

MVNOs Asia

2018

SHAPING THE ASIA PACIFIC MVNO MARKET

EXCLUSIVE
REPORT

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MVNOs Asia

SHAPING THE ASIA PACIFIC MVNO MARKET

By some distance the world's largest regional mobile market, Asia Pacific (APAC) is also the most diverse and complex.

Comprising more than 50 nations and territories, two continents and an area equivalent to more than a third of the total landmass of the Earth, the APAC region also boasts around 60% of the global population, including three of the five most populous countries on the planet (China, India and Indonesia).

Given its sheer size, it is no surprise that the 2.7bn unique mobile subscribers across the APAC region represents a market unrivalled anywhere else. But due to the unique demographics of a region that is characterised by sharp contrasts between urban and rural, wealthy and poor, well-connected and remote populations, even that colossal figure only represents a 67% penetration rate in mobile ownership.

That is why, as well as ranking as the world's largest mobile market, APAC is also consistently rated as the industry's biggest growth market. And as domestic markets across the region

open up to MVNOs, virtual operators are widely viewed as having most to gain.

In this report, we will provide a snapshot of the current state of play in the MVNO market across the APAC region. We will address the impact of regulation and market liberalisation, as well as how relationships with network operators are evolving in different domestic and sub-regional markets.

We will assess the latest business trends, including the roles MVNOs are playing in extending the reach of mobile in emerging, underdeveloped markets, and how virtual operators in more established areas are diversifying their offer to compete on more than price and data bundles.

We will provide a more in-depth analysis of four key markets from across the region and get insights from top industry analysts with their ear to the ground. We will then cast our eyes forward, asking what the key opportunities and challenges for the region's MVNOs are going forward, with a particular focus on the impact of technology.

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SNAPSHOT: THE APAC MVNO MARKET IN 2018

When asked their opinions on the prospects of regional MVNO markets, participants in KNect365's annual market survey, Shaping the Global MVNO Market 2018, were unanimous - APAC is the region where industry insiders expect to see most growth in mobile overall, and it is where they see the best opportunities for MVNOs.

This is backed up by most economic forecasts for the key APAC markets. According to GM Insights, China - the world's single biggest domestic mobile market - MVNOs are expected to grow at a CAGR of 16% to 2024, above the global average of 12%. This figure soars as high as 56% CAGR for MVNOs in emerging Asian markets, where low mobile penetration in less developed economies presents even greater growth opportunities.

The discrepancy between these figures says a lot about the diversity of the region. In China, growth can largely be accounted for by rapid urbanisation and a significant shift towards a consumer economy. This has created a huge market of tech-savvy, aspirational consumers looking to embrace mobile technology. Crucially, smartphone penetration remains below levels seen in Europe, USA and even more developed APAC economies like Japan, South Korea and Australia. That means there is still room for MVNOs to develop their offer around data.

In emerging economies like Pakistan and Bangladesh, mobile penetration remains as low as 50%, creating ideal "virgin territory" for MVNOs to move in on. Predictions for explosive MVNO market growth in these economies are largely founded on the rapid roll out of 4G - GSMA predicts that these two countries, plus India and Indonesia, will be major drivers of 4G connection growth in the coming years.

The issue of network infrastructure, however, reveals a marked urban-rural divide in Asian mobile markets. Huge swathes of the most remote rural areas remain beyond the reach of mobile network technology, or at best only served by 2G infrastructure, with geographical issues exacerbated by poverty and inequality.

In China, the difficulties (or lack of will on the part of MNOs) of extending infrastructure out to rural areas has been used to explain a slow down in mobile market growth now that the major urban centres have reached high levels of penetration.

Interestingly, in India a different picture emerges, where some MVNOs are focusing on developing services for rural areas because the levels of competition from MNOs in the cities is too intense.

Relationships between virtual operators and MNOs remain crucial to MVNO prospects in individual domestic markets. In the Middle East, despite some signs that governments in countries like Israel and UAE might be prepared to introduce MVNO licenses, a lack of will on the part of MNOs is preventing virtual markets from emerging. Elsewhere, in countries including Australia, restrictive commercial structures are viewed as holding back innovation amongst MVNOs.

