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ESG and the Supply Chain

ESG Supply Chain Network Enablement Drives Environmental and Social Benefit along with Measurable Business Benefits

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ESG visibility, improvement and reporting is both a primary concern as well as a core strategy for many global corporations today. Environmental, social, and governance (ESG) strategies also have the potential to become significant value drivers across a digitized supply chain network. Many companies are now reporting value-based ESG metrics along with their business and financial reporting on a regular basis. Capabilities around ESG visibility and improvement are early stage and primarily related to enterprise centric variables around manufacturing and energy consumption. This is a reflection of the current enterprise system limitations and information made available by hub and spoke style enterprise-centric type of systems.

Most corporations today have moved from being vertically integrated to incorporating a horizontal network of global trading partners. This trading partner ecosystem typically represents as much as 80 percent of the manufacturing, distribution, and logistics capacity related to the products being produced for the end consumer. And this means that 80 percent of the data and ESG improvement potential resides outside the enterprise in the form of upstream contract manufacturers, subsystem suppliers, tier 1, 2 and 3 supplier factories, distribution centers, warehousing, and logistics.

It is easy to see why major corporations will struggle with visibility and targeted improvements related to ESG given that as the demand generator in the network they only have the ability to report and improve upon 20 percent of the related variables while 80 percent remain with their trading partners who are running on a completely different set of systems and system architectures.

The enterprise systems in play today do provide some planning capabilities upstream and downstream in the supply chain network, but come up short when it comes to visibility, data, and execution. ESG reporting and more importantly the ability to improve upon the related variables is tied to understanding both the planning and execution of demand, supply, and logistics across the entire trading partner ecosystem.

The E in ESG, environmental criteria, includes the energy companies utilize, the waste they discharge, the resources deployed, and the impacts on life as a result of executing their business operations. E includes variables like carbon emissions, climate change, water management, greenhouse gas emissions, and chemical usage. Every company is essentially a hub where they both use and contract with their suppliers who use energy and resources across a horizontal trading partner network. Every company impacts the environment. The mindset of suppliers being just a spoke attached to an enterprise hub has left corporations with limited ESG visibility to upstream suppliers.

The S, social criteria, addresses the relationships companies have and the reputations they maintain with the people and institutions in the communities where their supply chain networks do business. S includes labor relations, diversity and inclusion. Every company operates across both a global supply chain network as well as a broad and diverse society.

The G, governance, is the internal set of systems which enable the practices, controls, and procedures companies adopt to govern, make effective decisions, comply with the law, and meet the needs of external stakeholders. Global supply chain networks, in addition to enabling for environment and social, require special care in the creation and management of supplier contracts to ensure that proper governance is enforced for critical variables such as child labor.

ESG has become foundational for companies in today's complex business environments. However, the ESG components themselves are not standalone, but rather are interrelated. For example, social criteria can overlap with environmental criteria and governance when companies seek to comply with environmental laws combined with concerns related to sustainability. Delivering on the governance aspects of ESG calls for performing not just to the letter of law but also their spirit. The digitized supply chain network capabilities required to deliver on the E and the S extends nicely to the G so that companies can get in front of violations before they occur, and enable transparency and collaboration with regulators leveraging real-time data as opposed to just submitting a report and hoping for the best.

The US Business Roundtable released a statement in August 2019 strongly affirming business's commitment to a broad range of stakeholders, including customers, employees, suppliers, and communities. According to a recent report by McKinsey, it is estimated that global sustainable investment now tops $30 trillion—up 68 percent since 2014 and tenfold since 2004. The acceleration has been driven by heightened social, governmental, and consumer attention on the broader impact of corporations, as well as by the investors and executives who realize that a strong ESG proposition can safeguard a company's long-term success.

