Your IoT-driven future

Our IoT Barometer 2019

The future is exciting.

Ready?

vodafone business

Foreword

This is our sixth Internet of Things (IoT) Barometer. Since the previous edition, we've seen a significant acceleration in adoption. The number of companies using IoT has risen to over a third (34%) and the scale and importance of IoT projects has grown. This surge has been driven by a range of factors — but key has been a breaking down of the barriers to entry.

When IoT was still a new technology, companies were often forced to develop their own solutions. Now, many companies become IoT adopters when they upgrade or replace systems. When it comes time to get rid of that old heating, ventilation and air conditioning (HVAC) system or to update your fleet tracking solution, the options often include IoT functionality by default. Organisations are also starting with off-the-shelf solutions, particularly smaller businesses with less IT resources. IoT enablement platforms and high-performance connectivity options like Narrowband-IoT (NB-IoT) are making implementation easier, and 5G will soon drive even greater adoption.

Companies are seeing the benefits of IoT and choosing to do more with it. Almost every adopter says their projects are delivering results, and over half say that the benefits are significant. These benefits range from cost reductions to improved safety; from increased responsiveness to entirely new revenue streams. Unsurprisingly, the companies that are seeing the biggest advantages are those that are the most committed to the technology. But it's not all or nothing — there are benefits to be gained throughout the journey, from first steps to the most highly sophisticated, fully integrated solutions.

The future of IoT is very exciting. But it isn't just a technology for uber-innovative startups. Most IoT projects aren't about creating headlines; they're about delivering bottom-line results. I believe that we've already passed the tipping point and IoT has entered the mainstream. 74% of adopters believe that within five years companies that haven't adopted IoT will have fallen behind. For many companies, it's no longer a case of whether or not to implement IoT, but how.

Since the first edition back in 2013, the Vodafone IoT Barometer has been an invaluable source of information for companies thinking about IoT. As the market has evolved, we've changed our focus from adoption to sophistication. This year, we've taken that a step further and developed the Vodafone IoT Sophistication Index. In addition to helping show the benefits of investing in IoT, it enables you to compare how you are doing relative to other companies like yours. Read on to discover more.

Stefano Gastaut
Chief Executive Officer, Vodafone IoT

February 2019

Contents

Defining Internet of Things (IoT)

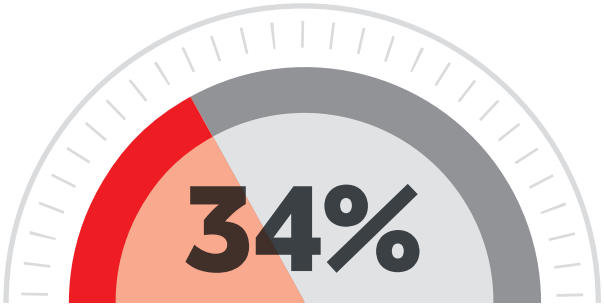
By IoT, we mean connecting sensors in things like cars, buildings and machines, enabling them to communicate about their status and environment and to be controlled remotely. It's making possible everything from asset tracking and condition monitoring to preventative maintenance and autonomous cars. The uses of this technology are broad and constantly growing.

The analyst's view

For each edition, we ask a leading analyst to provide additional perspective on our findings. This year, Michele Mackenzie, who leads Analysys Mason's IoT and M2M Services research programme, has added her valuable insight. See **page 29** for more information.

Executive summary

There are more adopters



of companies are using IoT, with over three-quarters (76%) of those saying that it's mission-critical to them.

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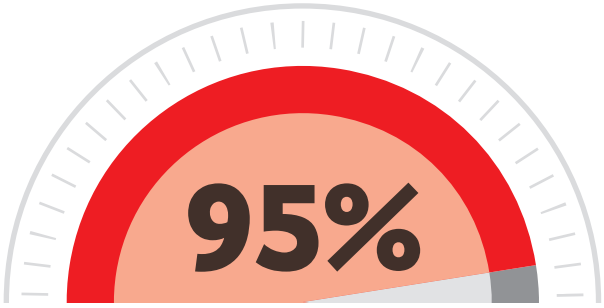
There has been a surge in adoption
Over a third (34%) of companies are now using IoT, up from 29% in the previous IoT Barometer. Regionally, the Americas saw the biggest increase — rising from 27% to 40%. The industries that saw the greatest increase were transport and logistics (27% to 42%) and manufacturing and industrials (30% to 39%).

Adopters are investigating existing solutions
Organisations are taking advantage of the more advanced off-the-shelf IoT products now available. 92% have either purchased equipment for internal applications with IoT built in or bought services that incorporate IoT. But where they're building customer-facing solutions, they're as likely to develop bespoke systems.

Adopters are moving beyond pilots
Adoption going up means that new companies are getting on board with IoT. That's why 29% are at the pilot-stage or just beginning to roll out their first full-scale projects. But many others have progressed beyond this. 70% of adopters now have one or more full-scale projects.

IoT is becoming business as usual
81% of adopters say their reliance on IoT has grown, and 76% of adopters say IoT is mission-critical to them. Some are even finding it hard to imagine business without it — 8% of adopters say their "entire business depends on IoT".

They're seeing tangible benefits



of adopters have already seen measurable benefits from IoT. And over half say those benefits are significant.

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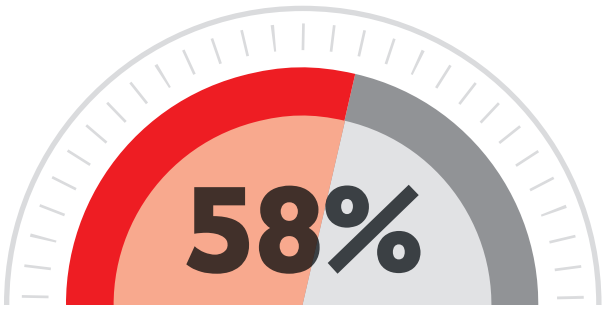
The benefits can be realised quickly
95% of adopters have already seen measurable benefits from their IoT projects. Over half (52%) have realised significant returns on their investment. Even organisations that have just implemented their first IoT projects report benefits. And the benefits increase as adoption and sophistication grow.

The most sophisticated are seeing the biggest benefits
We've identified five levels of IoT sophistication. 87% of the most sophisticated companies say they're experiencing significant returns or benefits from IoT, compared to just 17% of those in the least sophisticated group.

Results include increased revenue and lower costs
Managing costs has always been a strong use case for IoT. Where organisations report a reduction in costs from adopting IoT, the average drop is 18%. And that improves to 26% for the "most sophisticated". These companies are also more likely to report increased revenue as a benefit. On average, the "most sophisticated" are now achieving revenue growth of 22%.

The benefits are many and varied
Adopters are also seeing improved collection of accurate data (48%), increased employee productivity (47%), better asset utilisation (41%) and enhanced customer loyalty (39%) — to name just a few.

That's encouraging them to do more



of adopters are using analytics platforms to get more from their IoT data to improve business decision-making.

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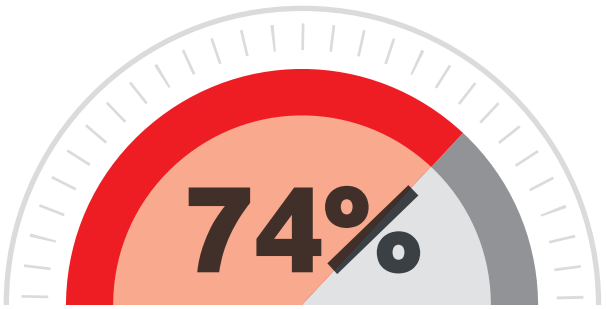
Confidence is growing
84% of adopters say their confidence in IoT has grown in the last 12 months. That's encouraging them to do more — 83% of adopters say the scale of their IoT projects has grown, 80% have more live IoT projects, and 79% say they're investing more.

Concerns are being resolved
Security isn't seen as a major barrier by adopters — most (65%) say their security concerns about IoT are no worse than with other new technologies. And 75% believe they have adequate skills to manage IoT security. Working with third parties can help — 96% of the "most sophisticated" companies are confident that their suppliers have the skills to manage IoT security risks effectively.

Adopters see IoT as central to digital strategy
72% of adopters say digital transformation is impossible without IoT. 89% of the "most sophisticated" companies think of it alongside analytics, artificial intelligence (AI) and cloud, not in isolation. They are leveraging it to drive broader objectives, including digital transformation.

Sophistication, and results, are linked with integration
87% of the "most sophisticated" users of IoT say they have fully integrated it with their core business systems. And they're using analytics (80%) to get more from the data they gather to improve business decision-making.

And that's why it's time to act



of adopters say that within five years companies that haven't adopted IoT will have fallen behind their competition.

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It's getting easier to take the first step
IoT enablement platforms are making it faster to build, deploy and manage connected solutions effectively. 45% of adopters would work with an IoT platform provider during the implementation phase of a project. Adopters are also using a variety of connectivity options based on what's best suited to particular use cases. 25% of adopters are already using low-power wide area network (LPWAN) technologies like LTE-M (Cat-M1) and NB-IoT. And many are looking to the future — 52% of adopters are considering using 5G.

Gathering data and using it are key to future success
Adopters are looking to use AI and data analytics to derive greater value from the data they collect from IoT devices. That's because they recognise just how important data will be to their future success. So much so, that 71% of adopters say they expect companies to start listing data resources on their balance sheets within five years.

IoT can't be ignored
Over half (55%) of adopters say IoT has already completely disrupted their industry. And 74% say that within five years companies that haven't adopted IoT will have fallen behind their competition as a consequence. It's time to act.

Read on to learn more about current trends in IoT and the many benefits adopters are seeing. You'll also discover how your organisation can become more sophisticated at IoT.

Key trends

Adoption has increased significantly

There was a surge in IoT adoption in 2018

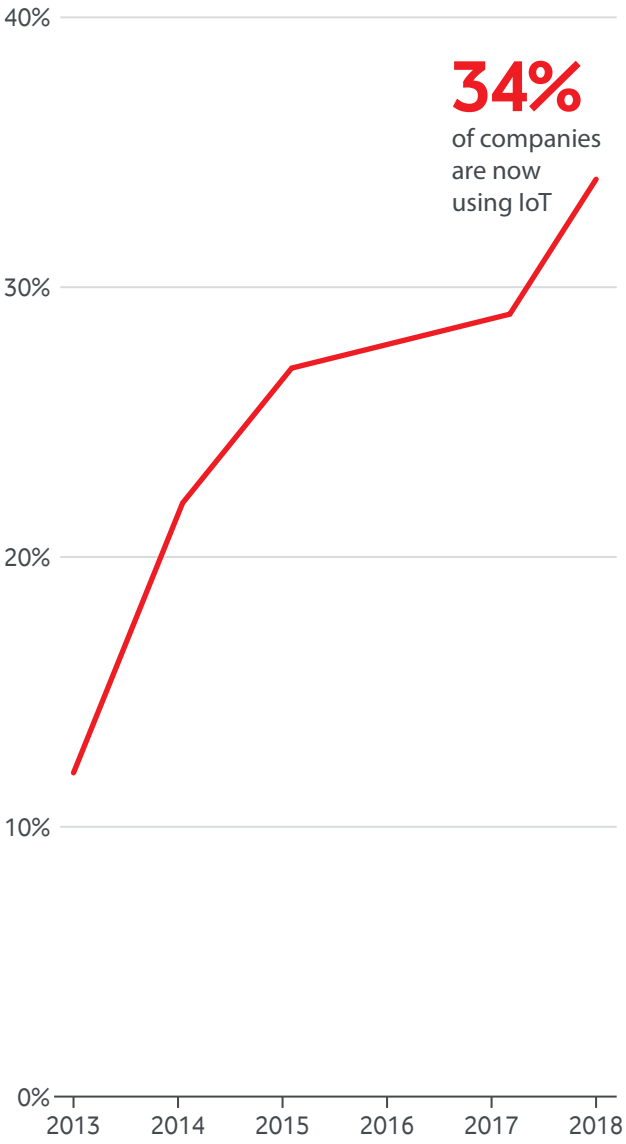


Fig 1. IoT adoption figures between 2013 and 2018

Since our previous IoT Barometer, there has been a dramatic increase in IoT adoption. It has risen by five percentage points, from 29% in 2017 to 34% in 2018. We believe that this is being driven by the growing availability of IoT enablement platforms and new, cost-effective connectivity options.

