

IV - ROI

You must master this chapter if you are:

- Selling the solution of problems through a product or service to business

- Becoming a manufacturer - one-person shop to giant

If you are in retail or in service to other consumers it would be a good idea to have an understanding of the principles behind ROI but not necessarily mastery.

ROI = Return on Investment = micro business plan

If an employee punches out 50 widgets an hour that sell for \$1 a piece the venture is making:

Sales	\$50
Cost of fully burdened direct labor	- 12
Material	- 5
Overhead	- 36
Gross profit	(\$3.00)

Parenthesis around the bottom line figure indicates a loss.

Overhead as a rule of thumb is three times labor + material

Fully burdened direct labor includes rent, supervision, indirect labor, benefits, vacation, facilities expenses.

The best fully burdened labor rate I every achieved in the United States was with Corsair Marine where the average hourly rate paid the factory workers was \$7.65 which worked out to be \$16.22 as a fully burdened rate.

The best ever in Mexico was \$2.86 fully burdened labor rate.¹

¹ You can see why so many companies set up operations south of the border.

The ROI process begins with a critical thought process which clashes with Business School accounting and traditional MBA ideology. You would think that any business manager would recognize the difference between money spent on a speeding ticket and money spent on a tool. Not so generally speaking. Fasten your seatbelt because this is a truly insane issue you will find unbelievable.

I ask the following question in all of my classes. “If your operator makes 50 widgets an hour and you pay the operator \$7.00 an hour in wages and the material costs a nickel per piece and you can sell each unit for a Dollar a piece. . . what is your loss if the machine is shut down for one hour?”

Nine of ten students (senior level managers) will respond with “It’s the hour’s wages lost, \$7.00, and we don’t count material because it wasn’t used!” Then they smile, proud of their mental gymnastics.

What do you think? Is the loss \$7.00 and we don’t count material?

Would you be at all surprised if we said the loss is \$50?

The loss to the business is the revenue that would have been possible during that one hour of production. Fifty Dollars! Can you see it?

Please do not move ahead until you have absolutely convinced yourself that this is an absolutely true statement. Work it out on paper, talk about it, give me a phone call even in the middle of the night -- but be sure you are totally convinced. You will be breaking a paradigm and it may be difficult but you simply must do it if you are going to sell solutions to business or if you are going into manufacturing. Over the last two years I have trained over 50 senior-level executives (most of them responsible for 80 to 200 people in their profit centers) and not one gave the right answer the first time it was asked.

The next concept you must clearly visualize in your mind’s eye is throughput. Remember, you are selling a solution or your are in manufacturing. Throughput is defined as the money left over after you have

paid all expenses and all material. Simple right? Yet it took a genius in physics to bring this notion to modern American management through a book called “The Goal” by Eliyahu M. Goldratt in the mid 1980’s.

Take any operation. A one person office or General Motors. Apply the rule and you can measure the efficiency of any operation. This is an extremely powerful tool for any supervisor, manager, sales engineer, promoter -- whatever.

You, as an entrepreneur selling a solution to a business, can make it possible for the champion at your customer’s site to carry the message of your solution through the chain of command to get the purchase order signed.

You, as a manufacturer, will be able to make quick back-of-the-envelope calculations on the fly to determine if a project is valid or not. It will help you gage the payback on virtually every activity in your organization which in turn will allow you to control your destiny.

In the case of the press operator and the \$1 widgets capable of putting out 50 units an hour. Throughput is minus \$3. Something should be done about it because for every hour of production you are losing \$3.

Let’s explore the choices:

- Increase production rates
- Decrease costs

Traditional managers almost invariably focus on ‘decreased costs’ as the solution to the problem. They automatically assume that increased production will simply increase losses at the rate of \$3 per hour.

Please do not underestimate the level of incompetence in the business environment. Nine of ten managers or decision-makers in industry today will tackle Decrease Costs as the solution.

