadband connectivity, including future LTE Advanced services to build more sustainable revenue.

APAC's large emerging markets are also now picking up pace in LTE rollouts during the course of 2013. Examples are the launches by Bharti Airtel in India and Smart Communications in the Philippines followed by the commercial rollout during the same year in China and Indonesia, according to Pyramid Research. Being first to market with LTE and gaining back ground lost with

3G are proving to be a powerful incentive for operators, says Pyramid, although a few countries have yet to announce any LTE plans due to a lack of development and little demand for data.

Research and Markets believes that key trends driving change in the developed Asia Pacific will include the spread of 4G, increasing smartphone penetration, and the roll out of national broadband networks and FTTx services.

1.1 CHINA

Home to the world's largest population at over 1.355 billion China is an up and coming economic powerhouse, accounting for over 35% of mobile market share in Asia. Naturally with such a large addressable population, Chinese Telecom Operators wield the world's largest subscriber base in terms of both fixed, China Telecom and mobile, China Mobile services, with monthly mobile net additions in China regularly reaching close to 10 million subscribers.

One of the big talking points in 2013 has been China's LTE rollout. China Mobile has been pushing the TD LTE standard worldwide and started conducting TD LTE trials in various cities across the country since 2012, including Shanghai, Hangzhou, Nanjing, Guangzhou, Shenzhen and Xiamen. Soon after several networks reached commercial levels such as in Guangzhou and Shenzhen with over 6,500 base stations across the two cities. China Mobile's rivals China Unicom and China Telecom started at the same time similar LTE trials but using the more common FD LTE standard.

In December 6, 2013 The Chinese Ministry of Industry and Information Technology (MIIT) has issued the country's first round of 4G licenses to China Mobile, China Telecom and China Unicom.

It is currently unknown if the three largest operators are obliged by the license terms to meet any rollout deadlines, or if they have had to pay any part of the fee upfront. All three of the licenses are for TD-LTE, with FDD-LTE licenses are expected to be issued in 2014.

While China Mobile decided to continue its main LTE network on the TD strain, both China Telecom and China Unicom are planning on deploying both technologies. China Mobile launching 4G services on December 18, 2013.

China Mobile reportedly snapped up 130MHz of spectrum across several frequency bands (1.9GHz, 2.3GHz and 2.6GHz). Meanwhile, China Telecom and China Unicom each won 40MHz of spectrum in unconfirmed bands.

Furthermore China's government is backing a huge national project to increase access to high speed Internet in the country. The Broadband China program is aimed at providing high speed fixed and mobile broadband connections to more than 250 million urban and rural homes by 2015.

1.2 JAPAN

Japan is among the world's most technologically advanced nations and this is reflected in its communications infrastructure. By the end of 2013 there were over 135 million wireless subscribers in the country of which the overwhelming majority were still 3G subscribers, according

to TeleGeography. All three of the country's major operators NTT DoCoMo, KDDI and SoftBank have launched LTE services and there is a growing LTE subscriber base.

One of the most significant events in the market end of 2012 (excluding the 2013 acquisition of Sprint while it is significant for Softbank is has no relevance APAC market overview) was Softbank's acquisition of what was previously the fourth operator, eAccess with consolidated subscribers exceeding KDDI for the first time. After closing the sale in January 2013, Softbank went about selling two thirds of eAccess to a group of more than ten companies including Samsung Electronics and Nokia Siemens Networks, in order to comply with limits on spectrum ownership covering wireless carriers and their subsidiaries.

In February 2013 DOCOMO signed agreements with Nokia Solutions & Networks (NSN) and Panasonic under which the vendors will help deploy LTE-Advanced infrastructure and announced in November 2013 that it has achieved what it claims to be 'the world's first transmission exceeding 1.2Gbps', by utilizing a single-size antenna and Smart Vertical multiple input, multiple output (MIMO) technology for LTE-Advanced (LTE-A) systems. According NTT DoCoMo the new transmission technology uses adaptive grouping of vertical antenna components and can achieve throughput equivalent to that of a four-antenna system. Smart Vertical MIMO, on other hand, reduces the cost and space of installing antenna equipment and improves spectrum utilization efficiency.

On the fixed side NTT dominates the market through its regional units East and West. The company had around 49% market share in December 2012, according to TeleGeography with nearest competitors Softbank BB at only 10.8% during the same period. Both NTT subsidiaries are continuing their fiber rollouts and are believed to wield significant market share of over 70% in this segment.

