MVNOs Series

2018

SHAPING THE EUROPEAN MVNO MARKET 2018

EXCLUSIVE
REPORT

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INTRODUCTION

The European MVNO market is the world's oldest, largest and most mature. Boasting more virtual network operators and more user subscriptions than any other region, MVNOs in some European countries command as much as 15 to 20% of the total mobile market.

By 2020, some estimates put the total number of MVNO subscribers on the continent at upwards of 110 million - not far off four times the total number in the USA.

With market liberalisation occuring in some European countries as early as 1995, and the world's first recognisable MVNO - Virgin Mobile - launched in the UK in 1999, the region's virtual networks have had close to two decades to emerge, grow and evolve. Operating in a market where 84% of the population owns a mobile phone and the mobile industry contributes nearly €600 billion to GDP, the incentives for European MVNOs have arguably been greater than anywhere else on the planet.

And in the EU, representing a significant proportion of the continent's domestic markets, including some of the biggest in the likes of Germany, UK, France and Spain, MVNOs have also found a highly supportive regulatory framework.

Yet success brings its own pressures. As we shall explore in this report, the European MVNO sector, and the mobile market in general, is intensely competitive. With mobile ownership having sat close to saturation point for a decade or more, vertical growth has become harder and harder, sparking fierce price wars and waves of consolidation. ARPUs first from voice and then from data have tumbled, the product of regulatory intervention and much as competition.

As the market stands on the brink of its 20th anniversary, in this report we will examine the forces shaping the European MVNO industry heading into a third decade. We will analyse the impact of Roam Like At Home, the EU's decision to ban roaming charges within its borders, and ask whether it deals a significant blow to the industry or, alternatively, a much-needed opportunity.

We will also look closely at the impact of consolidation on the market and ask whether carriers and virtual operators alike might not benefit from more collaborative rather than competitive relationships. With pricing on voice and data having practically become a zero-sum game, we will look at ways MVNOs are diversifying services to seek new value streams and assess the impact of OTT entrants. We will also look at the impact of new technology, specifically how digitalisation is changing business models and the size of the IoT opportunity, and ask whether over the next decade Europe's MVNO sector might see a significant shift away from consumer to B2B markets.

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SNAPSHOT: **THE EUROPEAN MVNO MARKET 2018**

Comprising around two thirds of the continent's nation states and population, it is no surprise that much of Europe's MVNO activity is concentrated within The European Union (EU). Around two thirds of all the continent's MVNOs are found in just five EU member states - Germany, the UK, France, Netherlands and Spain.

Germany boasts one of the world's largest domestic MVNO markets, with around 48 million subscribers and revenues of US $11 billion. This huge sector enjoyed rapid growth following a wave of operator consolidation in 2014, when the regulators sought to mitigate against price inflation by handing 30% of network capabilities to MVNOs.

The UK, meanwhile, has been described as one of the world's most crowded MVNO markets, with 13.5 million customers shared out between upwards of 100 virtual operators. However, 86% of these customers are shared out between a dominant 'Big 6' group of large MVNOs - Tesco Mobile, Virgin Mobile, GiffGaff, Lycamobile, Lebara and TalkMobile.

With Sky another sizeable player in the UK market, it is noticeable how big name brands from outside the traditional mobile sphere have used the MVNO model as a way into the UK market. Overall, one in seven UK mobiles are connected via a virtual operator and the sector is worth more than £2 billion.

As in most areas of industry and commerce, no one is quite sure how the UK's looming departure from the EU will impact on the MVNO sector, both domestically and on the continent. Outstanding issues to be resolved include whether the EU's Roam Like At Home (RLAH) rules will still relate to UK subscribers travelling in the EU, and how carriers which operate networks both on the continent and in the UK (including Vodafone, Orange, Deutsche Telekom and Telefonica) will handle wholesale arrangements in the newly separated markets.

Outside the EU, the biggest single domestic MVNO market in Europe is Russia. Although conditions for virtual operators in Russia have long been viewed as challenging due to the dominance of the country's big 3 carriers and little sign of regulatory intervention to liberalise the market, MVNOs are now estimated to control 2.6% of the country's mobile subscribers. Some analysts confidently predict that this will grow to 14 to 15% by 2022.

Carrier Tele2 Russia certainly appears to be taking active steps to increase its MVNO footprint, reporting 831,000 virtual subscribers on its network at the end of 2017. Its model seems to be using MVNO agreements to attract large non-telco players into the mobile space - Tinkoff Bank has this year announced a 1 billion rubles investment into its MVNO spin-off, Tinkoff Mobile, while Moscow-based ISP AKADO Telecom has also announced signing an agreement with Tele2.

Across Europe's most developed MVNO markets, there are mixed views on the potential for growth. In KNect365's global MVNO market survey carried out earlier in 2018, some respondents described growth prospects as ranging from slow to stagnant. A common theme was that traditional MVNO models are increasingly being squeezed through a combination of price competition and over-saturation in the market, although there were varied opinions on whether this made it difficult for new players to enter the market or else created new opportunities for innovative entrants with disruptive approaches.