The true solution is to increase production rates. Let’s take a look:

Give the production operator a chair. Instead of shifting from foot to foot losing rhythm, the operator now puts out ten more widgets an hour. Nothing else changes and the cost of the chair is recovered in two hours of work:

Sales	\$60
Cost of fully burdened direct labor	- 12
Material	- 5.5
Overhead	- 36
Gross profit	\$6.50

Increased production may put burden on sales but they can always find ways to induce customers to buy once they have a better price - so you may lose a Dollar as inducement you still end up with a net gain of \$8.50 every hour of the day through the simple act of giving an operator a chair!

Follow me closely here now - things may get a tad more complex.

Introducing Theory of Constraints management. Throughput is a function of productive capability as you just saw. We increased productivity just a bit and we got huge bottom line results. More than the actual cost of making the product. Cost of making the product is pennies to the dollars they affect. There is a leverage factor here within the world of productivity - manufacturing of any kind.

If productivity has such a huge leverage effect, anything done within the world of productivity is of great significance. A dollar spent on a tool is certainly more valuable to the operation than a dollar spent on a speeding ticket. Yes?

But most companies value a dollar for toilet paper the same as a dollar for a ball-end Allen wrench. And since more people use toilet paper, it's logical to assume that if I have but one dollar to spend, it will be on toilet paper. (Traditional management logic). But you and I know a ball-end Allen wrench is twice as productive as a conventional ended Allen wrench. It is

our job to show the dollar for a ball-end is more important than a dollar's worth of toilet paper. Not an easy task!

Next - since productive capability determines throughput, the total output of any productive system is determined by the slowest unit within the whole. This is called a bottleneck. Every system has a bottleneck - at all times. Remove one bottleneck, and another will immediately take it's place.

Mary puts out 10 an hour, down the line Joe puts out 8. There will be an accumulation of 16 units in front of Joe's workstation at the end of the day. Total output for the whole organization is 8 per hour. Joe controls output. He is the slowest. Now give Joe a tool to help him reach the 10 an hour. Mary and Joe are now making 10 an hour but sales can only sell 9. You start building inventory which costs money so you offer an inducement and sales now can sell 12 an hour. Mary and Joe again become the bottleneck.

Success in business is a function of how many bottlenecks you can remove within a given period of time. Some call this CPI for Continuous Process Improvement.

As a seller of solutions or manufacturer these principles are your holy grail. Once you master the concept of ROI, increased productivity and bottleneck breaking you will be a hero to the stockholders of the company you service.

Consider that direct labor is only 5% to 12% of all costs to any manufacturer at any given time - in most cases. Tools and production improvements are a fraction of the costs associated with most businesses yet it is the tool or system that leverages production capability. A one percent improvement in production capability is a 20% improvement at bottom line level. (If 5 is to 100, then 1 is to 20)

As obvious as this may seem to you now, it is beyond comprehension to traditional management who either grew through the ranks or got their training at the Harvard Business school or most other Business Schools. I am a graduate of a business school -- I did not learn the tremendous leverage

behind tooling until I was forced into creative ROI writing at Plamex, the Plantronics factory in Tijuana.

Even today, traditional ROI calculations are based on the following formula. Mine is different, you may or may have not noticed -- if you have traditional ROI formulas in mind.

Traditional ROI calculations use cost of direct labor as the driving factor against the purchase of new tools, equipment and solutions. If labor is \$5 per hour and a machine can be bought for a cost's less than \$5 an hour as amortized over, say, a two year period - then buy it.

In Mexico our direct hour labor rates are less than a dollar. To convince management to buy a \$30,000 machine would require the machine to eliminate at least 15,000 hours of work per year for a two-year payback. Capital equipment is purchased on a one to five year payback period, generally. Even a \$100 tool required justification "Can you eliminate 100 hours of work with the \$100 tool?"

Take any college textbook on operations and this is how ROI is calculated. labor costs vs. machine cost. Period.