Where operators have embraced the MVNO model in countries such as Japan, Malaysia and Singapore, another challenge is MNOs recognising the value and pushing into the market themselves with virtual sub-brands. This is why so many commentators and industry insiders agree that MVNOs across the region need to focus on service and business model innovation, leaving behind the traditional MVNO focus on price and data in order to maintain competitive advantage.

Customer service, digitalisation, B2B vertical integration and value-added offers making use of new technologies are widely cited as the key areas in which MVNOs should focus differentiation. According to Analysys Mason, operators across the region do not enjoy high levels of customer satisfaction, with Net Promoter Scores (NPS) below comparable averages found in other regions. This suggests APAC consumers would respond favourably to any kind of innovation in service and offer MVNOs could offer. With the proportion of postpaid contracts across the region unusually low, it might even help migrate more users onto the higher ARPU tariffs.

Finally, it should be remembered that the majority of APAC countries have only very recently opened their mobile markets up to MVNOs, if at all. As well as the Middle East, regulators in Indonesia are yet to issue MVNO licenses, while in India - the world's second biggest domestic mobile market - MVNOs only appeared in 2016. The first two years in India have been characterised by teething issues blamed on a lack of clarity in the regulatory framework, which are only just being resolved.

INSIDER'S EYE

Renato Andrade Reis, CEO of international MVNO services provider Acqua Telecom, shared his insights into the current state of the APAC market.

The Asian and Pacific markets are all set for significant growth. The main driver will be the increase in MVNOs focusing on value-added services (VAS) in areas such as gaming, Fintech, international packages etc. MVNOs are enjoying better revenues, with more individuals owning multiple devices, better advertising and better distribution.

In Japan and Korea, the regulatory environment is still an issue, but with that said, the MVNO market is closing in on almost 20% of the total market. Figures like these cannot be found anywhere else in the world. Gaming is a big thing for MVNOs in these countries, and the trend is to keep growing. Internet Initiative Japan (IIJ) is a good example of a company that has managed to break away from the traditional model and is now a major MVNE offering very close to full MVNO services.

Malaysia has a good quantity of MVNOs reaching close to 12% of the entire subscriber base and more than that, they are closing in on the available postpaid market. What is also interesting in Malaysia is how close MVNOs work with their host MNOs and how they truly complement each other. The trend here will be for Fintech to come into the market quite strongly in the second semester of this year.

The Philippines and Indonesia are a bit behind in overall MVNO market development, but Fintech will be a big trend in mobile here too. Indonesia is launching its first MVNO very soon and the Philippines has probably the biggest Fintech-based MVNO market in the world. Fintech already generates over \$45bn in revenues each month for MNOs and MVNOs across Asia!

Hong Kong's MVNO market is now facing something of a slowdown as the focus shifts increasingly to tourist packages. It's a similar story in Taiwan. In China, meanwhile, the existing MVNOs are all losing a great deal of money. In the coming years, either the Chinese government will let outsiders in or the local market will continue to be a losing proposition. Add to this that they have still no portability.

MOVERS AND SHAKERS

There is a mood of optimism across large swathes of the APAC MVNO market, with the region expected to continue its astonishing story of growth in the short to medium term. But which markets are setting the pace, what do MVNO prospects look like on a domestic level, and what are the key company names to watch out for?

In this section, we pick out four Asian MVNO markets - China, India, Singapore and Australia - and use their stories to add further depth and context to the regional picture.

CHINA

It has not always been an easy road for China's MVNO industry. The initial decision by the government to issue 37 licenses in 2014 was officially a trial of the concept, intended to break the domination of China's big three state-owned mobile carriers - China Mobile, China Unicom and China Telecom - and inject some competitive life into a sluggish market.

But although the big operators were compelled to sign deals with at least two virtual operators each, a lack of market regulation meant they naturally imposed high wholesale prices. Worse still, with the state conglomerates controlling a market that already enjoyed 96% subscription penetration, Chinese MVNOs were left to feed off the remaining scraps of marginal, low spend customers.

