



N-TIER TRANSPARENCY: 10 KEY FINDINGS ON GAINING ACTIONABLE INSIGHTS IN MODERN SUPPLY CHAINS

A study of 250 CPOs and CSCOs and their
approach to N-Tier Transparency

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In the ever-evolving world of supply chain management, one principle remains constant: change.

However, the pace of this change is accelerating, driven by geopolitical instability, macroeconomic uncertainty, and rising operational costs. Organizations must navigate these disruptions while simultaneously transforming their own processes to remain competitive.

Today's supply chains are more exposed to risk than ever before. From supplier financial stability and raw material shortages to regulatory shifts, geopolitical conflicts, and natural disasters, organizations must manage a growing array of threats across their supply networks. Recent regulatory developments, such as the German Supply Chain Law, CSRD, EUDR, CBAM, and CSDDD, further amplify these challenges by demanding greater transparency, accountability, and operational adjustments.

Despite these pressures, many organizations still struggle to gain visibility beyond their Tier 1 suppliers. Supply networks are vast, intricate, and constantly evolving, making it difficult to maintain accurate risk assessments. The added impact of trade wars, sanctions, fluctuating currency exchange rates, and inflation further complicates sourcing strategies and financial planning.

To better understand these challenges, Sphera conducted a survey to explore how Chief Procurement Officers (CPOs) and Chief Supply Chain Officers (CSCOs) are addressing *N*-Tier transparency within their supply chains. The research identifies key barriers, success factors, and strategies for balancing operational, strategic, and regulatory demands. This survey gathered insights from 250 senior supply chain decision-makers across the United States and Germany, shedding light on the critical issues shaping the future of supply chain management.

Key findings

1 & 2

Visibility beyond Tier 3

While 5 in 10 organizations have visibility beyond Tier 3 suppliers, nearly 70% struggle with data accuracy and quality from Tier 2-4 suppliers.

3

Reliance on manual processes

Despite recognizing issues with poor data quality and supplier cooperation, 26% of respondents still rely on manual risk assessments for supply chain monitoring.

4

Adoption of N-Tier transparency tools

90% of respondents are either using or planning to use N-Tier transparency tools, indicating a strong shift toward technology-driven visibility solutions.

5

Investment in transparency

Half of the surveyed organizations allocate 5-10% of their annual budgets to N-Tier transparency solutions, while the other half invest 11-20%, highlighting the growing strategic importance of transparency.

6

Sustainability and upstream visibility

70% of organizations leverage upstream supplier visibility to enhance engagement on sustainability data and transparency efforts.

7

Collaboration through audits

Joint audits and assessments lead supplier collaboration efforts for transparency, with 67% of organizations using these methods.

8

Regulatory influence

Over half of organizations report that regulatory requirements such as CSDDD and EUDR are driving their adoption of *N*-Tier transparency practices.

9

Future investment priorities

In the next 12-18 months, 53% of organizations plan to prioritize investments in traceability and transparency technologies.

10

Key barriers to *N*-Tier mapping

The biggest challenges to achieving comprehensive *N*-Tier supply chain mapping are high costs (24%) and the complexity of global supply chains (22%).



KEY FINDINGS 1 & 2

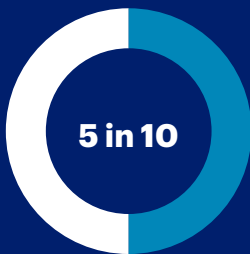
Visibility vs. transparency: Bridging the gap in supply chain risk mitigation

While many organizations report having visibility into Tier 2 and beyond, true transparency remains elusive. This lack of transparency prevents organizations from fully identifying and mitigating risks across their supply networks. Without reliable and accurate data, risk mitigation strategies remain incomplete, leaving organizations exposed to financial, operational, and compliance threats.

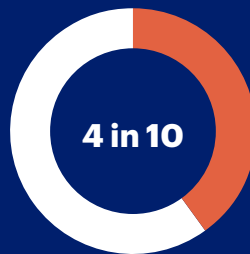
For Chief Operating Officers (COOs), Chief Supply Chain Officers (CSCOs), and Chief Procurement Officers (CPOs), achieving end-to-end risk mitigation has long been a priority. However, the growing complexity of modern supply chains, combined with fragmented data and limited supplier cooperation, makes this goal increasingly difficult to achieve. To address this challenge, many organizations have turned to N-Tier mapping technologies. Yet, despite these investments, concerns about data quality and transparency persist, limiting the effectiveness of these solutions.

