Appendix 33
p. 292, *The Missing Links* by Caroline Mondon (Industrial Press, 2016)
www.themissinglinks.info

What's Wrong With Supply Chain Metrics By Debra SMITH CPA and Chad SMITH

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A "Deep Truth" lies at the heart of how we perceive reality and how we behave in light of that perception. It is simply what we know. Yet challenging a Deep Truth is extremely difficult. Nobel Prize-winning physicist Niels Bohr once said the evidence to replace a Deep Truth must be so compelling, so obvious, that people must let go of their attachment to the status quo. In other words, once you see a deeper truth, you simply can't go back.

Today in industry we have a Deep Truth that permeates all our operational decision making and behavior. It's the assumption that return on investment (ROI) is maximized through and directly corresponds to the minimization of unit cost. Challenging this deep truth can be career limiting. After all, who would stand in front of the CEO and the board of directors and say, "We absolutely should not direct our people to minimize unit cost"?

What if Today's Deep Truth Is Totally, Completely, Unequivocally False?

Our argument is based on the following points. The whole idea that least unit product cost is an effective measure is an inappropriate use of an equation that both economics and physics reject. In 1934, legislation created a reporting requirement that has become the focus of accounting information and that replaced, almost by accident, the real definition and rules for relevant information for decision making and product costing. All of our information systems are hardcoded and/or configured to compile cost reporting and resource area measures from the wrong or misapplied rules and assumptions about how costs and revenue behave. Unit cost has become such a Deep Truth that it has eclipsed the entire discipline of relevant cost information derived according to management accounting principles. Even those who know what relevant costs are and how to calculate them operate inside a system that isn't capable of providing relevant information in an appropriate time frame in which to act. People no longer even question taking actions they know will lead to predictable and dire negative consequences that they must deal with later.

Bad Math

Unit cost equations aren't in and of themselves bad. They are simply linear, additive equations. The belief that unit cost calculations are actually meaningful for internal decision making is simply wrong. The current rules that generate the cost and reporting information industry uses to judge performance and make strategic and tactical decisions simply don't reconcile well with what's required to drive ROI in today's environment. One fundamental assumption underlies these rules: that ROI is maximized through and directly corresponds to the minimization of unit cost. This assumption is false. To grasp why this assumption is false requires an understanding of two key principles.

Principle 1: Flow Comes First

The recognition of manufacturing and supply chain as a process and system is essential to understanding how it should work. Understanding how it should work gives everyone the capability to define what the rules should be. Which rules need to stay? Which need to go? Which need to change? Which need to be added? The essence of manufacturing (and supply chains in general) is simply the flow of materials from suppliers, through plants, through distribution channels to customers, as well as the flow of information to all parties about what is planned and required, what is happening, what has happened, and what should happen next. An appreciation of this brings us to what is known as **The first law of manufacturing**—"All benefits will be directly related to the speed of flow of information and materials." (See George Plossl, *Orlicky's Material Requirements Planning*, 2nd edition, McGraw-Hill, New York, N.Y., 1994, p. 4.) A caveat here is that all information and materials must be relevant to the market expectation. We frequently observe organizations drowning in oceans of data with little relevant information and large stocks of irrelevant materials (i.e., too much of the wrong stuff).

"All benefits" will encompass service, revenue, inventories, expenses and cash flow improvements. A system that flows well produces consistent and reliable results. This has implications When revenue is maximized and protected, inventory is minimized, and additional and/or unnecessary ancillary expenses are eliminated, return on investment is favorable. Every for-profit company has a universal primary goal: maximize some form of return on shareholder equity. The best sustainable way to achieve that goal is to *promote and protect flow*. This is the very definition of an efficient manufacturing and distribution *system*. Conversely, one of the fastest ways to compromise ROI and system efficiency is to make decisions and reinforce behaviors that impede or block flow. We have to acknowledge that unit cost equations have nothing to do with measuring and/or predicting system flow.

