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OpenText™ Special Edition

Supply Chain Analytics

for
dummies[®]
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Define supply
chain analytics

Discover the approach
to getting started

Learn tips for optimizing
your supply chain

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Mark Morley

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OpenText enables the digital world, creating a better way for organizations to work with information, on-premises or in the cloud. OpenText™ Business Network simplifies the inherent complexities in trading partner ecosystems, providing a single connection that digitizes all information flows, whether they are suppliers, customers, banks, or other valued partners. OpenText operates the largest B2B integration network in the world, connecting more than 600,000 companies and processing over 18 billion transactions each year. For more information about OpenText (NASDAQ: OTEX, TSX: OTC), visit www.opentext.com.



Supply Chain Analytics

OpenText™ Special Edition

by Mark Morley

for
dummies[®]
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Supply Chain Analytics For Dummies®, OpenText™ Special Edition

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Introduction

Big Data is one of the hottest topics in the technology world today. Chief Information Officers (CIOs) across the globe strive to exploit the vast amount of data they have within their organizations to transform how they do business. The ability to gain insight into the information you have can make a huge difference in everything you do, from the experience you deliver to customers, to the efficiency of your business operations.

Your supply chain creates a massive amount of information. In fact, you could think of it as a “data lake” into which information constantly flows from systems such as accounts payable and receivable, Electronic Data Interchange (EDI), and Business-to-Business (B2B) integration, warehousing, transport, and logistics but also information from customers and suppliers. Being able to monitor, measure, and analyze this data in a near real-time environment will deliver tangible monetary value to your organization.

Applying analytics to the supply chain is still relatively new. As the technologies for intelligent analysis and data visualization explode, it is a great time to look at what your business can achieve through a comprehensive supply chain analytics strategy.

About the Book

Supply Chain Analytics For Dummies, OpenText Special Edition, provides you with a handy book full of everything you need to know to get started on your journey. This book consists of seven short chapters that cover

- »» What supply chain analytics is and what benefits it offers your business (Chapters 1 and 2)
- »» Which metrics and key performance indicators (KPIs) should you look to measure (Chapter 3)
- »» Where in your supply chain you can apply analytics and how this differs by industry (Chapter 4)
- »» How to begin implementing supply chain analytics (Chapter 5)

- »» What future directions you can expect from supply chain analytics (Chapter 6)
- »» Ten tips for optimizing your supply chain (Chapter 7)

Foolish Assumptions

When writing this book, I tried to make this book as accessible and readable as possible for everyone. The content is designed for supply chain managers and directors looking to implement analytics as well as line of business managers who wish to know more about the insights they could be receiving through supply chain analytics.

Icons Used In This Book



REMEMBER

I use this icon when there's something important you should commit to memory before you progress on with the chapter.



TIP

You'll find these icons dotted throughout the book, giving you helpful suggestions and bite-sized nuggets of useful information.



WARNING

I don't just know what to do. I also know what *not* to do. Look out for these icons to help you avoid some common pitfalls.



TECHNICAL
STUFF

This is the jargon buster icon. When I have to get technical, I give a little plain English explanation of what I mean.

IN THIS CHAPTER

- » Learning the different components of supply chain analytics
- » Understanding the role of analytics in the supply chain
- » Knowing what makes for good analytics
- » Learning the difference between analytics types

Chapter 1

Defining Supply Chain Analytics

Supply chain analytics has the power to completely transform your business, especially if you're in the manufacturing, automotive, retail, fast moving consumer goods (FMCG), and information technology sectors. So, this chapter sets out exactly what I'm talking about.

A simple definition

Supply chain analytics lets you make sense of the data in your supply chain, so you can make better decisions. That's really all there is to it! This is going to be a very short book. But wait — it's not as easy as it sounds.

Anyone with any supply chain experience knows what complex beasts they can be. In most organizations, the supply chains have grown and evolved over many years. Each one is a potentially data-creating monster — and data can be in all sorts of places and in all sorts of formats.

The global nature of today's business has led modern supply chains to become more intricate and diverse than anyone could've dreamed of only a few decades ago. Many companies have a network of supply chains connecting various suppliers and partners. In addition, the growth of partner-to-partner relationships means that companies are frequently also a part of other organizations' supply chains.

This complex supply chain environment presents a number of critical challenges for a business, including

- » Lack of synchronization between business strategy and execution
- » Lack of real-time visibility across supply chain operations
- » Inability to properly schedule production, leading to costly asset underutilization
- » Poor forecast accuracy, resulting in frequent stock-outs or excess inventory and safety stock levels
- » Lack of flexibility in the manufacturing, distribution, and logistics footprints
- » Inability to properly assess and prepare for supply chain risks

Applying intelligent analytics is the key to addressing all these challenges — and many more.

The Three Core Components of Supply Chain Analytics

Digitizing paper-based information has become a key strategic element for nearly every organization. In addition to the obvious data handling benefits, digitizing also creates new opportunities for data analysis, a.k.a. *analytics*. Analytics allows for automated number crunching on a huge scale and can quickly deliver decision-critical insights.

Of course, analytics isn't a new discipline. Supply chain managers have been populating spreadsheets and trawling through report printouts for decades. However, that kind of analysis can be painfully slow, complex, and — let's face it — tedious.

Analytics helps companies learn lessons from the past (not the dim and distant past, but the recent, relevant past) so they can make better decisions in the future. Ford, for instance, isn't going to glean many useful insights from studying data from the Model T production line. The information has to be up-to-date and presented in a way that makes it easy for users to extract the key information.

To deliver actionable insights (that is, insights that might result in taking action), supply chain analytics requires three core components, as shown in Figure 1-1:

- » **Data analytics:** The process of examining datasets using specialized systems and software to draw conclusions about the information they contain. Within the supply chain, this requires collating and analyzing data from a series of complementary systems.
- » **Data visualization:** The process of helping people understand the significance of data by placing it in a visual context. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized more easily with data visualization.
- » **Technology platform:** The underlying infrastructure — often including an analytics engine — that allows for the capture, storage, retrieval, aggregation, analysis, and reporting of all transactions taking place within the supply chain and with trading partners.

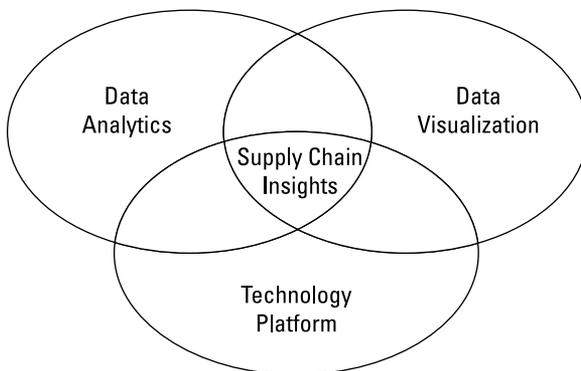


FIGURE 1-1: The core components of supply chain analytics that lead to better decision making.

By combining these three components, organizations can create an effective supply chain analytics solution.



The term *analytics engine* was originally coined by Charles Babbage to describe his pioneering computer. Today it describes any comprehensive internal system for data analytics. The important thing to know is that an analytics engine is embedded into a larger system and makes sense of the data it's handling.

How Supply Chain Analytics Works

Supply chain analytics makes two main business processes — order-to-cash (OTC) and procure-to-pay (P2P) — more efficient and effective. OTC is the downstream or sell-side process and includes all the steps required to receive and process a customer's order, from the customer placing the order to the order being delivered to the final bill being settled. Figure 1-2 illustrates these steps.

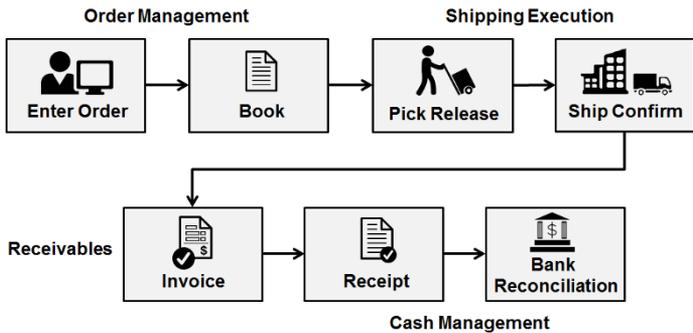


FIGURE 1-2: The OTC cycle.

P2P is the upstream or buy-side process of the business. It represents the relationships and transactions that an organization has with its suppliers. It includes quotations, purchase orders, receipt of materials, and paying supplier invoices, as illustrated in Figure 1-3.

Both OTC and P2P have a lot of moving parts. Many stages, sub-stages, and interconnected systems are involved. At each stage, many people, including managers and staff, need to know exactly

what's going on. Having the right data at the fingertips of those who need it is key to optimizing these processes.

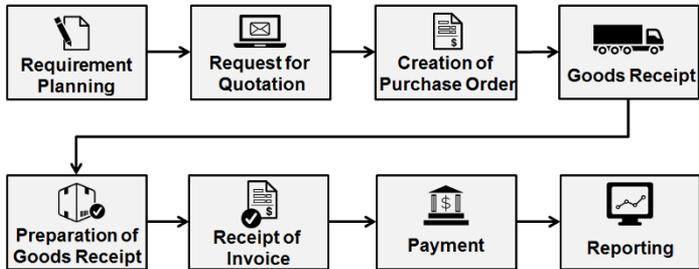


FIGURE 1-3: The P2P cycle.

