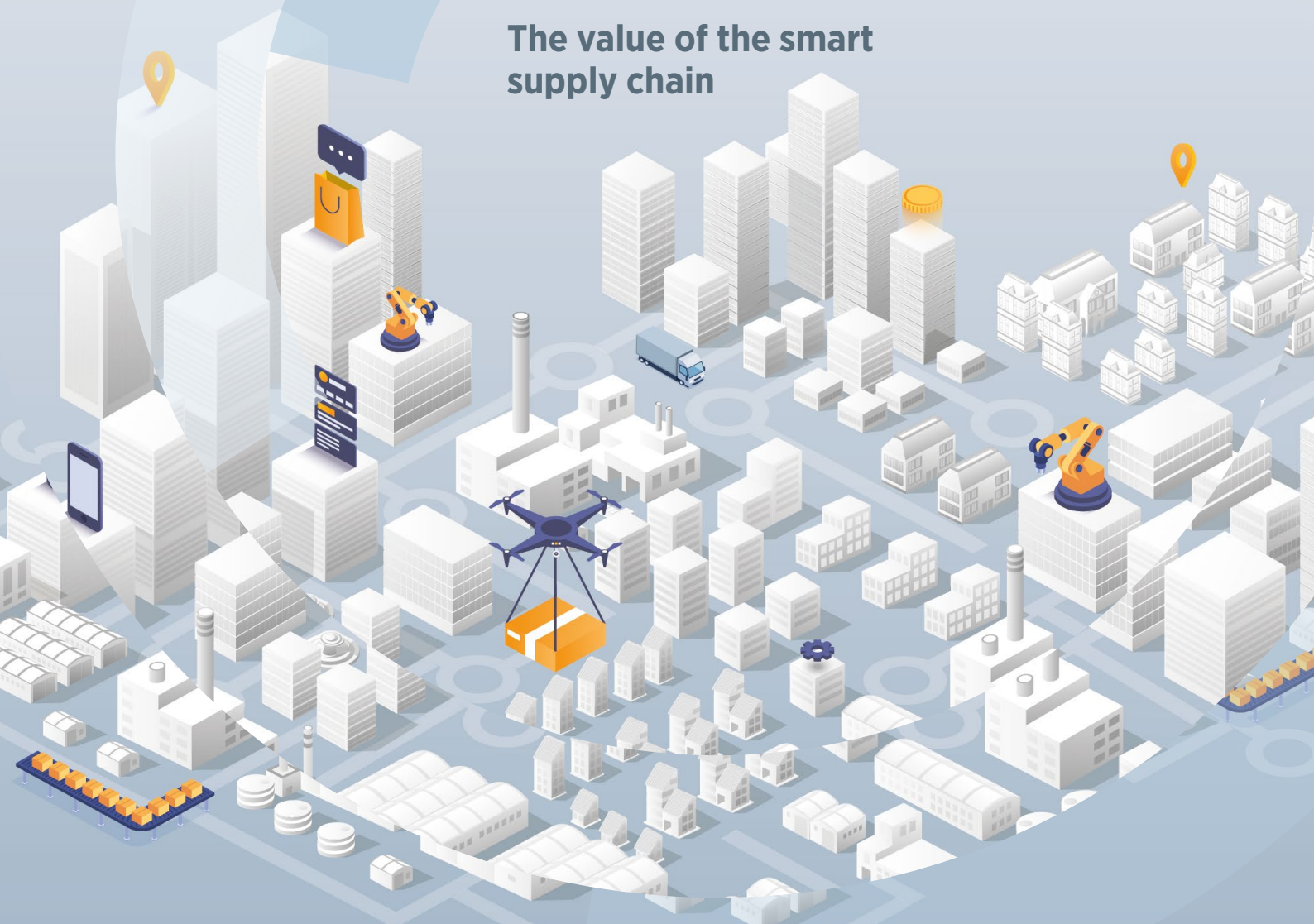


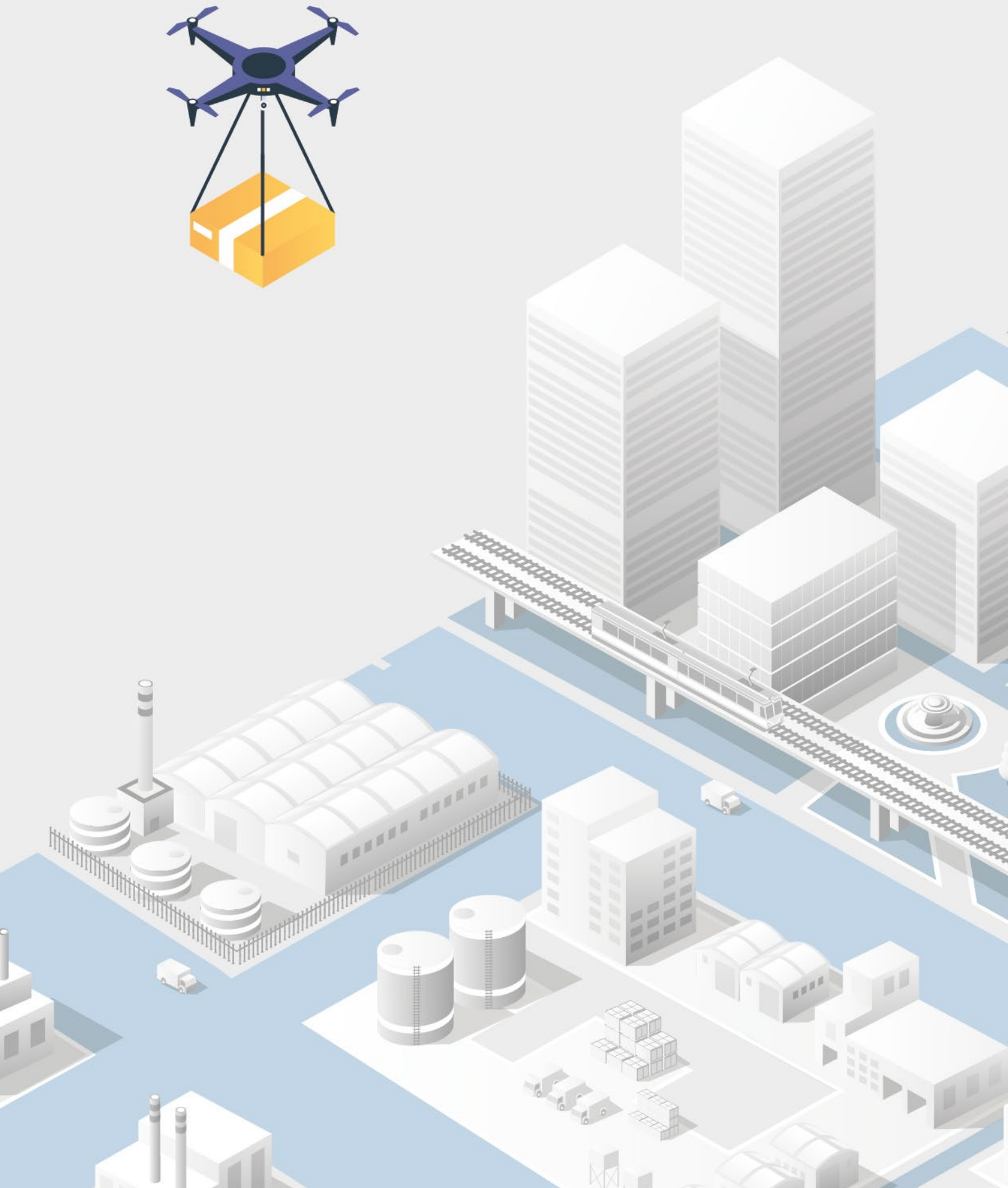


POWER YOUR POTENTIAL

The value of the smart
supply chain



Bringing Ingenuity to Life
paconsulting.com



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INTRODUCTION

POWER YOUR POTENTIAL WITH THE SMART SUPPLY CHAIN

Advanced digital technologies are bringing greater levels of insight and opportunity for supply chain leaders to unlock value and innovate. New ways to harness data and automation are enabling organisations to extract greater efficiencies, drive top-line growth, reduce risk, act with increased agility, and gain greater control and visibility of the end-to-end supply chain.

For some organisations, the smart supply chain allows them to forge direct, real-time customer connections, venturing into territory once occupied by sales and marketing, and reacting to shifting expectations and demand levels. This fresh insight creates a virtuous circle where organisations offer a product or service, monitor usage levels and customer preferences and behaviours, and then continuously refine their offer with increasing precision. For example, connected inhalers enable asthma sufferers to receive refills precisely when needed. Then, feedback on their usage and health enables the provider to optimise the device and develop new services.

But the reality of smart supply chain implementation is harder than the ambition. Clients tell us it's difficult to unlock the full value of smart supply chains. They often lack a vision or struggle to navigate a complex landscape of new technologies and systems. We wanted to explore how organisations can realise the opportunities of a smart supply chain. In partnership with the University of Nottingham, we spoke with over 100 global supply chain leaders across life sciences, industrial, manufacturing and automotive, consumer goods, and aerospace and defence organisations (see page 46 for further information on the methodology).

Sixty nine per cent of global supply chain leaders say the maturity of their smart supply chain vision is developing or basic.



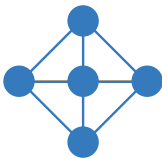
Key findings

Almost two-thirds of respondents (61 per cent) plan to implement significant improvements, aided by digital technologies, into their supply chain within the next three years. But we found that, while leaders recognise how technologies are catalysing change, many struggle to capture the potential of their smart supply chain. We found that:

- **69 per cent** of global supply chain leaders say the maturity of their smart supply chain vision is developing or basic
- **30 per cent** don't know how much value will be delivered through smart supply chain adoption
- **79 per cent** of organisations don't have the right mix of skills and capabilities to deliver a smart supply chain transformation.

Although these issues appear daunting, we commonly discuss and solve them for bold, forward-facing global clients. Based on our experience of delivering supply chain transformation programmes, and insights from our panel of global experts, we've identified a blueprint for success based on three organisational archetypes:

Archetypes when implementing a smart supply chain

Archetype	Characteristics
 Performance-led	Adopts digital technologies into supply chain functions with the primary aim of driving up performance in key metrics that influence day-to-day operations.
 Connectivity-led	Drives transformation by integrating the end-to-end supply chain, using technology to make connections from the customer, through the enterprise and out to suppliers.
 Agility-led	Digital becomes part of the organisation's DNA. By design, the customer sits at the heart of the supply chain – with an embedded culture of innovation and built-in flexibility allowing for rapid response to demand.

Where organisations sit will depend on their vision, industry sector, wider organisational strategy and how close they are to the end customer. All three archetypes have their merits and will generate value. A single archetype will be seen as a destination for some, while others will pick and choose elements from each of them for distinct parts of their organisation. Some see their path as an evolution across all three.