As a consequence, high wholesale prices and low ARPUs have left China's MVNO sector struggling against tight margins.

Yet in spite of the difficult hand dealt them, Chinese MVNOs have found a way. One advantage of operating in a country the size of China is that 4% of the population still represents an untapped market running into tens of millions. More than anything, China's MVNOs have shown ingenuity and innovation in finding ways to increase profitability with value-added services, especially in areas such as gaming, enterprise applications and international roaming.

One remarkable consequence of the success of Chinese MVNOs providing

services for China's enormous international diaspora is the decision of China Mobile, the world's largest mobile operator, to enter the market. It has secured a license in the UK to sell voice and data services on the EE network under the trading name CMLink. A bid to launch a similar service in the US has been blocked by federal authorities.

The entrance of China Mobile into the MVNO market will only further fuel criticism that big players hold too much power in the country's mobile ecosystem, suggesting the experiment has not achieved its desired goals. Just three MVNOs, Snail Mobile, d.Mobile and YuanTel, control around half of the virtual market in China, while major device manufacturers and webcos such as Lenovo, Alibaba and Baidu also have a stake in the sector.

Nonetheless, the country's authorities have decided that the trial has shown enough promise to be made a permanent feature of the mobile market. Early in 2018, the government announced that it would be launching full commercial licenses and making them available to foreign players for the first time.

With a formal and long-term licensing structure, it is hoped that market regulation will bring down wholesale prices and make the sector more attractive to newcomers. On that basis, it is predicted that China's MVNO market will grow at a CAGR of 16% to 2024, reaching 59 million subscribers.

INDIA

Much the same as China, India's even younger MVNO market has not had the most straightforward of beginnings. The world's second biggest mobile market issued its first MVNO licenses in 2016. Since then, like the Chinese experience, a lack of wholesale market regulation has left early virtual operators battling against high prices as established MNOs battle to maintain market share.

Things have not been helped by the ultra-competitive nature of the Indian carrier market, which has led to voice and data prices collapsing and a wave of consolidation which has caused the kind of disruption an emerging MVNO sector does not need to face.

When all the dust has settled, however, Indian MVNOs will have an opportunity to take a slice of what is forecast to be the fastest growing mobile market on the planet. With an estimated 40% of the country's population still not connected to mobile, remaining MNOs and virtual operators will be looking to make inroads to sign up half a billion new subscribers.

The opportunity might be enormous, but it won't be straightforward. Arguably more than any other country on the planet, India is characterised by a sharp urban-rural divide in the make-up of its mobile market. While carriers, many of them operating at a regional level, have sprung up in high numbers to do battle for the custom of the huge city populations, vast tracts of the country's remote rural hinterland have remained ignored and untouched.

That has created the unique situation where MVNOs are actively looking to India's rural areas as the most reliable sources of revenue. Many are launching mobile services to build on top of existing digital offers. As in examples like Aerovoyce, Fintech is proving highly popular, taking mobile wallet and mobile payment services to remote, underserved communities. In a country where large sections of the population do not have bank accounts or credit cards, these services are an important first step to joining the digital economy.

As Aerovoyce founder and CEO Sivakumar Kuppasamy told Medianama.com, rural markets are also attractive to new entrant MVNOs in India because there is less competition from established operators and, with less choice available, you can establish greater loyalty from customers. This means that, despite expectations, ARPUs in rural markets can actually be higher than in the cities.

One requirement for MVNOs to take advantage of underserved rural markets in India will be the development of network infrastructure that can support services with a realistic value proposition. 2G is still believed to account for more than half of subscribers in some areas. However, GSMA Intelligence predicts that India will be a global leader in 4G connection growth to 2025, as operators realise the value of extending infrastructure to reach beyond the biggest urban centres.

SINGAPORE

Like India, Singapore only gained its first MVNO in 2016. Like China, the decision by regulators to issue virtual licenses was taken in an attempt to shake up a comfortable and stagnant mobile market that had come to be dominated by just three major operators.

CirclesLife launched offering 4G services targeting a young, tech-savvy demographic that wanted data and online access over traditional voice and SMS packages. Most of the MVNOs that have come since have followed CirclesLife into that niche, but there are now signs that the market is starting to mature and diversify.

