

e2open

WHITE PAPER

Orchestrating Every Link:

Equipped for Today's and Tomorrow's Supply Chain Opportunities

Executive Summary

Organizations today are forced to address a new business reality. Struggling with high volatility, fast-changing markets and unpredictable consumer preferences, many still lack the power to tightly connect planning to execution. Meanwhile, agile upstarts and seasoned competitors with strategic online storefronts compound the Amazon effect and lead companies to take drastic measures to compete. These are just some of the issues.

Yet for many companies, one of the biggest roadblocks to unlocking the value in their supply chain is the rigidity of the very software they rely on to manage it: enterprise resource planning (ERP) and legacy enterprise systems designed for a different time under an outdated paradigm. To move beyond those limitations, companies must evaluate ways to achieve an integrated, agile and intelligent system that can solve enormously complex problems and deliver a competitive advantage.

Since planning decisions should be based on what is happening now, not last week or last year — and execution needs current signals to be smart — only a connected, intelligent supply chain can meet the need. The right technology senses real-time consumer demand, sees into supply constraints to determine what is possible and enables outside-in planning for a feasible and profitable strategy.

To achieve this, e2open has created one place in the cloud to run the supply chain that provides intelligent applications, a unified user experience, decision-grade data and an end-to-end platform for all direct and indirect channels. This solution brings together data from customers, channels, suppliers, contract manufacturers and underlying systems and sources to create a virtual representation of processes, status and stock — all of which is visible by internal and external stakeholders according to their role.

E2open adds advanced supply chain management (SCM) applications powered by cognitive artificial intelligence (AI), machine learning and automation so companies can use real-time data to deliver new insight and drive smarter decisions. By orchestrating every link so the supply chain functions in harmony, e2open's end-toend, modular platform delivers efficiency, agility and visibility while lowering costs and increasing productivity. E2open inspires enterprises to unchain their full potential for growth, value, and competitive advantage in ways that are transformative for the business.

A New Wave of Change

Today's competitive enterprise faces a new wave of challenges that go far beyond adopting ways to source raw materials, manufacture finished goods and fulfill customer demand. Pressure, turbulence and rapid change demand more from the supply chain than ever before, taking it from a tactical tool for product delivery to a means for achieving and retaining competitive advantage. The supply chain is now tasked with enabling companies to excel at customer service, exceed ever-changing customer expectations and capture new opportunities to drive profitable growth. As technology makes possible unprecedented capabilities — including big-data access — companies are paradoxically limited by technology. Freedom from traditional restrictions seems impossible in the midst of legacy systems and practices, cumbersome integrations and siloed workflows, among other things. Companies seeking to establish a more agile, collaborative, predictive and automated supply chain require the right technology to do so. What is needed is an integrated and unified end-to-end technology solution equal to the task with value extending far into the future.

Traditional Technology Limitations

For years, companies have invested heavily in ERP systems. These systems work well for many aspects of a business, such as creating a transactional system of record, which is far different from a supply chain planning system of record. With all the value ERP systems bring to businesses worldwide, they fall short of expectations when it comes to certain functions. SCM is one of them.

ERP's promise of powerful SCM applications has gone largely unfulfilled, and the basic SCM functionality from vendors offering modules that plug into core ERP has proved inadequate for optimizing operations, satisfying customers and eclipsing competitors. Today, with the immense capabilities of cloud computing and modern software, it's clear that a truly effective solution cannot be achieved through ERP alone.

Companies have searched for niche solution providers with applications that can sit on top of ERP systems and provide more robust functionality. This has entailed patching in best-of-breed software for a small number of capabilities while retaining ERP vendors for most other needs. Integration is achieved in a oneoff fashion, uniquely by each company, depending on the particulars of their technology landscape — a proposition that is both costly and suboptimal.

Roadblock to Opportunity

Relying on traditional foundations and practices has become a roadblock that prevents highly capable organizations from taking the right steps to achieve critical business goals:

- Integrating disparate solutions: Companies strive for a more effective supply chain but cannot wring efficiencies out of a disjointed combination of disparate ERP systems and point solutions.
- **Competing for market share:** Every industry has an Amazon. The struggle to keep up requires weighty investments to secure sufficient market share and stay in the game.
- **Gaining insight:** Companies need to be smarter but find themselves drawing upon stale, outdated information from legacy systems. Hands are tied despite the masses of data available across the supply chain.

