FedEx® Supply Chain

Improving E-Commerce Fulfillment Through Business Integration

Why an integrated culture is key for efficient and cost-effective e-commerce fulfillment.



Executive Summary

As e-commerce continues to outpace conventional retail, companies of all sizes are finding ways to disrupt traditional business models and seize market share. Unfortunately, many companies fail to properly consider the supply chain challenges unique to e-commerce. Business integration plays a key role in preparing fulfillment operations for efficiently handling e-commerce orders — far ahead of the click and order confirmation. In this white paper, experts from the fields of retail, marketing and supply chain management discuss how an integrated approach to marketing and logistics can help organizations fully embrace e-commerce and increase profitability.

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Improving E-Commerce Fulfillment Through Business Integration

Why an integrated culture is key for efficient and cost-effective e-commerce fulfillment.

E-commerce continues to outpace conventional retail — so much so that Forrester predicts e-commerce sales to constitute more than 15 percent of total U.S. retail sales by 2020, with an estimated value of $591 billion.[1] And while there are many factors fueling e-commerce growth, online marketing and customer acquisition are absolutely critical to e-commerce success.[2] With so many touchpoints available for marketers to engage with potential customers, such as email, social media and third-party marketplaces, online marketing has become increasingly prevalent, sophisticated and data-driven.



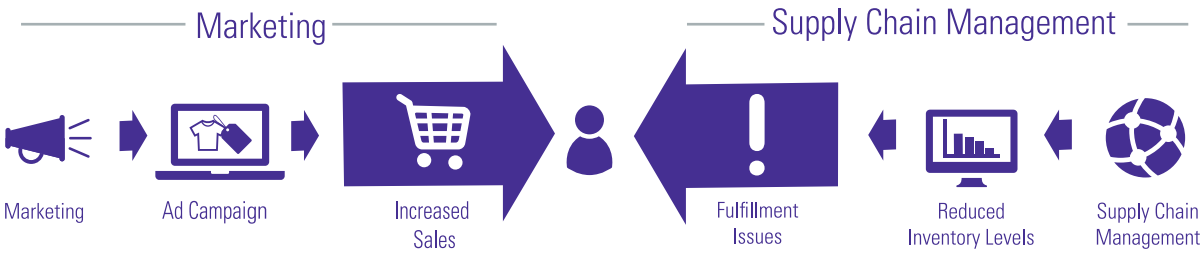
In the world of e-commerce marketing, the purchase of one product corroborates a customer's desire for another. It is no coincidence that adding one item to a shopping cart triggers a cascade of advertisements for related products. Smart marketers leverage algorithms to tailor their storefronts to visitors, helping to proactively place advertisements in real time to push larger orders and increase profitability. The same type of thinking lies behind free shipping thresholds: Marketers want to boost sales, maximize order density and earn repeat business through happy customers.

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Where marketing meets supply chain management

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Given the prevalance of online marketing, it is important to consider the potential pitfalls. A well-run marketing campaign can cause disruption across the supply chain if your company does not integrate marketing with e-commerce fulfillment. As an example of how the two processes are connected, consider the following example:



The marketing department of a large U.S. retailer develops an online advertising campaign to drive e-commerce sales of a certain product in the Northeast. The campaign is approved, advertisements are developed, and the website runs the product at heavily discounted prices. However, that retailer's supply chain management has been working diligently throughout the fiscal year to reduce inventory levels across their network of fulfillment centers. Unsurprisingly, online sales increase. But due to the lack of inventory levels in the region, the retailer is forced to expedite deliveries from remote fulfillment centers, greatly increasing transportation costs and nullifying any favorable outcome of the marketing campaign.

According to Dr. Mark A. Moon, Associate Professor of Marketing and Flaskerud Faculty Fellow at the University of Tennessee, Knoxville, the aforementioned scenario is "a classic, textbook consequence of a lack of business integration." Without that integration — or a cohesive approach to marketing, supply chain and other parts of the organization — business performance can suffer. The inability to fulfill orders efficiently can lead to delayed shipments, increased transportation costs and poor customer experiences on a massive scale.

To help provide guidance on better aligning your organization for e-commerce operations, FedEx Supply Chain has collected insights from experts across the fields of retail, marketing and supply chain management. In this white paper, those experts discuss how an integrated approach to marketing and supply chain operations can improve e-commerce fulfillment for companies of all sizes.



