



KPI-Driven Supply Chains: **How to Master Complexity, Optimize Inventories,** **and Meet Rising Customer Expectations**

Introduction

In today's hyper-competitive markets, manufacturers and wholesale distributors are challenged to achieve supply chain efficiencies that are on par with their rivals. To remain profitable and competitive, they must now adopt Key Performance Indicators (KPI) to drive processes and systems.

They must be able to actively track KPIs in their operations, turning these insights into agile moves and enhanced performance. Companies that fail to manage by KPIs are liable to misunderstand market trends and misallocate resources.

Given today's supply chain pressures, manufacturers are increasingly vulnerable to exceptions and unexpected events. "The supply chains for many companies become so extended in both time and space that the complexity becomes overwhelming," argues *Future Shock* author Alvin Toffler. "Just-in-time delivery is a great thing, but it also means that all the temporal tolerances get smaller. It makes the system more sensitive to disruption. It does not take much to knock it off of its tolerances."

What happens when manufacturers and wholesale distributors fail to identify and act on leading indicators? They are liable to suffer from excessive inventory holding costs, increasing transportation and labor costs, ineffective fulfillment, poor customer relationships and adversarial supplier relationships. They become dependent on costly expeditors.

Smart manufacturers and wholesale distributors are realizing they must adopt KPI-driven processes and systems if they are to continue driving profitable growth in today's challenging markets. But, in order to execute these strategies, they must have the underlying systems and infrastructure necessary to collect relevant information, manage and refine operational processes, and take the actions necessary to maximize their limited resources

They must gather relevant supply chain information and make it actionable. They must know what to measure and what questions to ask. KPI-driven execution in the supply chain, as we will discuss, requires manufacturers and wholesale distributors to instrument, analyze, control and optimize their end to end supply chain processes.

Market Drivers: Complexity, Improvement and Measurement

Manufacturers and wholesale distributors today are confronted with the growing complexity of supply chains, the necessity of implementing new performance-driving models and methodologies, and the need to measure and monitor their operations with increasing precision.

Complexity is a particularly difficult issue. It's far more challenging to manage and fill orders than it has ever been. In the past, companies managed finished goods warehouses – picking, packing and shipping orders at the pallet level to know distribution points using simple fixed process steps. Now, they must manage multi-channel fulfillment models prepared to delivered orders originating on the Internet, through catalogues and from retail sites. They now need to pick, pack and configure to customer specific quantities such as eaches and inners that need to be shipped to order specific locations such as home addresses, building sites or even a hospital floor. .

Today, warehouse and logistics management are riddled with manual processes that are static and incapable of managing the growing complexity of the supply chain. Companies need far greater visibility into their supply chains – both in terms of availability upstream and demand downstream. They must manage and monitor their supply chain processes with far greater proficiency to ensure they are delivering with the speed and accuracy that today’s demanding customers expect. They must manage themselves by the logic of pull-based, just-in-time approaches.

To address this rising complexity, manufacturers and wholesale distributors have sought solutions in various performance models and methodologies. They have embraced operating frameworks such as SCOR – Supply Chain Operations Reference – to implement best practices and processes, and continuous improvement methodologies such as Six Sigma and Lean Warehousing to drive and measure performance gains. They are concentrating on eliminating errors, inefficiencies and operational friction.

To this point, manufacturers and wholesale distributors have relied on manual measurement tools such as MS Access and Excel to gather operational data and analyze relevant trends. With a hundred rows of information on a spreadsheet tool, operations managers try to determine where their vulnerabilities lie and what actions they must take. But these tools face several limitations. Proliferating spreadsheets and databases may capture discrete measures, but aren’t integrated and can’t provide a unified view of operations.

Such tools are proving inadequate in terms of generating the key performance indicators necessary to run their increasingly complex operations. Conventional measurement approaches may produce gross level measures such as overall operation costs, number of daily shipments or cubic pounds/feet shipped weekly. More sophisticated measures – such as dock to stock time - – have been impossible to gather.

Now, manufacturers and wholesale distributors realize they must gather information pertaining to events, requests, and exceptions that occur throughout the supply chain. They must be able to rapidly act on these insights throughout their organizations and across geographies. They must also achieve Sarbanes-Oxley compliance as the demand for greater internal controls is mandated.

