



COUNCIL OF SUPPLY CHAIN MANAGEMENT PROFESSIONALS



THE DEFINITIVE GUIDE TO ORDER FULFILLMENT AND CUSTOMER SERVICE

Principles and Strategies for Planning,
Organizing, and Managing Fulfillment
and Service Operations

Council of Supply Chain Management Professionals and

Stanley E. Fawcett & Amydee M. Fawcett

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Published by Pearson Education, Inc.
Upper Saddle River, New Jersey 07458

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Printed in the United States of America

First Printing January 2014

ISBN-10: 0-13-345386-3

ISBN-13: 978-0-13-345386-7

Pearson Education LTD.

Pearson Education Australia PTY, Limited.

Pearson Education Singapore, Pte. Ltd.

Pearson Education Asia, Ltd.

Pearson Education Canada, Ltd.

Pearson Educación de Mexico, S.A. de C.V.

Pearson Education—Japan

Pearson Education Malaysia, Pte. Ltd.

Library of Congress Control Number: 2013953113

To our families—up and downstream.

*Our parents (Stanley, Francine, Arthur Dean, and Amy)
have provided years of encouragement.*

*Our children (Carisa, Tannen, Kjanela, Dallin, Keana,
and Taft) bring constant inspiration to our lives.*

Thank you!

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ACKNOWLEDGMENTS

We acknowledge the contributions of colleagues across the supply chain community who have brought SCM from the back office to center stage as the value creation engine of the modern corporation—and our modern economy. We would also like to recognize the following three groups:

- The CSCMP team—Rick Blasgen, Kathleen Hedland, Ann Neumann, Kathy McInerney, Heather Morys, and Jessica D’Amico, who deserve acknowledgment for providing vision and indefatigable efforts to advance the discipline.
- The SCPro Committee—Dr. Ted Stank (University of Tennessee), Dr. Chris Moberg (Ohio University), Dr. Tom Speh (Miami University), and Dr. Brian Gibson (Auburn University) deserve recognition for cultivating the SCPro concept.
- The book series editors—Dr. Chad Autry (University of Tennessee) and Jeanne Glasser Levine at Pearson deserve credit for creating the supply chain book series and guiding the development process.

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ASSESSING PERFORMANCE FOR SUCCESS AND IMPROVEMENT

Opening Story: Lessons from the Steam Engine

October 25: After the Task-Force Meeting

“Paul, before you leave, could I talk with you for a moment?” David asked.

“Sure David, what’s on your mind?” Paul responded.

“Your approach of ‘taking out the trash’ was quite novel. You dispelled false ideas and put the tough issues on the table. We really do speak different languages and we view IT’s role differently. Acknowledging those facts set the stage for us to *confront the brutal facts*¹ about IT enablement of order fulfillment and customer service. Thanks for that,” David said. Hesitating, David continued, “Anyway, as long as we are speaking bluntly, I’ve been losing sleep over Doug’s first visit to Diane. When Diane called you to check on our delivery performance, you told her we were hitting on all cylinders. I’ve dug into the last two years’ metrics. The metrics say your assessment was dead-on accurate. Our delivery is best in class. Monster’s and Doug’s reaction to the missed delivery window really rattled our world. We went from heroes to zeros in a single morning.”

“That was painful for all of us,” interjected Paul.

“That’s my point. How could we be so naïve? We had no idea how ticked Monster was. We take pride in our metrics-driven decision making—and we were beating all of our targets.”

“Yes, David, but we weren’t hitting the customer’s targets. I know where you are going with this. Measurement systems, like IT systems, are tools—they only do what we tell them to do. In this case, even though we’ve been tracking to industry standards, we

simply haven't been measuring the right things. I guess that's now our job—to figure out what the right things are.”

November 1: The Conference Room

“Good morning, everyone,” David greeted. “Today, our task is to begin to discuss the role of measurement in supporting world-class delivery performance. You’ve seen the agenda. We want to start off conducting a blameless autopsy.² The issue at hand is simple: We were caught totally by surprise by Monster’s harsh criticism of our delivery performance. Our culture is to measure everything, and we thought we were hitting the right targets. So, how is it that our measurement system failed in such a painful—and potentially costly—way? As we conduct the blameless autopsy, there are only two rules: (1) no holding back and (2) no finger-pointing.”

“I’ll be the scribe, if I can start,” Lisé said as she stepped to the whiteboard (see Table 6-1). “In the spirit of brutal honesty—and taking out the trash—let me plead *mea culpa*. Over in finance, we put a lot of pressure on you guys to hit short-term, financial metrics.”

“You sure do,” agreed David. “You’re always asking, ‘What’s the P&L impact?’ Sometimes, we just don’t know. A lot of what we do simply doesn’t translate to P&L impact—at least not in the time frame finance seems to want. I hope that doesn’t sound like finger-pointing.”

“You’re OK, David,” Lisé replied. “Let’s be honest, we have distinct world views. In finance, we answer to shareholders. But, our focus on the bottom line probably does handcuff you.”

“It does! Of course, it doesn’t help that we are managed as a cost center,” David agreed. “It’s tough to innovate and build new capabilities when we are always driving to reduce costs to keep top management happy. New capabilities cost money up front. The payback takes time.”

“That’s especially true if we don’t get it right the first time—and we seldom do. It takes experimentation and a lot of changed behavior across functions. That takes time,” Paul added.

“Lisé, you mentioned world views. So far, we’ve voiced three different world views. Let me add a fourth,” Trina noted. “As a customer-facing profit center, marketing sees the world uniquely from each of you. Order fulfillment is a cross-functional process. Yet, if we all make decisions based on our local measures, we are going to create tradeoffs and maybe even conflict. The resulting chaos can cause us to lose sight of the customer and drop the ball.”

“Fantastic,” David exclaimed, “Your points are all on target. From a blameless autopsy perspective, they tell us that how we measure is ‘killing us’—forgive the pun. When Diane asked me to head up this task force, I was also convinced that our problem was the

‘how’ of measurement. Until Doug dropped the hammer on us, I thought I understood why we measured—to document our performance. Right now, I’m not so sure about the why. Despite hitting our targets, we were failing to keep our most important customer happy. We really don’t understand the ins and outs of our processes. Shouldn’t measurement prevent this failing?”

“That’s an astute observation,” Paul chimed in. “After reading the agenda, I did a little out-of-the-box scanning. Do you know the story of the steam engine?” Blank stares prompted Paul to proceed, “The steam engine is the product of precise measurement. Only after finding a new way to measure the energy output of engines could inventors show that their ideas delivered better performance—you know, more power, less coal consumption. Without the micrometer, dubbed the ‘Lord Chancellor’—which could gauge tiny improvements—the feedback needed to build better engines would have never emerged.”³

“Let me jump even further afield. Did you know that Bob Beamon’s long jump record of 29 feet, 2 ½ inches set in 1968 stood for almost 23 years? Mike Powell beat the mark by two inches in 1991. Nobody has come close since. Other track-and-field records come and go, but bettering jumping technique appears to be as hard as mastering order fulfillment. However, measurement is changing the science of jumping. BMW, as part of its London Games sponsorship, designed a camera system to give jumpers the immediate feedback needed to improve technique. Before a jumper leaves the pit, he knows his horizontal and vertical velocities as well as his flight angle. While the memory of the jump is still fresh, he finds out how what he did affected his performance.”⁴

“Paul, where do you find time to read about steam engines and long jumping? Your point, however, is prescient. If measurement is going to help us build an outstanding order fulfillment capability, it must help us better understand and improve our processes. We should take a closer look at each of the issues on the board to see how accurate each point really is. I’ll put my team to work on this, but that will take some time. For now, maybe we should turn our focus to addressing the question, ‘What should a world-class measurement system look like?’ Lisé, would you put that on the board? So, what do you think?”

Causes of Measurement Failure	A World-Class Measurement System Should...
Short-term emphasis on financial measures	
Tough to document unique value creation	
Too cost focused—sacrifice capability building	
Different world views; that is, conflicting measures	
Lose sight of customer; internally focused	
Poor understanding; no learning	

Consider as you read:

1. Based on your experience, which of the causes of measurement failure hinders outstanding order fulfillment and customer service the most?
2. How can you apply Paul's analogous discussion of steam engines (innovation) and long jumping (learning) to improve the design of your measurement systems?
3. How would you respond to David's final question: What should a world-class measurement system look like?

Assessing Performance for Success and Improvement

“Not everything that counts can be counted, and not everything that can be counted counts.”

—Albert Einstein

A few years ago, the article, “On the Folly Rewarding A, while Hoping for B,” appeared in print. What an intriguing title! Have you witnessed this phenomenon? Perhaps you are old enough to remember the U.S. auto industry of the 1980s. Having dominated car manufacturing for much of a century, GM and Ford found themselves under siege. Toyota and Honda had landed in America with an aggressive plan to capture market share—sell high-quality cars at a price lower than their American rivals. To borrow from the old idiom, the Japanese carmakers quickly began “kicking ass and taking names.” Although GM and Ford attributed their Japanese rivals’ success to “low-cost labor,” the real secret to their success was a budding reputation for building reliable cars.⁵ Toyota had established a *strategic breakpoint* in the area of quality.⁶ The quality gap was so large that American consumers could not ignore it. By the 1990s, foreign nameplates—led by the Japanese—had captured over half of the California market.

How did GM and Ford respond? They announced (repeatedly) a new dedication to quality. In 1982, Ford aired a new commercial with the tagline, “At Ford, Quality is job 1.”⁷ But, nobody really believed it—and rightly so. Back on the production lines, productivity measures were still dominated. You know the rest of the story. Cost won out over quality! For the next 20 years, the Big Three U.S. carmakers struggled to close the quality gap and heal a tarnished quality image. Even today, many car buyers perceive Big Three products as inferior. What should you take away from GM and Ford’s miscues? Measurement speaks louder—and more persuasively—than rhetoric. Steven Kerr, the author of “On the Folly Rewarding A, while Hoping for B,” introduced the conundrum as follows:

Whether dealing with monkeys, rats, or human beings, it is hardly controversial to state that most organisms seek information concerning what activities are

rewarded, and then seek to do (or at least pretend to do) those things, often to the virtual exclusion of activities not rewarded. ...