Supply chain analytics consists of the three stages shown in Figure 1-4:

- » **Stage 1: Obtain the Right Data.** What data do you have? What format is it in? Where is it stored? Is it up-to-date and relevant for the type of analysis you want to undertake?
- » **Stage 2: Define the data for analysis.** What do you want to measure? How many datasets do you want to include? How often are you going to refresh or update this data? How are you going to display the results? What type of reports do you need to create?
- » **Stage 3: Discover the insights.** How are you going to visualize the data? How much drilling down will be required? How will executives need to be able to interrogate the data? Are you able to predict outcomes and trends?

Supply chain analytics can help an organization apply information to real business needs and pain points. For example, analytics can help improve forecast accuracy and reduce inventory (check out Chapter 2 for more info). For it to work effectively, however, the organization must know exactly what it wants to measure and why. For that, check out a more detailed explanation in Chapter 3.

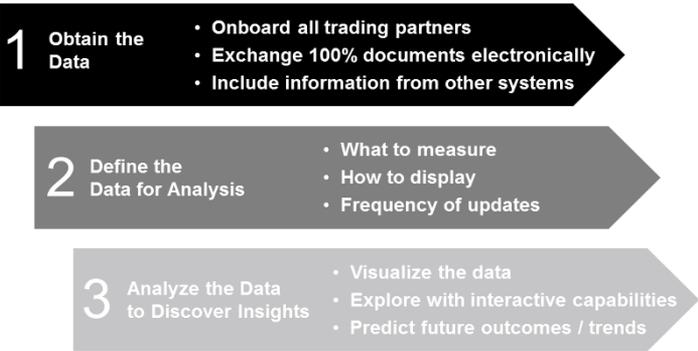


FIGURE 1-4: The three stages of supply chain analytics.

What Makes for Good Analytics?

To gain maximum insight, analytics systems must have access to *all* the data, from *all* stages in the process, and from *all* the systems involved in making the process work. An organization can get some valuable information from looking at data in a single system, but the real power of analytics comes when you combine data from multiple systems, in a process called *data blending*.

Data blending provides a quick and straightforward method of extracting value from multiple data sources and allows analysis on the entire dataset. It can deliver a single view of a specific area — such as perfect orders completed, for example — that allows the organization to evaluate performance at a glance, both for itself and its trading partners.



REMEMBER

Not all transactions in the supply chain will be in a digital format. Many companies still use telephone, email, and fax to place orders. When data blending, an organization must remember the data that's held on paper, and then work out how to include it within the analysis. For instance, faxed orders might be scanned and imported into an ERP system.

Data quality is an important concern. The information from an analytics solution must be

- » **Timely:** The decision-making process is accelerating. Companies can't wait days, weeks, or months for the

numbers to be crunched. The information must be presented in as close to real time as possible.

- » **Accurate:** People will make poor decisions if the original data is poor. The data that populates the analytics engine must be error free; otherwise, garbage in equals garbage out.
- » **Relevant:** There is a temptation with analytics to measure everything just because you can, but this leads to data overload. A good analytics solution should be able to zoom in on the relevant facts needed to address specific business issues.
- » **Integrated:** Looking at one data set in isolation is unlikely to derive the insight of combining multiple datasets. Analytics must present as complete a picture as possible (using the minimum number of datasets, of course!).
- » **Digestible:** Raw data is hard to digest. Even text-based reports are better displayed visually. The easier the analytics results are to digest, the more widely they'll be put to use.



REMEMBER

No set of analytics results should take more than 10 to 15 minutes to digest. That not only includes the top-line results but also the data underneath that people will drill down into.



WARNING

For any specific business process, try to include no more than ten different metrics. With more than this, the analytics can become very complex and the results very difficult to interpret and digest.

Types of Analytics

For most types of data analytics — and supply chain analytics is no different — there are three potential approaches:

- » **Descriptive analytics** looks at data and analyzes past events for insight as to how to approach the future. It is looking for the reasons behind past failure and success. *What happened, where, and why?*
- » **Predictive analytics** uses historical and transactional data to determine the probable future outcome of an event or a likelihood of a situation occurring. It exploits patterns found in the data to identify future risks and opportunities. *What will happen and what should be done next?*

» **Prescriptive analytics** automatically synthesizes big data, business rules, and machine learning to make predictions. It goes beyond predicting future outcomes by also suggesting actions to benefit from the predictions and showing the decision maker the implications of each decision option. *What are my best outcomes and what do I need to do to make them happen?*

Within the supply chain, descriptive analytics is still the most commonly implemented. Organizations are working hard to spot weaknesses and opportunities in their current operations. However, predictive and prescriptive analytics are steadily becoming more popular as the analytics technology evolves and the maturity of supply chain managers using analytics increases.

Figure 1-5 shows a slightly more complex model, with more than three layers, but conveying the same basic idea. (You discover the additional layers in Chapter 3.) As you can see in Figure 1-5, each type of data analytics builds on the foundation of the last.

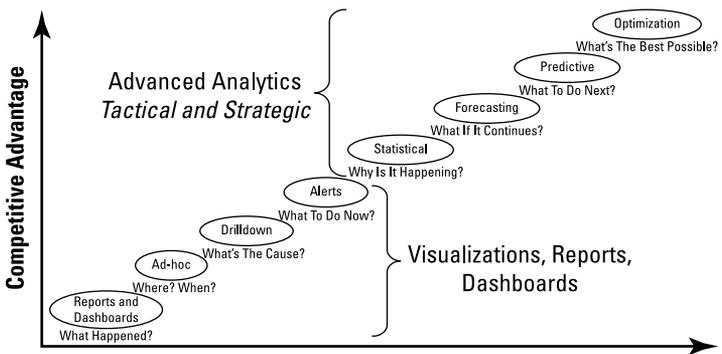


FIGURE 1-5: The landscape for supply chain analytics.

IN THIS CHAPTER

- » Learning about Big Data in the supply chain
- » Learning how analytics answers your supply chain questions
- » Examining the benefits of supply chain analytics
- » Discovering the role of B2B integration
- » Learning how analytics acts as a strategic differentiator

Chapter 2

The Importance of Supply Chain Analytics

If you can't measure it, you can't manage it. That's true in every part of business, and especially true in the supply chain. Supply chains are becoming more complex, more extended, and more global every day. Properly managed supply chains can result in competitive advantage by increasing efficiency and reducing waste. The key is to be able to analyze supply chain performance at a granular level.

When companies gain insight and perspective from their data, it allows for more informed decisions to be made; this drives greater supply chain efficiencies, which ultimately contributes toward increased profit growth.

Big Data in the Supply Chain

The volume of data in every supply chain is exploding from different data sources, business processes, and IT systems. It's not

going to stop any time soon. As more and more companies have digitized their business processes, it's created a virtual tsunami of data worldwide.



Recent research by the analyst firm International Data Corporation (IDC) predicted that there would be 163ZB of digital data in existence by 2025. Yes that is zettabytes! (A zettabyte is one one trillion gigabytes.)

But volume is only one element of data to manage. For the purposes of this book, there are four:

- » **Volume:** The amount of data that's stored within a supply chain
- » **Velocity:** The amount of data passing along a supply chain at any time
- » **Variety:** The different types of data, in terms of both format and function
- » **Veracity:** The need for that data to be reliable and accurate at all times

As the volume and complexity of data increases, so does the complexity and time taken to analyze that data and derive insights from it. I call that the *time to insight*.

The time to insight using traditional data gathering methods is typically measured in months. The process goes like this:

1. **An organization sets a "drop-dead" date on which to freeze the data.**
2. **It spends 30 days or so collating and processing the information to put it into a usable format.**
3. **Take another 30 days for an army of analysts to make sense of the information, and perhaps a few more months putting it in some semi-digestible format.**
4. **At last the data is presented to the board and key executives, who put together next year's plan based on data that's, by this point, six to nine months old.**

The entire life cycle of some consumer electronics products is shorter than that!

Such analysis methods are simply not adequate for dealing with the rapid-fire pace of change and disruption in today's markets. Some companies have previously invested heavily in data analytics for their supply chains, but these attempts have often been for specific business functions, rather than company-wide initiatives. Mid-level managers are good at analyzing their own specific areas, but they don't always see things from a company-wide perspective. One department might come to conclusions based on their analysis that another department's research contradicts, leading to "My facts are better than your facts!" arguments. Sound familiar?

The much-needed insights are hidden in a rapidly growing data lake, and it takes so long to extract the insights from the data that they ultimately aren't of much practical, actionable value. Worse yet, when the final analysis does come back, it's often siloed within the specific department that commissioned its extraction. There's no overarching, enterprise-wide view of the data, so the data could potentially return false insights that don't correlate with overall corporate strategy.



REMEMBER

The power of modern supply chain analytics lies in two areas:

- » It enables a company to fine-tune its supply chain by analyzing data and visually presenting results at a pace and in ways that haven't been possible in the past.
- » It enables a company to take an enterprise-wide holistic approach that relates *all* relevant information — wherever it is and whatever format it's in — to specific business processes or corporate objectives.

Your Questions, Answered

IDC is in no doubt that analytics is the backbone of the future of the supply chain. A recent OpenText sponsored report, "Unlock the Value of Your Supply Chain Through Embedded Analytics," looked at how embedded analytics could unlock more value from a supply chain. IDC said, "The best supply chains will be those that have the ability to quickly analyze large amounts of data and disseminate business insights to decision makers in real time or close to real time."