Confidence is growing too

As adoption has increased, so has confidence in the technology — 84% of adopters say so. More organisations are now aware of the technology and its potential. They have more access to information, and they're feeling reassured when it comes to matters like security and privacy. And that's why they're doing more of it. Adopters are scaling up — 80% say they have more live IoT projects, 83% say the scale of their IoT projects has grown and 79% say they're investing more in IoT. They're also expanding the reach of their projects. 45% already have projects that span countries, a further 40% expect to in future.

45% of adopters say their IoT projects cross international borders, with a further 40% saying that they will in future.

With lots of additional companies joining the ranks of adopters, it's unsurprising that 29% of organisations are at the pilot stage or just rolling out their first full-scale projects. But even so, 70% of adopters have one or more full-scale production projects. And as they do more with IoT, adopters are finding it hard to imagine life without it — 81% of adopters say their reliance on IoT has grown in the past 12 months.

76% of adopters say their IoT projects are mission-critical.

For many organisations, IoT is now central to how they do business. Over a quarter (27%) of adopters have multiple full-scale IoT solutions. One in 12 adopters (8%) now say that their "entire business depends on IoT".

8% of adopters are entirely reliant on IoT.

The analyst's view

"This year, adoption doesn't vary dramatically by industry vertical. This could mean that the attitude of companies towards new technologies in general has more impact than the sector they operate in. In time, there will be potential IoT applications in almost all vertical markets."

And it's delivering results

The vast majority of adopters (95%) are already achieving some benefit from IoT. Over half (52%) report significant returns. And 79% say IoT is enabling positive outcomes that would have been impossible without it.

95% **of adopters are achieving tangible benefits from their use of IoT.**

The benefit most often cited by adopters is reduced operating costs — over half (53%) have seen this. But the rewards go far wider. Many say their ability to collect accurate data has improved, employee productivity has gone up, asset utilisation and uptime has increased, and customer loyalty has improved. And a third (33%) of adopters say that IoT has enabled them to unlock entirely new revenue streams.

Adopters are reporting a wide range of benefits

Fig 2. What benefits are you seeing as a result of implementing IoT?

Companies in the Americas are seeing the biggest returns

The most dramatic leap in IoT adoption was in the Americas. Here, adoption rose 13 percentage points (pp) year-on-year, going from 27% to 40%. Respondents from the Americas were also the most likely to report significant returns from their investments in IoT — 73% did so, compared with 47% in Asia-Pacific (APAC) and 45% in Europe, Middle East and Africa (EMEA).

Every region reports benefits across the board — from reduced costs to new revenue streams. And as with the global picture, reduced operating costs is the benefit most likely to be reported. A few countries are exceptions to this — in China, the biggest reported benefit is improved employee productivity, while in Germany the top benefit is better collection of accurate data.

Companies of all sizes are seeing benefits

The highest adoption rate is among larger companies — it stands at 37% for those with 1,000 to 9,999 employees, and 35% for those with 10,000 or more employees. That's likely to be at least partly due to larger organisations having been involved with IoT for longer. 34% of organisations with 10,000 or more employees have been using IoT for more than three years, compared with 17% of small and medium-sized enterprises (SMEs). They were able to be there earlier, when implementing IoT would have been difficult for many smaller companies.

The picture is slightly different when it comes to benefits. Just under half (49%) of organisations with 1,000 or more employees report significant returns from their IoT investments. The figures are even more impressive for SMEs with fewer than 250 employees — well over half (57%) of them say they're achieving significant benefits. That's potentially because even the smallest of IoT implementations can have a major impact on a small business. And, thanks to off-the-shelf solutions, fairly advanced systems can be rolled out quickly by even the smallest of companies.

The IoT Sophistication Index

Since the launch of the first IoT Barometer in 2013, we've been reporting on the level of adoption, volume and scale. This year, we've created a sophistication model based on what we've seen the most successful implementers doing.

IoT is set to have a major impact on financial services, especially insurance. Adaptive personal travel policies can be triggered and adjusted automatically based on location and activities. Shipping insurance can be tailored down to the position of a container on a ship and its chosen route. The possibilities are enormous.

See more financial services examples >

Measuring IoT sophistication

Over the years, we've seen companies develop from pilots to full-blown implementation; from one project to many; from standalone to fully integrated with core business systems.

We've watched some organisations streak ahead with implementation, with lots of projects and devices. But many that didn't have a clear strategy didn't realise all the benefits that they could have. Likewise, some companies had a great strategy, but being slow to implement delayed the benefits, and in some cases allowed their competitors to get ahead.

It was our belief that companies needed both strategy and implementation to achieve the greatest benefits. But that was just anecdotal, and we wanted to test our hypothesis. That's why we've developed our IoT Sophistication Index. This assesses companies on strategy and implementation and places them into one of five bands (see right).

Strategy

This measure reflects how developed each company's IoT strategy is, and how reliant the business is on IoT — including how well IoT is integrated with core business systems. It also takes into account the use of IoT data in conjunction with analytics platforms, and whether IoT is part of the company's wider strategy linked with key business outcomes.

Implementation

This scale assesses actual experience with IoT. We looked at whether companies had fully deployed projects, pilots, or if their plans were still on the drawing board. For those with live projects, we asked how long they've been using IoT, how the scale of their projects has changed in the last 12 months, and how quickly they planned to expand their use. We also looked at what objectives they have for IoT.

The analyst's view

"Organisations are increasing their investment in IoT; and that's leading to greater sophistication. They're starting to develop more advanced solutions — for example, progressing towards the control and automation of remote devices, rather than simple monitoring. The IoT Sophistication Index could help organisations to benchmark their IoT progress against their peers and improve their understanding of best practices."

Five bands of sophistication

Based on analysis of respondents' answers, we've identified five levels of sophistication.

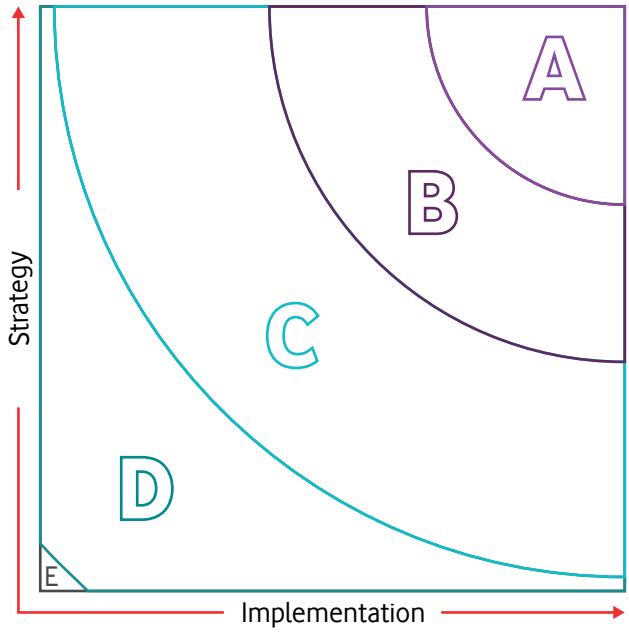


Fig 3. The Vodafone Business IoT Sophistication model

Band A: Most sophisticated
These organisations are most likely to have been an early adopter of IoT. They typically have multiple full-scale projects that are deeply embedded within the wider business. Most see IoT as mission-critical.

Band B: Very sophisticated
Many of these organisations have embedded IoT within their wider business and see it as mission-critical. They are also very likely to be using IoT in conjunction with analytics to support decision-making. They've probably scaled up their investment in the last 12 months.

Band C: Intermediate
Most companies in this band have at least one full-scale IoT project in place. Many have more than one, but are still focused on achieving only a single objective.

Band D: Beginners
This band includes companies making plans to adopt IoT within the next two years and those just starting out. Some have a pilot or small-scale trial, but they haven't rolled IoT out fully or integrated it with core business systems.

Band E: Still considering
These companies haven't adopted IoT, yet. The majority are considering it, but don't have firm plans to implement within the next two years. Just 2% of organisations have decided against it.

Sophistication and ROI

Organisations of all kinds report seeing significant benefits from IoT, but there's a clear correlation between the scale of rewards seen and sophistication.

When we viewed adopters through the lens of our IoT Sophistication Index, our hypothesis was proven correct — scale of implementation and depth of strategy does correlate with stronger results.

87% of organisations in band A say they've seen significant returns on their IoT investments, compared to just 17% of those in band D.

For example, where organisations report a reduction in costs from adopting IoT, the average is 18% — up from 16% in our previous report. And where they report an increase in revenue, it averages 19% — unchanged.

The returns improve with sophistication. This is most pronounced for reductions in cost. For "beginners" (band D) reporting a reduction in costs, the average is 13%; for the "most sophisticated" (band A) it's 26%.