Numerous examples exist of reward systems that are fouled up in that behaviors which are rewarded are those which the rewarder is trying to discourage, while the behavior he desires is not being rewarded at all.⁸

Despite living in an age of enlightened management, you have probably seen this phenomenon repeated over and over again—and not just at work. For example, as a society, we constantly fret over the national budget deficit, but we incent our congressional representatives to pursue pork-barrel spending. We deplore our education systems' failures and our students' low scores on standardized tests. But, we continue to reward mediocre teaching and, amazingly, student GPAs continue to go up. The never-changing reality is that rewarding A while hoping for B will kill any effort to change—at every organizational level.⁹ Rewarding A while hoping for B also alienates companies from critical supply chain stakeholders—customers, suppliers, and employees.¹⁰

The implication is clear. If you want to develop winning order fulfillment and customer service capabilities, you have to get measurement right. Measurement's power goes beyond motivation. Measurement provides the road map for helping you to go from your "as-is" capabilities to your desired "to-be" capabilities. Measurement also invites participation and incents alignment among all the diverse decision makers responsible for building—and constantly improving—those capabilities.

The Nature and Power of Performance Measurement

Attitude matters! Great companies are measurement fanatics. For example, one Fortune 500 executive expressed his company's attitude toward the measurement of order fulfillment activities as follows:

If it moves we measure it. We measure for how much it costs to move, what resources were used, did we move it to the right place without damaging it and how long it took. If it doesn't move, we measure how long it stays there and what resources are consumed while it sits. This framework is applied to the measurement of products, people, and equipment. Finally, we try to measure whether we did it as well as or better than anyone else could do it.¹¹

Why do great companies stress measurement? They know that sound measurement precedes the attainment of strategic goals—and ultimately success. You know the common catchphrase, "Information is power." Although many sources of information exist, measurement provides some of your most important decision-making information. However, unlike most sources of information, measurement informs both ways. How

something is measured provides understanding of how—and how well—that something is working. Equally important, what is measured communicates the importance of that something, whether it is a strategy or an activity.

The nature and power of measurement can be grasped by digging a little deeper into three common measurement mantras:

- If you can't measure it, you can't manage it.
- What gets measured, gets done.
- Measure twice; cut once.

Measurement Informs Understanding

The time-honored adage, “If you can't measure it, you can't manage it” moves from trite to impactful when it is elaborated as follows: “If you can't measure it, *you don't understand it*, and therefore can't manage it!” Lord Kelvin said it this way, “When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.”¹²

The effective design and control of order fulfillment and customer service systems requires that you go beyond meager knowledge of their role and function. You must gain an intimate understanding of how—and how well—they work. In other words, you need quantifiable order fulfillment and service goals and the key performance indicators (KPIs) to inform them. Targeted and accurate measurement provides this understanding. Measurement reveals and details how the pieces of a system interact. It tells you how much progress you are making toward your fulfillment and service goals. When integrated with key partner systems, measurement informs you regarding (1) customer expectations and satisfaction levels as well as (2) supplier capabilities. And if a process (or relationship) is failing to deliver, a measurement-driven, problem-solving methodology will provide you insight into why things are not working. That is, measurement instigates the investigation needed to root out the causes of system failures. Measurement, thus, provides the feedback needed to develop and execute value-added strategies.

Measurement Motivates Behavior

An important question is often asked in boardrooms, on factory floors, and at the loading dock: “Does strategic intent really translate into results?” What is your take on this strategy-to-performance question? You may be surprised by the answer—or maybe not. Despite all the hours spent formulating and communicating strategy, logistics research

suggests that the answer is often “No.”¹³ When does the strategy-to-performance connection break down? When measures are misaligned (see Figure 6-1). In the absence of supportive measures, strategy is not correlated with operational performance. Of course, this finding supports the introduction’s assertion that it is folly to seek A while rewarding B. Tom Peters, McKinsey consultant and author of *In Search of Excellence*, expressed this empirical finding via the more memorable phrase, “What gets measured, gets done.”

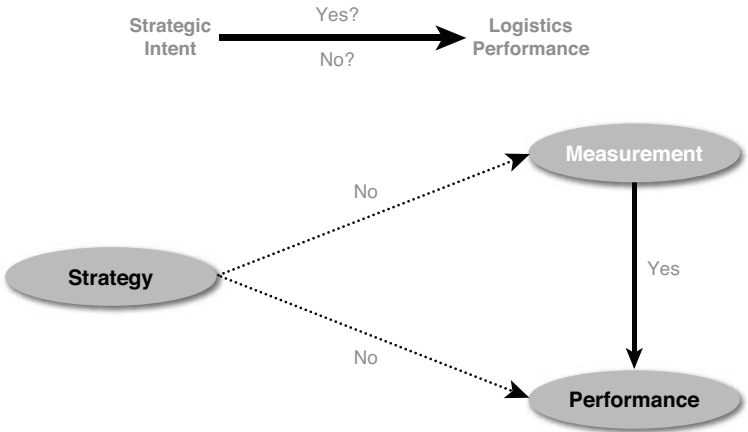


Figure 6-1 Connecting strategic intent to performance via measurement¹⁴

If you want to compete via order fulfillment and customer service, you need to remember that measurement shapes behavior. In fact, measurement is more influential than almost anything else you can do or invest in. You can hire the right people, provide them the right training, establish and articulate the right strategy, and still fail to perform if your measures promote counterproductive behaviors. People care about what is being measured. As a rule, people want to perform well. They want to be viewed favorably. They want to earn the merit raise. All of these outcomes hinge on their ability to perform according to what is being measured. When ego and pay are both tied to the same thing—that is, measurement—you can bet that people are paying attention. Because people want to know how they are being evaluated and they mold their expectations and behavior to the measures, you need to measure the right things.

Measurement Drives Execution

The first two mantras of measurement—that is, understanding and behavior—help you determine *what* to measure. The third mantra emphasizes *how* you measure. This idea is

expressed by the motto, “Measure twice, cut once” found on the occasional coffee mug or T-shirt. If you have ever done a construction project (big or small) around the house, you’ve probably experienced the frustration this motto seeks to prevent. You measured and marked a board incorrectly, cut it to your measurement, and then put it in place—only to find that it did not fit. The experience taught you that it is imperative to measure the right things *correctly*. An imprecise measure leads to a false cut, which costs you both time and materials.

If you measure the right things with right measures, good results naturally follow. Robert Kaplan, the architect of activity-based costing and balanced scorecards, has spent a lifetime trying to persuade decision makers that *how* they measure things matters. Elementally, he defines “correct” measurement as accurate, relevant, and timely.¹⁵ If you have accurate, relevant, and timely information for every activity involved in order fulfillment and customer service, you will be able to make effective decisions and deliver outstanding value. By contrast, sloppy measures practically guarantee inefficient processes and dissatisfied customers.

To summarize, rigorous, thoughtful measurement always precedes great execution and world-class results. When your measurement system enables you to do the right things in the right way, your odds of winning go up dramatically. This reality is captured by the following measurement equation, which you should make visible throughout your organization:

$$\text{Understanding} + \text{Behavior} + \text{Execution} = \text{Winning Results}$$

An added benefit of getting the measurement equation right is that good measurement practice provides the feedback that is so essential to learning, innovation, and invention. William Rosen, author of *The Most Powerful Idea in the World: A Story of Steam, Industry, and Invention*, argues that without measurement-driven feedback, invention is “doomed to be rare and erratic.”¹⁶ The right feedback powers progress, making innovation “commonplace.” In today’s fast, clock-speed world,¹⁷ outlearning rivals might be the only true source of sustainable advantage.¹⁸ Good measurement practice can help you outpace your rivals in today’s competitive race.

Measurement Practice—Understanding the Big Picture

Logistics is a measurement-rich environment. Traditionally, logistics measures have focused on five performance areas regarded as essential to delivering outstanding levels of profitable customer service. These five areas are asset management, cost, customer service, productivity, and quality (see Table 6-1).¹⁹ Most companies use a variety of measures to help manage each value-added activity. Despite extensive use of diverse

measures, many pundits (including Robert Kaplan) have long argued that traditional measures do not meet the needs of today’s decision makers.²⁰ For example, Wickham Skinner cautioned that, “the very way managers define productivity improvement and the tools they use to achieve it push their goal further out of reach.”²¹

Table 6-1 Traditional Measures Used to Manage Logistics Processes

Asset Management	Cost	Customer Service	Productivity	Quality
Inventory turns	Inventory carrying cost	Fill rate	Units shipped per employee	Damage frequency
Inventory obsolescence	Total landed cost	On-time delivery	Equipment downtime	Order entry accuracy
Return on assets	Outbound freight	Order cycle time	Order productivity	Picking/shipping accuracy
Inventory days supply	Warehousing labor costs	Complete orders	Warehouse labor productivity	Document/invoicing accuracy
Economic value added	Administrative	Customer complaints	Transportation labor productivity	Number of customer returns

If you take a close look at the measures in Table 6-1, you will note that they tend to focus on the here and now; that is, they are short term and local in nature. As this is true across other functions within most companies, the quest for local excellence often leads to turf wars. Traditional measures simply do not provide a holistic view of value-added processes. The measures are also internally focused—and to a large extent reactive. As such, they do not provide visibility up and down the supply chain. Not only is it easy to lose sight of customer needs, but it is also almost impossible to anticipate their future aspirations. Further, a financial focus excessively weights efficiency, leading to a drive to cut costs rather than build capabilities. How would you use the measures in Table 6-1 to identify and document unique value-creation opportunities? Remember, it is almost impossible to “cut” your way to great order fulfillment. Finally, English physicist Lord Kelvin said, “If you cannot measure it, you cannot improve it.”²² Ask, “Do traditional measures enable or promote the fast-cycle organizational learning and innovation we need to win customer loyalty?”

