



**Business  
Services**



**Thought Leadership Report**

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# Real-time intelligence and the future of supply chains

How the need for resilience is accelerating AI-enabled manufacturing, transport and logistics ecosystems.



A Financial Times Company

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**The global supply chain model shifted in 2020: the pandemic brought new risks into focus and accelerated fresh approaches to digital resilience, cost control and sustainability.**

**This report explores the state of these trends and looks at why real-time data is critical to the supply chain model of the future.**





# Introduction

The science of “supply chain management” was born in the wake of World War I. Business schools and governments refined and popularized systems that military leaders had devised to overcome the challenge of keeping frontline troops stocked with food, ammunition and provisions.<sup>1</sup> A hundred years later, should we expect a similar leap forward as a result of the pandemic – the most significant global crisis in a generation?

We commissioned this research to find out. We also wanted to explore the ways in which multinationals are accelerating their digitalization, artificial intelligence (AI) and data analytics programs to solve urgent supply chain challenges. The research includes a survey of 320 senior executives (CXOs, C-1s and C-2s) at multinationals headquartered in 18 countries, and six in-depth interviews with supply chain leaders.

For the vast majority of people we surveyed (75%), the pandemic has been the biggest business challenge of their careers. Throughout most of 2020, firms have been dealing with the immediate impact of the crisis. As we move into 2021, business leaders are enhancing their scenario planning to mitigate a broader set of risks, while driving innovation and improving ecosystem collaboration.

<sup>1</sup> <https://graphics.wsj.com/100-legacies-from-world-war-1/trains>

In **Part 1** of this report, we examine the **impacts of the Covid-19 pandemic**. How did organizations respond? How has it impacted business performance? And how will it shape future decisions?

In **Part 2**, we explore how **risk mitigation, cost control, sustainability and digital resilience** are converging and reshaping supply chains. Our interviewees highlight the need for real-time data insights that can be shared between ecosystem partners to support better end-to-end supply chain visibility.

Enterprises are under pressure to adapt to fast-changing customer needs, competitive challenges and sustainability goals. So, in **Part 3**, we outline the progress firms are making in deploying digital solutions to address these challenges and act on real-time data insights. We also explore how **AI-enabled supply chain planning and execution systems** can support these priorities.





# Part 1 | The biggest challenge





**Wars and pandemics are dissimilar, of course, but both can focus leaders on finding inventive solutions to urgent problems. Companies find a way to overcome inertia and internal politics to solve previously intractable problems.**

One example of this is Bring, the corporate market brand of Posten Norge, Norway's national postal service. It quickly realized it needed to eliminate any form of potential virus-spreading contact between its drivers and consumers when making deliveries, so it developed an application that sends a text message to the consumer at the time of delivery and enables them to use their own device to sign to confirm receipt.

A clever solution. But what is more remarkable is how quickly it was implemented to enhance Bring's "GLOW" e-logistics platform. "We sat at our leader's meeting in the morning and came up with this idea," says Jerker Dammbro, GLOW's Senior Vice President. "I talked to my developers at 10:30am. They accepted the challenge. By midnight it was in production, and we started using it the next day."

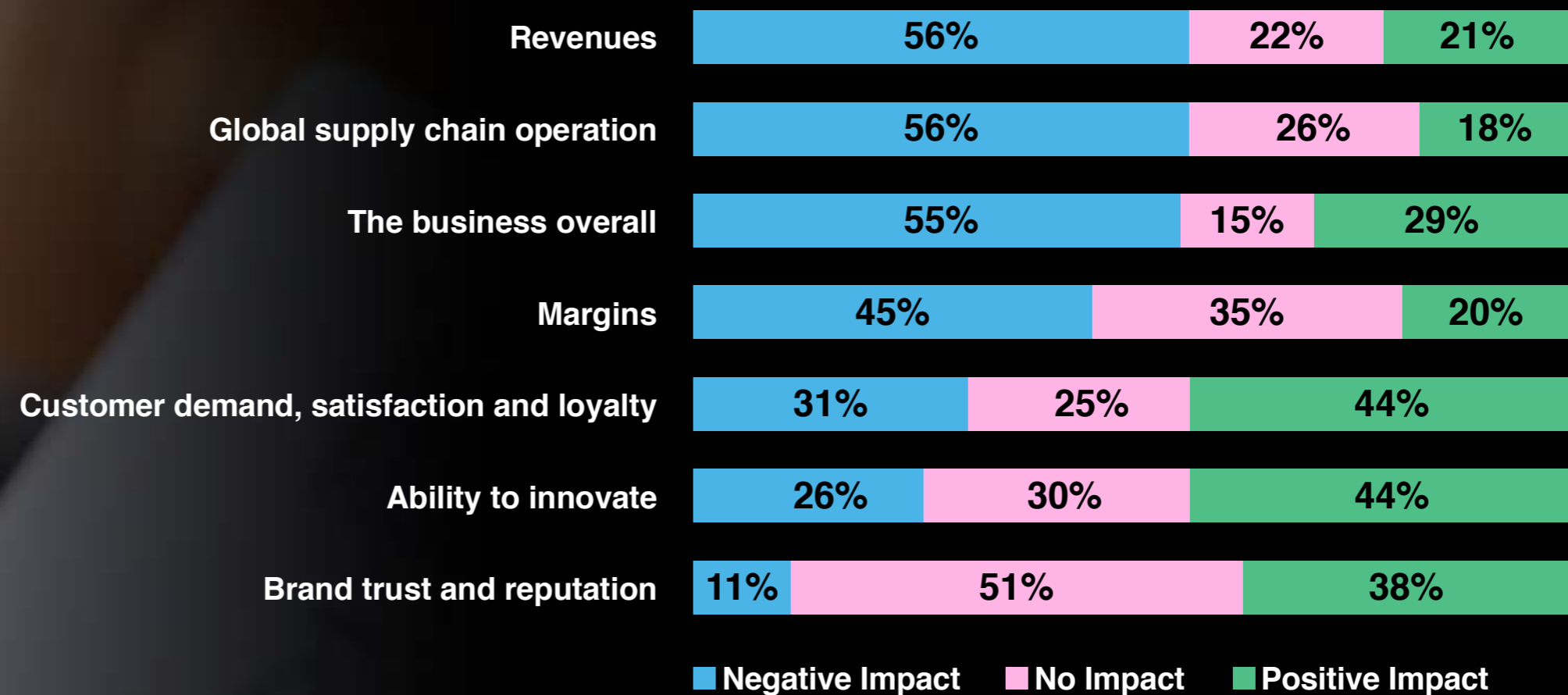
Many companies report similar experiences, and 74% of supply chain leaders in our survey have continued to innovate throughout the crisis. While 30% say the pandemic has not had any impact on their ability to innovate, 44% say that the crisis has had a positive impact. Only 26% say that their innovation efforts have been negatively impacted by the pandemic.