- **Breaking out of silos:** Rapid and decisive action is impossible due to delays caused by decisions made in silos with incomplete information.
- Connecting with partner ecosystems: It is critical to extend planning and execution beyond internal operations by connecting with partner ecosystems. This opportunity usually falls to the wayside, keeping companies from making better planning and execution decisions.
- Supporting the company vision: Supply chain capabilities should support the overall company vision, not hinder it — yet often the supply chain becomes a gating item. Technology limitations can also impact the agenda set forth by the chief supply chain officer (CSCO).



The Challenge of a New Business Reality

Companies must be armed with new tools and technology that empower the supply chain to drive the business. The reality is that the challenges have multiplied for today's organizations, demanding more than just another patched-in point solution:

- Volatility and complexity: Changing consumer preferences and growth through innovation have led to high stock-keeping unit (SKU) proliferation. In some markets, the number of items that turn over every year is staggering. The vast majority of introductions end up in the long tail, making it harder to run a profitable business.
- **Competitive pressures:** Competition from new, customer-centric entrants is increasing. There's an "Amazon" in nearly every industry. Likely every company can easily identify its Amazon and knows too well the impact of competition has on the business.
- **Financial pressures:** Companies are under tremendous pressure to perform financially, often focusing heavily on productivity and returns. CEOs are in danger of being sacked if market performance lags or upstarts have a larger market cap.
- Activist shareholders: Even companies with record profits are feeling the heat as they try to stay ahead of activist shareholders. Threats of hostile takeovers and private equity waiting at the gates have escalated the urgency to perform to an all-time high.

- Record merger and acquisition (M&A) activity: Extreme levels of M&A activity across the board put companies in constant flux. M&As repeatedly reshape the supply chain, with each new deal adding more discrete and disparate ERPs and enterprise systems to integrate.
- **Traceability, recall, regulations and more:** The ability to track components and monitor quality is becoming increasingly important. Regulators in many industries are tightening mandates, particularly in the area of pharmaceuticals.
- Omnichannel engagement: In many industries, an omnichannel approach is mandatory to remain competitive. Companies require the ability to efficiently support omnichannel strategies using effective collaboration across stakeholders based on a single source of truth.
- **Outsourced manufacturing:** In industries like high-tech, outsourced manufacturing is well established. For other industries, including consumer packaged goods (CPG) and food, the ability to pursue strategic initiatives like growth through innovation is becoming increasingly important.
- Agility to reflect business priorities: As CEO priorities change from year to year, the supply chain must be nimble enough to reflect those mandates and support the overall company vision.

Present and Future Supply Chain Requirements

The complex problems companies face today are not met with the systems architecture to solve them. Organizations require technology that addresses the challenges of today's new business reality and carries the supply chain well into tomorrow.

Synchronized System for Addressing Complex Problems

Global enterprise customers operate on a mammoth scale with many partners and disparate technologies to consider. They struggle to get information from where it originates and bring it into their systems in real time. Once information arrives, the supply chain applications used today are too narrowly defined for each functional area to make optimal use of the data.

Such systems perpetuate silos where applications and functions operate with an incomplete view. The current state of the supply chain looks different to each group, and their inability to see problems from others' perspectives exacerbates the situation. Different groups end up trying to solve the same high-level problem, often with completely different motivations and conflicting objectives.

By freeing up — and speeding up — information so stakeholders across all functional areas can use it in real time, companies can operate far more efficiently and unchain themselves from current architecture constraints. Readily available information enables cross-functional workflows and real process integration that brings teams together collaboratively and enhances decision making. Adding modern applications along with algorithms for AI and machine learning boosts the power of those data flows so the organization can get better insights and react with much more agility in the face of market pressures.

In the end, companies prefer not to think about conducting a planning process or transportation process. By transforming the supply chain into a synchronized system, they can worry less about running a supply chain and instead focus on running a business.



Capitalizing on Technology Advancements

Recent technology advancements have introduced the potential for big changes in SCM. One of the most significant is cloud technology, which provides for a new modular, extensible architecture that sits above multiple disparate ERP solutions and transactional systems of record.

Technological progress has also made possible connected ecosystems that can encompass all internal operations while extending beyond the four walls of an enterprise to include channel, supplier and logistics partner ecosystems. The result is connectivity across the end-to-end supply chain.

Al, another advancement, enables the conversion of masses of real-time data available in most business ecosystems into meaningful and actionable information. This facilitates continuous end-to-end planning and execution in a highly automated supply chain that can both sense and predict.

Analysts are increasingly recommending unified platforms to take advantage of these technology breakthroughs.



