

The next-generation supply chain

How emerging technologies are unlocking greater visibility and agility



INSIGHTS
Worldwide Business Research



AT&T Business

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Dear friends,

The COVID-19 pandemic caused significant disruption on global supply chains and exposed vulnerabilities in many organizations and industries. In addition, the pandemic tested the

resiliency and flexibility of large supply chain leaders globally as they worked to keep operations running.

CPG, Manufacturing, and Transportation companies are now evaluating and adjusting their operational models to mitigate risks and increase resiliency. By investing in digital technologies, companies can improve visibility into their operations, proactively identify problem areas, and increase efficiencies through the entire supply chain. While many companies understand the need to blend physical capabilities with digital technologies, the constant evolution of technology makes choices more

complicated. How can you be sure that your digital solutions work as intended for your industry, your size, or your specific business needs?

At AT&T Business, we're invested in your success. We are always here for you—ready to provide support when you need it to ensure you stay connected. No matter what lies ahead, we make your success a priority by remaining alert and responsive, anticipating your business needs. That is why we have published *The next generation supply chain*. Through this report, you will learn how manufacturers, CPG companies, and transportation companies are leveraging digital technologies to improve their supply chain operations. We hope this resource provides additional insights to help make your digital transformation journey successful.

Jush Danielson
AVP, Channel Marketing
[AT&T Business](#)

Executive summary

The world is constantly changing. Supply chain professionals must consider every opportunity for transformation to keep their businesses moving forward, especially during times of disruption.

While manufacturers, consumer packaged goods (CPG) companies, and transportation companies have made significant investments in technology in recent years, there is more precedence than ever for a transformative application of groundbreaking tools like artificial intelligence (AI), Internet of Things (IoT) devices, and blockchain technology.

The challenge for companies now is determining how best to deploy these technologies to gain complete visibility into the entire supply chain. This can't occur without buy-in from key stakeholders, including internal decision makers and supply and logistics partners. Legacy systems also continue to be a challenge at some organizations as they work to integrate must-have technologies into their aging but necessary infrastructures.

At AT&T Business, we're always there for companies who are looking to transform. We're bringing you this report to share how manufacturers, CPG companies, and transportation companies are leveraging IoT functionalities and other technology deployments to improve their supply chain operations. It includes benchmarking information as well as key suggestions from industry leaders.

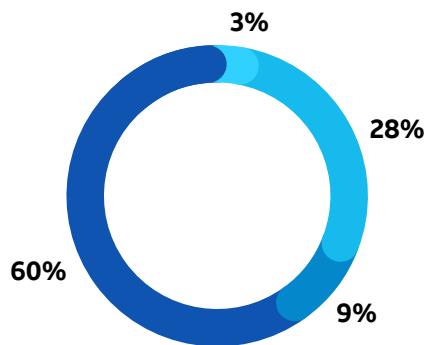


About the respondents

The WBR Insights research team surveyed 300 leaders from manufacturing, CPG, and transportation companies to generate the results featured in this report. The organizations represented in the report have at least one headquarters located in the United States.

Most of the respondents are directors (60%). The remaining respondents are vice presidents (28%), department heads (9%), or C-suite executives (3%).

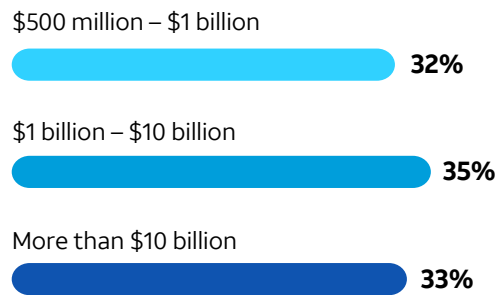
What is your seniority?



