HOW MODERN SUPPLY CHAIN RISKS NECESSITATE SUPPLY CHAIN VISIBILITY

INNOVATIONS in the supply chain industry have led to major improvements in efficiency, reliability and profitability. The risks have evolved, too, requiring new solutions and technologies, especially in a post-pandemic world. The top-performing supply chain companies are managing these risks and increasing profits by incorporating supply chain visibility technologies and processes.

Food Logistics

SDC SUPPLY & DEMAND CHAIN EXECUTIVE

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World events and technological innovations are ushering in a new era for the supply chain industry. Disruptions caused by the COVID-19 pandemic pushed the use of advanced technological strategies years forward within mere months. Associated lockdowns led to shifting customer demands and a need for greater transparency in orders, shipments and deliveries. Those issues have resulted in a greater use of big data, artificial intelligence (AI), robotics and similar technologies to improve visibility throughout the supply chain.

This 4-part white paper will uncover the logistics behind supply chain visibility, detailing how and what technologies companies are investing in, how companies are working to meet same-day delivery and what forms of technologies are best for mitigating supply chain risks. This series of white papers will break down grocery retail, last mile and warehouse automation, revealing how procurement software, enterprise resource planning (ERP), warehouse management systems (WMS), robotics and other automated solutions help companies better forecast for inventory, waste reduction, fleet management problems, a future in contactless and driverless and more.

Supply chain visibility is the use of data and technology to track orders end-to-end, from the components at the manufacturer to final product

delivery. The method provides insight into inventory levels, supply chain disruptions and can help prevent order and shipment errors.

What's more is, supply chain visibility processes allow companies to act on that information, make smarter decisions and manage risks.

With system integration and proper implementation, supply chain visibility can provide real-time notifications of raw material shortages, impending weather threats, labor unrest, demand spikes and other potential factors that can delay orders. This information allows companies to react faster with more flexibility and pivot workflows to improve profitability and delivery times. As supply chain visibility technology and processes become more sophisticated, the rate of adoption will greatly increase across the industry, experts predict.

"Visibility has markedly increased for the top 10% or 15% of leading-edge supply chain practitioner organizations," says Tom Derry, CEO of the Institute for Supply Management (ISM). "There's a huge opportunity for the rest of the organizations to improve their visibility and protect themselves from disruption. They haven't yet deployed, and they'll get there, but they're not there yet. We've got big changes and lots of good tools to help us, but we're really still in the early adoption stage."

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ADVENT OF VISIBILITY

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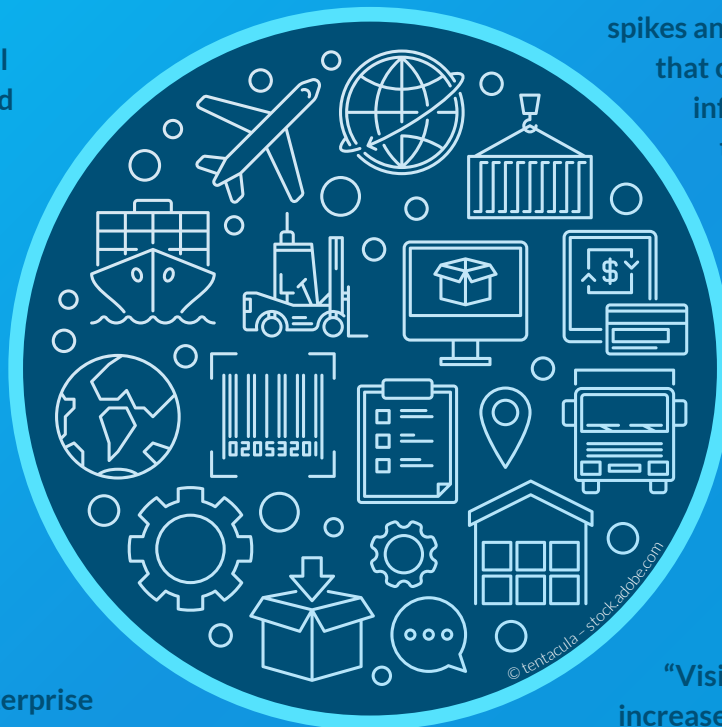
nventions and innovations have been driving the supply chain industry for more than 100 years. In the early 1900s, dollies, pallets, forklifts, and of course, mass production emerged. Later, in the mid-1900s, barcoding, steel shipping containers and computerized inventory management systems were developed. In the last half of the 20th century, universal product and electronic barcodes, warehouse management systems and massive container ships were put into use. In the new millennium, production and distribution systems advanced with the introduction of cross docking warehouse management systems, integrated global supply chains and the gradual shift to environmentally friendly sourcing.