Building Blocks of the Next-Generation Supply Chain

The supply chain of the future will be very different from what it is today, with algorithms, machine learning, cognitive computing and AI playing bigger roles. Building an SCM system that works in harmony is the foundation for success in that fast approaching future.

The next-generation supply chain must combine four key components that offer enterprises a unified, end-to-end digital cloud platform for SCM:

- A unified user experience: Companies need a common user interface that brings together data from every internal and external source and displays it in a single, cohesive view. Stakeholders must be able to obtain the up-to-the-minute information they need in a single location with role-based access. Business process workflows should extend across applications so they can quickly address cross-functional problems.
- **Multi-enterprise connectivity:** Many large corporations have multiple ERP systems and a wide range of external trading partners. To make full use of disconnected and siloed data, companies need a network to connect all stakeholders both internal and external.
- A digital twin of the supply chain: Multi-enterprise connectivity allows for the collection of data across the supply chain. To put this data to work, the next step is to establish a digital abstraction

layer that represents the end-to-end physical supply chain — also known as a "digital twin" — and continuously update it with a flow of information from underlying ERP and executional systems.

• A full suite of supply chain solutions: With a digital twin in place, organizations can then implement a broad range of planning, execution, visibility, collaboration and optimization applications powered by a common data platform so all parties share a single version of the truth for all functions.

Organizations can begin at their current level of supply chain maturity and use these building blocks to rapidly get ahead of the competition. With AI and automation, the digital twin gets smarter with every input, automating more work over time so supply chain managers can focus on the highest-value tasks.

In the end, this proven approach allows companies to transform data coming from their supply chain into a single, seamless flow of highly accurate, real-time insights. The result is unchained growth and a clear business advantage.

Ability to Leverage Outside-In Planning

With traditional planning workflows, companies develop demand and supply plans based on information within the four walls of the enterprise. Often referred to as "inside-out" planning, this is disconnected from what is occurring beyond those four walls. Inside-out planning fails to account for what is happening right now in the channel or with suppliers, resulting in a blind spot. Some systems might have visibility in the first tier, but there is nothing beyond — and traditional planning systems were not designed to use this kind of information anyway.



In reality, demand starts far outside the enterprise, with the consumer. A true picture of demand starts with getting point-of-sale (POS) consumption data and including channel data from retailers, resellers and distributors to determine what inventory is on hand. Customer collaboration should be included as well. All these inputs are required to sense actual demand and use it to plan across horizons.

Likewise, most of the supply risk also lies outside the enterprise — particularly if manufacturing is outsourced. Visibility into multiple tiers of supply, contract manufacturers and co-packers is essential to gain a true picture supply constraints and use them in planning. Supply constraints can even extend to remote suppliers five or six tiers down, so complete visibility is essential.

True end-to-end planning that can actively sense changes in market conditions and respond will combine consumer demand with supply constraints and balance these two factors with corporate objectives. This is "outside-in" planning — and it's only possible with an end-to-end platform.

Game Changer: Shaping the Demand Response

Connecting to the channel ecosystem does far more than feed data to planning engines. The flow should be bidirectional so the channel serves as a lever to shape the demand response based on supply constraints or even to create new demand. The ability to pull this lever and create a value-optimized response within the sales and operations planning (S&OP) process takes planning and execution to a new level.

For example, a company is approaching year end and senses a demand for 100,000 laptops with 1 GB of memory. Supplier collaboration reveals that the supply of 1 GB memory is constrained because only 25,000 units are available, but there is an excess inventory of 200,000 2 GB memory modules. As part of the S&OP meeting, stakeholders discuss the matter and engage sales operations to run an incentive program offering the 2 GB unit for the same price. Al demand software predicts an increase of 10 percent in demand with this offer when it is marketed as a promotion.

In the example, a connected platform enables both internal and external stakeholders to understand and evaluate all these options during a single S&OP meeting. The result is that the technology company exceeds its number because of the promotional uplift and uses its excess 2 GB chips with a short shelf life and declining book value. This value-optimized response can only be achieved with outside-in thinking and a platform capable of outside-in planning.



Benefits for the C-Suite

E2open's connected supply chain technology delivers unprecedented insight into how day-today operations contribute to high-level strategic plans established at the C level:

CEOs:

Leveraging end-to-end supply chain technology allows the company to monitor and preserve efficient processes and increase agility for overcoming disruptive market forces.

CFOs:

A more efficient supply chain helps the organization operate with less stock on hand while improving productivity, increasing cash flow and cutting operations expenses.

