E2OPEN®

WHITE PAPER

Building a Digital Supply Chain

Three Key Enablers to Get You There at Your Own Pace



Key Takeaways

Current supply chain management approaches have run out of steam. New technologies can be transformative, but only if three enablers are in place: high-quality and timely data from the entire supply chain, best-in-class decision-support engines, and a platform for enabling reimagined processes that break existing organizational silos. E2open makes such transformation possible, bringing supply chain efficiency as well as agility within reach.

Introduction

Leaders in every industry are exploring ways to get ahead – and stay ahead – at the same time that they are adopting new ways to source raw materials, manufacture finished goods and fulfill customer demand. They are also challenged by various drivers of change:

- Customers, both end-consumers and businesses, expect a greater variety of products to be available to them at the time and place of their choosing, with short demand lead times.
- Competition from new entrants is increasing.
- Regulators in many industries are tightening the mandates for quality and traceability.
- New sensors and predictive analytics technologies are making it possible to more accurately predict customer demand and produce and distribute products in smaller batches, even unit package sizes.

The question is, what technologies can address these challenges and enable the digital transformation of current operating and business models into their future state? The best-run companies continuously align and realign their supply chain strategy with their go-to-market strategy. However, many operations teams are realizing that value from their previous round of investments in supply chain technologies has peaked and they are unable to provide the step-change in performance that management requires. How can companies get an edge over competitors and break out of the current stalemate? The journey has to start with recognizing the problems that are still unsolved.

Management of supply chains, in practice, is anchored around functions – procurement, manufacturing, logistics, customer service, and so on. There are software modules designed specifically for each of these functions. However, many problems, especially those that matter most, do not align well with departments and organizational structures. This is the biggest barrier to improvement in supply chain performance for most companies, and this is the challenge that E2open addresses with the Harmony® user experience, the enabler behind E2open's mission to provide major enterprises with "one place in the cloud to run your supply chain."

Individuals from any department can leverage the Harmony user experience to navigate cross-app and cross-functional workflows that are truly outcome-focused, and go beyond the traditional boundaries (or silos) of individual functions and roles. Interventions may no longer be limited to specific software modules, and can instead follow the shortest path to mitigate supply challenges and quickly fulfill customer demands.

Before looking at the components of the E2open platform that make this transformation in supply chain management possible, let's review how supply chain technology has evolved over the past decade.

Supply Chain Technology Landscape of the Past

Companies have invested heavily in enterprise resource planning (ERP) systems in the last decade. These systems turned out to be great for maintaining a historical record of operations as they happened. However, the expectation that providers of ERP software would be able to turn out good quality supply chain management applications went largely unfulfilled. ERP vendors were able to produce software with basic capabilities as well as deliver rudimentary integration between different modules. But, the limited functionality of these planning and optimization systems proved inadequate for companies to run their operations, satisfy customers and keep competitors at bay.

Once it became clear that ERP-based architectures were hindering competitiveness, there was renewed interest in capabilities provided by niche solution providers. However, years of diversion of corporate resources into ERP had starved the independent software provider ecosystem of funds needed for innovation and growth. Survivors tended to be focused on their particular areas of expertise, but had given up on the effort to solve end-to-end problems or put forward a 'platform' vision. Companies responded by turning to best-of-breed software for a small number of capabilities, but retained software from ERP vendors for most other needs. Integration between solutions from different sources was done in a one-off fashion, uniquely by each company depending on the particulars of their technology landscape.