Taking a 360-degree view of the supply chain is the only way to collaborate effectively with top performing partners, improve business operations, and drive revenue. That's the high level. At the day-to-day level, it's simply about getting your questions answered — questions like the following:

- » Who are my top- and bottom-performing trading partners based on specific KPIs (such as complete orders, accurate shipments, on-time deliveries, and processing of payments)?
- » For which trading partners/customers has the volume (order/payment) increased or decreased by more than 20 percent over the last six months?
- » Who are my top trading partners and how many transactions have I completed with them?
- » Which of my customers sent me the most orders during the holiday season? Which ones sent a lot of changes?

These questions all have a common theme: Who are your suppliers and trading partners, and what are the facts about your interaction with them? Is this partnership strengthening or hurting my supply chain or my customers, therefore my pocket?

By receiving timely and insightful answers to your specific supply chain questions, you'll bring significant benefits to your business. I delve into some of those benefits in the next section.

Looking at the Benefits of Analytics



TIP

The use of intelligent, embedded analytics can benefit every part of a supply chain operation. You can realize the following benefits:

- » **Planning and scheduling:** Planning and scheduling is one of the most important parts of any supply chain. Get this wrong, and you're going to lose a lot of money. Supply chain analytics provides better insights into inventory levels across different locations. You also gain high-quality decision support through near real-time information, which can be vital if something goes wrong.
- » **Improved responsiveness:** Supply chain analytics helps you determine what stock you need in your supply chain. You

can predict what's likely to happen, so you can determine what items to buy, what items to discard, and what items you'll need more of. Armed with this information, you can be much more responsive to trends and events.

- » **Improved demand planning:** With supply chain analytics, you can examine past trends to predict what stock — and in what amount — your customers will require in the future. For each customer, you can see what items are selling well and what items didn't sell well. This increases customer satisfaction and can inform product development.
- » **Order optimization:** Supply chain analytics lets you optimize both the items you're ordering and the overall ordering process. You can increase the number of on-time orders, decrease the cost of acquiring items, and make sure you get what you order. Order optimization brings upstream benefits as well. For example, production is more efficient when assembly lines aren't waiting for parts.
- » **Real-time supply chain execution:** You can see your orders and supply chain in real time and be alerted as soon as an issue arises. You don't have to worry about where orders are, what's happening with them, or whether you need to make changes. Taking this one step further, prescriptive based analytics wouldn't just see what's happened; it shows you the options you have to do something about it right then — for example, what other suppliers are ready to source from immediately.
- » **Inventory management:** With supply chain analytics, you can plan, forecast, and fully optimize your inventory so you don't waste space or waste money with stock that may or may not be working the way it should. You can look across networks to consider consumption rates, inventory levels, and other aspects of your supply chain. You can create the right balance of inventory to keep the supply chain properly stocked while releasing cash for other activities.
- » **Replenishment planning:** With supply chain analytics, you can keep a close eye on inventory levels, noting where more stock will be needed and on what schedule. Further, you can see across your network of trading partners to discover who has the stock that you need and how you can avoid overstocking when it's not required.

- » **Improved partner performance:** Supply chain analytics gives you much greater visibility into your trading partners' activities and performance. You can see quickly which ones are delivering the most profitable business for you. You can determine which suppliers are good to work with and are reliable when an order is placed. Armed with this information, you're well positioned for contract and price negotiations.
- » **Improved cash management:** By helping to focus on elements like delivering perfect orders and controlling inventory levels, supply chain analytics helps with cash management. As you're able to deliver more orders on time and in full, you can reduce the errors and exceptions that drain profitability and damage customer relationships. You shorten the order-to-cash and cash-to-cash cycles and grow revenue by reducing waste.



TECHNICAL
STUFF

The cash-to-cash cycle is the time taken to turn your resource inputs (the cost of everything it takes for you to deliver your product or service) into cash. The shorter the cycle, the more money you have available.

Why B2B Integration?

More and more companies are beginning to take a holistic, end-to-end approach to supply chain analytics, and with great results. Strategically using data to transform traditional process-driven organizations can help them become more competitive, increase revenues and profits, reduce risk, and guide them to new initiatives.

A recent *Forbes Insights* article, discussing the problems that keep enterprises from seeing long-term value from their data initiatives, talks about the benefits of analytics maturity, how “laggard” organizations are process-based, and how the data generated is often seen as a secondary product. Too often, these organizations are unable to either share information or analyze data effectively within internal departments. While laggards struggle, 75 percent of top performers have a full range of enterprise, departmental, and line-of-business analytics groups that operate within a

well-aligned framework. The result is that top performers enjoy growth in revenues and operating margins of 15 percent, or more.

Another factor that distinguishes leaders is their implementation of business-to-business (B2B) integration technologies. B2B integration means the integration, automation, and optimization of key business processes that extend outside the four walls of a company. B2B provides a platform for the digital supply chain. It enables companies to conduct business with trading partners through the digital exchange of key business documents. Using B2B integration ensures that organizations have a single source for all their supply chain data. It enables them to embed an intelligent analytics engine within their B2B integration platforms.

According to the OpenText sponsored study with IDC, “How B2B Integration Drives Superior Supply Chain Performance,” companies that use B2B integration can expect some significant benefits, especially in supply chain processes. Figure 2-1 shows you these benefits.

+156%	<i>Faster Invoice Processing Time</i>
+89%	<i>More Responsive to Unforeseen Events</i>
+48%	<i>Improvement in Customer Order Delivery Time</i>
+35%	<i>Faster Inventory Turns</i>
+22%	<i>Reduction in Cash to Cash Cycle Time</i>
+16%	<i>Improvement in Successful Product Launches</i>
+3%	<i>Improvement in Perfect Orders</i>

FIGURE 2-1: The benefits of B2B integration.

Beyond providing a single source of supply chain information, embedding analytics within the B2B integration platform enables you to pull in data from a comprehensive range of other back-end and middle-end systems such as ERP, CRM, Warehouse Management, and Transport Management Systems. The analytics engine can pull all this disparate data together through data-blending, process it into meaningful information, and present it visually so that the results are easily digestible. This approach allows organizations to maximize their investment in analytics.

A Strategic Differentiator

Taking an enterprise-wide approach to supply chain analytics becomes a strategic differentiator. The holistic, near real-time access to actionable information gives advantage over competitors that are still involved in a siloed, ad-hoc approach to analytics.

In fact, according to research from *Forbes Insights*, which looked at the problems that keep enterprises from seeing long-term value from their data initiatives, only 7 percent of companies can be considered top performers in supply chain analytics. Among such organizations, 45 percent said their analytics strategy is well-established and viewed as a key strategy to support their business operations, while 38 percent had analytics capabilities within line-of-business but not cross-business. The research indicated that 10 percent of companies are laggards that have yet to start using analytics effectively.

Those numbers may be a little optimistic, however. Supply chain expert Thomas Davenport, says that 80 percent of companies are what he calls *analytics amateurs* — namely they can use spreadsheets and understand analytical transactions. Whatever the actual case, *Forbes* presents some compelling reasons for a company to become a top performer. Companies that lead in this area experience 15 percent or more increase in revenue growth and operating margin compared to other organizations.

IN THIS CHAPTER

- » Learning the key strategic drivers for supply chain analytics
- » Discovering why balance is important within analytics initiatives
- » Learning how to align key performance indicators (KPIs) with metrics

Chapter 3

Understanding the Basics of Metrics and KPIs

Supply chain analytics serves two main purposes: First, it allows a business to identify, diagnose, and correct inefficiencies and waste in its supply chain. Secondly, it enables a business to use supply chain data to identify, prioritize, and address business opportunities. Ensuring that you're measuring and reporting on the correct metrics is key to improving business performance. This chapter provides guidance on how and what to potentially measure across your business.

Strategic Goals

A company's growth and overall well-being depends heavily on its corporate strategy — in other words, the master plan that its top leaders have in mind. Will the company focus on building cash or opening new locations? Will manufacturing be top priority or R&D? This section gives you five areas of corporate strategy that can benefit from supply chain analytics.

Increase profitability

If a company wants to increase profitability, there are two ways to go about it: Make more sales to increase absolute revenue and/or reduce your costs to increase profit margin. Revenue analytics are designed to evaluate both factors.

To help grow the business, analytics can identify opportunities for supply chain initiatives. Detecting supply chain inefficiencies causing missed sales due to out of stock (OOS) is a key benefit of analytics. For example, if a particular supplier is continually late in its delivery and causes orders to go unfulfilled to your customers, this is an opportunity for improvement. Conversely, analytics can help companies aggregate their volumes to negotiate better rates, which will result in lower costs and greater profit margins. These simple examples are just the tip of the iceberg but clearly demonstrate that greater insight can drive profitability.

Forecast accuracy

For most businesses, the more accurate the forecasts — whether financial reporting, demand planning, or inventory management — the more effectively the business serves its customers and shareholders. Many factors affect forecast accuracy, such as supply chain cost controls, order fulfillment, and inventory optimization efforts. A number of small improvements can significantly improve forecasting accuracy. Modern forecast analytics use existing data to predict the volatility of a particular product line or stock item. The best results come from a large data pool with a number of data sources that cover at least a 12- to 18-month timeframe.

Working capital improvement

Working capital is money that's ready to spend, not tied up in inventory, real estate, or other assets. Working capital analytics places the focus on end-to-end supply chain inventory. For example, analytics might determine that a company has an inventory in excess of 15 percent, which could be liquidated (or just not replenished) to improve cash flow. Inventory analytics enables setting efficient inventory levels, determining how much

stock is currently in the supply chain, identifying slow-moving or obsolete stock, and deciding where stock should best reside for optimal logistics.