- C-Suite
- Department Head
- Vice President
- Director

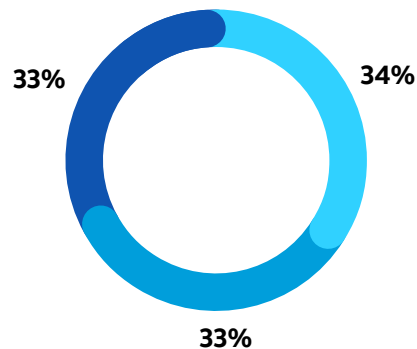
The respondents also represent companies of varying sizes as measured by annual revenue. About one-third of the respondents (33%) are from a large organization that makes more than \$10 billion per year in revenue. The remaining respondents are from organizations that make \$1 billion to \$10 billion (35%) or \$500 million to \$1 billion (32%) in annual revenue.

What is your company's annual revenue?



The respondents represent three different types of companies. In each case, about one-third of the respondents represent the transportation industry (34%), the consumer packaged goods (CPG) industry (33%), and the manufacturing industry (33%).

What type of company do you represent?



- Transportation
- Consumer Packaged Goods (CPG)
- Manufacturing

Key insights



Among the respondents:

- 71% currently use IoT technologies as part of their manufacturing, logistics, or supply chain processes. Among only this group, 52% use IoT for safety and compliance monitoring and 41% use IoT for asset condition monitoring.
- Among the 29% who do not use IoT technologies or solutions as part of their manufacturing, logistics, or supply chain processes, 47% claim difficulties integrating with legacy systems is among the challenges preventing them from rolling out an IoT capability in their supply chains. Nearly half (41%) cite ROI—no business case justifying the investment—as a challenge as well.
- 34% say integrating new technologies with legacy systems and 24% say demonstrating a business case are aspects of their business they struggle with when adopting digital solutions.
- When asked if their companies and suppliers have adopted a “single platform” framework for supply chain visibility, most claim they are either using this framework with all their suppliers (27%) or with some of their suppliers (41%). Most remaining respondents claim they are advocating for this type of framework (31%).
- 16% rate their companies’ current visibility into suppliers as “excellent,” while 58% rate it as “good.”
- 34% are currently using blockchain as part of their supply chain security strategy; nearly half (49%) are not currently using blockchain for this purpose but plan to do so in the future.

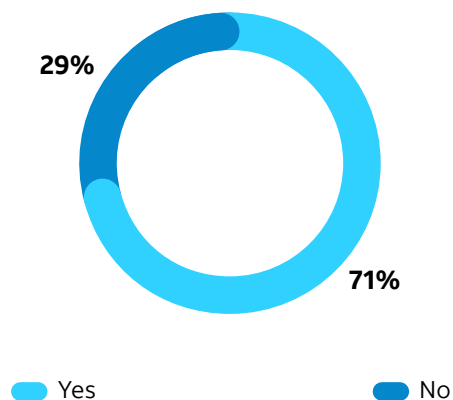
Most organizations leverage IoT despite barriers

Across industries, organizations are transforming their supply chains to be more efficient and resilient. Despite some significant challenges over the past few years, many companies in the manufacturing, transportation, and consumer packaged goods sectors have deployed technology infrastructures that grant them unparalleled visibility into their logistics and supply chain operations.

Internet of Things (IoT) technologies are at the forefront of these changes. They enable companies to track shipments across the world while simultaneously monitoring the condition of their assets. IoT devices are even being deployed in companies' manufacturing operations, allowing them to monitor their business-critical machinery in real-time as well as the production of their products.

According to this study, 71% of the respondents are currently using IoT technologies or solutions as part of their manufacturing, logistics, or supply chain processes. In the past, this type of technology was only affordable or accessible to companies with large budgets, as IoT represented the cutting edge of technology.

Do you currently use IoT technologies or solutions as part of your manufacturing, logistics, or supply chain processes?