The past few decades have ushered in an era of advanced technologies—such as the internet, cloud computing, AI, robotics, automation, direct-to-consumer strategies, supply chain visibility and more—that enable new supply chain strategies.

"We can use technology to map supply chains today, much more effectively than a decade ago," Derry says.

Influences on the growth and development of the supply chain include world events, treaty and trade changes, as well as globalization and social pressure.

CLOUD SEARCH

CLOUD SECURITY

CONNECTION

STORAGE

LAN NETWORK

BIG DATA

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NETWORK SERVER

DATA SHARING

REMOTE ACCESS

CLOUD DATA

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"You've got concerns about child labor or slavery in supply chains concerns about sustainability, safe conditions of people working in factories, and the consumer in many ways, is demanding that the OEM or the consumer-facing brand understand the issues and risks. That's forced them to have great visibility," he says.

Technological advancements have created a new set of challenges for the industry. The advent of e-commerce ordering has led to heightened demand and the expectation of fast delivery. Yet, tariffs, extreme weather events and global events can slow the pace of production, shipping and delivery.

"There are many good solutions out there today in the market that in real time can inform you about political events, strikes or weather events or something similar," Derry says. "Factory fires are still unfortunately a big fact of life. For many companies, any of these potential disruptions could be potentially quite severe."

In the past, data was difficult to organize and structure quickly and in a meaningful way. The systems of manufacturers, vendors, shippers have long been disparate. New platforms are emerging, however, to better integrate those systems, allowing for increased visibility.

"There has been a sharp increase in the need to track the supply chain end-to-end," says Susan Beardslee, principal analyst of freight transportation and logistics at ABI Research. "This began pre-pandemic for a wide variety of reasons, from tariffs and trade disputes to weather events to sustainability and ethical labor concerns."

When healthcare facilities were desperately short on personal protective equipment (PPE) like surgical masks and gowns, the need for increased supply chain visibility became readily apparent.

"The pandemic underscored this with PPE and vaccine-related supplies," she says. "Current disruptions, from container shortages to semiconductors, underscore the need for visibility, transparency and flexibility as a part of contingency planning and supply chain resilience."

Improvements in machine learning, AI and analytics has allowed for the development of technologies able to integrate with other platforms, analyze massive amounts of data, receive information from APIs and build predictions for every step in the process, making visibility the next frontier in the supply chain evolution. These systems have moved beyond traditional trend data. Through AI, visibility technologies can weigh external factors such as weather, trends, port traffic, manufacturer insights, stock and labor shifts and more. Visibility technologies allow companies to see factors influencing not only their Tier 1 suppliers, but also their suppliers' suppliers.

"There are tools today available for supply chain mapping, and people who are taking advantage of that understand what the supply chain looks like beyond the first tier," Derry says. "Ten years ago, you might know who you did business with on a direct basis as a Tier 1 supplier, but you had very little visibility beyond Tier 1. You weren't really aware of who your business was ultimately relying on because you didn't understand the relationships of Tier 2 and Tier 3 and Tier 4."

"THERE HAS BEEN A SHARP INCREASE IN THE NEED TO TRACK THE SUPPLY CHAIN END-TO-END."

Susan Beardslee, principal analyst of freight transportation and logistics, ABI Research

COVID-19 DISRUPTS THE SUPPLY CHAIN

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O ne of the greatest supply chain disruptions in history, the COVID-19 pandemic and resulting lockdowns, revealed industry vulnerabilities, slowing production and shipments. Just-in-time inventory management strategies proved insufficient for critical goods.