Although not inherently wrong, much of traditional measurement practice impedes outstanding order fulfillment and customer service! Regrettably, when it comes to the design of measurement systems, the fact is that “insightful” measures have too often been sacrificed on the altar of “easy” measurement. For example, consider classic productivity measurement. What is your view on productivity growth? Most managers believe that productivity growth, like a higher ROA/ROI, is good—the higher, the better. The

fact is, higher might be worse. Consider the ramifications of increasing order-picking productivity at the expense of poorer accuracy or higher damage incidence. If your ROI goes up because you skimp on needed investment, have you helped your firm position itself to win tomorrow's competitive battles? Not all tradeoffs are so easy to assess. With any of these measures, your real concern is why the measure (e.g., order-picking productivity) increased. If the process has improved because of better training, more clearly marked racks, or the use of radio-frequency technology, then you should document the improvements and make sure they are replicated across your organization as well as with key partners. If counterproductive behaviors are driving the so-called improved results, corrective action is needed. Productivity measurement can drive accelerated learning, but a narrow focus on efficiencies seldom does. More holistic, customer-focused measurement is needed.

Holistic Process and Supply Chain Measurement

A number of measurement-related processes facilitate true supply chain excellence for modern companies. These include total costing and the application of appropriate supply chain measures.

Total Costing

Total costing can reduce the propensity for counterproductive decision making described in the preceding discussion of productivity measurement. Total costs are simply the sum of all relevant costs for a given decision. Unfortunately, despite the rhetoric, few companies take a true total-costing approach to order fulfillment and customer service.²³ They can't! They do not know what all of the relevant costs are.²⁴ Figure 6-2 shares the findings from one research study, underscoring this reality. Ninety-four percent of logistics managers claim to use total costing, but in the next breath they acknowledge that they don't know what the cost of a back order or service failure is.²⁵ Consider how the problems associated with data availability and analysis are magnified as functional and company boundaries are crossed. Looking at Figure 6-3, how many decisions do you think are made using total supply chain costs? Does the lack of total costing influence service levels, customer satisfaction, and lifetime stream of profits?

To more fully understand the challenge of moving to more holistic costing practices, consider the notion of total cost of ownership (TCO), a type of total costing. TCO should be used in making purchasing decisions. It allows a true comparison of substitute materials or alternative suppliers. The equation for total cost of ownership is easy:

$$\text{TCO} = \text{Acquisition Cost} + \text{NPV } \Sigma (\text{Ownership Costs} + \text{Disposal/Scrap Costs})$$

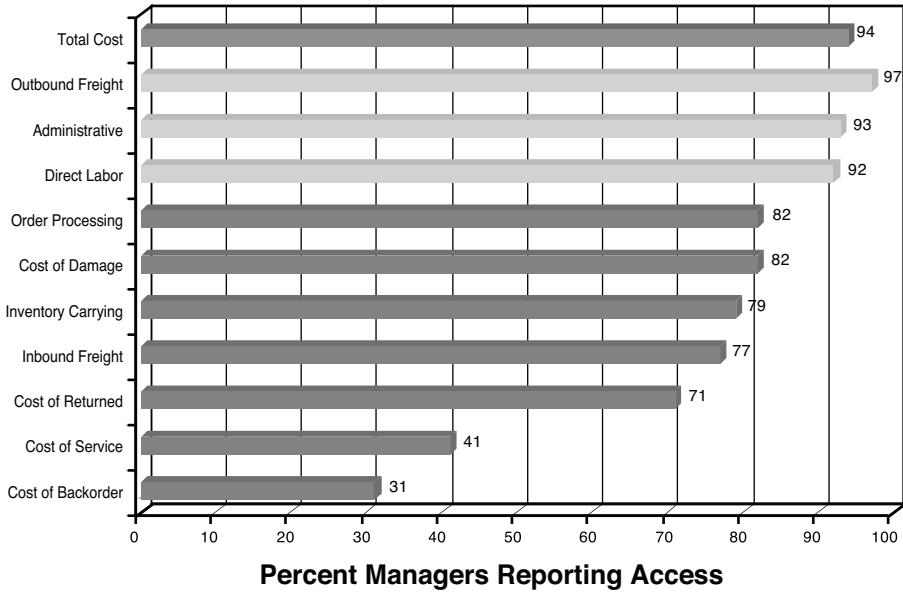
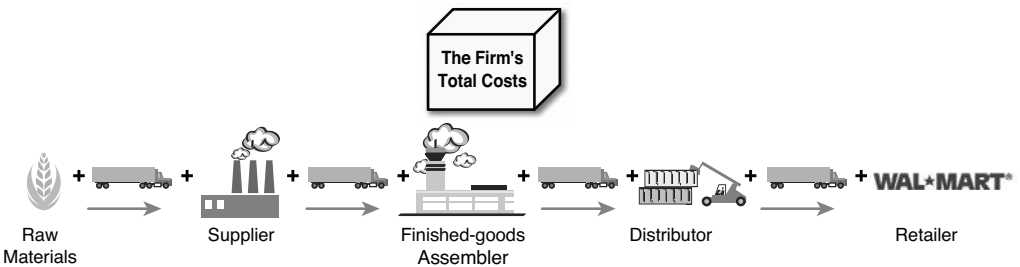


Figure 6-2 Data availability for total logistics costing



Total supply chain costs are the sum of all the costs incurred in planning, designing, sourcing, making, and delivering a product from raw materials to final customer.

Figure 6-3 Total supply chain costs²⁶

The hard part is identifying all of the relevant costs. Figure 6-4 depicts the challenge. Some costs, like purchase price, transport costs, and duties, are easy to identify and tie to a specific purchase. Other costs, including material handling, yield issues, and field failures, are incurred postpurchase and are more difficult to quantify. For capital equipment, the total-costing challenge is even greater. Ownership costs must be estimated over a much longer period of time. The result: Managers make decisions based on the easy-to-identify information. They do not do the detective work to really understand the

implications of their decisions. Given traditional reward systems, why should they? Figure 6-5 reveals that although many companies preach a TCO philosophy, what they measure is the purchase price. They sacrifice better decisions for easier decision making—a reality that hinders the development of better overall supply chain measures.

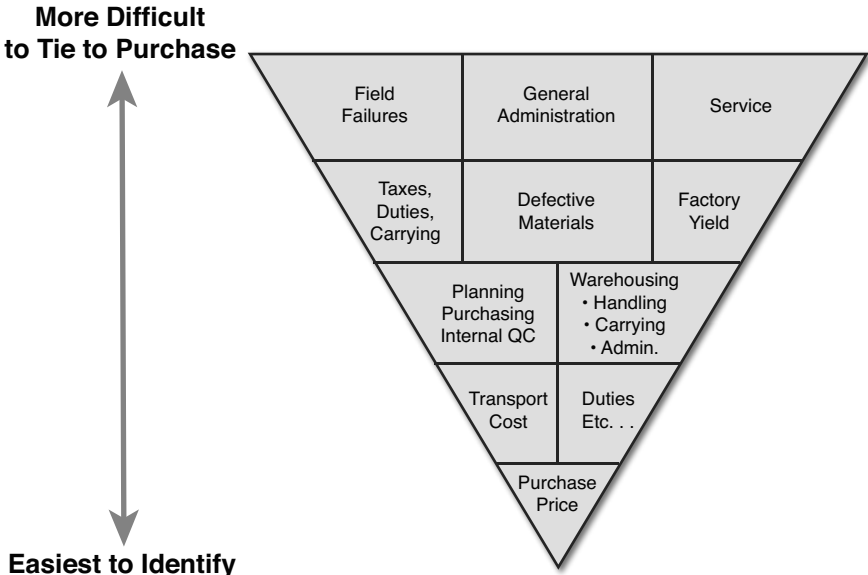


Figure 6-4 Total cost of ownership²⁷

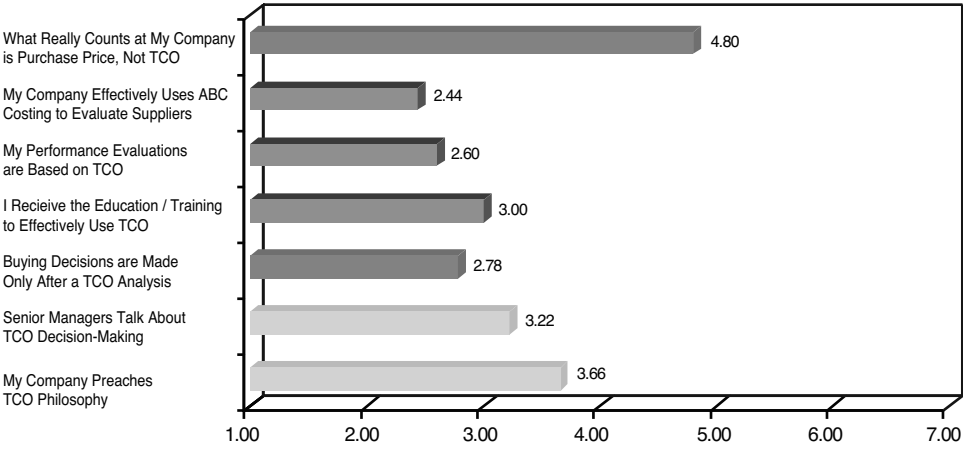


Figure 6-5 TCO building blocks

Supply Chain Measures

When asked to identify the key factors inhibiting better supply chain execution, one executive expressed a commonly held belief, saying, “*Metrics are critical! We don’t know what the new ones should be, but we need them.*”²⁸ The fact is that outstanding order fulfillment and customer service capabilities are supply chain capabilities. To provide fast, consistent cycles at the lowest costs, you have to rely on supply chain partners—namely upstream suppliers and logistics service providers—to perform. Yet, interorganizational (also known as supply chain-wide) metrics are almost nonexistent.