The further they progress, the more they learn, adapt and adjust – opening up the full value opportunities. As smart supply chains are a combination of technology and people, data and automation will free people up to apply their ingenuity to their organisation's most pressing challenges. And organisations will be able to better identify the skills gaps that will become increasingly critical.

Whatever your ambition is, and whether you have a clear vision or are yet to set one, we have a set of perfectly achievable actions to help you on your smart supply chain transformation journey.

The choice is clear: power towards a future of digital enablement or risk being left behind.

To unlock your smart supply chain potential, you must:

- **build your smart supply chain vision**
to suit your purpose and ambition, with the ultimate aim of creating a responsive smart supply chain
- **understand the total value opportunity**
by taking a long-term view of benefits across the end-to-end smart supply chain
- **accelerate technology adoption**
by scanning, assessing, piloting and scaling available options and linking their use to value outcomes
- **catalyse the business to execute,**
developing your processes and people with a relentless focus on efficiency, agility and exceptional service.

The smart supply chain is here. Make sure your organisation is equipped to unlock its full value and open up wider opportunities to transform.

It's a transformation every organisation must embrace. The choice is clear: power towards a future of digital enablement or risk being left behind.



THE SMART SUPPLY CHAIN OPPORTUNITY

We asked over 100 global supply chain leaders across life sciences, industrial, manufacturing and automotive, consumer goods, and aerospace and defence organisations for their views on smart supply chains.

Our questions explored the factors driving the shift to smart supply chains, as well as investment levels, maturity of visions, value expectations, barriers to success and much more.

What's driving the shift to smart supply chains?

74%

Cost pressures

For most organisations, the push to digital is driven by the search for new ways to reduce costs. Increasing globalisation, lower barriers to entry and greater competition, combined with deteriorating margins driven by market micro-segmentation, all make cost reduction an imperative.

59%

Advances in technology

Technology such as cloud computing, mobile devices and automation enable the supply chain to connect with other parts of the organisation. They facilitate streamlined processes, support data-driven decision-making and reveal new cross-functional opportunities.

56%

Changes in consumer or customer behaviour

Customers move in a digital world where they want sustainable products supplied with immediacy and personalisation. At the same time, brand loyalty is declining and customers are getting more savvy on price.

51%

New business models

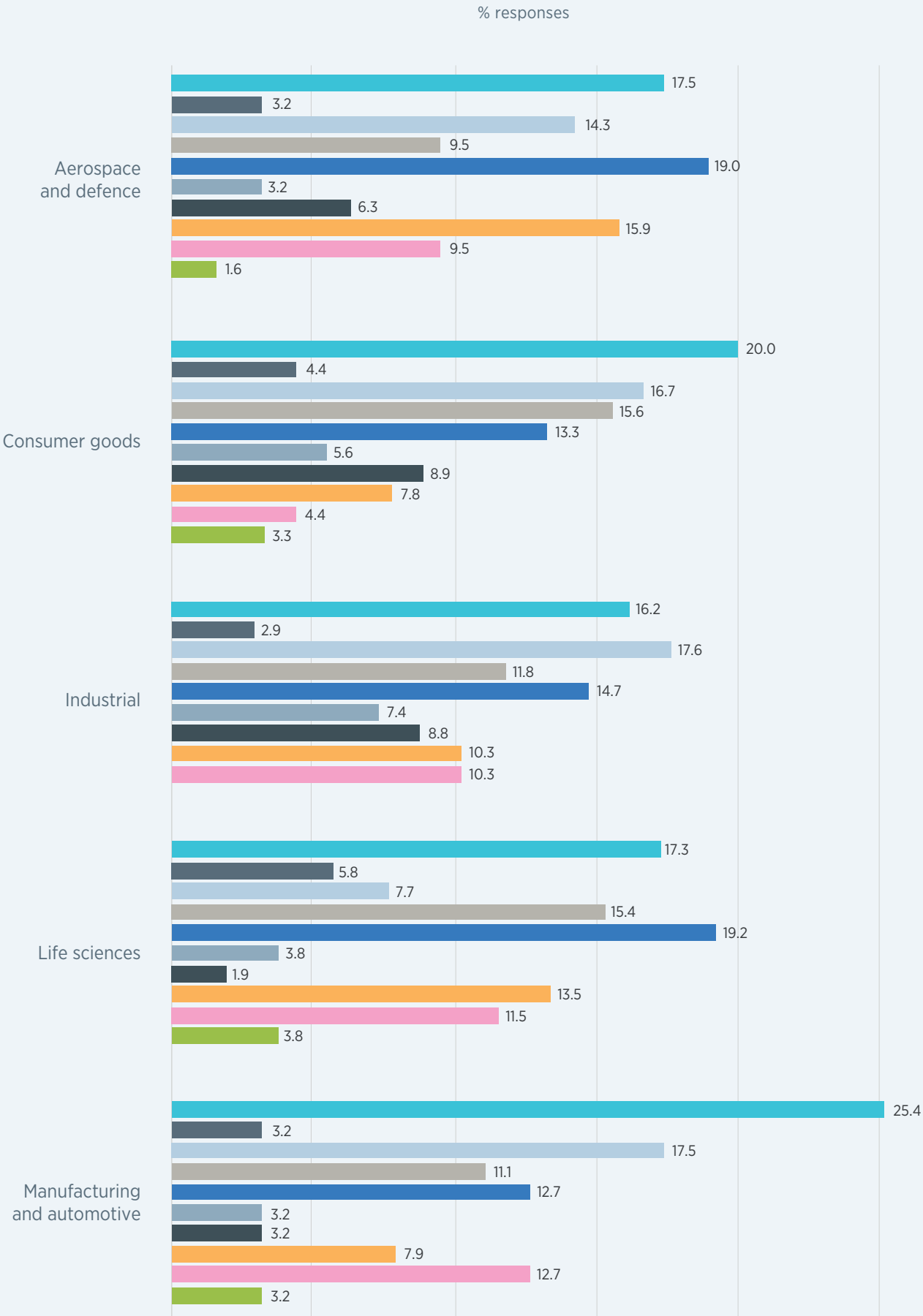
Integrated supply chain systems are becoming the foundation for new business models. For instance, businesses are exploring servitisation models through connected products to deliver customer-centric services, or deploying e-commerce platforms to better connect with both consumers and customers and achieve alternative revenue streams.

41%











Fear of being left behind

Four in 10 organisations are motivated by fear of being left behind as their competitors start making digital moves. Failing to keep pace risks losing market share, driving away vital talent and neglecting customer demand for new products and services. Leaders should replace the fear factor with a view of the upside, and embrace the opportunity and the value waiting for them.

Figure 1: What’s driving your shift to the smart supply chain?



Key:

 Cost reduction	 Requirements from suppliers or trading partners
 Regulatory changes in the industry	 The need to retain and develop talent
 Buyer or customer behaviour and preferences	 Fear of being left behind by competitors
 New commercial or business models	 Quality
 Rapid advancements in technology and access to these	 Other

Sector differences

Across the board, cost reduction was a prominent driver behind organisations' shift towards a smart supply chain. This is as expected in a cost-sensitive function where the impact on the bottom line is acutely felt.

Among aerospace and defence organisations, the rapid advancements in technology and fear of being left behind are most prominent. Large players and prime contractors in these sectors are beginning to invest in digital. Product offerings are having to become increasingly advanced and need coupling with a cost-effective aftermarket service offering over the operational lifespan. This is creating competitive tension, challenging other organisations to react or lose vital ground.

Consumer goods organisations highlight customer behaviour and new commercial models as important factors behind their smart supply chain ambition. Operating within a highly competitive environment driven by constantly shifting consumer demands, these organisations are forced to reinvent their products with greater speed and agility to ensure they can optimise the balance across portfolio complexity, shelf availability and inventory.

Among industrial organisations, customer expectations and advancements in technology are major drivers behind digital adoption. Innovation has led to smarter products and services, enabling greater connectivity across industrial operations and more intelligent after-sales services. These digital technologies are also supporting their internal operations to achieve bottom-line cost targets.

Life sciences organisations feel an increasing pressure to reduce and manage the cost of supply. They see technology as playing an important role in achieving this. Using data and analytics to maximise manufacturing yields and minimise inventory across the supply chain through intelligent planning and scheduling will help unlock value. Furthermore, the drive towards personalised medicine is opening up alternative business models where the patient is at the centre of the supply chain design.

The manufacturing and automotive sector is undergoing major changes. New entrants are disrupting the industry with technologically advanced connected products, platforms and personalised services. Gaining new customers and retaining existing ones is even more critical than ever.

What benefits are organisations looking to achieve?

54%

Enhanced visibility and transparency

Data from digital systems reduces errors by removing data collection and manual reporting processes. Data visualisation and analytics are enabling supply chain leaders to make effective decisions on managing inventory, reducing overall cost and lead time. They also improve risk management by helping organisations identify and address risks earlier, and support the sustainability agenda by enabling organisations to trace materials back to their source.

49%

Cost reduction

Improved visibility of supply and monitoring of process status is enabling reductions in inventory, improving the balance between supply with demand, and enabling predictive maintenance and real-time process interventions. In combination, this is supporting greater asset utilisation and end-to-end cost reduction. An unprecedented degree of precision helps some organisations achieve a reduction in baseline operational costs of more than 15 per cent, and free up time and energy for growth.

43%

Enhanced customer focus and service

Data from smart supply chains helps organisations understand how customers buy and use their products and services. This greater intimacy can be a springboard for developing new offerings that meet customer needs and preferences, opening up new revenue streams. Furthermore, digital enables organisations to provide customers/consumers with the immediacy and personalisation they're beginning to expect, supporting customer satisfaction, service levels and retention.

43%

Support for agile and dynamic operating models

In fast-changing markets, organisations must stay agile to compete successfully. That includes being able to adapt their operating models to respond to new demands, and to identify and seize new opportunities.

42%

Performance improvements

Performance improvements stem from a combination of cost reductions, quality improvements and increased capacity for growth. Digital technologies in the supply chain can help deliver all of these. For example, using artificial intelligence (AI) and machine learning can optimise production lines to improve yield. Further opportunities will stem from organisations using the same insights with their suppliers to optimise their products and supply.

Sector differences

According to our analysis of the data at a sectoral level, better connections between functions and with customers are a clear priority for life sciences organisations. Leaders in this sector are involved in developing smart medicines with the potential to dramatically improve outcomes for patients. Using real-time data to see how individual patients are using and responding to medicines is key to this ambition.

The performance gains enabled by smart supply chains can deliver a crucial competitive edge.