According to a February 2021 report by Ernst & Young, only 2% of companies that replied to the consulting company's survey about the business impact of the pandemic said they were prepared for the event. More than half, 57%, reported serious disruptions to their businesses. While some industries, like life sciences, reported positive results, other sectors, like automotive and industrial products companies, were negatively impacted.

Of those surveyed, 61% said achieving supply chain visibility will be their No. 1 priority over the next three years. Those companies plan to re-train and re-skill their workers on digital technologies to add supply chain visibility to their operations. Robots in warehouses, driverless forklifts and trucks, delivery drones and automated planning will be a reality by 2025, 52% of respondents said.

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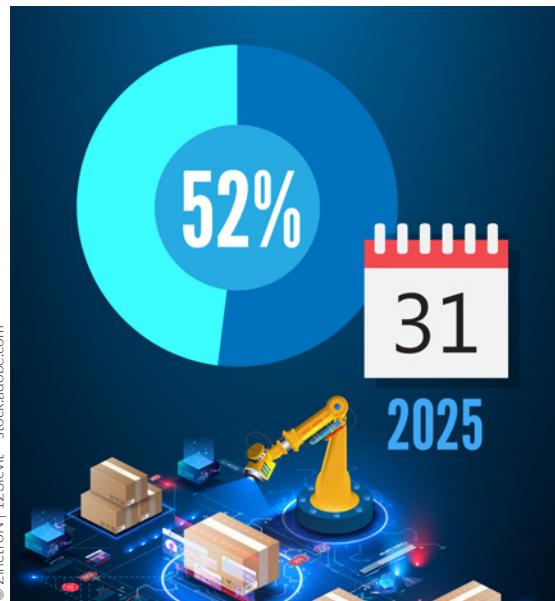
52% OF RESPONDENTS SAID ROBOTS IN WAREHOUSES, DRIVERLESS FORKLIFTS AND TRUCKS, DELIVERY DRONES AND AUTOMATED PLANNING WILL BE A REALITY BY 2025.

Quantitative Benefits From Visibility

Benefit Area	Description of Benefits
Gross margin	Reduce lost sales, improve order fill rates, improve customer service ■ resulting in revenue lift
COGS	Improve distribution center (DC) throughput, improve the goods receipt (GR) process, advaced shipping notification (ASN) accuracy ■ resulting in reduced direct material cost
Expenses (SG&A)	Elimintae overhead, reallocate FTE ■ resulting in reduced expenses
Balance sheet	Improve working capital, reduced stock (in-transit, safety) ■ resulting in healthier balance sheet

Source: Gartner

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LESSONS LEARNED FROM THE PANDEMIC

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One of the critical supply chain lessons learned during the pandemic, Derry says, was how reliant consumers are on a fragile global supply chain.

"We didn't realize how fragile, in a sense, global supply chains have become because of the overwhelming pressure, not just over the last decade, but also over the last three decades, to find the low-cost supplier in a low-cost country," Derry says. "That imperative to get the lowest cost of goods sold drove us to aggregate our spend volume to get more efficiency with a strategic supplier. What that means in the end is that you drive some

The PPE shortage magnified the lack of manufacturing suppliers, increasing risks down the line.

"During the most recent pandemic, we had an issue with surgical gowns that were defective from the supplier," he says. "There was no person or organization who could step in and beat that capacity requirement for a period of time, so there was a shortage of surgical gowns. There was that pressure and there's a realization now that, while we're driving toward the lowest actual cost in dollars and cents, there's a hidden cost around the risk premium."

Supply shortages, such as the PPE scarcity in 2020 or the semiconductor shortfall in 2021, have led to OEMs asking suppliers to diversify their footprint. Goods produced solely in China might soon also be manufactured in Vietnam or Mexico. China will continue to be a major player, but some manufacturing locations will shift, which will also help ease tariff burdens, Derry says.

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"In Mexico particularly, the automotive sector benefited from the tariffs that were imposed on Chinese suppliers because they

companies out of the market because they're not willing to compete or to be in the market at those low margins. What happens is, you end up reducing suppliers in the market."

weren't subject to the same tariffs in Mexico," he says. "China's overall market share declined, while Mexico's increased over the past year. There is some shifting of production globally on

"THERE ARE TECHNOLOGIES TODAY THAT ALLOW YOU TO DISCOVER THAT SUPPLIER WHO ISN'T ON YOUR RADAR."