1.3 SOUTH KOREA

Although a recent rise in tensions between North and South Korea has caused some concern, South Korea is expected to continue to maintain its position in the top tier of the global LTE league commercially deployed mid of 2013 LTE Advanced network with speeds twice as fast as their initial LTE Network.

Competition in the South Korean mobile market is fierce with its three operators, SK Telecom, KT Corp and LG Uplus fighting for subscribers. SK leads the mobile market with 50.3% subscriber share recorded at the end of 2012, KT ranked second with 30.8% and LG Uplus third with 19% during the same period, according to TeleGeography. In January 2013 all three operators were banned from customer additions by regulator the Korea Communications Commission (KCC) as punishment for a bitter LTE marketing battle for customers. LG U was given a 24 days suspension, SK 22 days and KT 20 days.

As one of the earliest adopters of LTE, South Korea has already reached over 27 million LTE subscribers by December 2013 respectively over 50% of total number of mobile users which just topped 54.4, an impressive statistic given that the country's population stands at around 49 million.

1.4 HONG KONG

One of Asia's economic powerhouses, the Hong Kong Special Administrative Region (SAR) of China has built one of the most sophisticated and dynamic telecoms markets in the world. Key to this development has been regulator the Office of the Communications Authority (OFCA). In order to support one of the world's highest mobile and fixed population penetrations at 230% and 50% respectively substantial infrastructure has been put in place. Hong Kong is a key gateway for various international carriers and vendors as well as a major landing point for subsea cables.

An estimated 90% of all households in Hong Kong have access to broadband connectivity, with the number of subscribers representing about 75% of the total internet subscriber base and there is a significant market for both triple and quad play services. Like Japan and South Korea all of Hong Kong's operators have launched LTE and a stronger than anticipated mobile growth rate has resulted. 3G and 4G subscribers are now believed to equate to close to 60% of Hong Kong's total mobile base, and data contributions to mobile revenue exceed 50%. Hong Kong's data demand is expected to continue to grow with the average 2.5G/3G/4G subscriber using in excess of 750Mbytes per month by November 2013 according to published data by Office of the Communication Authority Hong Kong.

1.5 MALAYSIA

Malaysia has experienced strong growth in its telecoms sector over the last decade, but this growth has not been consistent across the sector. The number of fixed lines in the country has been relatively static for around 10 years, and even showed evidence of shrinking in 2011, while in contrast the mobile market has grown dramatically. Having stood at six million subscribers in 2000 there were 37 million by March 2012, at a penetration of almost 130%.

The Malaysian Communications and Multimedia Commission (MCMC) awarded LTE spectrum licenses that came into effect at the start of 2013, enabling market leader Maxis to launch services in the Klang Valley area. In 2014 the operator is expected to continue to expand its network, which offers average downlink speeds between 10Mbps and 30Mbps.

There has also been progress in next generation fixed infrastructure, with incumbent Telekom Malaysia announcing that it had signed up more than 500,000 subscribers to fiber based services, according to local reports.

Malaysian operators have shown a willingness to engage in innovative partnerships to improve their customer offerings. These include an agreement between Maxis and Malaysian satellite pay TV service Astro to jointly develop and market telecoms product bundles including pay-TV, mobile and fixed broadband services. While third ranked DiGi has teamed up end of 2012 with WhatsApp to offer unlimited access to messenger services for customers in one of the very first revenue sharing business models between OTT providers and mobile network operators.

1.6 INDIA

India is the world's second largest mobile market behind China with a total of around 875.48 million wireless subscribers by October 2013, according to Telecom Regulatory Authority of India (TRAI) and 110 million mobile Internet users. What that means is that only about 13% of the total

number of telecom subscribers were actually accessing the Internet via its mobile phones. This places wireless penetration at around 68.9% leaving significant potential for growth, although it is believed that more effort needs to be made to address the country's rural population.



Despite experiencing its first subscriber decline in September 2012, the Cellular Operators Association of India (COAI) believes the market is set for growth having added 400,000 more GSM subscriptions in December. The decline was partly attributed to stricter SIM card registration requirements, with operators removing inactive, duplicate or fraudulent SIMs from their books.

A decision by the Indian Supreme Court to cancel 122 telecoms licenses awarded in a highly criticized 2008 auction process sparked arguably the worst period in the Indian telecoms history. The months that followed the decision saw bickering between operators, their partners and the government over several issues including license fees, auction prices and roaming deals, while Batelco and Etisalat decided to cut their losses and withdraw from the market altogether.

