

Do you have the full picture of supply chain resilience?

How different types of visibility can help build resilient supply chains

The past few years have clearly taught us that supply chains need to be much more resilient. But what if we told you that “redundancy” and “just-in-case” aren’t your only options for creating more resiliency? What if, instead, we said there’s a cost-effective capability that can help focus efforts and investments to enhance supply chains before, as well as during, disruption?

That capability is “intelligent visibility” across your supply chain. And, according to new Accenture research, it’s something many leading companies are trying to get more of. While the concept of visibility isn’t new, advancements in analytics and technologies are helping companies to make step changes in this area. Our findings reveal the progress these enterprises are making, where they feel they need to do more, and how their efforts are paying off.

Note: While this paper is based on research we conducted prior to Russia’s invasion of Ukraine, we believe its contents and concepts remain relevant in the light of current events

Intelligent visibility:

a cost-effective route to greater resiliency

Supply chain resiliency is traditionally thought of as buffer stock, more flexible manufacturing, and redundant supply sources—all of which cost money. This means customers might have to pay more for their goods and investors will have to sacrifice short-term profitability in the companies they have interests in. Neither of these has historically been acceptable, especially when the disruptions fade away.

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But it's also possible to cost-effectively create a more resilient supply chain with greater visibility. No longer are companies just limited to keeping more inventory and building redundant capacity across the board to guard against potential disruptive events. Instead, they can **build new capabilities that 1) help them assess where they're most vulnerable; and 2) enable them to see exactly what's occurring across their extended supply chain.** With these insights, companies can make quick, fact-based decisions to head off negative impacts from disruptions as well as better focus their investments to improve structural resilience.

Most business leaders would likely agree that more visibility is a good thing. But how good? What could companies do with greater visibility that they couldn't otherwise do? And does visibility alone truly make a supply chain more resilient?

Accenture wanted the answer to these and other important questions. **So we talked to a group of 30 leading supply chain executives representing a cross-section of geographies and industries.* In a series of interviews, we explored the extent to which executives' companies are using "structural" and "dynamic" visibility and the impact that's having on their supply chain's performance.** We explore what they had to say later in this paper.

At Accenture, when we think of visibility, we consider the **combination of structural and dynamic visibility supported by analytical techniques and artificial intelligence.** We call this "intelligent visibility." Intelligent visibility results in better financial performance, a key ingredient of resilience. Our analysis reveals that the companies in our research with greater intelligent visibility tend to perform better in terms of revenue, profitability, and share price performance—especially companies with higher visibility maturity.