This is a trend that resonates with Heineken. "The pandemic has opened a lot of eyes," says Istvan Lencz, the brewer's Head of Global Logistics. "Things we thought were impossible have happened. Now, we don't say that anything is impossible. There are many questions we're asking that we have never asked before, relating to our planning and how we organize ourselves – things we thought were crazy questions, we don't discount them so fast. When it comes to future scenarios, we need to keep our minds open."





**What impact is the global pandemic having on the following areas of your business? Respondents rated each area.**



The past decade has been a difficult one for supply chains. Organizations have needed to adapt to several major changes, from increased digitalization to more sustainable operations, all while building ever greater efficiencies and coping with natural disasters, geopolitical change and an explosion of new market entrants.

## A new appreciation of risk

In the survey, turmoil in international relations (43%) and competitive pressure (37%) emerge as the second and third biggest risks to respondents' supply chains. But both are dwarfed by the proportion that selected the global pandemic (70%) as the chief risk they currently face.

The vast majority of respondents we questioned (83%) say they are more aware of supply chain risks than they were a year ago. As a sudden shock event, the pandemic follows on from the eruptions of the Eyjafjallajökull volcano in Iceland in 2010, the tsunami and floods in Japan and Thailand in 2011 and global NotPetya cyberattacks in 2017. Indeed, disruptions lasting a month or longer now happen every 3.7 years on average, according to McKinsey.<sup>2</sup> Each of these events interrupted supplies of raw materials, components and finished goods. In some cases, whole industries realized they were dependent on a single factory or country for vital supplies.

In research from Gartner, published in May 2020, just 21% of supply chain leaders say they have a "highly resilient" supply network.<sup>3</sup> And 39% of respondents to our survey say that their supply chain could not cope with the impact of the global pandemic, which implies a significant interruption, or total breakdown, at some point in 2020. About the same proportion (42%) say that they are over-reliant on a small number of suppliers.



<sup>2</sup> McKinsey, Risk, resilience and rebalancing in global value chains, August 2020 <https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains>

<sup>3</sup> Gartner, Weathering the Storm: Supply Chain Resilience in an Age of Disruption, May 2020 <https://www.gartner.com/en/supply-chain/trends/weathering-the-storm-supply-chain-resilience-in-an-age-of-disruption>



# The supply chain reaction

**“We are moving to a new equilibrium,” says Thierry Driesens, Digital Transformation Officer at DHL Supply Chain. “After all this disruption, will leaders be brave enough to move away from a model that has a single source or point of failure, even if it is the cheapest option? Will they try to be less dependent on low-cost manufacturing countries?”**

As Driesens points out, bringing manufacturing back to your local market reduces your logistics costs, but often increases your manufacturing costs. “We don’t yet know if shareholders and customers will accept a new equilibrium if it means lower margins, higher prices, or both,” he says.

What changes are the companies we surveyed making to reduce supply chain risks?

- Nearly two-thirds (64%) plan to transform their onshore, nearshore and offshore manufacturing mix
- About 90% are overhauling their procurement and risk management strategies, or are considering doing so within two years
- Over half (54%) are carefully assessing their extended supply chains, and a further 38% are considering doing so within two years

Firms face difficult decisions about where to source or produce goods. Many low-cost regions are no longer as attractive as they once were because of shifts in industrial policy, rising labor costs, trade wars and the risk of disruption from events such as pandemics or tsunamis.

As a result, companies are nearshoring and onshoring some manufacturing capabilities – particularly when it comes to products that are of strategic importance.