Having visibility into your N-Tier and being able to identify suppliers beyond Tier 2 is an important first step. However, if you're still unable to gain transparency for risk and regulatory compliance, mapping your supply chain is simply an expensive and superfluous exercise.

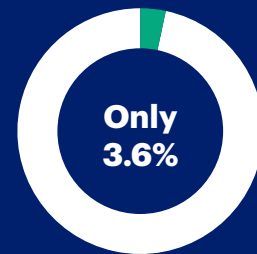
The survey data underscores these challenges:



of respondents report extensive visibility beyond Tier 3 suppliers.



only have moderate visibility, covering Tier 2 and some Tier 3 suppliers.



have partial visibility limited to key Tier 2 suppliers.



Challenges in achieving transparency

Organizations cite several obstacles to obtaining accurate data from Tier 2 and beyond:

35%

struggle with **supplier cooperation** and **data-sharing limitations**.

32%

report **poor data quality** and completeness.

28%

lack appropriate technologies or tools for deeper supply chain insights.

23%

cite **budget constraints** as a barrier to improving transparency.

22%

lack internal resources or time to address transparency issues.

These challenges highlight the critical gap between visibility and actionable transparency. Without accurate, real-time data, organizations cannot effectively assess or mitigate supply chain risks, making transparency an urgent priority for long-term resilience and compliance.

KEY FINDING 3

A fragmented approach to risk assessment beyond Tier 1

While organizations recognize the importance of assessing risks beyond Tier 1 suppliers, their approaches remain fragmented, with many relying on manual processes or third-party solutions. This lack of a standardized, integrated strategy increases the risk of data inconsistencies and gaps in visibility, making comprehensive risk mitigation difficult.

For organizations managing geopolitical risks, regulatory compliance, and environmental impacts, internal tools and systems play a significant role, but they are not universally adopted.



34%

of organizations use internal tools and systems to model risks.



26%

still rely on manual assessments based on supplier-provided information, despite concerns over data accuracy and reliability.



25%

turn to third-party risk management platforms for support.



12%

engage third-party consultants to assess risks.

The need for a more unified risk strategy

The reliance on manual assessments and fragmented third-party solutions indicates a clear opportunity for organizations to adopt more comprehensive, technology-driven approaches. As supply chain risks grow in complexity, ranging from geopolitical instability to regulatory shifts, organizations must ensure their risk assessment strategies are proactive, consistent, and scalable across all tiers.

Without a unified, data-driven approach, organizations remain vulnerable to hidden risks that could disrupt operations, increase costs, and impact compliance efforts. Strengthening supplier transparency and leveraging advanced risk assessment technologies will be key to building a more resilient supply chain.

KEY FINDING 4

Technology adoption is driving N-Tier supply chain visibility

A vast majority of organizations are embracing technology to enhance N-Tier and Sub-Tier supplier visibility, signalling a shift toward data-driven supply chain management. The survey reveals that 9 in 10 respondents use or plan to use technology and tools to track their suppliers beyond Tier 1.

A diverse range of technologies in use

Organizations are adopting a broad mix of technologies to attempt to improve supplier transparency, data accuracy, and risk assessment. The most commonly mentioned tools include:



Enterprise Resource Planning (ERP) Systems: SAP, Oracle, Microsoft Dynamics 365, Plentymarkets



Blockchain: Used for supply chain traceability and security



Artificial Intelligence (AI) & Machine Learning: Leveraged for supply chain mapping, risk prediction, and data analysis



Internet of Things (IoT) Sensors & GPS: Providing real-time tracking and monitoring of goods



Warehouse Management Systems (WMS) & Transportation Management Systems (TMS): Enhancing logistics efficiency and supplier coordination



Electronic Data Interchange (EDI): Facilitating secure data exchange between supply chain partners



Cloud Computing & Digital Twins: Enabling advanced modelling and predictive analytics for supply chain optimization



The shift toward dedicated N-Tier risk monitoring solutions

While many organizations have implemented technologies like ERP, AI, blockchain, and IoT to improve supply chain visibility, these tools were not originally designed as dedicated N-Tier risk monitoring solutions. Traditional supply chain management systems primarily focus on Tier 1 supplier relationships, leaving organizations with limited insights into the deeper layers of their supply networks. As a result, critical risks originating from Tier 2, Tier 3, and beyond often go undetected, exposing businesses to financial, operational, and compliance vulnerabilities.