CIOs:

Software that integrates seamlessly allows the company to gain industry-leading functionality while taking advantage of existing investments.

CSCOs:

Timely, high-quality, wide-ranging data combined with cross-functional workflows and applications addressing every aspect of SCM result in an agile supply chain equipped to support the corporate vision.

COOs:

Supply chain efficiency goes hand-in-hand with operational efficiency, improving costeffectiveness and protecting profit margins.

A Unified End-to-End Platform for Orchestrating Every Link

An end-to-end SCM approach reduces time to value and total cost of ownership compared to custom-integrated point solutions from multiple vendors. A single end-toend solution also streamlines planning workflows to increase productivity, freeing planners to focus on higher value-add activities instead of reconciling spreadsheets or replicating information in disparate systems.

Large companies with extremely complex supply chains need a platform that provides the end-to-end coverage offered by ERP systems combined with the best-ofbreed capabilities offered by point solution providers in a way that integrates and functions seamlessly. To achieve this, e2open has created one place in the cloud to run the supply chain using a unified end-to-end platform, enabling organizations to orchestrate every link in the supply chain.

Three essential elements that drive the connected supply chain are validated data, the SCM engine and cross-functional workflows. E2open technology supports these three pillars as strategic success enablers.



Strategic Enabler 1: Timely, Validated Data

Data determines the success or failure of supply chain initiatives now and in the future. The best and most useful data is optimized in terms of range, quality and timeliness:

- **Range:** To establish a far-reaching, comprehensive data range, data must be collected from all supply chain nodes that can impact customer satisfaction.
- **Quality:** Data from all nodes should be cleaned in source systems if possible. If not, errors should be identified and resolved collaboratively before they propagate further into SCM systems.
- **Timeliness:** To be useful for decision-making, data has to reach the company's planning and execution system before it is outdated.

E2open can gather data from the entire span of the supply chain the company controls. Data is acquired in a number of formats and by a number of methods, including certified adapters for ERP systems like SAP® and Oracle® as well as a full range of business-to-business (B2B) protocols. If the supply chain is simple, it may be as straightforward as collecting data from suppliers, factories and delivery operations. Larger enterprises with complex supply chains often have multiple fulfillment models, outsourced production, warehousing, logistics and distribution. These companies need a digital twin, a layer in the network representing the supply chain and bringing all data together from every link in the chain.

For the supply chain architecture to utilize all data from such a range of sources, the data must be normalized by converting it into a common format such as the Open Applications Group Integration Specification (OAGIS) standard. As soon as data is available from any node, it must be processed and propagated to all planning and execution systems.

The core platform component that enables data capture and normalization is the e2open Network, or E2net for short. E2net enables connections to all participants of the end-to-end supply chain, including external stakeholders.

Elements of the Supply Chain Digital Twin

The supply chain digital twin provided by e2open establishes a digital abstraction layer representing the end-to-end physical supply chain and continuously updates it with information from underlying ERP and executional systems. A transparent view of the truth lets organizations collaborate instantly, balancing supply and demand in real time.

Harmony

Designed based on extensive research into user habits, needs and preferences, the Harmony user platform delivers a consistent, sophisticated interface across all e2open's offerings. Personalized dashboards, easy drilldowns and actionable workflows enable users across the extended supply chain to connect, collaborate, visualize, plan and execute.

With Harmony, key business processes are streamlined via actionable views and integrated workflows, connecting users to applications and analytics powered by information from both within and outside the enterprise. The system presents one up-to-the-minute view for everyone involved — a single version of the truth, offered through a single pane of glass, for faster problem resolution, greater efficiency and productivity, and smarter decisions.

Intelligent Applications

Intelligent applications connect demand to supply, and planning to execution. This creates agility, intelligence, foresight and automation. Companies can sense demand using channel data, balance supply and demand against financial objectives and build realistic plans that factor in supply constraints across multiple tiers of suppliers, contract manufacturers and co-packers.

As the solution matures, integrated AI becomes smarter and smarter, fueling optimization at every level and allowing organizations to shape the channel for a value-optimized demand response. By connecting these powerful applications, each link of the chain smooths and harmonizes to boost performance upstream and down.

Networked Ecosystem

B2B integration used to mean point-to-point connections, and under that paradigm, someone is inevitably left out of the loop. With easy integration across all major ERP systems, e2open's cloud connectivity solution connects all partners, allowing the entire supply chain to exchange information and collaborate securely.