Ivan Landen, Chief Wireless Officer of Blue Wireless, explained: "The number of MVNOs has continued to grow over the last 12 months, with a range of new launches. Most of the MVNOs still follow the traditional 'selling SIMs to consumers' model, such as recently launched MyRepublic. But there are also now MVNOs focusing on new segments, such as Blue Wireless.

"For Singapore, the change has been modest and new entrants have not changed the business models and price levels significantly yet. The key factor for MVNOs to be successful is to provide added value for the specific segment they are serving, not just being cheaper than the mobile operator. This could be segments in consumer (youth, travellers etc.) but also in enterprise (IoT, digital signage, kiosks, security etc.)"

Like CirclesLife, Blue Wireless specialises in 4G/LTE services, but tailored to the business market. It provides SIMs and advanced networking equipment for branches, remote sites, kiosks and IoT installations in 20 countries across the APAC region.

Ivan believes IoT has a key role to play in the growth of the MVNO market across the region, especially with the arrival of 5G: "IoT is the major driver of change as it opens up new uses besides the traditional market of handphones. For operators to monetize 5G successfully, MVNO strategy is essential as most don't have the knowledge or capabilities to serve all new segments of the IoT market."

INSIDER'S EYE: AUSTRALIA

Gary Bhomer, Principal Consultant at Tel-Consult, shares his expert insight into the Australian MVNO market.

The MVNO mobile handheld market share has continued to grow in Australia. Pure MVNO's made up approximately 11% of the market as of June 2017, with this figure rising if you include MNO sub-brands and agents like Boost, Belong, Kogan and Virgin (note Optus announced the closure of the Virgin brand in Australia in May). The MVNO sector continues to gain traction and the last 12 months has seen a number of new entrants including:

- **Belong:** A Telstra sub brand focussed on the value segment targeting the likes of amaysim and Aldi Mobile.
- **Catch Connect:** An online discount retailer like Groupon.
- **Mate:** A simple discounted plan to add bundles with existing and new fixed NBN (broadband) customers.
- **Lyf:** Targeting the Millennial segment.
- **gotravelSIM:** Targeting the inbound traveller segment (backpackers, seasonal workers etc).

The MNO market is dominated by the incumbent Telstra which has 43% share, followed by Optus at 28% and Vodafone at 18%. Prices have declined on average by 7.1% over the past four years with data inclusions increasing at a phenomenal rate of 46% to the year ended June 2017 (source: ACCC).