Recognizing this gap, newer dedicated N-Tier transparency and risk monitoring solutions have emerged, specifically designed to address the nine essential risk categories that Chief Procurement Officers (CPOs) and Chief Supply Chain Officers (CSCOs) must manage. These categories cover:

1

Supplier-specific risks

Operational risks

Disruptions in a supplier's production, workforce, or technology.

Financial risks

A supplier's creditworthiness, liquidity, and long-term financial stability.

Reputational risks

Legal disputes, and legal violations, C-Level and core management changes.

Structural risks

Business ownership changes, mergers, acquisitions, or insolvency.

2

Regional & geopolitical risks

Disaster risks

Natural disasters, pandemics, and infrastructure failures affecting a supplier's location.

Geopolitical risks

Trade restrictions, sanctions, conflicts, and political instability.

Fiscal risks

Currency fluctuations, tax changes, and macroeconomic instability.

3

Industry & regulatory risks

Industry-specific risks

Supply and demand volatility, raw material shortages, and sector-specific threats.

Regulatory risks

Compliance with laws, including Environmental, Social, and Governance (ESG) regulations like CSDDD, EUDR, and CBAM.



How next-generation N-Tier solutions are closing the gap

Unlike legacy ERP or SCM tools, these next-generation N-Tier solutions are built to map, track, and assess risks across multiple tiers in a supply network. They leverage real-time data feeds, AI-driven analytics, and HI (Human Intelligence) verification to provide organizations with actionable insights into supplier vulnerabilities. This enables businesses to move beyond simple visibility and gain true transparency, ensuring they can proactively mitigate risks rather than reacting to disruptions after they occur.

For organizations striving to build resilient, compliant, and agile supply chains, adopting dedicated N-Tier risk solutions will be a game-changer. These platforms help businesses stay ahead of regulatory pressures, reduce financial exposure, and enhance overall supply chain stability, all critical factors in today's rapidly evolving global market.

KEY FINDING 5

Upstream supply chain visibility is essential for achieving sustainability goals

As organizations prioritize sustainability, upstream and midstream supply chain visibility has emerged as a critical enabler of environmental and regulatory commitments. By gaining deeper insights into their suppliers beyond Tier 1, companies can drive sustainability initiatives, ensure compliance with evolving regulations, and proactively mitigate environmental risks.

The survey results highlight the significant role of N-Tier transparency in sustainability efforts:



8 in 10

of respondents say visibility improves supplier engagement on sustainability initiatives.



7 in 10

report that it supports compliance with sustainability regulations and standards.



6 in 10

state that it helps them identify and mitigate environmental risks across their supply chain.



Only 1 in 10

believe upstream visibility plays a minimal role in sustainability efforts.

Beyond compliance: The strategic value of supply chain transparency

As sustainability regulations, such as CSDDD, EUDR, and CBAM, become more stringent, organizations are recognizing that upstream visibility is no longer optional. Businesses must track the environmental and social impact of their entire supply chain, ensuring that suppliers meet sustainability standards and avoid reputational risks.

Beyond compliance, increased transparency allows organizations to:



Foster collaborative sustainability initiatives with suppliers.



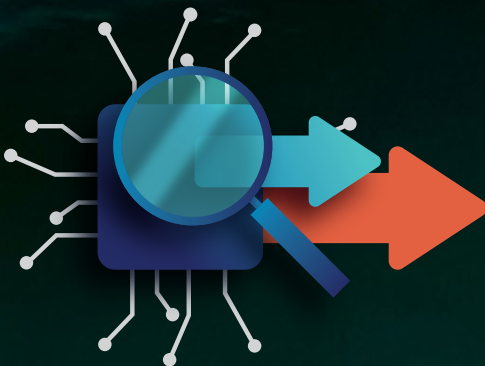
Reduce carbon footprints through better resource management and sourcing decisions.