TIP

To improve cashflow further, companies should be considering shortening daily sales outstanding (DSO) and reviewing payment terms with suppliers so monies owed are collected much sooner. The combination of improved inventory management, shorter DSO, and reduced payment terms help improve the overall working capital available across the business.

Operating margin improvement

The most common approach to improving your operating margin — the difference between your revenue and your costs — is through savings. Within the supply chain, that means knowing where your key areas of cost occur. So a company looking to reduce its operating costs and improve supply chain efficiencies will look for where unnecessary expense is happening. This could be where orders are incorrect and need to be redelivered or where customers are rejecting invoices or delaying payments. Additionally, the goal is to minimize the cost of capital and right-size the inventory levels to balance between OOS and inventory holding costs. To find out what's happening and why, you need to combine analytics covering supply chain network performance, inventory analytics, and supply chain expenses.

Risk management

Businesses ensure their continued survival by responsibly managing risks and that extends to the supply chain. Along with looking at KPIs, businesses today also frequently talk about key risk indicators (KRIs), which are risks they track and manage. Analytics can identify operational, financial, and compliance risks within a business's own supply chain operations as well as those of its trading partners.



REMEMBER

Supply chain analytics is most effective when it starts by addressing a real business objective. When you're defining your metrics, always make sure that they're fully aligned with your corporate goals.

Two Strategic Considerations

Defining the key strategic goal to achieve is a great first step in developing a company’s analytics initiative, but there are two important considerations. This section examines them.

Top down versus bottom up

When planning supply chain analytics, starting at the top with corporate goals ensures that the analytics are aligned with the business’s overall needs. However, many organizations have built their analytics capabilities in the opposite direction. They started by addressing a specific operational problem, such as “How many invoices are we sending, and how quickly are they getting paid?” and then developed analytics to address the specific question. Figure 3-1 illustrates the different approaches.



FIGURE 3-1: Top-down versus bottom-up analytics development.

As companies mature in their use of analytics, they tend to increasingly take a top-down approach. That doesn’t mean that the top-down approach is always the best one, however. The key is to find the correct balance for the situation and company. For example, a company might start by addressing ways to improve order cycle time and use that as the beginnings of a program to achieve better forecast accuracy.

Positive versus negative variance

Supply chain analytics is frequently about managing the variance of a particular metric. A simple rule is that lower variance — the difference between the predicted and actual value of the

metric — indicates a well-managed enterprise based on the accuracy of their forecasting.

When a company optimizes a process to meet its business objectives, some metrics will be negative and some positive. Part of analytics is ensuring that you find the most effective balance between them. The key is to understand the overall impact of both positive and negative variances and define the acceptable range of variance to optimize your business operations as shown in Figure 3-2.

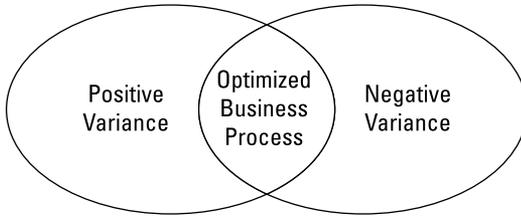


FIGURE 3-2: Defining acceptable ranges of positive and negative variance within metrics to optimize business processes.



WARNING

Don't treat variances the same across all metrics. That's like prescribing a single medicine for all patients without individual evaluations. If you do focus closely on individual metrics, make sure they're of real value to the bottom line.

For example, imagine you're an automotive supplier using Just-in-Time (JIT) manufacturing, a system where materials or components are delivered immediately just as they're required in order to minimize inventory costs. Your customers place small, frequent orders, so you're constantly adjusting your forecast to anticipate customer demand. When they demand more than expected, that's a positive variance and represents an opportunity for additional revenue. When the demand is lower, it's a negative variance and represents a liability of additional inventory and holding costs. However, the supplier needs to understand the acceptable range for both variance types to manage its financial risk and maximizing its commercial opportunities. Analytics is critical to understanding these values.



TIP

Even where you're not trying to balance positive and negative variance, you should clearly define the relationships between metrics. That's where the power lies. One small change in every metric can add up to a massive improvement across the business.

Maturity Models, Reference Models, and Benchmarking

What are the metrics for evaluating an analytics solution? (In other words, how do you know if it's working?) This section gives you a few basic ways to measure the success of your analytics program.

Maturity models

When planning a supply chain analytics strategy, a good place to start is to determine the maturity level of your current activities. Luckily, a number of services are available to help. Many organizations, like analytics training company TDWI (www.tdwi.org), have developed Analytics Maturity Models. These models help an organization understand the phases of maturity in analytics, interpret assessment scores, and provide best practices to move forward. Its customized strategies and actionable recommendations can help quickly advance a company's analytics initiatives to gain more value.



TIP

Don't use maturity modeling as a one-off exercise. Keep coming back to it and assess how you're improving. By combining this with regular benchmarking, you can establish a framework for continuous improvement.

Reference models

A reference model provides a set of management tools and best practice approaches for a specific business activity. Within the supply chain, the reference model most often applied is the Supply Chain Operations Reference (SCOR) model.



TECHNICAL
STUFF

SCOR was developed in 1996 by the management consulting firm PRTM, now part of PricewaterhouseCoopers LLP (PWC) and AMR Research, now part of Gartner and endorsed by the Supply Chain Council, now part of APICS, as the cross-industry de facto standard, strategy, performance management, and process improvement diagnostic tool for supply chain management.

SCOR helps address, improve, and communicate supply chain management decisions within a company and its trading partner community. Breaking down the supply chain by using the SCOR

model allows an organization to apply metrics to business activities at each of five stages: plan, source, make, deliver, return.

Benchmarking

Benchmarking enables an organization to compare its analytics performance with aggregated data from other companies within a specific industry sector, including the sector’s best performers. This provides valuable context, helping to set meaningful targets, gain insight into trends occurring across the industry, and find out how a company is doing compared to its competition.



WARNING

It’s good to benchmark and compare yourself against others, but don’t be tempted to set benchmark results as targets. If others in your industry sector are doing much better, don’t set matching them as a goal. Rome wasn’t built in a day. Set achievable targets for your business and develop at a pace your business can sustain.

Applying Goals to the Supply Chain

Reference models like SCOR can help apply analytics to the different parts of a supply chain process, as shown in Figure 3-3. It enables decision makers to focus on the supply chain activities to be measured and improved to achieve corporate goals. By identifying a series of related activities at each stage of the process, a company can drill down to work out the KPIs. Defining and measuring these KPIs will help create a useful overall picture of the changes needed in order to improve and grow.

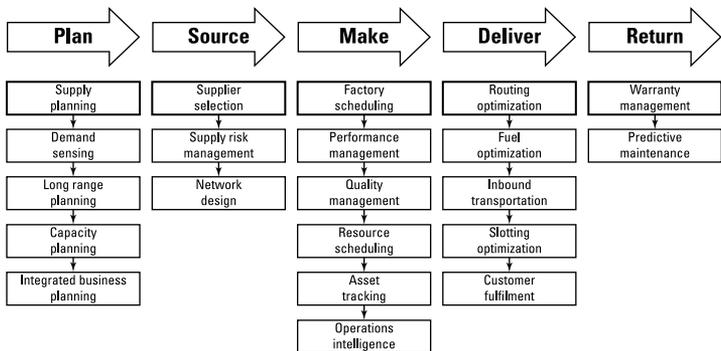


FIGURE 3-3: Example supply chain activities within the SCOR reference model.

What to Measure

After identifying the supply chain activities you wish to improve, the next step is to create a series of KPIs to ensure that performance targets are being achieved. Here is a short list of the types of KPIs commonly used within supply chain organizations.

- » Average customer order delivery time (in days)
- » Average service delay (in days)
- » Share of perfect orders delivered/received
- » Cash-to-cash cycle time (in days)
- » Days of sales outstanding (DSO) (in days)
- » Invoice processing time
- » Price per unit trend over time
- » Order volumes and associated change orders

Next, assign the metrics that will be measured to ensure the KPIs are met. A vast array of metrics is available, and there is no one-size-fits-all solution. Some metrics — such as invoice accuracy, quantity variance, and purchase costs — can apply to every business. Other metrics have more value for specific industries. For example, Advanced Shipping Notices (ASN) timeliness is important within the automotive industry, where JIT and Kanban manufacturing processes demand that parts be delivered exactly where and when required.

For the purpose of this book, I've broken down the metrics into three types:

- » **Business metrics:** Business metrics measures an activity that delivers value to the business. Examples include
 - **ASN timeliness:** The number of timely ASN creation instances as a percentage of total ASNs for a time period
 - **Delivery timeliness:** The number of “on-time” deliveries as a percentage of total number of deliveries for a time period
 - **Invoice accuracy:** Measures whether invoices accurately reflect orders placed in terms of product, quantities, and price by supplier, during a specified period of time



REMEMBER



REMEMBER

- **Price variance:** The actual invoiced cost of a purchased item, compared to the price at the time of order
A price variance exists if the price on the purchase order (PO) doesn't match with the invoiced price.
- **Order acceptance rate:** Fully acknowledged POs as a percentage of total number of POs within a given period of time
- **Quantity variance:** The difference between the quantity delivered and the quantity invoiced for goods received for a purchase order
A quantity variance exists if the quantity entered into the invoice doesn't match this open quantity.
- **Top partners by spend:** The top trading partners by the economic spend over a period of time
- **Top products by invoiced amount:** The top products by invoiced amount over a period of time
- » **Operational metrics:** Operational metrics look at how well your supply chain is performing every day. Examples include
 - **Transaction volume by document type:** The number and type of documents sent and received over a period of time (days, months, years)
 - **Transaction volume by trading partner:** The number and type of documents sent and received, ordered by the top ten and bottom ten partners
- » **Custom metrics:** These are developed specifically to address a business need that may be unique to your business. Examples include
 - **Average invoice \$ value by customer/supplier:** Used to consider the cost of processing a deal in comparison to its dollar value. If a partner is sending frequent invoices for \$10 and your processing cost is \$25, this would be an opportunity to improve the process.
 - **Total spend with strategic customers/suppliers:** The amount of spend associated with a trading partner based on invoices; may be compared to POs to understand where lost sales opportunities.