Pharmaceuticals are one example. “Sovereignty is important in the field of pharmaceuticals,” says Bernard Amoury, Vice President for Global Subcontracting at Sanofi. “So we are creating a new industry-leading European company to provide active pharmaceutical ingredients, and building new vaccine production centers in France.” This will provide Sanofi the flexibility and agility it needs to respond quickly to future pandemic risks.<sup>4</sup>

There is another shift that is also affecting supply chains. Emerging markets will buy up close to two-thirds of global manufactured goods by 2025, according to McKinsey, with much of this comprising of cars, building products and machinery.<sup>5</sup> Intra-regional trade is growing to meet this demand. China’s industrial policy is moving away from labor-intensive manufacturing, while frontier countries in Asia are picking up market share. Over the decade to 2017, China’s manufacturing share of GDP decreased from 34% to 30%, and Vietnam’s increased from 16% to 22%.<sup>6</sup>

<sup>4</sup> Sanofi invests to make France its world class center of excellence in vaccine research and production, June 2020 <https://www.sanofi.com/en/media-room/press-releases/2020/2020-06-16-12-00-00>

<sup>5</sup> McKinsey Global Institute, Globalization in transition: The future of trade and value chains, McKinsey & Company, 2019 <https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains>

<sup>6</sup> McKinsey Global Institute, The future of Asia: Asian flows and networks are defining the next phase of globalization, September 2020, <https://www.mckinsey.com/featured-insights/asia-pacific/the-future-of-asia-asian-flows-and-networks-are-defining-the-next-phase-of-globalization>





# Geodiversity + digitalization = flexibility

**In our survey, 83% of respondents say they need more speed and agility to cope with these kinds of changes. “People now truly understand the importance of flexibility – the value of flexibility,” says Heineken’s Istvan Lencz. “And that we need to build this into supply chains.”**

Many do that with geodiversity. Onshoring and nearshoring manufacturing enables firms to respond quickly to changing customer needs, while offshore factories allow them to produce goods for high-growth emerging markets.

Technology is assisting with this process. Firms are accelerating their digitalization programs with a focus on **smart factories** (see glossary) to produce a wider range of rapidly changing products in a cost-effective way. Schneider Electric, for example, has been able to increase operator efficiency by 25%, reduce the cost of maintenance by 30% and achieve energy savings of more than 30% by using the likes of predictive maintenance, the Internet of Things (IoT) and Autonomous Guided Vehicles (AGVs).<sup>7</sup> It is trialing advanced technologies run on a private 5G network at its 50-year old plant in Normandy, and also plans to build a state-of-the-art facility that will feature proven Industry 4.0 technologies.

**Smart asset tracking** (see glossary), is helping firms to deal with the challenges associated with sourcing goods from a wider range of offshore locations. And that is important. The World Bank’s Logistics Performance Index, which measures the logistics capabilities of the world’s major countries, includes “track and trace” as one of the six strength indicators that make a location attractive to source goods from.

This technology also supports better intralogistics – the movement of raw materials, components and tools across a site. “McConnell Dowell is a construction firm that delivers huge infrastructure projects in the APAC [Asia-Pacific] region,” says Frank de Jong, Senior Digital Business Consultant at Orange Business Services. “Just-in-time supplies are vital to deliver projects on budget and within deadline.

“We use IoT to track materials like concrete panels from the manufacturer through transport and installation,” he says. “Often, materials can’t be stored on space-constrained sites, so supply chain visibility is critical. Individual panels can be identified, which allows teams to avoid incorrect placement, reworking and project delays.”

**“ People now truly understand the importance of flexibility, the value of flexibility, and that we need to build this into supply chains.”**

Istvan Lencz, Heineken

<sup>7</sup> WEF, Fourth Industrial Revolution: Beacons of Technology and Innovation in Manufacturing, January 2019 [http://www3.weforum.org/docs/WEF\\_4IR\\_Beacons\\_of\\_Technology\\_and\\_Innovation\\_in\\_Manufacturing\\_report\\_2019.pdf](http://www3.weforum.org/docs/WEF_4IR_Beacons_of_Technology_and_Innovation_in_Manufacturing_report_2019.pdf)





# An ecosystem approach

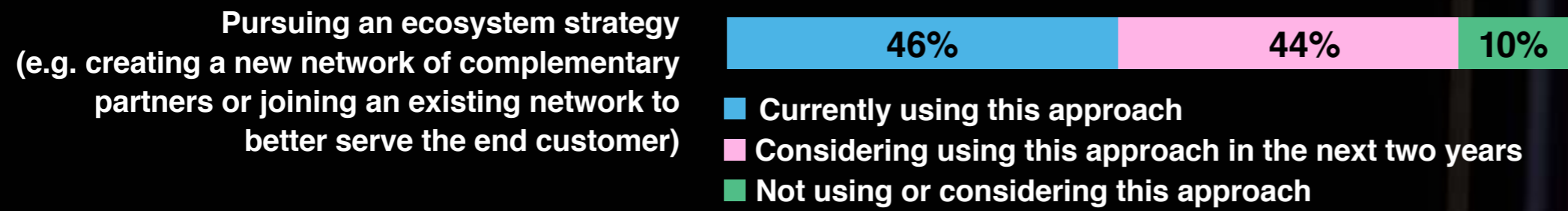
Logistics service providers have developed specialist supply chain services for construction companies. “Construction firms are switching their deliveries to a same-day service with GLOW – our e-logistics platform,” says Bring’s Jerker Dammbro.

“It’s very expensive to have a construction site at a standstill because you’re lacking the correct supplies. So it’s worth it for these customers to have it delivered the same day.”