Once everyone realizes the importance of flow, a few key principles emerge:

1. **Time is the ultimate constraint.**
2. **The system must be well-defined and understood.**
3. **Linkages or connections between points in the system must be smooth.**

Principle 2: Linear vs. Nonlinear Complex Systems

Understanding the need for flow isn't enough to understand the total implications for cost behavior. The supply chain systems of today are clearly nonlinear, dependent- event, complex systems. This simply means that today's supply chains don't look like chains anymore—they look and act like complex webs composed of a significant number of nodes of manufacturers, transportation companies, and distributors. Flow of information and materials loop and iterate in a nonlinear way through these larger numbers of nodes and connections. It's crucial to understand how the increased complexity makes today's supply chains much more susceptible to variability as opposed to supply chains and manufacturers in the 1950s and 1960s. Managing and limiting this variation is a huge challenge to flow and productivity.

The Rise of GAAP

As all accountants know, generally accepted accounting principles (GAAP) is the basis for standard reporting. A requirement for the fair presentation of financial statements to external users, GAAP is also a forensic snapshot of past performance. If companies use GAAP cost information to make planning, execution, and investment decisions today, they are *guaranteed* to use wrong or irrelevant information. Outcomes simply won't match expectations. These misalignments in expectations are reflected in the financial statement variances to plan and the failure of most improvement projects to deliver their promised savings to the bottom line.

The systematized drive to minimize costs leads to the opposite of its intention: lower service levels, depletion of cash, inflation of inventory, and the squandering of resource capacity and materials. Plant controllers and managers know this; they see it every day. They are constantly placed in conflict between meeting cost performance measures and protecting the other key performance indicators (KPIs). They know that if they do nothing but minimize and optimize cost performance, it directly jeopardizes the ROI of the whole system.

Getting Smarter—A Basic Blueprint for Change

Today's companies are drowning in an ocean of irrelevant data, irrelevant signals, and problematic conclusions.
Without challenging the Deep Truth of unit cost and linear rule assumptions, there's simply no land in sight. In order to move away from that Deep Truth, a Deeper Truth must be revealed. How will this happen? The blueprint for change is something we call "the smarter way," which has three simple steps.

Step 1: Install the Right Thoughtware in the Organization

Encourage and enable organizations to think systemically. In decades of combined experience with nearly 1,000 organizations, we've found that most people inside companies are prohibited from, discouraged from, and/or incapable of thinking about problems and solutions from a systemic point of view. To drive meaningful and rapid improvement, problems must be defined, and solutions must be developed from a systems-and-flow-based perspective with the New Normal in mind. Individuals and their organizations can be made capable, but organizations have huge obstacles standing in the way of re- moving the self-imposed variability of following inappropriate and outmoded rules.

Step 2: Become Demand Driven

The push-and-promote mode of operation must change, and the old rules based on cost-centric efficiency must go. Companies must embrace the new position-and-pull mode of operation and adopt new flow-centric efficiency rules that protect and maximize the flow of relevant materials and information. They will have to find a way to better align their resources and efforts with actual market and customer requirements in the more variable, volatile, and complex environment we have today.

Step 3: Deploy Flow Based Metrics

At this point you may be saying, "Wait a minute! If our organizations are full of the wrong rules, what are the right rules?" An appreciation for what the rules need to be requires Steps 1 and 2. The changes to sustain competitiveness in the New Normal require new rules, and measures always follow the rules. To embrace and deploy those metrics will necessitate the removal of some very ingrained, hardcoded assumptions, metrics, and rote behavior. Smart metrics are a function of understanding the fundamental principles of system flow, the causes of system variation, and the ability to think systemically. Unless people can think systemically and design operating models to fit the New Normal, these metrics will elude us.

For more see Demand Driven Performance *by Debra and Chad Smith (McGraw-Hill Professional, November 2013)*