Ensure ethical labor practices and responsible sourcing, strengthening corporate social responsibility (CSR) efforts.



Enhance stakeholder trust by providing verifiable data on sustainability commitments.



The path forward: Leveraging technology for sustainability transparency

To achieve meaningful sustainability impact, organizations must integrate advanced supply chain monitoring tools. Dedicated N-Tier transparency solutions further enable organizations to assess sustainability performance at every level of their supply network, ensuring alignment with global environmental and social responsibility goals.

KEY FINDING 6

Collaboration is key to enhancing supply chain transparency and performance

Organizations recognize that achieving true *N*-Tier transparency requires active collaboration with suppliers at all levels of the supply chain. With collaboration, companies can drive better compliance, improve supplier performance, and mitigate risks more effectively.

In order to achieve true transparency, organizations must focus on:



Artificial intelligence



Human intelligence



Supplier intelligence

When surveyed, organizations cite several obstacles to obtaining accurate data from Tier 2 and beyond:

- **35%** struggle with supplier cooperation and data-sharing limitations.
- **32%** report poor data quality and completeness.
- **28%** lack appropriate technologies or tools for deeper supply chain insights.
- **23%** cite budget constraints as a barrier to improving transparency.
- **22%** lack internal resources or time to address transparency issues.

The survey results provide clarity on this struggle within the methods of obtaining data which relies heavily on manual intervention and trust in supplier compliance:

67%

conduct joint audits and assessments with suppliers to ensure compliance and performance standards.

62%

provide training and resources to help suppliers improve their data reporting capabilities.

59%

incentivize transparency through contractual agreements, ensuring that suppliers commit to data sharing and compliance measures.

Moving beyond Tier 1:

Strengthening supplier relationships for greater transparency

While many organizations have historically focused on Tier 1 supplier relationships, the growing complexity of global supply chains requires companies to extend their collaboration efforts deeper into their networks.

By engaging with Tier 2, Tier 3, and beyond, businesses can:

- Improve data accuracy and quality by ensuring suppliers have the tools and knowledge to report information effectively.
- Align sustainability and compliance efforts by working closely with suppliers on ESG reporting and regulatory adherence.
- Reduce risks proactively by identifying potential supply chain disruptions early through joint risk assessments and performance monitoring.

The future of supplier collaboration: A technology-enabled approach

To make supplier collaboration more effective, organizations are increasingly leveraging a tripartite of solutions including:

- Human Intelligence to verify secure and transparent data sharing.
- AI-driven analytics to monitor supplier performance in real time.
- Supplier Intelligence collected through assessments and audits.

As N-Tier transparency becomes a strategic imperative, businesses that invest in proactive supplier engagement strategies will gain a competitive advantage, ensuring greater resilience, compliance, and long-term supply chain stability.

KEY FINDING 7

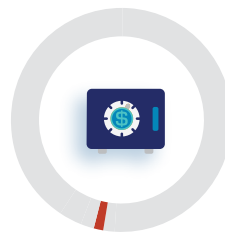
Significant budget allocation reflects the growing importance of upstream visibility

Organizations are dedicating substantial portions of their supply chain budgets to enhancing upstream visibility, signalling its increasing importance in risk mitigation, compliance, and operational efficiency.

The survey results highlight this financial commitment:



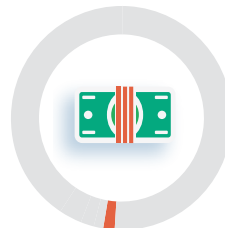
5 in 10 respondents allocate **5-10%** of their annual supply chain budget toward upstream visibility initiatives.



1.2% allocate more than **20%**, indicating a strong commitment to advanced transparency solutions.



4 in 10 invest even more, dedicating **11-20%** of their budgets to transparency efforts.



1.6% are unsure of their organization's budget allocation.



A small percentage (3.2%) allocate no budget toward upstream visibility, while **2%** invest less than 5%.

Why organizations are increasing investment in *N*-Tier transparency

The growing financial commitment to upstream visibility reflects the urgent need for better risk management, regulatory compliance, and supply chain resilience. Companies understand that limited visibility beyond Tier 1 suppliers leaves them exposed to financial, operational, and reputational risks.