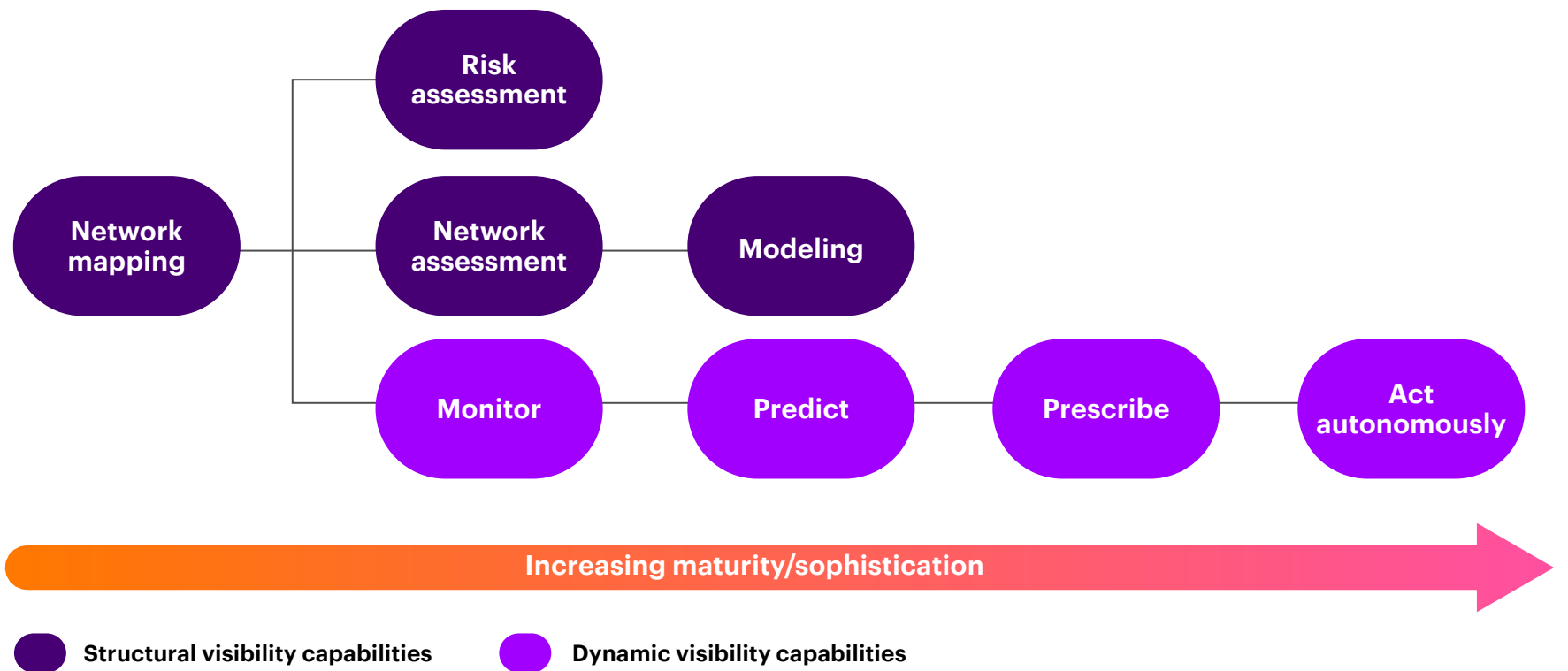
Of course, this is a small sample of companies. But their experiences suggest visibility can help companies avoid or bounce back from disruptions. And, in fact, we found that a company doesn't need perfect visibility to be more resilient. Visibility into certain product lines, customers, or suppliers often is sufficient. As one executive we talked to put it: "Is there 100% coverage? Of course not. We can't afford it. It's about certain moments, and also about time, money, and resources. Do we want to prepare for [every possible scenario]? No, we don't. But we do want to prepare for the most, let's say, obvious risks that we face in the business."

Now let's take a deeper look at what our executives had to say about how their companies approach different types of supply chain visibility and what it means for their business.

What are the different types of supply chain visibility?

Most people know what “visibility” means in theory. But in practice, there are different types of intelligent visibility that create supply chain resilience. As noted in Figure 1, we can categorize these types into two broad groups—structural and dynamic. Each has its own characteristics and benefits.

Figure 1: Accenture intelligent visibility for resiliency framework



Structural visibility:

what does our supply chain look like?

You could think of structural visibility as an X-ray that gives a company a snapshot of its operations at a point in time or over a certain period and helps uncover hidden issues. **Structural visibility includes such traditional activities as network mapping, risk assessment (e.g., classic risk management), network assessments, and modeling.** A number of companies are generating greater structural visibility with a digital twin—a virtual supply chain replica of their company’s operational backbone. With a digital twin replicating the typical behavior of a supply chain, a company can use advanced analytics to simulate and scenario model its supply chain’s performance and stress test its supply chain for risks and vulnerabilities. Such visibility is critical to preparing for disruptions.

Structural visibility helps companies understand such things as:

- Where their suppliers are
- Where their points of manufacturing are
- What logistics routes they use, including those of their partners
- Interrelationships across the broader supply chain network
- Potential supply chain risks and weaknesses

Do you have the full picture of supply chain resilience?

There are four main types of supply chain structural visibility:

- 01 Network mapping** documents the company-owned assets and those of key partners, illustrating their locations and connections between them. Effective network mapping should ideally include all suppliers—tier two and beyond.
- 02 Classic risk management** is the cyclical approach of identifying and resolving potential risks to the supply chain. The goal is to quantify them (typically in terms of likelihood, impact, and cost to mitigate), prioritize them, and then take action to remediate them. This exercise often is done as part of a larger company-wide risk management process. The best risk management programs are recurring and linked cross-functionally.
- 03 Network assessment** determines risk inherent in the network’s design. This includes location-based risk (geopolitical, environment, weather, etc.), proximity or distance to other nodes, and other factors (e.g., financial stability and ESG performance).
- 04 Modeling** refers to a computer-based simulation of the actual performance of the network (usually measured in terms of service or cost performance). Once the model is created, a company can measure its performance across multiple scenarios that represent potential real-world disruptive events. This is where using a digital twin and stress testing the extended supply chain against disruptive scenarios can have a huge impact.

