

IoT opportunities for telecoms operators



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Introduction

Operators face a range of issues when addressing the IoT market, from building awareness to building advanced solutions.

Welcome to our fourth selection of articles examining how telecoms operators are addressing the Internet of Things (IoT).

As with our previous collections, this edition is designed to give you a flavour of our thinking on IoT. Analysys Mason helps clients in all geographies and parts of the value chain to develop their approach to IoT. Our assignments range from rapid reviews of existing plans to full strategy development.

The articles in this collection reflect the diversity of areas that telecoms operators are facing with IoT – from horizontal issues such as technology platforms to domain-specific issues such as autonomous vehicles. However, as we discuss in our first article, operators should take care not to ignore the basics – general awareness of IoT and how it can be used remains low. This creates a barrier to adoption, but one that smart operators will help to overcome.

The following topics are covered in this edition.

- **IoT platform and technology deals.** A small number of new vendors, such as Actility, are winning a notable share of these deals. As this article describes, the market is getting more difficult for vendors to enter because most large operators already have multiple providers. New competitors will need strong differentiators.
- **Operator approaches to IoT security.** Adding higher levels of security may not directly increase revenue, but does provide a crucial differentiator. We discuss how operators will need to expand their security portfolio as they move along the value chain.
- **The choice of LPWA technology for challenger operators.** For most operators in the past 10 years, network upgrades have been more a matter of when than what. With IoT, operators have the option to take a different direction (for example, investing in LTE-M when competitors are opting for NB-IoT). This article explores the benefits of these different options.
- **The impact of autonomous vehicles on telecoms operators.** Autonomous vehicles will not need wide-area networks for real-time connectivity, and their requirements for non-real-time connectivity are unclear. We argue that entertaining passengers may be the larger opportunity for telecoms operators.
- **Our survey of 1600 enterprises.** While IoT suppliers focus on technology, most enterprises do not understand the potential benefits. This article argues that service providers that understand how to explain the benefits will be well placed to succeed.
- **Orange and Vodafone launched new consumer IoT products in November 2017.** The initial launches are interesting, but are only a first step. Success in the longer term will depend on what operators can learn from these early products.



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As ever, we welcome your feedback and comments.

Enterprise survey 2017: A lack of awareness of IoT is holding back its adoption more than technology issues

“It may be incorrect to assume that the take-up of IoT is being held back by competing technology standards, an uncertain business case or security concerns.”



TOM REBBECK
Research Director, Enterprise and IoT

Despite all the attention that IoT has received across multiple industry verticals, a significant percentage of enterprises have either not heard of IoT (29% of SMEs, 18% of large enterprises) or have no interest in adopting it (23% of all enterprises).¹

More work is required by solutions providers to explain to enterprises what IoT is and why it should be implemented. This is especially important for smaller enterprises. This article discusses some of our enterprise survey results in more detail to highlight the significance of the market opportunity for IoT solutions providers.

The number of SMEs that are unaware of IoT – or have no interest in it – is four times greater than those with operational solutions

It may be incorrect to assume that the take-up of IoT is being held back by competing technology standards, an uncertain business case or security concerns: enterprises would need to have explored IoT to understand any of these issues. Indeed, IoT may be restrained by a more basic problem of awareness. There is a positive message to take from this: there is still a massive, untapped market for IoT solutions providers that get their product and messaging right.

In our survey of 1600 IT and telecoms decision makers in enterprises worldwide, we asked whether they had heard of IoT and, if so, whether they had any plans to deploy IoT solutions. The results revealed that a small percentage of firms already had an operational solution: 12% of SMEs and 18% of large enterprises (see Figure 1). More striking, though, is the share of enterprises that was unaware of IoT or not interested in it: combined, this group of respondents was made up 52% of SMEs and over 40% of large enterprises.

One of the assumptions behind the large forecast numbers for IoT, including Analysys Mason's own forecasts, is that most companies or sectors will have some use for IoT solutions. However, while this may prove to be accurate in the long term, this perception is not shared by most enterprise firms today.

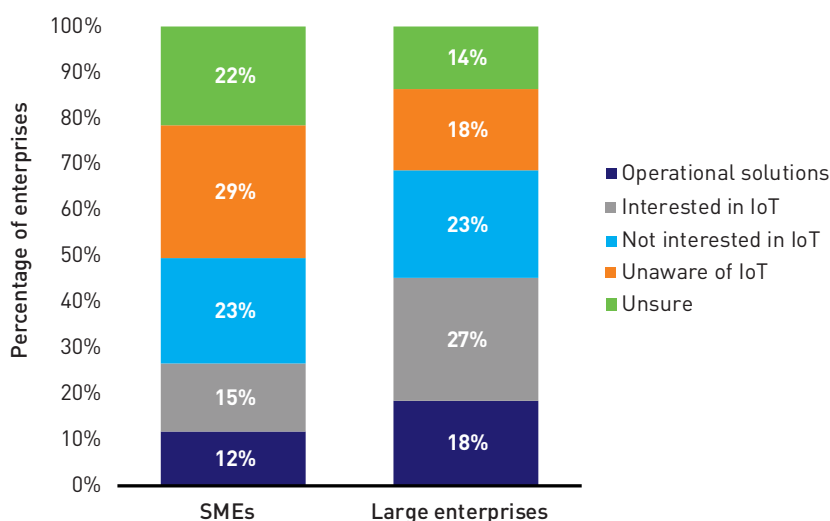


FIGURE 1: PERCENTAGE OF ENTERPRISES AT EACH STAGE OF IOT DEVELOPMENT, 2017²
[SOURCE: ANALYSYS MASON, 2017]

Also notable from these results is the stark difference between large and small enterprises, both in terms of the share of firms with operational solutions, as well as those that are interested in IoT (27% of large enterprises and just 15% of SMEs).