From a value creation perspective, delivering on ESG has shown higher corporate equity returns along with reduced downside risk. Maintaining this momentum moving forward requires a digitized supply chain network which includes all trading partners and runs based on a single version of the truth. Further, the network itself must be able to provide visibility to all state changes in the network - which are the core of ESG reporting. It is when something in the network changes state, whether it is the selling, procuring, making, moving, or storing product, that a company consumes or produces variable changes critical to ESG. In effect each company in the hub-to-hub network is enabled through a state-based ledger which ensures accurate and real time reporting of all variables.

Generating value across the supply chain network requires that the ESG solution platform resolve for today's increasing demand and supply variations which have exposed critical supply chain weaknesses, particularly among manufacturers and suppliers with poor workplace health and safety practices. In addition, evolving global guidelines for greater inclusion and transparency has resulted in companies with alleged human rights violations throughout their supply chain or lacking diversity within their workforce coming under increasing public scrutiny.

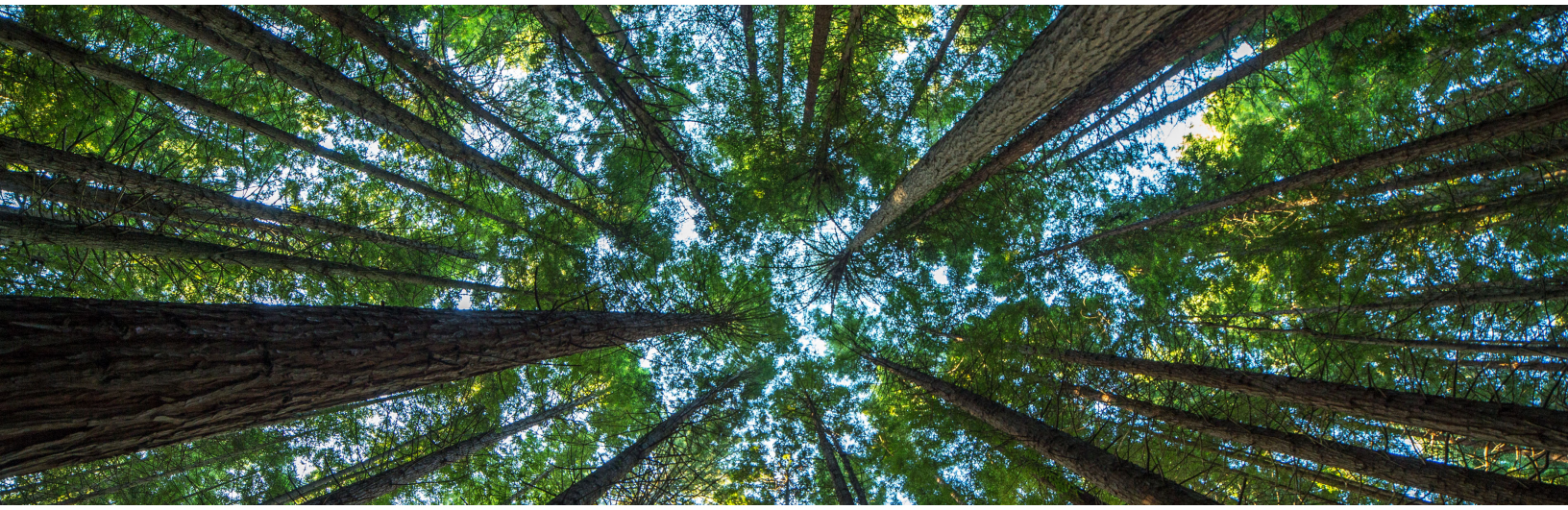
Moving forward, regulatory and consumer pressure for climate action has prompted companies to make a record number of ESG sustainability commitments. These commitments amplify the importance of sustainable, resilient, transparent, and legally compliant supply chains. While many companies have begun to report and adhere to the highest level ESG performance standards in their own operations, many of their suppliers may not hold similar practices.

Studies have estimated that up to 90 percent of a company's sustainability impacts originate in a firm's supply chain. Companies such as Nike, Marks & Spencer, and Hershey's have all recently experienced reputational and financial fallout caused by ESG-related scandals in their supply chains. Given the benefits to gain and the risks to lose, corporations are turning towards their supply chains to incorporate ESG considerations.

