Advanced Supply Chain Visibility & Transparency

An IBM Solution Brief
October, 2019

IBM

What is the visibility problem?

IBM defines “Advanced Supply Chain Visibility and Transparency” as the business capability to achieve visibility across the end-to-end supply chain. Advanced supply chain visibility and transparency allows companies to connect with confidence and collaborate, drive global visibility, and automate transactions in a compliant and scalable way. With the ability to act faster and frictionlessly, businesses can proactively manage disruption, reliably track, trace and document provenance and quality, and enhance the overall customer experience.

Many enterprises struggle with visibility across their end-to-end supply chain due to the number of third parties involved in moving goods. Studies find that the average global trade transaction requires 36 original documents with 240 copies involving 27 entities. This results in a lack of near-time transparency, and the inability to extract enough insights from data and apply automation to leverage these insights for greater effectiveness and efficiency. For modern supply chains that are complex and interdependent, managing how products are sourced, ordered, purchased, received, stored and distributed to wholesalers, distributors and stores in a timely, safe and accurate manner is a process plagued with inefficiencies and uncertainty.

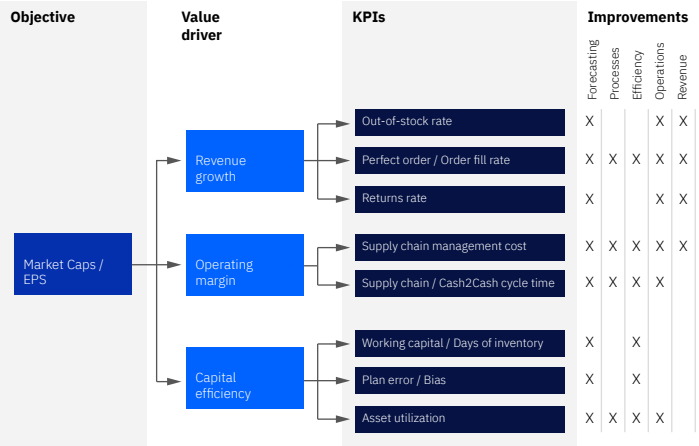
Key issues include:

- **Inaccurate** and **incomplete information** due to delays in data exchange/synchronization between various parties and/or operational systems which limits the ability to gain critical insights and may result in sub-optimal decisions and loss of efficiency.
- Instrumented systems using Internet of Things (IoT) and RFID technology generate a **high volume of relevant data that may not be tapped** appropriately to provide end-to-end and real-time transparency to supply chain events and exceptions.
- **Manual processes** are required to safeguard information and track provenance and, when pervasive, these processes can drive up time and cost.
- **Legacy operational systems** may not be able to meet the changing pace of events in the supply chain.
- Disagreements between multiple parties in the supply chain about the accuracy of data creates further delay as these issues are resolved through **complex, labor-intensive and time-consuming dispute resolution**.

Visibility alone is not the end goal, but a means to address challenges related to supplier provenance, item traceability and provenance, and reconfiguring the supply chain in real-time to deliver meaningful business value.

Supply Chain Visibility – Business Value Drivers and Benefits

In the consumer supply chain, the top key performance indicators (KPIs) measure the capability and reliability to deliver against customer expectations for an excellent experience.



In order to achieve this objective, companies must continually monitor consumer buying trends and adjust R&D and production cycles accordingly. Mobility is becoming a necessary management tool for competing with today’s online and mobile marketplaces. Efficient management of inventories, production schedules, supply chain operations, distribution channels and customer engagement is critical to survive and thrive. Leveraging the Internet of Things (IoT) for smarter automation and mobilizing operations will increase agility and win consumers.

Fundamentally, a supply chain is about moving goods from the source to the consumer with the enterprise in the center, irrespective of whether the enterprise is a retailer, consumer goods company, wholesaler or distributor. The foundation for a responsive supply chain is based on a modern information architecture that is designed to collect data in real-time from both internal and external sources, and is able to refine the data for consistency and provide secure access to the data in the digital supply chain. The full business value of the information architecture is realized when advanced analytics, artificial intelligence (AI), and automation are enabled and applied to business use cases in planning and execution processes, as described below.