After the KPIs and metrics are in place, it's time to plan the reports.

Looking at Reports

Chapter 1 states that there are three categories for supply chain analytics: descriptive, predictive, and prescriptive. While that is broadly true, there are different levels of report types that straddle these categories. Figure 3-4 shows a more complex view of these categories, with eight levels.

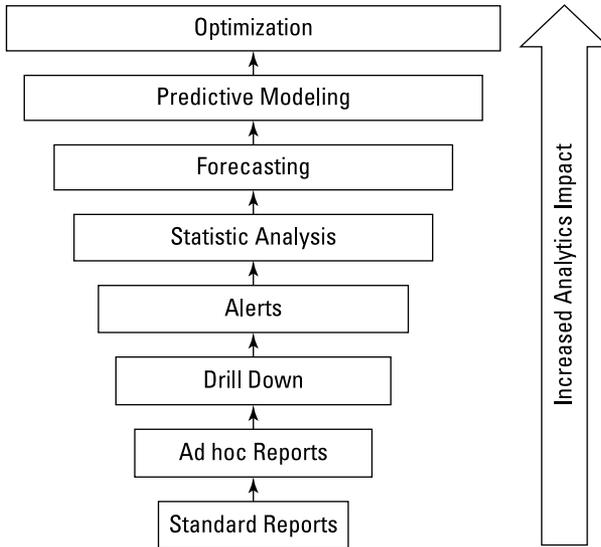


FIGURE 3-4: Types of reports for supply chain analytics.

Here's a quick explanation of the reports at each level:

- » **Level 1: Standard reports.** What happened? When did it happen? Think of a quarterly financial report. Standard reports tell you where you are but aren't very useful as a basis for long-range planning.
- » **Level 2: Ad hoc reports.** How many? How often? Where? Ad hoc reports answer very pointed questions about limited datasets. They are useful for gathering the quick facts needed to make limited-scope decisions.
- » **Level 3: Drilldown.** Where exactly is the problem? How do I find the answers? Drilldown enables you to look behind a summary value to see the data underneath it. For example,

whereas a standard report might provide the overall sales for a particular month, a drilldown might show you a list of individual sales transactions included in that total.

- » **Level 4: Alerts.** When should I react? What actions are needed now? An alert is a pre-set query — driven by business rules — that lets you know when something happens — good or bad. For example, you might set an alert to let you know when the inventory for a particular part number falls below a certain level.
- » **Level 5: Statistical analysis.** Why is this happening? What opportunities am I missing? This is a deep dive into a particular dataset to enable frequency, trend, or regression analysis to see why things are happening.
- » **Level 6: Forecasting.** What if these trends continue? How much will be needed, and when? Forecasting is one of the hottest markets — and hottest analytical applications — right now. Effective forecasting can help supply just enough inventory, so you don't run out or have too much.
- » **Level 7: Predictive modeling.** What will happen next? How will it affect my business? Predictive modeling suggests the likely outcomes for a certain set of actions under a specific set of circumstances.
- » **Level 8: Optimization.** How do we do things better? What is the best decision for a complex problem? Optimization is a type of prescriptive analytics that takes resources and needs into consideration and helps find the best possible way to accomplish goals.

Levels 1 through 4 are concerned mainly with descriptive analytics, while the mid-section, levels 5 through 7, are predictive. At the top end — levels 7 and 8 — are prescriptive reports.

Never underestimate the value of data visualization to help the story of how analytics resonates with your audience. To conclude this chapter, I quickly review a couple of descriptive reports. The reports shown in Figures 3-5 and 3-6 were obtained from OpenText's cloud-based supply chain analytics solution. Figure 3-5's report highlights a business metric known as *invoice accuracy*. This metric analyzes whether suppliers are invoicing correctly. In the example shown in Figure 3-5, the line chart automatically updates when a different date range is selected.

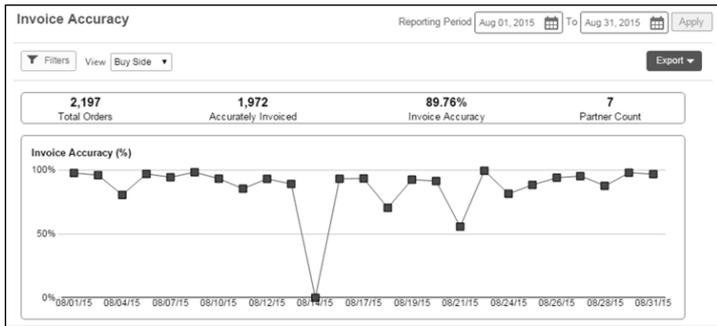


FIGURE 3-5: An example of the business metric invoice accuracy.

Figure 3-6 shows an example of the *document volume by type* metric. This metric summarizes the top 20 document types by total volume. These transactions could be any of a variety of types, including purchase orders, invoices, or advanced ship notices.

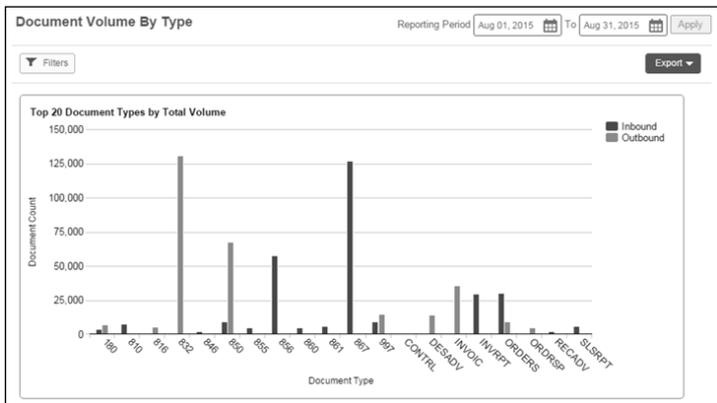


FIGURE 3-6: The operational metric Document Volume by Type.



TIP

Think of your supply chain as a journey. Sit down and sketch it out. Look at the different processes and the systems that support them. Consider all the datasets you'll need to collect to improve any part of any of those processes. (You look at this further in Chapter 5.)

IN THIS CHAPTER

- » Applying analytics to different areas of the supply chain
- » Discovering the benefits a business gains from each use case
- » Listing the data owners and data sources for each use case

Chapter 4

Use Cases for Supply Chain Analytics

Ready to see how supply chain analytics works in real life? This chapter showcases some areas where analytics can drive supply chain efficiency. I set out the key benefits, identify the data owners and data sources, and list the metrics you could use in each scenario for measuring performance and making decisions.



TIP

This chapter refers to the list of common supply chain metrics from Chapter 3, so you might want to glance back at that chapter as you go along.

Demand Forecasting

One of the most important tasks for any retailer is to accurately predict consumer buying patterns. This is especially true around seasonal holiday periods. By identifying the major buying patterns, the organization can gain much greater control of inventory and streamline supply chain operations. Buying pattern analysis is only one part of demand forecasting, and input from marketing systems helps combine this data with identifiable trends within the market to provide more context for decisions. Table 4-1 highlights how the demand forecasting process benefits from the use of analytics, who benefits in the organization, and the sources of information that are used as part of this particular use case.

TABLE 4-1 How Analytics Benefits Demand Forecasting

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Improve customer experience	Procurement Buying director Manager	B2B integration platform	Top trading partners by spend
Improve sales forecasting	Sales director Manager	Enterprise resource management (ERP)	Total units sold by Average Sales Price (ASP)
Reduce lost sales	Customer service director Manager	Customer relationship management (CRM)	Quantity sold by channel
Reduce out of stocks	Product manager	Marketing automation	Cycle time by product SKU/RMC
Maximize product price	CFO Financial director Product manager	Point-of-sale systems	ASP by SKU/RMC
Reduce lost, wasted, or written-off inventory (LWOWE)	Sales	eCommerce systems	Purchaser behavioral trends
Reduce inventory holding costs	Operations Logistics Procurement	Warehouse management system	Inventory turns by product SKU/RMC

Invoice Reporting

Invoice reporting is of great interest to procurement and finance departments as well as supply chain operations. Procurement and finance managers want to know about expenditures by product, supplier, region, or date range. They want to know how quickly expenditures were processed and how often they were rejected (both of which affect the cash-to-cash cycle). Supply chain operations want to know which trading partners are performing best.

Table 4-2 highlights how the invoice reporting process benefits from the use of analytics, who benefits in the organization, and the sources of information for this use case.