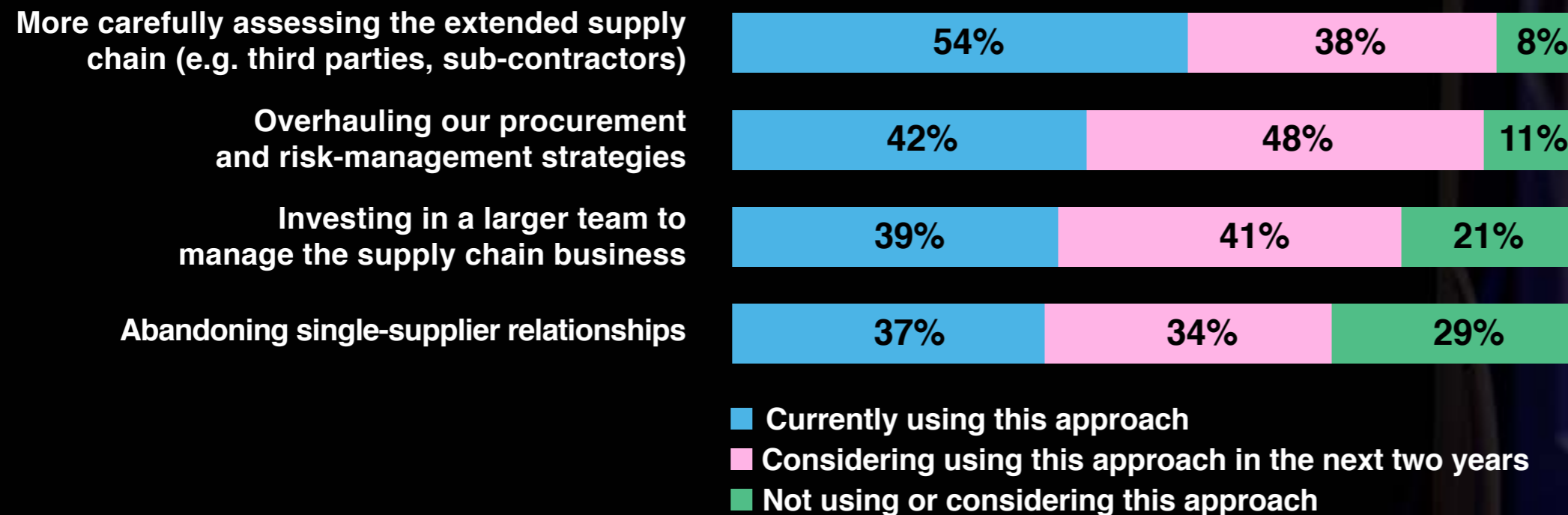
Bring’s closer partnership with its customers – including retailers and construction firms – underlines a key trend: business processes today are often outsourced to many specialist partners, including logistics service providers. There are significant opportunities to improve end-to-end supply chain experiences for the end consumer with integrated, secure and seamless managed services from third parties. And our respondents are recognizing this as a way to reduce risk: 90% say they are pursuing an ecosystem strategy or are considering doing so in the next two years.



## Of the following ways to reduce risk in your supply chain, which are you currently using, considering using in the next two years, or not using?



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# Part 2

## Real-time systems-level thinking





“Supply chain strategies require a total systems view of the links in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer.”

Professor Tony Hines, an expert in global business management

**Supply chains connect sources of production via distribution to consumption. Many diverse organizations are involved, including manufacturers, assemblers, warehouses, freight forwarders, airport and seaport terminals, shipping lines, government regulators, criminal investigators combatting illicit trade, distribution centers, logistics service providers and retailers.**

Every movement and handover between the links in this chain is a chance for something to go wrong, yet it all needs to happen at breakneck speed.

“Supply chain strategies require a total systems view of the links in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer,” said

Professor Tony Hines, an expert in global business management, in 2004.<sup>8</sup> Nearly two decades on, it is still a key challenge.

Take ports – a linchpin of global trade. “What we actually have at the port is a collection of capacities: the terminal capacity, tugboat capacity, crane capacity, storage capacity, road capacity and so on,” says Erwin Verstraelen, CDO and CIO at the Port of Antwerp. “Today, all of these pockets of capacity are optimized within their own scope. This is suboptimal. We’re going to evolve to a more of a system-level approach, powered by real-time data flows, where each step becomes part of the big equation. That’s where the huge potential is.”

<sup>8</sup> Hines, T. (2004). Supply chain strategies: Customer driven and customer focused. Oxford: Elsevier



**That kind of approach makes efficient collaboration between partners essential. But that is not always straightforward. Consider ports: 150,000 people work on the Port of Antwerp site – at firms such as BASF, Borealis and Covestro, or for the port authority itself. They operate across a 120km2 site – the equivalent of 22,424 football pitches – and in a typical year 15,000 ships and 60,000 barges visit the site.**

Without effective collaboration, inefficiencies can arise in the handovers between the transport modalities. Shipping containers and bulk commodities need to be transported by road, rail, pipeline or trans-shipped – moved from oceanic vessels onto smaller short-sea ships and river barges. Ships can be late, early or unexpected if they have to reroute due to bad weather. The tugboats and cranes tend to be operated by contractors, for example, so it is difficult to match supply and demand and ensure that all the machinery and equipment is fully operational all the time. To make matters worse, penalty fees are payable by the terminal operator or shipping firm – depending on who is liable – if a ship is not loaded or unloaded within an agreed timescale.

Up-to-the-minute data will make all the difference. “There is a need for real-time data

to start orchestrating entire supply chains,” says Verstraelen. “Today, everybody is using outdated information, and when problems occur, everybody is informed far too late.”

It is not just in global, or regional, logistics that real-time data has become increasingly essential. Without real-time visibility on the whole supply chain, accurate demand forecasting is challenging. “Almost all demand forecasting tools are still today very sequential,” says Sanofi’s Amoury. “One actor makes its own predictions based on information passed on by the previous one, then passes their own information up to the next player in the chain. Everyone uses sometimes outdated information. The more digitalized and transparent we could be, the more all the actors will improve their planning, based on real-time needs.”