Defining an integrated approach to the e-commerce supply chain

The concept of tying together marketing initiatives with supply chain operations has several different names, depending on whom you ask. Some call it Sales & Operations Planning (S&OP), while others refer to the idea as Integrated Business Planning (IBP). In Dr. Moon's book, titled Demand and Supply Integration: The Key to World-Class Demand Forecasting, he defines the approach as Demand and Supply Integration. The book presents the specific design characteristics of a quality demand forecasting management process and describes how to effectively integrate demand forecasting within an organization.

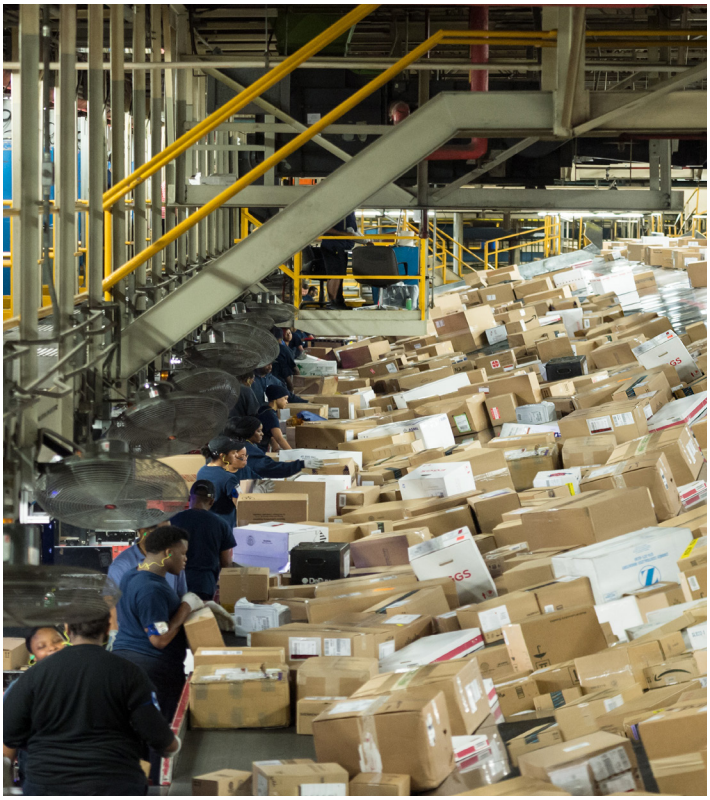
As defined by Dr. Moon, Demand and Supply Integration is "a very high-level process designed to integrate the demand side of the business, the supply side of the business and the financial side of the business into a cohesive organization — one that leads to good decision-making because information from all of those different parties is considered."

In a traditional company structure, departments can be vertically isolated — or "siloed" — across the organization. The demand side of the business, which includes sales, marketing and downstream partners, works independently from the supply side of the business, where the supply chain, operations and other upstream suppliers reside. With the disparate layout, organizations struggle to foster the appropriate amount of communication and cross-organizational collaboration needed to make informed decisions and run an efficient enterprise.

"Without an integrated approach, you get this throw-it-over-the-wall mentality," says Kate Vitasek, author, business consultant and faculty member in the University of Tennessee's Graduate and Executive Education program. "When optimizing marketing, the company does its best to sell as much product as possible, but they might not take delivery into consideration. If marketing and operations are not talking, it becomes very functionally siloed. You can actually hurt your reputation if you can't deliver. The goal should be to optimize the organization holistically, not just functionally."

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Common and costly fixes for e-commerce fulfillment issues

There are a bevy of problems that can arise if an organization has not strategically integrated the demand and supply functions of their business. To prevent fulfillment issues and ensure customer fill rates, supply chain professionals can end up stockpiling large amounts of inventory. Without foresight from the marketing team, supply chain management is left to decide between the lesser of two evils — either stacks of costly inventory, or unhappy customers due to stock-outs and delayed shipments. "Oftentimes, companies will end up with both," Moon states. "Too much of the wrong inventory and not enough of the right inventory." These issues can very easily translate to lost revenue, poor cash flow and diminished market share.

Lack of integration also results in much higher operating costs — and not just due to expedited delivery charges. There are a number of factors that drive up costs, beginning at production. To accommodate special or unexpected orders, there may be a need to shut down manufacturing lines and alter production schedules.