TABLE 4-2 How Analytics Benefits Invoice Reconciliation

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Increase invoice visibility	Procurement Buying director Manager	B2B integration platform	Invoice accuracy
Improve supplier management	Supply chain director Manager	Accounts receivable/ payable	Top products by invoiced amount
Improve invoice accuracy	CFO Financial director	ERP	Top trading partners by spend
Increase process automation	Operations Procurement	ERP/MRP	Perfect order fill rates
Improve bargaining position	Accounts payable	ERP/MRP	Aggregate spend by supplier/customer

Inventory Visibility

Inventory visibility enables an organization to combine inventory data with other elements to evaluate supply chain performance. Consider, for example, a global vehicle manufacturer that has implemented and standardized on an ERP system across all its plant locations. The company requires improved visibility of inbound ASN transactions to improve efficiency of its Just-In-Time (JIT) production systems. With multiple suppliers frequently delivering to each plant, the company requires complete visibility across multiple inventory locations. Table 4-3 highlights how the inventory visibility process benefits from the use of analytics,

who benefits in the organization, and the sources of information that are used.

TABLE 4-3 How Analytics Benefits Inventory Visibility

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Improve inventory visibility	Procurement Buying director Manager	B2B integration platform	ASN timeliness
Improve supplier management	Operations director Manager	ERP	Delivery timeliness
Improve inventory management	Transportation Logistics director Manager	Accounts payable/ receivable	Quantity variance
Implement vendor managed inventory	CFO Financial director	Warehouse management system (WMS)	Delivery count and frequency by trading partner
Reduce logistics costs	Operations Logistics	Transportation Management System (TMS)	Count of nodes by SKU/order
Reduce LWOE write-offs	Operations Logistics	ERP/MRP	Percentage of units wasted due to expiration
Reduce warehouse/distribution center carry costs	Operations Logistics	ERP/WMS/TMS	Total logistics cost per SKU/RMC

Partner Performance Reporting

You want to know what your partners are doing and how well they're doing it. That way you can develop deeper relationships with the high performing trading partners, and cut loose the ones

that don't provide good service and value. You can make sure that you're getting what you're paying for, and quickly make adjustments where that isn't happening. Table 4-4 highlights how the quality reporting process in relation to trading partners can benefit from the use of analytics, who benefits in the organization, and the sources of information that are used as part of this particular use case.

TABLE 4-4 How Analytics Benefits Partner Performance Reporting

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Improve supplier management	Procurement Buying director Manager	B2B integration platform	Returned product count and frequency
Improve supply chain management	Product director Manager	ERP/B2B integration platform	Delivery On-Time and In-Full (OTIF)
Improve renegotiating & bargaining position	Supply chain director Manager	Third-party trading exchanges	Order and price accuracy
Develop strategic supplier relationships	Operations director Manager	Accounts payable/receivable	Invoice accuracy against PO and contracted price
Reduce procurement costs	Quality team	ERP/quality reporting System	Track supplier compliance and quality resolution speed
Improve customer experience	Compliance officer Product management	B2B integration platform	Top SKU/RMC with quality issues

Procurement Reporting

Procurement reporting provides the information foundation improving the procure-to-pay process. It provides a clear idea of the amount of business the company is doing with each of its suppliers and how well each supplier is performing. Imagine a large organization that has recently completed an acquisition and now has thousands of new suppliers. If it can't quickly find out the exact spend with these suppliers, supply chain costs are likely to mount significantly. Table 4-5 highlights how the procurement reporting process benefits from the use of analytics, who benefits in the organization, and the sources of information used in this use case.

TABLE 4-5 How Analytics Benefits Procurement Reporting

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Reduce supply chain spend	Procurement Buying director Manager	B2B integration platform	Top trading partners by spend
Improve supplier management	Product director Manager	ERP	Price variance against contracts
Improve sourcing strategies	Supply chain director Manager	Accounts payable/ receivable	OTIF rates
Reduce procurement costs	Operations director Manager	ERP/B2B integration platform	Order acceptance
Improve bargaining position	CFO Financial director Marketing Product management	ERP/B2B integration platform	Top products by invoiced amount

Business Benefit from Applying Analytics	Data Owner	Data Sources	Example Metrics
Improve negotiation leverage	Operations Procurement	ERP/B2B integration platform	Volume of transactions by trading partner
Reduce procurement costs	Transport Logistics director Manager	ERP/B2B integration platform	Top trading partners by spend

- » Planning and building an analytics initiative
- » Measuring the success of an initiative
- » Discovering a short list of things to avoid

Chapter 5

A Six-Stage Approach to Getting Started

For most organizations, *analytics* has traditionally consisted mainly of looking at historical data in spreadsheets. Decisions have been as much about gut feel as they were about intelligent analytics. What could possibly go wrong? (You already know the answer to that, right?) Supply chain analytics can help an organization move from being a gut feel kind of company to an analytics-driven one.

It all starts by answering a few questions: What do I need to measure? Where's my data? Who should be involved? What software do I need? How can I measure success? I try to help you find those answers in this chapter.

Step 1: Identify the Business Problem

Start Step 1 by identifying the business problem and the KPI metrics that will be used to analyze and address the problem. Perhaps you need to release more cash from your supply chain, or reduce inventory levels, or address challenges you're having with on-time, in-full orders that are affecting your customer relationships. This step is about fully understanding the problem. Conduct

a thorough root cause analysis to discover why the problems are occurring and what actions to take to reduce inefficiencies and waste.

From there, you can begin to structure your analytics program, setting in place the KPI levels you want to reach and the metrics you need to measure to get there. After that's in place, it should be obvious which transactions are of interest.



REMEMBER

Just because you *can* doesn't mean you *should*. Many companies get new analytics tools and jump straight into measurement. They don't stop to consider the business problems they're trying to solve. These are the companies who struggle to justify their analytics investment.



TIP

When planning a supply chain analytics strategy, a good place to start is to determine the maturity level of your current activities so that a baseline operational state can be determined. Luckily, a number of services are available to help. Many organizations, like analytics training company TDWI, have developed Analytics Maturity Models. These models help an organization understand the phases of maturity in analytics, interpret assessment scores, and provide best practices to move forward.

Step 2: Find Your Data

After you've established your KPIs and metrics, it's time to go find the data you need. Start by looking at what you're already doing. Different functional units of your business may already be doing analytics, but very often departments don't communicate with one another, and no one person knows everything that's going on. If you're going to gain end-to-end visibility of your supply chain, you need to break down the siloes of information.

So, go out to the various departments and find out what analytics activities they're doing and what metrics they're currently measuring. Learn what data they're using and where it resides. After you know what's available, you can compare it to what you need and discover where the gaps are. Ask yourself these questions:

- » Is our existing data of good enough quality to use for analytics?

- »» What systems, transactions, and data are we not measuring?
- »» In what format is the data?
- »» Where does the data reside, and where is the best place to capture it?
- »» Do we need to capture data outside of our internal systems?
- »» How can we assure the new data meets our quality requirements?

At this point, data quality is paramount. You need to profile and cleanse your data to ensure that it's error-free. Because many data sources and data formats exist within the supply chain, this can be a major task.

By way of example, the details you have for your customer in one database are slightly different than what you have in another. Something as simple as this can lead to faulty results.

These challenges are compounded as you move toward more predictive and prescriptive analytics. These techniques begin to handle unstructured data in things like emails or social media posts. Analyzing unstructured data means understanding the context in which words and sentences appear. Where the same word has more than one meaning, it's easy to produce false results.

Data quality is one reason you need to be able to consolidate all the data you require on one analytics platform. Consolidation will enable you to integrate, standardize, and cleanse all your data so that it's available in a single useable format for analysis and presentation to your business users.

The second reason to consolidate your data is that you don't want to be conducting ad-hoc analytics on each separate data source and then drawing each set of results together in order to reach an overall conclusion. Data blending ensures that all relevant data for any particular metric is integrated and presented in a format that allows for automatic analysis. This technique is at the heart of the move from descriptive to predictive analytics. Data blending pulls in information from many different business systems including B2B networks, ERP, and transport/warehouse management systems. Data blending normalizes the information into a single flow before it is archived into the data lake, as shown in Figure 5-1.

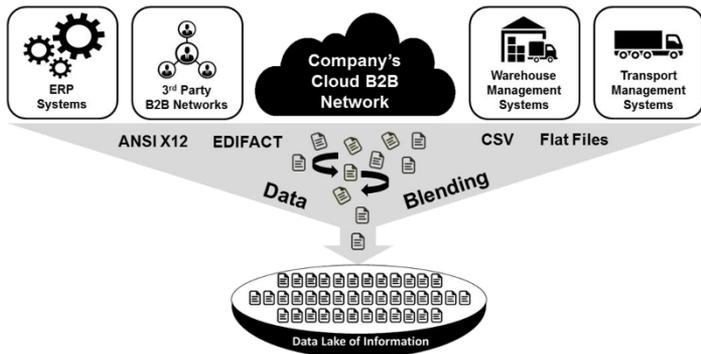


FIGURE 5-1: Data blending brings data from different sources together.

Two final points on data sources. First, many companies still use the phone, fax, and email as their main ways to interact with supply chain partners. A lot of supply chain information is still locked up in paper so find ways to make it available digitally and feed it into your analytics engine. Secondly, new data sources are appearing all the time, and your analytics engine will need to be able to accept data from those sources as soon as it becomes important to your business.

Step 3: Choose the Right Team

An analytics initiative requires a multi-functional, multi-disciplinary team in order to succeed. In addition to the IT staff and data analysts, you want active and enthusiastic involvement from business managers and users in each functional area that will benefit from the initiative. This starts at the top, as explained in this section.

Executive sponsors

The C-Level senior executives set the tone for any major change project — and, of course, they control the purse strings! Your analytics has a much greater chance of success and widespread adoption with a board member driving the program. Within C-level ownership, analytics initiatives can easily stall if they fail to quickly show benefits in terms of business performance and return on investment (ROI). (See “Step 6: Measure Success” later in this chapter for more on ROI.)