Despite the tough trading environment, more than a quarter of respondents (28.5%) still cited Europe as the region offering the best growth opportunities for MVNOs. Some analysts argue that European consumers, already at an advanced stage of engagement with mobile services, will soon start to look beyond price for increasing levels of specialisation and personalised service. This plays into the hands of agile MVNOs which have the experience serving niche markets while network operators, already faced with dwindling retail margins, are more and more likely to turn to wholesale business models instead.

On the other hand, there is a school of thought that suggests it is becoming harder and harder for MVNOs in Europe to operate out of the shadow of their network operators with any degree of independence. Some insiders told us they see MNOs aggressively targeting traditional MVNO territory in a bid to bolster their own dwindling margins.

As Henrik Liungman, Vice President of Services at ACN Europe, commented: "The trend is clearly towards larger data plans. The MVNO's are struggling to compete with the MNO's unlimited data offers on the retail side. 100G plans or unlimited data with caveats are not something MVNO's can offer with the current cost structures."

ROAM LIKE AT HOME AND THE IMPACT OF EU REGULATION

Unlike in many mobile markets around the world, the influence of EU regulators can hardly be described as hostile to MVNOs. If anything, the determination of Brussels to control price inflation and stimulate competition in domestic mobile markets across the bloc has led to some of the world's most favourable conditions for MVNOs to launch and flourish.

Whereas elsewhere across the globe governments have taken a more laissez-faire approach to mobile network regulation, essentially leaving carriers to dictate terms, the EU has been actively interventionist. The steps it took to reduce mobile termination rates (MTRs) and minimise cost differences between on-net and off-net tariffs were widely viewed as key contributing factors in the drastic decline of voice ARPUs for European operators.

Then the EU set its sights on another lucrative source of revenue for the mobile industry - roaming charges.

The rationale for banning roaming charges between member states is obvious from the mobile customer's point of view. Not so much high overseas call and SMS tariffs, what the EU wanted to eliminate was stories of unsuspecting holidaymakers leaving data roaming switched on and being charged hundreds of Euros for connecting to different networks as they travelled.

However, by effectively shutting down the market for overseas mobile services within the European Economic Area (EEA), some see the Roam Like At Home (RLAH) regulations as a damaging own goal scored against the pursuit of competition and fair pricing because of the impact it has on the MVNO market. Others argue that roaming charges are ultimately self-defeating as they encourage customers not to use mobile devices when travelling.

THE CASE AGAINST ROAM LIKE AT HOME

According to Juniper Research, the immediate impact of Roam Like At Home was likely to be an 11% slump in MNO revenues in the year following its introduction in June 2017. When we asked respondents to our 2018 global market survey how they saw that filtering through to MVNOs, they told us they were already seeing signs of carriers adopting more aggressive pricing policies in order to grab back market share from virtual players in a bid to offset their losses.

As Andy Peers, VP of Strategy and Innovation at MDS points out, RLAH actually cuts MVNOs out of the EU-wide roaming value chain. Roaming between EU countries still operates according to reciprocal wholesale inbound agreements which only GSA-member network operators can sign. That means MNOs still get a fee when a user from another operator from another country connects to and uses their network; what they can no longer do is charge higher than their own domestic rates for that access, which is why revenues from roaming are down by a third.

By contrast, MVNOs have never benefited from inbound roaming as they don't get 'guest' connections to their network. They can only buy pre-agreed resale packages for outbound roaming from carriers. RLAH has effectively eliminated the margins from this. Indeed, trade body MVNO Europe goes as far as call the arrangements "discriminatory", because carriers are still allowed to impose high wholesale roaming charges without any recourse for MVNOs to recover them.

Moreover, RLAH has closed the door on so-called retail roaming services within the EU, the market in which many so-called international MVNOs sell low-cost call and data packages for overseas use specifically to avoid high roaming charges. RLAH means there is no longer any need for these services within the EEA.

The biggest impact in this regard is on MVNOs which targeted low-cost roaming bundles at the business market. Whereas the typical consumer MVNO might expect to lose outbound roaming revenue amounting to two or three weeks per year per customer, B2B providers targeting regular business travellers have seen the whole foundation of their offer disappear. This is particularly a blow as, in most cases, low-cost international roaming was not the main revenue source but rather the carrot dangled to sell in other value-added services.

RETHINKING ROAMING

The alternative view is that RLAH should be viewed in the context of dwindling roaming revenues around the world, driven by a combination of consumer demand, regulation and emerging technology. Within the EU, RLAH is far from the first regulatory action taken to curb the excesses of high roaming costs - since 2012, price caps have reduced charges for data roaming within the bloc by some 96%.

And RLAH is not intended to create an EU-wide mobile free market which gives consumers carte blanche to access data services at rock bottom prices wherever they are. Recognising the need to protect operator revenues, regulators have included fair use protocols to stop unlimited data use across borders. This ensures RLAH can't be used by residents in one country buying cheaper plans from another to use at home. Another protection is that operators can apply for derogation from RLAH if they can prove a loss of 3% or more in their margins.

In a global context, of course, the EU is a relatively small market and there still exist plenty of opportunities for European MVNOs to target retail roaming services at rest-of-the-world travellers and migrant populations. But with the trend in revenues from roaming on the slide anyway, some see this as an opportune moment for the industry to rethink mobility across borders from scratch. For the most progressive and agile, brand new opportunities present themselves.