Purchasing costs could also increase if an organization struggles to meet demand, since procurement will not have the opportunity to buy ahead with favorable terms and conditions. According to Dr. Moon, these are the types of "reactionary activities that take place within the supply chain when they are caught flat-footed by either more or less demand than they anticipated."

Unique challenges of omnichannel fulfillment

The nature of e-commerce, along with increasingly nuanced consumer demands, can make things even more challenging for supply chain professionals. As Dr. Moon explains, "Marketers are people who like to give customers what they want, and e-commerce just adds more complexity to the choices that are available to customers." So while supply chain professionals might prefer to have one size, one color and one style, marketers continue to add new variations, driving SKU proliferation through the roof.

Omnichannel fulfillment strategies also pose unique challenges. Consumers have varied choices in how they want their order delivered. They can choose to buy online and pick up in the store; try a product on in the store and buy a different size online; or simply buy online and have the item shipped to their home. With the latter option, returns become more prominent, adding complexity to the supply chain.

"Just like adding new sizes, styles and colors makes the demand forecasting puzzle more challenging, adding omnichannel just multiplies, exponentially, the complexity of supply chain management," Dr. Moon comments. "With omnichannel, you've just made the number of very unpredictable future events even greater."

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Measuring the effectiveness of e-commerce fulfillment

Due to the evolving complexity of the e-commerce industry, companies need a data-driven approach to help guide operations. You cannot improve what you do not measure, and key performance indicators (KPIs) can offer valuable insight for developing continuous improvement programs. In regard to integrating demand and supply, Dr. Moon stressed forecast accuracy as one of the most vital KPIs. Without monitoring and improving forecast accuracy, integration efforts between supply and demand can be stymied from the outset.

"I like to think of Demand and Supply Integration as being the super process with lots of sub-processes underneath it," Dr. Moon explains. "To me the first — and I would argue probably the most important of those sub-processes — is demand forecasting. It's very difficult to create a supply chain that will be efficient and responsive if you don't have a good idea of what demand is likely to be. So demand forecasting and forecast accuracy, usually measured as mean absolute percent error, is very important."

There are also plenty of valuable outcome metrics for gauging the effectiveness of e-commerce fulfillment operations. Supply chain metrics, such as inventory turns, total costs, expedited freight and unit purchasing costs, can all go haywire if demand forecasting is not done well, resulting in tangible, externally facing business issues.

Visibility into inventory position and location is also critical for supply chain management. By employing aggregate inventory summaries and sales-by-channel breakdowns, companies can understand how each sales channel is performing and where inventory should be allocated — streamlining operations and eliminating potential fulfillment issues. These metrics can also help organizations leverage their aggregate inventory to fulfill online orders from the most efficient location.

Helpful KPIs for monitoring e-commerce fulfillment

- **Inventory turns:** Typically calculated per year, this metric is the number of times inventory is sold or used during a specified time period. If an organization has a well-run demand planning process, inventory turns occur with greater velocity, preventing inventory from sitting on shelves.
- **Expedited freight:** This transportation method is a more costly alternative used for time-sensitive shipments and non-optimal inventory placement in the logistics network. One goal of demand planning is to reduce dependence on this method of transportation.
- **Unit purchasing costs:** Also defined as total cost of acquisition (TCA), this metric comprises the net price of a good, in addition to the other costs associated with getting the good to its point of use. Unit purchasing costs can increase if procurement is forced to play catch-up with demand.
- **Dock-to-stock:** This measurement is the time it takes to make inventory available for fulfillment once it arrives at the distribution center. It is helpful for providing guidance on strategizing and implementing marketing campaigns.
- **Inventory accuracy:** This KPI monitors how closely official inventory records match with physical inventory. Inaccurate inventory records can cause severe disruptions between marketing and supply chain management.
- **On-time fulfillment:** This KPI provides insight into what percentage of your orders arrive on time. If supply and demand sides of an organization are siloed, it can lead to delays in shipments and dissatisfied customers.
- **Fulfillment accuracy:** This metric is the percentage of orders fulfilled with the correct SKUs and in the correct quantities. Frequently a service-level agreement between a third-party logistics provider and customer, this metric can be kept in good status with a warehouse management system for complete inventory visibility.
- **Order tracking:** An increasingly necessary feature for online shoppers, this metric provides visibility into an order from initiation all the way through delivery. With a warehouse management system and order management system in place, you can accurately monitor this vital KPI.
- **Order fill rate:** Measured as percentage of consumption orders satisfied from stock immediately available, order fill rate provides helpful insight into how well your demand planning process is working. If every online order requires movement of inventory from an upstream location to a fulfillment center, it can reduce fulfillment efficiency and drive up costs.
- **Storage space utilization:** This metric provides you with an understanding of how effectively and efficiently you are using your current warehousing capacity. Inefficient layout and disorganization can be detrimental to KPIs such as order fill rate and inventory accuracy.