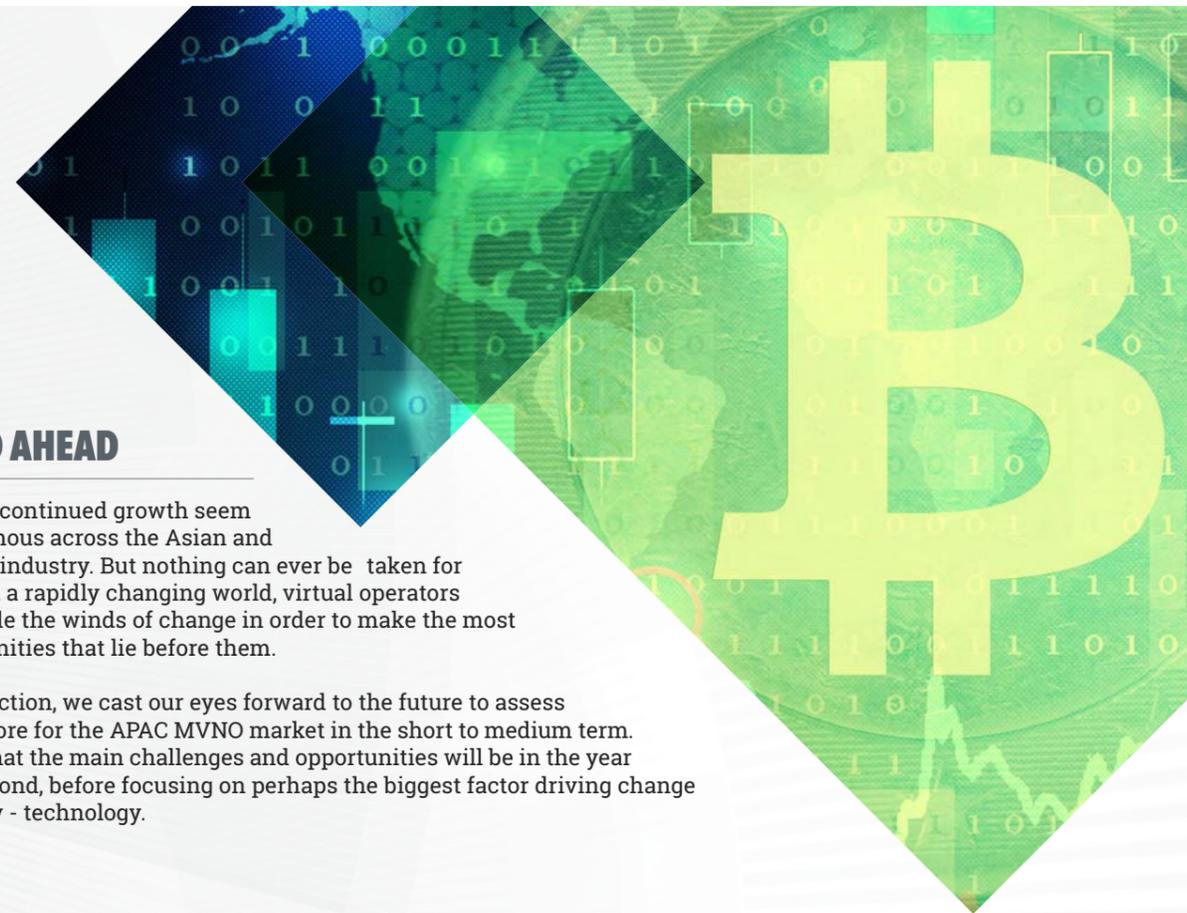
The Australian telecoms market is at a real inflection point with mobile competition at an all time high and the National Broadband Network (NBN) impacting fixed margins. As a result, telco's have been a drag on the local share market with Telstra's share price down by more than 50% over the past two years and amaysim, the largest MVNO in Australia with more than 1m customers, has seen its share price halved in the past 6 months.

Increased competition and the pending launch of TPG Mobile is resulting in lower ARPU's, higher inclusions and lower mobile margins. Optus and Telstra in particular have also focussed on exclusive sporting rights with Optus holding EPL and FIFA World Cup football rights and Telstra holding the local National Rugby League (NRL) and Australian Football League (AFL) digital rights amongst others.

Later this year we will see TPG Telecom launch their own mobile network. TPG is currently an MVNO on the Vodafone and Optus networks with around 400k customers. TPG has paid the highest amount ever seen globally per MHz/pop in the 700MHz band. It is certainly a move that has added fuel to the competitive fire!

The Australian market is still relatively undifferentiated with providers competing mainly on price and data inclusions, which have increased by a factor of four over the past two years! There are no providers adopting a digital first strategy although Telstra and others are moving to adapt their systems and processes, but this will take two to three years in my view.

As such I see an opportunity for digital first MVNOs to target the Millennial segment in particular. MVNOs are typically not encumbered by legacy BSS / OSS systems and are in a unique position to offer superior customer service and to put the customer in control. It will only be a matter of time before we see successful digital first propositions in the market, like IDMobile in the UK, CirclesLife in Singapore and more recently Yoodo in Malaysia.



THE ROAD AHEAD

Predictions of continued growth seem almost unanimous across the Asian and Pacific MVNO industry. But nothing can ever be taken for granted and in a rapidly changing world, virtual operators will have to ride the winds of change in order to make the most of the opportunities that lie before them.

In this final section, we cast our eyes forward to the future to assess what lies in store for the APAC MVNO market in the short to medium term. We will ask what the main challenges and opportunities will be in the year ahead and beyond, before focusing on perhaps the biggest factor driving change in the industry - technology.