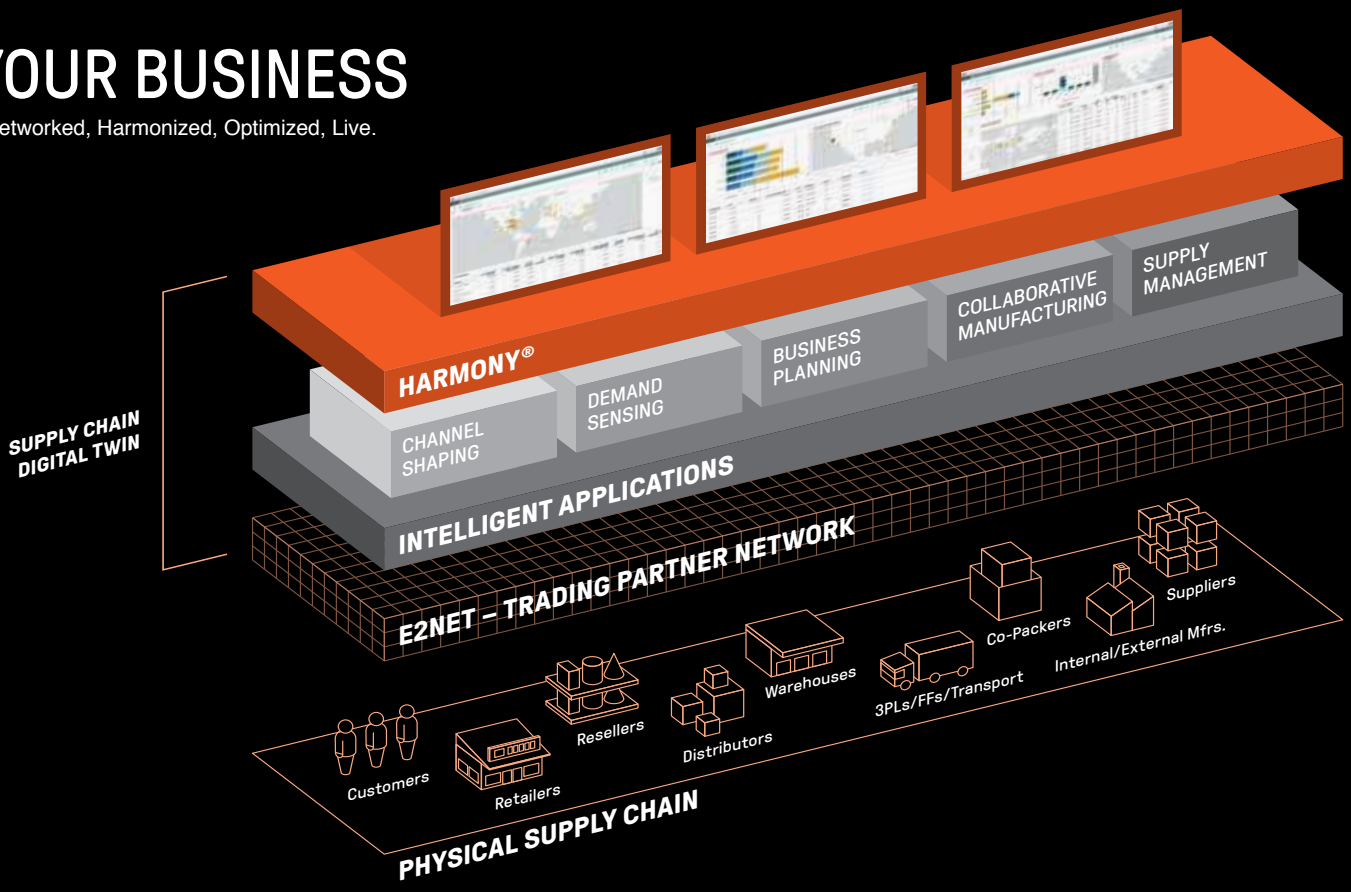
What was lost in this environment was the possibility of deploying end-to-end best-of-breed capabilities – based on truly transformative technologies that would enable enterprises to compete in a changing world, with efficiency as well as agility.

What Supply Chains Need for The Future

Fragmentation in the technology architectures of companies has also resulted in silos between functions within the same company. It is hard to move data between applications, and different groups can often be found trying to solve the same high-level problem with completely different motivations and conflicting objectives. Lack of common understanding of the current state of the supply chain and the inability to see problems from each other's perspective, only exacerbate the challenges.