Much of this can be explained simply by size - large enterprises have more projects (of all types) than SMEs and will therefore be more likely to have an IoT project. Large enterprises may also have more resources to explore new areas and ideas such as IoT. Conversely, SMEs may not be willing or able to commit resources to IoT projects, especially if they are experimental and come with uncertain returns.

For organisations that are hoping to sell IoT solutions, these results suggest that there is an untapped opportunity to provide IoT solutions to the lower end of the market (assuming that IoT is equally applicable to small, as well as large, organisations). However, few companies have the necessary skills to sell, deploy and support IoT solutions for the majority of SMEs and there is a lack of 'off-the-shelf' solutions that address the needs of these organisations.

China is behind in adoption today, but may catch up quickly

Our survey has revealed significant regional variation in the levels of interest in, and adoption of, IoT solutions.

The USA has the highest levels of adoption of IoT solutions. It is likely to maintain this position as a large share of enterprises that have not yet deployed solutions are interested in doing so (20% of SMEs and 30% of large enterprises).

Western European enterprises are more likely than Chinese firms to have an operational IoT solution in place, but Chinese companies are expressing a strong interest in IoT and may well close this regional gap. In Western Europe, the difference between the results for SMEs and large enterprises is also greater than elsewhere, possibly because IoT providers are focusing most of their attention on large enterprises.

The interest in IoT suggests that Chinese providers, including mobile operators, are doing a better job of raising awareness of IoT than those in Europe.

Overcoming a lack of awareness in IoT is more important than technology issues

For telecoms operators, or any other provider trying to sell IoT solutions, these figures should act as another reminder that IoT is still in its very early phases. Any IoT plan will need to have long time horizons. It is also a reminder that the technical issues facing IoT - in terms of standards and security - are secondary to the more-basic issue of helping enterprises to understand the potential benefits of IoT.

The results also mean that, for a provider that gets its product and marketing right, there is a significant market that remains largely unaddressed.

Questions?

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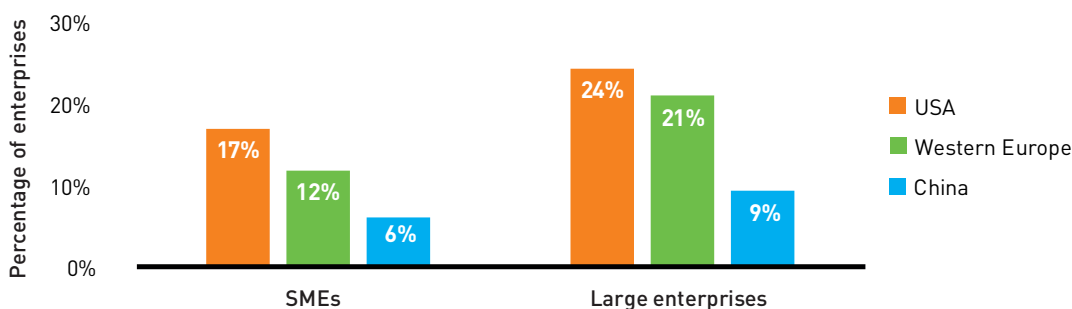


FIGURE 2: PERCENTAGE OF ENTERPRISES WITH OPERATIONAL IOT SOLUTIONS, BY COUNTRY/REGION, 2017 [SOURCE: ANALYSYS MASON, 2017]

¹ In February 2017, Analysys Mason interviewed 1600 enterprises across eight countries (Australia, China, France, Germany, Malaysia, UAE, UK and the USA) about their usage, providers and satisfactions levels of various telecoms and ICT products. For more information, see Analysys Mason's Enterprise survey 2017: enterprise interest in, and adoption of, IoT.

² Question: "Which of the following applies to your business when it comes to the Internet of Things?"; n = 1091 SMEs (less than 250 employees), 509 large enterprises (greater than 249 employees), (1600 enterprises in total).

IoT platform contracts tracker: Actility is winning a high share of telco deals

“Vendors that are trying to sell IoT solutions to operators are facing a rapidly maturing market.”



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Operators and vendors are keeping a close watch on contracts for IoT solutions. Analysys Mason has gathered the details of 280 deals in our recently published *IoT platform contracts tracker*. The key trends we have identified in this data are as follows.

- Vendors have an opportunity to do deals with large operators, but solutions need to be targeted (for example, towards specific vertical markets) or differentiated from those of established vendors. Big advanced operators, such as AT&T and Vodafone, have already signed deals for solutions across the value chain.
- Smaller operators (such as Telecom Italia and TELUS) have suppliers for connectivity management but will need support if they are to compete in other aspects of the value chain (for example, data management and application enablement).