Key drivers behind this investment include:



Regulatory pressure

New laws like CSDDD, EUDR, and CBAM are requiring organizations to improve supply chain transparency.



Supply chain disruptions

Geopolitical tensions, natural disasters, and financial instability demand a proactive approach to risk management.



Sustainability commitments

Companies must trace environmental and social impacts across their supply chains to meet ESG goals.



Core supplier and supply chain risk mitigation

Organizations must monitor and mitigate nine essential risk categories.

A shift toward dedicated *N*-Tier solutions

As businesses allocate more budget toward visibility, many are moving away from traditional ERP and SCM tools that were not designed for deep supply chain mapping.

Instead, organizations are adopting dedicated *N*-Tier transparency solutions that provide:

- Real-time supplier monitoring through AI and predictive analytics.
- Blockchain-enabled traceability for product origins and compliance verification.
- Advanced risk assessment tools that map and monitor supplier networks beyond Tier 1.

With nearly half of organizations allocating up to 10% of their budget and another 43% dedicating even more, it is clear that upstream visibility is no longer just an operational enhancement, it is a strategic necessity.

KEY FINDING 8

Regulatory requirements are a major driver of supply chain mapping

As global regulations become more stringent, organizations are increasingly shaping their supply chain mapping practices to align with compliance mandates. Regulatory frameworks such as CSDDD, EUDR, CBAM, and modern slavery laws are now fundamental drivers of transparency efforts, pushing businesses to enhance their visibility beyond Tier 1 suppliers.

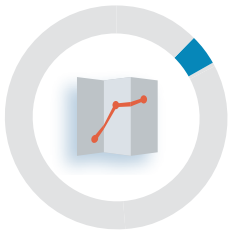
The survey data underscores the extent of this regulatory influence:



32% of respondents say regulations influence all aspects of their supply chain mapping.



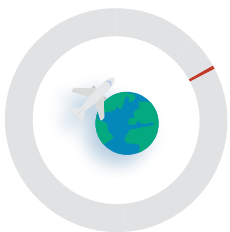
51% indicate they impact most aspects of their mapping efforts.



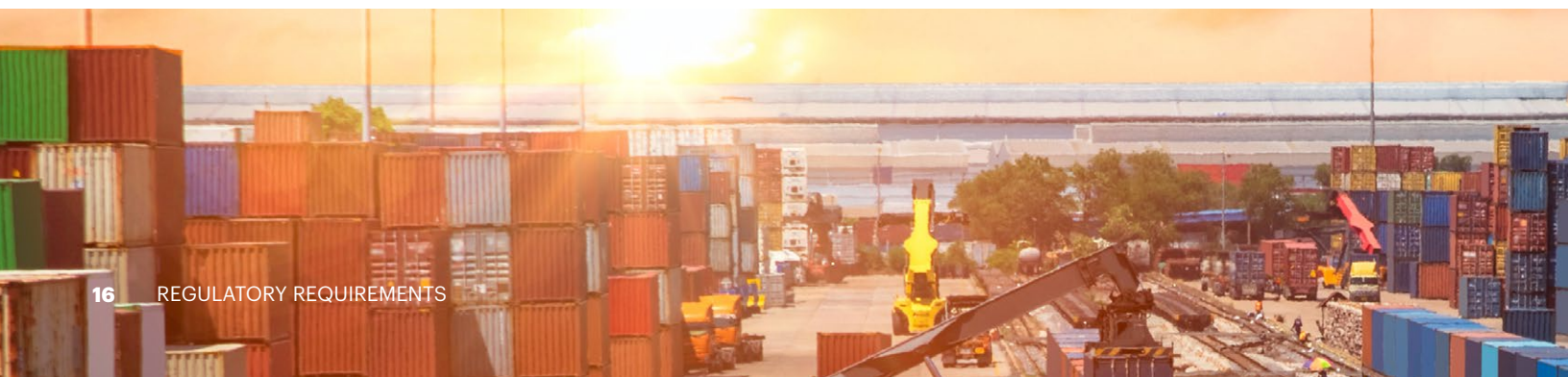
Only 4% say regulations have little influence on their supply chain mapping.



12% report that regulations affect some aspects of their approach.



0.4% are unsure about the impact of regulations.



Why regulations are reshaping supply chain mapping

Compliance is no longer an optional initiative, governments and regulatory bodies are imposing strict reporting, traceability, and due diligence requirements.

