PROCESS INNOVATION
CHANGING THE COST METRIC -- TOTAL COST OF OWNERSHIP
by Robert Porter Lynch

For centuries professional bookkeepers and accountants have poured over their cost analyses looking to cut costs and increase profits. Their approach is quite universal around the world. The traditional Profit and Loss Statement is composed of:

Revenues
- Cost of Goods Sold
  - Cost of Purchased Material
  - Cost of Value (Labor & Manufacturing) Added
  - Cost of Manufacturing Overhead
- = Equals Cost of Goods Sold
- SARD (or SAG)
  - Sales
  - Administrative
  - Research & Development
- = Operating Profit

This seemingly obvious system presumably accounts for everything. Engaging in simple cost-based accounting was perfectly acceptable in a world that existed when:

1. Your company wasn't connected to other companies except by "hands-off" supplier arrangements and transactional sales forces (pre-alliances, franchises)
2. Integration of complex systems (solutions, computer hardware & software, etc.) was not needed
3. Speed was not much of a factor in inventory, time to market, product innovation, etc.

However, while using simple accounting may have worked in the past, and may still work for balancing your check book or for paying your taxes, in reality, this type of accounting is blind to many factors that impact your competitive advantage in business.

When measuring innovation, especially process improvements such as cycle time, reduction in non-value added work, time to market, it is critical to use a measurement system that looks at things holistically, otherwise the metrics may be will highly distorted.

Remember the Yugo!

Let's illustrate the dichotomy between the simple cost-based accounting and a total-cost-of-ownership accounting with a simple example from the 1980's: The Yugo automobile was introduced into the US as a low cost car, and soon sales increased as customers were attracted to what they thought was the successor to the 1960's Volkswagen.

The Yugo began to bloom. Yet wasn't long before customer complaints began flowing in torrents. Brakes failed, engines sputtered, and transmissions died. Parts were scarce. Cars spent more time on the service lifts than on the road. Repair bills skyrocketed. Yugo sales

plummeted as its reputation turned to mud. Public floggings appeared in the press. Resale value was nearly zero. Junkyards became littered with nearly new Yugos.

What occurred was a perfect example of Total Cost of Ownership (TCO, and sometimes referred to as Total Life Cycle Cost, TLCC).

When the buyer added the cost of acquisition, the cost of repairs, the losses upon resale, and one's time out of work or play during repairs, it soon became evident that the Yugo was far more expensive to own than a Mercedes! Yet the cost of ***acquisition*** was quite low.

Unfortunately, this lesson has not been learned by many in either the automobile industry nor in other industries. Today, General Motors' warranty costs exceed their profits. Ford and Firestone's recall costs on failed tires will ruin Ford's annual profits and may very well be nails in Firestone's coffin.

A Lesson to be Learned

Recently I gave a speech at the National Association of Procurement Professionals, a very prestigious group composed of the best purchasing agents of the finest American corporations. Their membership reads like a Who's-Who in procurement. As I commenced my speech, I asked several questions of the audience of about 200 people.

First: *"How many of you understand the concept of Total Cost of Ownership?"* Everyone in the audience enthusiastically raised their hands in affirmation.

Second: *"How many of you believe Total Cost of Ownership is a very valuable tool in procurement decisions?"* Nearly everyone in the audience enthusiastically raised their hands in affirmation.

Third*: How many of you use TCO as a regular regimen in your buying decisions?"* This time only 2 people of the 200 raised their hands.

-Them new shoes you got there?
-Yep.
-How much they cost?
-Dunno, ain't finished wearin' 'em yet.

Why if the issue is so important, do only 1% of the companies have the knowledge, discipline, and rigor to use it on a regular basis? While I don't have statistical evidence to give a rationale for such behavior with any certainty, an informal poll of professionals in the field indicates that usage of TCO is limited because of several reasons:

1. It's *harder to use* because it is more complicated than simple component-based cost accounting
2. There's *no software available* to provide ease of use

3. Many *financial managers don't use it*, either because they are not familiar with it, or because Wall Street doesn't use it, or the Financial Accounting Standards Board (FASB) doesn't endorse it. Talking TCO to financial officers is often like talking to a brick wall.