# Collaboration meets real-time data

**“Today, everybody is using outdated information, and when problems occur, everybody is informed far too late.”**

Erwin Verstraelen, CDO and CIO at the Port of Antwerp



A woman with curly hair is shown in profile, looking at a large digital display in a server room. The display shows various data visualizations, including a map and charts. The woman is wearing a grey sweater and a red lanyard. The background is a server rack with many cables and lights.

# The power of real-time data

**These challenges highlight a need for a radical rethink about the role of data to drive more efficient supply chain ecosystems.**

“I graduated 25 years ago as a maritime economist,” says Verstraelen. “When I look at the entire maritime and supply chain industry today, it’s almost as if nothing has happened. The entire industry became globalized, but we’re still using technology from the last century – EDI [Electronic Data Interchange], for example. We’re not leveraging common data standards. There’s a huge opportunity for a technology overhaul.”

Real-time data can now be captured in cost-effective ways to power better workflows that extend across an ecosystem of business partners. However, just 45% of respondents to our survey say they are using real-time data insights to drive better decision-making today. That figure is likely to double over the next two years: 44% say they have plans to launch real-time data initiatives.

“There is a need to be able to collect real-time data at key moments and share insights with ecosystem partners and employees in frontline roles in ways that make sense for them,” says de Jong. “Physically producing and moving goods around the world is still very much a people business. At the same time, we’re seeing a growing need for AI-enabled supply chain planning and execution systems to take real-time data and turn it into insights and action. Either through automated systems or digital work instructions for employees in frontline roles.”



## Of the following ways to reduce risk in your supply chain, which are you currently using, considering using in the next two years, or not using?

Leveraging real-time data insights and AI to improve supply chain visibility and decision making (e.g. pricing, location of stock, quality control/assurance)



Increasing the level of automation to handle high volumes of demand (e.g. drones, robotic process automation, APIs for better workflows)



■ Currently using this approach

■ Considering using this approach in the next two years

■ Not using or considering this approach





# Sustainability sustained?

Real-time data has another benefit: it can improve environmental, social and governance performance indicators. Consumers increasingly want to buy goods and services from firms that do good for the planet – or at least do no harm. Capgemini recently found that a significant majority of consumers (79%) are changing their purchasing preferences based on sustainability.<sup>9</sup>

However, the pandemic has drawn attention away from sustainability issues for 65% of respondents to our survey; instead, they have “focused on keeping the lights on.” The good news is that this situation appears to be temporary: 78% of respondents say that sustainability has become a primary way to drive product or service innovation.

“Has the focus on sustainability disappeared because of Covid-19? No. For most companies, it has just been a little lower down in priority, but it is already coming back,” says DHL’s Thierry Driesens. “We’re still in the

middle of a crisis, but we now know how to manage it better. Now, companies are returning to sustainability initiatives, some are even accelerating them.”

Verstraelen at the Port of Antwerp explains why this is. “The pandemic will stop, somehow,” he says. “But climate change, sustainability – those trends and risks are here for the next few decades. For example, the European Green Deal is going to put more pressure on all stakeholders to identify the origins of emissions and minimize their environmental footprint. The supply chain is an important element of that.”

“We’re still in the middle of a crisis, but we now know how to manage it better.”

Thierry Driesens, DHL



<sup>9</sup> Capgemini Institute, How sustainability is fundamentally changing consumer preferences, August 2020 <https://www.capgemini.com/research/how-sustainability-is-fundamentally-changing-consumer-preferences>





# Sustainability as innovation enabler

**In 2020, revenues have suffered at just over half (56%) of firms surveyed and some 64% say they need to significantly reduce costs wherever possible.**

As we accelerate out of the crisis, digitalization and data collection have become a primary enablers of cost reduction, sustainability and innovation initiatives. In fact, 85% of survey respondents believe becoming more sustainable can help them save costs as well as help the planet. A further 78% say sustainability has become a primary way to drive product and service innovation, which is vital to their future competitiveness.

Around 80% are investing in digital technologies to become a more sustainable business. More specifically:

- 59% are using digitalization to manage and control sustainability factors (such as energy, fuel and water usage) and 38% are considering using this approach in the next two years.
- Half say their organizations are investing in new data-collection technologies to give better insights into key sustainability metrics, with another 44% considering using this approach in the next two years.

If businesses follow through on these ambitions, digitally driven sustainability management programs could be almost universal within two years.

“You can combine your digital journey and your sustainability journey because one contributes to the other,” says Driesens. “There’s no conflict there, and actually we see in many cases this leads to cost reduction as well.”

There are now examples where multiple priorities – digitalization, cost efficiency, sustainability and even safety – converge within a single initiative. For example, Heineken works with numerous small logistics providers worldwide, and many do not have any technology to monitor fuel consumption. So Heineken helps them to record data from the telematics systems present on most trucks, and works with them to harness the power of the data.

“If you get that data, you can work on driver behavior,” says Heineken’s Istvan Lencz. “You feed key data points back to the driver: indicating, hard acceleration, rapid breaking, and so forth. This has a big impact. The beauty of this is that the technology – or the data it generates – helps companies to reduce fuel consumption, which saves costs while also reducing emissions. Most importantly, it encourages safer driving.”



# Cost, carbon and customer co-benefits

Routing is another way in which data can bring cost, carbon and customer co-benefits. Alongside a start-up called Foxtrot, Orange Business Services has run a successful pilot using AI-enabled routing.