The key regulatory drivers influencing supply chain mapping include:



Corporate Sustainability Due Diligence Directive (CSDDD)

Requires companies to conduct due diligence on human rights and environmental impacts across their supply chains.



EU Deforestation Regulation (EUDR)

Mandates organizations to trace product origins to ensure they do not contribute to deforestation.



Carbon Border Adjustment Mechanism (CBAM)

Forces businesses to monitor and disclose carbon emissions from imported goods, directly influencing supply chain decision-making.



Modern Slavery Laws

Increasingly require businesses to prove the absence of forced labor in their supply chains, necessitating deep supplier visibility.

From compliance to competitive advantage

Organizations that proactively integrate *N*-Tier transparency solutions can go beyond compliance to gain a competitive edge.

Leading companies are leveraging holistic AI, HI and SI *N*-Tier solutions to:

- Reduce compliance risks by ensuring they meet legal requirements before enforcement deadlines.
- Enhance supply chain resilience by identifying potential disruptions linked to regulatory changes.
- Strengthen stakeholder trust by demonstrating commitment to ethical sourcing and sustainability.

With over 80% of organizations reporting that regulations influence most or all of their supply chain mapping, it's clear that compliance is no longer just a box to check, it is a core component of supply chain strategy.

KEY FINDING 9

Technology and collaboration are the top priorities for enhancing supply chain transparency

Over the next 12 to 18 months, organizations are focusing their efforts on improving supply chain transparency and resilience, with technology investments and supplier collaboration emerging as key priorities.

The survey results highlight the top two strategic focus areas:

53%

plan to invest in technologies for traceability and transparency for deeper supply chain insights.

42%

aim to strengthen collaboration with key suppliers, recognizing the importance of joint efforts in improving data sharing, compliance, and risk mitigation.

41%

prioritize expanding supply chain transparency beyond Tier 1 suppliers, addressing the growing need for N-Tier transparency.

40%

are focused on enhancing risk management capabilities, highlighting the rising concern over financial, geopolitical, and operational risks in global supply chains.

Only 0.4%

plan to invest in technologies for traceability and transparency for deeper supply chain insights.

The shift toward proactive supply chain management

These priorities reflect a strategic shift from reactive risk management to proactive visibility and resilience-building. As regulatory pressures, supplier disruptions, and sustainability commitments intensify, organizations are recognizing that technology-driven transparency and supplier collaboration are essential for future-proofing their supply chains.

Key trends shaping visibility initiatives



Technology-driven transparency

Companies are increasingly leveraging *N*-Tier technology to track supplier compliance, sustainability metrics, and risk factors.



Collaborative supplier relationships

Strengthening partnerships through joint audits, data-sharing agreements, and transparency incentives is becoming a key strategy for improving supply chain integrity.



Beyond Tier 1 mapping

Businesses are moving away from a Tier 1-centric approach and expanding their visibility deeper into the supply chain, ensuring holistic risk management and compliance.



Integrated risk management

Organizations are embedding real-time monitoring and predictive analytics to anticipate and mitigate potential disruptions before they escalate.

The road ahead: Building a transparent and resilient supply chain

With over half of organizations prioritizing technology investments and nearly as many focusing on supplier collaboration and extended visibility, it is clear that the future of supply chain management will be defined by digitalization, partnership, and end-to-end transparency.

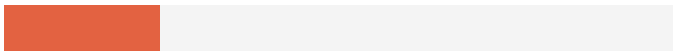
KEY FINDING 10

High costs and complexity are the biggest barriers to N-Tier supply chain transparency

While organizations recognize the importance of comprehensive N-Tier supply chain mapping, significant barriers remain, with cost and complexity emerging as the top challenges.

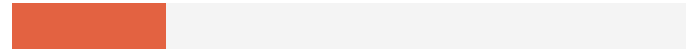
The survey results highlight the most pressing obstacles:

24%



Cite the **high costs of mapping and transparency initiatives** as the greatest barrier, reflecting the financial burden of implementing advanced traceability solutions, data platforms, and compliance programs.

22%



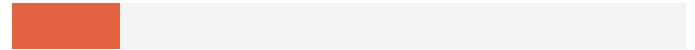
Struggle with the complexity of global supply chains, as modern networks span multiple tiers, geographies, and regulatory environments, making visibility difficult to achieve.