At this layer, the data is cleaned, normalized and stored securely in the cloud so it can be readily available to applications and users at all points in the network. This enables companies to view a full representation of all data, from every point in the supply chain, from end to end — including how much stock a supplier is holding, as well as the supplier's supplier.

Physical Layer

Outside the digital twin is the physical layer. A company's physical supply chain is the global, multi-partner, incredibly complex network of suppliers, subcontractors, third party logistics (3PL) providers, distributors and retailers that has built up over time. Some companies still run this using spreadsheets, and it's likely that certain partners have manual processes for billing, payments and more. The network contains are multiple versions of the truth, along with silos. All these factors bring challenges — and opportunities to unearth long-buried value.

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Strategic Enabler 2: Intelligent Applications

The sensing, planning, optimization, execution, visibility and collaboration functions are powered by e2open's suite of modular SCM applications. Using data acquired and normalized by E2net, these applications leverage automated algorithms and advanced machine learning to drive supply chain processes within the enterprise and across external trading partners.

A wide range of applications empower companies to achieve visibility, collaboration and control:

- Demand planning and sensing capabilities use pattern recognition and machine learning to reduce forecast errors significantly over any time horizon.
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- Inventory optimization leverages algorithms that have been proven to be more effective than other commercially available solutions, ensuring that inventory is staged to meet demands on-time and in-full at the least possible cost.

- Supply planning capabilities generate constrained plans considering various dimensions of demand priority, such as strategic customers, geographies and channels.
- S&OP creates consensus plans that are aligned across functional departments and meet corporate objectives for customer service and profitable growth.
- Procure-to-pay enables automatic, real-time reconciliation of purchase orders with shipments, receipts and invoices for streamlined process execution.
- Inventory collaboration tracks on-hand, in-transit and on-order inventory, regardless of where it is physically stored, who manages it and who owns it.
- Demand signal management capabilities allow companies to capture, store, cleanse and harmonize all available retailer, distributor, syndicate and operational data, along with information such as weather, geo-demographics, attribute and loyalty data for comprehensive visibility into factors influencing customer demand.

Taken together, e2open applications enable end-to-end decision-support workflows, incorporating the closedloop integration of demand with supply, and planning with execution. E2open makes it possible to predict the impact of an anticipated demand spike on supply constraints, take mitigating actions, immediately put plans into action and track those plans through resolution while adapting the supply chain response along the way.

Strategic Enabler 3: Cross-Functional Workflows

The most visible component of the e2open platform is the Harmony user experience. Harmony provides integrated workflows, dashboards and analytics for efficient and collaborative decisionmaking, resulting in increased user productivity.

Unlike traditional supply chain systems where users can operate only in one software solution at a time, Harmony enables workflows that span multiple applications, allowing users to remain focused on the business issue at hand and analyze its end-to-end impact. Harmony breaks down functional silos by putting relevant information within reach of all stakeholders that need to access it for the efficient and agile management of the supply chain.

Harmony's analytics capabilities power sophisticated outof-the-box dashboards and charts that can be modified via drag and drop. These dashboards can consume data from multiple application engines, enabling the analysis of supply chain challenges from all perspectives.

The Connected, Intelligent Approach

Combining the strengths of ERP systems and individual point solutions while shedding their weaknesses, the e2open platform provides end-to-end supply chain connectivity and integration for tracking from clicks to components to customers. This complete platform is also built with best-of-breed point functionality at every step. Modular deployment enables companies to implement capabilities according to the pace and priorities of their unique business.

Manufacturers can enhance and automate processes to dramatically reduce costs, improve productivity and optimize cash flow through a network that can quickly perceive changes in the supply chain and respond to them. Companies can transform processes by extending planning and execution beyond the enterprise to gain competitive advantage, capture market share and perhaps even become the next Amazon for their industry. Large, high-profile organizations are leveraging e2open's unified, end-to-end platform to bring together planning and execution, supported by the application breadth to meet functional requirements and the depth to solve new challenges. The future is now — and with it comes satisfied customers and shareholders along with better service levels, sales and margins.



About e2open

At e2open, we're creating a more connected, intelligent supply chain. One that starts with the ability to sense and respond to real-time demand and supply constraints. One that brings together data from customers, channels, suppliers, contract manufacturers and partners. One that enables companies to use data in real time, with cognitive artificial intelligence and machine learning to drive smarter decisions. One that delivers all this complex information through a single pane of glass that provides a clear view across the supply and demand ecosystem. E2open is changing everything.

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