Impossible to justify a several thousand dollar machine when the cost of labor is less than a dollar and it only replaces a portion of one person. So I had to find a way to convince Santa Cruz management that there would be a payback of some kind. I wrestled with this, researched technical journals, consulted college professors of business administration, nothing but the old 'tried and true' formula of the past. But I was convinced there must be a way. So I took the Plantronics year end report to stockholders and saw sales in the high millions and since our plant in TJ accounted for 90% of all product sold, and it suddenly hit me! If we, in TJ, are only 5% of total company expenses, and we generate 95% of all revenues, then every dollar spent in TJ will make \$20 in revenues!

But I had to convert the dollar issue into productive units to get away from the idea of direct labor - to bury it somewhere - to hide it from management.

Instead of dollars I put number of hours worked. So, if 450 people in the plant generate eighty million in sales, that means that each person is generating roughly \$178,000 in revenues per year. Each person works 48 hours a week so each hour of productive time is \$71.31 in revenues to the company.

I have in effect converted the impossibly low \$1 dollar an hour into \$70+.

Now, if I can build a tool for \$500 that will increase a person's productive capability by 10%, then we are adding \$7 of value to the company for every hour the employee is working. Payback on the \$500 tool is 71.4 hours, or two weeks.

I was able to sell this concept and ***within a year we developed tools, systems and processes that doubled production output with an increase in personnel of only 20%***. We would have continued on this track except for the fact the Mexican operation had a different board of directors and different agenda. It's revenues were derived from a formula based on the number of hours worked and not by the number of units made. Thus, for every hour of work we tooled, resulted in one less hour of billing for the Mexican business. When I brought this to the attention of the Plantronics CEO my 'position' was suddenly eliminated.

As a frequent speaker at The Society of Manufacturing Engineers meetings I teach as many people as possible, using this example as a means of introducing a better way to calculate ROI than the traditional. I am beginning to see it applied here and there, but it still has not caught on as it should. There are simply too many college professors with tenure who don't know better, who have no intention of learning, and who thrive on living in the past. If you think change is difficult in the real world, try it in academia!

Fortunately a fellow by the name of Genechi Taguchi is coming to the aid of this party through his concept of the Quality Loss Function which validates the example I use on the first page of this paper; that the loss to the enterprise

for that one hour of down-time is the loss of possible sales revenues.² Turn it around, and you can say that for every increase in productive capability is worth the potential sales revenue and has nothing to do with the cost of direct labor.

What does this mean to you as a person selling solutions to industry?

Remember that the majority of companies are managed by old-line thinkers. You may be working with the new-breed people at the engineering or floor level and they know how to solve problems and make things but for the most part they don't know how to communicate with upper management to get the resources they need to do their job. When they tell their boss that a super-duper tool will make life easier, their boss thinks they're just lazy and don't want to work³.

You must help your customer sell the concept through the system. They need to know how to convert the time saved benefit from your solution to dollars and cents as seen by management. Traditional ROIs don't work in most cases. What you learn in this chapter is what you will have to teach your end-user to help them promote the project through the organization.

The comment most often heard, the major complaint in virtually all technical professions today, is that it is almost impossible to get management to listen to their requests for tools, hardware, machines, systems that are of possible benefit to the enterprise. Engineers, floor-level supervisors, technicians and the like speak a language of improvements and problem-solving. When they ask for money for a project they speak of improvements. What a manager is hearing is the people don't want to work -- they just want some damned fool thing to make things easier. Even with the method presented in this chapter it

²Taguchi claims the loss is to society and he's probably right.

³One day I mentioned the fact that some of the workers had air wrenches in their tool-boxes they had smuggled into the plant -- and I was going to say that tools make a difference -- when the division manager interrupted and said "Yea! lazy bastards get away with it every time!" I stopped cold. No sense continuing any intelligent conversation in that environment. This was, I repeat, WAS a billion dollar company. Look it up, Rohr Industries.

may be difficult for your champion to sell it. Change is the most difficult thing to handle at any level.