Tom Derry,
CEO,
Institute for Supply Management (ISM)

the margins, and it's still shifting to reflect the economic realities of policy in the world today."

Part of the expanding footprint requires the increased insight into suppliers' suppliers, Beardslee says.

"Many companies had little to no information on their suppliers' suppliers, and the ability to trace their supply chain down to raw materials," she says. "Too many did not fully comprehend their reliance on an ecosystem built over 1-2 decades in China. The lack of visibility made just-in-time strategies very difficult and led to a strong pivot to 'panic pallets,' particularly with consumer essentials."
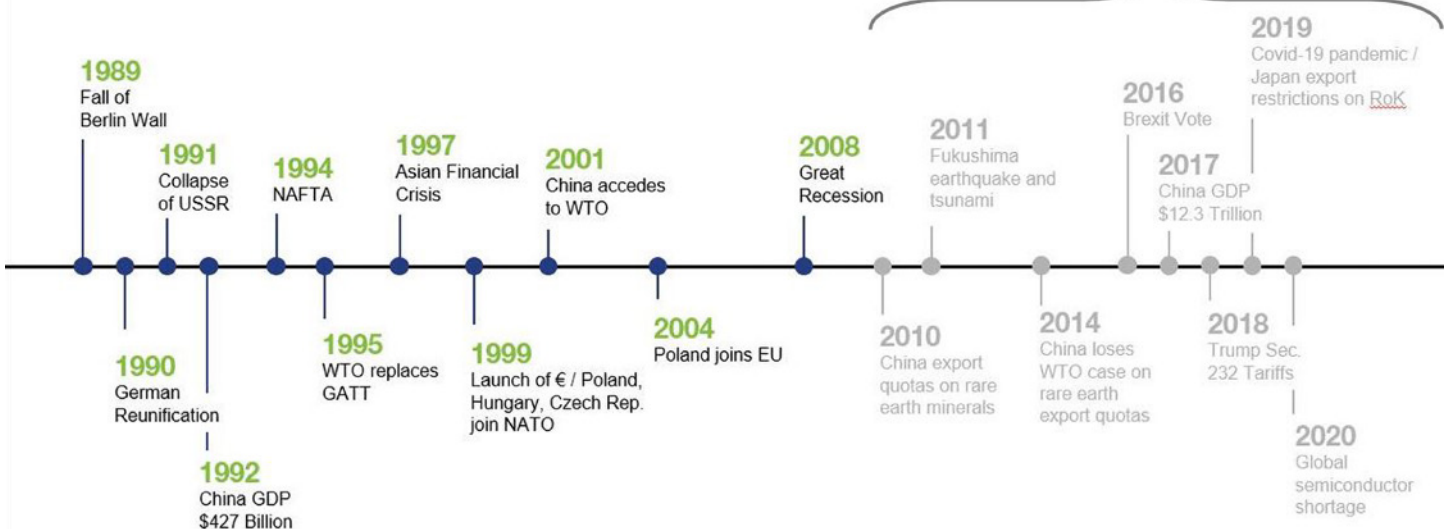
Without advanced technologies, finding new suppliers can be next to impossible, especially when manufacturers are pressured to

produce at the lowest costs possible. Visibility technology has played a role in identifying new suppliers, Derry says.

"There are technologies today that allow you to discover that supplier who isn't on your radar," he says. "Supplier discovery is another area where technology has helped us expand our range of vision and identify potential partners that provide either technologically innovative solutions or cost-competitive solutions or both. Markets are more fluid today than they were a decade ago. If you're thinking there are really only four or five suppliers for my particular product or my particular industry, that might be outdated thinking and the new technology can help you discover other options."

Supply Chain Timeline

Signs of fracturing in the global consensus on the benefits of free trade and recognition of fragility of global supply chains.