Structural visibility

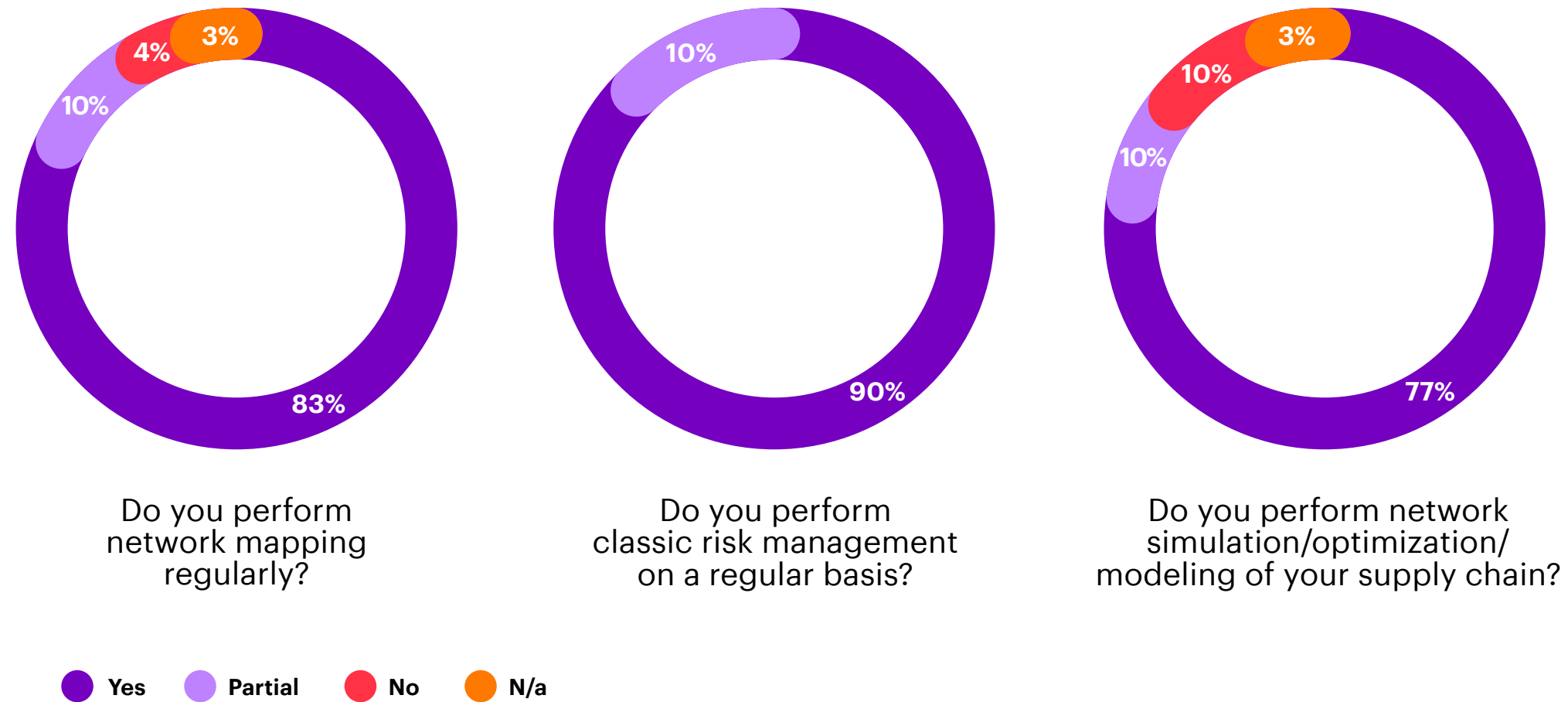
At an aggregate level, an advanced level of structural visibility is common across the companies researched (Figure 2). Most companies employ regular network mapping, classic risk management, and network simulation/optimization/modeling. Such activities tend to be more frequent during times of disruption. That said, a number of executives we spoke with indicated their companies still struggle with structural visibility—especially when it comes to suppliers. In fact, executives said structural visibility isn't necessarily available for the entire supply base, but can be limited to certain suppliers.