- The market is relatively mature – a few vendors are dominating each section of the market. For example, Cisco Jasper, Ericsson and Vodafone have won around two-thirds of the publicly announced contracts for connectivity management. Cumulocity and PTC/ThingWorx have won around half the contracts for application enablement.
- Established telecoms vendors are offering solutions that are close to connectivity, but new vendors have opportunities in this area – for example, Actility has taken a strong position in the low-power, wide-area (LPWA) network space.

Our analysis reveals that AT&T, Deutsche Telekom, SoftBank and Vodafone are well advanced with their IoT solutions

The IoT software stack has components that can be grouped into three basic layers:

- connectivity management
- device and data management
- application enablement.

Analysys Mason's new IoT platform contracts tracker focuses on operators' deployments and lists the public contracts that they have with platform and middleware providers. It includes more than 70 operator groups and 50 IoT vendors, and covers deals in 95 countries across 8 regions. It also highlights the main features of the deployed solutions. In total, it covers 280 deals.

We have analysed the contracts between operators and vendors to assess where most of the activity is happening (see Figure 1). Vendors are categorised based on their main features, and operators are categorised based on the number of IoT platforms that they have implemented.



The number of publicly announced contracts tells us how advanced each operator is in developing its IoT solution. The operators with the lowest number of deals (categories 3 and 4) are generally at early stages of their IoT roadmaps and are looking to enable connectivity and device management capabilities. These are mainly operators in regions where IoT markets are relatively underdeveloped and the drivers to invest in IoT platform features beyond those of basic management are few. On the other hand, operators with multiple platform deployments (categories 1 and 2), such as AT&T, Deutsche Telekom and Vodafone, are more advanced with respect to their IoT roadmaps and operations are competing in more demanding markets. These operators continue to tighten their control over the IoT network with multiple connectivity and device management platforms while exploring different monetisation approaches and use cases through application enablement platforms.

Activity is one of a small number of start-ups to win a significant number of contracts

The tracker also tells us which vendors are most successful. Vendors with the highest number of deals are Cisco Jasper (60 contracts), Ericsson (21), Gemalto (26) and Vodafone (31, of which 7 are for third parties). All these vendors provide connectivity management tools primarily. Activity is one of the few start-ups that has managed to capture a new opportunity in the connectivity market by enabling LPWA networks, while established vendors continue to deliver cellular management solutions.

Cumulocity and PTC have the highest number of application enablement platform deals. However, telecoms vendors are absent from this market despite having launched similar solutions. For example, Nokia introduced its IMPACT platform but is yet to announce any public deployments. Huawei, NEC and ZTE have a limited number of public deals, which are

mainly for connectivity and device management solutions. Cloud and business solution providers such as AWS, IBM and Microsoft Azure are also not high on the operators' supplier list for IoT but they offer cloud-hosting solutions.

As operators gain strength in the IoT market, their IoT goals shift from providing basic coverage to improving the quality and range of services. Tracking these goals and how they change will help platform vendors understand and optimise their solutions to meet the operators' varying requirements.

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Operator category (based on the number of deployments each operator has)	Connectivity management (for example, Cisco and Ericsson)	Device and data management platforms (for example, HPE and nTels)	Application enablement platforms (for example, Cumulocity and PTC)	Operator group
1 (Each operator has five platform deployments or more, with at least one solution for each layer)	A	A	A	Examples: AT&T; Deutsche Telekom; SoftBank;
2 (Each operator has between 3 and 4 platforms with at least one platform for the connectivity management layer)	A	B	B	Examples: Bell; KDDI; NTT Docomo; Telefónica
3 (Each operator has only two platforms with at least one platform for the connectivity management layer)	A	C	C	Examples: China Telecom; Telecom Italia; Telstra; TELUS
4 (Each operator only has a connectivity management platform)	A	D	D	Examples: America Móvil; Ooredoo; SmarTone

FIGURE 1: OPERATORS' IOT DEALS AND SELECTED EXAMPLES, 2Q 2017

[SOURCE: ANALYSIS MASON'S IOT PLATFORM CONTRACTS TRACKER]

Operators should match their IoT security strategies with their ambitions in the IoT market

“It is unlikely that IoT security will generate a significant new revenue stream, but it will be critical in winning new business and differentiating operators’ services from those of competitors.”

We forecast that 6.4 billion IoT connections worldwide will use fixed, mobile and low-power wide-area (LPWA) networks by 2025. As the IoT market grows, so does the security risk. The discussions on how to secure the IoT are increasingly the focus of attention. An end-to-end IoT project consists of multiple, often diverse, devices, various platforms, layers, and interfaces, creating many dimensions to secure. Security has moved up the list of priorities for IoT

projects. Telecoms operators, as IoT service providers, need to develop their IoT security capabilities with relevant products and skills to match their IoT strategy and ambition.

Telecoms operators need to develop security offerings to match their IoT proposition

Operators have a strong legacy in securing the connectivity layer with carrier-grade, embedded security



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solutions. Security requirements such as secure transmission, safe data and user authentication have been fused into the operator networks for decades and cellular networks are generally viewed as secure and reliable.

However, in the IoT market, operators increasingly address components beyond connectivity to capture a larger share of revenue. Moving up the value chain requires more specialist security expertise, which CSPs do not always have. Operators will increasingly need to do the following.