Regardless of the reasons, Total Cost of Ownership is a compelling process for creating competitive advantage, as the following case study will indicate.

Scott Paper Case Study

Prior to being acquired by Kimberly Clark several years ago, Scott Paper was one of the world's largest producers of paper, with 20 plants in nearly twenty countries.

The paper making process requires that wet pulp slurry be deposited uniformly on a continuously moving fabric belt. The fabric belt (known as "fabric" in the industry) is approximately 12 feet wide and the belt is about 60 feet in circumference. Fabrics are woven to enable the water in the pulp to be drawn out through the fabric, so that when the pulp leaves the end of the belt, it is in a semi-solid, rather gelatinous form. Once leaving the fabric belt, the pulp goes onto other machines, which further dry and then press the pulp into paper. Fabrics cost approximately $25,000 each.

For years, each plant's procurement team had negotiated with fabric vendors. Knowing that the sales price was about $25,000 (simple "component cost" to Scott), the procurement directors were always rewarded for driving costs down. Every buyer was trained in being a tough negotiator; they all knew that there was 5-10% that should be driven out of the sales price. Each year the procurement group aimed to push down the prices, thereby driving down the profit for the fabric manufacturers. At the end of the year, rewards were allocated to those buyers who got the most favorable pricing. And for years, Scott Paper's procurement department patted itself on the back for doing a wonderful job at keeping both the supplier's profits and Scott's prices low.

However, Scott Paper's profitability was among the lowest in the industry, making it ripe as a takeover target. But the purchasing managers were all confident that they were doing their part to get costs down to the lowest level possible.

In 1994, a new VP of Procurement, Ted Ramstad, arrived on scene and began challenging the traditional thinking. In an effort to understand the real cost of the fabric, began conducting a reevaluation of cost. Internal data was gathered:

- While replacing fabrics, the paper machine must be shut down, at a cost of nearly $100,000/day to the paper company (because paper manufacturing requires a continuous process, and the machine is considered efficient only when it runs 24 hours a day)
- It takes about 8 hours to put fabric on a paper machine
- Fabrics lasted an average of 40 days
- Most fabrics broke on the machines

- When a fabric broke, it normally had less than 10% wear
- Seventeen companies supplied fabrics to Scott around the world. Each plant manager had a "favorite" supplier, but there was no compelling reason for using one supplier over another. Procurement assumed it could use the large number of suppliers in a competitive manner to keep the costs low.
- Cost of Goods Sold (COGS) for most suppliers was about 35% and R&D was 3-5%
- Most plants had 4-6 fabrics in inventory

While most of the buyers were unconcerned about this information, Ramstad and his team, applying TCO thinking, began probing and asking more questions:

- How can we lengthen the time a fabric lasts on a machine?
- How long should a fabric last?
- Are we getting the *best* fabrics from our suppliers, or just the *cheapest?*
- What suppliers are providing the research and development to give us better performance from our fabrics?
- Would few suppliers give us volume-purchasing power?
- Could we build win-win incentives to get more value from our suppliers and their fabrics?
- Where is there significant "non-value added" in the system?
- What benchmarks should we be using to be "best in class?"
- If the "absolute component cost" of a fabric is $25,000, what is the "Total Cost of Ownership," and how does this compare as a "relative competitive advantage (or disadvantage)?"

Armed with a new focus and an energetic spirit, Ramstad's team began a world-wide search for answers. Fabric suppliers were interviewed, and information was gathered regarding competitors, indicating:

- The industry average fabric life span was 60 days
- The industry benchmark fabric life span for one paper producer was 470 days
- Only three suppliers were interested in helping Scott increase fabric longevity
- None of the suppliers believed their fabrics were at fault for Scott's low life span; all blamed either the operators or the machinery manufacturers.

A Crucial Juncture

Now came the real test. In a "Simple Accounting, Component-Cost" world, fabrics clearly cost $25,000 apiece. But Ramstad stuck his neck way out and maintained that this was only true in a narrow, "absolute" sense. In a broader, "relative advantage" perspective, the formulation of cost looked radically different. Here's what Ramstad's TCO calculations looked like:

- **Fabric Cost:** If the highest standard benchmark life is 470 days and Scott's standard is only 40 days, the relative cost of the fabrics Scott was purchasing is really 470/40, or 11.75 times the highest benchmarked competitor.