Data owners

The data owners will primarily be the departmental heads of the functions where your analytics activities are focused. These are the people who help define what should and shouldn't be measured. They can explain how the analytics is going to be used within their departments and how they want to digest the information. Working with the data owners, you should ensure that

- » They're involved from the strategy and planning stages.
- » They lead the input for metrics within their business areas.
- » They provide regular feedback on the performance of their analytics and the relevance of their metrics.
- » They receive visual analytics reports when they need them in a format they can easily digest.
- » They have access to top line results but can drill down into the analysis as they require.



TIP

If not handled properly, metrics can end up driving efficiency and not effectiveness. You don't really need to get better at something that's doing your business no good. If you involve departmental managers at every stage of the initiative, you have a feedback loop to ensure you always measure the right things and have a clear idea of the new things you need to look at.

Internal data users

The day-to-day users of analytics within your supply chain are essential to building success. Supply chain analytics puts a lot more power at their fingertips. They are no longer simply just reading a dashboard. They are now able to drill down into issues and make decisions based on the analytics data. Working with the data users, you should ensure that

- » They fully understand the functionality of the analytics solutions they're using.
- » They have an understanding of the analytics techniques being used.
- » They understand how the analytics data relates to the company's KPIs and their own performance metrics.

- » They're empowered to make business decisions based on the analytics reports.
- » They receive visual analytics reports when they need them and in a format they can easily digest.

External trading partners

The power in supply chain analytics comes from building closer and more effective working relationships and business processes with trading partners. Much of the information you need for daily operations comes from external sources. Working with trading partners, you should know

- » Which trading partners you need to onboard
- » How you're going to onboard them
- » What data you need to capture and share
- » Whether you have the means to capture that data if it's external to your systems
- » What you expect from them as a result of your analytics initiative
- » Whether you want them to provide input into your initiative



REMEMBER

Supply chain analytics can radically change how you work with trading partners. This moves beyond simply transactional processing to the creation of knowledge-sharing networks where analytics data is shared between partners and forms the basis for collaboration across a range of KPIs.

Step 4: Select the Right Tools

Data analytics has traditionally been the preserve of the IT department. However, a new generation of tools are making analytics much more accessible to business people. There are two approaches to modern supply chain analytics: Select the tools you need to create a standalone analytics solution, or select supply chain systems with an analytics engine already embedded into business process flows. In this section, you look at each of those two options.

Standalone analytics solutions

Standalone analytics solutions provide deep and rich analytics functionality; however, they still require an element of IT resources to integrate to backend enterprise systems or business processes. A typical standalone analytics solution features the following capabilities:

- » Data capture
- » Data modeling
- » Data reporting
- » Data visualization
- » Intuitive dashboards



WARNING

Although you'll benefit from best-of-breed functionality from choosing standalone software packages for each of the items in the list, there are clear drawbacks in terms of integration, maintenance, and support. The learning curve and training expense of teaching internal staff to use each package also has to be taken into account.

Embedded analytics solutions

Increasingly analytics is becoming embedded in business systems. Embedding allows the functionality within the system to quickly implement analytics into a supply chain. Being built into the business system can boost performance and reduce costs while delivering analytics within a package that internal staff is already comfortable using.

An embedded analytics approach makes sense when the system you choose

- » Can capture data from across a complete business process
- » Can bring together internal and external data
- » Can capture data from other systems and databases
- » Can bring together data into a single actionable format
- » Has comprehensive visualization and reporting functionality
- » Has a wide range of pre-existing business and operational metrics
- » Has the ability to create the custom metrics you require



WARNING

One potential drawback of an embedded approach is that the analytics within these systems can be limited to aspects of the system's capabilities. For example, many ERP systems enable you to analyze simple metrics, such as the performance of purchase orders or orders created in the system, but are incapable of looking across entire business processes or including data from other data sources.

Step 5: Start Small, Think Big

Implementing analytics successfully isn't a simple process. It takes time and effort to create the correct data structures and technical infrastructure to enable effective analysis. As the saying goes, don't try to boil the ocean. You're not going to have an analytics-driven organization from day one. Start small, and look for quick wins.



TIP

Highlight one key business objective where analytics has the greatest potential to deliver real gains to your business, and focus on that for starters. You can derive a manageable amount of KPIs and associate a small number of metrics with each. As your analytics initiative begins to demonstrate benefits to your business users and executives, you'll see demand for analytics grow organically within your organization. However, you should always have a wider strategic goal for how you can extend analytics into other areas of your supply chain. With the initial success, you'll be able to take a structured approach to increasing the business functions you cover and the metrics you measure.

Step 6: Measure Success

You must be able to demonstrate the benefits of your analytics initiative. However, it can be tricky to identify benefits — especially financial ones — when your analytics investment is designed to deliver into operational areas such as performance efficiencies.



REMEMBER

While showing financial benefits will always be the most important way of demonstrating the success of your analytics initiative, it's essential you don't overlook the benefits of improving supply chain metrics that lead to financial performance improvements in other areas.

For example, if you use analytics to bring preparation time for sale and operations planning meetings down from weeks to days, you free your team to be more productive and revenue-generating in their day-to-day roles. More accurate data is also going to make the decisions coming from those meetings far more accurate.



TIP

To help measure the impact of your analytics initiatives, take the following steps:

- » Establish and share a performance baseline prior to analytics implementation.
- » Identify and document risk and inter-dependencies — such as cultural resistance or technology barriers — that may impede the progress of your initiative.
- » Be clear where your goals are supply chain, rather than financial, improvements.
- » Select quantifiable financial benefits and design your initiative for quick wins that deliver them.
- » Report on all improvements in supply chain agility and responsiveness — attach any resulting improvement to financial metrics where possible.
- » Capture improvements in the actual process of generating and using analytics.
- » Document and communicate the growth of demand for analytics in other areas of the business.
- » Demonstrate how the analytics initiative has improved other business activities, such as placing a focus on driving best practice on process workflows.
- » Include the feedback of customers and suppliers when assessing the impact of the initiative and reporting back to the business.

Aim for continuous improvement. So, like the analytics process itself, when analyzing your analytics initiative, you need to measure and measure and measure again.

Six Things to Avoid

If you've been reading this chapter straight through, you know what you *should* do to get started with supply chain analytics. Here, I give you a few things you shouldn't do:

- » **Use dirty data:** If there are errors in your data, your analysis is going to be flawed. Your decisions will be based on poor data, and, once discovered, it will raise questions over any future analysis. This is the top reason analytics initiatives fail.
- » **Measure too much:** If you try to measure everything, you'll end up measuring nothing. Too many metrics brings back a huge amount of data, leading to confusion and a lack of focus. You'll miss the insight in the data.
- » **Measure too little:** At the other end of the scale, you can measure too little. Measuring a single metric in isolation from everything else may help improve that metric, but you'll miss the relationships between metrics that drive improvement in your business processes.
- » **Create conflicting metrics:** You need to define your goal clearly and build metrics around it. If you don't do this, you could establish conflicting metrics. For example, setting a high fill-rate goal could inadvertently lead to inventory overstocks.
- » **Use outdated data and metrics:** It seems obvious, but you need to make sure your data is up to date (or at least still relevant). On top of this, you must ensure that the metrics you already have still reflect your business goals.
- » **Not establish ownership:** As with any technology program, executive buy-in matters. Failure to establish executive-level sponsorship is likely to lead to your analytics initiative stalling and slow adoption across your organization.

IN THIS CHAPTER

- » Discovering the pace and variety of today's supply chain data
- » Increasing integration and embedding of analytics
- » Learning how prescriptive analytics comes to maturity
- » Seeing cognitive analytics on the horizon

Chapter 6

The Future of Supply Chain Analytics

Supply chain analytics has advanced a long way in a short time. Many companies today want to improve their business decisions by applying analytics to their corporate data. Yet, as the pace of “business as usual” quickens and the variety of data sources continues to grow, it can become difficult for organizations to keep up.

This chapter outlines some of the future trends in supply chain analytics, but here's an executive summary: *faster and more varied*. In other words, to stay competitive, you need to make sure your analytics work as closely as possible to real time and handle as many kinds of data as possible. Analytics will become progressively more embedded with data systems, and decision makers will rely more on prescriptive and cognitive analysis techniques.

Growing Pace and Variety of Data

Every day the modern supply chain creates a greater scale, scope, and depth of data. The *Forbes* article, “Ten Ways Big Data Is Revolutionizing Supply Chain Management,” suggests that there are now

over 50 separate data types generated within supply chains, and more types are appearing all the time. The situation is further complicated by the fact that much of the new data is held in unstructured formats such as business documents, emails, online chat facilities, and social platforms. Figure 6-1 summarizes the most common types of data, arranged by volume, velocity, and variety.

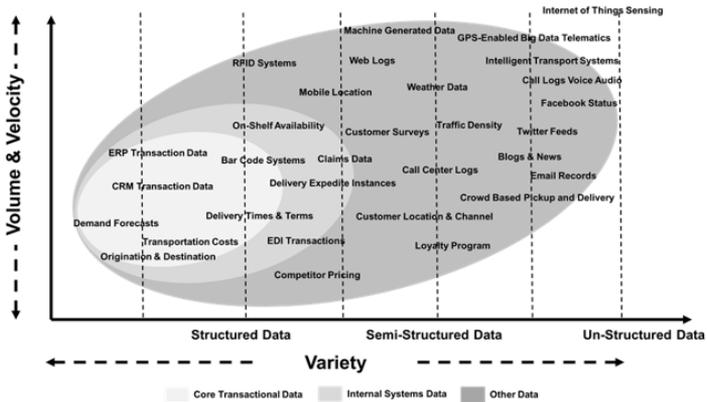


FIGURE 6-1: The growing variety of data in the supply chain.