What is required is the synthesis, standardization and simplification of information gathered from different sources, and its harmonization into a shared silo-breaking view. The goal of such a technology architecture would be to acquire data from all relevant sources, both within and outside the company (i.e., from its partners), in any format and without unduly burdening the providing entity. This data would be made available to best-in-class sensing, planning, optimization, collaboration and execution engines, as well as for other uses within the company (such as analytics). The output from planning engines would be made visible to different functions within the company and outside (i.e., the partners), depending on roles. Processes would be redesigned with their end-to-end impact and reach in mind, rather than architected in a piecemeal fashion, so that even where different groups are interested in different aspects of the information, the data and analytics would emerge from a common and consistent core. Finally, rapid analytical capabilities would allow users to explore problems from different perspectives and initiate closed-loop problem resolution workflows.

In Harmony, E2open has created the next generation platform that follows this layered approach to help companies compete now, and into the future.



Enabler 1: Acquiring Timely and Validated Data

The Digital Supply Chain can only be enabled by data. The range, quality and timeliness of data determine the success and failure of digital initiatives now and into the future.

- **Range:** Collect data from all the nodes of the supply chain that can impact customer satisfaction. If the supply chain is simple and the activities within the control of the company are simply to source from suppliers, make using its own factories and deliver directly to customers, then the company should gather data from the entities and sites involved in these activities. If the supply chain is more complex, with multiple fulfillment models, and outsourced production, warehousing, logistics and distribution, then that's the supply chain to represent digitally.

- **Quality:** Data from all these nodes should be cleaned in source systems if possible. But, if not, errors should be identified after acquisition at the interface layer and resolved collaboratively before they propagate further into supply chain management systems.

- **Timeliness:** It is not enough for data to be high quality and represent the complete range of nodes in the supply chain – it has to reach the company's planning and execution system before it is outdated. Again, these standards of quality and timeliness apply to data from the complete range of supply chain nodes that influence the customer's perception of the value delivered – whether these sites and facilities are managed directly by the company or by partners.

E2open can gather data from the entire span of the supply chain that the company controls. Data may be received from different systems in a variety of formats, sometimes over B2B connections and at other times by more manual methods (depending on the technical readiness of different parties). This data is normalized by converting it into a common format – the OAGIS canonical – so that data from disparate systems is standardized and cross-checked for consistency and correctness by correlating it with other data elements (e.g. a Shipment with a Purchase Order). Errors and mismatches are identified and collaboratively resolved before they can reach the internal planning and execution systems of the company.

The core platform component that enables this 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, whether internal-only, or a mix of internal and external. Data is acquired in a number of formats and by a number of methods, including certified adapters for ERP systems like SAP and Oracle, and a full range of B2B protocols. Most importantly, as soon as data is available from any node, it is processed and propagated to all planning and execution systems that depend on high-quality data for the business functions they support.