I think we can at least reach a rough 85% to 90% of [structural] visibility, but only covering tier one suppliers,” said a supply chain leader at an electronics company. “Maybe then for electronic components, we also cover the tier two suppliers, but for other categories we have not covered as much.”

Structural visibility

Figure 2: Extent to which participants have structural visibility



Here's a snapshot of what executives had to say about their progress in structural visibility.



Network mapping

"We rely on our partners to understand their networks and explain them to us, but they aren't as robust as they should be," said an automotive executive. "I would give the automotive industry a 3 or 4 out of 10 on network mapping."

"Honestly, it is even tough to do [network mapping] annually, with the given set of resources, the diverse vendor base, and set of information or complexity which is being expected," noted an executive at an automotive supplier.

"Ten years ago, we were [updating our network map] probably every week," said a vice president at a high-tech company. "Right now, it's gone to every day."



Classic risk management

"We do risk management initiatives all the time," observed an executive, from the chemicals industry. **"We've been trying to de-risk our supply chain every day since disruption started to be prevalent."**

"We are reviewing risk on a regular basis, which can be a lot of different kind of risks," said an aerospace executive.

"External, end-to-end supply chain risk. It can be an accident. It can be a production risk. It can be supplier risk, physical and regulatory risk. It can be a problem of capacity, inflexible production, poor quality issues relating to lead time, and so on."



Modeling

"We run modeling simulations for producing various products," observed an executive at a global consumer goods manufacturer. "For example, we know [all the] items from suppliers that go into making toilet paper. We have software that says, 'Okay, supplier A falls down. What is the mitigation plan to move to our second-tier suppliers or to shift to a different region?' It's a simulation of how we would continue to supply and maintain that product. So, essentially, you're resilient."

"[Modeling] has definitely pointed out certain things that we were oblivious to in terms of total landed costs, lead-time impacts, and some duties and tariff impacts," noted an industrial equipment company executive. "Now that we know those things, we're taking those things into account and saying, 'Okay, how can we do that better?'"

Dynamic visibility:

what's happening across our supply chain right now?

If structural visibility is an X-ray, dynamic visibility is more like a video that enables a company to monitor and respond to events in real time. Dynamic visibility, typically generated with the help of a supply chain control tower, is a progression of increasingly mature capabilities that help companies see:

- Where products are across the supply chain
- How plants and warehouses are running
- When and where disruptions are occurring
- What disruptions are affecting, and how

Importantly, with greater dynamic visibility maturity, a control tower also emphasizes execution. This enables companies to take action on issues as they see them—or, in some cases, have that action be taken autonomously by the control tower itself.