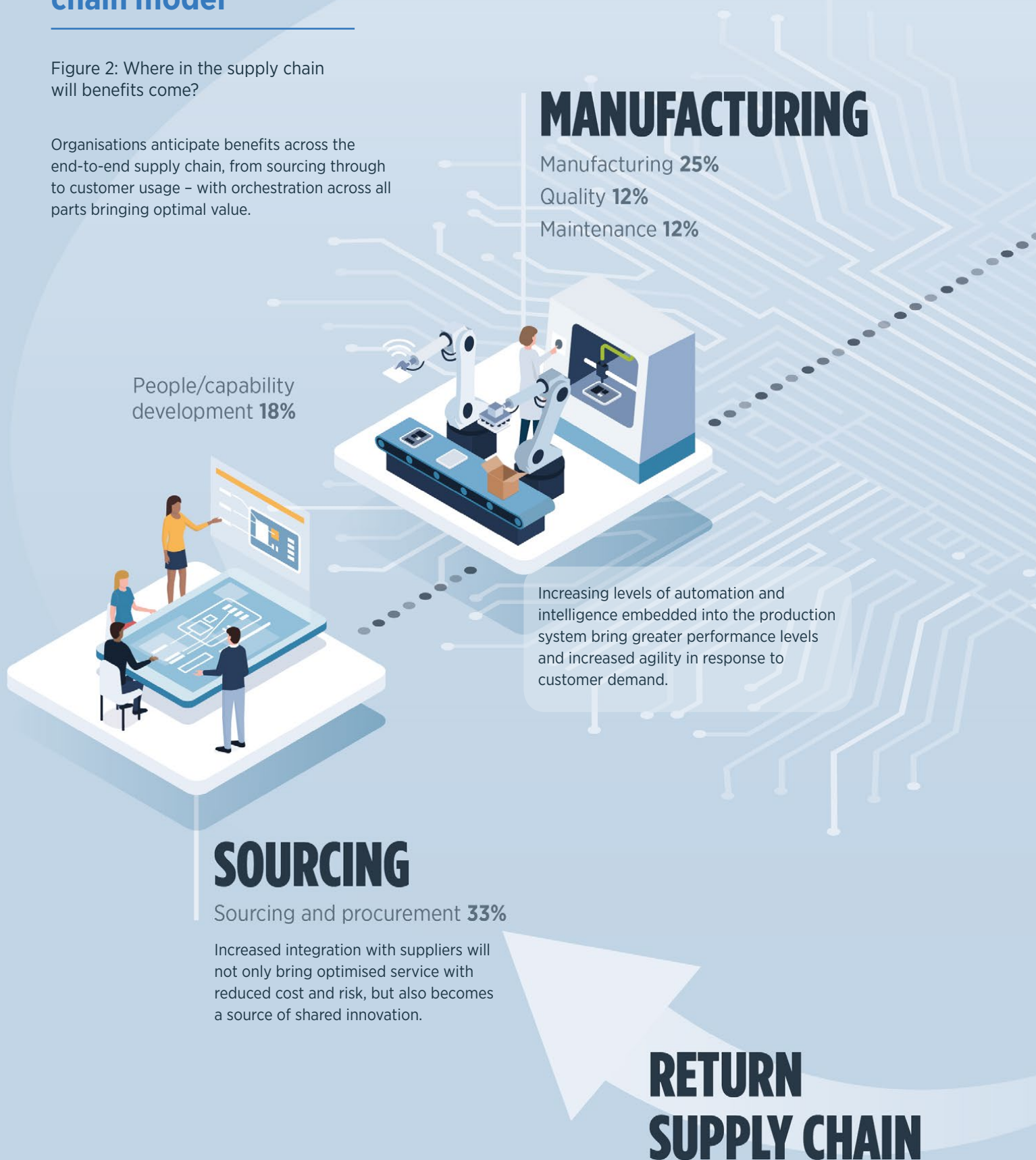
Consumer goods organisations show a clear focus on achieving performance benefits. These businesses are operating in a highly competitive environment, where margins are low and it's easy for customers to switch between similar brands. The performance gains enabled by smart supply chains can deliver a crucial competitive edge.

In the manufacturing and automotive sector, it's all about agility. Organisations in these sectors are running complex supply chains reliant on just-in-time practices that span continents. The visibility and control enabled by digital systems allows them to dial capacity up and down as required, and to redirect resources to respond to shifting global demand.

The smart supply chain model

Figure 2: Where in the supply chain will benefits come?

Organisations anticipate benefits across the end-to-end supply chain, from sourcing through to customer usage – with orchestration across all parts bringing optimal value.



End-to-end integration enables better coordination between all functions and the wider enterprise, bringing an effective response to customer demand and minimising the cost to serve.

DISTRIBUTION

Logistics and fulfilment **54%**

Warehousing **19%**

Real-time tracking of goods and services into customers will create greater levels of supply chain performance and insight, without escalating costs and environmental impact.

The expectations of consumers are changing rapidly, with unprecedented levels of product customisation, multi-channel buying opportunities and a demand for ever-shorter lead times.

Commercial applications **19%**

SMART CUSTOMER

Customer service **32%**

The return flow of products for redistribution, reuse and repair requires integration and efficiency, with information and insights from their use helping refine products and services.

New product development **13%**

UNDERSTANDING THE CHALLENGE

Given these drivers and the perceived potential of smart supply chains, appetite for developing and deploying new digital capabilities isn't the issue. Just one per cent of organisations are yet to start their smart supply chain journey. The real challenge is driving successful implementation. Seventy per cent of respondents said their smart supply chain adoption is currently only at a 'developing' or 'basic' level.

Our research also paints a worrying picture about what organisations expect to achieve. Forty per cent of respondents feel their organisations will not effectively adopt smart supply chain capabilities within the next three years. There's a danger many will fail to achieve their ambitions or realise the full value of their investments.

Lack of a clear vision

Our research finds that over half of organisations have no clear vision for their smart supply chain. In the absence of a clear vision, there's:

- no way to align supply chain initiatives with the business's strategic objectives
- no formula to establish appropriate budgets for investment
- no framework for open dialogue with their workforce or wider ecosystem – partners or suppliers – about how the future will look.

This finding is in keeping with our own experience. We often see efforts to adopt smart supply chains thwarted by problems with the vision. It might be too narrow or too distant from reality – and even a perfect vision can be inadequately communicated. Often, these problems occur in combination. In some cases, we see programmes with no obvious vision at all, or certainly not one that more than a handful of people are aware of.

Over half of organisations have no clear vision for their smart supply chain.

With smart supply chains being a board level agenda, supply chain leaders should be operating at a level where their vision is bought into by the wider business and aligns with – and drives – the overall strategic vision. Our recommendations give you the building blocks to shape your overall vision towards a supply chain that delivers value in line with the broader organisational strategy.

The challenge here chimes with one we're witnessing as organisations look to transform themselves digitally across the entire organisation. Our survey on digital transformation across large, established organisations found that three-quarters are experiencing tension between traditional and new ways of working, and two-thirds are over-investing in what they're good at today and under-investing in what they should be good at tomorrow.¹

A clear vision for your smart supply chain can help reduce this tension and prepare the organisation to transform for tomorrow, catalysing wider digital transformation.

Figure 3: My organisation has a clear smart supply chain vision

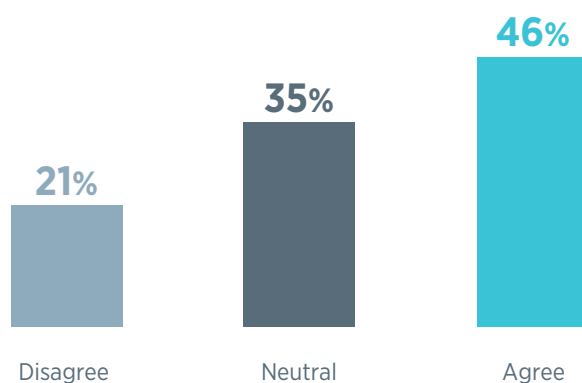
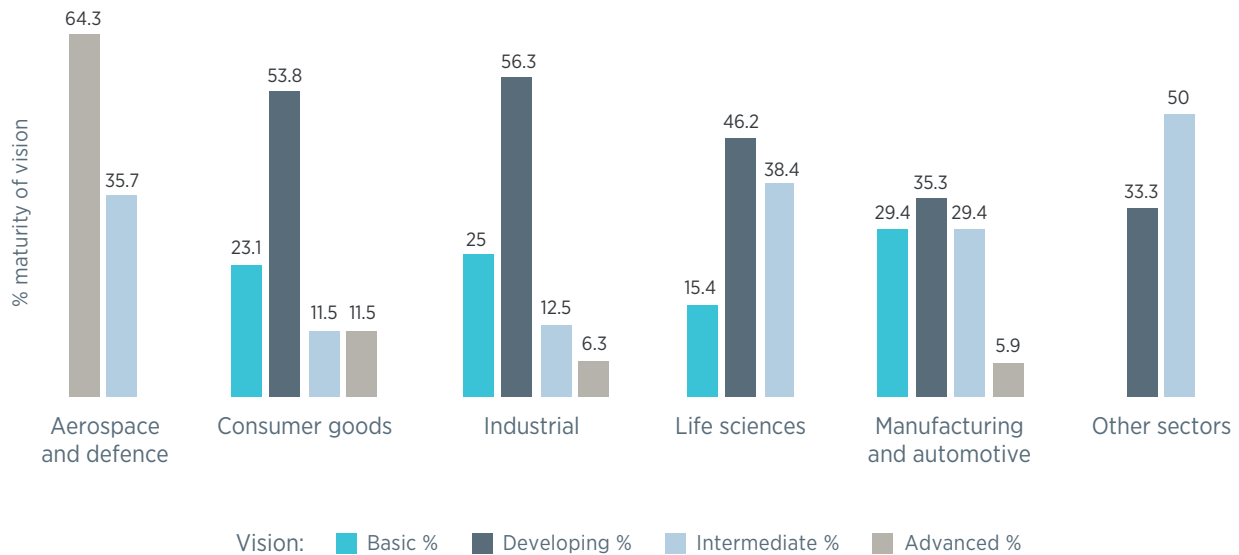


Figure 4: How mature is your organisation's smart supply chain vision?



Sector differences

Many organisations have failed to move beyond a basic vision. For these organisations the vision rests with a handful of supply chain leaders who see the need to change, but this hasn't yet been recognised by the overall organisation. Eighteen per cent of organisations say their smart supply chain maturity is basic. Across consumer goods, industrial, and manufacturing and automotive, many organisations are watching and waiting and are yet to make their move. The risk is that they'll act too late and fall behind, allowing others who've taken the initiative to accelerate beyond them. And the threat is compounded by the relatively long turnaround cycle to see results, meaning a slow start will push them back considerably.

By far the highest proportion of respondents (51 per cent) said their smart supply chain vision is developing. These respondents recognise the value of embracing smart supply chain technologies and are generally supported by a senior supply chain leader who's leading the change. This surge of development is common across all sectors, with aerospace and defence by far the highest. This could be a result of having to make up for an initial slow uptake, or where examples of initial industry successes have spurred action.