Over the past 20 years, beginning perhaps with the efficient consumer response initiative, many efforts have been undertaken to identify and define the supply chain measures of tomorrow.²⁹ Such measures, of necessity, are difficult to calculate and rely on information provided by supply chain partners. As a result, few breakthrough measures have been developed. Table 6-2 shows that these efforts have yielded three types of measures:

- **True supply chain measures**, that is, measures that do actually attempt to measure across the supply chain, but are so costly that they are only used as part of the efforts to benchmark supply chain performance for a specific industry. For example, the Efficient Consumer Response (ECR) initiative in the food industry documented over 120 days’ supply of finished goods inventory was held by manufacturers, distributors, and retailers. Although some firms had reduced their own inventory levels, overall supply chain inventory remained high. Inventory had merely been shifted to other channel members.³⁰
- **Theoretical supply chain measures**, that is, measures that express important concepts regarding supply chain performance and that would provide insight into interorganizational performance, but are not used to manage day-to-day operations.
- **Supply chain measures in name only**, that is, they are truly firm-specific measures, but they provide more insight into supply chain dynamics than traditional measures. Two of these measures have had noted and lasting influence on supply chain thought and practice—perfect order fulfillment and the cash-to-cash cycle time:
 - **Perfect order fulfillment**—Perfect orders are hassle free. You can describe this in one of two ways: everything was just right or nothing went wrong. Consider how hard this is to achieve. Gus Pagonis, the general who managed logistics and resupply for the first Gulf War, described logistics as follows: “If you go an hour without a screw-up, you’ve had a great day.” The perfect order thus sets a very high performance bar. The Supply Chain Council defines a perfect order as follows: an order delivered to the right place, with the right product, at the right time, in the right condition, in the right package, in the right quantity, with the right documentation, to the right customer, with the correct invoice.³¹

Table 6-2 Supply Chain Performance Measures

Terminology	Definition
<i>True Supply Chain Measures</i>	
Inventory days supply	The total number of days of inventory required to support the supply chain—from raw materials to the final customer acquisition. This is expressed as calendar days of supply based on recent actual daily cost of sales.
Total supply chain cost	The sum of all the costs incurred in planning, designing, sourcing, making, and delivering a product broken down for each member of the supply chain.
<i>Theoretical SC Measures</i>	
Supply chain response time	The theoretical number of days required to recognize a major shift in market demand and increase production by 20 percent.
Source/make cycle time	The cumulative time to build a shippable product from scratch—if you start with no inventory on hand or on order. It consists of total sourcing lead time, release-to-start build, total build cycle time, and complete build-to-ship time.
Value-added productivity	Total company revenues generated less the value of externally sourced materials expressed as a ratio of total company headcount.
<i>SC Measures in Name Only</i>	
Perfect order fulfillment	A perfect order is an order that is delivered complete, on time, in perfect condition, and with accurate and complete documentation. Fulfillment is the percent of orders that are perfect (Perfect Orders/ Total Orders).
Cash-to-cash cycle	The time required to convert a dollar spent to acquire raw materials into a dollar collected for finished product (Total Inventory Days of Supply + Days Sales Outstanding–Days Payables Outstanding).
Order fulfillment cycle time	The average actual lead times consistently achieved, in calendar days, from customer order to customer delivery. This includes order authorization to entry, entry to release, release to shippable, shippable to customer receipt, and receipt to customer acceptance.
Inventory dwell time	The ratio of days inventory sits idle to days inventory is being productively used or positioned.
On-shelf in-stock percentage	The percentage of time that a product is available on the shelf, rack, or wherever the customer expects to find and buy it. This measures the supply chain’s ultimate ability to satisfy the end customer.
Customer inquiry response time	The average elapsed time between receipt of a customer call and connection with the appropriate company representative.
Customer inquiry resolution time	The average elapsed time required to completely resolve a customer inquiry.

Any kind of error busts a perfect order. Nine out of ten imperfect orders fail due to one of the issues listed in Table 6-3. Outstanding performers hit perfect order percentages of only about 90 percent. The Grocery Manufacturers Association provides performance statistics for a few components of a perfect order (see Table 6-4). Focusing just on four issues—on-time delivery, orders shipped complete, orders shipped damage free, and orders shipped with the correct documentation—the average perfect order percentage is 84 percent.³² Pursuing the perfect order can help you avoid complacency and drive improvement as you find and remove the root causes of perfect order failures. Until recently, many considered the perfect order to be the pinnacle of logistics performance. However, some leading firms see a flaw in this logic: The perfect order is inward looking; it ignores customer perceptions of service levels.

Table 6-3 Perfect Order Busters

Order entry error	Missing information
Ordered item is unavailable	Late shipment
Incomplete paperwork	Inability to meet ship date
Picking error	Early arrival
Customer deduction	Inaccurate picking paperwork
Damaged shipment	Invoice error
Overcharge error	Credit hold
Error in payment processing	

Table 6-4 Calculating a Perfect Order

Perfect Order Elements	Average
Percent on-time delivery (OTD)	93 percent
OTD to DC within 30 minutes	
Percent orders shipped complete (order line item fill rate)	97 percent
Percent of orders shipped damage free	99 percent
Percent of orders sent with the correct documentation	94 percent
Invoice accuracy	
Total Perfect Order ($.93 \times .97 \times .99 \times .94 = .84$)	84 percent

- **Cash-to-cash cycle time**—Cash is king. Recognizing this fact, companies are managing their cash flow more aggressively. One CFO explained the strategy as follows:

We have made working capital reduction a priority. ...We are able to operate some of our businesses with negative working capital. Rather than putting money in inventory or receivables we prefer to have our suppliers finance us by increasing our short-term liabilities, thus freeing up capital for other investments.

How much money can a company free up? A recent *Wall Street Journal* article noted, “Procter & Gamble is planning to add weeks to the amount of time it takes to pay its suppliers, a shift that could free up as much as \$2 billion.”³³ The opportunity to “live off of someone else’s dime” has made cash-to-cash cycle time a pivotal measure—one that shows the direct financial benefit of supply chain initiatives to senior management. This is critical as finance is the language of business. Freed-up working capital can be invested in new products, better processes, or more collaborative relationships.

The formula to calculate a company’s cash-to-cash cycle is as follows:

$$\begin{aligned} \text{Cash-to-Cash Cycle} &= \text{Total Inventory Days of Supply} \\ &+ \text{Days Receivables} \\ &- \text{Days Payables} \end{aligned}$$

Let’s use this equation to look at two companies’ cash-to-cash performance over time. Dell and Walmart are often considered to be cash-to-cash champions. Their cash-to-cash calculations for 2004 and 2012 are shown in Table 6-5. A close look shows a company’s cash-to-cash performance depends on two key issues: (1) highly efficient processes that minimize inventory and speed collection of payables and (2) leverage with supply chain partners that enables quick collection of receivables and delayed payment to suppliers. From a co-value-creation perspective, building efficient processes is the preferred approach to reducing cash-to-cash cycles. How do Dell and Walmart stack up? Both companies achieve short or negative cash-to-cash cycles, granting them financial flexibility. Both companies rely on extremely tight logistical operations to minimize inventory. Dell leans more on leverage to extend its payables. Walmart collects receivables more quickly.

Table 6-5 Cash-to-Cash Cycle Calculations for Dell and Walmart*

	Sales	Inventory	Receivables	Payables	Inventory Days	Days Receivables	Days Payables	C2C Cycle
2004								
Dell	\$39,667	\$327	\$3,635	\$9,935	3.01	33.45	91.42	-54.96
Walmart	\$258,681	\$26,612	\$1,254	\$31,051	37.55	1.77	43.81	-4.49
2012								
Dell	\$62,071	\$1,404	\$6,476	\$11,656	8.26	38.08	68.54	-22.20
Walmart	\$446,114	\$43,803	\$6,768	\$38,080	35.84	5.54	31.16	10.22

* Dollar values expressed in millions.

Finally, although most companies use aggressive cash management to free up working capital, a few have identified an opportunity to improve supply chain relationships and overall supply chain performance. One executive explained his company’s novel approach to cash management, “Most large companies strive to reduce their cash-to-cash cycle, but not every company has the same cost of capital. Total supply chain costs can be reduced if the company with the lowest cost of capital accepts longer cash-to-cash cycles. We try to look at this as we manage relationships.”

Customer-Centric Measurement

A new metric is gaining attention. Although its acronym—SAMBC—isn’t nearly as catchy as “the perfect order,” the concepts it promotes are catching on as a better way to evaluate order fulfillment and logistics service performance. Deirdre White, associate director of customer service at P&G, defines Service As Measured By the Customer as, “The percentage of measured customers at which we are at or better than expected service targets, where the targets are established by and with each customer.” Ms. White explains why SAMBC is a more relevant and important metric, “Our view on service had been very internally focused. We lost a lot of opportunity to create value for our customers and ourselves.”³⁴

Regardless of how well your company thinks it is performing based on the internal metrics, what really matters is how the customer perceives your performance. That is, your customer gives you the grade that matters, deciding whether you pass or fail. Using the example of a supplier that splits a 100-case shipment (95 shipped/5 short) because of space constraints, Ms. White demonstrates how easy it is to see past each other in the order fulfillment process. The supplier ships the remaining cases on the next truck and feels it has fulfilled the order. As you might guess, the customer disagrees.³⁵ Unhappy, the customer is likely to look for a new, more perceptive and responsive supplier.