So far in 2013 there have been noticeable movements in the market including a deal between the previously at odds Ambani brothers. According to reports, Mukesh Ambani intends of use the fiber assets of his brother Anil's Reliance Communications to provide the backbone for Reliance Jio Infocomm's 4G network. The deal is the first cooperation between the two since the Reliance business empire was split.

Although the majority of consumers in India use basic 2G services, there is a growing market for mobile broadband. Mobile market leader, Bharti Airtel, beat Infocomm in the LTE race by launching services end of 2012 and now covers Calcutta, Bangalore, Punjab and Pune with its network. By end of 2013 India had 88.5 million 3G/4G subscribers representing 7.2% of its overall mobile subscribers.

1.7 VIETNAM

Vietnam has during the recent years aggressively expanding its national infrastructure and growing its subscriber bases across all market segments. Progress in developing the mobile market has been especially impressive, although there has been a substantial moderation in growth recently. While the Internet market, and particularly the rollout of broadband Internet, is still in the early stages of development, the last six years have seen a significant surge in the country's online access. Most significantly, there has been a major push into mobile broadband.

As the telecom sector continues to expand rapidly statistical data published by both the government and the operators were often contradictory and shall be read with caution. In September 2012,

according to Vietnam's General Statistics Office (GSO), the number of telephone subscribers nationwide was 135.9 million, which included 15 million fixed-line subscribers and almost 121 million mobile phone subscribers. Since late 2012, the government published less and less official subscriber numbers which made it difficult to get an accurate view of the market. In any event, there is no doubt that the country's mobile market has been on a long run of growth and that even as the annual rate of mobile subscriber growth fell below 10% a year the market remained competitive and offered a good platform for further growth.

The industry-wide 'correction' in mobile subscriber figures put the number at 134 million by end-2012 equivalent to a penetration of 149%. 3G is in particular attractive in Vietnam dominated of state owned companies including market leader Viettel, second place Vinaphone and third place MobiFone there is deemed little opportunity for international players. On the fixed line side the government seems to be hedging its statistics, a market segment struggling to a certain degree over the last few years with growth now flattened out respective even decline further. This is not to underestimate the fixed line infrastructure that has been already been put in place providing excellent national coverage. As for the Internet, user penetration was estimated at a very healthy 39% coming into 2013. The broadband segment growth was particularly strong, although much more of the growth was in mobile wireless broadband rather than in fixed broadband.

Vietnam – key telecom parameters – 2011 - 2013

Category	2011	2012 (e)	2013 (e)
Fixed-line services:			
Total number of subscribers	15.4 million	14.9 million	14.5 million
Broadband Internet:			
Fixed broadband subscribers (total)	3.84 million	4.45 million	5.40 million
Mobile services:			
Total number of subscribers	127.3 million	134.1 million	138.0 million

Source: BuddeComm

The telecom market in Vietnam continues to attract investor interest, but there is cautiousness as the global industry senses that 'the bubble has burst' in Vietnam.

Russia's Vimpelcom was the latest foreign Telco to depart, selling its shares in the Beeline operation to its local partner. Hutchison Telecommunications is now the last remaining foreign investor as a partner in fourth ranked operator Vietnamobile. However British Telecom and Thailand's True Corp are continuously expressing interest in entering the competitive Vietnamese mobile market. It is generally agreed that the country has come out of a period of wishful thinking and must now face certain realities.

Market highlights according to BuddeComm are:

- Vietnam's mobile market stood at 135 million subscribers by mid-2012, for a penetration of 150%;

- The country's annual growth rate in mobile subscribers was reported close to 40% in 2010 but after the market correction growth had moderated considerably (less than 10% annually);
- In the 2007/2012 period the country's fixed broadband Internet market has surged, jumping almost 300% to reach more than 4.5 million by end-2012 while the fixed broadband penetration remained at 5% of population;
- With interest in broadband services in Vietnam finally picking up, much of the growth was in mobile wireless broadband;
- Fixed-line subscriber numbers were stagnating in 2010/2011 and went into decline in 2012;
- Following on from the successful launch of its Vinasat-1 satellite in 2008, Vietnam successfully put Vinasat-2 in orbit in May 2012;
- Rationalization of the mobile market has started with Viettel acquiring the cash-strapped EVN Telecom in 2012.

2 THE OPPORTUNITY

There are 6.8 billion mobile subscriptions worldwide, estimates ITU in February 2013 published data. That is equivalent to 96 % of the world population, which is a huge increase from 6 billion mobile subscribers in 2011.