It dynamically schedules the route that drivers should take to reach multiple drop-off points, depending on real-time congestion levels and the promised delivery times. This enables the trucks to spend less time sitting in traffic and complete their rounds faster. Foxtrot's studies show that the technology is able to reduce driving distance by 16% and boost on-time deliveries to an average of 98%.<sup>10</sup> Meanwhile, businesses can use digital twins (see glossary) and blockchain to support

fair trade and traceability. Blockchain is a software technology that can be used to store and share data with a large network of participants in a secure and transparent way without a central authority; data cannot be modified once added.<sup>11,12</sup> It can enable consumers to trace the provenance of the ingredients that make up their products and ensure they come from sustainable sources, and helps brands to combat counterfeiting and fraud.<sup>13</sup>

<sup>10</sup> Orange Business Services, Climate change sustainability has become a business imperative, September 2020 <https://www.orange-business.com/en/magazine/climate-change-sustainability-has-become-business-imperative>

<sup>11</sup> Orange Business Services, Better by blockchain, August 2019 <https://www.orange-business.com/en/library/white-paper/better-blockchain>

<sup>12</sup> Orange Business Services, Blockchain can build a better supply chain, February 2018 <https://www.orange-business.com/en/blogs/blockchain-can-build-better-supply-chain>

<sup>13</sup> Orange Business Services, Enterprises built on principles: the rise of purpose-led business, February 2020 <https://www.orange-business.com/en/magazine/enterprises-built-principles-rise-purpose-led-business>



## Which approaches to becoming a more sustainable business is your organization currently using, considering using in the next two years, or not using?

Using digitalization to manage and control sustainability factors (e.g. energy, fuel or water usage)



Investing in new data-collection technologies to give us better insights into key sustainability metrics



■ Currently using this approach   ■ Considering using this approach in the next two years   ■ Not using or considering this approach





# Part 3

## AI-enabled insights and action



**“ For example, knowing the next mode of transport for every imported container would help a terminal increase turnaround efficiencies and its capacity significantly. ”**

Erwin Verstraelen, CDO and CIO at the Port of Antwerp

**Real-time data insights are now possible at scale. That is thanks to 5G, which can support data collection through mass IoT networks and computer vision, combined with edge and cloud computing architectures to enable rapid, AI-driven analytics using digital twins.**

Data from multiple digital twins can even be aggregated for a composite view across a number of real-world entities, such as a manufacturing plant, a port or even an end-to-end supply chain.<sup>14</sup>

“Greater visibility creates operational efficiencies, whether it is by doing more with less, optimizing the capacity you have, or creating higher value through innovation,” says Port of Antwerp’s Verstraelen. “Once

you have the basic data flows optimized, harmonized and made transparent and secure, then you can get enormous value – even from a single data field.

“For example, knowing the next mode of transport for every imported container would help a terminal increase turnaround efficiencies and its capacity significantly.” he says. “That is just from making a simple data field visible for one stakeholder.”

<sup>14</sup> <https://www.dhl.com/content/dam/dhl/global/core/documents/pdf/glo-core-digital-twins-in-logistics.pdf>



# AI-enabled planning

**Digital twins can support descriptive, predictive and prescriptive data analytics, enabled by AI and machine learning algorithms. Firms can move from analyzing past performance to answering questions about what is likely to happen next. The goal is to be able to anticipate what will happen, when it will happen and why.**

The Port of Antwerp, for instance, has created a 3D digital representation of the port called APICA (Antwerp Port Information and Control Assistant), which is fed with real-time data on shipping movements, weather conditions, air quality levels, water levels, personnel availability and the operation of bridges and locks – all enabled by IoT sensors, cameras and drones.<sup>15</sup> With this, users gain total situational awareness of port movements, and by adding historical data they can forecast what will happen in certain situations and better manage issues, such as harmful emissions from ships, in real time. Now, the port and its ecosystem partners



are trialing a 5G private network to increase data collection and efficiency. Our survey shows how organizations are prioritizing AI as one of the primary technologies for investment. It is the highest or second-highest area respondents will be investing in for sustainability, resilience and risk mitigation, and the closely related areas of data analytics infrastructure and automation also feature in the top three or four spots for each of these priorities.

“AI models are helping to optimize complex scenarios everywhere,” says Orange’s Frank de Jong. “We can model how disruption at one point will impact all corners of an organization and its supply chain. This enables us to optimize stock levels, identify where new suppliers are needed, forecast demand and automate intelligent responses so that decisions are effectively instant. There are so many applications right throughout supply chains – from simple robotic automation through to advanced deep learning systems.”

<sup>15</sup> <https://www.youtube.com/watch?v=kLLTNRPgLe8>



# AI-enabled execution

**Turning data into action involves automating tasks, based on AI insights, wherever possible. But it is equally important to empower employees with real-time AI-enabled data insights so that they can make the right decisions where manual interventions are necessary to add value.**

Just 42% of firms say they are reducing risk in their supply chain by increasing the level of automation they use to handle rapidly changing demand levels, but that figure is forecast to double over the next two years. Meanwhile 80% believe it is vital to empower employees and supply chain partners with data insights.

“We’re at a tipping point when it comes to advanced automation,” says de Jong. “There is now sufficient real-time data available from relatively low-cost IoT sensors, HD cameras and computer vision applications. In addition, AI and machine learning algorithms are now within reach of every organization via edge and cloud platforms, which means they can classify and analyze historic and real-time data and make predictions and recommendations. APIs between back-office systems can then execute those

requests with the option of AI-enabled chatbots to alert human supervisors.”