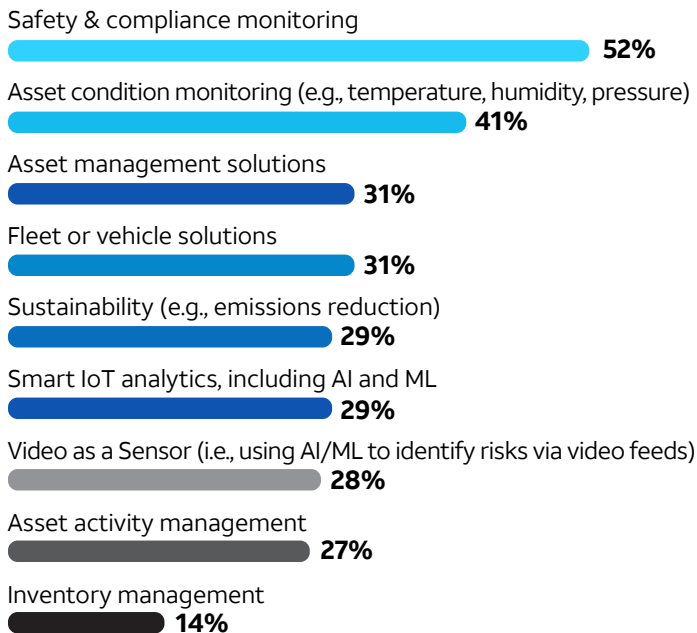
Now, it is becoming more accessible. For example, mid-sized organizations and SMBs can adopt IoT through affordable programs offered by third-party providers.

Companies are deploying IoT in a variety of ways depending on their industry. For example, most of the respondents who are using IoT (52%) say they are currently using the technology for safety and compliance monitoring. In this context, IoT devices can be installed in warehouses, vehicles, and other types of machines to monitor safety requirements and ensure suppliers and logistics partners are meeting compliance standards.

Similarly, 41% of the respondents are leveraging IoT to monitor asset conditions like temperature, humidity, and pressure during transport. This is an especially important capability for companies that produce or sell goods that must be kept in specific conditions to remain viable. Products like medicines fall into this category, but so do consumer devices, food items, and other perishable products.

Meanwhile, IoT-based asset management solutions and fleet solutions are increasingly important for transportation companies as well as any organization that relies on extensive fleet resources to manage their supply chains.

Since you said, “Yes,” for what purposes do you currently use IoT technology as part of your supply chain strategy?

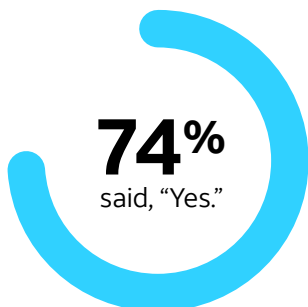


What features await the next generation of supply chain professionals?

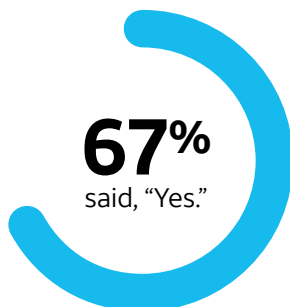
“New innovative features will increase the accessibility to critical information yet maintain security and privacy compliances.”

— Department head, transportation company

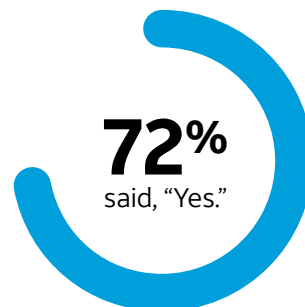
Do you currently use IoT technologies or solutions as part of your manufacturing, logistics, or supply chain processes?



Transportation



Consumer Packaged Goods (CPG)



Manufacturing

Indeed, respondents representing transportation companies are the most likely to use IoT devices among the three industries represented. Among the 74% of transportation respondents who are currently using IoT technologies as part of their supply chain processes, 29% say they use fleet or vehicle solutions.

Significantly, 29% of all the respondents currently using IoT technologies in their supply chains are leveraging them for sustainable purposes. For example, IoT sensors can be connected to fleet vehicles to monitor emissions, ensuring logistics professionals keep them within standards. Today, some IoT service providers can empower their clients to drive internal sustainability measures by deploying IoT devices across the company's assets.

