

Operation Excellence

May 1, 2012



Throughput (Thruput) Improvement versus Cost Reduction

About a year ago, I accompanied a team to make an ERP proposal for a small to medium sized manufacturer in the metal stamping business. (What was ironic about the visit was that several years before I had interviewed with that company for the President's position – I had to agree, the fellow that got the job was a better fit. During our meeting, the President jokingly told me... "You are the lucky one... you didn't get the job!")

However, during our discussions with that management team, we spent a great deal of time on a couple of topics: scheduling and what would be better metrics for the company. The President asked me, "what is the most important metric of any business – what measurement do we want to focus on making better?" Without hesitation, I replied "Thruput!" (My spelling of "Thruput" is much "greener").

I was surprised that the company's team had never heard the term before (there has been a lot of business literature devoted to "Throughput" during the last 2 decades – if you do a Google search on "Throughput Accounting", you will get >3,300,000 hits). Recently I have had two clients that are smaller (but potentially very profitable) wrestle with the decisions on their product offerings – what should be their product mix? Again "Thruput" holds the key to the answer.

What is "Throughput/Thruput"? Quite simply it is the incremental cash that is generated by selling a product or service. In a mathematical sense it is:

Selling Price
-minus Raw material (and any other totally "variable" costs)
= Thruput

The power of this method is that there is absolutely NO allocation that clouds or confuses the analysis. If you sell 5 different products:

	Product					
Thruput	A	B	C	D	E	Total
Sales/Selling Price	\$100	\$200	\$75	\$175	\$500	\$1,050
-Raw material and other totally variable costs	50	120	40	110	275	595
Thruput	\$50	\$80	\$35	\$65	\$225	\$455

$$\text{Total Thruput} = \text{Thruput (A)} + \text{Thruput (B)} + \dots + \text{Thruput (E)}$$

Now that was simple... what is the big deal? Two concepts really make this an eye opener:

1. Profit is simply Total Thruput minus total Operating Expense.
2. Profit is maximized by prioritizing a product's Thruput (i) per unit of Constraint Resource.

Profit is Total Thruput minus total Operating Expense. Cost accounting has been labeled "Public Enemy Number One!" Remember a few years back when ABC cost analysis was going to be the holy grail for cost analysis? I'll bet more than \$1B was spent by US companies implementing ABC accounting and I can't name a single firm that is still using it yet today! You can allocate costs until the end of time, but even in a relatively simple system, you cannot get an accurate TOTAL cost of a product. You CAN get an accurate INCREMENTAL cost of a product by considering Thruput. A system has a cost or Operating Expense (OE)... efforts to allocate OE to specific products are a waste. Efforts to allocate costs do not improve your ability to consider how to generate CASH. Thruput allows you to figure out where you can generate CASH.

[Remember the priority... "If you have cash, nothing matters.... If you don't have cash, nothing else matters!]

$$\text{Total Thruput minus Total Operating Expense} = \text{Profit.}$$

What is not true is the following:

Sales minus total Product Costs = Profit. WRONG! Allocations are always flawed.

[This newsletter is limited... I would suggest that there are two very good books on this subject... Throughput Accounting by Thomas Corbett and The Measurement Nightmare: How the Theory of Constraints can Resolve Conflicting Strategies, Policies and Measures, by Debra Smith]

Profit is maximized by prioritizing a product's Thruput (i) per unit of Constraint Resource. The second item referenced above really brings it home. Consider the following actual example of a company that I visited last week:

	Product					
Thruput vs Constraint	A	B	C	D	E	F
Selling Price per unit	\$1,100	\$650	\$1,200	\$725	\$4,200	\$450
-Raw material and other totally variable costs per unit	50	50	750	225	2800	50
Thruput per unit	\$1,050	\$600	\$450	\$500	\$1,400	\$400
% T/SP	95%	92%	38%	69%	33%	89%

If you are to look at the 6 products in this analysis... you could conclude that the most "profitable" products are A & B, followed by F, D, C and lastly E.

However, if you are to consider \$ Thruput generated per unit of the system's constraint... it is a very different situation:

	Product					
Thruput vs Constraint	A	B	C	D	E	F
Selling Price per unit	\$1,100	\$650	\$1,200	\$725	\$4,200	\$450
-Raw material and other totally variable costs per unit	50	50	750	225	2800	50
Thruput per unit	\$1,050	\$600	\$450	\$500	\$1,400	\$400
% T/SP	95%	92%	38%	69%	33%	89%
Units of Constraint required per unit	24	24	2	3	6	6
\$ Thruput per Constraint Unit	\$43.75	\$25.00	\$225.00	\$166.67	\$233.33	\$66.67
Product "Priority"	5	6	2	3	1	4

In this company there is a capacity on the constraint of approximately 140 units (hours) per month. The total Operating Expense for the company is about \$5000 per month. If the company were to spend all of the constraints time on Product B (with a 92% "margin")... they could only sell about 6 units per month (140 hours/ 24 hours per unit of B= 5.83 units per month)

By producing nothing but product B, they would LOSE \$1,400 per month!

$$6 \text{ units of B} * \$600 \text{ T per unit of B} - \$5,000 \text{ Operating Expense} = -\$1,400$$

If they were to spend all of their time on producing and selling product E (the product with the lowest margin – only 33%), it becomes a much different situation... they have the capacity for 23 units per month of product E.

By producing nothing but product E, they would make a profit of \$27,200 per month!

$$23 \text{ units of E} * \$1,400 \text{ T per unit of E} - \$5,000 \text{ Operating Expense} = \$27,200 \text{ PROFIT!}$$

Realistically, the market may be the constraint for product E... they are not sure that they can sell 23 units per month... but the dilemma is that they currently have a backlog of 12 units of product B... (and that is equal to 2 months of production --- they will not be able to generate enough cash by selling 12 units of product B to cover their operating expenses for the next two months -- YIKES!)

Throughput/Thruput... if you are not using this accounting method you can be creating a real dilemma for you and your company. It is **the most important measurement and decision making tool.**

The above numbers are real... and I believe show a real need for companies to incorporate Theory of Constraints, AND Lean, AND Six Sigma into their improvement efforts. In this situation, TOC quantified and identified the focus points... leverage points if you will. LEAN and Six Sigma tools can then be incorporated to apply improvement efforts on these focus points.

Can you manage costs?... yes... but there is a limit... can you increase Thruput?... probably by a significant multiple versus what can be achieved through cost reduction. Don't be the foolish Corporate Treasurer that enthusiastically reported, "Costs have come down quicker than our revenue has decreased" (Rohr Corporation – 1996)

There was an article referenced on LinkedIn this past week by H. William Dettmer... "Systems Thinking and The Cynefin Framework". It is not an easy read, but I found it to be a fascinating piece on bringing change to systems/organizations with various states of complexity. In that article, Bill quotes W. Edwards Deming:

"Profound knowledge must come from outside the system – and it must be invited in." Unfortunately, this doesn't happen as often as it should.

If you are intrigued or interested in incorporating Thruput into your metrics and decision making tools, we are most willing to help. Please contact us and "invite us in".

All the best!

Jim

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