Return on investment increases with sophistication

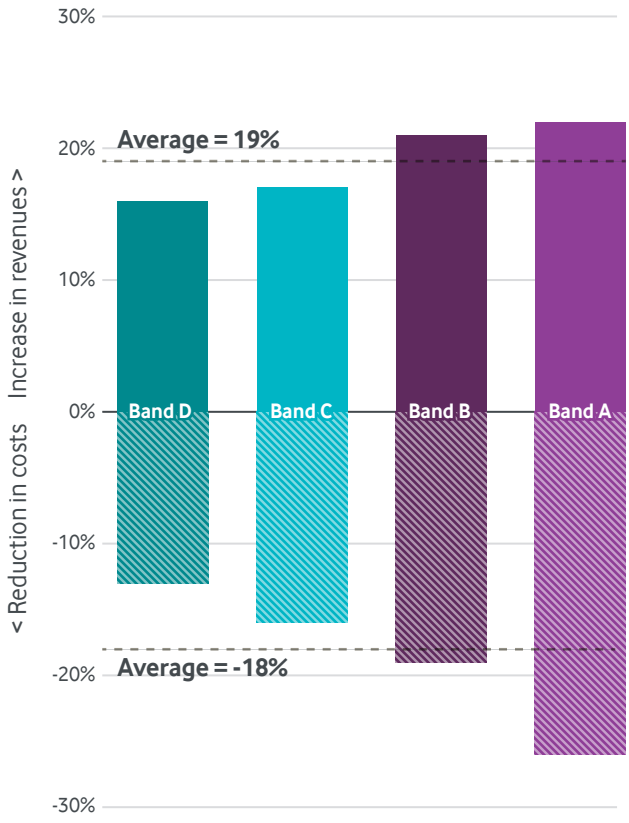


Fig 4. If you saw an increase in revenue or reduction in costs as a result of IoT, what was the average amount? (adopters)

As sophistication grows, organisations are more likely to report significant benefits

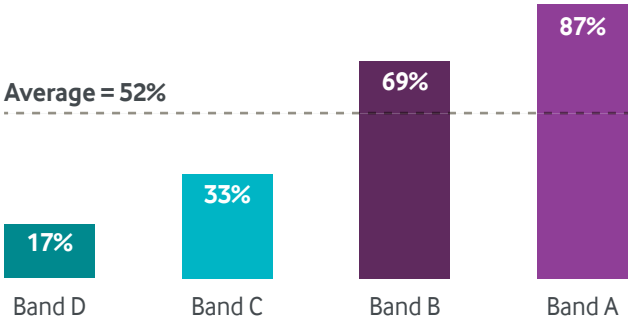


Fig 5. Have you experienced significant returns or benefits from implementing IoT? (adopters)

Whichever benefit you look at — from reduced operating costs to new revenue streams — those in the highest bands are the most likely to be realising it. For example, 38% of companies in band D say IoT has helped reduce their operating costs; that goes up to 71% among those in band A. And while 31% of those in band D have seen regulatory or compliance benefits from IoT, the figure for band A is almost double that (58%).

The most sophisticated users of IoT are also more likely to be experiencing multiple benefits. That's likely to be because their IoT solutions are more highly integrated. They don't just have a single solution with a sole purpose.

Less sophisticated organisations may still be using IoT for one or two specific tasks. Our research suggests that as companies use IoT more, they'll realise further ways to take advantage of it and the benefits will begin to snowball.

Respondent's insight

"Without IoT, our market competitiveness would become nothing. We need to incorporate IoT into every one of our products to stay competitive. It's also very important for our business transformation."

Manufacturer, China

Regional breakdown

Global

Just over a quarter (27%) of the companies we looked at fell into one of our top three sophistication bands. While the percentage of companies in band A (most sophisticated) barely changes by region, the spread across the other bands varies much more.

We investigate regional differences in more detail below.

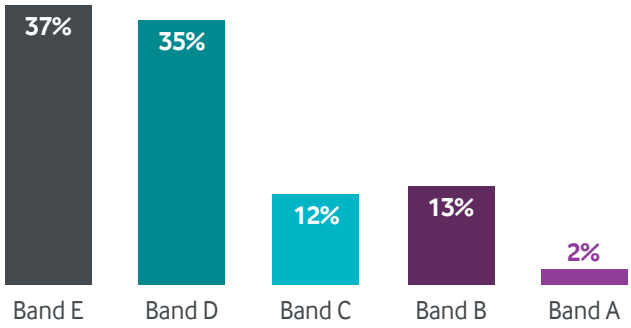


Fig 6. Distribution of sophistication, global (all respondents)

Americas

Companies in the Americas have the highest average sophistication. This suggests that they have progressed further with moving from discrete projects to coordinated programmes that are part of their strategic objectives. As a result, they are more likely to be realising greater benefits.

25% **of companies in the Americas are in one of our top two sophistication bands.**

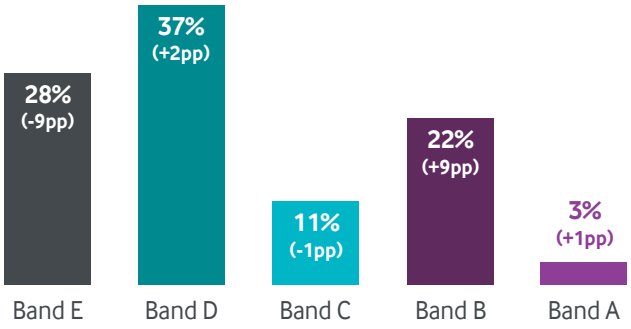


Fig 7. Average IoT sophistication in Americas region (all respondents)

Asia-Pacific (APAC)

Although in terms of regions, APAC leads in adoption, it has a significantly lower percentage of organisations in the top two bands. This implies that despite their enthusiasm, companies in this region have further to go in developing their programmes and achieving all the possible benefits.

43% **of companies in APAC are already using IoT.**

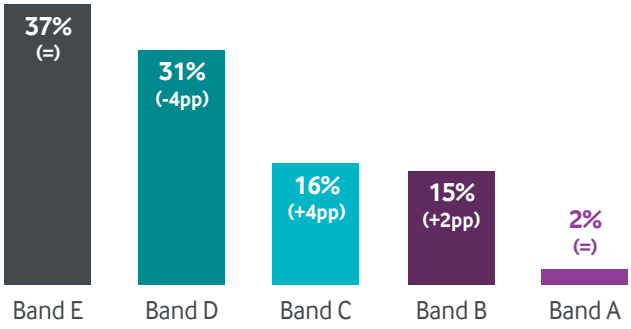


Fig 8. Average IoT sophistication in APAC region (all respondents)

Europe, Middle East and Africa (EMEA)

EMEA has the highest percentage of companies in band E. It also has the lowest share of companies in the top three bands, just 22% — the Americas tops that list with 36%.

This places EMEA at the bottom of the pile in terms of sophistication.

83% **of adopters in EMEA said IoT is critical for the future success of their business.**

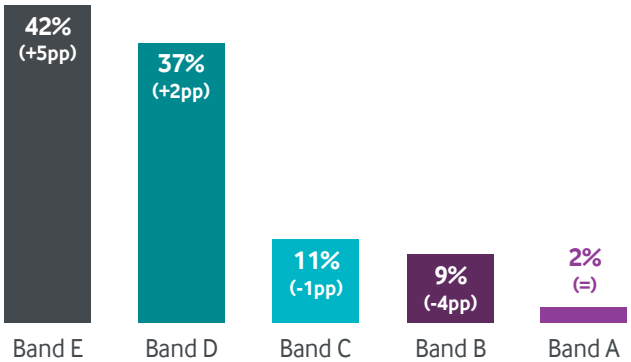


Fig 9. Average IoT sophistication in EMEA region (all respondents)

IoT use by industry

Adopters across all industries are using IoT for a wide range of purposes — from fleet management and security to offering innovative new services.

IoT is helping transport and logistics companies to monitor the location of shipments, cargo and assets in real-time. This means they can optimise routes, cut fuel use, avoid delays and trace problems more quickly.

See more transport and logistics examples >

The picture by industry

When we look at IoT sophistication overall, 53% of adopters fall into the top two bands. Few have a strong strategy but are yet to implement, or vice versa — companies tend to progress at both measures simultaneously.

Interestingly, adopters tend to score fairly similarly on strategy and implementation.

But IoT sophistication varies by industry, and even within industries. Some, like retail, are quite homogeneous. Others, like energy and utilities, see much more variation between companies.

We look at these differences in greater detail over the next few pages.

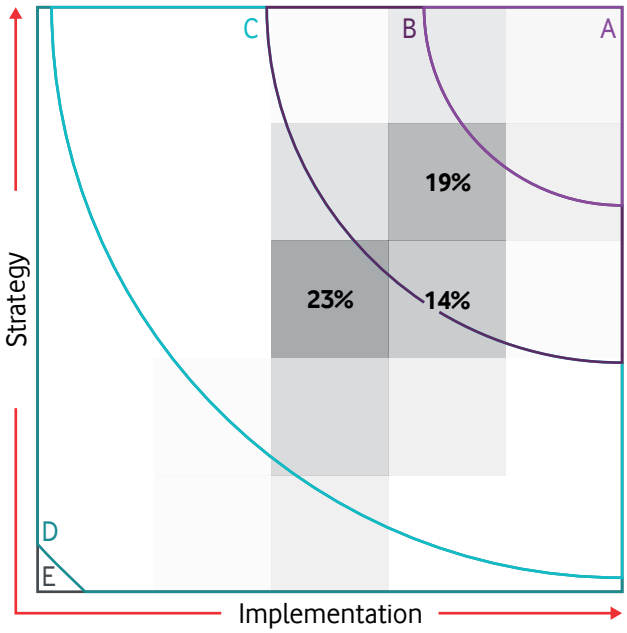


Fig 10. Spread of all adopters by IoT sophistication

In these charts, the shade of each of the 25 blocks is related to how many companies fall in that part of the grid. Darker means a higher percentage.

Transport and logistics

Transport and logistics reported the highest adoption rate at 42%. And at 15 percentage points, it also achieved the biggest year-on-year increase. To complete the hat-trick, it also had the highest average sophistication score.

Half of transport companies, those moving people, have adopted IoT. And these companies are scaling up — 90% say they're spending more on IoT than 12 months ago, and 83% have more live IoT projects. They're typically using IoT to track the physical security of assets (60%), and to measure occupation — for example, traffic congestion and parking (60%).

Among logistics companies, those moving things, adoption is 38%. They're using IoT for a wide range of purposes. 76% are using it to track consumption (e.g. the use of fuel). 71% are using it to track the location of vehicles and cargo, which can help them identify smarter travel and shipping routes, avoiding congestion and reducing fuel use. IoT is also paving the way for adopters to offer entirely new product and services — like working with insurers to offer dynamic pricing of cargo insurance.

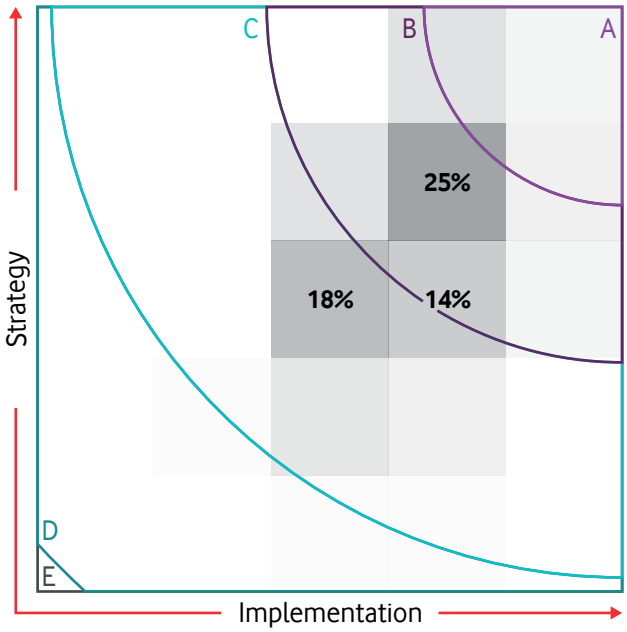


Fig 11. Spread of transport/logistics adopters by IoT sophistication

Over half of adopters (65%) are in one of the top two bands. This high level of sophistication is likely due to intense competition and rising customer expectations.

Financial services

This year, for the first time, our survey data has enabled us to look at IoT adoption in the insurance sector specifically. While insurers are relatively new to IoT, it's proving fertile ground for digital transformation — and adoption has already reached 34%.

IoT can help insurers speed up claims applications and risk assessments. It's enabling entirely new products like usage-based bike insurance. It can even be used to encourage better customer behaviour — IoT sensors can alert homeowners when they've left a window open, an appliance turned on or a door unlocked. 84% of insurance adopters say their core business strategy has changed as a result of IoT.