What features await the next generation of supply chain professionals?

“Supply chain professionals should focus on sustainability with the support of the technology they will have in the future.”

— **Director, manufacturing company**

Organizations that aren't currently leveraging IoT devices in their supply chains cite many different types of barriers to their progress, but some of those barriers are common across industries.

For example, integrating new technologies with legacy systems is a universal challenge among companies pursuing digital transformation. At 47%, almost half of the respondents who aren't currently using IoT say this has been a challenge for them.

Other significant challenges include a lack of demonstrable ROI (41%) and a lack of buy-in from internal stakeholders (33%). These challenges are both intertwined, however, and they are more pronounced in some companies compared to others.

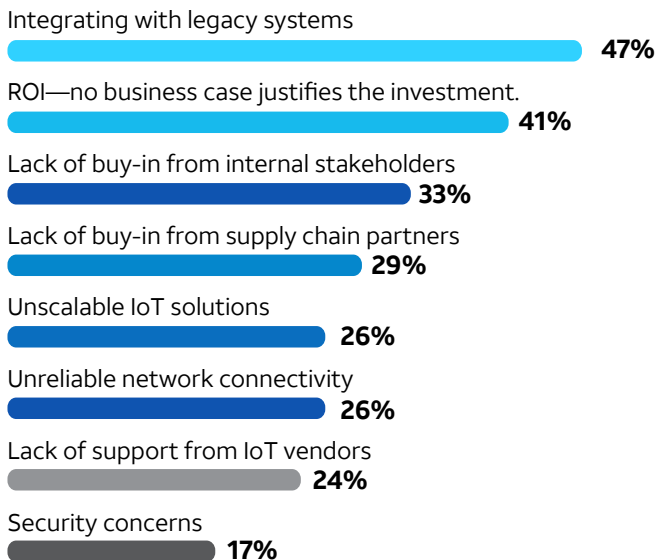
Based on the segmented data on the previous page, CPG companies are the least likely to use IoT technologies as part of their manufacturing, logistics, or supply chain processes in the study. About one-third of the CPG respondents (33%) aren't currently using IoT for these purposes, compared to 28% of manufacturing respondents and 26% of transportation respondents.

Further examination of this data reveals additional trends. Most (~52%) of the CPG companies that aren't using IoT don't do so because they can't justify ROI.

This suggests that investments into IoT technology may be easier to justify in industries that rely on larger, more expensive types of equipment, such as heavy manufacturing or transportation. In these cases, decision-makers may be more willing to invest if it means they can optimize the performance of these machines, or if it could help them reduce repair costs and maintain uptime.

Although IoT capabilities have many uses for all types of industries, technology leaders must be able to provide a business case for adoption. Case studies and industry data visualizations are often successful means of conveying the importance of investing in these technologies. Pilot programs can also help stakeholders understand the long-term benefits of investing in IoT.

Since you said, "No," what challenges are preventing your organization from rolling out an IoT capability in the supply chain?



What features await the next generation of supply chain professionals?

“There is a high demand for processes to be completed sooner. Be it manufacturing, packaging, procurement or distribution, digital assets will be used to improve on time management.”

— Vice president, CPG company

Blockchain is set to transform the supply chain

Beyond IoT, companies are still pursuing digital transformation through the deployment of other advanced technologies. Tools like artificial intelligence and machine learning can enable companies to analyze immense data sets and realize insights almost instantaneously. And because ML technology learns as it operates, these processes can eventually grow faster and more robust.

AI is also an important component in predictive analytics. This technology allows organizations to make predictions about inventory levels before demand reaches peak levels. Instead of sacrificing potential revenue due to out of stocks, manufacturers and CPG companies can guarantee products will be available when resellers and end-users are ready to buy.