*By no means is this an exhaustive list. These terms and definitions are meant to provide insight into several important supply chain metrics as they apply to Demand and Supply Integration.

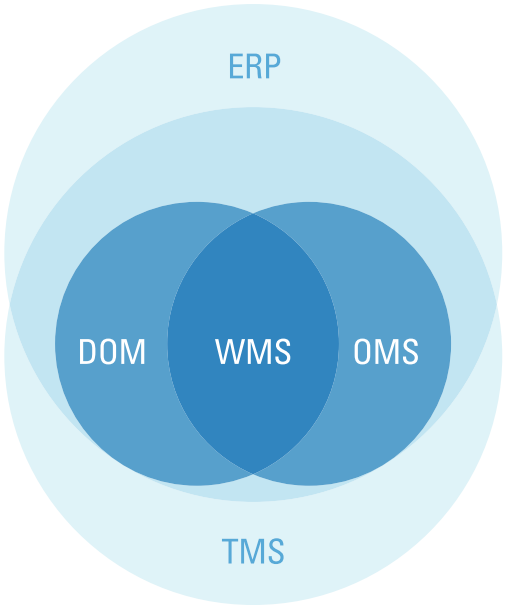
Implementing an integrated IT ecosystem for better visibility

In order to drive continuous improvement throughout the supply chain, it is important to have a system in place that aggregates and helps interpret supply chain KPIs. An integrated IT infrastructure, one that incorporates an enterprise resource planning (ERP) system, a warehouse management system (WMS), a distribution order management system (DOM), an order management system (OMS) and a transportation management system (TMS), can collect and provide visibility into the operational data necessary for formulating good business practices and sustaining integration efforts. With those systems in place — along with communications processes to fuel informed decision-making and qualitative evaluation — organizations can leverage predictive analytics to drive enterprise-wide operational efficiency.

"What's really important from a demand planning perspective is predictive analytics — to be able to evaluate what has happened in the past to help you plan for future events," explains Ninaad Acharya, Senior Manager of Strategic Initiatives at FedEx Supply Chain. "With the right IT ecosystem in place, along with current customer insight, you can better model what your demand will look like in the future. Rather than reacting to the ups and downs of the business, you can closely predict when your spikes in demand will take place and allocate enough inventory to support those anticipated peaks."

Within the greater IT ecosystem, the WMS plays a pivotal role in providing specific, last-mile information. The WMS keeps track of inventory by location — whether it's at a brick-and-mortar store, a returns center or a fulfillment center — and it can be integrated with every other warehouse in an organization's network. This helps enable omnichannel commerce by providing companies visibility into where a product is within their entire network at any given time. They can then use that visibility as part of the demand planning process to stage products efficiently and fulfill orders from the most logical location.

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Integrated IT infrastructure

ERP — Enterprise Resource Planning System

WMS — Warehouse Management System

DOM — Distribution Order Management System

OMS — Order Management System

TMS — Transportation Management System

"In the end, the right warehouse management system helps set up the warehouse for high demand flows and high SKU levels, while maintaining the ability to get items out the door in an efficient manner."

– **Dan Coll,** FedEx Supply Chain

Implementing an integrated IT ecosystem for better visibility

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"In order for distribution centers to run as effectively as they can, managers need insight into what expected demand is going to be at a fairly granular level of detail," Dr. Moon says. "They need to know what demand for different SKUs is going to be at different locations. And that's where the whole omnichannel or e-commerce piece of it becomes very complicated. It's one thing to measure what demand is likely to be for a product category in total, it's another thing to measure it at the location level — because that's what you need in order to stage the inventory in the correct location."

The complicated nature of e-commerce fulfillment makes the WMS a powerful tool for driving operational efficiency. A top-tier WMS can be tailored to provide a nuanced overview of every product moving within the supply chain — enabling sophisticated operational metrics, such as utilization of multiple pick/pack methodologies and managed inventory capabilities for single or multiple distribution centers. It can also oversee packaging information for reducing damage and transportation costs, in addition to back-order management, returns processing and labor planning.