Juniper Research, for example, argues that losses in roaming revenues will quickly be offset by more people using their data as a matter of habit when they travel. It suggests that once high charges became common knowledge, many mobile subscribers became "silent roamers", switching off their data completely when abroad and only using their mobile devices to connect via WiFi. This, Juniper states, costs the mobile industry billions in reduced data use. It advocates this as a key reason for roaming surcharges around the globe to be scrapped, normalising anytime, any place data use amongst millions more "active roamers".

With the experience of RLAH to draw on, EU-based operators will be well placed to capitalise early on any such changes.

There are other reasons to believe that roaming as we know it has had its day in the sun. Technology is coming up with ways to make the need for bilateral roaming agreements between different domestic carriers obsolete. The connected car and fleet vehicle markets, for example, have grown in tandem with the evolution of eSIM technology because of its ability to provision connections to different networks remotely and automatically.

Instead of effectively joining a foreign network as a guest, and paying for the privilege through an agreement managed by your home provider, eSIM has the capability to just transfer you to a new provider whenever you arrive in a new country, provisioning connectivity, billing, services, everything. For vehicle manufacturers, this is highly attractive because it removes one element of complexity and cost from shipping products between different markets.

A similar approach is the development by the ITU of the global IMSI ranges for data services. Acting as an international wholesale network, the vision is that this will enable the development of a 'global SIM' for borderless IoT applications, stepping outside the roaming paradigm completely.

There are plenty of opportunities for virtual operators here. As eSIM use spreads - and the prediction is it is set to have a major impact on the consumer device market, too - there will be a growing demand on the wholesale side for MVNE-type players who can broker the deals between many different carriers that enable automatic remote provisioning as users cross borders. One suggestion is that Blockchain technology, in the form of automated smart contracts, could be used to manage this.

MARKET TRENDS 1: CONSOLIDATION & PARTNERSHIPS

As in any highly competitive, crowded market, consolidation is a long-running trend in the European mobile industry. When businesses reach a point where they can no longer grow organically through their own innovations in products, services and pricing, they naturally turn to mergers and acquisitions as a means to boost revenues and margins.

Assessing the impact of M&A on Europe's MVNO market is a complex undertaking. Although not exclusively, the majority of M&A activity is driven over MVNOs heads by network operators. At carrier level, the general consensus is that too much consolidation is bad for virtual players. Reducing the number of operators is supposed to reduce competition in wholesale markets, leading to less beneficial pricing and access conditions. One recent report into M&A activity in Germany, Austria and Ireland concluded that carrier consolidation tends to lead to inflated retail prices, too.

It doesn't always work that way, of course. France's MVNO sector famously said the introduction of a fourth national carrier, Free Mobile, had made conditions much worse for them, sparking a price war in retail markets that drove down revenues. Still, earlier in the year we heard concerns from Dutch MVNOs about T-Mobile NL's proposed €190 million take over of Tele2. As things stand, their worries appear to have found sympathy with regulators, as the European Commission (EC) has voiced its objection to the deal..

One obvious example where carrier consolidation has benefitted the MVNO sector is Germany, where the 2014 acquisition of E-Plus by Telefónica Deutschland was approved by the EC on the condition that it sold 30% of the merged company's network capacity. The main beneficiary of this capacity sell off, Drillisch, now runs an operation that in scale and business model resembles an MNO, providing retail mobile services through a variety of sub-brands. The key difference is, it still leases rather than owns its network. Drillisch itself as also been on the acquisition trail, absorbing 1&1 Telecommunication into its business as part of a partnership deal with ISP United Internet.

Another trend that some see growing in the European market is carrier takeovers of MVNOs, and also MVNO-to-MVNO mergers. The former represents a way for MNOs to grab back market share by using their financial clout to takeover successful businesses in niche markets. MNOs can then run acquired virtual operators as sub-brands, putting the squeeze on competition with superior marketing resources. This is considered a key factor in the decline of the MVNO market in Spain.

Consolidation is also taking place between MVNOs. Again looking at Spain, one recent example saw Masmovil buy out competitor Llamayar. Masmovil's Chief Strategy Officer Pablo Friere said that faced with a need to create revenue growth of 7% per annum, a 33% increase in prices or a 70% reduction in the cost per GB just to maintain margins, M&A was the only way forward.

On the flipside of all this, there are those who believe outright acquisition of MVNOs is not in the best long-term interests of carriers and virtual operators alike, and advocate an approach based on strategically aligned partnerships instead. While he acknowledges that the number of MVNOs in Europe is falling, Federico Homberg of Deutsche Telekom believes the market is actually seeing a shift away from the 'branded reseller' model towards more independent 'full MVNOs', which offers significant benefits to all parties.

"With business models such as branded reselling it is difficult to scale," he said. "With business models like light or full MVNO you add a lot of complexity on the strategic level (e.g. how to differentiate the main brand and the MVNO brand), on the marketing level (marketing expenses, expenses for sales channels etc.) and on the financial level (ARPU dilution)."

One of Deutsche Telekom's virtual partners is MobileOne, a company which considers itself a 'smart MVNO'. According to CEO Norbert Schuppler, the concept describes a partnership model based on "intelligent differentiation", or ensuring virtual operators can offer carriers a "complementary customer segment beyond its natural reach, with no cannibalisation." It's a case of you scratch my back, I'll scratch yours - instead of MNOs and MVNOs competing for the same consumer markets based on price and service, they can actually complement one another by aligning their strategic strengths.