It's not just in insurance that IoT is having an impact. Across the financial services sector as a whole, 82% of adopters have more live IoT projects, and 86% say their confidence in IoT technology has grown. They're already more reliant on IoT than many other sectors — the majority (80%) say their IoT projects are already mission-critical. Over half of financial services companies rank as very sophisticated in our Index.

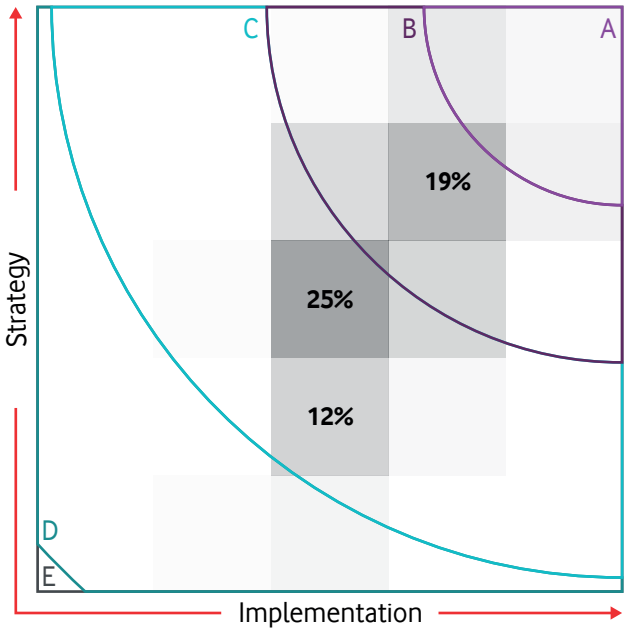


Fig 12. Spread of financial services adopters by IoT sophistication

The high sophistication of adopters in financial services may be partially driven by the emergence of fintechs, which have disrupted many segments.

Healthcare and wellness

Healthcare companies are investing more in IoT and scaling up their programmes. 77% of healthcare adopters say they're spending more on IoT than 12 months ago and 77% say the scale of their projects has grown. That's having an impact on the sophistication of their IoT projects — 57% of adopters fall into one of the top two bands of our Index.

People are living longer, shifting emphasis to chronic care and enabling self-reliance for longer. There's also a growing focus on wellbeing and preventive care. That's reflected in the way adopters are using IoT. Three fifths (60%) are using sensors to monitor people and their health — from blood pressure to sugar levels. IoT can also have a major impact by encouraging patients to take their medicine as prescribed.

With tight budgets, healthcare providers and payers need clear evidence that IoT will enable better patient outcomes. The growth in investment demonstrates their increasing confidence in IoT. 86% say they're more positive about the potential of IoT than 12 months ago. 70% say their IoT projects are mission-critical.

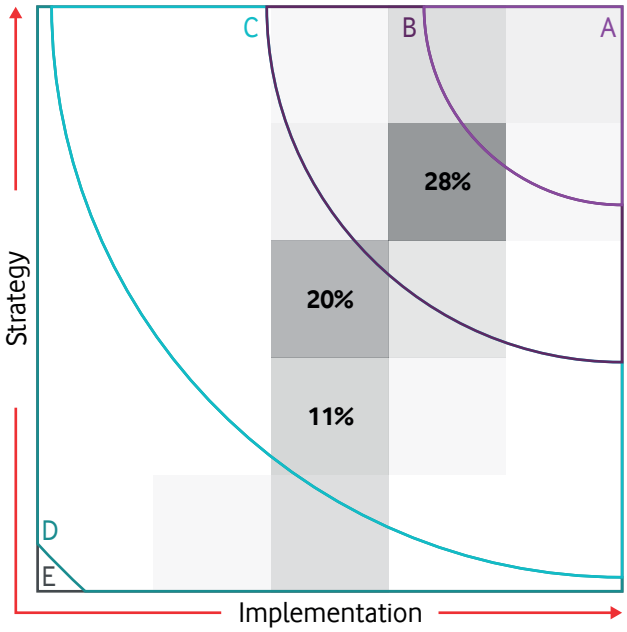


Fig 13. Spread of healthcare/wellness adopters by IoT sophistication

Looked at by sophistication, adopters in healthcare are quite dispersed. But it has the highest share in band A (most sophisticated) indicating advanced strategies and sizeable implementations.

Automotive

Adoption in the automotive sector rose to 36% this year. 77% of adopters said that compared to 12 months ago, they have more live IoT projects.

Many customers now seek out smart features, built-in entertainment streaming and assisted driving. 86% of adopters are using or plan to use IoT to increase revenue, create new products and differentiate their services. Some features are being legislated, such as automatic alerts to the emergency services in the event of an accident. The introduction of C-V2X is set to further disrupt the industry. It enables vehicles to communicate with each other and infrastructure, helping to avoid accidents and reduce congestion.

It's increasingly important for those in the automotive supply chain to identify productivity gains and improve visibility. 65% of adopters are using IoT to optimise the utilisation of assets and streamline processes. Vehicle manufacturers are also investing in partnerships to deliver products like usage-based insurance.

In terms of sophistication automotive adopters are fairly evenly split (46:54) between bands A and B (most sophisticated and very sophisticated) and bands C and D (intermediate and beginners). That's reflective of the different business types covered by this sector — from manufacturers to independent dealers.

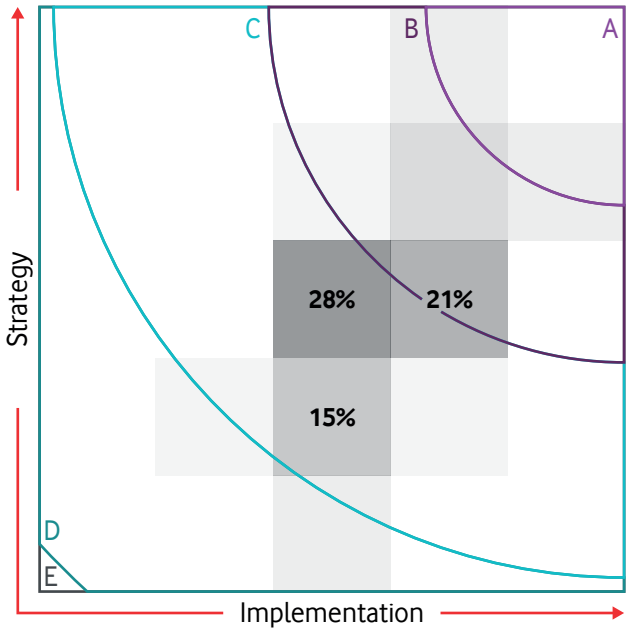


Fig 14. Spread of automotive adopters by IoT sophistication

The highest concentration of adopters in automotive is around the boundary between band C and band B.

Energy and utilities

Energy and utility companies, sometimes encouraged by government regulation or investment, are seeking to reduce waste and environmental impact.

Many initiatives hinge on IoT technologies, like smart meters and smart grid systems — 67% are using IoT to measure consumption. Others, like increasing renewable energy capacity, rely on equipment with IoT built in. IoT is also being used to monitor remote infrastructure — 75% are using it to monitor the physical security of assets — and improve customer service by optimising the job planning and routing of service staff.

This wide range of use cases explains why adoption rose to 36% in 2018. Compared to a year earlier, 84% say the scale of their projects has grown.

In an industry where plans have to be made years in advance and investments often run into hundreds of millions, it's critical to get your IoT strategy right. But legacy infrastructure is making integration more difficult and impacting the levels of sophistication in this sector.

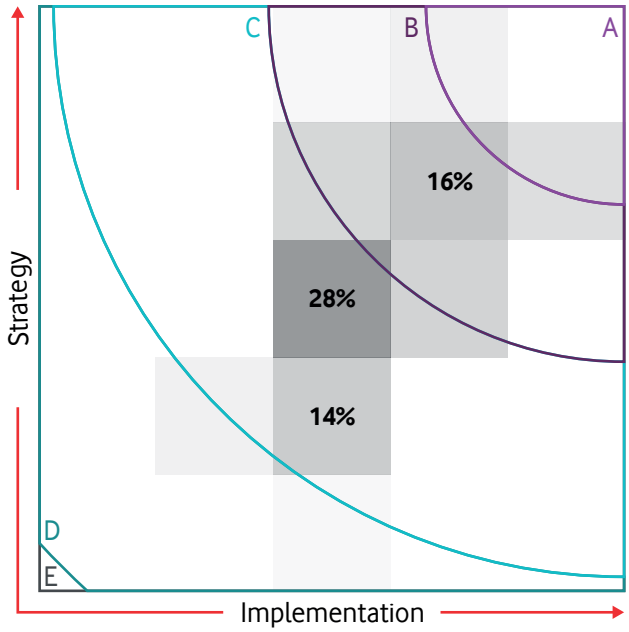


Fig 15. Spread of energy and utilities adopters by IoT sophistication

Energy and utilities adopters are concentrated in band C and band B (53% and 40% respectively).

Manufacturing and industrials

In manufacturing and industrials, adoption of IoT rose from 30% to 39%. Just under half (49%) of IoT adopters in these industries rank as very sophisticated.

Companies are under pressure to get products to market faster and deliver greater personalisation. 69% of adopters are using IoT to increase efficiencies and optimise asset utilisation. 63% are using it to monitor environments — such as light, temperature and humidity — helping them maintain product quality and workplace safety.

As IoT becomes integral to every part of the manufacturing process, companies are becoming more reliant on it. 75% of adopters say their IoT projects are already mission-critical. 81% are spending more on IoT than 12 months ago and 85% say the scale of their IoT projects has grown.

IoT is also bringing the concept of digital twins to life. A digital twin is a detailed virtual replica of a physical system — including machines, people, etc. — that can be used to model its behaviour. Because they are based on real-world data, they can help solve issues — for example, identifying a correlation between equipment failure and sudden temperature changes. They can also help predict the effects of proposed changes and enable new revenue streams through servitisation.

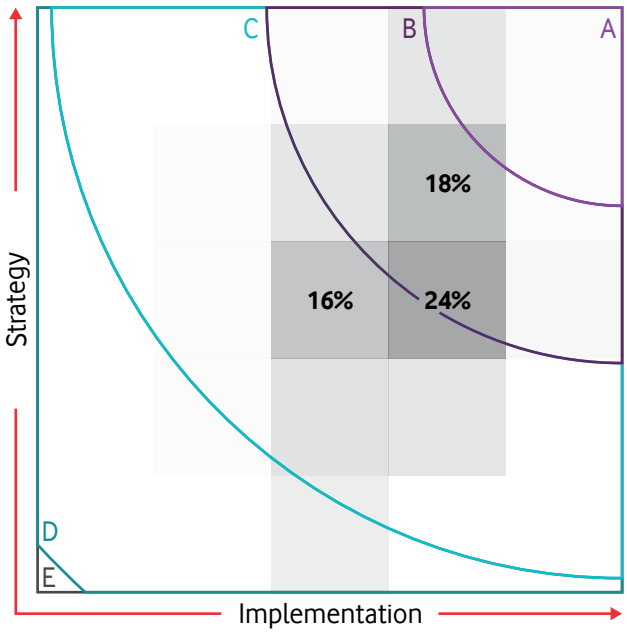


Fig 16. Spread of manufacturing/industrials adopters by IoT sophistication

92% of adopters in manufacturing and industrials fall into band B (very sophisticated) or band C (intermediate) — 49% and 43% respectively.