Twenty eight per cent of organisations say their vision is intermediate or advanced. These organisations have a defined vision, underpinned by a roadmap and business case, that's been communicated across the business. And these visions have board-level blessing as they align with the overall strategic goals of the organisation. Across the sectors, consumer goods has the greatest proportion of organisations driving ahead with an advanced vision, with the rest lagging behind. These organisations must respond to the challenge or risk being left behind.

The omission of any advanced visions across the life sciences sector is explained by the sheer challenge of unifying large and fragmented organisations that operate in highly regulated environments. In addition, many leaders in this sector are grappling with how the future of personalised care and patient-centric ecosystems will impact on their current supply chain, let alone one that is part of a more radical vision.

Uncertainty around value opportunities

Knowing what practical steps to take to realise the opportunities is just as big a hurdle as setting the vision. Almost 60 per cent of respondents told us they had only a basic or developing understanding of how to apply digital capabilities to unlock value in their smart supply chain. And six per cent of respondents aren't even aware of how the smart supply chain can unlock hidden value.

Without this, organisations are stuck knowing only what the smart supply chain can offer in principle, but not how to calculate or derive value.

Organisations are stuck knowing only what the smart supply chain can offer in principle, but not how to calculate or derive value.

Figure 5: Rate your organisation's understanding of how the smart supply chain can unlock hidden value

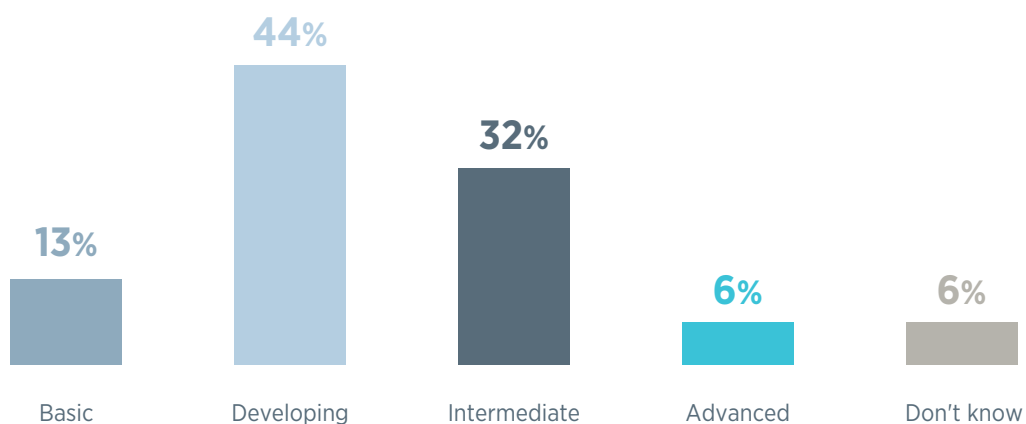
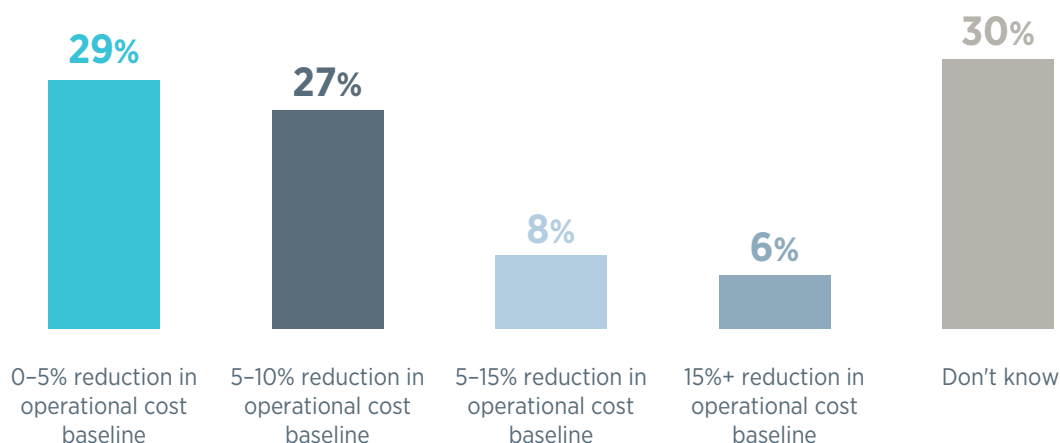


Figure 6: How much value will the smart supply chain deliver you over the next one to three years?



The majority anticipate value equivalent to up to 10 per cent of operational costs over the next one to three years, but one-third cannot put any figure on the value they might realise. This makes attracting business engagement and investment in digital solutions difficult.

And yet the opportunities are clear and waiting. We've seen clients realise more than double the benefits projected in the original business case submission when capturing and quantifying the broader business benefits. The more data led and agile you become, the more insight you're able to intelligently harness and the more value you'll continue to unlock. Success breeds success, until your increase in skills and capabilities leads to a complete transformation.

We've seen clients realise more than double the benefits projected in the original business case submission when capturing and quantifying the broader business benefits.



Turning ideas into reality

Take an example from life sciences, based on work delivered by our Global Innovation and Technology Centre. On pharmaceutical production lines, machines are becoming routinely equipped with sensors generating sophisticated performance data.

As a result, manufacturers will begin to predict with unprecedented accuracy when a failure is likely to occur and what its root cause will be. They'll use this insight to realise proactive maintenance strategies, minimise downtime, release capacity and manage operational risks.

Meanwhile, data from suppliers will provide additional and accessible detail on the concentration of individual batches of raw, active materials. Production lines will be more highly tuned to their inputs, environment and operating conditions. This will optimise yield and deliver a positive impact on costs and sustainability. Additional data for each batch will trace its origin back to its source, helping to protect brand reputations and, if required, allow for rapid investigations.

Downstream, data will also have a transformative impact. Logistics companies will exploit the internet of things (IoT) to track pharmaceutical drugs and ensure they're kept within the desired temperature conditions during storage and distribution. Data collected and monitored during the delivery of products will help optimise distribution plans to minimise costs, maximise efficiency and ensure best quality.

And when it comes to the end customer, asthma inhalers, for example, will be connected devices, relaying back information on usage to the manufacturer. This data will provide new insight and, with this, the opportunity to offer new services: refills for the inhaler will be delivered exactly when the individual customer needs them. Using digital channels to add personalised training on how to adjust usage for optimum results will bring the brand into the customer's everyday world.

Low investment levels

Difficulty in understanding the full value that smart supply chains can unlock is constraining planned levels of investment – which are generally low. Nine out of 10 firms are either unclear of their investments or plan fairly modest investments in smart supply chains. Thirty-five per cent expect to invest one to two per cent of revenues within the next 12 months.

There are other factors at play. Experiences of complex, costly and delayed IT programmes, or asset development platform programmes that have spanned years, have made organisations reluctant to invest. We also see confusion around project ownership, with a conflict around whether IT or supply chain functions own digital projects in the supply chain. However, allocating ownership to either one fails to recognise the organisation-wide impact of smart supply chain investments. The reality is these investments need to be owned and delivered by the whole business.

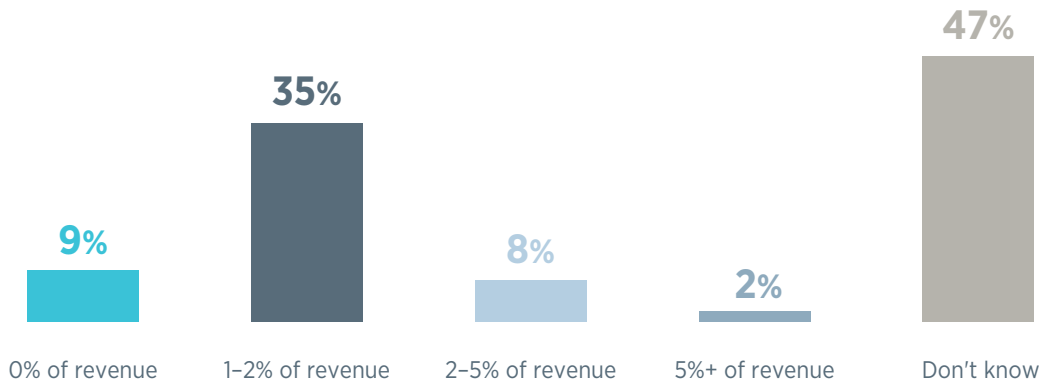
Traditionally, organisations have looked to R&D to develop products to attract customers and bring competitive advantage, but organisations are increasingly looking beyond just their products and to their supply chains to bring greater competitive advantage.

The level of smart supply chain ambition needs to be reflected with significantly higher investment.

If there is belief that the smart supply chain will differentiate, it brings into question the lower investment levels into new supply chain capabilities compared to the typical figures of 5-15 per cent of revenue spent annually on R&D.

Even when decisions on digital investments take place at business level, building the case is rarely straightforward. Depending on the technologies involved and the complexity of the case, you may be expecting to deliver returns within two to five years – or in some cases longer. But because quantifying the value unlocked by emerging technologies is a still-developing science, it's difficult to make a clear calculation.

Figure 7: What level of smart supply chain investment is your organisation expecting over the next 12 months?



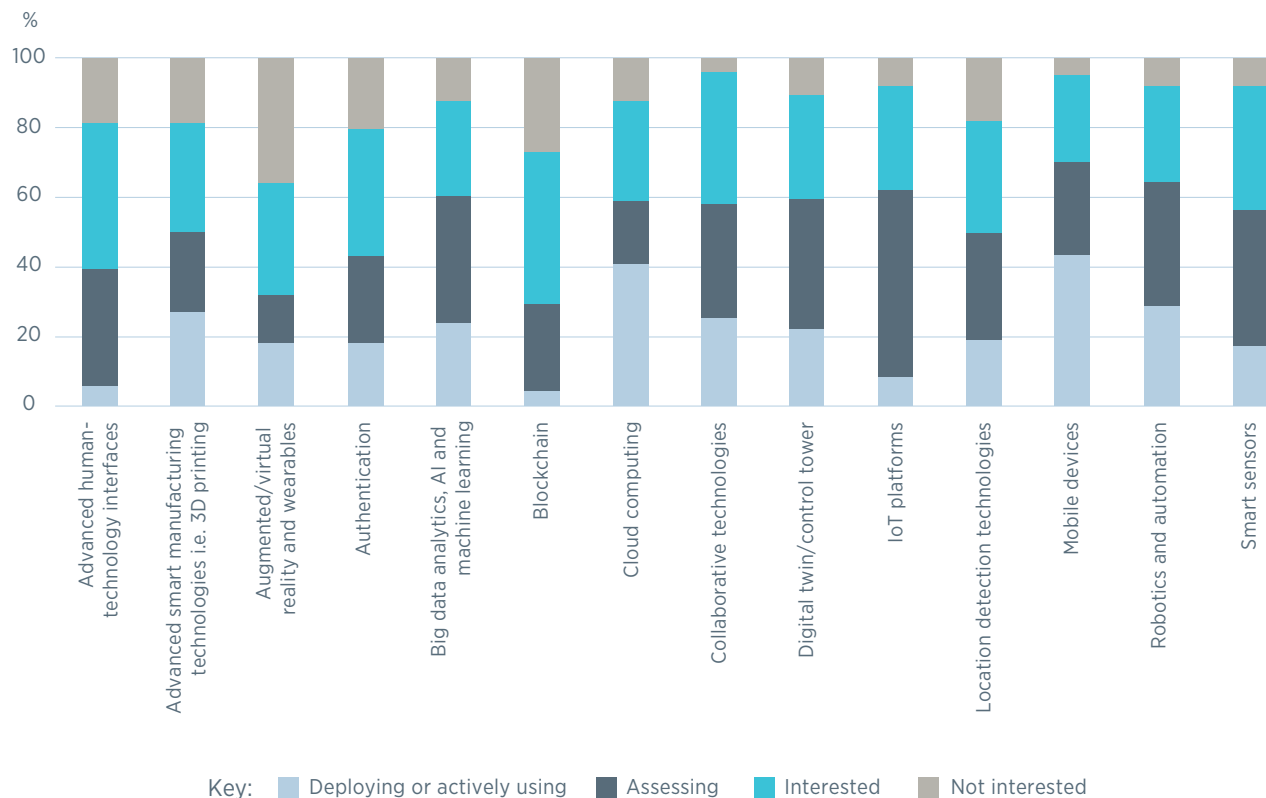
Navigating the complex technology landscape

