



*The continuous pursuit of excellence*

## Throughput Accounting Fundamentals

### *Financial reporting for operational decision-making*

August 2016

#### **General:**

Throughput Accounting is a simple, yet extraordinary, way to look at a company's finances. It focuses on revenue generation, not product costing. As such, it focuses on the positive potential of a company (the generation of wealth) and not on the reduction of costs. That is not to say that good stewardship of resources is ignored. It's just that the focus is on generating revenue, not cutting costs.

Another power of Throughput Accounting is its focus on system effectiveness as opposed to local efficiencies. This aspect alone is sufficient to deliver powerful measuring tools into the hands of the business manager. Throughput Accounting provides financial tools that allow operational managers to make excellent, and quick, business decisions.

An important aspect of Throughput Accounting is that the metrics are derived using the same data as in the existing cost accounting system. This means that there is no investment in additional accounting software or resources. No additional entries have to be made. The numbers are simply calculated in a different way and presented in a different report format.

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#### **Basic Metrics:**

Throughput Accounting recognizes three fundamental metrics. These are:

- Throughput
- Inventory
- Operating Expense

**Throughput** (expressed as \$T) is the rate at which a company earns money through sales. It is a measure of value added. A company buys raw materials, transforms them into finished products and sells them to their customers. Throughput is the measure of value added due to the transformation of raw materials into finished products. The formula for Throughput calculation is:

$$\text{Throughput} = \text{Sales} - \text{truly variable expenses}$$

Truly variable expenses (expressed as tve) are those outflows of cash associated directly with a specific product or job. They are "variable" in that changes in tve are directly associated with changes in sales. Typical variable expenses are:

- Raw materials
- Sales commissions
- Transportation costs
- Outsourcing

If all four were active, the formula for \$T would be:

$$\text{Throughput} = \text{Sales} - (\text{raw materials} + \text{commissions} + \text{freight} + \text{outsourcing})$$

The continuing objective should be that Throughput is always trending up.

**Inventory** (expressed as \$I) reflects the money required to purchase the things the company intends to turn into \$T. Essentially, this includes the investment in all raw materials, work-in-process and finished goods inventories. The value of \$I is calculated at the price paid to the vendor for the materials. Generally, the value of materials does not increase as they move through the business system; they do not "accrue value" in the Throughput Accounting approach.

There is a circumstance in which Inventory is valued differently. After WIP passes through the system's critically constrained resource, it is valued at the price of the sale. If the finished product, having passed through the Control Point, is damaged such that it is not accepted by the customer, the business has lost more than the raw material value; it has lost the value of the sale. Capacity of the critically constrained resource has been consumed, and, is lost forever. In order to satisfy this customer, the business must essentially start from scratch and manufacture the job again with no additional income. As well, time at the critical Control Point must be consumed again to complete the order. This is very bad and must be vigorously avoided.

The continuing objective is to work in a "lowest possible" Inventory environment.

**Operating Expense** (expressed as \$OE) reflects the money the business spends in turning Inventory into Throughput. This includes all outflows of cash that are not associated with a particular product or job; essentially all expenses not classified as tve. Included are all wages, salaries, occupancy costs and all other overhead associated with operating the business.

The company should strive to be good stewards of its resources. It should not carry an operating expense that is not clearly necessary. However, it is important to maintain a predetermined level of *Protective Capacity* in order to be able to quickly respond to the inevitable and unpredictable fluctuations of daily business operations. Protective Capacity is not excess capacity; it is required capacity to maintain a smooth operating system, which is always more productive than a "balanced capacity" approach. As a result, Protective Capacity helps to *make* money. The recognition that there must be a plan for absorbing the effects of the inevitable attacks by "Murphy" is a hallmark of the

Synchronous Flow business process and it supported by the metrics provided through Throughput Accounting.