Retail

Compared to 12 months ago, 75% of adopters in retail are spending more on IoT, 73% have more live IoT projects and 77% say the scale of their IoT projects has grown.

Store environments can be greatly enhanced using IoT — 58% of adopters are using it to track environmental factors such as light levels, sound and temperature. IoT can also help retailers generate valuable data on visitor movements and behaviour — 45% of adopters are using sensors to track the occupation of stores and parking areas.

Much of the new in-store technology transforming the industry either revolves around IoT, or includes it in some form. Those that have adopted IoT see it as an increasingly important part of their core business strategy — 84% say it has changed their strategy for the better. And 80% say their IoT projects are mission-critical.

Retail shows the highest concentration of sophistication in our study. This may be due to shorter technology refresh cycles in the industry — retailers are under great pressure to innovate and keep up with changing customer expectations to stay competitive.

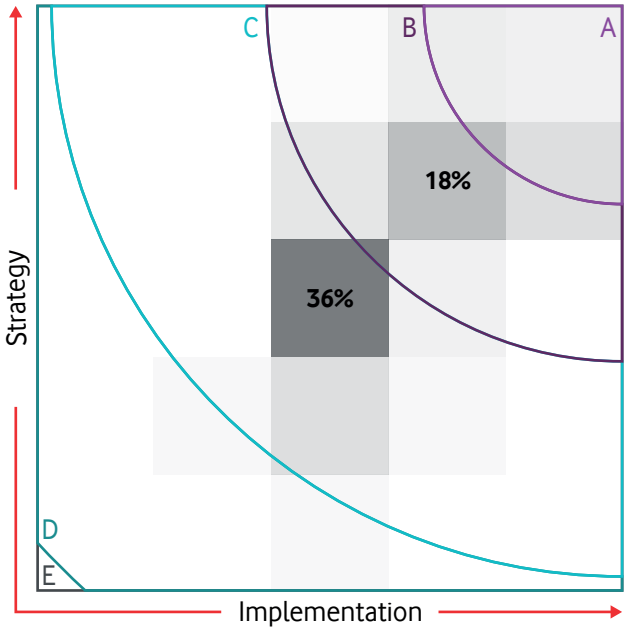


Fig 17. Spread of retail adopters by IoT sophistication

Retail shows one of the highest concentrations of adopters by sophistication, with over a third (36%) falling in just one block.

How to improve your IoT strategy

The more sophisticated your use of IoT, the more likely you are to see strong benefits. So how can you increase your sophistication and improve your ROI? Start by looking at your IoT strategy.

IoT is transforming the automotive industry. It's already improving supply chains and enabling new driver aids and passenger entertainment. C-V2X will take this further, enabling communication between vehicles and infrastructure, helping to reduce accidents and congestion.

See more automotive examples >

Developing your IoT strategy

The most sophisticated IoT users have a clear strategy that's aligned with their business objectives and their broader transformation plans. And they're making full use of the data they collect to inform their business decisions.

Treat IoT as a critical part of your digital strategy

Digital strategy is increasingly key to business objectives. Today, how well a company can leverage the latest technologies is playing a growing role in its market position. IoT plays a key part in this. Almost three-quarters (72%) of adopters say digital transformation is impossible without IoT. Even considerers recognise this — over half (55%) of them agree, even though they're yet to put their ambitions into action. For the most sophisticated users, IoT is becoming business as usual. It's another key element in their overall digital and business strategy.

72% **of adopters say digital transformation is impossible without IoT.**

Organisations are aware of IoT's far-reaching impact within their sector. Over half (55%) of adopters say IoT has completely disrupted their industry, and 44% of considerers agree. But IoT isn't all about disruption. Not every company can start from scratch or get billions in venture capital funding. IoT is enabling improvements to how businesses of all shapes and sizes operate on a day-to-day basis. 83% of adopters say IoT is an essential part of the digital workplace.

Respondent's insight

"One of the main challenges ... is to switch the organisation over to a digital mindset. For example, in sales, a product is no longer just a product. It's combined with apps, it's combined with the cloud. Every manager has to get an IT understanding to sell this new process."

Retailer, Germany

73% **of adopters say IoT is too important to be left to IT alone.**

The most sophisticated organisations, those in band A, are the most likely to agree with this sentiment. 89% of them believe IoT cannot be left to IT alone, compared to 66% of organisations just starting out (band D). 63% of adopters say IoT is paid for within departmental budgets, not as an IT project.

Larger companies think wider

Bigger organisations are the most likely to say that the responsibility for IoT spans multiple departments and stakeholders. 74% of the largest adopters (those with 10,000 employees or more) say that IoT is too important to be left to IT alone. That drops to 66% for SMEs. Larger adopters are also more likely to be using AI to understand and action data from their IoT devices — 84% of adopters with 1,000 or more employees are doing so, compared to 74% of SME adopters. This could be attributed to a relative lack of resources and expertise.

The analyst's view

"Some types of company are pursuing IoT more aggressively than others, but in time, we think there will be potential IoT applications in almost all vertical markets. To understand how far we are along the IoT journey, it's useful to make a comparison with cloud adoption. Only now, more than a decade after Amazon Web Services (AWS) was first offered as a commercial service, are we seeing truly widespread adoption of cloud services. IoT will probably require a similar timescale to become truly 'business as usual'. As this is the sixth IoT Barometer, we're already over halfway through this schedule, suggesting rapid change over the next few years."

Integrate IoT with your business systems

There's a general consensus that IoT shouldn't be considered in isolation. To realise the full benefits, organisations need to integrate it with other key technologies. 89% of the most sophisticated (band A) companies think of IoT alongside analytics, AI and cloud, not as a standalone technology. That compares to 66% of organisations just starting out (band D).

38% of adopters say integration of IoT with business systems is their primary focus. That puts it top of the list of priorities.

The vast majority of adopters have at least started to integrate IoT with their business systems — just 1% say there's no integration. Doing so is the primary focus for adopters across all levels of sophistication. At 38%, it ranks higher than both expanding existing IoT projects (34%) and developing new projects (28%).

Integration with business systems is high

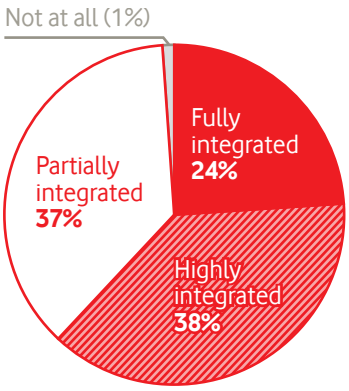


Fig 18. How integrated are your IoT projects with existing business systems and processes?

Integration with core business systems is one of the major components of our sophistication calculation. 100% of those in band A said that they'd done this — 87% said they'd integrated "fully" and 13% "highly". Just 22% of those in band D said they'd started integrating, and none said they'd integrated fully.

As those in band A are the most likely to report significant benefits, this suggests a strong correlation between integration and positive results.

Adopters are focused on integration because of the huge impact it can have on how easily they can expand their use of IoT and achieve a wider range of objectives. Organisations that have fully integrated IoT are in a better position to scale quickly and to see improvements in business outcomes. 95% of adopters where IoT is fully integrated say it's enabling their digital transformation, compared with 55% that haven't started integration. They're also more likely to report that their core business strategy has changed for the better as a result of adopting IoT and — probably not unconnected — be looking to scale their projects quickly.

Degree of integration is a strong predictor of reliance

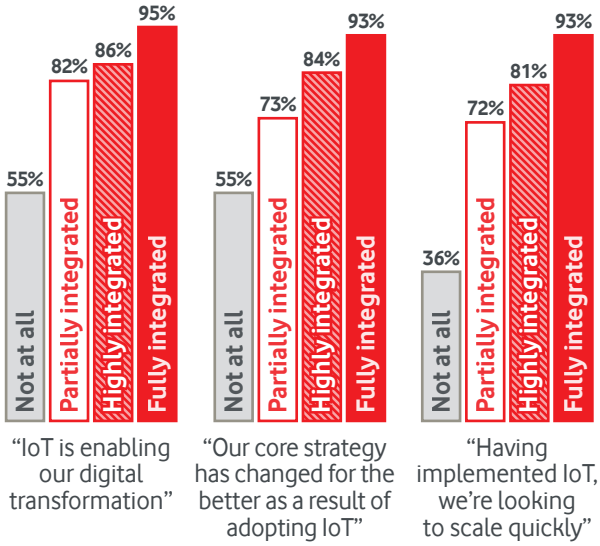


Fig 19. To what extent do you agree or disagree with the following statements?

Fortunately, integration is becoming easier. The pioneers had to develop their IoT solutions from scratch. Now, there's greater availability of off-the-shelf solutions, and integrating these with core systems is simpler thanks to IoT platforms. Today, all leading ERP and CRM systems have functionality that enables organisations to integrate IoT solutions. There are also web-based services like IFTTT and Zapier. And many telecommunications providers are offering dedicated IoT platforms, making it easier for companies to develop, test and manage IoT projects.

Transport and logistics are focused on new IoT initiatives

IoT adopters in transport and logistics are primarily focused on rolling out new IoT initiatives — 40% of transport and 37% of logistics adopters say this is their priority. In transport, that may be because they're so advanced when it comes to integration, and this is freeing them up to focus on branching into new areas. 52% of transport adopters say that their current IoT projects are already fully integrated — more than in any other sector.

Choose the right connectivity

Different IoT projects have different needs. For example, an application that monitors the storage conditions of medical samples doesn't need to send lots of data, but reliability is critical. One which tracks the location of individual parcels doesn't need to send updates every second, but it needs to be cost-effective.

There are now connectivity options that meet the different needs of the huge variety of IoT applications. We asked companies about three characteristics:

Time sensitivity

A lot of IoT applications depend on speed. 72% of companies said that they have a project where data must be delivered within seconds, or less. But 39% said that they have an application where a transmission delay of hours wouldn't matter. And 21% said they have both.

Volume of data

The amount of data which devices need to transmit can also vary greatly between projects. For example, a video-based application will typically need to send more data than one which monitors something simple like the humidity in a manufacturing plant or whether a vending machine is working. That explains why 70% said that they have an IoT project that sends a lot of data, more than 10 MB per device per day, while 39% said that they have an IoT project where devices only send a small amount of data. 20% said that they have both.

Cost

Sometimes keeping costs down is crucial to making an IoT business case work. 43% said that they have an application where they would trade slower delivery of messages for a reduction in cost. Conversely, 64% said that they'd pay more for consistently fast delivery of messages. 25% said that both were true.

Respondents' insights

"... in some instances, such as an emergency, we need data transfer to be immediate. But we probably don't need real-time communication for the other connections — it can be sent in a batch at end of the day, week or month. It depends on the goal of the service you're providing or the IoT application."

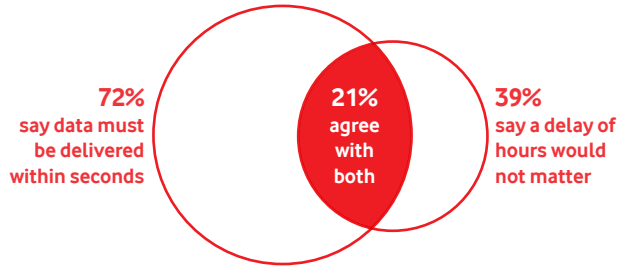
Insurer, Spain

"If I build a router for a bus, I might need media streaming or a wireless connection, depending on the bus size ... that's why there are so many different standards. It also depends on how much power you need, and the range needed."