To meet the expectations of their customers and remain competitive in today’s demanding markets, best-in-class manufacturers and wholesale distributors have implemented KPI-driven processes and systems. As a greater percentage of the manufacturing and wholesale distribution companies’ overall operational costs shift to the supply chain, they are maximizing efficiencies across their supply networks. They are cost effectively moving products to their customers on the required shipping dates and in the required quantities. Indeed, they are now challenged to produce actionable intelligence that goes far beyond what they’ve had in the past.

Business Challenges: Confronting Rising Costs and Expectations in Today’s Hyper-Competitive Markets

With large manufacturers and wholesale distributors gaining greater efficiencies through volume production, small- and mid-sized manufacturers and wholesale distributors are challenged to differentiate themselves in other ways. They must offer preferable pricing or enhanced service quality.

The only way to compete in this environment is by perpetually improving and streamlining their processes. They must identify opportunities to compete on superior supply chain execution.

However, they can't drive process improvement without a vigorous commitment to KPI-driven strategies based on real-time data collection. Existing spreadsheets and database tools, which tend to disperse information rather than consolidate it into actionable intelligence, won't get them there. In the absence of KPIs that provide actionable intelligence, manufacturers and wholesale distributors are liable to experience an array of problems that undermine performance. Among them:

- **Excessive inventory holding costs.** As inventory piles up or becomes obsolescent, inventory costs rise substantially. The key factor driving this challenge is exceptions handling. While companies may be on monthly or weekly planning cycles, costly exceptions are emerging on a daily or even hourly basis – driving up costs and the need for adjustments. Without data to indicate exceptions, it's impossible to improve the planning cycle and reduce inventory holding costs.
- **Increasing transportation and labor costs.** As supply chain demands and customer orders become more complex, companies see transportation and labor costs escalate. Smaller shipments, for instance, naturally drive up costs. If companies are incapable of consolidating them into larger shipments based on optimal carrier mode selection, fulfillment becomes more expensive.
- **Ineffective fulfillment.** In an era that increasingly stresses the “perfect order,” manufacturers and wholesale distributors are expected to deliver on time in the required quantity and under the agreed-upon specifications. If a company struggles to effectively manage exceptions, it is liable to perform ineffectively on measures of fulfillment. Many companies, however, tend to meet fulfillment requirements through costly and inefficient recovery processes when exceptions do occur. When a supplier's shipment is late or arrives with damaged materials, for instance, they must actively deploy a series of expeditors to meet the customer's expectations.
- **Inadequate customer service.** When manufacturers and wholesale distributors are unable to meet customer expectations, they reduce customer satisfaction and even run the risk of customer defection. Manufacturers and wholesale distributors strengthen customer relationships when they enhance predictability – even when they must periodically adjust commitments. The essence of strong relationships is proactive communications and predictable service. However, manufacturers and wholesale distributors are often unable to meet the customer's high expectations when they themselves lack visibility into supply chain operations.
- **Adversarial supplier relationships.** When manufacturers and wholesale distributors are unable to effectively collaborate with their suppliers, they introduce an array of costly exceptions into the supply chain. Rather than concentrating on squeezing suppliers on price, companies can achieve maximum performance by working together to manage such issues as ship dates or custom labeling. These relationships, however, often remain adversarial when relevant KPIs are not available, information is not shared and suppliers are perceived as unresponsive.

Such challenges threaten to undermine the success of small- and mid-sized manufacturers and wholesale distributors who must differentiate themselves in today's crowded and demanding markets. To operate and execute their supply chain processes in far more productive ways, best-in-class

companies are embracing KPI-driven strategies and solutions. They are implementing processes and systems that give them the leading indicators necessary to act in an agile, responsive and profitable fashion.

Solution: KPI-Driven Supply Chain Execution

To drive out costs and drive performance to new levels, best-in-class manufacturers and wholesale distributors are now implementing KPI-driven processes and systems that enhance supply chain execution. They understand that key performance indicators give them the actionable intelligence required to both strengthen supply chain planning and take corrective action in real-time when exceptions and unexpected events occur.