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**Throughput Accounting Financial Statements** result in exactly the same bottom line net profit as do the traditional cost accounting financial statements. The difference is in how Throughput Accounting handles the revenue and expense elements of the business. Costs associated directly with a specific sale (materials, outsourcing, freight and commissions) are deducted from the sales price to reflect the value added for that sale, called Throughput. All other costs (all those not associated with a particular sale, but are regular costs of the business including all labor and overhead) are listed as Operating Expense. Please note that there is no attempt to determine the cost of making a single product (product cost) or to calculate profits on a single order. There is no attempt to allocate any expenses in any way.

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### **Performance Measures:**

The basic Throughput Accounting measures of T, I and OE are combined in various ways to provide the fundamental financial performance measures. Some of the more notable are:

**Net Profit:** Net Profit is calculated as Throughput minus Operating Expense:

$$NP = T - OE$$

Once the business system has covered all fixed operating expenses (OE), any additional \$T flows directly to the bottom line.

**Return on Sales:** ROS is a contrasting measure of the effectiveness of the bottom line to top line metrics of the company. It is the ratio of net profit to sales and is calculated as:

$$ROS = NP \div Sales$$

**Productivity:** Productivity is a simple and powerful measure of business effectiveness. It reflects the relationship between \$T (the measure of value added) and \$OE (the money the company spends to create the \$T). This is the basic effectiveness ratio (output over input). Since it does not reveal any sensitive information, it can be shared with company employees as the “score” of overall system performance on a daily basis. As such, it can be used as a valuable motivational tool for the production employees. It also can be used as the basis for a performance incentive system that can share the fruits of improved performance with the people who worked to create it. Productivity is calculated as:

$$Pr = T \div OE$$

If Pr is equal to one, the company is at break even. Typically, a Pr score of 1.25 will produce a ROS of about 10%.

**Octane:** Octane is a measure of revenue generated per job relative to the time it consumes at the business system Control Point. This accomplishes a focus on the resource in the system where revenue is generated. The clearly communicated focus is that this resource should operate as effectively as possible. This means that this resource should be optimized (well engineered and finitely scheduled) and that all other resources should subordinate all their activities to assure the most effective operation of the Control Point.

Ideally, the Control Point is where revenue is generated. This is “where the cash register rings.” Revenue generated per unit of time at this function (called Octane), is a clear indication of effectiveness at this critical resource. Octane can provide value comparisons between products, market segments and Customers. As an approach toward continuous improvement, it allows a focus on the prioritized issues that affect the critical Control Point of the business.

Octane is calculated as:

$$\text{Octane} = T \div Cu$$

\$T is the measure of value added for that job and Cu is the measure of time at the Control Point that is consumed in completing that job. Travel time to the job is considered “setup” time and is included in the calculation of Cu.

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The following is a typical example of a Throughput Accounting financial statement:

|  |           |                 |
|--|-----------|-----------------|
| Sales  | \$300,000 |                 |
| Costs  |           |                 |
| Raw materials  | \$100,000 |                 |
| Outsourcing  | \$30,000  |                 |
| Commissions  | \$5,000   |                 |
| Total costs  | \$135,000 |                 |
| Throughput (\$T)   | \$165,000 | (sales – costs) |
| Inventory (\$I)  |           |                 |
| Raw material   | \$28,000  |                 |
| Work in Process  | \$3,500   |                 |
| Finished goods   | 0         |                 |
| Total \$I  | \$31,500  |                 |
| Operating Expense (\$OE)<br>(all labor and overhead)           | \$135,000 |                 |
| Net Profit (NP)  | \$30,000  | (\$T - \$OE)    |
| Productivity (Pr)  | 1.22      | (\$T ÷ \$OE)    |
| Return on Sales (ROS)  | 10%       | (NP ÷ sales)    |
| Total Control Point time (Cu)                                  | 275 hours |                 |
| (Set-up and processing time at the Control Point for all jobs) |           |                 |
| Average system Octane (T/Cu)                                   | \$600     | (\$T ÷ 275)     |



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