To meet customers’ real needs, you must understand them from the customer’s vantage point (see the discussion in Chapter 1, “Meeting Customers’ Real Needs: The Nature of Service System Design,” regarding customer service, satisfaction, and success). Traditional customer service measurement—which relies on internally generated statistics on such things as fill rates, on-time delivery, and response time to inquiries—cannot provide this insight. You have to ask customers what services they truly value. Then you have to find out how they measure them. You may discover that the “high” service levels you have been providing are not highly valued by customers. P&G’s White noted customer conversations can reveal nasty surprises. She explained that in one instance, it dawned on members of the fulfillment team that P&G had “missed expectations for several years.” After digging into the problems and better defining who controlled each part of the fulfillment process, P&G’s performance improved by 50 percent within six months.³⁶

Establishing customer-centric measurement is more about process than building a list of metrics. The process requires that you not only meet with individual customers to agree on the metrics to be used, but also align your measures to the customers’ measures—at least for your most important customers. Even though many metrics are industry standards, each customer is likely to have tweaked them to fit his or her own competitive priorities. At UPS, customer feedback led managers to change measures that were expressed in terms of average performance levels (e.g., percent of shipments delivered damage free) to absolute measures (e.g., damaged shipments delivered to a specific customer). A senior manager explained, “To say that we deliver 99.5 percent of our packages damage free might give us a false sense of well-being. To say that 5,000 customers received damaged packages from us on a particular day puts an entirely different perspective on our performance.” Table 6-6 summarizes the essence of customer-centric measurement.

Table 6-6 Customer-Centric Measurement

Traditional Customer Measurement	Customer-Centric Measurement
Internal service measures over satisfaction measures	External assessment that reveals what customers really think is important and how they measure your performance
Measures that are expressed as averages	Measures that are expressed in both average and absolute terms—on a customer-by-customer basis
Measures based on industry standards and that treat all customers the same	Measures that recognize unique needs of individual customers and are aligned to those needs

Balanced Scorecards

The early nineties were a time of rapid change. The competitive environment was more dynamic and turbulent than ever before and new technologies were enabling companies

to experiment with new business models. However, managers felt they lacked the measurement capability to drive needed change and implement new strategies. In fact, many managers felt that measurement was holding them back—keeping them from making decisions that would create the value customers were demanding. Within this setting, Robert Kaplan and David Norton introduced the balanced scorecard concept. Their goal was to provide a measurement framework that would overcome the backward-looking and short-term nature—which were viewed as critical deficiencies—of widely used financial metrics.³⁷

Why was a new, balanced approach needed? In an environment of constant change, managers needed a tool that could both inform and motivate the right change. Remember, measurement is powerful precisely because it informs decision making and motivates needed behaviors. Larry D. Brady, executive vice president at FMC, commented on the need for better measurement, saying, “If you are going to ask a division or the corporation to change its strategy, you had better change the system of measurement.”³⁸

The balanced scorecard supports change and better decision making by incorporating four distinct dimensions into a holistic management dashboard. Specifically, a balanced scorecard invites you to ask four questions about your company’s mission and strategy:

- “To achieve our vision, how should we appear to our customers?”
- “To succeed financially, how should we appear to our shareholders?”
- “To satisfy our shareholders and customers, what business processes must we excel at?”
- “To achieve our vision, how will we sustain our ability to change and improve?”³⁹

By focusing on customer expectations, operational excellence, future capability development, and financial metrics, the scorecard brings balanced insight to decision making (see Figure 6-6).

Taking a balanced approach yields several advantages vis-à-vis a more financially oriented measurement methodology. First, scorecards translate vision into actionable behavior. The scorecarding process provides a top-down reflection of your company’s goals, deriving measures directly from strategy-driven goals. Second, the resulting scorecard communicates top-management’s vision throughout the organization. Research has shown that when a scorecard is not in use, up to 95 percent of a typical workforce cannot articulate the company’s strategy.⁴¹ Members of your team cannot align to and coalesce around a strategy they do not understand. Third, a well-designed scorecard not only integrates internal and external perspectives, but it is also forward looking. Your scorecard invites managers to ask, “What capabilities do we need to build to better meet customer needs and improve shareholders’ returns?” Naturally, the follow-up question is, “How do we invest in and organize for this capability development?” Fourth, because

a complete scorecard should consist of only about 20–25 metrics, it helps you focus on what is really strategically important.⁴² The scorecard imposes discipline, helping decision makers avoid distractions and “shiny objects.”

The Balanced Scorecard Links Performance Measures

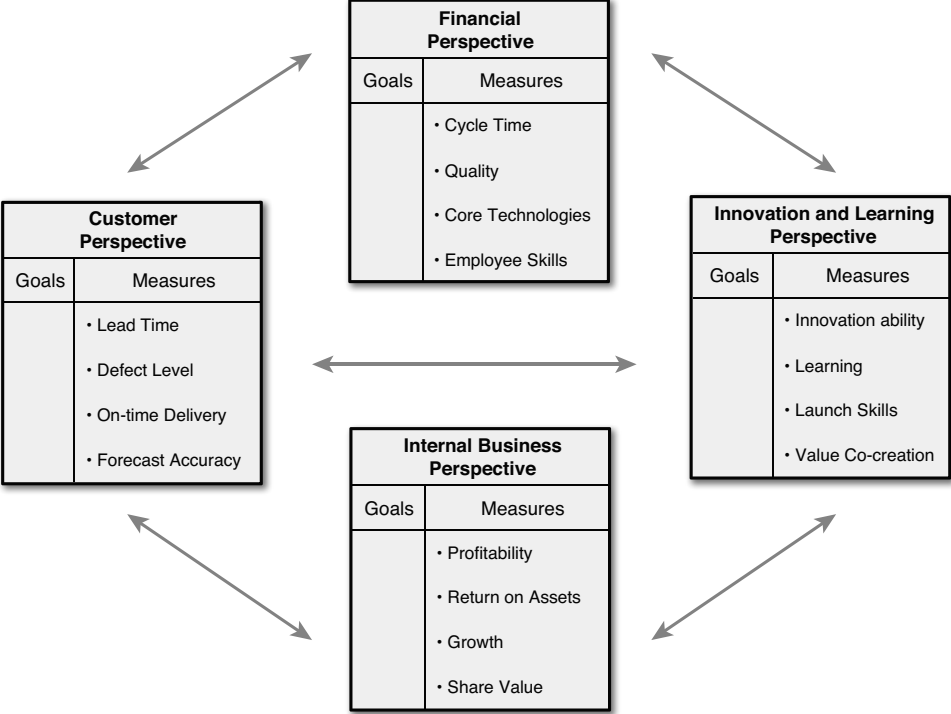


Figure 6-6 The balanced scorecard⁴⁰

Now, the pivotal question, how do you construct an effective scorecard? The process begins with a firm and determined recognition that a new approach to measurement is truly needed. If your team doesn't buy in to a deep underlying need for a scorecard, they will not invest the time and effort to do it right. Because scorecards are so powerful at communicating strategy and guiding behavior, a bad scorecard is worse than no scorecard. Figure 6-7 provides the basic blueprint for scorecard construction. Once your vision of the future is defined and agreed upon, you must translate vision into strategy. Ask the question, “If my vision succeeds, how will I differ to my shareholders, my customers?”⁴³ This question will help you determine the nature of your “to-be” value-added and innovation capabilities. With this high-level foundation in place, the process

becomes much more granular. The following four steps will help you translate strategy into an actionable scorecard:

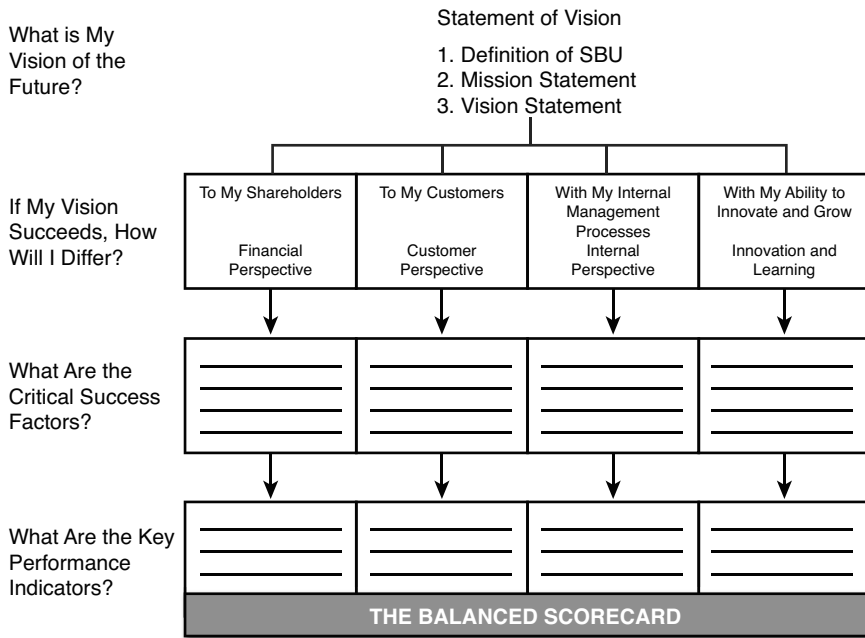


Figure 6-7 A blueprint for constructing a balanced scorecard⁴⁴

1. **Establish goals**—Goals matter! They set the direction for your company and they define what you need to measure; that is, they define the understanding, motivation, and execution you need your metrics to promote. To make sure you get your goals right, you should consult the following sources of information:
 - **Environmental scan (also known as SWOT analysis)**—Most companies conduct a periodic scan of the competitive environment to identify potential competitor moves, changes to industry structure, emerging technologies, and future government regulations. Each of these issues could potentially change the rules of the competitive game, requiring you to build new capabilities in order to survive and thrive.⁴⁵
 - **Best-in-class benchmarks**—If you want to offer customers truly competitive service levels, you need to benchmark best practices for relevant capabilities and processes. Benchmarking is the formal process of comparing the attributes of one organization with those of another. Proactive benchmarking helps

you assess and improve your company's competitive abilities. Benchmarking involves the following:

- a. Identifying the attribute (e.g., capability, process, or routine) you want to improve and then finding a company that achieves best-in-class performance in that area
- b. Documenting the benchmark company's process at strategic and operational levels to identify specific opportunities for improvement
- c. Developing a detailed, step-by-step strategy to bring the best practice in-house

Your quest is to find the very best ways to do the things (e.g., fast-cycle delivery, vendor managed inventory, integrated business planning) that matter to your customers. To do this, you have to banish the not-invented-here mind-set that afflicts many firms. Your motto should be, "Good practice is good practice, wherever it is found." Deliberate benchmarking not only improves specific capabilities, but also stimulates constant learning.

