Back to Basics – part 1

by Martin Powell

In this series of articles we intend to start with a basic assumption and then using simple logic to derive the operational rules of operations or a manufacturing organization. By the way, when we are talking about a manufacturing organization, we do not talk about the section that actually manufactures – we are talking about the entire organization that its survival depends on manufacturing parts. Many of the principles also apply for any for profit business.

Let's start with something we think we can all agree on – in many businesses from many managers we have heard the following statement:

"A company's long term survival depends on its ability to ever increase productivity"

Productivity – what is productivity? Today we find this word in articles, papers, lectures, books – all over the place – but can any one of you define precisely "what is productivity?" If we turn to a dictionary definition, we find out that they define this word in a manner that does not match with our understanding in manufacturing organizations. One dictionary even says – "Productivity; see Productive" and for "Productive; see Productivity!" No so helpful.
Under TOC we believe that Productivity is the act of bringing the company closer to its Goal. Every action that brings a company closer to its Goal is "Productive" – every action that does not bring the company closer to its Goal is not "Productive". At first glance it looks like this definition did not add very much. We just substituted one buzz word - "Productive" – for another – "Goal". But this is not valid, because if we examine it carefully, we see that now we understand that "Productivity" is a buzz word unless we first define:

"What is the Goal [ongoing purpose] of a for profit business (manufacturing or otherwise)?"

Maybe the easiest way to answer this question is by the elimination process. Let's find out what is NOT the Goal. We think that you all agree that the Goal of a manufacturing organization is NOT to consume raw materials, even though some people in the purchasing department behave as if it were the Goal. The Goal of a manufacturing organization is NOT to provide work to people; we haven't created our business in order to provide work. The Goal is also NOT to produce products as so many companies have discovered lately when they have been stuck with huge inventories of finished goods. The Goal is also NOT high quality – it might be a means but it is NOT the Goal. The Goal is NOT to be at the forefront of technology – that's not the Goal. The Goal is also NOT to capture a market share – once again it might be a means but it is not the Goal.

So, ***"what is the Goal of a for profit business (manufacturing organization)?"***

The TOC philosophy assumes that the only Goal of a for-profit business is to make money. Making money is the only Goal – everything else is a means to achieving the Goal – NOT the Goal itself. Correct purchasing, producing products, good human relationships, high quality, good technology, capturing a market share are all just means to achieve the Goal and NOT the Goal itself.

Now that we have stated the Goal, we have to define it more precisely – we have to understand what we mean by the words "making money". We have to understand what we mean when we regard the organization as a money making machine. In order to do so we have to define measurements that will enable us to understand whether or not we are making money.

It is quite clear that first of all we need an absolute measurement – like Net Profit. This will not be enough; we need a relative measurement as well – like Return on Investment (ROI). Why do we need both of them? We need Net Profit because, if I am telling you that a company is making 30% ROI, it still does not say that the company is good or bad. If the total investment is £10 then 30% ROI is not a big deal but if the investment is £1 billion – then wow what a company. Likewise Net Profit by itself is not enough. If we say that the Net Profit is £1 million, is it a good company or not? Well it depends, if the investment in this company was, say, £100 – what a company! But if the investment was £1 billion, well it's not the best company in the world. So we need both measurements – Net Profit and Return on Investment.

But these two measurements are not enough as too many companies have found out – we need a third measurement; a measurement of survival – something like cash flow. If we have enough cash flow then cash flow is not important at all. If we don't have enough cash flow – nothing else is important! Most companies go bankrupt not because they don't have enough Net Profit; not because they haven't scored high on ROI; but simply because they run out of cash. They hit the red line of survival. They didn't have enough cash flow.

So we see that when we look on "making money", we need all three measurements. Naturally we can increase Net Profit at the expense of ROI – or vice versa. We can increase Net Profit today at the expense of Net Profit in the future. This is what we call "making policy" but in this article we are not interested in determining good policies – in standardising the proper ratio between the three measurements. What we are interested to do in this article is to determine the Goal of "making money" for any company and for any policy – and the Goal of "making money" is to increase all three measurements simultaneously – to increase Net Profit; to increase ROI; to increase cash flow simultaneously today as well as in the future – that's the Goal – not simply to increase Net Profit by itself – not to increase ROI by itself – not just to increase cash flow but to increase all three of them simultaneously.

But if we will stop at this point, it will be very, very hard to derive operational rules that the local areas in the organization can follow. What we have to do is define another set of measurements that are equivalent to the three measurements above. Equivalent in the sense that the new set of measurements will provide us with the means to evaluate whether or not our actions are helping us in making money. Let us suggest this set of measurements – and it is THROUGHPUT, INVENTORY and OPERATING EXPENSE. But since there are so many buzz words floating around – let's define each of them very precisely.

THROUGHPUT according to the TOC definition is the rate at which money is generated by the system through sales. Through sales NOT through production – if you have produced something and you have not sold it – it's NOT Throughput.

INVENTORY according to the TOC definition is all the money the system has invested in purchasing things which it intends to sell. If we look very closely on this definition, we see that it deviates quite a bit from the usual definitions of inventory. One major difference is the fact that this definition

excludes money added by the system after purchasing. Inventory as we said is the money invested in purchasing not the money added afterwards by the workforce. Another difference between this definition and the usual one is that it excludes some things which we are purchasing but that the system does not intend to sell – like for example, lubricating oil for machines. Lubricating oil is NOT regarded as inventory since the system does not intend to sell it.