  Therefore, 11.75 x 25,000 unit purchase cost = $293,750.

  (To understand Relative Competitive Advantage, think of relative motion. Consider the analogy of driving down a highway at 40 miles per hour in the right hand lane. The average competitors are in the middle lane, passing you at 60 mph. But the Best-in Class competitor flies by in the left lane at 470 mph. This is the Relative Competitive Advantage view of costing)

- **Down-Time Cost**: Add an additional 8-hour portion of $100,000 per day to reflect the downtime for changing the fabric. (8hrs/24hrs x $100,000 = $33,000) Relative to the best in class competitor, Scott has to make 11.75 changes to the best-in-class competitor's one change.

  Additional relative cost to Scott is 11.75 X $33,000 = $387,750.

- **Burdened Labor Costs:** It takes two men 8 hours to change a fabric. At a burdened labor rate of $45/hour, the labor costs are 2 X $45 X8 = $720. Relative to the best in class competitor, Scott has to make 11.75 changes to the best-in-class competitor's one change.

  Additional relative cost to Scott is 11.75 X 720 = $8,460.

- **Total Cost of Ownership:** Adding these figures, the results are overwhelming. Relative to the best in class, Scott's "relative disadvantaged cost" is $689,969! A far cry from what was thought by procurement to be a $25,000 belt.

The procurement group had naively engaged in myopic thinking; they were playing the game "too small." Squeezing the supplier for a 5-10% discount made no sense when the stakes were really about how to gain an advantage of nearly $700,000. This is a "strategic systems" view of cost, (versus a component cost view).

Ramstad was relentless, not stopping here. He saw the relative disadvantage to be multiplied by the number of plants globally. Therefore, by multiplying the "relative single plant competitive disadvantaged cost" by the 20 plants throughout the world, there was nearly $14 million of advantage to be gained on this single line item alone.

(Note: the standard accounting systems at Scott could not measure this factor, and therefore it was "invisible" to the Chief Financial Officer, who steadfastly called this accounting hocus-pocus.)

Undaunted, Ramstad pressed on. He advocated that the problem was even worse, since much of this inventory was actually scrapped due to product redesign before the inventory was utilized. What's more, he took the position that if Scott bothered to add the time-value of money for financing the inventory of belts (because of frequent breakage several extra belts had to be kept on hand) that the extra inventory was tying up capital. Eventually Ramstad was able to eliminate $20million in inventory.

And it doesn't stop here. By selecting the best-in-class suppliers, thereby reducing the number of suppliers to two or three globally, and negotiating long term contracts, Ramstad was able to convince suppliers that they no longer needed to make sales calls on Scott's procurement officers. Because Sales Costs were 35% of the component price, he persuaded the remaining suppliers to lower their prices 25%, increase their R&D budgets to focus on continuous innovation that would provide better products, provide technical support, and work with the machinery companies who manufactured the equipment to improve sensing and tuning devices.

Because of the higher volumes for the remaining two suppliers, the supplier's actual profits were substantially higher under the new model than before. And by not handling a continuous stream of bidding and purchasing, which previously accounted for 3-5% of

the cost of ownership, Ramstad was able to reduce the procurement force significantly as well.

Comparing Traditional Procurement with TCO

Compare Ramstad's approach to the way most procurement professionals are taught: *beat the supplier down on price, and when the supplier screams, you are only beginning to get what you want.*

In the Scott Paper example, there was nearly $14 million of potential saving lying fallow in this one line item, totally unrecognizable by traditional bookkeeping measures. The $14 million was ready to fall to the bottom line as profits. The traditionalists had been placidly cruising in self-congratulatory low gear in the right hand lane, drinking their own bath water, with their blinders on, as competitors flew by them in the left hand lane driving a fast new paradigm.

But to get the money, you had to use a totally different measurement system. Remember: "*If you can't measure it, you can't see it, change it, nor manage it."*

How does TCO compare with Traditional/Simple Component Based Accounting? In the traditional system, price is price, cost is cost, and the relationship between buyer and seller is "transactional," in that one provides cash in exchange for a product and/or service.

