

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.

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Table 1

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Table 2

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- 5 81F5 =145 1 G55;<d <?C
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- 895 D814D9?>1< 133?E>D>7 @B13D935C 45F5>?@54 9- D85 5B1 ?6 =1CC @B?4E3D?> 1>4 1B5 21C54 ?> D85 3?>35@D ?6 53?>?>=95C ?6 C31-5 D8B?E78@ED 133?E>D>7 9C B??D54 9- D85 G?B4 ?6 =E9@>5 @B?4E3D =1CC 3ED?>=9C1D?> 1>4 3?=@5H =9H 4539C9?>C +8B?E78@ED 133?E>D>7 9C 21C54 ?> D85 3?>35@D ?6 53?>?>=95C ?6 6?G D81D G5 9-3B51C5 @B?D1294D 1>4 B54E35 3?C 21 9-3B51C9>7 D85 B105 ?6 6?G D8B?E78 D85 G8?5 @B?35CC ?B F1-E5 C0B51=

+8B?E78@ED 133?E>D>7 @?CDE<D5C D81D 5F5B1 2EC9>5CC @B?35CC 81C 1D -51C ?>5 3?>C0B19>D 25 D 5AE9@=5>D C;9< ?B @B?354EB5 @?431 !D B5-530C D85 @89?C?@81 ?6 D814D9?>1< 3?C 133?E>D>7 D81D @B?D1294D 9C =1H9=9C54 G85> =1389>5 1>4 <12?EB ED99C1D?> 1B5 =1H9=9C54 2ED 9-3?>D81C 1B7E5C D81D G5 9=@B?F5 D85 @B?D1294D ?6 1 @B?35CC ?>D 21 9=@B?F9>7 D85 6?G D8B?E78 D85 G8?5 @B?35CC D? 3ED?>=5B 45=1>4 +8EC D85 Accounting Dictionary 45@>5C D8B?E78@ED 133?E>D>7 1C 1 =1>175=5>D 133?E>D>7 C1C05= D81D C55;C D? =1H9=9C5 D85 B5DEB> ?> 2?D0-5>53; 13D9F0D

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n)1/4()043 9C 45@>54 1C >5D C1-5C -5CC D?D1<F1B912-5 3?C D?D1<F1B912-5 3?C 9C ECCE1<D D1;5> 1C =105B91<3?C ?>D D8?E78 D85B5 =11 25 ?D85B D8E4 F1B912-5 3?C 9- 1 @1B9D9E<1B @B?35CC

- n Investment is defined as the money tied up in the process or value stream – that is, the equipment, inventory, facilities, buildings and other assets and liabilities that form part of the value stream or process; note that throughput accounting values inventory strictly on totally variable cost – material cost – only, without labour or overhead
- n Operating expense is the other direct costs associated with the value stream or process excluding any allocations of corporate or other external overheads
- n Net profit, also called value stream profit = throughput less operating expense

Proponents of throughput accounting argue that only three business ratios are needed for decision-making and performance improvement of business processes:

- n Return on investment is net profit divided by investment, expressed as a percentage, and is a useful measure to compare value streams; we can improve a value stream's return on investment by increasing the revenue of the value stream, by reducing inventory as we improve flow and by reducing waste
- n Productivity is defined as throughput divided by operating expense, expressed as a percentage; this is a reflection of the level of contribution in the value stream
- n Investment turns is defined as throughput divided by investment, expressed as a ratio; any decision that improves this ratio for a value stream will inevitably improve the profitability of the value stream and thus the investment turns measure is a useful first-cut way of ranking alternative decisions

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% - $10,200 \div 10500$; and throughput investment turns are 0.0204 ($10,200 \div 500,000$).

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:

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

	Women's shirts	Men's shirts
Weekly market demand	120 units	120 units
Price per unit, €	105	100
Material cost per unit, €	45	50
Throughput per unit	60	50
Sewing time, minutes per shirt	15	10
Throughput per minute of constraint resource	3.53	5.00

Shirt-making business: process analysis

Table 3

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



	Women's shirts	Men's shirts
Output	80 units	120 units
Revenue, €	8,400	12,000
Material cost, €	3,600	6,000
Throughput, €		10,800
Operating expense, €		10,500
Net profit (loss), €		300

Shirt-making business: revised profit statement

Table 4



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.

About the author



Ross Maynard is a Fellow of the Chartered Institute of Management Accountants and a consultant specialising in throughput accounting and lean service improvement.

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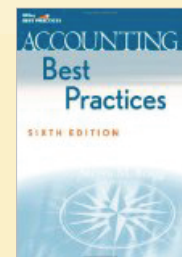
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