By monitoring and managing their processes with increasing precision, companies can master the growing complexity they now face, handle exceptions with greater skill and cost-effectively meet the growing expectations of their customers.

KPI-driven strategies, however, depend on operational models and improvement methodologies that help manufacturers and wholesale distributors determine, monitor and enhance appropriate measures. They also depend on the underlying systems necessary to collect relevant information, distribute it and drive corrective action in real-time. KPI-driven supply chain execution possesses four key dimensions:

- **Instrument.** This dimension revolves around implementing the systems that will collect the appropriate data at minimal cost, minimal effort and with maximum accuracy. It concerns the systems of data collection, pulling streams of data together to provide a consolidated view of relevant KPIs and measurement points.
- **Analyze.** Drawing on data feeds and key performance indicators, decision makers can detect problems and analyze what corrective actions must be taken to address them. In this way, exception handling – the major source of supply chain inefficiency – can be streamlined and cost-effectively managed.
- **Control.** KPI-driven supply chain execution systems not only present performance indicators, they facilitate real-time, corrective action. They allow the decision-maker to close the loop and manage the resolution of a non-conforming event by, typically, invoking a relevant workflow that drives immediate action.
- **Optimize.** Based on KPIs and other analysis, decision-makers can take the steps necessary to improve performance over time. They can monitor historical trends, predict future ones and look for patterns. Through such findings, manufacturers and wholesale distributors acquire the perspective necessary to drive improvements and optimize operations.

Companies often tend to handle exceptions and unexpected events by deploying expeditors and other personnel to handle problems. Such approaches are excessively costly, however. By implementing KPI-driven approaches to leverage actionable intelligence, best-in-class manufacturers taking immediate action on exceptions while reducing them over time through continuous improvement efforts.

Level 1 Strategic Metrics	Performance Attributes				
	Customer-Facing			Internal-Facing	
	Reliability	Responsiveness	Agility	Costs	Assets
Perfect Order Fulfillment	✓				
Order Fulfillment Cycle Time		✓			
Upside Supply Chain Flexibility			✓		
Upside Supply Chain Adaptability			✓		
Downside Supply Chain Adaptability			✓		
Supply Chain Management Cost				✓	
Cost of Goods Sold				✓	
Cash-To-Cash Cycle Time					✓
Return on Supply Chain Fixed Assets					✓
Return on Working Capital					✓

Figure 4 - SCOR Performance Attributes and Level 1 Metrics

Source: The Supply Chain Council

The Benefits of KPI-Driven Supply Chain Execution

Manufacturers and wholesale distributors derive benefits from this approach by engineering costs out of their supply chain execution processes. The greatest gains are accomplished by taking control of the processes in real-time, identifying and isolating costly exceptions, and monitoring those exceptions as carefully and efficiently as possible.

By accomplishing this objective in a collaborative way across one's own organization or across the entire supply chain, manufacturers and wholesale distributors produce significant cost savings and service improvements. Companies that bring KPI-driven strategies to supply chain execution realize benefits in terms of:

- Reduced inventory holding costs
- Reduced transportation and labor costs
- Enhanced order fulfillment
- Higher customer satisfaction and retention rates
- Collaborative supplier relationships

Such efforts lead to increased responsiveness and increased profitability, while enabling the best-in-class companies that adopt these approaches to enhance their competitiveness. By driving out unnecessary costs associated with exceptions and inefficient processes, they strengthen their connections with suppliers and deepen customer relationships.

Case in Point: Motorola

One company that exemplifies the power of KPI-driven supply chain execution is Motorola. After its 2007 acquisition of enterprise mobility products maker Symbol, the Schaumburg, Illinois-based electronics giant began applying its deep strengths in Lean Six Sigma to supply chain and distribution activities linked to the acquired company. The company's newly acquired McAllen, Texas facility became the central focus of its efforts.

Relying on CDC Software's Catalyst Warehouse Management System, Motorola was able to rationalize Symbol's manufacturing and distribution network. It compressed overall manufacturing and distribution lead times through a supply chain network redesign initiative. Motorola was able to consolidate operations around this single distribution facility in McAllen.