Portio Research predicts that mobile subscribers worldwide will reached 7.0 billion by the end of 2013, 7.5 billion by the end of 2014 and 8.5 billion by the end of 2016.

Mobile subscribers in the developed world are rapidly reaching saturation point with at least one mobile subscription per person. Mobile penetration in developed nations is around 128 percent of the population. This means market growth is being driven by demand developing world, led by rapid mobile adoption in China and India, the world's most populous nations. Mobile penetration in developing nations is around 89 percent of the population, according to the ITU.

Mobile Subscriber Base – Regional
(in million, 2013 forecasted)



Source: Portio Research Ltd.

Mobile subscriptions globally outnumber fixed lines by nearly 7:1 (over 8:1 in developing nations) and Mobile broadband outnumbers fixed broadband already 3:1. APAC accounts for 51.9% of global mobile and 43.9% of fixed line subscription.

Subscriber Base Growth Rate – Regional
(in percent)



Source: Portio Research Ltd

With stats like this, it is easy to see that voice business is controlled by tier one operators, while OTT players such as Viber, Skype, Line, Kakao Talk are emerging strongly and eating away voice profit margins.

Niche market voice players dominant in many markets outside of APAC have not been able to gain significant market share in mainstream voice market.

Key Global Telecom Indicators for the World Telecommunication Service Sector in 2012 (all figures are estimates)

	Global	Developed Nations	Developing Nations	Africa	Arab States	APAC	CIS	Europe	The Americas
Mobile cellular subscriptions (millions)	6,835	1,600	5,235	545	396	3,547 (51.9%)	476	790	1,048
Per 100 people	96.2%	128.2%	89.4%	63.5%	105.1%	89.7%	169.8%	126.5%	109.4%
Fixed telephone lines (millions)	1,171	520	652	12	35	515 (43.9%)	72	243	272
Per 100 people	16.5%	41.6%	11.1%	1.4%	9.3%	12.9%	25.7%	39.0%	28.4%
Active mobile broadband subscriptions (millions)	2,096	934	1,162	93	71	895 (42.7%)	129	422	460
Per 100 people	29.5%	74.8%	19.8%	10.9%	18.9%	22.4%	46.0%	67.5%	48.0%
Mobile broadband growth CAGR 2010-2013 (millions)	40%	N/A	N/A	82%	55%	22%	27%	33%	28%
Fixed broadband subscriptions (millions)	696	340	357	3	12	303 (43.5%)	38	168	164
per 100 people	9.8%	27.2%	6.2%	0.3%	3.3%	7.6%	13.5%	27.0%	17.1%

Source: Based on International Telecommunication Union (February 2013)

Notes:	China: 1,218.5 million subscribers	90.2 percent of population in Q2 2013
	India: 738.9 million subscribers	59.7 percent of population in Q2 2013
	USA: 345.2 million subscribers	110.0 percent of population in Q2 2013

At the end of 2012 there were 5.2 billion mobile subscriptions in the developing world (76.6 percent of global subscriptions). Mobile penetration in the developing world now is 89 percent, with Africa being the lowest region worldwide at 63 percent.

3 SMS BUSINESS OPPORTUNITIES

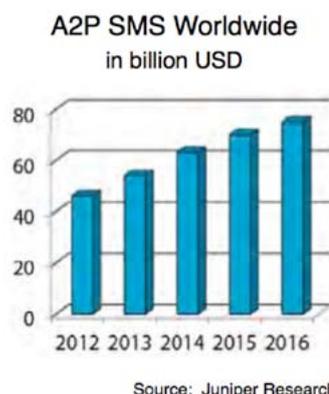
Since APAC is dominated by mobile it is obvious that SMS plays a significant role for every MNO. More though, many voice wholesaler are looking at possibilities to improve their shrinking voice margins by focusing increasingly on data services such as SMS which will along with the surge of Smartphone penetration further stimulate the market for SMS services.

However it is important to distinguish between P2P (Person to Person) communication and the more lucrative A2P (Application to Person) business model. While OTT players are taking away P2P revenue at large from the MNOs the A2P business continuous to grow rapidly.

Juniper Research estimates that the proportion of A2P/P2A traffic relative to the total will increase from 13% in 2010 to 22% by 2016.

In terms of traffic volume A2P/P2A traffic is thus expected to increase from 720 billion messages annually in 2010 to massive 2.4 trillion messages by 2016.