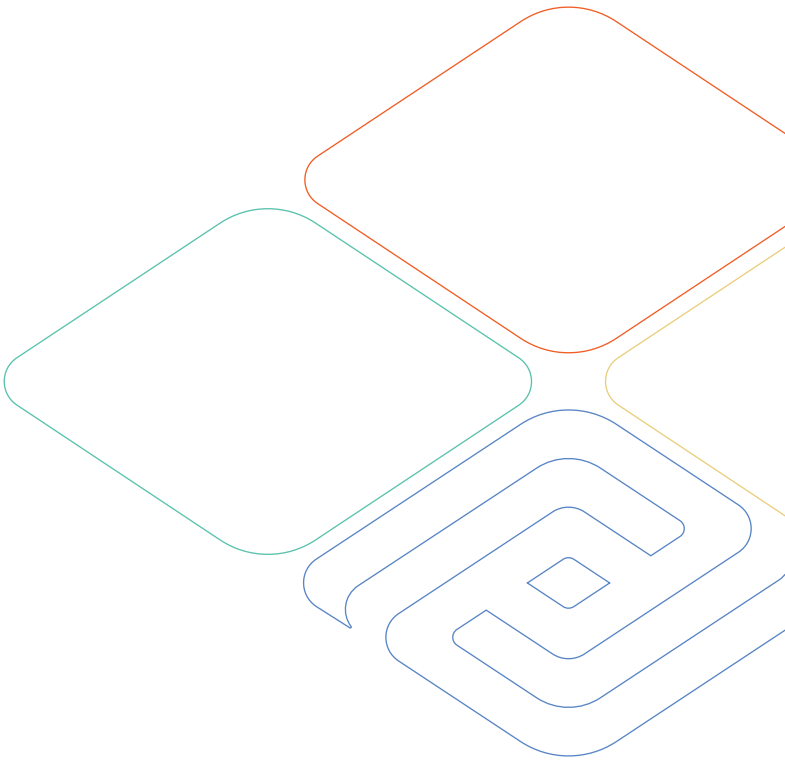
Enabler 2: Better Engines

E2open's Supply Chain Management Engines power sensing, planning, optimization, execution, visibility and collaboration functions. These engines utilize the data acquired and normalized by E2net and leverage automated algorithms and advanced machine learning to drive supply chain processes within the enterprise and across external trading partners.

- **Examples of Sensing, Planning & Optimization Applications:** E2open's Demand Planning & Sensing solution uses pattern recognition and machine learning to reduce forecast error significantly over any horizon – daily through multiple years – compared to existing and alternative approaches. Multi-Enterprise Inventory Optimization uses algorithms that have been proven to be more optimal than other commercially available solutions, to ensure that inventory is staged to meet demands on-time and in-full, at the least possible cost. The Supply Planning & Response solution generates constrained plans considering various dimensions of demand priority, such as strategic customers, geographies and channels. E2open's Sales & Operations Planning creates consensus plans that are aligned across functional departments and meet corporate objectives for customer service and profitable growth.
- **Examples of Execution, Visibility & Collaboration Applications:** E2open's Procure to Pay solution enables automatic and real-time reconciliation of purchase orders with shipments, receipts and invoices for streamlined process execution. Inventory Collaboration is used to track on-hand, in-transit and on-order inventory, regardless of where it is physically stored, who is managing it, and even who owns it. Demand Signal Management solutions allow companies to capture, store, cleanse, and harmonize all available retailer, distributor, syndicate and operational data, along with information such as weather, geo-demographic, attribute and loyalty data, for comprehensive visibility to factors influencing customer demand.

Taken together, E2open application engines enable the orchestration of end-to-end decision-support workflows, incorporating the closed-loop integration of demand with supply, and planning with execution.

It is possible to predict the impact of an anticipated demand spike on supply constraints, take mitigating actions, immediately put the plans into action, and track them through resolution – adapting the supply chain response along the way, depending on actual real-time demand and supply conditions.



Enabler 3: Cross-Functional Workflows

The final and most visible component of the E2open platform is the Harmony user experience. Harmony provides integrated workflows, dashboards and analytics for efficient and collaborative decision-making, 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 across multiple applications, allowing users to remain focused on the business issue at hand, and analyze its end-to-end impact. This breaks down functional silos by putting more relevant information within reach of all users that need access to it for the efficient and agile management of the supply chain.

The analytics capabilities of Harmony power out-of-the-box modern looking dashboards and charts, that can be modified via drag and drop configuration, as per user roles. These dashboards can consume data from multiple application engines, allowing supply chain problems to be analyzed from all perspectives.



What Does This Mean for You?

How can these future-oriented platform components be used to enable differentiated supply chain capabilities today? While this depends on the specifics of the company's strategic objectives and current technology architecture, some simple examples can be drawn up. An enterprise trying to replace its outdated, largely spreadsheet-based planning infrastructure with the latest capabilities, may start with a foundational architecture, enabled by the core capabilities of Demand Planning, Inventory Optimization, and Supply Planning. The company may use E2net as described above, to digitize the bidirectional communications with internal facilities and business units, as well as with suppliers, contract manufacturers, 3PLs, and channel partners.

As the new capabilities are internalized and an organizational competency develops around the acquisition, deployment and use of new supply chain technologies, the enterprise may iteratively refresh its capability landscape with more application engines like Inbound VMI, Logistics Visibility, Customer & Channel Collaboration, Drop-Ship and the like, continuing on to truly innovative capabilities like Demand Sensing coupled with retailer data acquired via Demand Signal Management solutions. Of course, it is possible to craft another path through the complete set of E2open's application engines, depending on the starting maturity level and strategic goals of the enterprise.