Much of this first-wave smart supply chain investment is being directed at three key technologies: mobile devices, cloud computing, and robotics and automation.

These technologies are obviously of interest – they’re the logical first steps and are familiar technologies for most. But leaders should challenge themselves to be more ambitious. Those organisations making greater strides go beyond improving their current operations, exploring solutions that

push them into new areas of opportunity. Examples gaining significant traction include digital twins, IoT, smart sensors, big data analytics, AI and machine learning platforms, and the means of connecting these through cloud-based services.

Figure 8: Leaders' interest levels in smart supply chain technologies



Further barriers

As organisations eye up the potential benefits from smart supply chains, our research reveals further barriers delaying the shift to digital.

Four in 10 organisations told us that other pressing issues are the key barrier stopping them capturing value from digital. Their attention is focused on delivering against day-to-day demands and short-term needs rather than considering how digital adoption can help address challenging trends such as economic uncertainty, skills shortages and pressure from disruptive competitors.

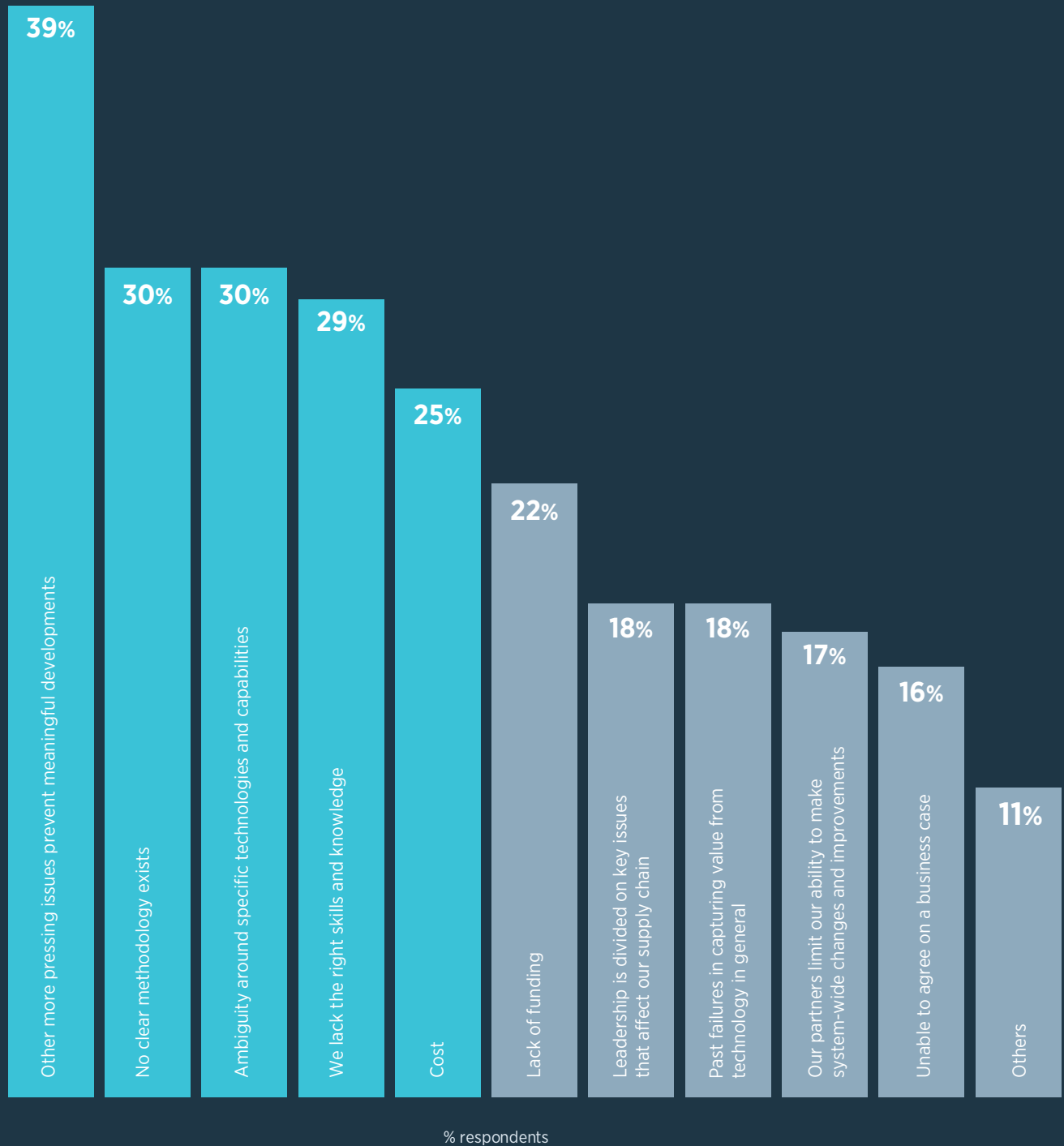
The absence of a clear methodology is a key barrier too. In the past, a relatively simple route to building new capabilities existed:

- invest in key technology from established vendors
- integrate with existing systems using traditional deployment methods
- develop, tailor and optimise over time.

Now, change is happening so fast, there's no longer a clear route forward. One in three organisations say this lack of a methodology, and the ambiguity around technologies, is holding them back from deploying and scaling their smart supply chain. Proven and familiar delivery approaches, built around key milestones, can be costly and slow. Although familiar, they often miss the mark with employees and customers.

Alternative methodologies, such as Agile and Design Thinking, are becoming well established across many sectors and can deliver and embed technology change faster and more efficiently. On paper, they can appear daunting and disorientating – at least at the start. As organisations respond to the challenge of running such processes across multiple functions, they require a major shift in the way the organisation thinks and delivers – but once harnessed they return tangible benefits.

Figure 9: Which factors are limiting your ability to capture smart supply chain value?

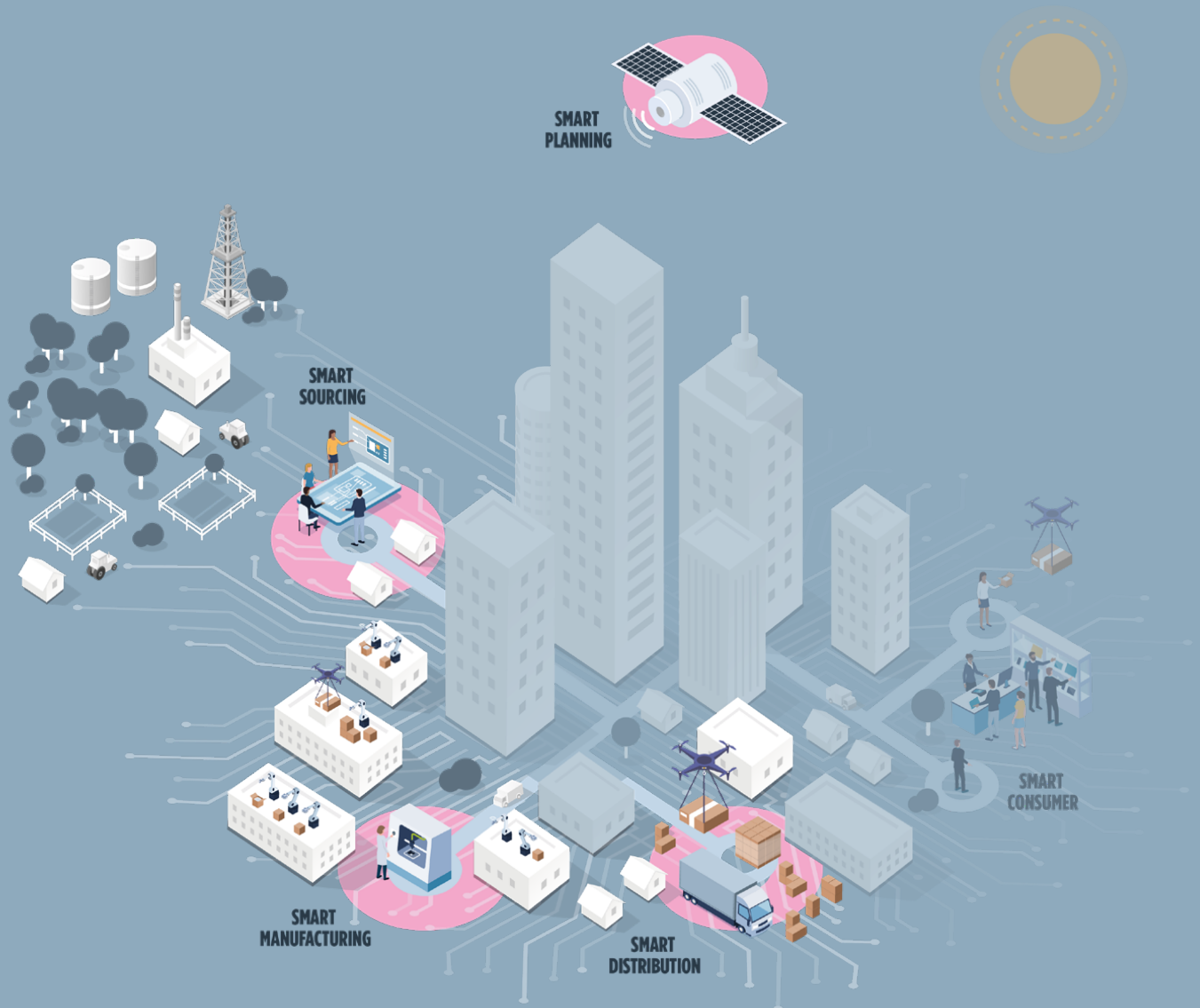


POWER YOUR POTENTIAL: IDENTIFY YOUR ARCHETYPE

Opportunities await those who choose to make the move to a smart supply chain. And we believe these opportunities are currently underestimated. Too many leaders go straight from appetite to action. We advocate an **appetite > archetype > action** approach in order to set the ambition and align a common direction forward.