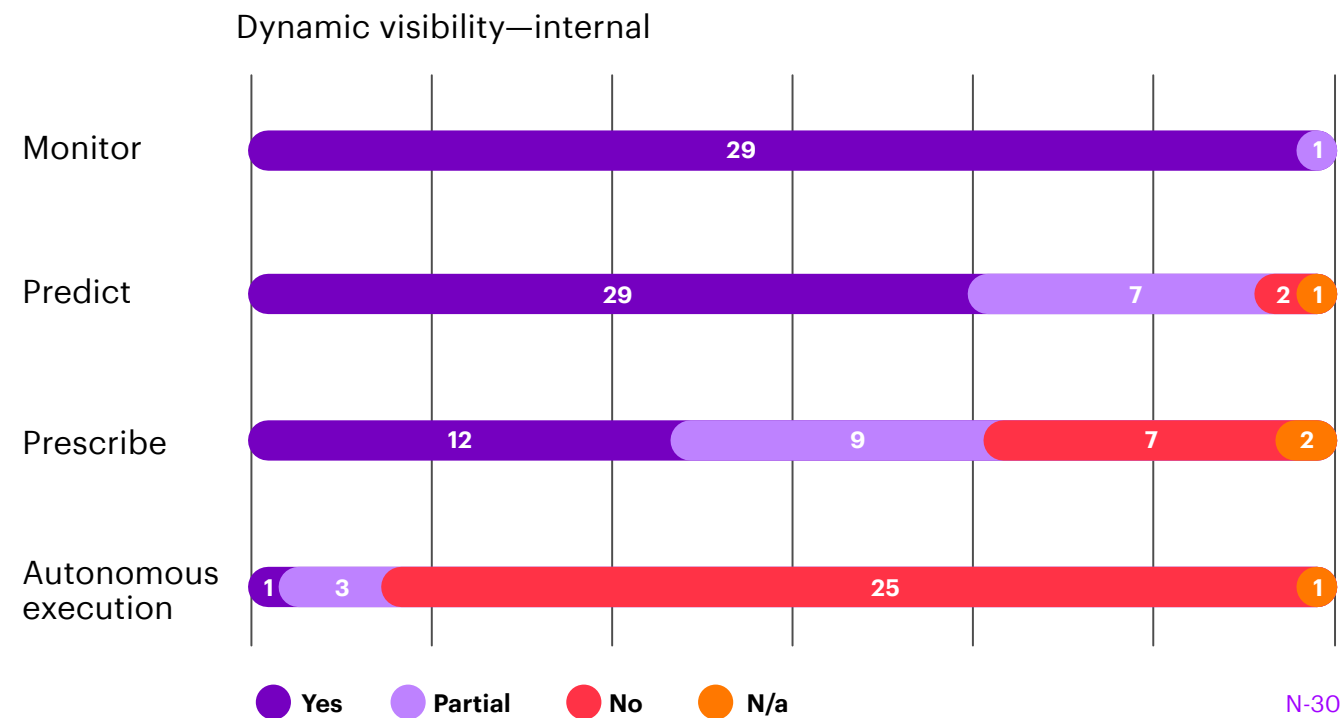
There are four main types of dynamic visibility:

- 01 Monitoring** is the most basic level. It involves collecting and observing signals that indicate the performance and status of supply chain functions, ideally in real time. A core capability for monitoring is a control tower—which a number of companies we talked to have in place—that leverages real-time data from key partners like suppliers and logistics providers. Control towers often include or are augmented by third-party monitoring services, such as Resilinc, RiskMethods, Everstream, or Interos to name a few.
- 02 Predicting**, the next stage, is using real-time supply chain signals to generate projections about the supply chain's future state. Predictions are made via a control tower's embedded trend analytics capabilities and the data collected through monitoring, for instance predicting which purchase orders are most likely to face delivery issues.
- 03 Prescribing** is more sophisticated. It involves using real-time supply chain signals and a control tower's algorithmic decision-making capabilities to recommend actions that take advantage of opportunities and minimize the impact of disruptions. An example of prescriptive visibility is dynamically re-routing in-transit supply to different locations.
- 04** Ultimately, with the right capabilities, dynamic visibility can drive **autonomous execution**. At this stage, a control tower leverages artificial intelligence/machine learning and robotic process automation. In doing so, it can independently act on real-time supply chain signals to capitalize on opportunities and minimize the impact of disruptions.