Fenercell's Hakan Demir believes a more collaborative ecosystem will become even more essential to enable mobile operators of types to take full advantage of the emerging opportunities in IoT. He said: "Operators need to widen their cooperation space, including their rivals, get used to sharing, transform their organizations, form well-functioning clusters etc. in order to maneuver through the complexities and high demands of the IoT business, as well as exploiting the advantages e-SIM promises."

INSIDER'S EYE: WHERE NEXT FOR MVNOS IN THE MATURING MOBILE EU?

Ian Streule, Partner at Analysys Mason, talks through some of the patterns of consolidation and acquisition he sees affecting EU-based MVNOs.

The mobile market in the EU is mature and arguably has been for some time. This maturity – fundamentally leading to low growth opportunities – has led to the aspirations of MNOs to seek cost-reducing and scale-improving transformations. Partial consolidation of networks through RAN sharing has been successful, as have MNO mergers in most but not all cases.

The MVNO market in Europe is also effectively maturing. In some countries, MVNOs have gained 10-20% of the total market share, but there is a limit to the number of sub-segments which can be targeted by MVNOs and increasingly MNO sub-brands. Heavy MVNOs can also be run across multiple countries with core network switches in one location, served by signalling and traffic links to the host MNOs in each jurisdiction. MVNEs can effectively offer the same multi-country operation to multiple MVNO brands.

We think the next wave in the MVNO market is consolidation and acquisition of MVNOs, through a number of routes (Figure 1):

- Acquisition by network operators – acquiring the customer base, either retaining or dropping the sub-brand, is a relatively common exit-route for successful MVNOs.
- New financial owner – as some MVNOs have been established by private shareholders, sale of control to a financial investor provides impetus to turn the MVNO into something else, bigger and better.
- Technology merger – given the reliance of MVNOs on a key technology platform, then there are synergies in service offerings, expansion and independence from the combination of MVNO and supporting or supplementary technology.
- MVNO mergers – where there is substantial scale involved, then MVNO mergers can realise material gains in operational efficiencies, and potentially also with improved wholesale negotiating strength with respect to MNOs.

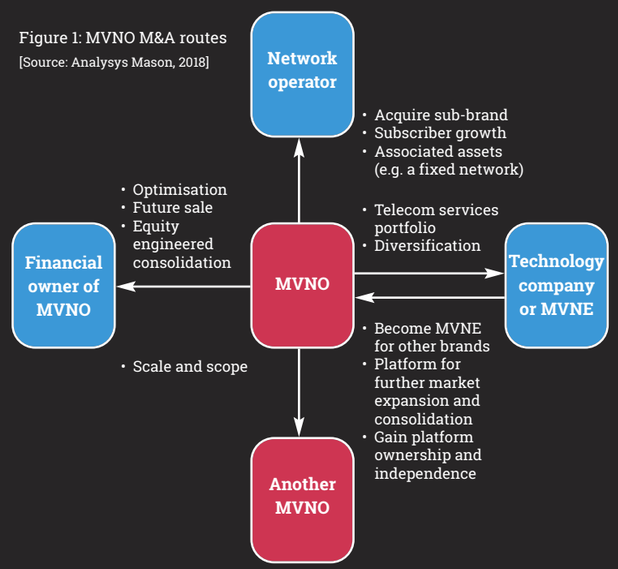


Figure 1: MVNO M&A routes [Source: Analysys Mason, 2018]

There have been a number of recent transactions in this space (Figure 2), however various specific issues would have arisen in each situation.

Target, function	Buyer, business activity
Sisteer, MVNE	El Telecom, MVNO
Cyta Hellas, Fixed operator and MVNO	Vodafone Greece, Mobile operator
Plenti, MVNO	TDC (Denmark), Quad-play operator
Lebara, international MVNO	Palmarium, private equity Palmarium, private equity
Llamaya, MVNO	Másmóvil, fixed and mobile operator
Noitel, MVNO	Clouditalia, telecom and cloud computing service provider

Figure 2: Recent MVNO transactions [Source: Analysys Mason, 2018]

These cases are relatively smaller transactions compared to MNOs and lack fundamentally scarce but easily valued network or intangible assets (e.g. radio sites and spectrum, which are integral to all MNOs). As a result, MVNO consolidation and acquisition cases will need to explore the detailed technicalities of platforms, host network relationship, expectations of niche customers, attractiveness of narrow proposition-specific segments, and potentially low-margin sales businesses predicated on a crucial wholesale supply contract.

MARKET TRENDS 2: **VAS & DIVERSIFICATION**

If Europe's MVNOs are having walk a fine line between becoming smothered and displaced by renewed carrier interest in their markets and gaining the advantages that closer strategic partnerships can bring, they are having to strike a similar balance in their relationship to OTT players.

On the one hand, there is little doubt that the encroachment of non-telco players into the mobile market, particularly in the form of software developers offering zero tariff messaging and calls via apps, is contributing to the intense market competition European MVNOs are experiencing. In our last global survey, a persistent theme was the perceived twin threat of market consolidation and convergence, as network operators teamed up with media companies, content providers, multi-service operators and many more to create bundled service offers they can use to make a grab for greater market share.