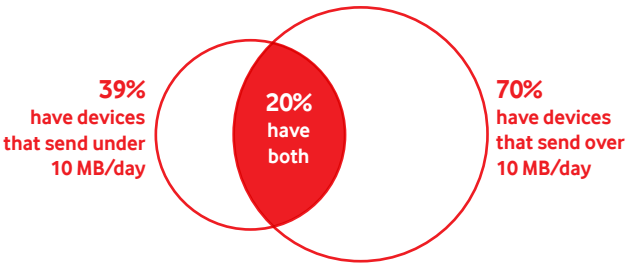
Manufacturer, Germany

There's no one-size-fits-all approach to IoT

Time sensitivity



Volume of data



Speed/reliability versus cost

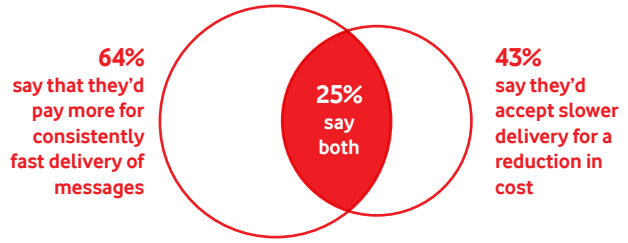


Fig 20. Which of these is true for your current IoT projects?

All of this means that you need a flexible IoT infrastructure, with the right kinds of connectivity to support different projects. This will help you get the performance you need while avoiding spending more than you have to.

An IoT platform can give you visibility into the operation of your devices and networks, helping you to manage multiple types of connectivity and optimise performance.

The analyst's view

"Companies have a range of different objectives that they want to achieve through IoT deployment, such as reducing costs, achieving regulatory compliance and meeting environmental objectives. The IoT solution must deliver on these goals. However, after initial IoT deployment, companies often end up with a much greater awareness of how the technology can be used to address other business challenges."

Use AI to extract insights

Getting the greatest value from IoT means looking beyond how it can drive efficiencies. IoT devices can provide data that's critical in improving customer experiences and driving more informed business decisions. Looking forward five years, the most sophisticated (band A) organisations are unanimous (100%) that data from connected assets will be key to decision-making; that compares with 72% of beginners (band D).

100% of the most sophisticated agree that data from connected assets will be key to decision-making.

Technologies like AI will be important for getting the most out of IoT data and drawing actionable business insights. AI can spot correlations between disparate sets of data that a human analyst might miss. 81% of adopters say AI will be important to help them understand and action data from IoT. And it's not just those who are doing it already — 69% of considerers recognise its importance too.

AI could also prove critical in identifying what data should be kept and what can be disposed of. At present, there's a danger that companies aren't keeping data because it doesn't require an immediate action — for example, the temperature of a machine is within the permissible range. But minor variations in temperature could potentially have a correlation with machine failures.

Keeping hold of data requires flexible storage. Most adopters (59%) are storing IoT data in the cloud. The scale and accessibility are ideal for IoT projects. What's striking is that a similar proportion (58%) are already seeking to draw meaningful insights from their data using analytics platforms — and that figure goes up among more sophisticated organisations. Within band A, 80% are already using analytics platforms with IoT data to support decision-making.

Adopters are using analytics and the cloud

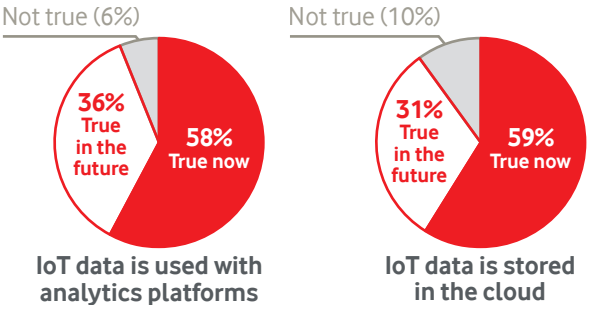


Fig 21. Which of these is true for your IoT projects?

Earn your customers' trust

More and more people are interacting with IoT in their daily lives, via connected TVs, smart lighting systems and even virtual assistants like Alexa. That's giving organisations access to more granular data on customer behaviour and needs. But, as the technology becomes more prolific, it's also raising public awareness about data privacy issues.

That means to realise the greatest returns from your IoT investments, you need to earn your customers' trust. That takes robust IoT data management. And it means being open with users. 94% of organisations in band A say they're transparent with users about what IoT data they collect and how they use it; that compares to just 66% of those in band D.

Respondent's insight

"... you always have what data you're exposing at the front of your mind. For us, it's very key that all data we're going to use for training and building algorithms is anonymised. You need to be on the right side of government regulations."

Healthcare company, South Africa

The analyst's view

"In most of the IoT use cases we see, companies are focused on how they can use the data internally — for example, analysing machine usage data so they can schedule predictive maintenance. They are not typically sharing their IoT data with third parties. This means that they are avoiding many of the problems around data ownership and privacy.

Some companies are looking at how they can extract more value from their IoT data, possibly by combining it with other sources of information, or selling it to others. However, it's still early days in the development of models for monetising IoT data. Exploring opportunities in this area will obviously raise questions around data privacy, but also around business models, data quality and compatibility of data formats."

Ways to accelerate your IoT plans

With a solid strategy you're in a strong position to benefit from IoT. But the right approach to implementation is also key to realising IoT's potential, de-risking your projects and accelerating your returns.

IoT-enabled smart cities are already having a major impact on the wellbeing of citizens around the world. Digital buildings solutions can enhance the performance of CCTV security cameras and improve energy management and sustainability, while smart traffic light systems can reduce road congestion.

See more smart city examples >

Speeding up implementation

The growing prevalence of IoT is making it easier to implement advanced solutions that deliver on business objectives. Even the most sophisticated companies are using off-the-shelf services, where it makes sense. And they're investigating new connectivity options to provide the best possible ROI and user experience.

Investigate existing IoT solutions

Having a robust IoT strategy is only half the picture — you need to be able to deliver on it. It's now easier than ever to implement sophisticated IoT programs and integrate them with existing infrastructure.

For many IoT applications — such as digital building solutions like smart lighting and building energy management — commercial off-the-shelf products offer a quick and low-risk alternative. Even sophisticated IoT-enabled security systems can now be bought as plug-and-play solutions. These can be easily retrofitted to existing CCTV systems, creating a state-of-the-art solution. And even where a more tailored solution is required, it's often possible to customise an existing bit of IoT kit.

Application enablement platforms are now available that can be used to rapidly develop and localise applications. 45% of adopters would work with an IoT platform provider during the implementation phase of a project.

53% say that managed solution options are important to them when developing an IoT solution.

We also found that adopters are investing heavily in equipment that already has IoT built in. That's particularly true for internal applications. 92% of adopters have either purchased equipment for internal applications with IoT built in or bought services that incorporate it.

Of course, it's likely that in many cases there wasn't a conscious decision to choose IoT. The growing usage of IoT means that often the best solution for a particular application uses connected sensors. HVAC systems are a good example. Predictive maintenance solutions mean that failures can be foreseen, and an engineer despatched with the right parts to service the system before any of the building's residents even suspect there's a problem. Companies will be attracted to the idea of equipment that "just works", regardless of how that's achieved. This explains why so many adopters have bought products or services with IoT built in.

When it comes to external, customer-facing IoT solutions, adopters are much more likely to be only using bespoke systems, whether that's developing new products with IoT incorporated or retrofitting existing ones. One reason for this is that where something offers a competitive edge, they're likely to want to have more control and own the intellectual property.

Adopters are taking multiple routes to development

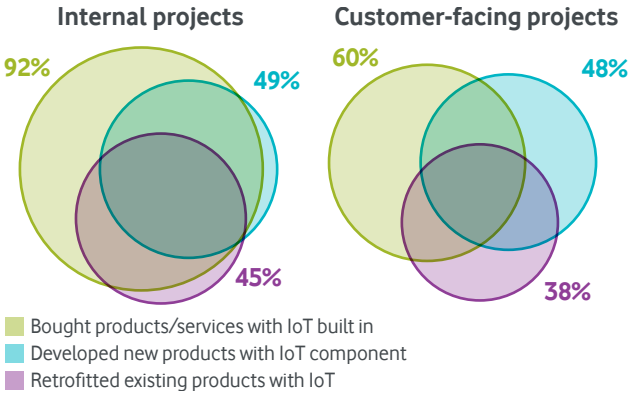


Fig 22. How have you incorporated IoT into what you do?

Insurers making quick wins with built-in IoT

87% of adopters in insurance have purchased internal equipment with IoT already built in — that's more than in any other sector. This could be because insurance is relatively new to IoT. It's likely these companies are trying to achieve quick wins that don't require a major overhaul of legacy infrastructure and systems. 31% of insurance companies say that a greater availability of managed services or off-the-shelf IoT solutions would spur them on to invest more in IoT.

When it comes to external or customer-facing IoT solutions, only 15% of insurers have rolled out products with IoT built in, but 52% have retrofitted IoT to existing products. This could involve adding IoT to policyholders' existing surveillance systems or upgrading older cars with telematics to offer usage-based insurance.

Explore your connectivity options

Different IoT applications will have different requirements. Adopters realise that, and that's why they're already using a range of connectivity options for their IoT projects. And they're looking for new options that will enable them to implement projects more quickly and provide better end-user experiences.

27% of adopters say that new connectivity options like 5G and specialised IoT networks would drive them to invest more in IoT.

Variety of connectivity is linked to sophistication

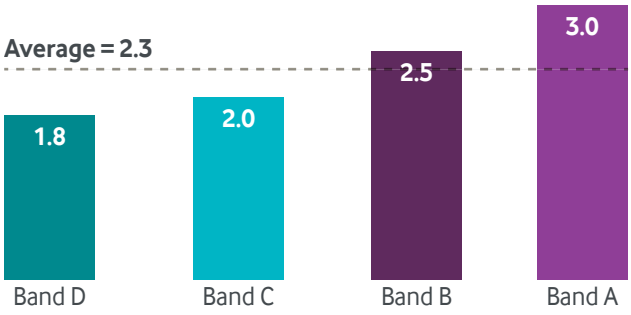


Fig 23. Which of the following connectivity options are you currently using for IoT?

The most commonly used option is cellular (including 4G and 4G+). That's currently used by over three quarters (76%) of adopters. Over two thirds of adopters (69%) use Wi-Fi for their IoT programmes, while a third (33%) are using fixed line. On average, IoT adopters in band D (beginners) are using two different forms of connectivity for their IoT projects. That increases to three for the most sophisticated users (band A).

As their reliance on IoT increases, organisations are likely to need more connectivity options. For example, a project might require satellite to cover areas not covered by cellular networks (like 4G); or a second type of connectivity might be needed for resilience purposes where transmission is time-sensitive.