Using these methods, supply chain managers can make accurate determinations about inventory based on several factors, such as region, location, usage, and time frame.

Still, some organizations are struggling to deploy these technologies as part of their supply chain operations. Over one-third of the respondents (34%) say integration is a challenge—they struggle to integrate new technologies with legacy systems. This mirrors previous responses about IoT in the report.

With which aspect of your business do you struggle the most concerning the adoption of digital solutions (such as IoT, AI, and predictive analytics)?

Integration—We struggle to integrate new technologies with legacy systems.



ROI—We struggle to demonstrate a business case for new digital solutions.



Output—We struggle to implement digital tools that track product outputs to distributors/customers.



Culture—We struggle to manage how technology changes our culture or processes.



Input—We struggle to implement digital solutions that track material inputs from suppliers.



Almost one-quarter of the respondents (24%) also say demonstrating ROI is a key barrier to adoption. Again, this response mirrors previous responses about IoT. This demonstrates that these challenges are not unique to the deployment of IoT—they are prevalent for other technologies as well, and perhaps more so for relatively unproven technologies.

Technologies like blockchain—the database technology that stores data in blocks via a decentralized ledger—are still considered experimental in many industries. However, there is growing evidence that blockchain specifically is making inroads in supply chain management.

Like IoT, AI, and predictive analytics, blockchain technology holds significant promise to increase visibility, accountability, and security across the supply chain. Although the technology originally found its start in the cryptocurrency market, it is quickly being adapted for logistics and supply management purposes.

Using blockchain, companies across the supply chain can use a decentralized and universally verifiable ledger to keep track of goods and products as they make their way from one point to another. Any deviations from the ledger are quickly identified by multiple nodes in the network. This makes blockchain technology virtually unhackable and highly resistant to fraud.

Are you currently using, or do you plan to use, blockchain as part of your supply chain security strategy?

We are currently using blockchain for this purpose.



We are not currently using blockchain for this purpose, but have plans to do so in the future.



We are not currently using blockchain for this purpose, but are considering doing so.



We are not currently using blockchain for this purpose, and have no plans to do so.



Blockchain also serves as a public ledger for transactions. This makes it possible to ensure compliance standards are met from the moment a product is produced to the moment it is provided to the end-user.

At 34%, one-third of the respondents are already using blockchain as part of their supply chain security strategy, at least to a degree. Blockchain requires

What features await the next generation of supply chain professionals?

“AI will be a new and unique feature. It will make the supply chain seamless in terms of operations. Technology will be able to predict everything, but it will provide control in challenging times.”

— Director, CPG company

participation, so it can't grant full visibility into the supply chain until every supply partner takes part in the program.

However, about half of the respondents (49%) have plans to introduce blockchain into their supply chain security strategy in the future. Another 14% are considering it.

Based on these responses, there is a high level of interest in this technology among CPG companies, manufacturers, and transportation companies. Blockchain participants would record data like prices, quality assessments, certifications, asset conditions, and more, ensuring every partner in the supply chain has access to relevant information. As a result, blockchain could improve efficiency substantially while reducing losses and costs.

What features await the next generation of supply chain professionals?

“Collaboration between external and internal stakeholders can be prompted through the use of digital platforms. Data updates will be more frequent and reliable.”

— **C-suite executive, manufacturing company**

The “single platform” framework is becoming standard

To manage these technology deployments and gain visibility across the supply chain, organizations need intuitive solutions that are accessible by anyone in the company. In the past, many organizations relied on separate suites of software to manage their supply chain capabilities. While this offered visibility, that visibility was often compartmentalized.

Now, companies have an opportunity to leverage a “single platform” framework for supply chain visibility. In this context, the single platform framework refers to a technology infrastructure that is accessible to manufacturers, logistics partners, and suppliers up and down the supply chain. It provides each party with real-time visibility without reliance on disparate systems.

In total, 68% of the respondents are currently using this framework with at least some of their suppliers. This includes 27% who are already using this type of framework with all their suppliers and another 41% who are using the framework with at least some of their suppliers.