- **Customer feedback**—If you look at the mission statements of successful companies, you will consistently find five essential words, "meet or exceed customer expectations." To do this well, you need to talk with your customers. To get the real skinny on how you can better meet their needs, you need to earn your customers' trust. This means they trust you will be able to live up to your promises of better service and they want to work with you over the long haul.⁴⁶ Otherwise, they are unlikely to waste their time giving you the feedback you need to really distinguish your performance.

2. Identify metrics—With goals established, you are ready to derive the metrics that make up the heart of your scorecard. In addition to evaluating current measures and conducting internal brainstorming sessions to ideate new measures, you should look to the following for inspiration:

- **Industry standards**—In most industries, a set of standard metrics exists for key value-added activities. For logistics, standard metrics are likely to look like those listed in Table 6-1. Professional associations, industry consortiums, consultants, and textbooks are good places to look to make sure you do not miss the obvious.
- **Best-in-class benchmarks**—Just as some companies excel at value creation, others are known for their use of creative and effective measurement practice. Check out what they are doing and see how their metrics fit your needs.
- **Customer feedback**—When you ask customers how you can better meet their needs, follow up by asking how they evaluate your service. Request a copy of

their supplier scorecard and go over it with them to find out exactly how they define and calculate their measures. This understanding will help you align your measures with theirs.

Because your competitive context, core competencies, and customer relationships are distinct, you will want to tailor some of your metrics. Tailored metrics recognize the fact that a one-size-fits-all approach to measurement cannot realistically cultivate high-caliber, value co-creation relationships.

Tailored metrics derive their value from their ability to communicate specific expectations, align partner efforts, track specific process capabilities and performance, and promote the collaborative behavior needed to pursue special projects and inculcate one-of-a-kind relationships. Table 6-7 shares a checklist of the attributes of an effective tailored measure. For each “No” that you check, you need to ask if this deficiency will undermine the metric’s effectiveness, leading to poor understanding, counterproductive behavior, and unintended consequences.

Table 6-7 A Checklist for the Development of Tailored Metrics⁴⁷

This Tailored Measure Is...

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Aligned with organizational goals
<input type="checkbox"/>	<input type="checkbox"/>	Aligned with project goals
<input type="checkbox"/>	<input type="checkbox"/>	Customer oriented
<input type="checkbox"/>	<input type="checkbox"/>	Meaningful to workers, managers, and customers
<input type="checkbox"/>	<input type="checkbox"/>	Consistent across appropriate functions or departments
<input type="checkbox"/>	<input type="checkbox"/>	Designed to promote cooperative behavior both horizontally and vertically
<input type="checkbox"/>	<input type="checkbox"/>	Communicated to all relevant individuals
<input type="checkbox"/>	<input type="checkbox"/>	Simple, straightforward, and understandable
<input type="checkbox"/>	<input type="checkbox"/>	Easy to collect the needed data
<input type="checkbox"/>	<input type="checkbox"/>	Easy to calculate
<input type="checkbox"/>	<input type="checkbox"/>	Available on a timely basis—in real time when possible
<input type="checkbox"/>	<input type="checkbox"/>	Strategic and tactical
<input type="checkbox"/>	<input type="checkbox"/>	Quantifiable
<input type="checkbox"/>	<input type="checkbox"/>	Designed to drive appropriate behavior
<input type="checkbox"/>	<input type="checkbox"/>	Designed to drive learning and continuous improvement
<input type="checkbox"/>	<input type="checkbox"/>	Designed to provide information that is actually used in decision making

Adapted from Fawcett, Ellram, and Ogden (2007)

3. **Integrate with information system**—To be effective, your scorecard needs to be populated with accurate, up-to-date information. During the scorecard development process, you need to make sure that your systems are able to collect and analyze all of the information needed to populate the scorecard. You also need to run a pilot test to ensure that all the links are correct and the metrics are valid. GIGO can sully the credibility of a newly launched scorecard.
4. **Implement**—When the scorecard has been fully validated, you need to make sure that it is rolled out with proper training. The key here is to make sure people understand why the scorecard was developed, what individual metrics mean and how they are calculated, and how to use it for holistic decision making. The odds are that many of the decision makers who will be using the scorecard should have participated in its development. Although such inclusion may increase development time, it mitigates implementation headaches. People support what they help create.

To summarize, the scorecarding process unleashes the power of measurement. A well-designed scorecard helps you develop the strategic focus, the value-added capabilities, and the supply chain relationships you need to win tomorrow's battles for the customer's loyalty. It also accelerates learning. Finally, when customized scorecards are co-created with your most important customers, you achieve better alignment, build deeper and stronger trust, and set the stage for future collaboration.

Measurement Practice—Delving into the Details

Driving operational excellence means getting into the trenches to learn how—and how well—the specific activities and processes that constitute order fulfillment and customer service are really working. Figure 6-8, Panel A, shows a format used by many companies to disaggregate core elements of logistics service into metrics. Adopting a similar process will help you measure the little things that ultimately determine whether or not a process performs as promised. Panel B provides standard definitions for key fulfillment and service metrics.

Paying close attention to these measures underlies your ability to control daily operations and promote continuous improvement. The feedback from these measures can help you answer the following question: What should we be willing to pay to improve performance? Let's take a look at two fulfillment goals—providing outstanding product availability and shortening order fulfillment cycles—to illustrate the type of analysis you need to conduct to evaluate performance and profitability tradeoffs.

Translating Service Goals to Metrics		
Element	Definition	Typical Metric Measured from Customer Perspective
Product Availability	Usually defined as percent of times product is available to fill first request orders	<ul style="list-style-type: none"> Order fill rate Case fill rate
Order Cycle Time	Activities and time that elapses between when an order is placed and when the shipment is received.	<ul style="list-style-type: none"> Order cycle time in days % orders received within x days On-time delivery
Logistics Operations Responsiveness	<ul style="list-style-type: none"> Ability of the supply chain to meet special customer requests Ability of the supply chain to adapt to sudden changes in volume 	<ul style="list-style-type: none"> Response to special request (hours, days) Time required (days) to respond to x% increase in unanticipated demand
Logistics System Information	Ability of an information system to supply timely and accurate information	<ul style="list-style-type: none"> Response time (hours, days) to requests for information % compliance to EDI
Postsale Product Support	Ability to provide customer support after product delivery, including technical information, spare (replacement) parts, or product return	<ul style="list-style-type: none"> Response time to service request Cost to return product Spare part availability
Source: Adapted from James F. Robeson and Robert G. House		

Availability Measures	
Fill rates	Measures the magnitude or impact of stockout over time.
Stockout frequency	Refers to the probability that a stockout occurs in a firm with no available inventory to meet customer orders.
Orders shipped complete	Requires shipping everything that a customer orders to count as a complete shipment.
Operational Measures	
Speed of the performance cycle	The elapsed time from when a customer established a need to order until the product is delivered.
Consistency of the order cycle	Measured by the number of times that actual cycles meet the time planned for completion.
Malfunction recovery	The ability to quickly implement contingency plans when a failure occurs in the supply chain.
Service Reliability Measures	
Damage-free shipments	Measures how many shipments arrive without damaged products.
Error-free invoices	Measures what percentage of invoices contain no errors.
Shipment/order match	Order measures how many shipments contain the exact amount of product ordered.
Shipped to correct location	Measures how many shipments are made to the customer's selected location.
Source: Definitions taken from Bowersox, Closs, & Cooper, (2012)	

Figure 6-8 Logistics order fulfillment and service metrics^{48, 49}

Product Availability

Product availability is typically measured using a fill-rate metric; that is, item fill rate, line fill rate, or order fill rate. Figure 6-9 illustrates how these metrics are calculated for an order that consists of multiple lines. Please note that the customer has ordered different quantities for each line (i.e., a specific SKU). As a result, the choice of metric—item versus line fill rate—provides a very different perspective on the level of service provided. For Scenario A, the line fill rate is a respectable 90 percent. However, the item fill rate is 45 percent—a truly dismal service level. The math for Scenario B shows an item fill rate of 69 percent and a line fill rate of 40 percent. Although the item fill rate is better than the line fill rate, both represent unacceptable performance. For both scenarios (A & B), the order fill rate is 0 percent, so is the perfect order rate! The point is simple: You need to understand the nature of the metric, how it is calculated, and what the results are truly telling you. This fact is true for all metrics, not just fill-rate measures. You can't afford to let the inappropriate use of metrics (either wrong metrics or wrong use of metrics) lull you into a false sense of high performance.

Order Consists of Multiple Lines			
Line	Items Ordered	Scenario A Items Filled	Scenario B Items Filled
1	10	10	0
2	20	20	0
3	30	30	30
4	10	10	0
5	20	20	0
6	30	30	30
7	10	10	0
8	20	20	0
9	30	30	30
10	220	0	220
Total	400	180	310
Item Fill Rate			
Scenario A: $180 \div 400 = 45\%$			
Scenario B: $310 \div 400 = 69\%$			
Line Fill Rate			
Scenario A: $9 \div 10 = 90\%$			
Scenario B: $4 \div 10 = 40\%$			

Figure 6-9 What do different fill-rate metrics mean?⁵⁰

Adapted from Coyle, Langley, Gibson, and Novack (2011)

Now, let's address the question of how much you should be willing to pay to improve availability performance. Consider the ensuing scenario, which might describe your last year's order profile:

- The average order is for 1,000 units.
- You delivered 10,000 orders last year.
- Your pretax profit per unit was \$50.
- Your pretax profit per order was \$50,000.
- Your percent of incomplete orders back-ordered is 70 percent (30 percent are canceled).
- Your back-order costs per order were \$200 (e.g., administrative, handling, shipping).
- Invoice deduction for short orders is \$500.