For many use cases, LPWANs like LTE-M (Cat-M1) and NB-IoT, which are built in line with the same New Radio standards as 5G, will be a good choice. A quarter (25%) of adopters — and 51% of the most sophisticated users (band A) are already using one of these technologies. That's reflective of the fact that licensed LPWANs are designed specifically for IoT use cases where only small amounts of data need to be communicated. And the longer battery life they provide makes them a strong option for connecting sensors in remote or inaccessible locations.

Get ready for 5G

You'd expect the next generation of cellular to support higher performance, but 5G promises much more too:

- **Improved security:** 5G has been developed with security in mind. It offers improved encryption and a number of features to prevent the interception of traffic.
- **More credentialing options:** 5G supports additional ways of identifying devices, including pre-shared keys, certificates and token cards. This will help those managing large IoT implementations.
- **Greater robustness:** 5G uses network slicing to separate traffic and offer improved quality of service management.
- **More specialised services:** With more network management done in software, 5G will make it easier to tailor services to particular use cases. This will be important as IoT is used in more and more applications.
- **Near-zero latency:** 5G promises to cut transmission delays to mere milliseconds. This will be critical to delivering emerging IoT applications like connected cars, smart cities, eHealth and industrial automation.

So, it's little wonder that over half (52%) of adopters are considering using 5G as it becomes available.

52% of adopters are considering using 5G.

5G will also play an important role in realising multi-access edge computing (MEC), a cloud-based architecture that will enable computing at the edge of the network. Because processing is done close to users and devices, issues with network congestion and downtime should be reduced. This will enable extremely low-latency applications — such as collision avoidance in vehicles.

Respondent's insight

"If all the promises of 5G are realised, then it opens up more potential for IoT."

Automotive manufacturer, global

The analyst's view

"Initially, 5G networks are likely to support relatively niche IoT use cases. But the market will expand as coverage improves and 5G begins to deliver on its full promise: lower latency, higher speeds and greater reliability."

Build on your experience

Adopters are using IoT to monitor and track a wide range of variables — from location to health, consumption to condition. The current average per organisation is four, and the most common use case is tracking the security of physical assets.

Adopters are tracking a wide range of variables

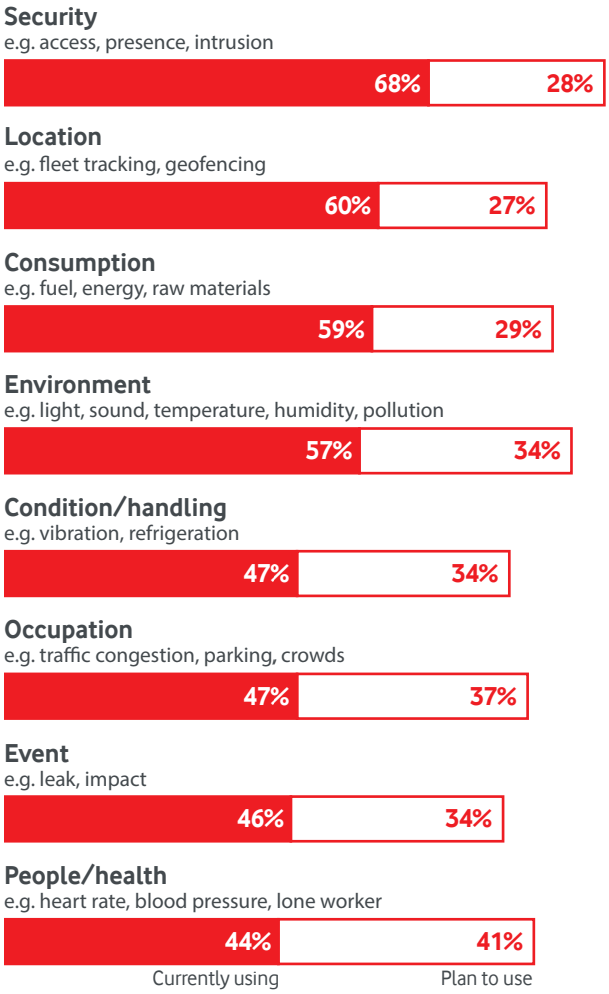


Fig 24. What are you currently using IoT to detect, measure or track? And what are you planning to use it for?

Looking at current and planned uses of IoT, it appears that most companies started with more obvious use cases — perhaps as they are seen as easier to implement. But they soon realised that they can use their IoT sensors to capture other useful data too, and that the potential benefits go way beyond their initial vision. For example, a fleet manager might start tracking vehicles to optimise routes, but the IoT data eventually allows the company to offer add-on services to customers, like real-time delivery alerts.

Organisations rolling out their first IoT pilot may have a specific objective in mind. That's most likely to be to improve a particular process — 63% of adopters are using IoT to improve efficiency. But many have recognised that the potential benefits go way beyond that first goal.

While relatively low down the list at the moment, a lot of companies are looking at the use of IoT to detect events such as an impact or leak. This is already widespread among financial services companies, including insurers. Almost half (48%) of these companies are already doing this, with a further 33% planning to do so. This needn't involve new hardware, sometimes "synthetic sensors" will do the job. For example, IoT-enabled CCTV cameras installed to improve security can also be used to spot leaks and raise an alarm. In the home, digital assistants (like Amazon Echo) are being used to detect intruders.

Over half (57%) of adopters are using IoT to manage risk and compliance, 53% are using it to increase revenue and 53% are using it to cut costs. Among those in band A, these figures are significantly higher — 82% are using IoT to manage risk and compliance, 85% are using it to increase revenue and 69% are using it to cut costs. This suggests that as organisations grow more sophisticated, they move beyond using IoT to cut costs and start to focus more on revenue generation.

85% **of the most sophisticated adopters are using IoT to increase revenue.**

Realising the full potential of IoT gets easier with experience. Adopters see familiarity with the technology as the biggest factor having a positive impact on ROI. The most sophisticated organisations — and those achieving the biggest returns — have experience of IoT projects designed to achieve a wide range of objectives. They're not just focusing on one area. They recognise the potential benefits across the board.

Respondent's insight

"Once we get there ... and give the customer a very focused product that solves a certain problem, then I think there'll be the next wave of 'Ok, what additional services can we add?'"

Automotive manufacturer, global

Get the expertise you need

To help implementation go smoothly, many organisations are creating dedicated IoT teams. 60% of adopters already have a team dedicated to IoT, and a further 31% are planning to put one in place. Many of these teams are likely to be cross-functional — working across multiple departments.

But even with dedicated teams, few organisations have sufficient expertise to go it alone. Most adopters (53%) also work with third parties.

More adopters plan to use third-party expertise

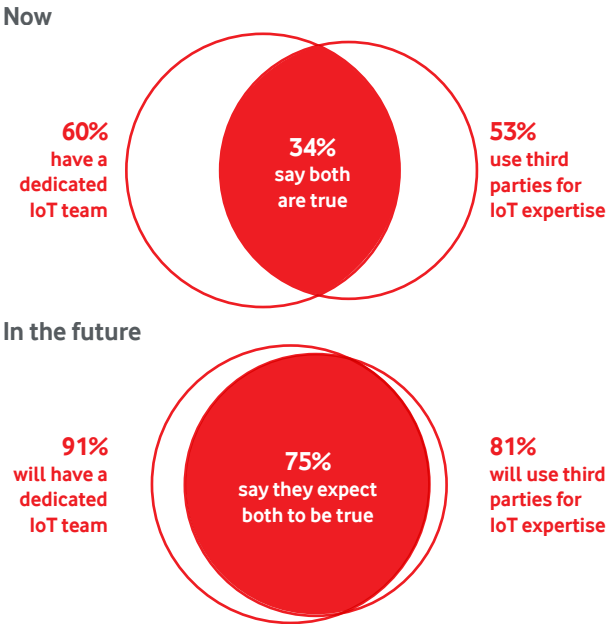


Fig 25. Who do you turn to for help managing IoT?

Looking ahead, the number of adopters expecting to have a dedicated team is set to rise to 91%, and 81% anticipate having a trusted third party. 75% expect to have both and just 2% expect to have neither.

60% of the most sophisticated companies rely on third parties for IoT expertise.

Of the most sophisticated adopters, 60% rely on third parties for IoT expertise, and 24% plan to in the future. And the majority (79%) of adopters say they've increased their use of partners to deliver/manage IoT-based solutions — that goes up to 98% for the most sophisticated adopters.

Increasingly, IoT projects aren't seen as standalone; they're being integrated with existing technology and systems that are core to the business. Adopters know how important it is to get this integration right. That's why over half (56%) are working with systems integrators, and 35% plan to do so.

56% of adopters are using a systems integrator to integrate IoT projects, and a further 35% plan to do so in the future.

Respondent's insight

"... in the digital economy, you have ecosystems, collaboration, partnerships. It's hard to do everything on your own — you'll lose a lot of insights ... We're having to create an ecosystem of partners around us ... so we can achieve our goals in a smarter and faster way."

Insurer, Spain

The analyst's view

"Any organisation implementing IoT needs to think carefully about how to structure the project team. A dedicated team is likely to be able to move faster, but may struggle to get the project integrated with other parts of the business. An existing team will face the opposite challenge.

Based on this year's IoT Barometer findings, it seems that organisations are favouring dedicated teams to lead IoT projects. This may be the most effective approach now, but further down the track, as these projects become more deeply integrated with the rest of the business, it could be that these functions are absorbed into other teams."

Build security in from the outset

If you build security in from the outset, it doesn't have to be a barrier. 84% of adopters say that security is something to be tackled, not a reason to reject innovation. And as businesses do more with IoT, their confidence in security tends to grow. 82% of the most sophisticated organisations (band A) say concerns about IoT security are no worse than with other new technologies. That's compared to 59% of beginners (band D), who may be lacking in confidence due to a relative lack of IoT experience.

84% of adopters say that security is something to be tackled, not a reason to reject innovation.

Overall, 75% of adopters believe they have adequate skills to manage IoT security, compared to 56% of considerers. But there's a significant increase in confidence when you look at the most sophisticated organisations. The vast majority (98%) of band A companies say they have adequate skills. That drops down to 61% for band D. This suggests that more sophisticated companies have a stronger grasp of the risks and how to manage them.

Working with third parties can help. Encouragingly, 96% of the most sophisticated adopters are confident that their suppliers have the skills to manage IoT security risks effectively. Building partner ecosystems can help companies implement more robust security and data management at every step of the journey. And that's especially important as more IoT applications become mission-critical for organisations.

96% of the most sophisticated adopters are confident their suppliers have the skills to manage IoT security risks.

Adopters are taking a range of measures to improve the security of their IoT devices. Almost half (46%) are training their existing staff on security, and 40% are testing IoT devices during the development phase. Only a quarter of adopters have contracted a security consultant, although this goes up to 35% for those in the most sophisticated band — which are likely to have more complex projects and possibly more sensitive data to protect.

Respondent's insight

"IoT security is definitely very important to us. It's not currently an issue, but it's something we always have to keep an eye on because every day there is new hacking going on."