Yet on the other hand, there is also widespread agreement that this is a trend virtual operators simply must follow if they are to stand any chance of retaining their positions in the market. As Hakan Demir, founder and CEO of Turkish MVNO Fenercell, puts it, "consumer interest has shifted from better (and better) connectivity to services; they take connectivity as granted. OTT players coming from different spaces and much later into the picture are more admired and have created more value than the operators."

In other words, if MVNOs wish to keep up with where the value is in consumer mobile markets, they are better served copying rather than trying to resist the OTT model.

Asked about their strategic priorities going forward, numerous European MVNOs told us they were focusing this year on diversifying offers beyond voice and data with value-added services. This is more than just a matter of countering the threat from OTT players - with ARPUs from voice and data on a long decline, it is a case of finding new revenue streams to prop up margins.

Lycamobile's Chris Tooley argues that part of this shift involves looking at OTT apps not as competition, but as complementary to MVNOs' own objectives. Apps are here to stay, consumers have already decided that, so operators should focus on creating data packages that give them a stake in OTT adoption. Hakan Demir argues that operators will have to get out of their "walled garden" mindset to embrace this new collaborative ecosystem, but suggests MVNOs are better placed to do this culturally than MNOs.

The ability to offer value-added services also demands changes in the wholesale market. European industry insiders taking part in our global market survey told us they were looking for greater flexibility in billing and rating systems, while another talked about data and capacity deals evolving. There is also a recognition that diversification creates opportunities for MVNEs to create platforms which enable new services as simple-to-run bolt-ons.

Simon Tan of global mobility innovator uCloudlink goes as far as suggest MVNOs would be best served embracing the OTT business model completely. By abandoning conventional SIM ownership to become "OTT-MVNOs", they could open up new market possibilities in borderless service provision. This is a trend that can already be seen in the emergence of AppVNOs and, with its remote provisioning capabilities, could well evolve in tandem with more widespread adoption of eSIM.

IN **SEARCH** OF THE **VALUE-ADD**

So what are Europe's MVNOs and operators doing to extend their service ranges and differentiate their offers in a way the generates new value in such a crowded market?

One of the most significant trends shaping how mobile operators can add value to their own business from OTT services is zero rating. The decision to exclude popular services such as Facebook, WhatsApp, Twitter, Netflix and so on from data use might seem disingenuous - aren't operators cutting themselves off from a revenue stream, i.e. the data used when subscribers access these high-traffic apps?

In reality, of course, this represents an indirect and ultimately low value source of income. Of much greater value is the incentive operators can offer to customers to sign up for or remain on a plan by letting them use their favourite apps without eating into their data allowance. It's a type of unlimited data allowance by proxy.

As with unlimited data plans, MNOs have a major advantage over virtual players when it comes to zero rating because they have so much more capacity. It is doubtful that any MVNO could follow the example of Three's 'Go Binge' plan, which offers unmetered access to high bandwidth content apps like Netflix, TVPlayer, Soundcloud and Zeezer. Three's virtual UK competitor Virgin Mobile, for example, has to settle for offering zero rated plans for Facebook Messenger, WhatsApp and Twitter, which use up much less data.

If offering a free hit to OTT communications platforms sounds like an MVNO shooting itself in the foot, Virgin Media MD Jeff Dodds has a simple answer. "We want to focus our services towards how our customers use their devices and live their lives, giving them value that they can see and understand," he said.

Zero rating is a convenient way for operators to add a content (or social messaging) play to their offer. If they want to bundle in content directly, they either need a direct partnership with an OTT provider, or the services of a specialist MVNE. One such example is Madrid-based 'gaming-as-a-service' provider PlayGiga, which offers a platform for MVNOs to include cloud-based gaming in their service bundle. CEO Javier Polo said: "Telcos are looking for content to expand their service, monetise the network, or reduce churn."

Another growth area amongst European operators is financial and payment services. The best examples of MVNOs utilising FinTech demonstrate a clear vision for how financial services can add value to a specific market segment. For Lebara, for example, adding international money transfers made perfect sense as a complement to its international prepaid SIMs targeting migrant worker and ethnic populations. Eastern European MVNO Globaltel, meanwhile, markets itself to the youth segment and signed a deal with Mastercard to provide subscribers with a 'virtual credit card' specifically for online gaming and content purchases.

Other multi-play innovations are seeing mobile providers make use of the expansion of IoT and smart infrastructure to offer services in areas like energy, utilities and healthcare. Yet adding value to mobile is not all about bundling in more and more services. There are plenty of examples of operators approaching it from a customer service angle, and using innovations in things like pricing and loyalty to increase their appeal.

UK MVNO Sky Mobile, for example, struck on the idea of allowing customers to accumulate unused data and cashing it in for discounts on mobile device purchases. The Superdrug MVNO, meanwhile, another UK-based virtual operator run by the retail chain of the same name, is exclusively available to the brand's loyalty scheme members only.

FUTURE PROSPECTS: **NEW TECHNOLOGY, NEW MARKETS**

So crowded has the European consumer mobile market become that there are plenty of industry insiders who question how much sustained value operators will get from switching attention from connectivity to services in the long term. Eventually, extensive content plays will become the norm, turning what was once an innovation into a race to the bottom on pricing which ultimately favours the biggest players with the scale to monetise unlimited zero rated offers.