- Map their security offerings closely to the IoT components of the value chain that they provide, such as the application, device and enabling capabilities like hosting. Providing enhanced security for devices beyond SIM authentication may not be familiar territory.

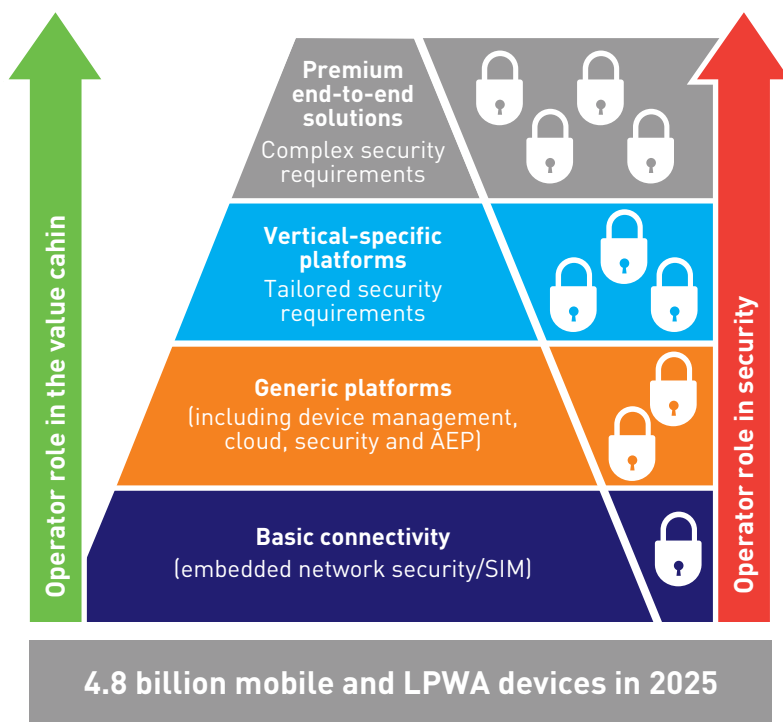


FIGURE 1: THE OPERATOR’S ROLE IN IoT SECURITY MUST MATCH THE OPERATOR’S ROLE IN THE IoT VALUE CHAIN [SOURCE: ANALYSYS MASON, 2017]

- Tailor the security offering for their target verticals. This will require an understanding of the technical component of the offering but also regulatory compliance and business models. Those operating in the EU will need to understand GDPR compliance, for example.

Operators will need to partner or invest to align their security offering with their IoT proposition. Operators that already benefit from an internal cybersecurity unit, like Telefónica and Vodafone, may have the necessary skills to build their own solutions but most will still need to partner for some or all solutions. A few operators, primarily those that have invested heavily in specific sector expertise, may make strategic investments or acquisitions to bolster their offering. Bold moves such as this will send a clear message to the market about their intentions and role in the value chain. Interestingly, this bold approach is not confined to the large global operators such as Telefónica or Singtel. Smaller national and regional-focused operators with strong IoT business units, such as KPN and Tele2, have acquired to strengthen their security credentials.

Despite the significant effort and investment required, it is unlikely that security will generate a significant new revenue stream in its own right. However, it will be critical in winning new business and potentially differentiating the operator's service from that of competitors.

Security can help operators differentiate and strengthen their LPWA service

By 2025, more than half of the total wide-area IoT connections globally will be on LPWA networks. This will bring new and different challenges. Many of the devices connected to an LPWA network will be low-power devices with limited computing power, factors that will restrict security options.

Operators using 3GPP standards (NB-IoT and LTE-M) have a clear opportunity in the early phase of LPWA market development to differentiate their offering from the proprietary networks by marketing the inherent secure nature of

their networks. Operators have been slow to promote the value of embedded standardised security in their cellular networks (although the real value of security may have only recently come to the fore). Providing additional security layers by design from the outset of the project will likely add some additional upfront costs but will reduce the overall costs of delivering security for the lifecycle of the project. For example, building in extra layers to secure and update the connected devices.

Operators could position security as a core differentiator to their LPWA proposition and:

- **promote** the embedded security attributes of the network and the SIM and market the capabilities of their connectivity and device management platforms in detecting anomalies and mitigating the consequences – for example quarantining devices, OTA updates etc.
- **develop** new capabilities internally or through partnerships to provide additional, value-added security layers that are cost effective for LPWA solutions – for example, some operators are exploring the idea of offering additional security in the SIM
- **ensure** that their security offering addresses each component of the value chain where they provide solutions and leverage professional services and cybersecurity business units to advise on and implement security solutions.

IoT security could be an important differentiator

Selling IoT security solutions will not necessarily generate substantial revenue for operators. Security at the connectivity layer is embedded but should be a feature that could bolster the value of the connectivity offering. Security for other components of the value chain will be a premium service but is unlikely to generate significant revenue. However, IoT security will be a critical factor in winning IoT business with the potential to differentiate the operator's service from its competitors.



Questions?

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LPWA: challenger operators could benefit from using a different technology to that of the market leader

“The case for challenger operators to deploy an alternative technology to market leaders is compelling because it may provide opportunities to differentiate on more than price and target different use cases to market leaders.”