Dynamic visibility

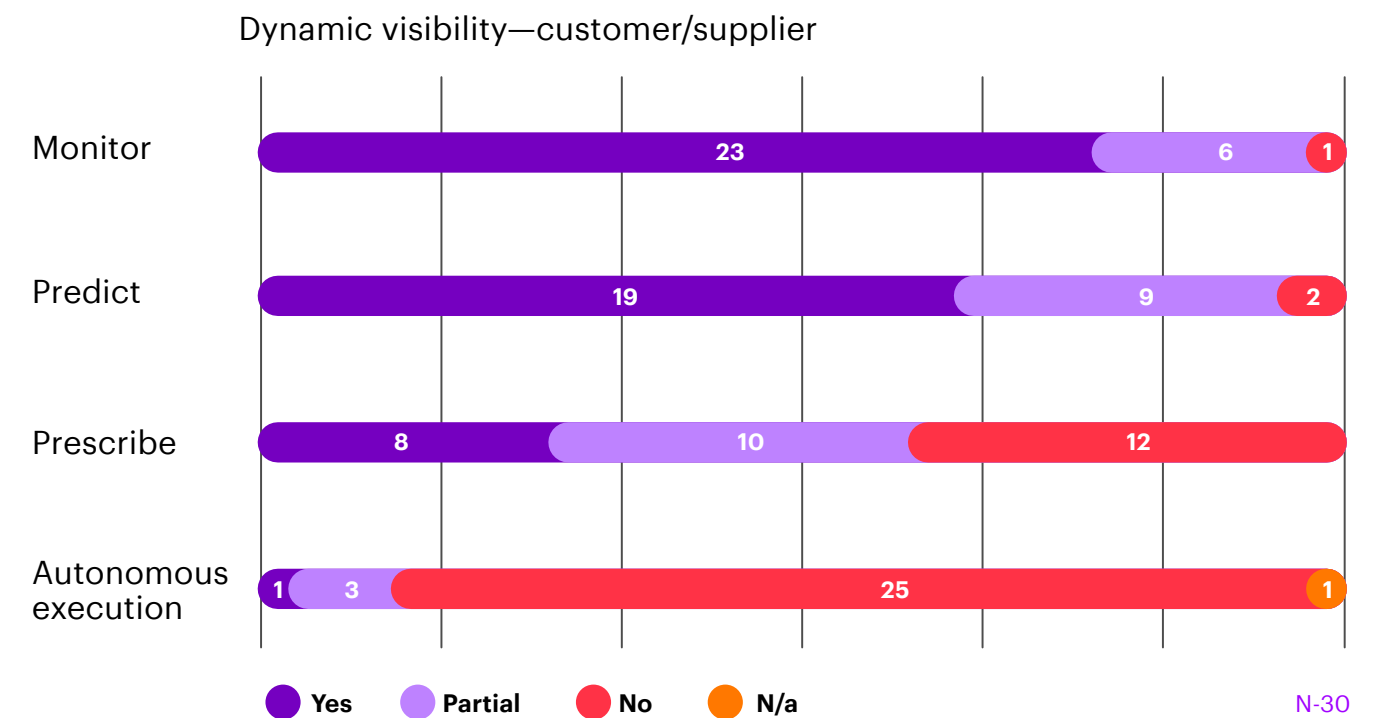
While companies have relatively mature structural visibility capabilities for their own operations (with the exception of N-tier supplier visibility), dynamic visibility is more nascent. For instance, when it comes to their internal operations (Figure 3), most companies said they're strong in the first two stages of dynamic visibility, monitoring and predicting. About 40% said the same about the third stage, prescribing actions. External events also receive the same kind of attention: Most companies monitor them and use data predictively, but a smaller group use data prescriptively.

Figure 3: Extent to which participants are using dynamic visibility internally



We see a similar situation with suppliers and customers (Figure 4). Most companies monitor demand and supply and use data predictively, while prescriptive use is somewhat uncommon. Suppliers seem to be more actively and deeply monitored than customers—but not all suppliers and products. In general, executives suggest achieving full external visibility is far more difficult than full internal visibility.

Figure 4: Extent to which participants are using dynamic visibility with customers and suppliers



Dynamic visibility

The fourth phase of dynamic visibility, autonomous execution, still has a long way to go. It's reported to be used in limited situations or for specific events by only a few companies in our research. That's primarily for internal operations and suppliers and customers. No companies reported using autonomous execution for external events.

Here are some select comments from executives on their progress in the four types of dynamic visibility.



Monitoring

"Internally, I think we have fully achieved monitoring visibility," said a chemical company executive. "We really have the visibility and also we understand if things happen, we have a kind of early warning system in place where we can react."

"Internally we have an end-to-end control tower, so that way we monitor the real-time shipment information from the supplier side to the customer side," noted an electronics company executive. "We can have a real-time monitoring of the situation and if anything potentially went wrong, the system will alarm. Then we'll take some proactive action to prevent the issue from impacting customers. We [also have a service that] is embedded into our control tower. We have all the external events, political, the weather, the congestion. Not only that, we have a data analysis team proactively building some models to monitor some external information so that we can better benefit our forecast."