This risk management is a key reason for corporations to enable a multi-party, multi-tier digital supply chain network capability. The ability to better identify and manage potential risks across the trading partner ecosystem along with full supplier collaboration needs to become a core ESG and sustainability capability. Looking upstream in the network, the ability to mitigate raw material risks and their related supply chain disruptions has become critical in today's market. Costs have increased across the network due to supply chain disruptions which can be resolved resulting in greater productivity and efficiency. And the manufacturer's brands themselves can suffer reputational damage due to both upstream and downstream issues which must be managed through an advanced ESG supply chain network. Given the ability to mitigate risk, ESG and sustainability enablement directly generates increased shareholder value along with providing benefit to all partners across the supply chain network due to reduced variability in demand and supply along with providing reduced information and physical supply chain lead times.

The variability and disruption companies are experiencing today will be systemic moving forward. Resilinc reports that supply chain disruptions are up 67 percent over the past year not including the effects of COVID. Problems that affect companies today are often external to any one enterprise and thus a network-based solution and technology approach is warranted.

As markets continue to rebound while still being plagued by ongoing disruptions, corporations, customers, buyers, sellers, logistics providers, federal governments, and investors are all calling for systemic changes in supply chain management to prevent future disruptions. Evolving consumer demands for transparency along with increased stakeholder attention on the ESG performance of a company's suppliers has also placed pressure on companies to change how they enable their



supply chain capabilities through advanced software systems. Resiliency, continuity, and operational readiness are core capabilities required to further reduce disruption, provide for risk anticipation, and be able to mitigate that risk. Enabling an end-to-end digitized supply chain network for planning and execution provides risk reducing capabilities such as diversifying the supply base geographically, multi-sourcing key commodities, or reducing the number of unique parts required for assembly. Advanced analytics play a big role in inventory management, for example multi-echelon inventory optimization (MEIO) algorithms to revisit safety stock parameters along with structuring redundancy in transportation routes and promoting secondary supplier relationships.

These measures enable a disrupted supply chain to regain full functionality after a shock much faster than less resilient supply chains. For example, when COVID began, the food retailing companies running on One Network were able to easily ratchet up volumes while the food service companies were able to ratchet down, in near real time, as demand shifted, without incurring waste or additional costs. It has been shown that less resilient supply chain can lose as much as 40 percent or more of their annual profits over extended time periods.

Today many companies are budgeting initiatives to 'green' their supply chains. Manufacturers are innovating with eco-friendly packaging, while retailers are developing low carbon alternatives. In 2020, there was also a dramatic increase in large manufacturers and retailers committing to carbon neutral operations – including reduction commitments across their supply chain operations. For instance, Apple and Novartis, committed to being 100 percent carbon neutral across their respective supply chains by the end of 2030. Microsoft committed to removing its historic emissions by 2050, in addition to achieving a carbon neutral supply chain. Surveys have shown that consumers will pay a premium for sustainably produced products. Companies with more sustainable practices can better attract top talent, boast higher retention rates, and increase customer loyalty.

Given the necessity of including suppliers as part of the ESG initiatives, an advanced supply chain network which can represent all trading partners in the ecosystem is a must have, along with a real-time single version of the truth which sits on a ledger-based platform to track all state changes and related environmental reporting and impacts across the end-to-end network. Understanding state changes in real time is the only way to get ahead of both the risks and the problems, along with implementing processes which ensure future performance.

Supplier risk can have severe impacts on corporations who can face significant financial and reputational risks when their suppliers violate labor laws, discriminate, or negatively impact their local communities. Several fashion brands, including Boohoo and H&M, faced intense public backlash in 2020 due to the alleged use of forced labor by their suppliers. In contrast to this negative risk, IBM attributes its supply chain diversity as being a key factor in winning contracts. Governments are also increasingly considering a supplier's supply chain sustainability in major procurements and approvals for large, complex projects such as infrastructure, mining, and energy projects. Supplier representation in a

supply chain network can be configured to include these types of supplier risk along with the related reporting.