Hyperautomation is the new term for technologies like Robotic Process Automation in combination with IoT, AI, OCR (Optical Character Recognition), document processing, chatbots, APIs and blockchain.<sup>16</sup> For example, a bot enabled with IoT can check real-time inventory levels. Auxiliary AI systems can predict demand, based on historic trends, and ask the bot to initiate purchase orders (via APIs into the ERP system) when supply levels dip below required thresholds. The bot can even flag anomalous patterns with the relevant human manager. Beneath this interplay of human and digital strengths, blockchain can support robust governance by reliably tracking the provenance of goods to comply with ethical and sustainable sourcing initiatives.

<sup>16</sup> Gartner, Move Beyond RPA to Deliver Hyperautomation, December 2019  
<https://www.gartner.com/doc/3978174>







# A digital and human approach

**Not all processes can be automated: there will always be tasks where the human touch is vital.**

Augmenting these workers with digital work instructions via ruggedized tablets, smartphones or virtual or augmented reality devices in easy-to-consume formats is key. It enables people to be more productive, reducing fatigue and frustration.

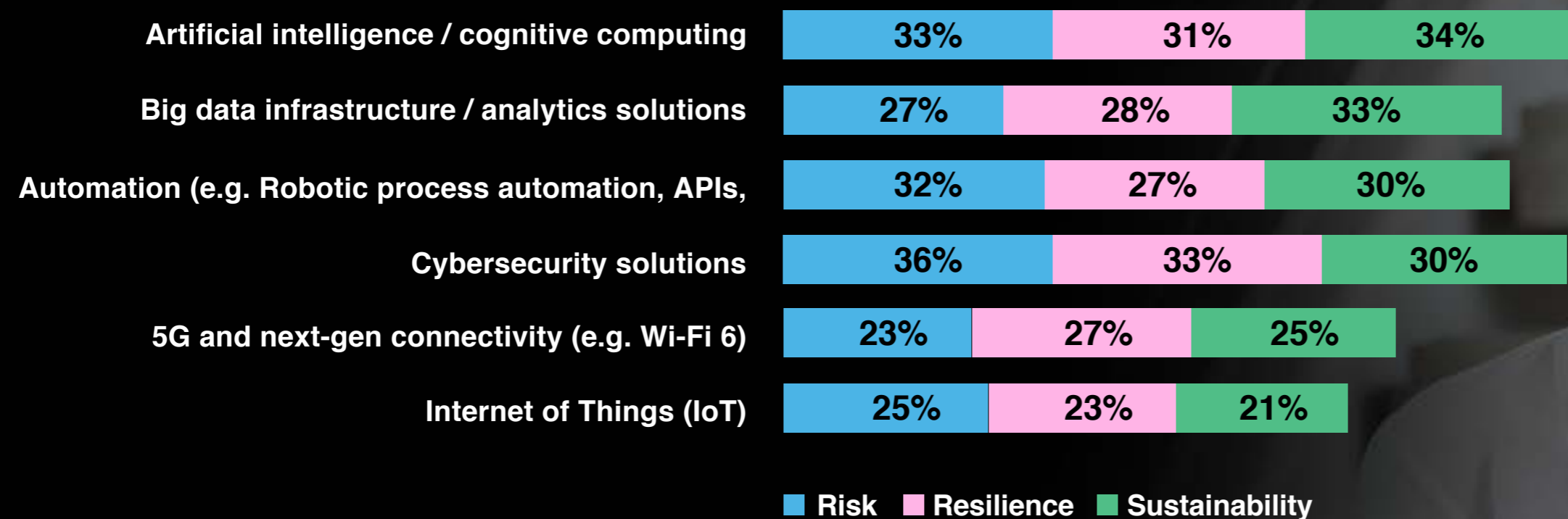
The chemicals company Covestro, for instance, manufactures insulation for housing and refrigerators in a plant on the Port of Antwerp site.<sup>17</sup>

The company is using augmented reality glasses, enabled by 5G, to address unexpected production and maintenance issues as part of the 5G trials with Orange and the port authority. The head-mounted displays enable hands-free working through two-way video cameras that support “see-through services”: An expert in a control center can see what the field worker sees and project data on to the machinery or environment they are looking at.

<sup>17</sup> <https://www.youtube.com/watch?v=gvouYxZouCQ>



## Which approaches to becoming a more sustainable business is your organization currently using, considering using in the next two years, or not using?





# Summary

## Four Digital Levers



# “ You don’t have to take one step forward, you have to take a quantum leap. ”

Erwin Verstraelen, CDO and CIO at the Port of Antwerp

**This is a pivotal moment in the history of the world economy, and the pressures on supply chains are considerable. We are seeing an inexorable rise in consumer demand from emerging markets, high levels of concern about environmental and sustainability issues and the need to reduce risks and increase resilience in mature markets.**

Three-quarters (75%) of executives we surveyed say they are now giving equal weight to cost and risk in purchasing decisions. Geodiversity of supply chains is increasing, which creates complexities and intensifies the need for advanced digitalization.