"The WMS can be implemented to help with demand planning in a very efficient manner," explains Dan Coll, who specializes in e-commerce fulfillment at FedEx Supply Chain. "With the correct WMS, we can evaluate the exact volume of every individual item moving through the warehouse, helping us to slot them correctly. We can then take this a step further by slotting the item based on the rate of picks, and then slotting the warehouse based on volume velocity. This is all possible because the WMS can track the size of the item and the inventory turn at the SKU level. In the end, the right WMS helps set up the warehouse for high demand flows and high SKU levels, while maintaining the ability to get items out the door in an efficient manner."

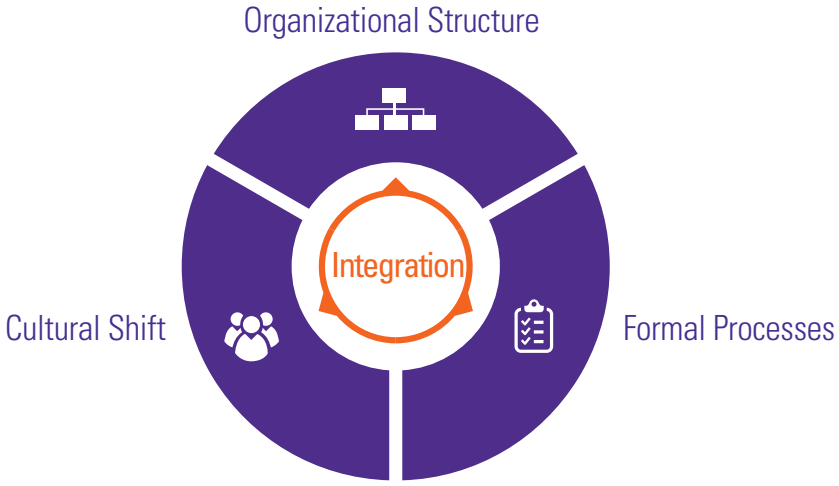
Finally, it is important to note that qualitative analysis is a critical piece of the demand planning puzzle. Without qualitative judgement that can place KPIs in context, you can't answer the bigger question, which is: Will the future look like the past? As Dr. Moon explains, "Identifying historical demand patterns through predictive analytics is a good place to start, but the insight that comes from internal collaboration and qualitative evaluation is critical for uncovering clues as to how the future will look in comparison to the past."

Overcoming the cultural hurdles of integration

At surface level, implementing a process to integrate the demand and supply sides of an organization seems like common sense. However, there are a number of major hurdles to developing this type of integration — and they are all the more difficult with larger organizations. One challenge, for instance, is receiving a quality demand forecast from sales and marketing. If sales believes that providing a forecast will impact their quota or that their capacity may be limited for future sales, they may be inadvertently incentivized to provide misinformation.

"There are all these structural barriers to creating an organization that pulls together in an effective way," Dr. Moon comments. "The culture drives everything. If you have a silo-like culture where sales, marketing, supply chain, operations and finance don't speak each other's languages or don't have a mechanism to sit down and do it effectively, then you're not going to have an integrative culture."

In order to achieve integration, Dr. Moon provided three different mechanisms, or levers, that can be put into place to help overcome hurdles. The first is organizational structure. If a company is organized to create a reporting structure that aligns different business units in a sensible way, it can enable integration. The second lever is a set of formal processes. For instance, implementing regular meetings in which various departments discuss demand planning can help get every business unit on the same page. The final lever, according to Dr. Moon, is creating a cultural shift.



"The biggest, most challenging, but most effective lever that has to be pulled is culture," Dr. Moon explains. "This includes the way people are measured and rewarded, the way people think about how they do their jobs, and the messages they receive from their senior executives. These are the cultural elements that are important to drive Demand and Supply Integration."

Outsourcing to overcome silos and provide a more holistic perspective

While outsourcing may seem at odds to an integrative process, choosing an experienced third-party logistics provider (3PL) can provide a valuable and insightful perspective. When you insource, it can be difficult to view the supply chain from a holistic perspective — across all the different business silos — to determine which KPIs are the most important for your long-term success. Working with a 3PL can help you purposefully contemplate vital operational metrics, determine the benefits you want from a provider, and implement a continuous improvement strategy to achieve those outcomes.