CHALLENGES AND OPPORTUNITIES

Alongside optimism, the APAC market insiders who we surveyed for our Shaping the Global MVNO Market 2018 report were quick to point to the complexities of the region and the many pitfalls MVNOs face. Aside from sheer geographical size and demographic diversity, many pointed out that ARPUs remained stubbornly low, mainly due to unfavourable wholesale market conditions, intense competition and a lack of differentiation.

The eagerness for many MNOs to launch their own virtual sub-brands rather than focus on a wholesale role, and the entrance of many big name players from outside the traditional telecoms sphere offering OTT services certainly doesn't make conditions any easier.

The danger is that, with squeezed margins and high CAPEX costs, there is little room for pure MVNOs to invest and innovate in order to find the value-added revenue streams they need to thrive. With few domestic APAC markets yet at the advanced stage of wholesale market regulation seen in Europe and North America, the worst case scenario would be 'MVNO' becoming an add-on service controlled by the biggest players, rather than an independent market in its own right.

The good news for APAC MVNOs is that carriers are feeling the pinch as well. In crowded markets such as India, consolidation is expected to bring greater order and stability to the mobile market. In countries dominated by a small number of MNOs like China, Singapore and Australia, there is a growing appetite

amongst regulators to back the MVNO model as a means of stimulating competition.

And then there is the question of market reach. In countries like India and Indonesia, MNOs have found it difficult to reach large sections of their geographically and demographically diverse societies. There is a growing recognition that small, agile MVNOs with a specific niche focus offer the best ways to connect dispersed and remote populations, doing a difficult and resource-intensive job for the operators.

What is widely recognised, however, is that successful MVNOs going forward will have to keep looking for new business models and new ways to differentiate beyond voice and data packages, if for no better reason than the margins bottoming out in these services. OTT entrants provide additional competition, but they also illustrate a model that MVNOs can use to their advantage.

Already used to creating carefully targeted value propositions for niche segments, MVNOs are perfectly placed to add content and value-added services which appeal strongly to very specific demographics. We have already seen examples such as LycaMobile bundling in livestream cricket packages for Bangladeshi nationals working overseas. In areas such as gaming, sport, entertainment, health, fitness, financial services and transport, MVNOs have the opportunity to pick and choose services to create the ideal 'Mobile+' proposition for their niche.

THE ROLE OF TECHNOLOGY

Key to this is the development and adoption of technology. Whether it is adding livestream sports packages to your bundle or mobile wallet payment services, MVNOs need access to the right applications and platforms to deliver the service.

For OTT content and value-added services, four technologies are viewed as central to how the MVNO market will evolve - IoT, eSIM, Fintech and Blockchain. In our 2018 global MVNO market survey, more than two thirds of respondents said they would be investing in these and other technologies in the near future, with half picking out IoT as the one they expected to have the biggest impact.

At the same time, the process of digitalisation - turning businesses into mainly online operations run in the cloud - is seen as an important step laying the foundations for MVNOs to innovate with their business models, increase flexibility and cut operating costs. The 'as-a-service' cloud model is becoming increasingly popular in mobile retail, B2B and wholesale partly in response to changing user expectations. In Australia, for example, the largest carrier Telestra has announced plans to digitalise large section of its business with a view to creating a 'simple' and 'effortless' experience for customers.

But digitalisation is also seen as a natural step towards delivering OTT and value-added complementary services. The easiest way to allow an end user to make payments, access games or entertainment or even make toll-free calls over WiFi on a smartphone is via an app. Building, selling and managing apps is therefore expected to be a key part of digitalised MVNO business models in the future.

Let's take a closer look at the main technologies expected to provide the best opportunities for MVNOs as they look to shape new value propositions.

IoT

The Internet of Things represents both a landmark opportunity for MVNOs and the biggest disruption the market has faced since it came into being. The provision of machine-to-machine connectivity services for industry, vehicle fleet management, Smart Cities, Smart Homes, connected cars, agriculture and much more is a huge departure from mobile operator's traditional territory selling voice and data SIMs.

The demand for connections is expected to shoot into the billions rapidly, especially with the arrival of 5G. With such numbers and such diversity in the types of connectivity and support required across sectors, it is expected that traditional operators will lean heavily on MVNOs to deliver specialised services to different niches.