Motorola applied its process improvement methodology to identify multiple points within the warehouse that lent themselves to redesign and improved performance. Using visual cues such as color coding on picking labels, for instance, the company was able to reduce order processing times and enhance shipping operations. Its "hot pick" methodology was applied to pre-consolidate large orders.

Embarking on a Lean Six Sigma journey, Motorola identified several key performance indicators to drive analysis, action and continual improvement. Among the KPIs the companies relied on:

- *Dock to Stock* to make material available for sales (target reached: 1 hour);
- *Outbound Processing Time* to enhance the efficiency of processing all orders (target reached: 3.5 hours);
- *Inventory Accuracy* to control location variances, eliminating mistakes and errors (target reached: 99.65% - 3500 PPM);
- *Shipping Accuracy* to eliminate discrepancies and shipping errors (target reached: 99.98% - 200 PPM).

Ultimately, Motorola was able to meet its objective of creating a lean operation. It lowered labor costs significantly. While the operation required hundreds of people and ran around the clock seven years ago, it has since doubled fulfillment with a 300% reduction in labor running on one shift. Most of these gains can be attributed to process improvement. Having instrumented its KPI-driven approach and gathered data for analysis, Motorola has delivered measurable performance gains that are truly best-in-class.

Decision Criteria: What to Look for in a Software/Solution Provider

Manufacturers and wholesale distributors exploring the possibility of investing in KPI-driven supply chain execution should consider software and solution providers that meet certain key criteria. As best-

in-class companies that have made these investments have found, appropriate solution providers should have:

- Supply Chain Execution Expertise. They should understand the complexities associated with today's supply chain execution processes as they are experienced by today's manufacturers and wholesale distributors.
- Process Improvement Expertise. Solution providers should be familiar with these approaches and capable of adapting their solutions to support the process improvement efforts of their clients. Most importantly, they should be able to instrument their systems for these methods.
- Flexible Event Detection Systems. They should have instrumented their systems to track key performance indicators, monitor operational processes and take corrective action in real-time when necessary.
- Analytical Tools. Tools should be able to analyze collected data or nonconforming event notifications. Leveraging this information, corrective action can be executed – minimizing the exception resolution cycle.
- System Agnostic. KPI-driven execution systems should be capable of integrating with any ERP or Warehouse Management solution – no matter the vendor.
- Scalable Solution. Recognizing that small- to mid-sized manufacturers are typically unprepared to invest vast sums and wait 9-12 months for implementations to be completed, solution providers should provide offerings that match existing budgets and grow to meet the needs of their clients.

KPI-driven supply chain execution offers small- and mid-sized manufacturers and wholesale distributors an opportunity to outmaneuver and differentiate themselves against larger rivals. But they'll need to commit themselves to new methods, methodologies and systems – based on key performance indicators – that make supply chain intelligence actionable. As best-in-class manufacturers and wholesale distributors of all sizes have discovered, such moves are essential if one is to compete – and win – in the hyper-competitive markets of the present and future.

About CDC Supply Chain

CDC Supply Chain - formerly Catalyst International and Industri-Matematik International Corp. (IMI) is the Supply Chain management product division of CDC Software and has provided specialist supply chain solutions to our customers for over 40 years. CDC Software now serves more than 6,000 customers in over 50 countries.

CDC Supply Chain offers a broad range of integrated, open standards-based solutions that service key areas of complex supply chains and distribution networks. The solutions can operate as standalone modules or can seamlessly integrate into an enterprise's existing applications. Key functionality in the CDC Supply Chain Suite includes order & inventory management, demand & replenishment planning, warehouse management, transportation management, dynamic route planning, slotting, labor management, cross dock planning and yard management.

Some of the world's leading companies use CDC Supply Chain including: Ahlsell, Ahold/Albert Heijn, Aldo Shoes, Astra Zeneca, Boeing/Aviall, Canadian Tire, Celesio/NMD, The Container Store, Dixons Group, Fred's Inc, General Motors, Homebase, Kramp Group, ICA Norway, Isaberg Rapid, Legrand Group, Motorola/Symbol, NorgesGruppen, Pan Nordic Logistics, PepsiCo International, SABIC (GE Plastics), Schenker Logistics and Tuko Logistics. For more information, please visit www.cdcsupplychain.com.

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