18%



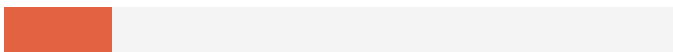
Identify **limited access to appropriate technologies**, indicating that many existing systems are not designed for deep-tier mapping.

14%

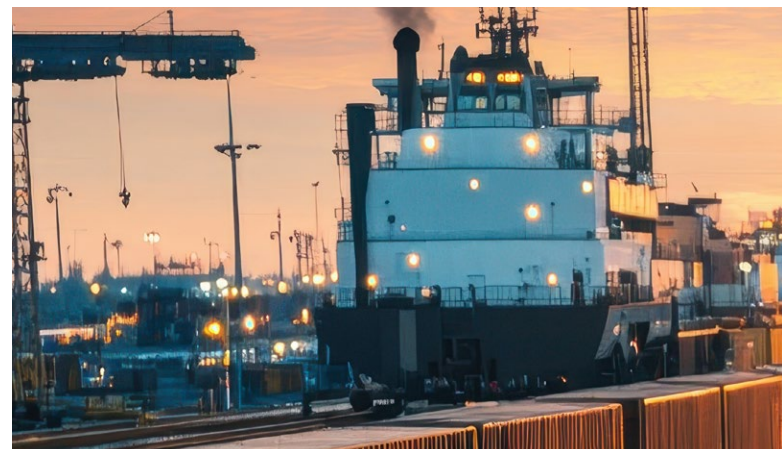


Point to **a lack of supplier cooperation and trust**, underscoring the challenge of getting suppliers to share accurate and timely data.

14%



Report **insufficient internal resources and expertise**, revealing that organizations may lack the personnel or specialized knowledge required for effective N-Tier transparency.



Breaking through the barriers: The path to effective *N*-Tier mapping

Organizations seeking to achieve comprehensive supply chain visibility must address these challenges by adopting cost-effective, scalable, and collaborative approaches:



Investing in cost-effective technologies

The rise in *N*-Tier transparency platforms is helping reduce the cost burden of deep-tier visibility.



Simplifying complexity with digital solutions

Companies are leveraging automation, predictive analytics, and real-time monitoring to streamline multi-tier mapping and reduce the challenges of managing vast supplier networks.



Enhancing supplier Collaboration

Establishing mutual transparency incentives, joint audits, and standardized data-sharing frameworks can help overcome trust and cooperation issues with suppliers.



Building internal capabilities

Upskilling procurement teams and integrating risk management, compliance, and transparency into core business functions can address internal resource and expertise gaps.

From barriers to breakthroughs

Despite the challenges, organizations that successfully navigate these barriers will gain a competitive advantage, ensuring compliance, risk mitigation, and supply chain resilience. The increasing availability of dedicated *N*-Tier transparency solutions means that businesses no longer need to rely on outdated systems, instead, they can implement fit-for-purpose tools that provide real-time risk insights and end-to-end visibility.