Significantly, only 1% of the respondents are not currently using a single platform framework and are not advocating for it. The remaining 31% of the respondents aren't using it but are advocating for it.

Have you and your suppliers adopted a “single platform” framework for supply chain visibility, or are you advocating for this framework in the future?

We are currently using this framework with all our suppliers.



We are currently using this framework with some of our suppliers.



We are not currently using this framework, but we are advocating for it.



We are not currently using this framework and are not advocating for it.



What features await the next generation of supply chain professionals?

“The inclusion of emerging technologies will transform the performance of the supply chain entirely. Supply chain professionals will have access to real-time information. Decision-making fluency will also increase because of this.”

— **C-suite executive, transportation company**

These responses are similar to those of other questions relating to supply chain visibility. Most of the respondents are at least considering blockchain as a viable technology, for example. Many transportation, manufacturing, and CPG companies are searching for ways to increase real-time visibility, especially if their current solutions don't meet their needs.

Nonetheless, 74% of the respondents rate their company's current visibility into its suppliers at least “good”—they at least have an acceptable level of visibility. Within this group, 16% believe their visibility is “excellent.” They have full visibility into all their suppliers.

How would you rate your company's current visibility into its suppliers?

Excellent—We have full visibility with all our suppliers.



Good—We have an acceptable level of visibility with suppliers.



Fair—We have some visibility with suppliers.



Moving forward, real-time visibility is likely to transition from being “nice to have” to business-critical. As companies continue to migrate to the single platform framework and adopt transformative technologies like AI and blockchain, only companies that can optimize their supply chain operation will stay competitive.

Visibility will be especially pertinent as consumers, business clients, and other end-users continue to focus on digital fulfillment to obtain products. Companies can no longer afford to be out of stock or suffer from delayed orders due to supply chain miscalculations.

What features await the next generation of supply chain professionals?

“The next generation of supply chain professionals will drive the business forward using new communication and collaborative solutions. The influences of 5G and the potential of newer versions of modern telecom solutions will be pursued.”

— **C-suite executive, manufacturing company**

Conclusion: a more agile supply chain

Researchers asked the respondents to describe what they believe will be the common features of the supply chain once the next generation of professionals takes over.

Most of the respondents foresee technologies that are now novel becoming commonplace. They believe solutions like IoT, AI, and 5G will bring unprecedented levels of visibility and efficiency to supply chain operations.

For the end-user, this will lead to fewer delays. Orders will be completed in rapid time thanks to robotics and automation, and there will be fewer stock issues thanks to predictive analytics. Although this will result in more resilient supply chains moving forward, it will also result in a more agile deployment of these technologies.

As one director from a CPG company puts it, “Agility will be the most unique feature of the supply chain as digitization will be able to provide solutions for almost every situation.”

This is an important statement given the disruptive nature of the past few years. Based on the results of this study, it’s clear that manufacturers, transportation companies, and CPG companies are prioritizing visibility, sustainability, and faster processing in their supply chains strategies. They are also searching for singular platforms that will enable every stakeholder to collaborate, drive business value, and solve pressing challenges.



Key suggestions

- Implement IoT technologies as part of your manufacturing, logistics, or supply chain processes. Most organizations have already implemented IoT in some capacity and are using it for safety and compliance monitoring, asset condition monitoring, asset management, and more.
- When searching for new technology providers, focus on providers that can assist you with legacy integrations. Legacy integration was a key challenge among the respondents for both IoT and blockchain technology.
- Work with your supply partners and stakeholders to obtain buy-in for deployments of blockchain. Most organizations aren't currently using blockchain for supply chain security, but most are at least considering it for the future.
- If you haven't already, consider moving your company and your supply partners onto a single platform framework to give every party visibility into the supply chain. This may require each organization to share some data, but it could ultimately transform the supply chain to be more agile and collaborative.

About the authors



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