Energy and utilities company, Germany

Adopters are taking a range of measures to secure IoT

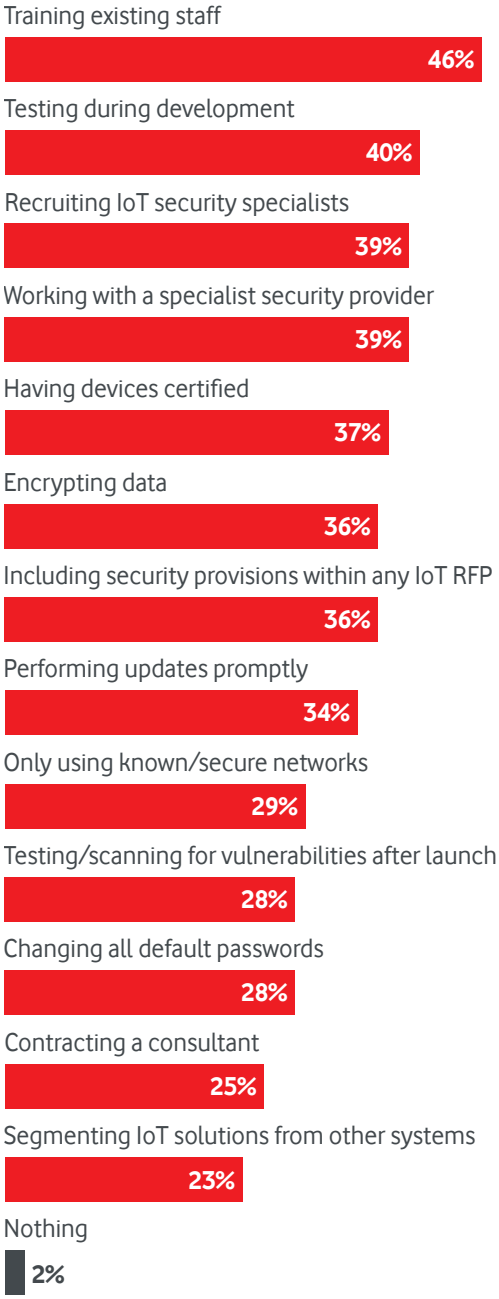


Fig 26. What are you doing to improve the security of your IoT devices?

The analyst's view

"This year's IoT Barometer shows how seriously adopters are taking potential problems with IoT security, with only 2% not doing anything to improve protection of their devices. The results also show that once companies have launched an IoT solution they tend to become more comfortable with the risks. Even pilots and proofs of concept — which may not turn into commercial projects —provide plenty of opportunity to learn lessons, especially around security. Also, best practices for security are well-documented and widely understood."

It’s time to act

The impact of IoT is only going to get bigger. Organisations that don’t act soon could be left behind. But the good news is that it’s easier than ever to get started and there are benefits all along the sophistication journey.

From telemedicine to fitness, IoT is having a significant impact on the healthcare and wellbeing industries. It’s helping people to stay healthy and independent, and enabling clinicians to deliver better care. For example, it’s being used to help patients to take their medicine as prescribed, cutting costs and improving outcomes.

See more healthcare examples >

Act now

For many, IoT is reshaping their whole industry. But you don't have to be an uber-innovative startup to take advantage of it. IoT is fast becoming mainstream, enabling all kinds of organisations to improve their operations and transform customer service. Soon companies that haven't ingrained IoT into how they operate will be at a disadvantage.

A digital evolution

60% of adopters say IoT will have completely disrupted their industry within five years. Even considerers recognise the importance of IoT and are planning their first moves.

74% of adopters say that within five years companies which haven't embraced IoT will fall behind their competition.

It would be hard to have missed the discussion going on about the value of data and the impact it's having on business fortunes. The data gathered by IoT has a huge role to play. It can help companies improve internal efficiencies, understand their customers better and unlock new revenue streams — especially when combined with analytics and AI.

71% of adopters say companies will list their data resources on their balance sheets — they believe it's that valuable an asset.

In fact, 71% of adopters say that within five years companies will list their data resources on their balance sheets — and that goes up to 91% for the most sophisticated IoT adopters. That's a strong indication of how much strategic and competitive value they think IoT data will have.

Respondent's insight

"... the major driver for us to consider IoT implementation is the concern about our competitiveness. When our competitors have started to use IoT to enhance their products' marketability, we have no choice — we have to follow. The key is to maintain and even enhance our competitiveness. So, the driver is actually an external force."

Manufacturer, China

Taking your first steps

For organisations that are yet to adopt IoT, this could sound daunting — but it doesn't have to be. Our research has shown that IoT is a journey, with benefits to be realised every step of the way. It's true that the more sophisticated your strategy and implementation are, the more you stand to gain. But even IoT beginners are seeing a range of benefits — and projects tend to snowball, unlocking further possibilities and benefits.

It's also easier than ever to get started. With new connectivity options, you can cost-effectively support a variety of applications and their different performance needs. And the latest IoT platforms are making it easier to develop new solutions and manage them from a single pane of glass. Plus, there's a growing range of off-the-shelf IoT solutions that don't need huge amounts of technical expertise to implement. This is giving even small organisations the confidence to get started.

73% of adopters believe that in five years everything will be connected — we'll no longer think online/offline.

Looking to the future, it's unlikely we'll even be talking about IoT in five years' time — just like we no longer talk about client-server, and we now just assume that most things will live in the cloud.

IoT is all around us. It's becoming an inseparable part of normal business operations for many organisations. But ubiquity won't lessen its impact. Quite the opposite.

What next?

For many organisations, IoT is already business as usual. They are reaping the benefits, and as they become more sophisticated the results are growing. But that doesn't mean it's too late to start. Join them now.

vodafone.com/business/iot

About the survey

This year, we interviewed more businesses than ever. Respondents were carefully chosen to represent the diversity of companies and their objectives.

Our core sample consists of 1,430 qualified respondents involved in shaping their company's IoT strategy, suppliers and technology requirements. They represent a selection of regions, industries, company sizes and job roles. This mirrors previous years, enabling us to make meaningful year-on-year comparisons.

To provide additional insight, this year we surveyed a further 328 IoT adopters, similarly spread across regions and verticals. This has enabled us to delve deeper into how adopters think and act. It was also crucial for testing the sophistication model and analysing the correlation with benefits realised. These additional respondents were not included in our year-on-year analysis to avoid skewing comparisons.

Split by vertical sector

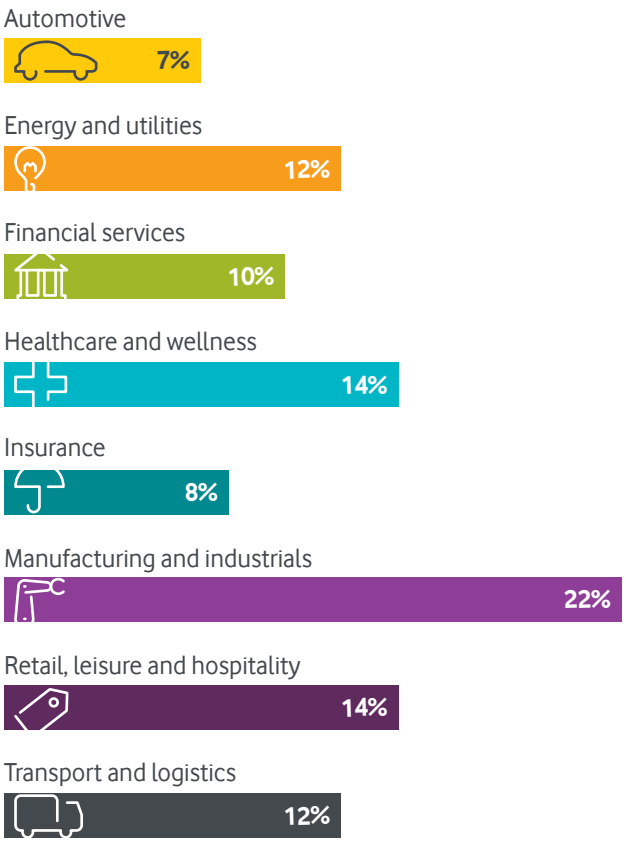


Fig 27. Split of core sample by vertical sector

Split by region

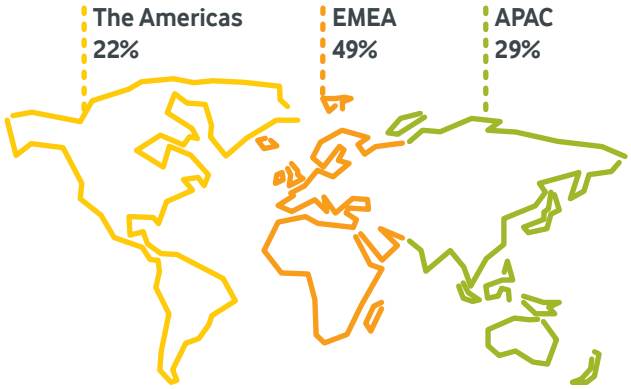


Fig 28. Split of core sample by region

Split by business size

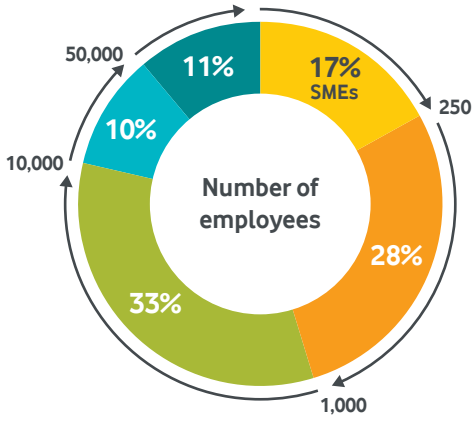


Fig 29. Split of core sample by business size

Split by respondent's role

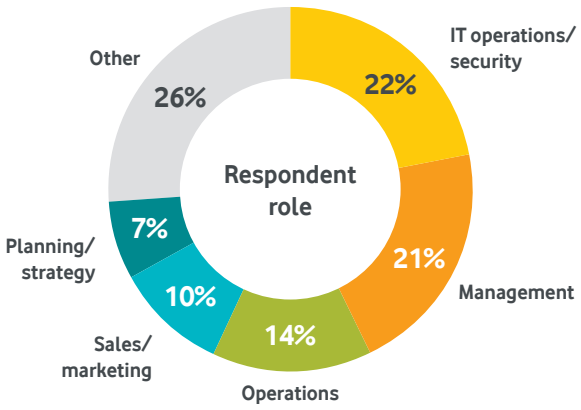


Fig 30. Split of core sample by respondent's role

Contributors

Analysys Mason

Analysys Mason is a global consultancy and research firm specialising in telecoms, media and technology for more than 30 years. Since 1985, Analysys Mason's consulting teams have played an influential role in key industry milestones and helping clients through major shifts in the market. Our research divisions continue to be at the forefront of digital transformation. With offices around the world, our experts provide local perspectives on global issues.

Michele Mackenzie leads Analysys Mason's IoT and M2M Services research programme. She has 20 years of experience as an analyst and has conducted research on key IoT verticals such as utilities, automotive, healthcare and fleet management. She has also written reports on the role of key network technologies such as NB-IoT.

Find out more at analysysmason.com

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For more information, visit vodafonebusiness.com

Vodafone Business Internet of Things (IoT) connects machinery, vehicles and other assets to the network, delivering new functionality and enhanced services. Supported by more than 1,300 dedicated employees, our end-to-end IoT solutions make it easy for businesses to deliver and deploy IoT solutions across multiple territories. We have been highly rated by prominent industry analysts including Analysys Mason, Current Analysis and Machina Research. We are also positioned as a Leader in the Gartner 2018 Magic Quadrant for Managed Machine-to-Machine Services.

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