Mobile operators have a significant opportunity to offer LPWA solutions (see data in Analysys Mason’s DataHub), but competition will be intense. The leaders have decided which technology to support – for example, AT&T has opted for LTE-M, Orange uses LoRa and LTE-M and Vodafone has gone for NB-IoT. Many other operators, especially smaller ones, have yet to make a firm commitment, but some challenger operators are planning

to deploy different technologies to the market leaders. This article, based on our detailed report on approaches to LPWA, examines the options they face and the factors that will affect their decisions.

For the traditional mass-market smartphone opportunity, the technology upgrade path, through flavours of 2G, 3G and 4G, was clear. IoT is a new market and the old rules do not always apply. There are clear benefits for operators

Country	Operator	LoRa	LTE-M	NB-IoT	Sigfox
France	Orange	✓	✓		
France	Bouygues	✓			
France	SFR				✓
Japan	NTT			✓	
Japan	KDDI		✓	✓	
Japan	Softbank	✓	✓	✓	
USA	AT&T		✓		
USA	Verizon		✓		
USA	Sprint		✓	✓	
USA	T-Mobile			✓	

FIGURE 1: SELECTED OPERATOR/MARKETS LPWA TECHNOLOGY CHOICES
[SOURCE: ANALYSYS MASON]



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willing to take a risk on an alternative strategy from the leaders. This article examines the options they face and the factors that will affect their decisions.

Operators have three main approaches to LPWA technology choice

Mobile operators have three main options to consider when choosing an LPWA technology. They are as follows.

- **Follow the leader:** The challenger operator chooses the same technology as the market leader. For example, if the leading operator is launching LTE-M then the challenger would do the same.
- **Choose an alternative to the leader:** The challenger operator chooses a different technology to that of the market leader. For example, if the leader chooses LTE-M then the challenger will deploy NB-IoT.
- **Wait and see:** The challenger operator waits for a winning technology to emerge before committing.



With LPWA, challenger operators have an opportunity to differentiate. Figure 1 illustrates some of the technology choices that leading and challenger operators have made. There is currently no clear trend on the approach that challenger operators are taking; some follow the leader, others do not.

Despite the risk, adopting an alternative technology has obvious advantages

Some of the advantages for challenger operators to deploy a different LPWA technology are as follows.

- **The alternative technology will be better suited to particular use cases.** It is uncertain how large the differences between NB-IoT and LTE-M will be in terms of price and performance, but if NB-IoT does have clear price advantages or longer battery life than LTE-M, it will be more attractive for some applications such as metering. This could benefit T-Mobile USA. Moreover, challenger operators could benefit enormously if their chosen technology is used for a mass-market proposition. For example, if LTE-M is used by a future Apple Watch, KPN would be in a strong position in the Dutch market compared with its competitors, T-Mobile and Vodafone, which are focused on NB-IoT.
- **An alternative technology could open up the enterprise market.** Most challenger operators have a limited presence in the enterprise market. An alternative technology with clearly differentiated performance could help open new enterprise opportunities.
- **It should reduce competition based purely on price.** If all three/four operators offer the same network technology and coverage, strong price competition will be inevitable. Different

technology options should put some limits on this price competition, which may benefit all operators.

- **The operator may be in a better position to support multi-country contracts.** Deutsche Telekom will be able to offer NB-IoT connectivity across all its countries, while Orange can offer LTE-M everywhere it is present. This would not be possible if the operator followed the market leader in each country it is present. Large operator groups, like Vodafone, may also generate some cost synergies from deploying the same technology in all countries.

A strategy that involves selecting an alternative technology also has disadvantages for challenger operators:

- advantages may only last a short time because it is relatively inexpensive and quick for competitors to upgrade their existing infrastructure to support the same technology
- big opportunities may be missed, for example, if the strongest area of demand is for NB-IoT-based solutions and they only offer LTE-M
- local developers may focus on the technologies offered by the leading players
- they may end up supporting a redundant technology.

Naturally, these disadvantages are inverted if the challenging operator chooses a different technology from that offered by the leading operator.

Should LPWA operators wait and see?

Operators also need to consider the consequences of being late to market if they adopt a wait-and-see approach. The appeal of waiting is clear: the existing

enterprise base is limited and NB-IoT or LTE-M are relatively quick to deploy. However, operators with ambitions to play a role in IoT risk foregoing a valuable learning experience in the early LPWA market and the opportunity to capture some of the early demand. Bouygues Telecom, KPN and Swisscom all gained valuable expertise by entering the market early with LoRa, which should help them when developing 3GPP IoT networks.

Challenger operators should consider a fresh approach to LPWA technologies

Challenger operators that are developing strategies to enter the LPWA market should carefully evaluate the benefits of adopting a different technology to the market leaders. Differentiation in the LPWA market will be critical given low connectivity revenue and heightened competition from proprietary LPWA players. This may require a bold strategy but could pay dividends by differentiating the proposition and allowing challenger operators to compete on more than just price.

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¹ For more information, see Analysys Mason's Mobile payments in emerging markets – beyond m-pesa. Available at: www.analysismason.com/About-Us/News/Newsletter/mobile-payments-in-emerging-markets-Jan17/

Autonomous vehicles: entertaining passengers may be the big opportunity

“Self-driving cars will depend much more on on-board processing than on the cloud.”