In Asia, Singapore has been quick to get on board with IoT with a futuristic 'Smart Nation' vision of thousands of interconnected services. Major carriers including Singtel, M1, UnaBiz and StarHub have already completed or announced

IoT network rollouts.

India's Plintron, meanwhile, the world's largest fully digitised B2B MVNE, reports that it is already seeing plenty of interest from MVNOs wanting assistance setting up IoT services in response to demand in their domestic market. In Australia, although there are currently few dedicated IoT MVNOs, global connectivity providers such as Cubic, Transatel and Kore Wireless have all signed local wholesale agreements for IoT networks and the MVNO market is expected to grow in due course.

Overall, the picture across the region is that the IoT market is not yet big enough to support a drastic shift away from consumer services for MVNOs, but growth will accelerate. Much will depend on the roll out of 5G, which is expected to arrive in the first APAC markets in 2019, although it may be the case that wholesale agreements for MVNOs don't emerge for another couple of years.

eSIM

The third phase of the GSMA's standardised remote provisioning protocol for embedded SIM has introduced far-reaching interoperability between operators, networks and devices and brought a breakthrough into the consumer market a step closer.

To date, e-SIM has mainly had an impact in IoT applications such as the connected car market where remote provisioning has resolved problems around roaming and international product shipments associated with physical SIMs.

If and when it starts to be adopted in the smartphone market, it is expected to cause a huge shake-up of the mobile value chain. Without a physical SIM to sell, operators will be pushed out of their traditional role controlling network access. Consumers will instead be able to switch operators and packages 'over the air', creating a much more fluid and flexible digital market.

Device manufacturers stand to benefit where operators lose out, with an opportunity to form direct relationships with customers providing network services bundled in with the device. The likes of Samsung and Huawei are expected to introduce their first e-SIM smartphones in 2019.

OEMs, however, will still need the infrastructure and expertise to provide connectivity, and a lot will depend on the approach of MNOs. They could seek direct partnerships with manufacturers to manage e-SIM connections on their behalf, or they could see more value in allowing smaller, agile virtual operators to step in and offer this as a specialist service.

Some commentators believe that the flexibility of eSIM will actually loosen the ties between MVNOs and operators and give virtual players more opportunity to innovate in their business models. One prediction is that we will see the emergence of international IMSI MVNOs who will specialise in managing roaming between different domestic networks from a single remotely provisioned service.

Futoshi Sasaki, Deputy Manager of the MVNO Business Management Office at Internet Initiative Japan (IIJ), believes the benefits e-SIM will bring to the consumer experience will benefit MVNOs.

"The most important essence for building an e-SIM ecosystem is terminals," he said. "The third phase of e-SIM standardisation includes many attractive new features like LPA-API and rich UI for activation. I hope these new outcomes will wake new market demands and bring positive feedbacks for the supply side.

"The non-standardized soft SIM technologies have arisen mainly in China, with successful partnerships between operators and manufacturers. The lesson is that the innovation will be brought by not only standardisation, but also the drastic experience of consumers intensely cycling the ecosystem."

FINTECH

Digital finance services such as mobile banking, mobile wallet and mobile payment are widely viewed as a key growth area in the APAC region. MVNOs and MNOs alike are signing up to deliver Fintech value-added services at a rapid rate - 12 new entrants in just two weeks, in one example we heard about.

And as in the example of India's Aerovoyce, an MVNO run by financial services company ADPAY, the emerging market is attracting Fintech specialists to try their hand at telco services, too.

Fintech may have a particular appeal for the diverse demographic groups found across the APAC region. On the one hand, for increasingly tech savvy urban populations, the ability to make contactless payments from your smartphone and bank on the go fits well with an increasingly mobile lifestyle.

On the other hand, the combination of Fintech and mobile has the potential to be a force for inclusion across the region's poorer, remote, rural populations. In areas where few people have bank accounts and debit cards, for example, mobile payment provides a means to take part in the new digital economy, buying goods and services online and paying through your mobile operator.