TCO is more analytical. Calculations are done to determine costs related to each of these factors:

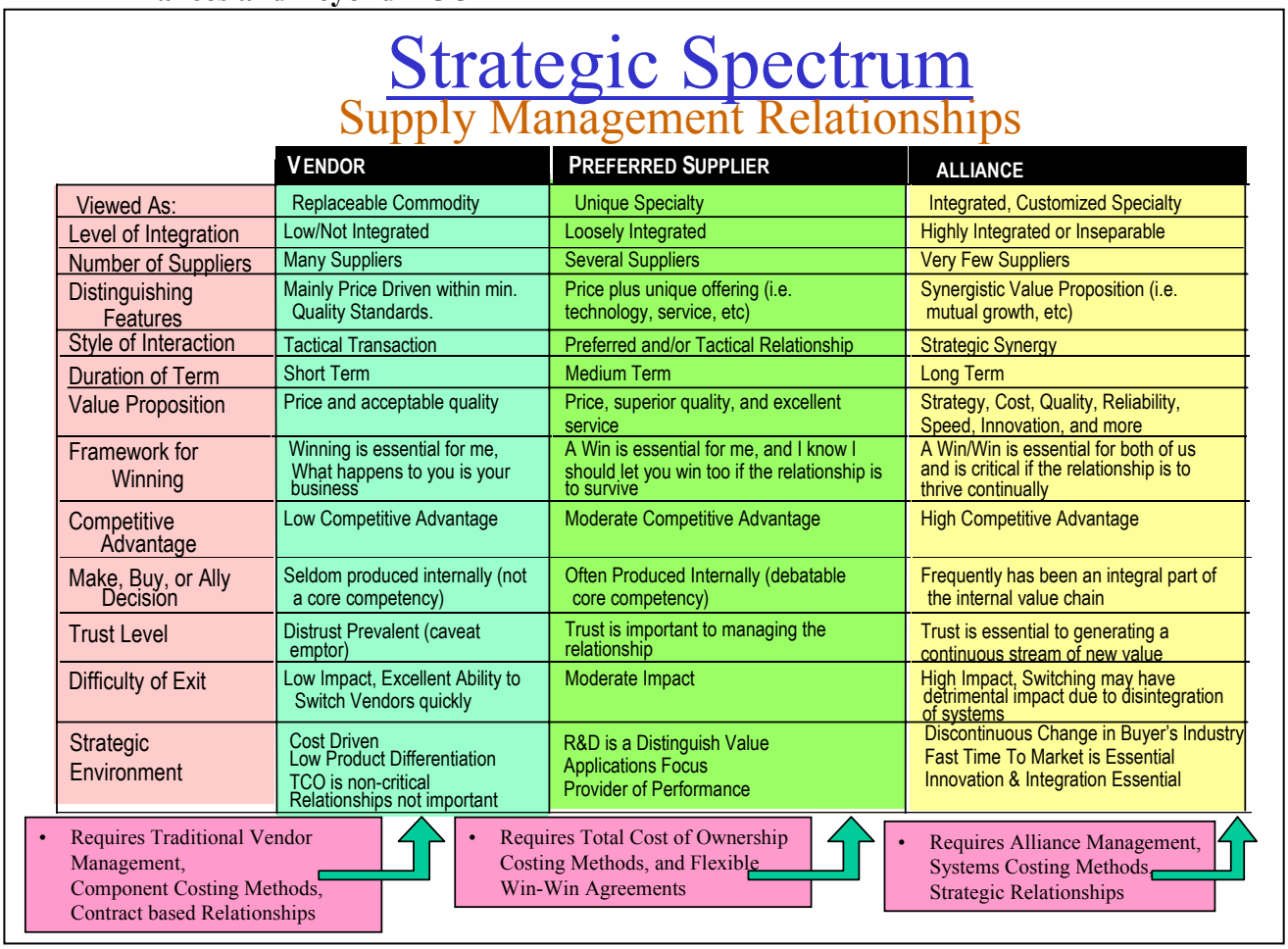
- Requirements Definition
- Source Identification
- Acquisition
- Storage & Inventory
- Operations, Installation, Maintenance
- Breakdown, Scrap & Waste
- Warranty & Service
- Retirement & Disposal
- Future Strategic Positioning

In manufacturing environments, typically Acquisition Costs represent only 25-35% of the TCO. (if this seems strange, you are still "wired" into the old paradigm. Remember Scott Paper and the Yugo.)