Predicting

"We have more than 10,000 suppliers and a hundred million parts," observed a high-tech executive. "So we just focus predictive [visibility] on strategic parts. We are not 100% focused on every commodity or part."

"We have achieved predictive dynamic visibility—totally," noted an executive from a global industrial manufacturer. "Let's take sales as an example. We know what we are going to sell for the next month, but the hit ratio also gets affected from external factors, and that's why it differs from time to time. But I would say, 90% of the time, it's reliable and we get it done."



Prescribing

"Prescriptive visibility is probably very limited," noted an automotive executive. "The best example might be around weather events. So as weather events are moving into a region or about ready to move into a region, there may be recommendations on what to do with the partners or suppliers that are within those areas. And that may include pulling ahead shipments due to an expectation that a weather event might cause a flood or cause other road closure conditions, for example."

"[We only have partial prescriptive visibility], first, because of the complexity of the supply chain," said an executive with a global retailer. "So, how big is your supply chain, what kind of assortments do you maintain? If it is a very big business, where you have your assortments spanning across say millions of items, it becomes extremely difficult to capture the data. Second, even if you're capturing the data, the accuracy of data is another challenge."



Autonomous execution

"We certainly are monitoring, possibly some predictive with anticipating certain countries," noted a chemicals company executive. "It's a combination of in-house resources. It's not autonomous. We're inputting some of the information, but it's our ERP that acts as the engine for this."

"In very random cases we use robotic process automation," reported an electronics company executive. "So there is already some logic built in to say, if you find this kind of delay, then the RPA will follow the logic to send some email to some people. But that is just a starter, not fully automated."

"There are definitely elements along the supply chain that are autonomous, but there's always a percentage that don't flow autonomously and require manual intervention," indicated a consumer goods manufacturer executive.



Case studies: visibility and resiliency in action

It's clear from our executive interviews that companies are making progress in gaining greater internal and external visibility, and that such visibility is playing an important role in helping some companies become more resilient. **Here, we highlight the experiences of two such companies Accenture has worked with.**

Moving a Tier 1 technology supplier from reactive to proactive resilience

A European tier 1 technology supplier faced a huge challenge: The company's supply chain, impacted by the microchip shortage, was struggling to manufacture enough product to meet demand. Given the magnitude of the problem and its strategic nature, company leaders realized they had to focus on future resilience instead of simply solving the current crisis.

Working with Accenture, the company began by looking at critical suppliers and materials, as well as current practices, to identify "low-resilience" areas to prioritize. **Accenture helped the company analyze multiple risk inputs, developing a heatmap of components covering their risk exposure and impact on revenue.** Going a step further, the company and Accenture developed a digital twin to provide visibility into interdependencies. They were also able to identify the revenue streams and the clients that relied on specific subcomponents.

The company's supply chain leaders are now working with Accenture on deploying a digital twin-enabled [supply chain stress test](#) that looks across the multi-tier, end-to-end supply chain to further identify vulnerabilities and areas of risk and calculate Time to Survive (TTS) and Time to Recover (TTR) for specific threats or disruptions. The results of the stress test will lay the groundwork for subsequent strategic and operational actions the company should take to reduce supply chain vulnerabilities





Helping one of the world's largest consumer goods companies set up a Sales & Operations Execution (S&OE) organization to maintain and improve service levels during crises

A global consumer goods manufacturer, hit hard by the pandemic, was struggling with service levels: Its case fill rate (CFR) was just around 84%, or 11 to 14 percentage points below pre-pandemic numbers. This represents the biggest threat to the company's business—it could result in lost sales and customer defection to competitors that are reacting faster to build supply chain resiliency. The existing organization design struggled to keep pace. Planners had to shift from tactical planning to constantly dealing with significant deviations in their plans. This, in turn led to a lack of focus on the Sales & Operations Planning (S&OP) process and limited execution reaction. The need to rethink how to effectively run the supply chain function was clear.

As part of developing a roadmap to return service levels to pre-pandemic figures, **Accenture worked with the company to set up a new S&OE organization, operated temporarily by Accenture and, over several months, transferred back to the company.** Today, a predictive early alert tool and ticketing system that are part of the S&EO workflow design enable the S&OE team to handle a high number of exceptions in a structured way across five key workstreams: materials/suppliers, manufacturing, logistics, customer, and continuous improvement. The same team is also now empowered to resolve issues by making informed decisions about how to change plans that are no longer feasible.