Even on customer service, the great bastion of MVNO advantage, there is no guarantee that the smallest players will always be the most agile, the most personal, the most niche. In the world of retail, Amazon has proven that the biggest fish in the pond can set the standards on price, choice, convenience and service all at the same time, and consumers flock to it.

That is why in some quarters it is believed the future of MVNOs lies outside the consumer markets. The modern smartphone user is more interested in device brand and features than network services, anyway, and once OEMs can start embedding eSIMs directly into their handsets, what with all the app-based OTT options available, mobile operators could find themselves forced completely out of the retail market.

But while selling SIMs to consumers may become less and less of a viable model for MVNOs, and growing body of opinion holds that selling mobile services to business will become more and more lucrative.

B2B services now account for a fifth of the UK MVNO market. Mobility in general is a growing trend in the business as companies adopt new and flexible approaches to organisation, such as remote working and distributed workforces. Businesses want different things from mobile services to consumers. Getting the biggest feature bundles for the best price is not the overriding determining factor. While value is important, businesses also want guaranteed reliability, premium QoS, customisation and full integration of mobile into existing communications and IT architectures.

Tomi Saario of Finland's Aina Group suggests that a successful 'B2B MVNO' is one that can forge strategic partnerships to offer business customers the kind of sophisticated integrated services they want. Nick Wooten of BT Wholesale agrees, arguing that relationships with MNOs are critical in the business sphere to allow virtual operators the chance to offer desirable services like fixed mobile convergence and high-speed broadband bundled in with mobile. He also suggests more business-focused resellers should and shall become full MVNOs to take advantage of full customer ownership.

Technology is set to play a critical role in how the European business mobile market evolves. On the one hand, the growth of the Internet of Things (IoT) means that businesses are increasingly not just looking to mobile as a means of keeping their staff in touch and working wherever they happen to be. Across a huge swathe of industries, from manufacturing to healthcare, agriculture to utilities, logistics to public administration, the vision of smart automation depends squarely on network connectivity at unprecedented scale.

On the other hand, technology will hand mobile operators the means to meet these demands and make the profitable. Digitalisation is seeing MVNOs and MVNEs adopt 'as-a-service' cloud business models that are perfectly suited to the flexibility and customisable, open architecture approach businesses desire. Network expansion and virtualisation is creating the capacity to meet enormous new demands for connectivity, while eSIM is transforming how network access and services are provisioned in ways that make them much more business friendly.

DIGITALISATION: **A FUTURE IN THE CLOUD**

When we asked participants in our MVNOs global market survey what their investment priorities in 2018 were, a third of European respondents (30%) said digitalisation. Widely associated with the Cloud but in reality encompassing a much broader range of technological transformations, digitalisation to many industry players is a critical stepping stone to service innovation, adding value to operations and embracing new markets.

Some of the reasons European survey participants gave for prioritising digitalisation included the ability it would give them to better serve 'mobile first' strategies for business customers. One respondent told us that they believed 'unified digital systems' would allow them to work as a 'full operator', with greater speed and flexibility in the market.

Customer service came up repeatedly in responses, for example the fact that the Cloud made it easier to automate aspects of service. Another European industry figure told us that online sales, marketing and support structures resulting from digitalisation would lead to better customer targeting and cost optimization.

One Europe-based MVNE said digitalisation would help them develop a "true UC-app" which would help MVNOs deliver better service. This is exactly the kind of integrated communications approach which appeals to business customers.

'As-a-service' cloud-based business models are expected to become more and more common throughout the B2B mobile ecosystem. Businesses in general are migrating IT services to the Cloud because they are easier to deploy, offer greater flexibility and scalability, and drastically reduce capital investment in equipment and infrastructure - everything you need is offered as part of the service. The same benefits apply to MVNEs and MVNAs, who are able to develop comprehensive 'Wholesale-as-a-Service' (WhaaS) and 'Platform-as-a-Service (PaaS) offers which are drastically reducing overheads and time-to-market for new virtual operators.

According to Achilleas Philippopoulos, Head of MVNO at Cyta, another key benefit of digitalisation is making customer acquisition much easier and cheaper. "We view digital transformation technologies as the main drivers of our business," he said, "especially when it comes to digital acquisition, which we have started using to lower our Subscriber Acquisition Cost (SAC), moving from the traditional acquisition partner channels to our own digital channel.