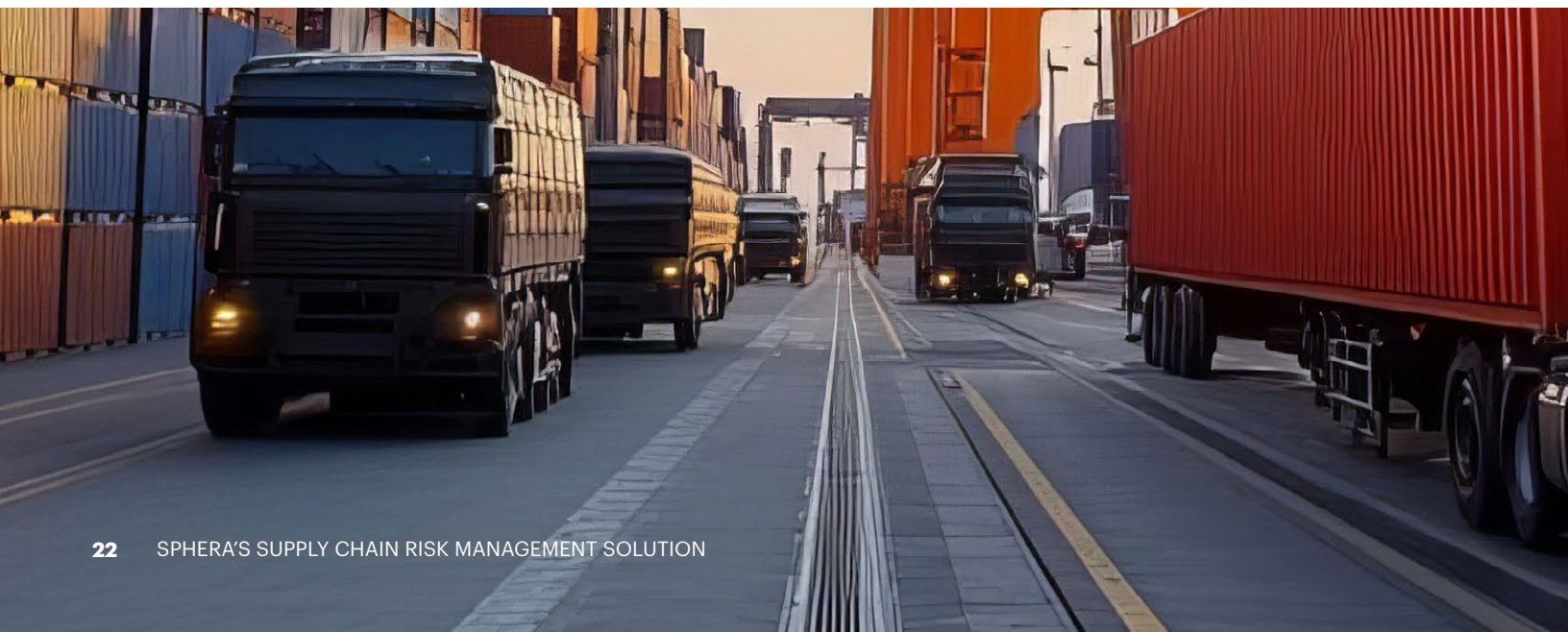




Sphera's Supply Chain Risk Management (SCRM) solution

Sphera's Supply Chain Risk Management (SCRM) solution **empowers organizations to future-proof their supply chains** by providing real-time visibility, risk intelligence, and actionable insight for proactive mitigation strategies. With a combination of **Artificial Intelligence (AI)**, **Human Intelligence (HI)** and **Supplier Intelligence**, Sphera helps innovative supplier chain leaders detect disruptions before they escalate; whether from geopolitical shifts, human rights violations, or supplier failures. Its end-to-end transparency ensures that organizations can assess risks across N-Tier suppliers, strengthening due diligence and compliance with evolving ESG regulations.

By leveraging **data-driven decision-making**, companies can transition from reactive crisis management to strategic resilience, optimizing sourcing strategies and minimizing exposure to high-risk regions. As supply chain uncertainty grows, Sphera's SCRM solution offers the agility and intelligence necessary to not just survive but thrive in an increasingly complex global market.





Sphera's SCRM N-Tier solution

With deep visibility into indirect Tier 2 & 3 suppliers (Tier N), our solution empowers you to proactively monitor and mitigate risks before they impact your business, it takes into account not only the essential 8 core risks categories but also encompasses the 9th risk pertaining to regulatory compliance.

Key benefits:



Early risk detection

Identify potential disruptions in your extended supply chain before they escalate.



Compliance monitoring

Ensure regulatory and sustainability compliance across your supplier network.



Disruption intelligence

Stay ahead with real-time insights on supplier, process, geopolitical, and environmental risks.



Cost avoidance

Reduce financial impact by mitigating issues before they become critical.



Alternative supplier visibility

Leverage a global library of suppliers to support duo- and multi-sourcing strategies.

With Sphera's **N-Tier Risk Management**, you can enhance data accuracy, eliminate blind spots, and maintain full control of your supply chain. Take a proactive approach to risk management and ensure operational resilience in today's volatile market.



Supply chains in an era of uncertainty

The future of supply chains will be shaped by new challenges and uncertainties—from climate risks and cyber threats to shifting trade policies and raw material shortages. Companies that embrace agility, intelligence, and resilience will not only survive future disruptions but thrive in an unpredictable world.