Benefits, Now and For the Future

The primary benefit of E2open's layered architecture is flexibility. Assess your competitive threat and opportunity landscape and decide which capabilities need to be elevated with the highest priority. The answer may be to leverage point-of-sale data for better sensing of current demand, shape demand based on current constraints in the supply network, or even acquire another company for complementary product or technology. The answer may even be to work with new suppliers or co-packers for a new product line, or coordinate with joint venture partners to bring new offerings to market. The E2net layer, which makes data acquisition and normalization possible, enables quick and easy digital representation of your supply chain by integrating across all your ERP instances, even as you acquire or divest companies, and add or drop contract manufacturers, suppliers, distributors or other nodes. This is in contrast with significantly more time and effort taken to represent a new supply chain node in ERP systems.

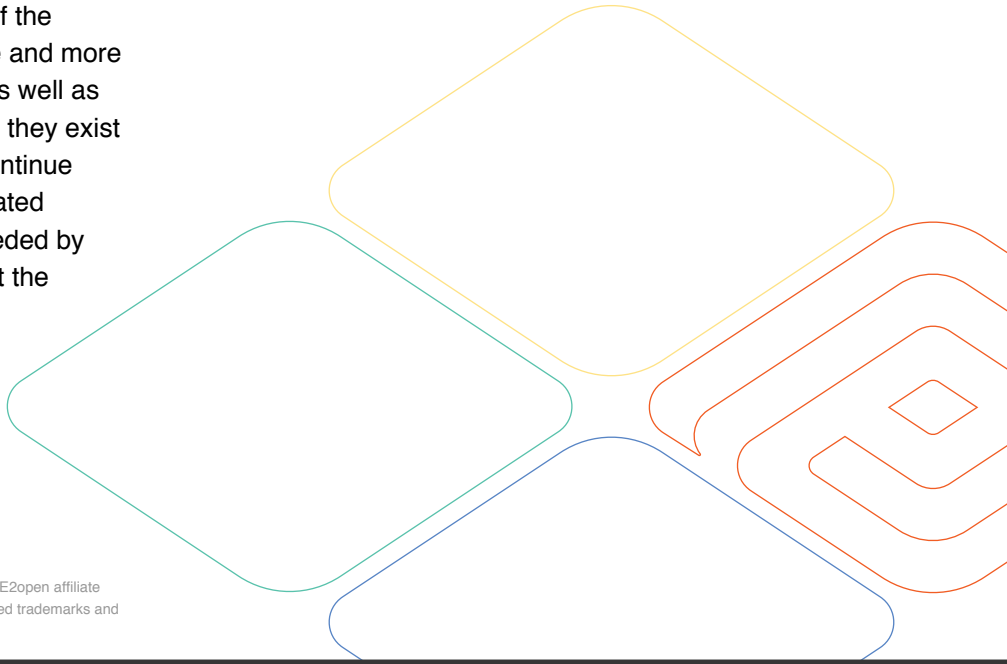
The Supply Chain Management Engine layer makes it possible to embark on your Digital Transformation journey now, starting with the capability that would have the shortest time to value in your environment – given your current technology and capability landscape and strategic objectives. Additional engines can be added as needed based on the strategic roadmap of the enterprise. E2open is continuing to add more and more capabilities based on organic development as well as by acquiring best-of-breed capabilities where they exist outside E2open. All these applications will continue to work together, leveraging E2open's Integrated Data Model – and will enable capabilities needed by enterprises to compete not just tomorrow, but the day after.

The Harmony user experience layer makes it possible for users to learn and continue to use one system, even as the underlying engines evolve. The focus remains on the supply chain and on competing successfully by providing the best customer service.

The supply chain of the future will be very different from what it is today, with algorithms, machine learning, cognitive computing, and artificial intelligence playing a bigger role. E2open's Harmony is the foundation for success in that fast approaching future.

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. Demand. Supply. Delivered.



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