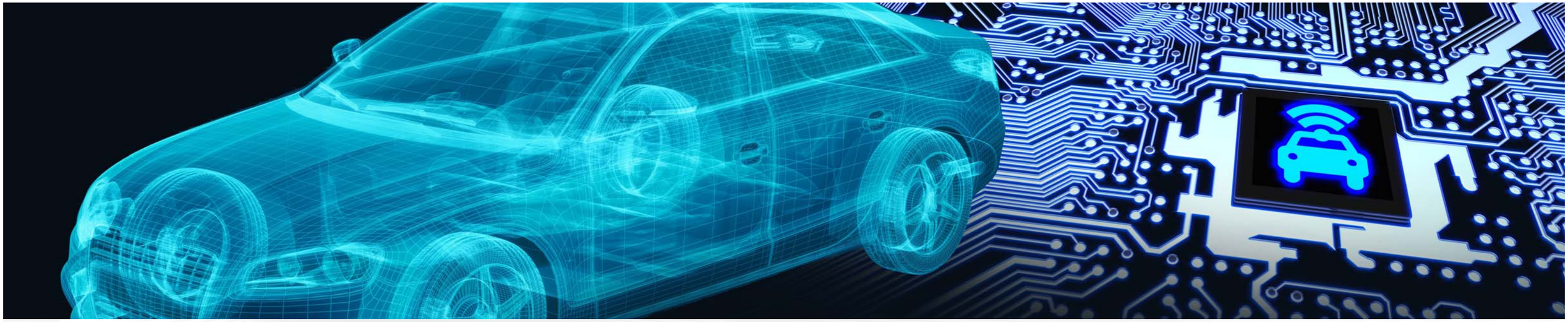
"We view the future as being mostly digital. Becoming future-ready requires changing the customer experience and our operational efficiency to stay ahead of the pack in order to perform better than our industry peers. Engaging with innovation is to my opinion the best way forward, meeting customer needs while reducing our costs at the same time."

Philippopoulos is also a great believer in digitalisation being a gateway for bringing disruptive technologies like Artificial Intelligence into the industry, which he sees as playing a critical role in customer service going forward. "Artificial Intelligence (AI) is in my opinion the top digital innovation which will let machines do more with self-learning technology in terms of personalizing recommendations and the content each one of us wants to access," he said.

Another technology which many see entering the mobile industry in the wake of digitalisation is Blockchain. Compared to other regions, a higher proportion of European respondents to our 2018 MVNOs global survey see Blockchain having an impact in the short to medium term.

Blockchain in Telecom is an innovative new mobile ecosystem platform that has evolved out of Russian MVNO Allo Incognito and promises to use Blockchain to eliminate global roaming. Chief Business Development Officer Oleg Pravdin explains: "Blockchain technologies will disrupt traditional contracts for mobile access, so that any operator can become a global, agile, innovative, no-investment, value-added service provider.

"Blockchain changes the rules of a telecoms network, since it enables a smart contract between the network and consumers at any point in time and space, enabled through a digital identity app. There would be no mutual agreements, commitments, or vertical integration, and so any operator can become global, quick to launch, with no investment in infrastructure, and offer new digital VAS."



CONNECTED CARS: **IOT AND ESIM IN ACTION**

Aside from digitalisation, almost two thirds of European participants in this year's global MVNOs market survey (60%) said they would be prioritising investment in other technologies. Asked which technologies they believed were poised to have the biggest impact on the mobile industry, a resounding 53% said IoT, followed in second place by eSIM (20%).

Although there is concern that eSIM potentially pushes virtual operators in particular out of the connectivity value chain - with remote provisioning, the ecosystem no longer needs businesses selling SIMs to provide network access - the consensus is that connectivity is only a small part of the IoT picture. Some put it at as little as 10% of the overall value. Whereas traditional SIMs are predominantly about access, eSIMs embedded in the next generation of smart devices are about provisioning services, whether that be network switching, security, payment services, data analytics or so on.

Although we talk about IoT as a single concept, it is actually a hugely diverse concept which impacts on practically every industry. Can large carriers provide the services required by every business in every sector at the requisite level of specialisation. MVNOs have the right characteristics in terms of size and agility to be able to deliver niche services to specific sector. That is why players have talked to us about their ambitions to focus on developing mobile services for new applications for new industries, to become an integral part of the new ecosystem for the a newly connected world.

IoT provides the scale of the opportunity, eSIM makes it easy to reach. As Fenercell's Hakan Demir says: "The best case potential for operators that can be presented by IoT and eSIM can be headlined like this: 'Not only people, but things are out there to be subscribers, in the order of billions and you can reach them without expensive logistics/dealers. That is, an untapped big market to be acquired with less costs (less SAC).'"

One notable example of this already driving a highly lucrative market in Europe is the connected car industry. Vehicles capture perfectly why cellular is the de facto networking infrastructure of choice for IoT - they move around, so mobile connectivity is essential. But eSIM also plays a critical role. For manufacturers, the idea that you would have to fit different SIMs in cars for different markets is problematic, as is the idea that vehicles crossing borders might start to incur roaming charges for their owners. eSIM remote provisioning also means that different services can be easily provided for different use cases, whether it is allowing car owners to pick and choose their infotainment packages, or providing fleet operators specialised logistical tools.

Overall, revenue from the connected car market as a whole in Europe is expected to reach US $9 billion in 2018, up 12.6% year on year, with 46.1 million connected vehicles on Europe's roads, a penetration rate of 17.2%. That figure is predicted to reach 40.6% penetration by 2022 - well on the way to half of the continent's vehicles connected to cellular networks.

The region's single biggest domestic market is Germany, which will account for almost a quarter of the market's revenue this year (US $2.2 billion) and boasts 10 million connected vehicles, a penetration rate of 25.8%. That is expected to reach 57.9% by 2022.

The connected car market is creating opportunities for digital specialists who can sit between network operators and the automotive industry to offer eSIM management services, for example in handling connectivity across multiple carriers. In Germany, there are clear examples of this attracting new players into the mobile services market, effectively creating new types of MVNO. For example, Munich-based global security giant Giesecke & Devrient has, through its G&D Mobile Securities subsidiary, made a major investment in developing eSIM management solutions for a wide range of IoT applications, including connected vehicles. G&D has worked with BMW to provide all in-car connectivity services - telematics, infotainment, in-car WiFi hot-spot - from a single embedded SIM. Previously these different services all required different cards.