Conclusion

What are the main messages of our research? We see four key takeaways for companies looking to use visibility to drive greater supply chain resiliency:

01

When it comes to resiliency, visibility delivers.

Our analysis shows that companies with greater visibility are better positioned to weather all kinds of disruptions.

02

Good enough is, usually, good enough.

Full visibility across the supply chain isn't necessary, or economically feasible. Focus on the really important areas of the business.

03

Structural visibility is a requirement.

Every company should, with the help of digital twins, have the basics such as network mapping, risk management, network assessments, and modeling in place. They can leverage advanced analytics to go to the next level—especially around end-to-end visibility and simulation.

04

More advanced dynamic visibility should be the target.

Predictive visibility and autonomous execution, achieved with a sophisticated control tower, are the keys to maximizing resiliency.

Conclusion

Supply chain executives recognize how critical visibility is to resilience, and will remain in hot pursuit of the capabilities they need to make their operations as transparent as possible.

And that means they can avoid the excessive costs, inefficiencies, and complexity related to redundancy and buffer stock that can dampen their companies' operational and financial performance. Investors, customers, and the bottom line will appreciate that.

Authors



Stéphane Crosnier

Managing Director—Strategy & Consulting, Supply Chain & Operations, Resilience Global Lead, UK and Ireland Lead

Stéphane leads Accenture’s Supply Chain & Operations practice in the UK and Ireland, where he helps clients digitally transform their operations for improved performance and enhance their supply chain resilience through strategic risk management and stress testing. In his global lead role for Supply Chain Resilience, he works with clients to employ data analytics and technology to help clients prepare for market shifts and build more resilient, cost-effective systems for future growth. He’s also helping clients use technology to create transparent and traceable end-to-end supply chain solutions to create supply networks that positively impact business, society, and the planet.

Stéphane earned an MBA in supply chain management from ESSEC Business School and a degree in Math and Computer Science from École centrale de Nantes.



Maria Rey-Marston, PhD

Managing Director—Strategy & Consulting, Supply Chain & Operations, Innovation Global Lead

As Supply Chain Innovation Global Lead, Maria designs adaptive supply network strategies that drive sustainable 360 value. In her work, she uses data and technology to create integrated systems to drive customer experiences, optimize business performance, and build resilient, responsible, and transparent supply networks. In her work as an advisor, technologist, and educator, Maria strives to find the balance between mastering the fundamentals of the operation and the enduring innovation derived from new technologies and diversity of thought. This is the Human+ machine combination that transforms supply chains.

Maria received a PhD in business performance from Cranfield University (UK), a Master’s in Supply Chain Strategy and International Logistics from the Georgia Institute of Technology (US), and is an Economist from Universidad del Rosario in Bogotá, Colombia.

Researchers



Stephen Meyer

Principal Director
Accenture Research,
Supply Chain & Operations,
Research Lead



Deepak Tantry

Research Associate Manager
Accenture Research,
Supply Chain & Operations

Contributors

Keith Walker

Managing Director
Strategy & Consulting,
Supply Chain & Operations,
North America Resilience Lead

Suresh Veeraraghavan

Managing Director
Strategy & Consulting,
Supply Chain & Operations,
West Lead

Meagan Sweigart

Marketing Manager
Marketing + Communications,
Supply Chain & Operations Marketing,
Content Lead

Methodology

Our study examined a large sample of listed companies across industries and geographies, and we chose 30 companies based on whether they displayed resilient or non-resilient characteristics during the COVID-19 crisis. We analyzed three financial metrics to achieve this: revenue, profitability, and total return to shareholder (TRS). We first examined the consensus estimates of revenue and operating income for 2019 and 2020, before the crisis began, and then compared them to the actual performance. Companies were classified according to their deviations from the consensus estimates. We also looked at the TRS before the market crash of 2020 and classified these companies as resilient or non-resilient based on how long it took for them to recover to their level before the crash. Finally, only companies that emerged resilient in 2 out of 3 criteria were classified as Resilient.

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