While autonomous vehicles are gaining huge attention from all sectors, there is little assessment of what they mean for the telecoms sector. Based on a series of discussions with players in different roles in the value chain, and our own analysis, Analysys Mason believes that, while autonomous vehicles may have a transformative impact on society, their impact on the telecoms industry is likely to be modest. This article is based on our more-detailed report on this topic, *Autonomous vehicles: exploring the opportunities for operators*.

Autonomous cars will turn drivers into passengers, generating new demand for telecoms operators' services

Autonomous vehicles are unlikely to rely on telecoms networks, despite the often-made association between 5G and autonomous driving:¹ self-driving cars will depend more on on-board processing than the cloud. Real-time connectivity will be beneficial, but not essential.

Telecoms networks will be used for non-real-time updates to and from the vehicle (such as traffic information,



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mapping information and software updates), but bandwidth requirements for these services may be (relatively) low.

However, autonomous motoring will turn drivers into passengers, and potentially into consumers of video, gaming and audio content – all of which could generate new demand for telecoms operators' services. The time frames for these developments this will be long: fully autonomous vehicles may not form the majority of vehicles until after 2030, depending on technology developments, regulation and consumer acceptance.

Figure 1 summarises the main opportunities for telecoms operators with autonomous cars.

Autonomous cars do not need wide-area connectivity

Self-driving vehicles rely on information coming from their on-board sensors (for example, radar, lidar, optical) to navigate because cellular services cannot always be guaranteed to be reliable. Information from a wide-area connection will help supplement the on-board data, perhaps giving additional information about the actions and intentions of other vehicles, but the vehicle will never be dependent on that information.

This is essentially the way that experimental autonomous cars are working today – information from on-board sensors is combined with highly detailed (up to 10cm) maps. These maps can be updated, in non-real time, using a cellular connection (or via a Wi-Fi connection and fixed broadband).



FIGURE 1: AUTONOMOUS VEHICLE OPPORTUNITIES FOR OPERATORS
[SOURCE: ANALYSYS MASON, 2017]



Developments in ‘vehicle-to-everything’ (V2X) technology will not change this. The information available to the autonomous car will become richer, but will only act as a supplement to on-board systems. V2X could have other impacts though: unlike today’s experimental autonomous cars, which each act as an isolated unit, V2X technology could allow different vehicles to act in concert – for example allowing vehicle platooning or smoother traffic flows in cities.

Bandwidth requirements are hard to calculate, but may be (relatively) low

Intel created some interest by suggesting that autonomous cars will generate 4TB of data per day.² However, this figure needs to be treated carefully. Based on the inputs provided by Intel, it seems this figure is based on a car driving for at least 15 hours a day – reasonable for the average self-driving Uber perhaps, but unlikely for a typical private car.

Intel’s 4TB figure must also be treated with caution because it is the amount of data that needs to be processed, not the volume of data that will be uploaded to the cloud. Most of the information processed by the vehicle will likely be immediately discarded – if the car ‘sees’ what it is expecting to, and navigates without incident, little of the data needs to be retained and only anomalies will be shared with the network. Assuming a car is driven (or, more accurately, drives) for an hour a day, the car could generate as little as 250MB if only 0.1% of the data processed

locally needs to be uploaded. The 0.1% figure could be too low, but illustrates that we should not assume that autonomous cars will, by their nature, generate massive quantities of data for telecoms operators. In any case, as only anomalous data will be uploaded, it will likely only be a tiny fraction of the total data processed.

Connectivity requirements for entertainment may be (much) higher than for the vehicle itself

Autonomous driving will change how we spend time in the car.³ Former drivers will have more time available than before, and this could generate opportunity for telecoms operators – for streaming video, audio, or even augmented reality games⁴ that mix the passing environment with game play, such as racing other cars.

Again, the exact impact of all of this is difficult to estimate, but could be well over 1GB⁵ for 30 minutes of video streaming. This could be addressed either by adding a vehicle’s existing connection to a data plan, through tethering smartphones or through in-car Wi-Fi hotspots that use a car’s OBD-II port.⁶ While there will be some opportunity to provide connectivity for cars to self-drive, both from providing the bandwidth and any new infrastructure that could be needed by V2X, entertaining the passengers could be the larger opportunity.

Development timescales are likely to be long

All of this will take a long time to develop and deploy. Full autonomy is unlikely to be available before well into the next decade.⁷ Assuming that autonomous cars replace traditional cars at a similar replacement rate that we see today (with around 7% of cars replaced each year), it may be 2035 until half the cars on the road are autonomous. It could happen quicker – for example, through retrofitting vehicles with autonomous capabilities, through legislation that encourages autonomy (or even bans driving), or through autonomous cars replacing multiple traditional cars. All these are possible, but it would be a bold assumption to expect many autonomous cars ahead of 2025.

The telecoms industry may be well advanced with 6G before autonomous cars have a major impact.

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¹ An automotive/telecoms joint industry body is called the 5G Automobile Association [5GAA].

² Intel Newsroom (15 November 2016), Data is the New Oil in the Future of Automated Driving.

³ It is difficult to know what the impact will be on the total amount of time we spend in a vehicle. For example, improved traffic flows could increase average speeds, which may reduce commute times,

or autonomy could result in longer commuting distances.