1989 Fall of Berlin Wall

1990 German Reunification

1991 Collapse of USSR

1992 China GDP $427 Billion

1994 NAFTA

1995 WTO replaces GATT

1997 Asian Financial Crisis

1999 Launch of € / Poland, Hungary, Czech Rep. join NATO

2001 China accedes to WTO

2004 Poland joins EU

2008 Great Recession

2010 China export quotas on rare earth minerals

2011 Fukushima earthquake and tsunami

2014 China loses WTO case on rare earth export quotas

2016 Brexit Vote

2017 China GDP $12.3 Trillion

2018 Trump Sec. 232 Tariffs

2019 Covid-19 pandemic / Japan export restrictions on RoK

2020 Global semiconductor shortage

ISM INSTITUTE FOR SUPPLY MANAGEMENT

TRENDS IN VISIBILITY SYSTEMS

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Supply chain companies are integrating visibility into their systems in many ways. One top trend Derry is seeing is visibility in procure-to-pay (P2P), where purchasing and accounts payable systems are integrated.

"You don't need people touching paper, you don't need people touching purchase orders," Derry says. "You need your employees and staff ordering from online catalogs. That's a clear place where everyone has moved."

Spend analytics programs are also popular, he says.

"There are pretty good packages out there on spend analytics that can help you understand the patterns of your spend, and therefore, where there are opportunities to be more efficient and get better pricing," Derry says. "It's particularly true for companies that are a little decentralized."

As consumers turned to online grocery shopping, for example, during the pandemic, those in the foodservice and retail industries were forced to quickly pivot to move an extraordinary amount of goods. Visibility technologies allowed for better planning in that space, says Marjorie DePuy, senior director, supply chain and sustainability at the FMI-The Food Industry Association.

"We have more information at our fingertips in real time than ever before—geospatial data, product data, asset data—throughout the system and in all networks," she says. "It is possible to know where your coffee beans were grown, where the milk truck is, who picked the order at the distribution center and when the driver will arrive at the store. With greater visibility into consumer purchasing as well, there are more feedback loops possible, which

allows for better planning through the sales and operations process."

1. For companies just starting to implement automation, what is the best form of technology to start with? (Select your top 3)	
Blockchain	15%
Automation/Robotics	29%
WMS/TMS	28%
Cloud-based	44%
Software Solutions	44%
IoT	13%
ERP	19%
Track-and-Trace	33%

According to a survey conducted by Food Logistics and Supply & Demand Chain Executive, cloud-based, software solutions and track and trace ranked as the Top 3 forms of technology companies are investing in.

Supply chain visibility technology helps with another industry need—speed.

"Above all, visibility is essential and so is speed," she says. "Real-time visibility enables better decision making, planning and response at the speed of business."

DePuy cautions that strong relationships between trading partners are still critical to supply chain and logistics success.

"Relationships and communication are still at the forefront in our industry," she says. "All the tools in the world don't matter when you don't have the people powering the decisions and ensuring the goods are harvested, procured, produced, transported, stored, delivered and merchandised. Our biggest lesson learned is that visibility is a shared responsibility between trading partners."

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"WE HAVE MORE INFORMATION AT OUR FINGERTIPS IN REAL TIME THAN EVER BEFORE..."

Marjorie DePuy, senior director, supply chain and sustainability, FMI-The Food Industry Association

MANAGING RISKS

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One of the greatest concerns of supply chain professionals is managing risks, says Mark S. Baxa, president and CEO of the Council of Supply Chain Management Professionals (CSCMP), and there was no end to the risk mitigation required during the pandemic.

"Beyond the impact of COVID-19 on the supply chain that most supply chain professionals are beginning to understand more fully, at the heart of the most significant impact to supply chain performance is risk, described in three words--complexity, competency and capability," Baxa says.

Over time, as companies add to their networks, their systems become more intricate. Introducing supply chain visibility on top of a standardized operation can improve total supply chain process flow, align cross-functional performance metrics and deliver an advantage in the marketplace, he says.

"Supply chain networks that are built over time to meet the needs of delivering products to market often become increasingly complex as variables within functions are addressed over time, in an attempt to smooth out the overall process and improve efficiency and cost positions," Baxa says. "As a result, supply chains often become misaligned or disjointed across functions and therefore non-value-added complexity arises. People in operational roles and those who lead supply chain functions can find themselves in a place of limited knowledge that causes functional or holistic supply chain process breakdown due to a lack of simply 'what to do next.' In the end, the supply chain can become at risk in terms of performance, where the overall capability to deliver on its promise can literally fail the business."

