believe that the role of the accountant in business is to provide timely and actionable management information to managers for the purposes of reviewing performance, planning improvement activity and making business decisions.

Unfortunately, in many businesses, we accountants do not meet this requirement very well! The problem, I believe, is our obsession with unit costs or product costs. This obsession is easy to understand; in life, we buy stuff in units and we sell things the same way. Our minds have become trained to the idea of units; and because we pay the same price per unit for one carton of milk as for five, it is easy to think that it costs the same to sell one carton as it does five.

Of course it does not, and in fact cost and price have nothing to do with each other at all. Price is set by the market: by the features and benefits your product or service offers compared to the competition; and by how well you manage product and corporate image. Cost is a function of the process through which you produce the product or service. Price is based on units because it is easy to understand and easy to make transactions that way. That does not mean that cost has to be on the same basis.
It is the total process costs we should be working with, not some notional unit cost based on a load of assumptions that few people know in detail, still less understand.

Which is the most profitable product?

We do not need to work out a standard product cost here. Our conventional unit-cost thinking tells us that women’s shirts will be more profitable: they require less total machine time, which means lower absorption of overheads and thus a higher unit profit. This suggests that we should meet the full market demand for women’s shirts and fill any spare capacity with men’s shirts.

Unfortunately this is the wrong answer.

Let us say we have 2,400 minutes of available time each week on the cutting machine and 2,400 minutes on the sewing machine. We cannot meet the market demand for 120 shirts of both types of shirt per week because the capacity of the sewing machines is limited to 2,400 minutes per week. This is not considered in the standard cost calculation, and if we follow conventional cost calculation based on machine or labour minutes, we get the profit statement shown in Table 2.

We have made a weekly loss.

Notice I have used the term ‘throughput’ in the table. This is a term that derives from Eli Goldratt’s book: The Goal and his work on Theory of Constraints. Throughput accounting seeks to align costs with the flow through a value stream or business process in order to drive improvement.

While traditional accounting practices developed in the era of mass production and are based on the concept of economies of scale, throughput accounting is rooted in the world of multiple products, mass customisation, and complex mix decisions. Throughput accounting is based on the concept of economies of flow: that we increase profitability and reduce cost by increasing the rate of flow through the whole process or value stream.

Throughput accounting postulates that every business process has at least one constraint, be it equipment, skill or procedure/policy. It rejects the philosophy of traditional cost accounting that profitability is maximised when machine and labour utilisation are maximised, but, in contrast, argues that we improve the profitability of a process only by improving the flow through the whole process, to customer demand. Thus, the Accounting Dictionary defines throughput accounting as: a management accounting system that seeks to maximise the return on bottleneck activity.

At this point a few throughput accounting definitions are in order:

- Throughput is defined as net sales less total variable cost: total variable cost is usually taken as material cost only, though there may be other truly variable costs in a particular process.
In our shirt-making example above, total throughput is €10,200 with the proposed product mix. If we assume an investment of €500,000 in the process, then we have a negative weekly throughput return on investment - net profit = investment. Throughput productivity for the week is 97% - 10,200 ÷ 10500; and throughput investment turns are 0.0204 (10,200 ÷ 500,000).

As we have discussed, throughput accounting seeks to maximise the return on the process constraint, so we need to consider the capacity of our resources. In the shirt-making example we are limited to 2,400 minutes per week on both our cutting machines and our sewing machines, and it is the sewing machines that are the constrained resource.

Throughput accounting says we should analyse the process’s throughput according to the constrained resource – see Table 3.

Although it is women’s shirts that have a higher throughput per unit, it is the men’s shirts that maximise the throughput per minute of available sewing machine time – the constrained resource. Let us look at the profit statement if we now meet the full market demand for men’s shirts and fill any spare capacity with women’s shirts – see Table 4.

Total net profit is increased. Let us also look at the throughput accounting ratios:

- **Weekly throughput return on investment** is 0.06%
- **Throughput productivity** for the week is 103% – an improvement
- **Throughput investment turns** are 0.216 – an improvement

### Shirt-making business: process analysis

**Table 3**

<table>
<thead>
<tr>
<th></th>
<th>Women’s shirts</th>
<th>Men’s shirts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly market demand</td>
<td>120 units</td>
<td>120 units</td>
</tr>
<tr>
<td>Price per unit, €</td>
<td>105</td>
<td>100</td>
</tr>
<tr>
<td>Material cost per unit, €</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Throughput per unit</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Sewing time, minutes per shirt</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Throughput per minute of constraint resource</td>
<td>3.53</td>
<td>5.00</td>
</tr>
</tbody>
</table>

The figures are slightly odd looking because we are only considering one week’s data and comparing it to total investment in the process. Nevertheless it is evident that we have developed a more profitable product mix by ignoring what conventional cost accounting told us and by focusing instead on the constrained resource.

Unit costs and unit profitability tell us nothing. What we should be interested in is the cost of the process as a whole and, in particular, the capacity of the resources in the process. Any resources that are at or near full capacity are constraints. If we then have product-mix decisions to make then we need to consider the throughput per unit of constrained resource. The total amount of machine or labour minutes absorbed in the product is of no relevance. It is the constraint alone that restricts the flow through the process and that needs to be considered in our calculations. The constraint should also be our priority for improvement: improve the constraint and you improve the flow through the whole process. Lean techniques come into play here.

Let us consider one final element in our shirt-making example. We have the opportunity either to invest €10,000 at the cutting process to deliver 30% – 720 minutes per week – extra capacity or to invest €100,000 at the sewing process to deliver 30% – 720 minutes per week – extra capacity.

**Which option should we choose?**

A €10,000 investment at the cutting process might well improve efficiency metrics at the process through faster cycle times. However, we already have plenty of spare capacity at this process and the investment will yield no financial benefit.

At the sewing process, the 720 minutes per week extra capacity would allow us to fulfil market demand completely for both types of shirt. An additional 40 women’s shirts per week could be produced and sold, generating an additional €2,400 throughput profit.

### Shirt-making business: revised profit statement

**Table 4**

<table>
<thead>
<tr>
<th></th>
<th>Women’s shirts</th>
<th>Men’s shirts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>80 units</td>
<td>120 units</td>
</tr>
<tr>
<td>Revenue, €</td>
<td>8,400</td>
<td>12,000</td>
</tr>
<tr>
<td>Material cost, €</td>
<td>3,600</td>
<td>6,000</td>
</tr>
<tr>
<td>Throughput, €</td>
<td>10,800</td>
<td>10,500</td>
</tr>
<tr>
<td>Operating expense, €</td>
<td></td>
<td>10,500</td>
</tr>
<tr>
<td>Net profit (loss), €</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>
per week. This is pure profit as our overheads – operating expenses – have already been covered. The investment would pay back in 42 weeks, and all the throughput accounting ratios would improve.

Only 600 additional minutes are needed at the sewing process to meet market demand, leaving 120 minutes per week spare capacity. This offers the potential for new product development, new markets and new customers.

These decisions are all made by looking at the process as a whole, its costs, revenues and resources and their capacity. We use the throughput per minute of constrained resource to make decisions, supported by the three key throughput accounting ratios.

I believe that throughput accounting meets the requirement of accountants in business: to provide timely and actionable management information to managers for the purposes of reviewing performance, planning improvement activity and making business decisions. Is it time you changed cost reporting and performance analysis in your business? Throughput accounting is easy to understand, straightforward to implement and provides valuable tools for understanding and improving business processes. By contrast, complex standard cost calculations are unhelpful and, in many cases, actually counterproductive.

References

1. CORBETT, THOMAS, Throughput Accounting, North River Press, 1998

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