Those able to identify the right course of action for their organisation, based on our archetypes, will position themselves to unlock wider business transformation and greater value opportunities. It's time to identify your archetype:

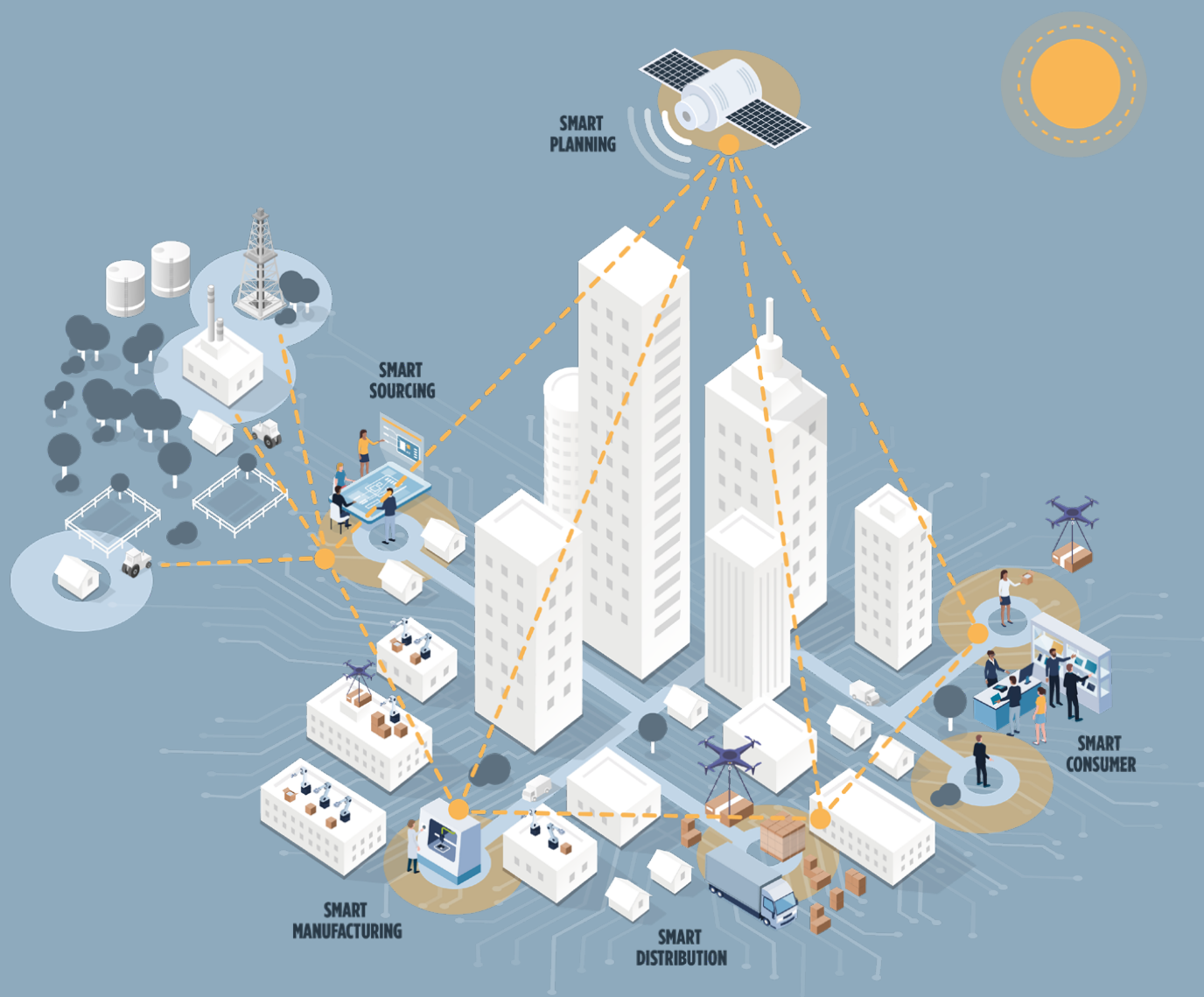




Performance-led

24% of respondents aspire to this archetype.

For many organisations this is the starting point for digitising your current supply chain. This is where you can achieve benefits through cost reduction, quality and performance improvement, and around unlocking capacity for growth. Organisations will typically apply point solutions around existing technologies and legacy systems.

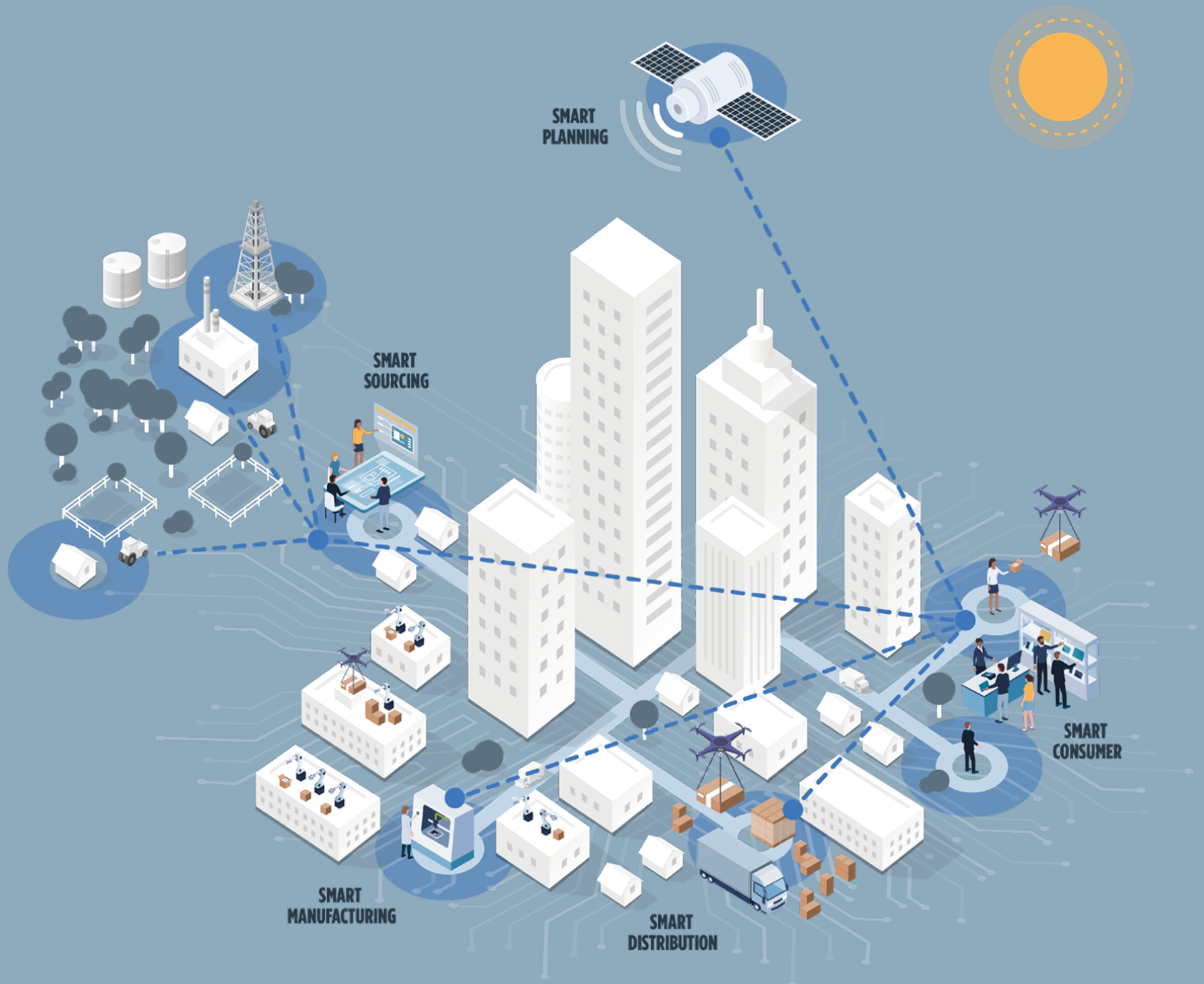


Connectivity-led



11% of respondents aspire to this archetype.

Where organisations look to link their digital capabilities across the supply chain. This is where you drive transformation through end-to-end supply chain integration, leveraging those point solutions, utilising data and analytics across the value chain and embedding digital in your vision and strategy.



Agility-led



11% of respondents aspire to this archetype.

For those looking to maximise their ability to compete effectively in fast-changing markets. Digital becomes part of your organisation's DNA and the customer sits at the heart of a fully integrated enterprise with the smart supply chain at its core. An embedded culture of innovation and built-in responsiveness allows for true agility.

51%* are either looking to transition through these archetypes or are picking and choosing elements from all three.

*3% of respondents did not select an archetype

From archetype to action

We often find that leaders and organisations relate to more than one archetype. Some of their functions operate with a performance-led focus while others transition to a more connectivity or agility-led approach. Over half of our supply chain respondents (51 per cent) told us they're either looking to transition through these three archetypes or are picking and choosing elements from each of them to apply to distinct parts of their organisation. The trick is identifying what's right for you and where you want to be, unifying the ambition and then identifying the appropriate actions to take.

Smaller, newer organisations, such as start-ups, will be able to progress quickly to an agility-led approach. Others will feel comfortable sticking with a performance-led approach for now. This is currently the case for 24 per cent of supply chain leaders. With quick wins ready and waiting, this will be the right place for many organisations. But you could miss out on added benefits by not exploring aspects of connectivity-led and agility-led approaches. Worryingly, three per cent of leaders are unable to identify with any of these approaches.

More commonly, organisations with legacy structures will see this as an evolving journey. Initial success with performance-led initiatives brings clarity around the potential, and you can then look towards moving to a connected-led level before aspiring to become the agility-led archetype. This type of model gives your transformation clarity and direction – helping to bring the wider organisation with you on the journey. It also addresses short-term pressures, building foundations while keeping an eye on long-term value. Then, as understanding and confidence builds, your vision expands beyond an internal view to include the customer. Along the way, you're engaging leaders, building key skills and fostering the right culture.

Over half of our supply chain respondents told us they're either looking to transition through these archetypes or are picking and choosing elements from each of them.