Visibility processes help get to the "real truth" of an operation, he says.

"As a part of the digital transformation in the supply chain, visibility has graduated from a logistics technology to an all-in, comprehensive supply chain capable technology when viewed from above," Baxa says. "Every supply chain process has the ability to optimize their practices with enabling software that, as a result, can provide visibility into the functions themselves and the holistic supply chain. We now have the advanced capability to see nearly every step and measure the outcome of every step in the supply chain."

When trying to manage risk, visibility has improved intelligence about various potential disruptions, Derry says.

"We've gotten a lot better at managing risk in the past decade. We are not as proactive yet, but we're less reactive," Derry says. "Where weeks or months might have gone by in the past before we knew something was going on with a supplier, we now often know in real time that there's an issue with a supplier that might be a classic disruption event. It might be a raw material shortage, but it could also be, for instance, the financial health of that supplier."

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"VISIBILITY PROCESSES HELP GET TO THE 'REAL TRUTH' OF AN OPERATION."

Mark S. Baxa, president and CEO, Council of Supply Chain Management Professionals (CSCMP)

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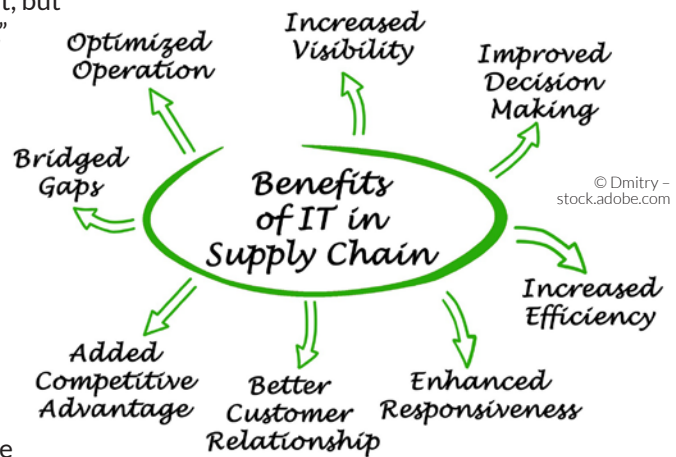
ADJUSTING TO CHANGING TIMES

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Supply chain companies have many challenges to meet in coming years, from potential disruptions and risks to new rules and regulations, all while remaining competitive. Beardslee says the companies that have incorporated advanced technology processes, like supply chain visibility, are pulling ahead of their competitors.

"Companies that were already well-positioned based on scale, technology, partnerships, etc., have pulled farther away from competitors over the last 13 months," Beardslee says. "Implementation of technology, such as control towers, leverage machine learning to assess significant variants in very complex supply chains. Multi-party network platforms allow for enhanced collaboration across the supply chain, connecting multiple businesses to one version of data, in real-time."

During the pandemic, companies issued more procedure changes than ever before.

"They were often adjusting to new regulations or business processes daily to keep employees and customers safe," says DePuy. "With more visibility across the networks, it is also critical to remember that our transportation and distribution networks run across state lines, so greater coordination and simplification of responsible regulation will assist everyone to keep the goods flowing."

Innovations in the supply chain industry during the past several decades have led to major improvements in efficiency, reliability and profitability. The risks have evolved, too, requiring new solutions and technologies, especially in a post-pandemic world. The top-performing supply chain companies are managing these risks and increasing profits by incorporating supply chain visibility technologies and processes.

Check back for the remaining three parts of this white paper, which will break down grocery retail, last mile and warehouse automation and how these relate to the state of supply chain visibility.

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A SIX STEP PROCESS TO SUCCESS
Source: Gartner

DETERMINE
overall strategy, identify stakeholders and develop SCV strategy

DESCRIBE desired solution strategies in terms of business processes measured by metrics

CONVERT targeted improvements to baseline performance levels into financial results

SELECT performance metrics to support the SCV strategy being pursued

NEGOTIATE targeted improvements to baseline performance levels

DEVELOP the TCO and calculate the ROI

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