Analytics systems have traditionally been good at handling structured data, but future systems will need to be equally good at capturing and analyzing unstructured data. Analytics engines will need to be able to combine multiple data types to provide a holistic view of supply chain operations.

Social data

The phenomenal growth of social media has changed the way everyone communicates. Today, it's one of the largest sources of unstructured data for informing supply chain actions. As social media data becomes more integrated into supply chain analytics, systems will improve in a number of key areas, from demand sensing to customer acquisition and retention. For example, companies will be able to use the latest buzz on social media to inform product innovation or the timing of new product launches.

Internet of Things

The Internet of Things (IoT) is set to reshape many parts of modern society. IoT is a growing number of Internet-enabled machines and devices that can communicate with each other over

the cloud. It's driven by the smart data at the heart of automated machine-to-machine communication. There are many potential applications for IoT in the supply chain. For example, consider the visibility of stock in transit using Radio Frequency Identification (RFID) — an electromagnetic, field-based identity and tracking solution — tags, and satellite-based Global Positioning System (GPS) devices or optimal logistics route planning and fleet utilization with sensors constantly measuring everything from fuel consumption and tire pressure to the temperature of perishable food in transit. With so much of the process automated, advanced analytics ensures everything is working properly and provides real-time insight on which to base agile business decisions.

Mobile data

The convergence of cloud computing, mobility, and location-based services will drive a new stream of supply chain analytics. Companies will be able track materials in motion anywhere and in real time. This convergence also offers the potential for completely new models of agile supply chain deployment based around advanced analytics and GPS-enabled systems. For example, when a customer enters a store, the retailer can transmit price-matching guarantees and personalized offers based on a combination of consumer preferences, relevant product promotions, and available stock levels.

Becoming Integrated and Embedded

More and more companies are finding that embedding analytics is the way to go for efficiency and profitability. While still at early stages, analytics are increasingly being embedded in systems including demand forecasting, integrated business planning, supply chain optimization, and logistics management. Accenture's global operations Megatrends study, "The Big Data Analytics in Supply Chain: Hype or Here to Stay?", has found that embedding analytics into supply chain operations accelerates supply chain processes by almost one and a half times over ad-hoc analytics systems. Companies experienced a 4x improvement in order-to-cash cycles and over 2.5x improvement in supply chain efficiencies.

A new generation of supply chain and B2B integration solutions are appearing with an advanced analytics engine already installed. These cloud-based services give access and visibility to the data

that passes over the network. The power of this approach is that it gives an end-to-end visibility of business processes while providing the right information to the right people at the right time. If you're using a B2B integration platform to transact with trading partners, for instance, you have near real-time access to all purchase order and invoice data so you can spot inefficiencies and waste in both your order-to-cash and procure-to-pay processes.

As data grows and analytics solutions mature, the types of analytics you can undertake are also evolving. Today, most companies are still conducting descriptive — what happened? — and predictive — what will happen? — analytics, but the use of prescriptive analytics is growing. Cognitive analytics is also on the verge of offering the potential to move beyond data insight.

Prescriptive Analytics Is Maturing

Prescriptive analytics builds on the foundation of descriptive and predictive analytics. Using predictive and prescriptive analytics can provide a competitive advantage because it enables companies to understand and interpret past and future events and base better business decisions on that information. Figure 6-2 highlights the different steps required to achieve a cognitive approach to supply chain analytics.



FIGURE 6-2: The maturity of supply chain analytics.

At this point, prescriptive analytics adoption is still low. A recent survey entitled “Forecast Snapshot: Prescriptive Analytics, Worldwide 2016” from Gartner found only 10 percent of companies have currently implemented prescriptive analytics. This figure is set to increase 35 percent by 2020, according to the research firm. The slow uptake of prescriptive analytics reflects the relative maturity of supply chain organizations. Two trends suggest that implementation: First, technology solutions with prescriptive capabilities are increasingly available. Secondly, like every other technology adoption curve, the maturity curve for analytics is shortening rapidly. What would've taken years to achieve can now happen in months.

Cognitive Analytics Is Coming

Cognitive analytics promises to unlock the full value of digital unstructured data — emails, social media, and IoT sensor data — and help companies make smarter decisions. It combines older analytics approaches with natural language processing, neural programming, machine learning, and artificial intelligence to rapidly find answers in massive amounts of data. You can ask a question in the same way you'd ask another person, and receive an answer within minutes.

Cognitive analytics creates unique queries on the fly, based on natural-language input. You don't have to program structured queries into the system and apply them to datasets. Think of a service call to a customer center that has cognitive analytics. The organization no longer has to send a repair engineer out to diagnose and fix the problem. Instead, the automated system identifies similar problems and patterns querying maintenance logs and service call audio files, and implements a successful, automated resolution.

Cognitive analytics flips conventional thinking on analytics. Rather than asking “How do I create a query that will interrogate the data sets to get the answer I want?”, it asks “How do I structure and access the datasets I need to make the answer to my question complete and reliable?”

Implemented properly, cognitive analytics offers a whole new way to improve your entire supply chain, personalize your customer experiences, and enhance knowledge-sharing within your organizations and with your trading partner network.

IN THIS CHAPTER

- » Understanding the need for planning and strategy
- » Looking at common data structures and terminology
- » Setting achievable and actionable goals

Chapter 7

Ten Tips for Using Analytics to Optimize Your Supply Chain

This chapter presents ten useful tips for getting started with supply chain analytics and making the process as smooth and successful as possible.

Establish a Cross-Department Analytics Program Team

Running a global supply chain operation requires intricate planning, sourcing, delivery, and measurement. This takes different people with different skills. Use a cross-departmental program team to ensure proper business value is being delivered in the most technically sound and efficient manner.

Start with Your Business Objectives

Supply chain analytics works best when it addresses a real pain point within the business. A top-down approach helps align your metrics to definable business outcomes, but there are times when a bottom-up approach is required to deal with specific failings within a business process. The optimum analytics solution is a balance between approaches.

Break Down the Communications Silos between Teams

Businesses that segregate operations can't fully harness the potential of cross-functional platforms. By aggregating all data into a single, multi-department system, a company's analytics capabilities grow dramatically as information flows seamlessly and cultural resistance is reduced.

Normalize Data and Terminology

Often separate departments have their own data terminology and structures. These act as a barrier to enterprise-wide analytics. By making all data uniform, across all platforms and departments, information can be processed and understood much more easily, resulting in faster and more efficient decision making.

Ensure Reasonable and Achievable Goals

The potential of supply chain analytics means organizations can over-reach when establishing their implementation. Business executives should clearly outline goals in areas such as revenue, sourcing, and customer service that each department can practically achieve. Look for goals that can work in tandem to multiply their value.

Start Small but Think Big

Implementing analytics successfully isn't a simple process. It takes time and effort to create the correct data structures and technical infrastructure to enable effective analysis. As with any IT project, start small and look for those quick wins. However, you should have a wider strategic goal for how you can extend analytics into other areas of your supply chain. Start planning now.

Organize the Data Necessary for Business Growth

Not all data is created equal — some information is inherently more valuable to a company's priorities. You must identify your top business priorities. Work out what data is needed to help meet those priorities, where it's stored, and how it can be retrieved. Work out how you want the analysis displayed and how much drill-down is required into any specific data set.

Prioritize and Streamline Your Analytics Reports

Don't try to do everything at once. Start off by prioritizing your goals and efforts in order to optimize the data. You should concentrate on the top-line items before moving on to additional analysis in order to best understand the data and forecasts. Encourage the analytics team to include no more than ten metrics for any business process to avoid "paralysis by analysis."

Turn Data into Decisions

After you've analyzed the data, act on the results. The purpose of data analytics is to prescribe an actionable insight to the decision maker. Effective analysis highlights inefficiencies within your supply chain, and executives must be prepared to capitalize on the opportunities that the insights suggest.

Be Flexible, Be Agile

The success of a supply chain relies on the ability to be more efficient and informed. Intelligent analytics is necessary to provide deeper visibility across the entire supply chain. However, business is dynamic and increasingly global. You must ensure your analytics capability continues to measure the right things or be able to quickly introduce new metrics and KPIs as business changes.

Notes

Notes

Do You Have the Necessary Insights to Improve Supply Chain Performance?

OpenText™ Trading Grid™ Analytics provides a powerful, cloud-based approach to analyzing large volumes of transaction information, even if information resides in other enterprise business systems.

For more information on how Trading Grid Analytics can provide deeper insights into your supply chain, visit:

www.opentext.com/campaigns/supply-chain-analytics

Alternatively, please call:

1-800-334-2255 and select option 3



Develop your supply chain analytics strategy

Applying analytics to the supply chain is still relatively new. As the technologies for intelligent analysis and data visualization explode, it is a great time to look at what your business can achieve through a comprehensive supply chain analytics strategy. This book provides you with everything you need to know to get started on your journey. Discover the benefits that supply chain analytics offers your business.

Inside...

- The importance of supply chain analytics
- Metrics and KPI basics
- Real use cases for supply chain analytics
- The future of supply chain analytics
- Things to avoid in supply chain analytics

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