However, internal cultural barriers to integration can be exacerbated when outsourcing if your supplier relationship isn't focused on collaboration, making it imperative to select a 3PL that has the ability to understand and solve your unique business challenges.

"The supplier and the buyer should look at the business holistically and optimize for desired outcomes," Vitasek explains. "We call it a 'What's in it for We?' mindset, where you work together in a highly collaborative and highly transparent way to optimize the business. The natural buyer-supplier relationship does not really entail transparently sharing all aspects of the business. The more you can have transparency and collaboration, the better the service provider can perform and lower the cost structures for the buyer."

The greater the complexity of the organization, the more important it is to find the right strategic fit for your business. If the commercial agreement only focuses on specific services or business activities, it doesn't incentivize innovation or continuous improvement. At the end of the day, cross-organizational collaboration is more important than any individual service level agreement. That collaborative approach to solving unique business challenges is a cornerstone of FedEx Supply Chain, and it is a necessity when helping a company to integrate business processes and holistically optimize the supply chain.

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Integration recommendations for burgeoning brands

In regard to developing an integrated culture, small and medium-sized businesses are at a distinct advantage. In entrepreneurial or start-up types of organizations, people are typically responsible for more than one highly specialized task. While the multifaceted aspect of each person's role lends itself to integration, it is important for small businesses to keep integration in mind as they grow.

"Small companies should put in place formal mechanisms to bring together sales, marketing and supply chain people to share information," Dr. Moon says. "Putting those formal mechanisms in place fairly early in a company's life cycle is a whole lot easier to do. Then it becomes a part of their DNA right from the beginning."

Traversing the complexities of e-commerce

Regardless of the scale of a business, e-commerce will continue to evolve, and organizations will have to adapt along with it. New delivery methods — such as curbside pickup — seem to manifest at various retailers overnight and disappear just as quickly. So even with analytics-driven supply chain management, the tumultuous e-commerce marketplace remains challenging to predict.

"We don't know the future — that's the whole challenge here," Dr. Moon explains. "We can use the past to help us get insight into what the future might bring, but the past is only so helpful. It doesn't tell us everything. So unless you have insight from sales or marketing, you don't know what those spikes in demand are likely to be. That's the most fundamental piece of Demand and Supply Integration — simple communication between marketing or sales and supply chain regarding when to anticipate spikes in demand."

Due to the inherent complexity of running an e-commerce or omnichannel operation, it is beneficial to lean on a 3PL experienced with e-commerce fulfillment for companies of all sizes. At FedEx Supply Chain, we have provided a foundational foothold for our customers to grow and adapt throughout the emergence of e-commerce. With our network of more than 130 operations throughout the U.S. and Canada, FedEx Supply Chain has the infrastructure in place and the experience required to help organizations balance between traditional brick-and-mortar operations and their growing e-commerce fulfillment needs.

To learn how FedEx Supply Chain can provide your organization with the flexibility and scalability needed to enable e-commerce, please go to supplychain.fedex.com.



More info

- Contact your FedEx account executive
- Go to **supplychain.fedex.com**
- Call 1.800.378.9671

Acknowledgments

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Kate Vitasek is an international authority for her award-winning research and Vested® business model for highly collaborative relationships. Author of six books and a faculty member at the University of Tennessee for Graduate & Executive Education, she has been lauded by World Trade Magazine as one of the "Fabulous 50+1" most influential people impacting global commerce.

Dan Coll
Dan Coll has spent the past 15 years in the logistics and distribution industry — with a primary focus on e-commerce fulfillment. Previous to joining FedEx Supply Chain, he founded and operated an e-commerce fulfillment company that successfully fulfilled millions of orders for hundreds of internet retailers in the U.S. and abroad. In his current role at FedEx Supply Chain, Dan uses his passion for e-commerce and logistics by working with organizations to streamline e-commerce fulfillment, retail distribution and reverse logistics — with a core emphasis on delivering the optimal customer experience in a fiscally responsible manner.

Ninaad Acharya
As Senior Manager of Strategic Initiatives at FedEx Supply Chain, Ninaad is responsible for the strategic oversight and development of the FedEx Supply Chain IT platform — including its build and monthly product release. Before working on strategic services, Ninaad was responsible for design and delivery of multiple, large-footprint distribution centers in a variety of industries, including e-commerce, retail and fast-moving consumer goods. Before joining FedEx Supply Chain, Ninaad worked for many retail organizations on delivering strategic supply chain solutions to help solve their biggest business challenges.

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