Improved forecasting
On the planning side, availability of accurate and current (real-time) information related to inventory and goods movement from various supply chain activities, and collaboration between trading partners, drives critical decision making and leads to improved forecasting. Instant visibility and predictive analytics will change the way enterprises execute demand and supply planning.

Streamlined processes
On the execution side, availability of data from trusted sources and use of blockchain smart contracts drive faster reconciliation of freight invoices, automation of accounts payable and dispute resolution processes.

For a major consumer packaged goods (CPG) company, IBM leveraged machine learning, AI and automation to reconcile transportation invoices and to correct errors automatically. This led to a 5%-7% cost savings.

For a major retailer, IBM is using smart contracts to speed up the dispute resolution process from 45 to 5 days. On a $21B worth of goods, this will free up $100M in working capital.

Improved efficiency
Visibility enables automation of labor-intensive manual business processes such as reconciliation and dispute resolution, which translates into savings from direct labor, shorter order-to-cash cycle and fewer resources tied up in materials and inventory. Another benefit is a reduction in idle time for goods being moved. Visibility helps to pinpoint where goods are and when they will be available so that transportation providers can be scheduled with greater precision. This in turn reduces the overall average transit time of moving goods from point A to point B.

In one pilot project, IBM was able to cut the end-to-end transit time by 10%-20% by using both electronic contract documents and real-time process visibility.

Once the supply chain is digitized, adding emerging technologies like AI and machine learning (ML) as well as intelligent automation like robotic or business process automation (RPA/BPA) and smart contracts save time and money. IBM calls this the intelligent self-correcting supply chain.

Agile operating model
Improved forecasting and better visibility into demand enable enterprises to support agile Direct-to-Consumer (DTC) operating models in addition to traditional bulk goods movement. It allows companies to deliver a superior customer experience by offering flexible fulfillment modes such as buy online/pickup in store, buy online/ship from store, direct to location delivery, next day delivery, and same day delivery. Visibility drives intelligence and optimization of the fulfillment process resulting in reduction of shipping costs, markdowns and lost sales, and improved customer satisfaction.

A better way to meet these growing needs is to harvest all of the consumer information made available through digital and physical channels, digitize the inventory and apply advanced AI and ML models including voice and natural language understanding to meet the customer where they are. Using global inventory visibility (DCs, fulfillment centers, and stores), real-time sales velocity and fulfillment optimization, retailers and consumer goods companies can tune their businesses to grow revenue profitably while creating award-winning customer experiences and engendering long term loyalty which increases lifetime value of the relationships with their customers.

The results are dramatic. IBM helped a large department store leverage this new set of technologies to completely transform their DTC fulfillment operations. They were able to reduce shipping costs by 5%-7% while at the same time reducing the order to ship time by 30% and the order to delivery time by 33%.

Opportunities for revenue growth
The proliferation of inexpensive mobile devices coupled with cloud-based delivery of high-capability order management systems makes it possible for suppliers of any type and size to collaborate electronically and efficiently with any potential manufacturer, distributor and consumer. The end-to-end reach of technology and its associated increased visibility suddenly enables any party along the supply chain, both large and small, to drive towards opportunities for increased revenue, not just cost management.

For a large retailer, IBM helped to improve product gross margins by 150 basis points across the board by enabling them to take into account sales velocity, inventory and replenishment levels across all their distributors. This allows them to meet customer demand by fulfilling from locations where they are able to predict markdowns and by avoiding fulfilling from locations where they predict they will be out of stock.