TCO requires rigor – hard work, data collection, insightful thinking, and intuition. However, in complex systems, where the suppliers and providers must be carefully linked to provide a totally integrated set of services and products, TCO has major competitive advantages.

However, TCO is just the first step in entering a new world of competitive advantage. It opens new avenues to far more possibilities, once one is ready to change the measures and relationships between buyer and seller, or between manufacturer and distributor. The following chart helps illustrate the difference between Vendor Relationships, Preferred Suppliers, and Alliance Relationships that will go beyond TCO.

Alliances and Beyond TCO



TCO is just the beginning of the Revolution in Supplier Relationships. When one shifts the paradigm further to a strategic alliance between the two companies, both parties are enabled to enter a strategic world where Total Value Analysis is considered. In a Total Value Analysis, TCO is just a part of the perspective.

Honda USA uses a Total Value Analysis approach with its suppliers. It chooses its suppliers because they are willing to take costs out of the entire system, not just by lowering component costs. Honda and their suppliers, together in an alliance, look to improve quality, accelerate design and delivery cycle times, make continuous improvements, improve quality, and make servicing more convenient. All these factors have a number of powerful impacts on the entire value chain, from supplier to manufacturer to dealer to customer. This approach lowers warranty costs, improves customer satisfaction and customer retention, which lowers sales costs, all of which improve profits.

According to Dave Nelson, former Senior Vice President of Procurement of Honda and now of John Deere, who established the system: *"When we receive a suggestion from our*

suppliers, we split the savings 50/50. However, if a supplier is not making their profit numbers, we give them a larger percentage of the savings, sometimes up to 100%. It helps them out. We want strong partners, not weak ones. And when things are tough, we are like a family, we all tighten our belts, but we all stay profitable." Nelson states that TCO is "absolutely essential" as a measurement system in supplier alliances.

While such an approach may seem overly altruistic compared to the traditional approach to beating up supplier, Honda views their relationship with suppliers quite differently. Honda wants strong suppliers that are willing to make long-term commitments and investments to make Honda the best in terms of innovation, reliability, profitability, and long-term sustainability in the marketplace.

In Total Value Analysis a number of factors are considered in addition to TCO, each of which has an impact on competitive advantage, such as:

- Systems Integration
- Recruitment of Best People
- Flexibility/Adaptability
- Cross Functionality
- Elimination of Non-Value Added Work
- Continuous Improvements
- Continuous Cost Reductions
- Reduction of Labor Costs
- Improvement of Competitive Advantage
- Depth & Breadth of Experience
- Commitment to Best Practices
- Quality Upgrading
- Customer Service
- Teamwork
- Training
- Investment in R&D
- Reliability
- Integrity & Trust
- User Friendliness
- Innovation
- Information Sharing
- Speed Increases
- Customer Satisfaction

Seven Solution Sets

Making the shift from a component-based, transactional relationship to a systems-based strategic relationship takes more than words to accomplish. There are seven key processes – or "solution sets" designed to accomplish a Total Value Analysis:

1) Continuous Innovation
- Focus on Ultimate Customer's & Consumer's Strategic Needs
- Continuous Innovation and Co-Creation

2) Cycle Time Acceleration
- Integration & Co-Location
- Real Time Information
- Cycle Time Analysis

3) Value Chain Reengineering
- Value Mapping & Networking
- Interface Improvement

4) Systems Costing
- Total Cost of Ownership
- Target Costing
- Continuous Cost Improvement

5) Build Strategic Alliance Relationships
- Strategic Alignment
- Utilizing Best Practices/Processes in Alliance Architecture
- Shared Risks & Rewards
- Flexible Agreements
- Strategic Supplier Portfolio Management

6) Eliminate All Non-Value Added Work
- Duplication & Needless Transaction Elimination
- Frictional Cost Analysis

7) Performance Measuring
- Hi Performance Standards
- Best Practice Benchmarking
- Realignment of Rewards

The new world is yours to create, and your collective futures all depend upon it.