Making the transition demands change across every aspect of your organisation – in vision, in understanding, in ways of working and in mindset. The challenge is substantial. From our experience of helping others through this journey, we've developed the following key actions for success:

- **build your smart supply chain vision**
to suit your purpose and ambition, with the ultimate aim of creating a responsive smart supply chain
- **understand the total value opportunity**
by taking a long-term view of the wider supply chain
- **accelerate technology adoption**
by scanning, assessing, piloting and scaling available options and linking their use to value outcomes
- **catalyse the business to execute**
developing your processes and people with a relentless focus on efficiency, agility and exceptional service.

Rentokil

Becoming a more data-driven business using the internet of things

Everyone wants foods and medicines to be manufactured and stored in clean, hygienic premises. Rentokil's pest control services allow businesses in these sectors to maintain those conditions, meeting strict safety standards and – ultimately – to trade.

The company had already spotted the potential of the IoT to improve its services. At 1,000 customer sites, it was using traps fitted with sensors that sent a message whenever the trap needed clearing or maintenance. As a result, Rentokil has the ability to monitor a customer's location 24/7 and have real-time updates on any infestation. This enables Rentokil to provide a more pro-active pest management service based on customer needs.

Rentokil wanted to expand the connected business to 10,000 sites within less than a year – but its infrastructure was already struggling with the volume of data the sensors were generating. The company asked our digital and IoT experts to create a cloud platform to support the expansion.

Time was of the essence so, working with our partner, Google, we chose an Agile approach to develop the platform quickly. With six bursts of activity ('sprints') we made rapid progress and showed early on how the solution would deliver value. We launched the new platform successfully in 12 countries. The new platform gives Rentokil the capacity to meet its immediate expansion target and offers effectively unlimited scalability for the future. This will become key as the company takes advantage of its data to build stronger relationships with customers, increase the flexibility, responsiveness and profitability of its operations and become a truly digital business.

Build your smart supply chain vision

Reconfiguring the supply chain to capitalise on digital opportunities brings radical and disruptive change. It affects a significant number of people and involves complex connections and processes across the supply chain. To embark on this change without a clear destination risks confusion, inefficiency and resistance – resulting in higher costs and worse outcomes.

A clear vision paints a picture of the future that helps everyone understand where they fit. As a result, initiatives and new capabilities are more easily aligned, creating a whole greater than the sum of its parts.

As you define your vision and prepare for the subsequent recommendations, you'll need to:

Develop a performance-led vision

A performance-led vision focuses on driving cost reductions and quality improvements, and increasing capacity for growth. This is an inward-looking view with the aim of optimising the organisation's current system to realise performance goals.

Here, individual supply chain functions drive to deliver on their own visions, and typically apply point solutions to target known metrics, issues and inefficiencies. Cross-functional initiatives and capabilities are not yet aligned.

This type of vision works well for those looking to quickly start their smart supply chain journey. With discrete, focused solutions, it's relatively easy to demonstrate value, build momentum and start familiarising people in building and driving change.

Progress to a connectivity-led vision

Here, the focus of the organisation starts to turn outwards. It aims to understand how joining up digital capabilities across the end-to-end supply chain can help serve customers better and even develop new revenue streams from connected products and services.

A clear vision paints a picture of the future that helps everyone understand where they fit.

Organisations will use demand-sensing capability to improve forecast accuracy for reductions in inventory. Operations are synchronised to ensure the products customers want are available on demand. Meanwhile, integrating systems and data with suppliers helps to visualise the supply chain. This improves governance and decision-making, enhances delivery performance and helps mitigate risk.

Reach for an agility-led vision

An agility-led vision enables the organisation to adapt in response to customers' evolving demands. This model is most commonly emerging in start-ups that are unconstrained by legacy systems or the scale of established operations. But larger organisations increasingly appreciate that this is where their future lies. To succeed, they must be intent on becoming 'super disruptors' and commit to embedding digital into the DNA of the organisation.

Automation and artificial intelligence give organisations the capability to respond rapidly to customer demands, and to flex to changes in demand using agile, modular manufacturing lines that are easy to adapt. Looking at reinventing how your production lines manufacture, for example, can enable the production of personalised products without a disproportionate leap in the cost of goods.

Veolia Water Technologies

Securing further success by seizing the opportunities in the digital world

Veolia Water Technologies (VWT) is a global company specialising in water treatment solutions. It provides the complete range of services needed to design, build, maintain and upgrade treatment facilities for industrial, commercial and municipal customers. VWT were looking for new ways to deliver more value to their customers using digital solutions and innovative business models.

They asked us to help them develop and test digital services that would appeal to their customers. Our expert team brought a strong customer perspective, combined with detailed knowledge both of the water market and digital strategy and technology. We combined our insight with the expertise of VWT's team to create a long list of ideas.

We used our experience in the sector to identify their customers' current and future needs and the particular capabilities VWT would need to offer attractive new digital services.

This work informed a review and analysis of the long list. VWT tested two preferred options with customers – who liked both. One offers new ways to access Veolia's engineering capability and this allows operators to manage equipment more efficiently. The other uses advanced data science and analytics to help customers make more effective use of data to optimise water treatment processes.

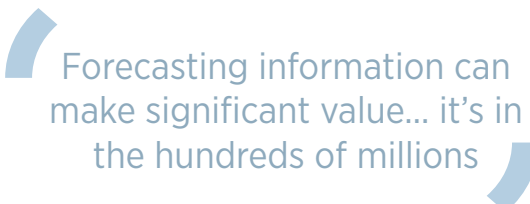
We helped VWT pilot these services, getting valuable customer feedback. Having learned how to make the services most effective, they're now offering them to more customers. Using our think big, start small and scale fast strategy, VWT now understands how to profit from the power of digital, and the skills they'll need. They're moving from just selling products to selling services, with the agility and capability to succeed in a fast-changing digital world.

Understand the total value opportunity

The smart supply chain and its capacity to deliver both short-term benefits and long-term value is a board-level agenda for most organisations. But many struggle to put a figure on how much value digital can unlock.

Quantifying the potential value is difficult for several reasons: new technologies are often unproven, value could be returned across a broad range of functions, and soft benefits such as customer satisfaction are tricky to quantify. One respondent told us: “That connectivity of digital information that tells us how long a product’s going to last, what needs replacing, what parts [are needed], is critical. The accuracy of that forecasting information can make significant value... it’s in the hundreds of millions.”

Some cases become more complex as they require a mix of technologies. A predictive maintenance capability for process equipment, for example, requires sensor technology, a data platform and mobile connectivity. Much of this cost is beyond the core equipment hardware and lies in data platforms and systems that can later be leveraged to develop use cases across the enterprise. When making your case, it’s about taking a wider view of value beyond the anticipated returns from this single instance.



Forecasting information can make significant value... it’s in the hundreds of millions

Leaders must also look beyond conventional assessment and business case models that often seek a return within two to five years. Digital investments will deliver value years into the future.

To generate value at speed, it’s vital leaders embrace the ‘think big, start small, scale fast’ approach – using pilots and minimum viable products to demonstrate potential, gain feedback, celebrate success and win buy-in. Results from such an approach can inform business cases that are refined and improved as you go.

Actions by archetype:

Performance-led

Manage upwards, gaining support from the strategic parts of the business by ensuring your business case aligns to the overall strategic aims of the business. Does the Chief Operating Officer have visibility of your aspirations and activities?

Build an internal network of subject matter experts across plants, functions and geographies to explore best practice and cross-pollination of ideas and leverage internal capabilities.

Look outwards and speak to established suppliers you already work with, incorporating their experience into a compelling value case.

Connectivity-led

Focus on how to effectively measure end-to-end value through all supply chain functions – alignment with all relevant groups to gain insights and consensus.

Be bold – it can be difficult to demonstrate value from all investments, but these should be seen as building blocks to future development.

Expand your focus to include broader value drivers – such as skills, capabilities, core process improvements and organisational changes – in your business case. Although these aren't typically included, they will underpin the supply chain transformation.

Agility-led

Use data from across the enterprise to create value, closely collaborating with wider functions to create responsive quick-wins for customers.

Connect with wider stakeholders, from academia through to start-ups and tech giants, to co-create new ideas and solutions.

Make the case for sophisticated modelling and simulation techniques, such as digital twins, to outline potential value cases without the need for physical changes to your supply chain.

Accelerate technology adoption

Faced with an array of new technologies and systems, organisations often struggle to work out which best address their business challenges and how to go about applying them. One comment from a consumer goods sector respondent is typical of what we hear from our clients: “[We’re] missing clarity about which are the right technologies for us (must-haves vs nice-to-have vs obsolete).” When selecting technologies, the starting point should be based on the capabilities the organisation requires to realise its vision.

The process of scanning and assessing solutions takes place in a rapidly developing technology landscape. Those that are most successful are constantly scanning and piloting at different horizons – both emerging technologies and more industrialised solutions. Having this perspective helps you choose which technologies to back and provides assurance around how they’ll evolve and support your organisation’s digital journey.

In addition to in-house development teams or innovation labs refining solutions, technology partners can provide faster access to the required solutions. This type of collaboration creates a virtuous circle where all parties benefit from accelerated development and the ingenious ideas sparked by a diverse range of views.

Those that are most successful are constantly scanning and piloting at different horizons – both emerging technologies and more industrialised solutions.

Prototypes and pilots help you understand whether new solutions can be applied successfully and how much value they can drive. Even failed prototypes or a negative outcome can be just as instructive as a successful pilot or positive results. These activities are about learning quickly and failing fast, with a view to correcting course to result in the best route forward.

Organisations often fail at the scale stage. This could be down to resource constraints, as the development team becomes the deployment team, or because scale becomes a design consideration too late in the process. Regional centres of excellence can help create larger deployment teams and provide the supporting processes and governance required to rapidly deploy technology across the enterprise – delivering the maximum value potential.

Actions by archetype:

Performance-led

Assess both emerging and mature solutions – prioritising those that deliver quick wins and prove worth to the business.

Start small and test the technology as a pilot, then update the business case and gain support.

Design with scale in mind – create the blueprint, identify broader use cases and deploy at speed.

Connectivity-led

Co-locate key stakeholders and subject matter experts to collaboratively identify and develop technologies and systems.

Scale technology across the business by identifying new use cases based on supply chain processes and capabilities.

Upskill your people so they can adopt an agile approach to deploy multiple use cases – building communities of expertise internally and giving them the tools to interact and learn.

Agility-led

Adopt a start-up mindset and create the space for multi-function teams to shape innovative solutions away from the confines of business as usual.

Break away from your legacy supply chain by re-inventing traditional processes, assets and products.

Become the conduit/engine for wider transformation by collaborating with broader business functions, such as R&D and sales, to co-develop new products and inform the wider business design.

European city transport operator

Using big data analytics to predict maintenance requirements

Public transport operators run a significant maintenance operation to keep buses, metro trains and trams running safely and reliably. Carrying out planned maintenance to prevent problems is far more cost-effective than waiting for an incident that requires urgent, unscheduled work. A European city transport organisation wanted to know if they could use big data analytics to predict maintenance requirements for trams more accurately. We helped them find out.