Architecture

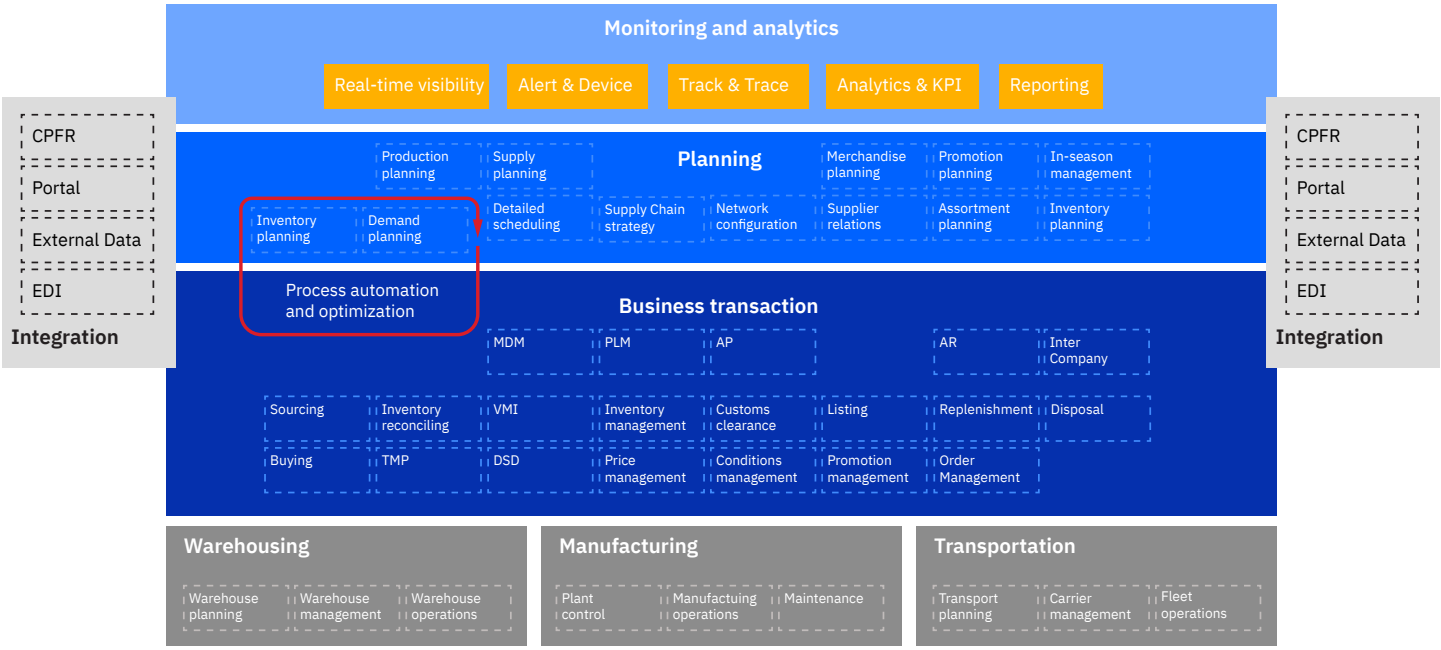
Companies need to super charge specific capabilities to build a modern, intelligent supply chain. We have extended the Supply Chain Operations Reference (SCOR) model to highlight these new capabilities required for:

- Monitoring and analysis of supply chain performance and data
- Planning and modeling changes to the supply chain
- Business transactions supported by intelligent workflows
- Supporting the intersection with domain-specific management in the areas of warehousing, manufacturing and transportation

We have overlayed business activities in boxes on top of these business processes, and highlighted the impacts of visibility investments in orange.

Advanced visibility and analytics applications belong in the Monitoring and Analytics activity band. Insights drawn from these applications influence planning activities, which in turn result in corrections to the supply chain through the business transaction layer all the way down to the management tiers (warehousing, manufacturing, and transportation) leveraging business process automation. Using the SCOR model with activities shows how comprehensive end-to-end visibility and analytics functions are essential to an efficient supply chain, resulting in the perfect order.

Extended SCOR Model - with activities



IBM Solutions

The extended SCOR model can be used to understand the current state of a company's processes and goals, quantifying operational performance and comparing company performance to benchmark data.