If you delivered 85 percent complete orders last year, how much cash flow did you lose because of poor product availability (i.e., your inability to ship complete orders)? The *relevant costs* to include in the calculation are as follows:

- Cost of canceled orders (i.e., 30 percent of incomplete orders × pretax profit per order)
- Back-order costs (i.e., 70% of incomplete orders × back-order cost)
- Invoice deduction cost (i.e., 70% of incomplete orders × invoice deduction)

Based on the 85 percent complete order rate, your total number of incomplete orders was 1,500 (i.e., 15% × 10,000 orders). The calculations follow:

$$\begin{array}{rcl}
 \text{Cash Flow Lost} = & \mathbf{\$23,235,000} & \text{or} \\
 & & .3 \times 1,500 \times \$50,000 \quad (\text{canceled orders}) \\
 & & + .7 \times 1,500 \times \$200 \quad (\text{back-order cost}) \\
 & & + .7 \times 1,500 \times \$500 \quad (\text{deductions})
 \end{array}$$

Suppose that during your visits to customers, they complained that you were 10 percent under the industry standard for shipping complete orders. They implored you to do something about this. How much money should you be willing to invest in added inventory, better information systems, or closer relationships (e.g., VRM) that would enable you to hit the 95 percent target?

Based on a 95 percent complete order rate, your total number of incomplete orders would be 500 (i.e., 5% × 10,000 orders). Your new lost cash flow is calculated as follows:

Cash Flow Lost =	\$7,745,000	or	$.3 \times 500 \times \$50,000$	(canceled orders)
			$+ .7 \times 500 \times \$200$	(back-order cost)
			$+ .7 \times 500 \times \$500$	(deductions)

The low end of what you should be willing to pay to improve fill-rate performance is the difference between \$23,235,000 and \$7,745,000 or \$15,490,000. This \$15.5 million becomes the number against which you weigh the costs and benefits of different improvement initiatives. Why is this the low end? The odds are pretty good that if you improve your ability to deliver full shipments, two things will happen. First, your customers will cancel fewer orders, reducing your canceled order costs. Second, your better performance will attract some additional sales, increasing your top-line revenues.

Order Cycle Time

The ability to deliver orders quickly can buy you flexibility in how you manage your overall value-creation system. That is, if you have a fast-cycle logistics delivery capability (Amazon’s rationale for building a vast network of fulfillment centers), you could potentially smooth your production flow, allowing you to lengthen production runs, eliminate wasteful setups, and focus on innovating more-effective processes. Of course, you might simply seek to capture market share by offering faster-than-industry-average delivery times, which would reduce your customers’ needs to carry inventory.

The question is: How much should you be willing to pay to improve performance? You know that the basic order cycle consists of four major components: order placement, order processing, order preparation, and order shipment. Each component—as well as the overall order cycle—can usefully be described statistically using the mean and range. That is, your customers can usefully know when to expect the order to arrive (the mean) and what the worst-case scenario is (the upper end of the range). Figure 6-10 depicts these relationships.

Now, imagine you have met with your customers to learn more about their expectations as well as their sensitivity to faster order cycle times. They tell you that shorter cycles are important. Indeed, they would like you to reduce your current order lead time by 50 percent. They would also like you to reduce the variability of the order cycle; that is, they want you to promise a more consistent, reliable lead time. As you talk, it is clear that customers feel the current order cycle is driving up two inventory-related costs: (1) demand inventory to cover the order cycle lead time and (2) safety stock to compensate for your highly variable order cycle. Subsequent to meeting with your key customers, you mapped out your order cycle to find out how it was working. You also initiated a series of brainstorming activities to see if a 50 percent reduction in cycle time is even possible—let alone financially viable. The facts you discovered are as follows:

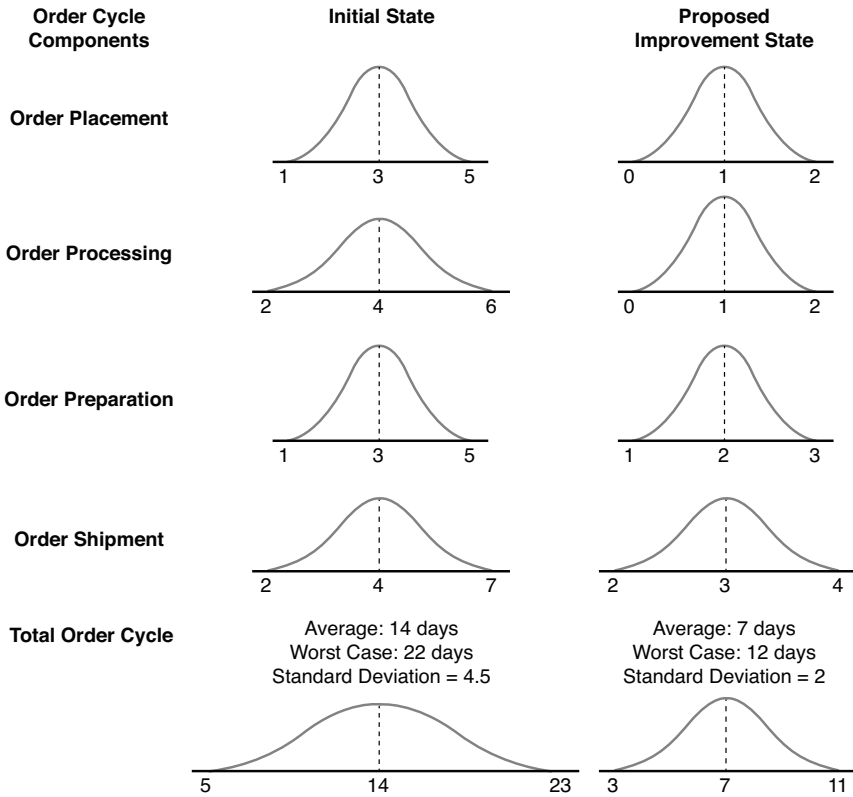


Figure 6-10 Understanding the effects of order length and variability⁵¹

	Current Customer	Capability Request
Average order cycle time	14 days	7 days
Standard deviation of cycle time	4.5 days	2 days
Service level	95 percent	

You also know the following for your most important customer:

- Sales price: \$250
- Historical demand per day: 5,000 units
- Inventory carrying cost: 20 percent
- The z-score for a 95 percent service level: 1.96

Based on the nature of the system and its costs, you are confident the greatest opportunity for cost avoidance is found in the demand inventory for your 14-day lead time. By cutting your lead time in half to 7 days, your customer could reduce its inventory levels by 7 (i.e., $14 - 7 = 7$) days' worth of sales. Thus, your calculations are as follows:

$$\text{Inventory Cost Savings} = 7 \text{ days} \times 5,000 \text{ units/day} \times \$250 \text{ per unit} \times 20\% = \mathbf{\$1,750,000}$$

Turning to the safety stock calculations, you decide you want to make sure everyone sees the actual inventory impact of the proposed change. So, you calculate the absolute unit numbers for current versus proposed safety stock levels. Figure 6-10 modeled your order fulfillment system statistically, creating a standard normal probability distribution for lead-time performance. Variability is measured by the standard deviation of cycle time. Your confidence that the system will perform is captured by the z-score. From a statistical perspective, the z-score is the distance from the mean as measured by the number of standard deviations. A z-score of 1.96 signifies that you are 1.96 standard deviations above the mean. That is, your fulfillment system will deliver to this time 95 out of 100 times. Your calculations follow below:

$$\text{Current Safety Stock} = 5,000 \text{ units/day} \times 1.96 \times 4.5 \text{ days} = 44,100 \text{ units}$$

$$\text{Proposed Safety Stock} = 5,000 \text{ units/day} \times 1.96 \times 2 \text{ days} = 19,600 \text{ units}$$

Thus, if you can reimagine your order fulfillment system so that it delivers in 7 days on average with a standard deviation of 2 days, your customers will need to carry 24,500 fewer units of safety stock inventory (i.e., $44,100 - 19,600$). The cost savings are calculated below:

$$\text{Safety Stock Cost Savings} = 24,500 \text{ units} \times \$250 \text{ per unit} \times 20\% = \mathbf{\$1,225,000}$$

The total inventory cost savings for your customer is the sum of the demand and safety stock savings:

$$\text{Total Inventory Cost Savings} = \$1,750,000 + \$1,225,000 = \mathbf{\$2,975,000}$$

If your customer is willing to share cost savings on a 50/50 basis for the first year, you could invest up to \$1,487,500 to improve your system. P&G has provided up-front funding for smaller suppliers to make such investments because managers at P&G know that improved supplier performance will enable P&G to recoup the investment many times over (and year after year). Of course, shorter cycle times might also reduce the amount of inventory you have to hold in order to meet customer service expectations. This would free up additional capital to invest in cycle-time reduction. Finally, shorter cycle times could improve your value proposition, helping you capture market share and driving top-line revenue gains. But, you won't know until you find out what customers want, model your system, and crunch the numbers.

Your takeaway: The devil is in the details. So are your opportunities to drive consistent improvements in your order fulfillment and customer service processes. Well used,

metrics can drive the constant learning and improvement that is needed to win tomorrow's competitive game.

Conclusion

Measurement matters! Consider the following examples:

- A logistics professional in the midst of a commuting nightmare came home each week to a discouraged and distraught sweetheart. After returning home one Friday night and listening to all sides of the story, he grasped that without more help around the house, the mess and chaos had become overwhelming. Knowing that good practice is good practice, he developed a simple scorecard, defining goals and establishing measures. Rewards were linked to the measures and the new scorecard system was introduced and explained to the couple's six children. The next morning, the family's six-year-old son arose early (at six o'clock) to clean the bathroom—all on his own initiative. From that point on, the house stayed clean. Your takeaway: Metrics motivate.
- At the turn of the millennium, A. G. Lafley, P&G's CEO, lamented that fewer than 10 percent of all new product ideas came from outside the company. Seeking to amp up innovation and drive growth, Lafley announced the new goal: "I'm a big believer that we sometimes need help in solving problems. So I have set a goal to get half of our innovation from outside."⁵² A new measure—product ideas generated from outside the organization—became a key talking point. It also provided the motivation to build new organizational capabilities.