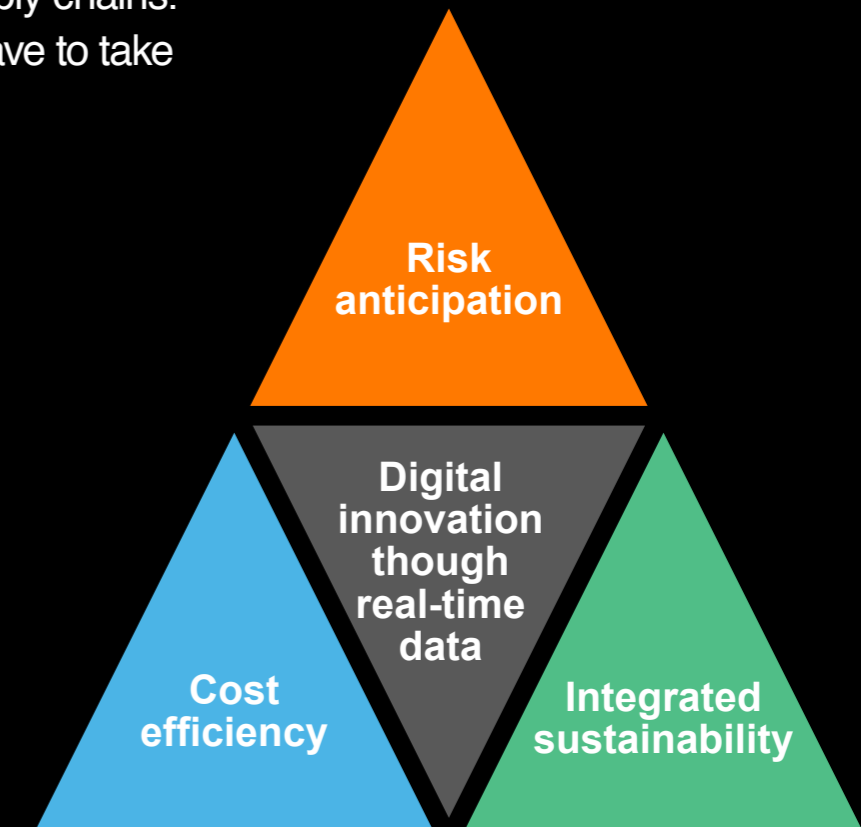
This is where technology comes in. And there are four important digital levers that can help businesses to address these challenges:

- **Real-time data** to feed digital twins and digital threads (see glossary) and enable AI-driven descriptive, predictive and prescriptive insights.
- **Smart factories** to support small-batch production of a rapidly changing portfolio of products in a cost-effective way in mature markets.
- **Smart asset tracking** to help firms manage ecosystem participation and deliveries from an increased number of suppliers across a larger regional footprint in real time.
- **Digital monitoring and management of environmental, social and governance issues** to help businesses win over consumers.

At the beginning of this report, we explained how another major global crisis, World War I, caused a giant leap forward in the management of supply chains for frontline troops. Will the pandemic – the most significant global crisis in a generation – have a similar impact?

Erwin Verstraelen thinks so. “There are a lot of new things on the table, because of Covid,” he says. “A lot of things were discussed theoretically before now. But everybody said, ‘Ah, but that’s not going to work. That’s not possible.’ All of a sudden, innovative ideas have proven themselves because of the crisis. For example, remote education and remote healthcare. The same thing will happen with supply chains. You don’t have to take one step forward – you have to take a quantum leap forward.”

**Innovations using real-time data sources will support progress in three critical areas: risk, costs and sustainability.**



# Glossary

## Digital threads

All the data associated with a product from a design, engineering, manufacturing, distribution and after-market perspective, including product-in-use and service history information. Digital threads can improve supply chain process flows, ensure traceability in the event of any component failure or recalls and support predictive maintenance.

## Digital twin

A representation or model of a real-world process, object or system. The digital twin is continually fed with data collected from the physical object it is linked with so that it evolves in the same way and future scenarios can be assessed.

## Smart asset tracking

Helps firms pinpoint supplies that get stuck in transit at customs or transport hubs across geodiverse supply chains. With their exceptionally long battery lives, IoT tags can enable firms to track the position, speed and temperature of assets for many months as they are shipped by sea around the world.

## Smart factories

Enable firms to switch rapidly between making different products, accelerate NPI (new product introductions) and support mass customization in more cost-effective ways. Smart factories use digital twins to model data relating to new products and production processes. They use IoT, computer vision and AI analytics for quality control checks on raw materials, in-progress work and finished goods, and predictive maintenance to prevent production problems and unscheduled downtime.

# Survey methodology

## This research is based on

1. A quantitative, online survey of 320 senior executives from several industries, and
2. Qualitative, in-depth interviews with selected leaders and experts in supply chain management and innovation.

It was conducted between August and October 2020.

### Countries:

- North America: 34%
- Europe: 35% (Belgium, Denmark, Finland, France, Germany, Luxemburg, Netherlands, Norway, Sweden, Switzerland, UK)
- APAC: 31% (Australia, China, Hong Kong, India, Singapore)

### Seniority:

- C-suite: 25%
- C-1 level: 42%
- C-2 level: 33%

### Revenue:

- \$500 to \$999.9m: 28%
- \$1bn to \$4,99bn: 30%
- \$5bn to \$9.99bn: 19%
- \$10bn to \$19.99bn: 11%
- \$20bn to \$49.9bn: 7%
- \$50bn+: 6%

### Sectors:

- Retail: 26%
- Pharmaceutical, biotech, medical: 24%
- Manufacturing and electronics: 19%
- Construction/real estate: 10%
- Logistics and transport: 9%
- Energy/resources: 8%
- Automotive, aerospace, defense: 6%



**Companies thrive on innovation.  
We work to shape yours.**

## **Want to know more?**

To find out more about how we can help you with your digital transformation strategy, please contact our digital consulting team at **[consulting@list2.orange.com](mailto:consulting@list2.orange.com)**