Improving information visibility, data collection and management of suppliers' ESG performance must be included as part of the supply chain network strategy. Companies need visibility to quality data on end-to-end operations to ensure compliance with current and future disclosure regulations, as well as enable reporting requirements of voluntary standards which include the Global Reporting Initiative (GRI), Task Force on Climate-Related Financial Disclosures (TCFD), and the Sustainability Accounting Standards Board (SASB). As part of the voluntary disclosure, many companies would like the ability to publish information related to their suppliers' production facilities, allowing their customers to trace the origins of their products upstream in the supply chain network. With 80 percent of Fortune 100 companies using the GRI standards to report on their sustainability-related activities, voluntary disclosures of a company's supply chain sustainability are becoming more commonplace and now expected by many stakeholders.

The problem is that based on the limitations of hub and spoke style ERP software, companies have only been able to gain ESG related visibility to the data from their Tier 1 suppliers using the available point to point integration provided by these software solutions. The hope is that that these suppliers will promote ESG reporting upstream into their own supply base. In practice, this rarely occurs and significant ESG risk persists. The intense stakeholder scrutiny Adidas and Calvin Klein experienced when upstream suppliers were found to be dumping chemicals into rivers in China or the public fallout HP and Apple underwent when allegations surfaced of hazardous working conditions in suppliers' factories are examples of the upstream risks that suppliers add to a company. Companies can mitigate these risks by including all upstream suppliers in the supply chain network platform in order to mitigate vulnerabilities. Gaining total visibility on end-to-end operations is table stakes moving forward and most corporations will require a platform upgrade in order to deliver on these capabilities and the related goals.

To enable for ESG both today and in the future, the optimal technology stack will be based on a real-time SVOT supply chain network which sits on a state-based ledger style platform that alerts for risk and disruption. This needs to be coupled with artificial intelligence (AI) and machine learning (ML) to provide prescriptive analytics based on having end-to-end visibility and data across the supply chain network. Companies can leverage massively scalable digital solutions to collect, aggregate, and analyze ESG data across all suppliers while also collaborating on actionable solutions driven through the latest AI/ML technologies.

Drive ESG and sustainability strategies to become core to decision-making, where transportation planning and execution considers ESG/Carbon emission factors, and where ESG ratings can be configured as one of the objective functions for planning various assets including vehicles. And as part of tendering, ESG rating can be considered as part of the overall tendering strategy. One Network Enterprises enables these types of capabilities and is unique as an advanced technology platform and software solution. We provide the ability to create opportunities for businesses to identify problematic suppliers upstream in the network up to tier 3 and beyond, avoid costly controversies, and promote sustainability efforts with the certainty that their total supply chain will stand up to stakeholder scrutiny.

About the Author

Joe Bellini is certified in AI/ML from the MIT Sloan School, is an alumnus of Harvard Business School, and has degrees in Applied Mathematics and Statistics and Mechanical Engineering. He is a past award winner in the Mathematics Olympiad competition and has been listed by Supply and Demand Chain Executive Magazine as a Pro to Know for the past two years.

ABOUT ONE NETWORK

One Network is the leader in intelligent control towers for autonomous supply chain management. From inbound supply to outbound order fulfilment and logistics, this multi-tier, multiparty digital platform helps optimize and automate planning and execution across the entire supply network and every trading partner. Powered by NEO, One Network's machine learning and intelligent agent technology, real time predictive and prescriptive analytics enable industry-leading performance for the highest services levels and product quality at the lowest possible cost. It's the industry's only solution with a fully integrated data model from the consumer to suppliers and all logistics partners, providing a network-wide, real-time single version of the truth. Leading global organizations have joined One Network, transforming industries like Retail, Food Service, Consumer Goods, Automotive, Healthcare, Public Sector, Telecom, Defense, and Logistics. Headquartered in Dallas, One Network has offices across the Americas, Europe, and APAC. For more information, please visit www.onenetwork.com

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