Specifically, with the goal articulated and the metric established, P&G leaders knew they needed to invest in a new vehicle to make it easy for outsiders to share their best ideas. Connect & Develop, an Internet-based crowdsourcing initiative, was put in place. Lafley also realized that to succeed, P&G needed to establish a trust-based collaborative routine: "We want to be known as the company that collaborates—inside and out—better than any other company in the world."⁵³ By 2010, P&G obtained over 42 percent of its new product ideas from suppliers, customers, and even competitors. Lafley explained,

But my point of view was, wherever they come from, you've got to get the people with the idea, the technology, and the ability to execute the idea in the marketplace together. For example, one product is the Swiffer—the technology in the duster that helps it pick up so much debris came from a competitor in Japan called Unicharm.⁵⁴

Your takeaway: Metrics guide capability development—they can make the improbable possible.

These two examples illustrate the power of measurement. Measurement communicates ideals and motivates behavior. Unfortunately, far too many companies have failed to see that measurement is an essential part of strategy. The reality is that measurement is essential to strategy execution. It also guides strategy development. Without aligned and effective measure, most of what we have talked about in the first five chapters of this book will fail to deliver results. With this in mind, let us tweak and then answer David's question from the opening story: "What are the characteristics of a best-in-class measurement system?" At a minimum, your measurement system should do the following:

- Connect your strategy and your daily efforts to what customers really value. It should help you understand exactly how they are evaluating your performance.
- Communicate expectations and motivate the right behavior—everywhere! You need to make sure your employees, your suppliers, and your customers know where they stand. Celebrate with them when they perform, correct them when they fail, and encourage them to learn always.
- Balance financial and cost measures with important, hard-to-quantify strategic measures that support longer-term strategic initiatives. Capability and relationships development requires supportive measurement.
- Support functional and operational excellence even as it promotes value co-creation across organizational boundaries—within the firm and across the supply chain.
- Help you understand and constantly improve/innovate value-added processes across functional and organizational boundaries.

The bottom line: If you don't measure well, you will never measure up!

Endnotes

1. Collins, J. 2002. *Good to Great*. New York: HarperCollins.
2. Ibid, 1
3. Gates, B. 2013. "My Plan to Fix the World's Biggest Problems." *The Wall Street Journal*, January 25.
4. Cacciola. 2012. "Cracking the Long-Jump Code." *The Wall Street Journal*, February 14.
5. Hayes, R., and Wheelwright, S. 1984. *Restoring Our Competitive Edge: Competing through Manufacturing*. New York: John Wiley and Sons.

6. Haas, E. 1987. "Breakthrough Manufacturing." *Harvard Business Review* 65(2):75–81.
7. Ford Motor Company. 1982. Commercial-Ford-Quality Is Job 1. Retrieved September 28, 2013, from <http://www.youtube.com/watch?v=UEB6l6YUx7E>
8. Kerr, S. 1975. "On the Folly of Rewarding A, while Hoping for B." *Academy of Management Journal* 18(4):769–783.
9. Fawcett, S., Andraski, J., Fawcett, A., and Magnan, G. 2009. "The Art of Supply Change Management." *Supply Chain Management Review* 13(8):18–25.
10. Fawcett, S., Magnan, G., and Williams, A. 2004. "Supply Chain Trust Is within Your Grasp." *Supply Chain Management Review* 8(2):20–26.
11. Bowersox, D., Calantone, R., Clinton, S., Closs, D., Cooper, M., Droge, C., Fawcett, S., Frankel, R., Frayer, D., Morash, E., Rinehart, L., and Schmitz, J. 1995. *World Class Logistics: The Challenge of Managing Continuous Change*. Oak Brook, IL: Council of Logistics Management.
12. Kelvin, W. 1889. *Electrical Units of Measurement* (Vol. 1). London, UK: Macmillan.
13. Fawcett, S., Smith, S., and Cooper, M. 1997. "Strategic Intent, Measurement Capability, and Operational Success: Making the Connection." *International Journal of Physical Distribution & Logistics Management* 27(7):410–421.
14. Fawcett, S., Ellram, L., and Ogden, J. 2007. *Supply Chain Management: From Vision to Implementation*. Upper Saddle River, NJ: Prentice Hall.
15. Kaplan, R. 1991. "New Systems for Measurement and Control." *The Engineering Economist* 36(3):201–218.
16. Rosen, W. 2012. *The Most Powerful Idea in the World*. Chicago, IL: University of Chicago Press.
17. Fine, C. 1998. *Clockspeed*. Reading, MA: Perseus Books.
18. Fawcett, S., Andraski, J., Fawcett, A., and Magnan, G. 2010. The Indispensable Supply Chain Leader. *Supply Chain Management Review* 14(5):22–29.
19. Bowersox, D., Closs, D., and Cooper, M. 2012. *Supply Chain Logistics Management*. New York: McGraw-Hill/Irwin.
20. Kaplan, R. 1984. "Yesterday's Accounting Undermines Production." *Harvard Business Review* 62:95–101; Eccles, R. 1991. "The Performance Measurement Manifesto." *Harvard Business Review* 69(1):131–137; Kaplan, R. S., and Norton, D. P. 1996. *The Balanced Scorecard: Translating Strategy into Action* Boston: Harvard Business School Press.

21. Skinner, W. 1986. "The Productivity Paradox." *Harvard Business Review* 64(4):55–59.
22. Ibid, 12
23. Waller, M., and Fawcett, S. 2012. "The Total Cost Concept of Logistics: One of Many Fundamental Logistics Concepts Begging for Answers." *Journal of Business Logistics* 33(1):1–3.
24. Ibid, 11, Bowersox et al.
25. Ibid, 14
26. Ibid, 14
27. Ellram, L. 1999. *The Role of Supply Management in Target Costing*. Tempe, AZ: Center for Advanced Purchasing Studies.
28. Fawcett, S., Magnan, G., and Ogden, J. 2007. *Achieving World-Class Supply Chain Collaboration: Managing the Transformation*. Tempe Arizona: Institute for Supply Management.
29. Kurt Salmon Associates, Inc. 1993. *Efficient Consumer Response: Enhancing Consumer Value in the Grocery Industry*. Washington, D.C.: Food Marketing Institute.
30. Ibid, 29
31. Dwyer, K. 2008. "Perfect Order Fulfillment: Getting It All Right." *Inbound Logistics*, April 2008. Retrieved September 27, 2013, from <http://www.inboundlogistics.com/cms/article/perfect-order-fulfillment-getting-it-all-right/>
32. Banker, S. 2010. "The Perfect Order Metric Is Not Sufficient." *Logistics Viewpoints*, January 28. Retrieved September 27, 2013, from <http://logisticsviewpoints.com/2010/01/28/the-perfect-order-metric-is-not-sufficient/>
33. Ng, S. 2013. "P&G, Big Companies Pinch Suppliers on Payments." *The Wall Street Journal*, April 16. Retrieved September 28, 2013, from <http://online.wsj.com/article/SB10001424127887324010704578418361635041842.html?KEYWORDS=serena+ng+big+companies>
34. Bowman, R. 2011. "The Perfect Order Isn't So Perfect." *SupplyChainBrain*, November 21. Retrieved September 28, 2013, from <http://www.supplychainbrain.com/content/blogs/think-tank/blog/article>
35. Ibid, 34
36. Ibid, 34
37. Kaplan, R., and Norton, D. 1992. "The Balanced Scorecard—Measures That Drive Performance." *Harvard Business Review* 70(1):71–79.

38. Kaplan, R., and Norton, D. 1993. "Putting the Balanced Scorecard to Work." *Harvard Business Review* 71(5):134–137.
39. Kaplan, R., and Norton, D. 2007. "Using the Balanced Scorecard as a Strategic Management System." *Harvard Business Review* 85(7/8):150–161.
40. Ibid, 37
41. Kaplan, R., and Norton, D. 2012. "The Balanced Scorecard's 20th Anniversary." *Harvard Business Publishing Newsletter* 14(3).
42. Ibid, 37, 39
43. Ibid, 39
44. Ibid, 38
45. Ibid, 9; Fawcett, S. E., Magnan, G. M., and McCarter, M. W. 2008. "A Three-Stage Implementation Model for Supply Chain Collaboration." *Journal of Business Logistics* 29(1):93–112.
46. Day, M., Fawcett, S. E., Fawcett, A. M., and Magnan, G. M. 2013. "Trust and Relational Embeddedness: Exploring a Paradox of Trust Pattern Development in Key Supplier Relationships." *Industrial Marketing Management* 42(2):152–165; Fawcett, S. E., Jones, S., and Fawcett, A. M. 2012. "Breakthrough Trust: The Catalyst to Collaborative Innovation." *Business Horizons* 55(2):163–178.
47. Ibid, 28
48. Coyle, J., Langley, C., Gibson, B., and Novack, R. 2011. *Supply Chain Management: A Logistics Perspective*. Florence, KY: South-Western College Publications.
49. Bowersox, D., Closs, D., and Cooper, M. 2012. *Supply Chain Logistics Management*. New York: McGraw-Hill/Irwin.
50. Ibid, 48
51. Lambert, D., and Stock, J. 1982. "Using Advanced Order Processing Systems to Improve Profitability." *Business Horizons* 32(3):23–29.
52. Florian, E., Smith, F., Barrett, C., Lafley, A., McNerney, J., and Collins, A. 2004. "Special: CEOs on Innovation." *Fortune*, March 8. Retrieved September 28, 2013, from http://money.cnn.com/magazines/fortune/fortune_archive/2004/03/08/363668/index.htm
53. Huston, L., and Sakkab, N. 2006. "Connect and Develop: Inside Procter & Gamble's New Model for Innovation." *Harvard Business Review* 84(3):58–66.
54. Ibid, 52

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