IBM has a broad portfolio of services and software offerings to help companies improve their supply chain performance KPIs as they introduce advanced end-to-end visibility and transparency capabilities and evolve towards an intelligent, self-correcting supply chain.

		Sources			**Uses**					
Visibility and Transparency Capabilities	**Type**	Events	Transactions	Alerts	Visibility	Advise	Track & Trace	Analytics & KPIs	Reporting	Automation
IBM Sterling Supply Chain Insights with Watson Provides Intelligence Services and Control Tower capabilities. Leverages composable data and AI services that are trained in supply chain and open to developers for rapid integration.	SaaS	X	X	X	X	X		X	X	
IBM Sterling Supply Chain Business Network IBM's premier B2B collaboration network for the exhange of business documents between all parties participating in the supply chain. The solution includes a series of operational applications for various visibility operations, such as over all end-to-end transaction status as well as status details on individual documents.	SaaS		X	X	X			X		
IBM Sterling Delivery Transaction Intelligence Provides end-to-end visibility of order to cash and procure to pay transaction flows, as well as bring blockchain to the IBM Sterling Supply Chain Business Network to provide a single record of truth, complete with transparent immutability, data rights, audit trail, permission and privacy.	SaaS		X	X	X			X		
TradeLens A digital blockchain-based platform that empowers businesses and authorities along the supply chain with a single, secure source of shipping data, enabling more efficient global trade.	SaaS	X	X		X		X			
IBM Food Trust Improves transparency, standardization and efficiency throughout the food supply chain through the use of blockchain technology.	SaaS		X		X		X			
IBM Cognos Analytics Provides a rich toolset for reporting, analytics, scorecarding, and monitoring of events and metrics.	SaaS and Software	X		X				X	X	
IBM Blockchain Platform Digitizes transaction workflow through a highly secured, shared and distributed ledger that improves transparency and trust.	SaaS	X	X	X			X			
Hypertrust Extends IBM Food Trust to the food service industry by enabling process standardization and automation. Modules include Restaurant Insight, Franchisee Insight, Supplier Insight, Product Insight and Trace Module.	Services	X		X	X		X			
IBM Watson IoT Platform Securely connects, manages and analyzes IoT data to deliver insights and enable informed, real-time decision making through cognitive analytics.	SaaS	X			X		X			
IBM Business Automation Workflow Automates digital workflows to increase productivity, efficiency and insights.	SaaS and Software	X	X	X						X

Conclusion

The most immediate, pressing technological need in today's supply chains is end-to-end visibility. This visibility is necessary to both improve the mean time to recovery around supply chain disruptions as well as lower costs through more efficient inventory management and shipping coordination. But as supply chains are getting faster, orders smaller and more frequent, and technical barriers to participate are lowering, simple visibility is not enough. Applying AI and machine learning to the data flowing through the network is necessary to gain insights into trends that will lead to disruption if not corrected. Then, applying business process automation to correct the problem and remove the human element becomes the next logical progression of the solution.

As with all technology adoption, it is important to start simple, realize actual value quickly, and grow from there. Logically, to realize value, key performance indicators must actively be measured before and throughout the advanced visibility adoption path in order to quantifiably measure success. IBM has many solutions to help the customer with their advanced supply chain visibility journey, as well as a global services team with a rich history in supply chain and order management practices who can help with tailoring any solution to meet the customer's needs.

IBM Corporation
New Orchard Road
Armonk, NY 10504
Produced in the
United States of America
2019

This document contains information pertaining to the following IBM products which are trademarks and/or registered trademarks of IBM Corporation:

- IBM® Sterling Supply Chain Business Network
- IBM Sterling Supply Chain Insights with Watson
- IBM Sterling Delivery Transaction Intelligence
- IBM Food Trust
- IBM Cognos Analytics
- IBM Blockchain Platform
- IBM Watson IoT Platform
- IBM Business Automation Workflow

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

All client examples cited or described are presented as illustration of the manner in which some clients have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual client configurations and conditions. Contact IBM to see what we can do for you.