A few years ago the Society of Manufacturing Engineers asked me to write an article which would appear in their many publications. It has been showing up on a regular basis and one can assume it is of value. Although I use Composites as the end-all solutions, you as a solutions marketer could substitute your product for the word composites and use what you want from the article to help you sell.

FUMBLE RECOVERY - NOT JUST IN FOOTBALL!

Wayne Lundberg, CMfgE

On Monday a Director of Operations walked me through his plant at one point mumbling "These shop people don't even know how to use the bathroom! How can I get quality?" On Tuesday a Vice President of Operations at another plant pointed at the excessive work in process and said "These people can't do anything right!" Comments like this are made by upper management people on a regular basis and I wonder how many 'shop people' even suspect they are being blamed for the company's woes. Management 'assume' the people know what to do. The people 'assume' management will tell them. Both have dropped the ball and don't even know it.

If Manufacturing Engineers don't pick up this fumble we are not fulfilling what could be our professional Hippocratic oath. For us to pounce on the ball may not be rewarding, and bloodied noses may be the result, but we are among the few that can do anything about it - at least we know which end-zone to run to!

We can make sure that when a new process is introduced into the shop that we have covered all training requirements from maintenance to process control, EPA to OSHA, hazardous waste to life-cycle know-how including customer service, from quality parameters to a method of measuring quality issues. These, as well as the normal engineering functions of putting a system to work. There simply isn't anybody else to do it!

The task is ours by default. And if we have to sell, sell, sell what is right and what has to be done through the administrative

bureaucracy, then that's what we have to do!

Somebody has to pick up the fumble! In today's pass-the-buck environment where scapegoatism reigns supreme, we may be the only voice left that can be heard. It is our knowledge of how to convert materials into something with added value that will bring this country back into the running. As it was with the farmer at the turn of the century - a lone figure on a vast plain, ignored by most, held in contempt by Wall Street- but they brought us into the real gold. Now it's our turn.

Now, more than ever before, composite materials⁴ for use in tooling and fixturing as well as for the manufacture of products, are among the most powerful levers for rebuilding America. By nature this magical material lends itself for the making of one-offs, of prototyping new products and ideas, of making a quick tool at a fraction of the cost, for giving the sales department enough beautiful shining models to go out into the world to SELL. With orders in hand they will come back and the factories will turn on the midnight lights and we may even see second and third shifts again!

Fellow manufacturing engineer: We can pick up the fumble by learning the basics of salesmanship and project management, then use these tools to solve the management/personnel rift - and save the country.

⁴ Insert your own solution statement and use whatever you want from the article to help you convince your customer that you have a cost effective solution to their problem

Appendix - Elpac Mexicana S.A. de C.V.

Throughout 1993 some \$500 a week was spent in tooling components, fixtures, motors, controllers and the like at Elpac Mexicana. These tools took seconds and minutes out of production time. One tool cost less than a dollar and removed four seconds out of an eight second operation. Considering the operation was for millions of insertions per year the tool paid for itself in a split second. Many machines were built with this \$500 a week budget that enabled the parent company to begin shifting the purchase of transformers from the Orient and getting better price and delivery from their own company in Mexico. Quality improved with each new device put into use. Cost of finished goods continued to drop which allowed their sales department to make special deals which in turn got more business which in turn made the Mexican operation grow from 23 people to 180 in two years.

But the big boss kept worrying about the \$500 a week, and other incidentals that kept getting into the weekly expenses such as a free pair of glasses to an employee -- a new set of posters indicating the dangers of chemical spills by the barrels of chemicals -- a set of overalls for the maintenance people and steel-toed shoes for the people working transformers. These costs were forever a bone of contention - an irritant that could not be scratched away. So they decided to do away with the \$500, and the person spending the \$500.

A year later that same company is down to 35 people, have lost their major accounts, and are having a very difficult time holding their company together.

They saved \$500 a week at the expense of a cash cow. They killed the goose that laid the golden egg.

What is really interesting, is that this story is not the exception, but the rule. It has happened in at least a dozen variations in my experience over the last dozen years. Believe it or not!