Furthermore while P2P market value is decreasing rapidly due to the OTT players such as Whatapps, Viber and Line the highly lucrative A2P market shows constant growth of 6-10% dependent on the market (from 42 billion USD globally in 2012 to 70.1 billion USD by 2016 according Juniper Research.

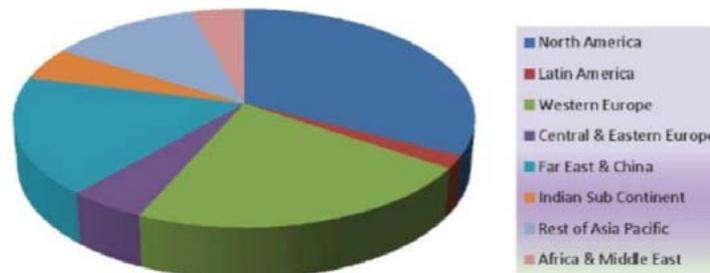


3.1 NORTH AMERICA MAINTAINS REVENUE LEAD

Data from “A New Era for Messaging” indicates that among the eight key global regions tracked by Juniper, North America and Western Europe will representing the largest shares, roughly 20% of the A2P SMS messaging market, followed by Far East/China.

The rest of Asia/Pacific will represent a slightly smaller share of the A2P SMS market than Far East/China, with Africa/Middle East, Central/Eastern Europe and the Indian Subcontinent following. The smallest share will be held by Latin America.

Global Revenue from A2P SMS Split
by Eight Key Regions 2016



Source: Juniper Research

3.2 A2P REVENUE TO OVERTAKE P2P REVENUE

Juniper predicts that in 2016, revenue from A2P messages will overtake that of P2P SMS during that year as the strategic focus for players within the mobile messaging ecosystem shifts from communication between individuals, to sending and receiving service-enabling messages.

However, Juniper forecasts that revenue from P2P SMS, commonly referred to as texting, will peak in a number of regions during the period between 2010-2016 as it reaches a low point in valuation. Juniper finds that even in other regions where SMS has not reached the same levels of traffic, revenue growth will be moderate due to continuing competitive pricing, particularly of prepaid message buckets.

3.3 SMS REMAINS KEY PART OF MNO REVENUES

Despite its being the oldest form of value-added mobile services, Juniper says SMS is still the most prominent form of mobile messaging and remains a key part of MNO revenues. The penetration of mobile devices, the number of these devices supporting SMS, and number of mobile subscribers engaging in SMS makes it ubiquitous among consumers.

In addition, the simplicity of SMS makes it versatile beyond P2P communication. Juniper says A2P and its opposite, P2A messaging are increasing their share of the SMS market due to uses such as financial services, advertising and social networking.

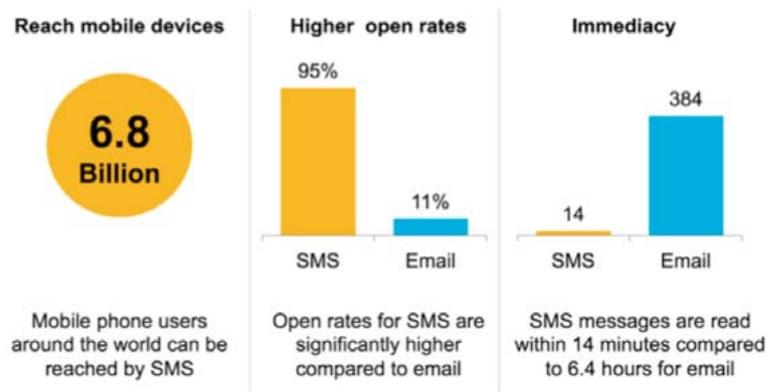
In contrast, adoption of MMS messaging has been slow outside the US and China due to pricing and lack of user interface integration. Smartphones have boosted mobile IM, but Juniper does not forecast mobile IM posing any significant threat to SMS dominance. Mobile email is also growing, but Juniper expects most of that growth to occur within older user demographics

3.4 JAPAN THE "GALAPAGOS ISLAND"

In contrast to the rest of the world Japanese MNOs just started to realize the magnitude of SMS and its revenue potential While i-mode and mobile email used on Japan's proprietary Feature Phones

has been regarded as the default mobile communication solution, the raise of Smartphones took Japanese MNOs by surprise. More secure and real time communication needs along with one-to-one engagement possibilities opened started to gain rapid traction.