⁴ New York Times (15 June 2017), Envisioning the Car of the Future as a Living Room on Wheels.

⁵ Netflix uses around 3GB per hour on the “high” data usage setting. For further details, see Netflix’s How can I control how much data Netflix uses?

⁶ For example, see AT&T’s range of connected car offerings.

⁷ If at all – some are sceptical as to whether it is even possible. For example, see Tech Crunch’s Toyota’s Research Institute head says full autonomous driving is “not even close”.

Vodafone and Orange's moves in consumer IoT are encouraging, but cautious, first steps

“Orange and Vodafone's success will not depend on the sales of these devices but on whether the operators can learn from these initial products in future iterations.”



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Vodafone and Orange separately launched a new series of connected consumer devices on consecutive days in early November 2017. The new products suggest different approaches to the consumer IoT market; Vodafone focusing on devices with a separate cellular connection (a niche market so far), Orange on mass-market gadgets that connect to a smartphone. The Vodafone strategy should be more defensible, as it has more unique differentiators, although the Orange approach may have more revenue potential in the short term.

The products and pricing offer few surprises

None of the products announced by either operator is radically new.

- Vodafone launched four connected devices (a camera and trackers for bags, cars and pets) as well as a dedicated SIM for IoT products (the 'V-Sim'). Initially, they are only available to Vodafone's residential customers but will be available to customers from all networks in time. While Vodafone is using a new brand for these devices,

'V by Vodafone', it has no unifying theme; each item will appeal to a different market. There are positives to this approach – Vodafone is testing the appetite for a variety of solutions – but it will make it more challenging to position them in the minds of consumers (unlike, say, Nest with its smart home range).

- Orange is offering a new version of its VR headset (the 'VR2'), a 360-degree camera for Android devices (the 'Live Cam'), and the Orange Drone. There



are some links between the different devices – for example, images from the 360-degree camera can be viewed on the VR headset, as can images from the drone's onboard camera.

The pricing models are also conventional.

- Each Vodafone device comes with an upfront cost (GBP50–GBP339 or EUR49–EUR379 depending on the item and country), plus a monthly fee (GBP3–4 or EUR3–5). The main novelty is that the monthly fee for all products is flat with no usage component. Contracts have no minimum length and connectivity can be 'paused' and reconnected later. Even with this flexibility and the flat fee, consumers may resist paying a monthly fee for a new type of service. As we have written before, we believe that for consumer IoT solutions to be successful, providers may need to move away from monthly fees¹
- As Orange's gadgets do not have a separate SIM, the only cost is the device itself. Prices are EUR50 for the VR headset, EUR80 for the drone and EUR149 for the 360-degree camera (EUR99 initially). In some markets, instalment plans will be available.

Both operators are essentially testing demand for new categories. We expect more innovative products and pricing models to be offered later. As LPWA devices and networks become more widely available, we would expect Vodafone, and possibly Orange, to launch products with only an upfront fee, which includes bundled connectivity.

The operators are hoping that a combination of their distribution capabilities, retail presence, trusted brand and, for Vodafone, network will help them introduce these products to a broader audience.

Vodafone has a narrower focus but a stronger differentiator

The obvious difference in approaches is the inclusion of the SIM in Vodafone's devices. By focusing on things connected to a wide-area network, Vodafone is exploring devices that have had limited market reach to date – for example, products from small firms, like Locca and Trax. Vodafone is hoping that with a more

well-known brand, greater marketing push and lower pricing it can succeed.

Orange is entering a more competitive market. Handset manufacturers, like Samsung, are bundling in VR headsets with new phones and drones can be bought for less than half the price asked by Orange. The 360-degree camera is a relative novelty for now, but competition will intensify. In the near term, Orange's branding may help attract some customers to a new technology. In the medium term though, its brand is unlikely to be sufficient to justify premium pricing; other differentiators will be needed.

Vodafone and Orange will face stiffer competition from other operators in consumer IoT than in enterprise IoT. Enterprise IoT propositions require vertical market expertise, sales channels, the ability to integrate with existing systems and so on – all of which provide high barriers to entry. Orange and Vodafone, with large enterprise customer bases, were better positioned than most in enterprise IoT and have capitalised on this. The consumer IoT market may be easier to enter for more operators – barriers to entry are lower, and most operators have assets they can leverage, like a retail presence and a known brand.

Success will depend on the operators implementing the lessons from initial products

For both operators, the launch of new connected devices represents a bold move into new areas (or for Orange, a continuation of its steps in VR). Whether these moves are a long-term success will probably depend not on the sales figures for the products launched in November 2017 but on whether the operators can learn from these initial products and develop new versions. Too often in the past, the failure of operators has not been to experiment, but to learn from and follow through with experiments in new areas.

Vodafone at least recognises this. In its 2Q 2017 Vodafone results², Vodafone CEO Vittorio Colao said "the reason why we are launching consumer IoT in November 2017 is not really for what we are going to do in 2018 or 2019, but it is to prepare a strong platform for the next 10 years,"³ indicating both the senior-level support and long-term thinking behind the project.



Questions?