In its latest innovation, G&D has worked with Deutsche Telekom and AT&T to provide a service whereby BMW customers can pair their mobile phone data plan with their car's embedded SIM. Rather than connecting hands-free calls via Bluetooth as they drive, calls can be made and received directly via the car's in-built infotainment system. Similarly, service like digital radio, traffic updates and video streaming will be handled directly by the car's onboard computer, not the handheld device. This is an early example of eSIM being used to cross the boundaries between IoT and consumer services.

Germany's other internationally renowned automotive manufacturers have also been proactive in forging partnerships for eSIM management. Volkswagen works with Vodafone and Dublin-based IoT MVNO Cubic Telecom to provide mobile services via eSIM for its Audi brand. Cubic operates the largest independent LTE platform in Europe for IoT and connected car applications. Volkswagen has also entered into a partnership with Deutsche Telekom which integrates its Car-Net App Connect with the latter's Magenta SmartHome platform, allowing drivers to do things like switch their home heating on or open electric gates and garage doors from their car.

Daimler, which owns the Mercedes-Benz and Smart car brands, has also been quick to join the party, working with French-based digital security specialist Oberthur Technologies to provide eSIM-based telematics and in-car infotainment services. The next frontier in connected car technology is driverless cars, which has already been developed to the proof of concept stage. Due to the stringent requirements for 100% reliable universal connectivity this technology will require - meaning ultra-dense, high capacity networks - driverless cars are unlikely to appear on Europe's roads until after 5G roll out. Audi has already announced plans to launch semi-autonomous 5G connected cars in partnership with Huawei by the early 2020s.

On the topic of network development, a perhaps surprisingly low percentage of MVNOs who took part in our 2018 global survey saw 5G as a priority area as yet. This is perhaps understandable as MVNOs have little say in network evolution - whatever benefits they gain from 5G will come only after roll out is complete and a wholesale market takes shape.

At carrier level, however, investment in networks goes hand in hand with reshaping the market to embrace the IoT opportunity. Deutsche Telekom, for example, is making a €5.7 billion investment in its network infrastructure in 2018 alone. Head of Business Development for Commercial Roaming Federico Homberg said: "In specific growth areas, such as IoT, we are undertaking multiple initiatives. We are partnering with small & agile companies, e.g. with a company called 1nce in the NB-IoT space.

"We are investing in companies like relayr, an IoT startup that enables interoperability between industrial-grade platforms. And we are out-placing innovative business ideas as external companies so that they can grow their business without the legacy of a big organisation. An example would be mobiledgeX, a company building a mobile edge computing platform."

SUMMARY

The European MVNO market certainly finds itself in a moment of flux and upheaval. For the world's oldest and biggest regional virtual operator sector, these are certainly interesting times.

The EU, the regulatory body that did much to incubate the growth of the world's first regional MVNO industry, certainly caused a stir when it pushed through plans to ban roaming charges within its borders. Although it has a direct impact on operator margins, there is no suggestion that mobile operators will not emerge from Roam Like At Home just as strong, if not stronger, as they were before.

In some respects, the end of roaming charges in the EU perhaps sounds the death-knell for the old way of doing things in the mobile industry's Old World. With new technologies like eSIM, Blockchain and the global ISMI SIM coming on line, roaming charges may soon become a thing of the past worldwide. In a broader sense, especially with the emergence of eSIM, operators can no longer rely on a revenue model based solely on charging for connectivity. Services are what matter, what value you can offer the customer.

Waves of consolidation at carrier level, largely sparked by intense pricing competition, are starting to extend into the MVNO sector across Europe. Ian Streule, Partner at Analysys Mason, sees a trend towards network operators seeking to exert greater control over their value chains by buying out MVNOs and co-branding with them - expect to see more MVNOs of the "powered by Vodafone" or "powered by T-Mobile" type, he tells us.

One potential consequence of the growth in MNO sub-brands could be, as seen in the UK, a smaller number of virtual players emerging as dominant forces as they take advantage of preferential network access and greater resources. As growth opportunities are increasingly lateral rather than vertical, i.e. based on moving customers towards the advanced data services offered by LTE (and further down the line 5G), being close to the network becomes a key strategic advantage.

Some argue that, rather than consolidation pushing MVNOs out of the ecosystem, strategic partnerships with network operators will become increasingly important for virtual operators seeking new revenue opportunities, especially through value-added services (VAS). This also applies to partnerships with non-telco content and OTT service providers, with European MVNOs starting to compete with zero rating offers for the most popular digital services, as well as getting involved in lucrative media markets such as live sports.

Finally, Europe's MVNOs are looking to brand new markets and brand new business models away from the consumer sector in business services. In the UK, for example, more than 20% for the MVNO market is now focused on business. In Germany, the connected car market is the most advanced in the world, creating brand new opportunities for agile, specialist operators at the intersection of IoT and eSIM technologies. Yet another significant trend is digitalisation, with the adoption of cloud-based 'as-a-service' business models by virtual operators positioning them ideally to make the transition into B2B, and to take a step up the value chain to offer mobile enabling services to emerging IoT markets.