For a pilot project focused on tram brake incidents, we brought together data from a range of sources: logs on engine condition, speed and time logs on how trams were being driven, and data on the state of the rail network. Then we built a model to identify patterns in the data that occur prior to a brake incident. We also trained the tool to get better at doing this the more data we added.

The results were astonishing. The tool correctly predicted 67 per cent of brake incidents, outperforming the industry standard by a factor of ten. Our analysis showed that by targeting preventive maintenance more accurately and reducing the need for emergency repairs, the transport organisation could create substantial savings.

With our help, they are now exploring opportunities across their operations. Together, for example, we are looking at using data on traffic flow and passenger numbers to predict more accurately when trams will arrive at stations.

Our pilot proved the potential of big data analytics to help the organisation address practical operational challenges and achieve real financial benefits. The eventual impact in terms of cost reductions and service improvements could be enormous.

Catalyse the business to execute

Digitalisation needs to be pervasive and built from the ground up, not re-engineered into legacy systems

The increase of data and connectivity has blurred functional boundaries and created new dependencies between areas such as product development, supply chain and operations, IT and customer-facing functions.

But deploying new digital technologies and solutions with old processes, legacy systems and operating structures is a major inhibitor to successful smart supply chain adoption. As one life sciences leader told us: “Ad-hoc digitalisation does not release the full value. Digitalisation needs to be pervasive and built from the ground up, not re-engineered into legacy systems.”

In the future, multi-disciplinary, distributed teams will come together on an array of jobs – focusing on outcomes rather than traditional job descriptions. These open ways of working call for new styles of leadership and culture, and a shift in values, behaviours and mindset. Old processes built around legacy technologies will need to be refreshed or redesigned to enable novel approaches across the supply chain.

Innovation labs or centres of excellence will give teams the time, environment and space to scan, assess, pilot and scale new technologies. Bringing together specialists into teams helps them to innovate at speed without the restrictions of business as usual. A focused and properly funded centre of excellence can help pull in new digital talent, foster those new skill sets and develop a culture of innovation. These aspects turn you into a destination employer where talent seeks to join you.

An alternative is to select a pilot site, concentrating skills and resources in one location to accelerate learning. Here, new solutions can be applied and appraised in a real-world setting, and the impact of unsuccessful experiments can be contained. It's the best place to de-bug new solutions before rolling out best practice across the wider network. Pilot sites are particularly good for performance-led initiatives and can help identify the skills needed and training requirements to roll smart supply chain initiatives out across their organisations.

Leaders must ensure they're involved at every stage of the transformation. Engage with users to make sure they see value in your proposed approach and dispel any fears around this major change. This will make it faster and easier to roll out new ways of working.

Actions by archetype:

Performance-led

Enhance your short-term smart supply chain capabilities with external support, ensuring speed of delivery and identifying which skills you need to build your organisation for the future.

Prove and move – share success stories to demystify and generate demand for new solutions.

Bring supply chain process owners and users into the development journey – gain their acceptance and confidence to evolve business processes.

Connectivity-led

Take a macro view of wider structures and ways of working, addressing replication and inefficiencies to improve performance as a whole.

Build new capabilities and skills to match new structures – for example, equipping people to develop supply chain insights and solutions from data outputs rather than spending their time creating manual management reports.

Take ownership of the broader, end-to-end supply chain performance – as a leader, your role is key to achieving the full potential of smart supply chain transformation.

Agility-led

Re-design new processes and structures from the customer backwards.

Instil flexible, focused, non-hierarchical structures that enable teams to work with entrepreneurial freedom – focusing on outcomes rather than job roles.

Create a roadmap for how to connect the workforce to new technologies, demonstrating how they can shape more interesting roles, provide more freedom and unleash their ingenuity.²

Leonardo Helicopters

Getting ready to win new business by setting a course for transformation

Leonardo Helicopters in the UK design and build some of the world's most advanced military and search & rescue helicopters. They're looking to develop their business in established and emerging markets. And that means getting everything from engineering and supply chain to costs and procurement into the best possible shape.

To prepare for a two-year transformation programme, we've helped the UK business be clear about what they want to achieve, and how.

We started by running focus groups with people from all parts of the business. We asked them how they felt about it, where they thought it could go and what it would take to get there.

Using the results, we helped the leadership team come together around a vision for the transformation. It's called #OurChangeOurFuture and based on Leonardo being the business that customers choose to work with and employees choose to work for. And that means building a culture that looks for continuous improvement, focuses on customers and celebrates success, with everyone taking responsibility for delivering on commitments.

We also helped the leadership team set a great example by working and behaving differently, for instance in how they overcome obstacles to success.

The work led to a launch event for around 80 senior people. That gave them the chance to hear about the #OurChangeOurFuture programme and also discuss their role in making it happen. The day left Leonardo's UK staff equipped to run such events with their own teams – and within around a month, 600 people had already participated in similar sessions as part of a business wide engagement programme. The work has laid the foundations for Leonardo to achieve its ambitions for the future.

INSPIRE CHANGE THROUGH THE SMART SUPPLY CHAIN

For many leaders, changing a supply chain you've built and developed over decades can seem like an insurmountable task. The scale of the challenge and the relentless pace of change can leave you exhausted or immobilised by inertia.

At PA, we believe the opportunity lies in acting with optimism. And this optimism can inspire new ideas and possibilities, be it business transformation or wider societal change. Fifty years ago, man first stepped on the moon. The vision and ambition of John F. Kennedy (JFK), brought to life by a diverse team of experts, propelled us – and our imaginations – to new frontiers. That is the power of optimism when coupled with a vision.

Bring technology and people together

Advanced technologies alone can't provide you with a smart supply chain. Your people will make or break your transformation. Building the smart supply chain means asking the workforce to let go of legacy ways of working and leave behind traditional practices and attitudes. This will not happen overnight. People will need support at every stage, from early pilots and initial deployment right through to scaling across the enterprise.

Without engagement and commitment, the journey will be hard and slow. People will block innovation and resist change. And ultimately the organisation may never achieve its vision. To avoid this fate and realise the potential of technology investments, leaders should:

Create opportunities for people to come together.

As traditional functional silos start to break down, teams become increasingly multi-disciplinary and come together to collaborate and share ideas both physically or virtually. And people don't have to be specialists to make a valid contribution. At PA, we believe ingenuity sparks when diverse views, different experiences and unique perspectives converge. Diversity is a growth ingredient.

Build confidence and positivity. People need time to get comfortable with new solutions. And they need to be trusted to run with change, with support available when needed. An old-school command and control style of leadership will fall flat. Leaders must empower employees, reward initiative and make it clear it's okay if ideas fail – as long as lessons are learned.

Adopt new ways of working, create a shift in values and behaviours and foster a growth mindset. New technologies change what's expected of people at work. They free people up to apply their ingenuity to the organisation's stickier challenges, and to imagine and identify brand-new opportunities.

These shifts will create a workplace that is energising and exciting. Those who appreciate that the 'soft stuff' is the hard stuff and commit to making the change successful will create an inspiring environment; one where they can develop their skills and flex their intellects in a workplace where innovation and ingenuity are prized.

Those who appreciate that the 'soft stuff' is the hard stuff and commit to making the change successful will create an inspiring environment.

Ignite ingenuity and catalyse change

We all have a responsibility to take these opportunities and inspire those around us. It's time to capture that belief in a brighter future and have your own JFK moment.

The opportunities are too considerable to ignore. Every leader should embrace the opportunities presented by the smart supply chain. To power the possible in your organisation, you need to:

- **identify your archetype** and decide whether you'll stay there or evolve across all three to open up the full value opportunities
- use your archetype to **build your smart supply chain vision** to suit your purpose and ambition
- **understand the total value opportunity** by looking to the long-term view of the wider supply chain
- **accelerate technology adoption** by scanning, assessing, piloting and scaling your options and linking their use to value outcomes
- **develop your organisational design** to maximise efficiency and enhance agility.

By shaping your smart supply chain around our three archetypes and following our building blocks for success, you'll unlock greater value across your end-to-end supply chain. In doing so, you'll inspire and motivate your people, create better customer connections and power wider organisational transformation.

AUTHORS



GEORGE MARINÓS

Smart supply chain expert

George leads PA's smart supply chain proposition, working with organisations to develop and execute their digital strategies and ensure they make the right technology decisions. George is an expert at building a strong case for change and delivering transformative change.



MARTIN SOWDEN

Smart supply chain expert

As one of PA's lead consultants on the topic of smart supply chain, Martin supports organisations in practically driving the digitalisation of their supply chain and manufacturing operations. Martin focuses on building new capabilities that deliver sustainable value and support transformational digital strategies.



RUAN JONES

Consumer expert

As a partner in PA's Global Innovation and Technology Centre, Ruan has extensive experience in helping clients develop and grow their manufacturing capabilities, and in embedding new technologies and processes that will deliver sustainable value into the future. Ruan's focus is on balancing technology with commercial growth ambitions.



TIM LAWRENCE

Manufacturing expert

As head of PA's manufacturing sector, Tim is leading the transformation of aerospace, industrial and automotive clients through implementation of digital and Industry 4.0 in operations and supply chain. He focuses on delivering smart supply chains from strategy through to implementation.

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ABOUT OUR RESEARCH

Over 100 global supply chain leaders responded to our Smart Supply Chain and Operations survey, conducted throughout Q2 and Q3 2019 in partnership with the University of Nottingham.



**University of
Nottingham**
UK | CHINA | MALAYSIA

This research was conducted in partnership with the Institute for Advanced Manufacturing, University of Nottingham (Prof. Svetan Ratchev) and Nottingham University Business School (Dr. Harsh Dadhich and Prof. Kulwant S. Pawar).

Their input built a picture of the progress they're making in transforming their supply chains. Over 70 per cent of respondents were business leaders or senior managers. They represent companies that are mostly global in scale, with significant UK operations. The companies operate in sectors including life sciences, industrial, manufacturing and automotive, consumer goods, and aerospace and defence. They work mostly in end-to-end supply chain, manufacturing, sourcing and procurement, supply chain planning, warehousing and logistics.

Endnotes

¹ *Transforming for tomorrow: preparing incumbents for digital disruption*, PA, September 2019

² *People and machines: from hype to reality*, PA, June 2019





About PA.

We believe in the power of ingenuity to build a positive human future in a technology-driven world.

As strategies, technologies and innovation collide, we create opportunity from complexity. Our diverse teams of experts combine innovative thinking and breakthrough technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

An innovation and transformation consultancy, we are over 2,800 specialists in consumer, defence and security, energy and utilities, financial services, government, healthcare, life sciences, manufacturing, and transport, travel and logistics. We operate globally from offices across the Americas, Europe, the Nordics and the Gulf.

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