OPERATING EXPENSE according to the TOC definition is all the money the system spends in order to turn INVENTORY into THROUGHPUT. It is not just direct labour, it is not just the foreman on the floor, it's not just management, it is also the Secretary of the boss. If the boss's Secretary does not help in turning INVENTORY into THROUGHPUT her salary is not OPERATING EXPENSE, it is simply a waste. So let's repeat it - OPERATING EXPENSE is all the money the system spends in order to turn INVENTORY into THROUGHPUT.

Why did we deviate in the definitions of INVENTORY and OPERATING EXPENSE from the usual definitions? It was done in order to eliminate the confusion between "direct" and "non-direct" expenses – to eliminate the confusion in the spending of a pound, whether or not it is investment or expense. When we look on the salary of direct labour how do we treat it – as investment or as an expense? If we look on the added value of the workers to inventory we basically treat this spending of money as investment. But if the worker stayed idle we treat it as an expense. So we have a debate when we are paying the salary whether to regard it as investment or operating expense. In order to eliminate this confusion, we have defined INVENTORY and OPERATING EXPENSE the way that we have done it.

In order to understand a little bit more, let's look on some other examples. Scrapping parts – whenever we scrap a part, the system does not intend to sell it anymore, which means that at that moment the money invested in purchasing the raw material in that part is not inventory anymore it is operating expense. When we look on a machine, the depreciation of a machine is operating expense. When we look on inventory, the money invested in purchasing inventory is, according to our definitions, inventory and the carrying cost of inventory is an operating expense.

What is the Goal expressed in these operational measurements? It is NOT to increase THROUGHPUT; it is NOT simply to reduce INVENTORY; it is NOT to simply reduce OPERATING EXPENSE – it is to increase THROUGHPUT whilst simultaneously to reduce INVENTORY and reduce OPERATING EXPENSE. It is very easy to do each of them separately. It is very easy to reduce OPERATING EXPENSE – fire everybody! Do you really think that this will bring you to the Goal of making money? It is very easy to reduce INVENTORY – stop purchasing! We doubt that you are going to make money by this action.
So the Goal in practical terms is – once again - to increase THROUGHPUT whilst simultaneously decrease INVENTORY and OPERATING EXPENSE. It looks as if we are hammering home a point which everybody knows, but in order to see the far reaching importance of this definition; to understand why we defined so precisely the operational measurements, let's look on how the whole western world is treating their operational capacity. In the western world, we are trying very hard to balance the operational capacity.
Balancing operations is attempting to match capacity to market demands.

The way that organizations are behaving today is that they are trying to have capacity from each and every resource to meet exactly the marketing demand – they don't want to have less capacity than is needed because this will lead to loss of THROUGHPUT but they also don't want to have excess capacity because this is simply a waste. So when demand is falling, immediately we are trying to balance the excess capacity that appears in operations. Well of course we cannot fire a machine; we cannot even ask a tool to take a vacation – but there is another type of resource that we can trim – the workers. So whenever demand is falling, in order to save OPERATING EXPENSE we are trying to lay off people.

What we see in every sizable business is that people are hired, transferred from one department to another – sometimes laid off. All of it in order to balance the capacity to meet market demand. But let's view it according to our Goal – let's view it according to our operational measurements. When demand falls and we are trimming the workforce, trimming the excess workforce – do we increase THROUGHPUT? No – we are not going to sell more because we layed off some people. Do we reduce INVENTORY? No – it doesn't have anything to do with it.

What we are attempting to do is just to reduce OPERATING EXPENSE. But we said that the Goal is not to look on OPERATING EXPENSE in isolation. We said that the Goal is to reduce OPERATING EXPENSE whilst simultaneously reducing INVENTORY and increasing THROUGHPUT. So the only justification for trimming the excess capacity can be that while reducing OPERATING EXPENSE we have not increased INVENTORY and we have not reduced THROUGHPUT!

Let us emphasise it – there is a hidden assumption here – the assumption that in trimming the excess capacity we do not affect INVENTORY or THROUGHPUT. As a matter of fact this assumption is totally invalid. We can prove that when capacity is trimmed to meet exactly market demands – no more and no less – THROUGHPUT and INVENTORY are affected. THROUGHPUT goes down – INVENTORY goes through the roof – and because the fact that INVENTORY goes up the carrying cost of the inventory, which is OPERATING EXPENSE goes up. So we don't know even if OPERATING EXPENSE goes down!
In other words once we prove this – we have proved that a balanced operation is a bottom-less pit.

In manufacturing, how come in spite of so many efforts of so many people, in so many plants, we cannot bring even one example of a perfectly balanced plant?

Let us answer it. Survival is the reason, because the major force in the plant is survival and survival precludes balancing the plant. Once we come even close to balancing the plant, THROUGHPUT starts to fall down, INVENTORY starts to go up more than usual and we retreat; we add capacity. This is a major reason why we do not see any perfectly balanced plants in reality. The same is true for other organizations who have tried to balance the capacity of operations to the market demand.

The logical proof will be shown in – Back to Basics – part 2

Martin Powell
Director
Goldratt UK

Back to Basics – part 1

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