The relationship is seen as a win-win for both Fintech providers and mobile operators. The convenience of mobile is a key enabler of Fintech growth, meaning digital finance companies are actively looking for operator partners. For MVNOs, additional services such as Fintech provide a means to differentiate and tap into new value streams, with their carrier expertise acting as a bridge to potential new markets.



BLOCKCHAIN

Out of all the technologies touted as being influential in how the MVNO market evolves, Blockchain is the one that remains most firmly in the concept rather than implementation phase.

Some industry insiders, amongst them Hakan Femir of Turkey's Fenercell, believe Blockchain and distributed ledger technology in general have the potential to radically reshape the MVNO business model in much the same way IoT and e-SIM could transform the mobile ecosystem.

It is predicted to be a \$1bn sub-sector within telecoms alone by 2023.

Best known as the technology which underpins cryptocurrencies like Bitcoin by allowing safe, transparent transfer of digital assets via an online network, Blockchain has clear synergies with Fintech. It could be used as the basis of banking apps, while Russian MVNO MoBee has already launched a mobile wallet concept using its own cryptocurrency.

But as Blockchain boils down to a digital storage and data sharing technology, its potential applications go way beyond Fintech, from providing a platform to run

membership and loyalty card apps to managing contract and billing relationships between operators and MVNOs.

Perhaps one of the most interesting potential applications is its use alongside e-SIM in the creation of international MVNOs. Used as the basis of a contractual system, its distributed, decentralised nature allows an unlimited number of parties to sign up. MVNOs seeking network agreements with carriers in multiple countries could use this to offer customers simultaneous contracts with dozens of operators the world over, all from signing up for a single service, resolving the roaming issue once and for all.

For now, however, some analysts are wary of the 'hype' surrounding Blockchain, pointing out that it has to date had no practical applications in the APAC MVNO market, and perhaps remembering the years of talk about IoT with very little in the way of material benefits.

Asia is, however, well represented on the global Carrier Blockchain Study Group (CB SG), with mobile players Turkcell of Turkey and Japan's Softbank joining telcos from Malaysia, Philippines, Vietnam and Kuwait.

CONCLUSION

Overall, evaluating the current state and future prospects of the Asian Pacific MVNO market has to take into account that it remains a young sector. With only a handful of the region's fifty-plus nations boasting what could be called a mature MVNO market, and many yet to see one emerge at all, the prevailing trends are those you would expect from any sector still finding its feet.

But all the indications are that MVNOs will play a central role in what is almost unanimously seen as the biggest growth mobile market in the world. As seen in countries like China and Singapore, regulators are warming to the idea that licensing MVNOs is a viable option for introducing more competition into domestic mobile markets against the anti-competitive instincts of the largest carriers.

It has to be hoped that willing to issue licenses will be followed by a willing to regulate the wholesale market too. Following China and India, all eyes will be watching Indonesia, the third regional giant in terms of population, as it prepares to launch its first MVNO.

Aside from competition, extending the reach of mobile services is another reason why MVNOs are likely to become increasingly important across the region. With half a billion people still not connected to mobile services at all, MNOs have shown that the job of reaching the vast populations across enormous

geographic and demographic divides is too big for them alone.

Many will surely realise that, far from representing unwelcome competition, smaller, agile MVNOs represent a way to gain value from spare capacity and reach untapped markets they have not been able to make an impression in. The fact that MVNOs in Japan and South Korea enjoy 20% market share demonstrates their is room for them.

Finally, MVNOs across the APAC region can enjoy huge gains from new technology. Aside from providing consumer services to a population of 1.6bn people, the evolution of IoT will create mobile connection demands for billions of smart devices. The big carriers will need all the help they can get meeting this demand.

Similarly, while e-SIM threatens to significantly disrupt the traditional mobile value chain, it creates new opportunities for businesses to manage B2B and consumer provisioning services, or international interoperability as a replacement for roaming. Fully digitised MVNOs will be able to specialise in delivering cloud-based added value services, selling and managing apps for Fintech, gaming, entertainment and so on. Further down the line, they could be using Blockchain technology to create complex ecosystems of app services with a single point of access for customers.

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