The Power of SMS versus Email



Source: International Telecommunication Union (ITU)
eMarketer.com

Furthermore an open-rate of 95%+ for SMS compared to 11% for email speaks for itself! The use of SMS for various business models such as

- Debt collection
- One-time password
- Authentication and
- Notification services

are still at the beginning but adaptation is happening fast. Industry experts predict that Japan may account in the next 3 years for 10-12% of global A2P revenue, in USD 7-9.4 billion USD and bears as such enormous market potential in the years to come.

4 BRIDGE ALLIANCE LINKS 500M M2M SUBSCRIBERS IN ASIA

According to the press release from 27 January 2014 – 11 leading Asia Pacific mobile operators today form the region's largest Machine-to-Machine (M2M) alliance to offer a 'one-stop-shop' experience for M2M deployment across the Asia Pacific region. Bridge M2M Alliance is a center of excellence for M2M services and solutions to attract partnerships and provide customers with an end-to-end M2M regional capability.

Bridge M2M Alliance comprises members of Bridge Alliance and is made up of

- Airtel (India)
- AIS (Thailand)
- CSL (Hong Kong)

- Globe Telecom (Philippines)
- Maxis (Malaysia)
- MobiFone (Vietnam)
- Optus (Australia),
- SingTel (Singapore)
- SK Telecom (South Korea)
- Taiwan Mobile (Taiwan) and
- Telkomsel (Indonesia).

Together, the group serves a combined base of over 500 million subscribers, making it the largest M2M alliance in the Asia Pacific region.

Bridge M2M Alliance eliminates the complexity of dealing with multiple operators by offering seamless delivery of regional M2M services across geographical borders. The Alliance will also improve customers' service experience through enhanced interoperability, service levels and customer support.

Alessandro Adriani, CEO of Bridge Alliance, noted: "Asia is made up of highly varied economies, uneven technological development and diversified regulatory requirements. As a result, multinational businesses find it extremely difficult to navigate the intricacies of the region and to fully capitalize on economies of scale. The evolution of Bridge Alliance in the M2M business is an indication of the commitment from the 11 operators to overcome these challenges for the success of customers' businesses."

The M2M partnership covers commercial as well as technological cooperation across various industries such as vehicle telemetry, security, energy management, etc. This enables the development of new business models, creation of new products and services and reduction in customers' operational costs. The alliance is determined to build an innovative ecosystem by partnering technology players in the M2M value chain like application developers, module manufacturers and service providers.

Alliance members will continuously cooperate to secure significant commercial benefits and economies of scale for customers and enable joint product development initiatives. Being key operators in the respective countries, they are well placed to leverage and support multinational companies hoping to ride on Asia's growth, as well as Asian companies looking to expand globally.

5 CONCLUSION

The APAC region has witnessed one of the fastest growths in telecommunications/ICTs and particularly mobile telephony, while 6 out of 25 top performers on ICT Development Index (IDI - 2012) are from the Asia Pacific according to the International Telecom Union.

Despite this stupendous growth, 77.5% of the population in the Asia Pacific do not have access to Internet, while the situation for broadband access is even more challenging. Considering the role of digitization and broadband in countries, countries are gearing towards improved connectivity through deployment of robust telecommunication / ICT infrastructure and applications.

Those are posing several challenges such as deployments of 3G and 4G networks, migration from analogues to digital broadcasting, spectrum re-farming for IMT Advanced bands/digital dividend, launch of satellite, submarine and terrestrial connectivity for greater bandwidth capacities. Furthermore emergency and disaster communications, role of social networking giants and requirement of infrastructure, net neutrality, convergence of sectors and institutions, international connectivity and mobile roaming especially in the landlocked and small island developing states, development of local languages and applications in addition to diverse cultures and languages as well as the digital gaps between the haves and have nots in the APAC region.

In other words, closing the digital gap is an important component of on going efforts across the region to promoting enhanced regional connectivity, which includes better understanding and links amongst peoples a task most countries are aggressively pursuing.

Xona Partners (Xona) is a boutique advisory services firm specialized in technology, media and telecommunications. Xona was founded in 2012 by a team of seasoned technologists and startup founders, managing directors in global ventures, and investment advisors. Drawing on its founders' cross functional expertise, Xona offers a unique multi-disciplinary integrative technology and investment advisory service to private equity and venture funds, technology corporations, as well as regulators and public sector organizations. We help our clients in pre-investment due diligence, post investment life-cycle management, and strategic technology management to develop new sources of revenue. The firm operates out of four regional hubs which include San Francisco, Paris, Dubai, and Singapore.

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