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¹ For more information, see Analysys Mason's Providers should apply the lessons of prepaid phones to consumer IoT. Available at www.analysysmason.com/About-Us/News/Insight/Consumer-IoT-Jan2015.

² A slide of the earnings presentation was also dedicated to the consumer IoT proposition. For more information, see www.vodafone.com/content/dam/vodafone/investors/financial_results_feeds/half_year_30september2017/H1_2018_Presentation_DOWNLOAD.pdf.

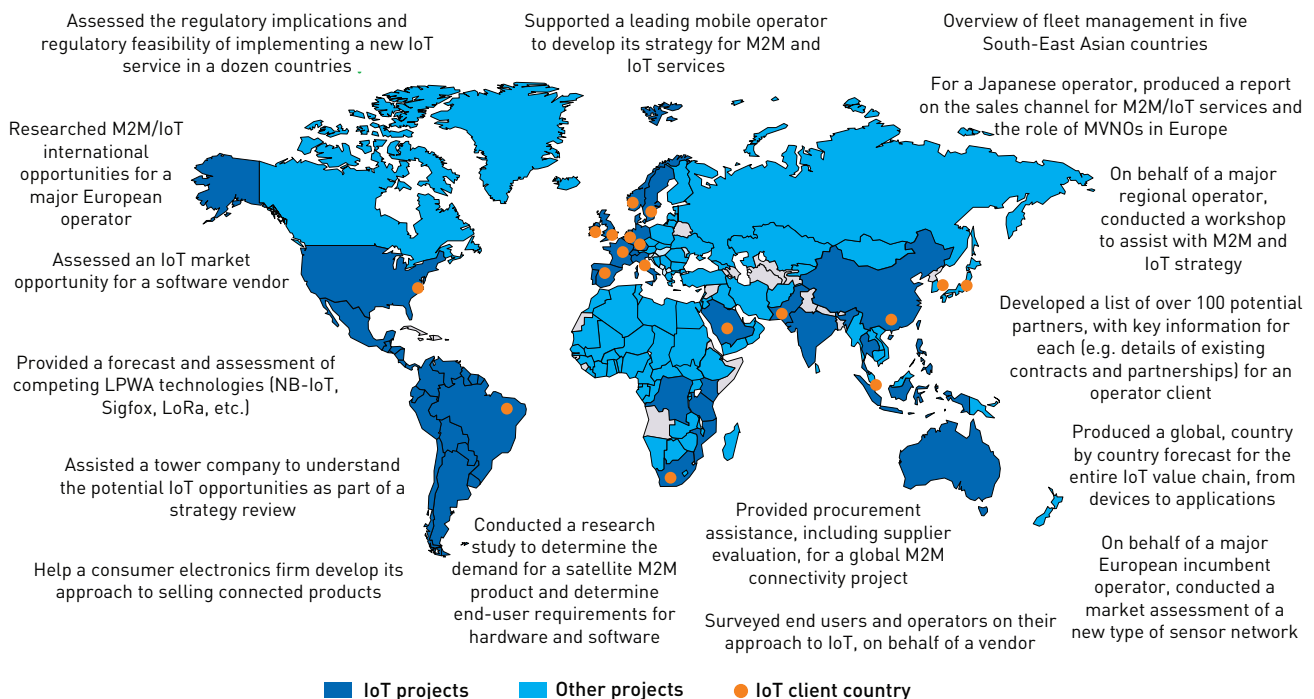
³ Source: <https://seekingalpha.com/article/4124876-vodafone-group-plc-vod-q2-2018-results-earnings-call-transcript>.

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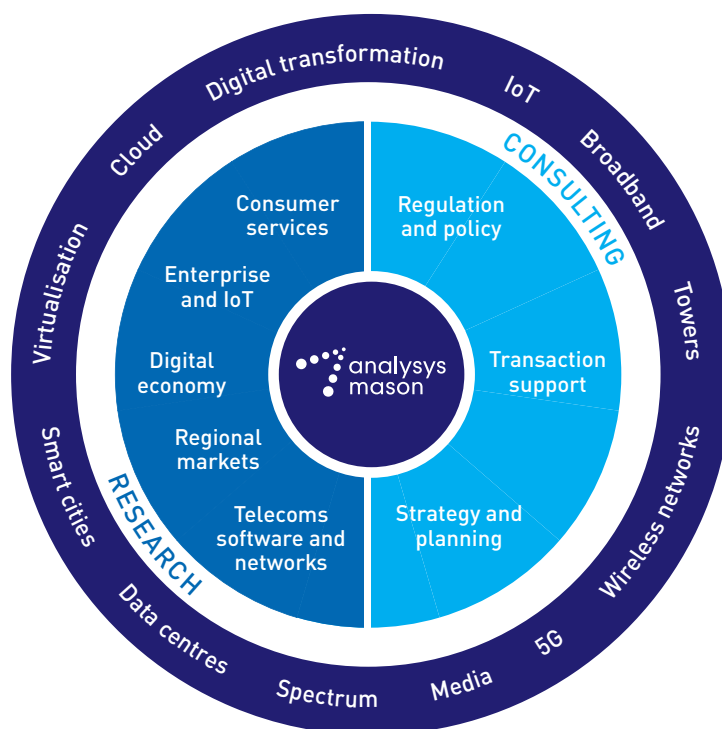
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