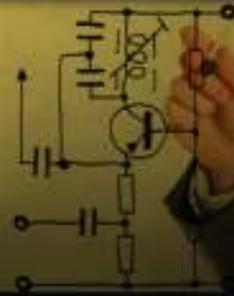


Losing Money to value vampires?

Putting out daily fires with dry hose?
Feeling the pain of systems that never seem to work?

VALUE TRANSFORMATION LLC



Value Transformation LLC

- Product Development training and consultancy
- Project Management and Software handling

Value Transformation LLC is a product development training and consulting concern, from the cradle to the grave, from intellectual property to end of life of the product. We are presently developing an online site to provide ease of access.

The following material has origins in the book Reducing Process Costs with Lean, Six Sigma, and Value Engineering Techniques a book published by Taylor and Francis and written by Kim H Pries and Jon M Quigley

VALUE TRANSFORMATION LLC

Cost Improvement Approaches

- Project Management
- Home Grown
- Arbitrary Cost Down
- Isuzu Teardown
- Lean Manufacturing



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We will show a number of approaches our organization can employ to improve our costs. The primary topics will be:

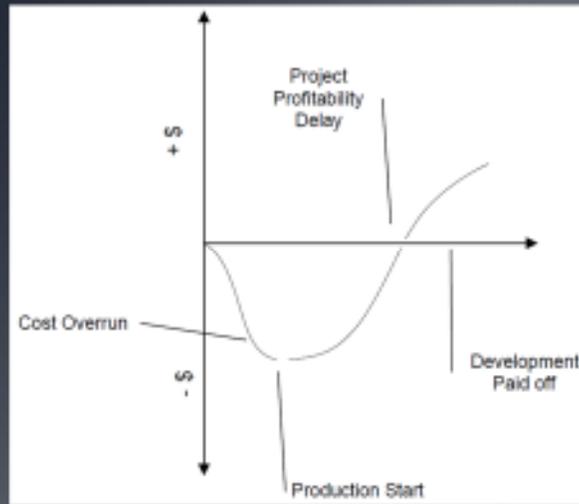
- Project Management
- Home Grown Methods
- Arbitrary Cost Down
- Isuzu Teardown
- Lean

There are many more methods, though these can provide considerable benefit. As all organizations are different, including the strengths of available talent, so too should we consider different approaches to achieving our organization's financial objectives.

That is not to say that the use of only one of the approaches will help you achieve your goals. In fact, a variety of perspectives provide you with more information, much like looking at a seemingly one dimensional square from another perspective can better inform you that you are looking at a cube.

We include project management, for a few reasons. First, many organizations (probably all) have some sort of project management aspect in developing or delivering new things. It does not matter if those new things are product or service. When we take on a project we are working toward some scope that is defined (should be anyway) and a budget and cost target. We are in the best position to optimize the value we are delivering to our customer and our organization.

Project Cost Overrun

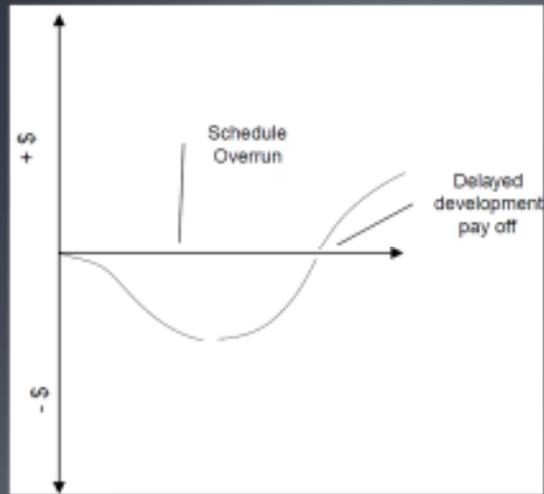


There are a number of studies that indicate the project management area is rife for improvement in many organizations. Check out some of the CHAOS reports from The Standish Group to learn more.

Cost over runs mean we have invested more in our project than we had planned and now our payback period for the project is longer than we planned. Assuming the product has the market penetration and profit margins we expected, we delay our pay off of the money invested. We cannot just simply raise the sale price of the product to recoup as we may impact customer volume or take rate.

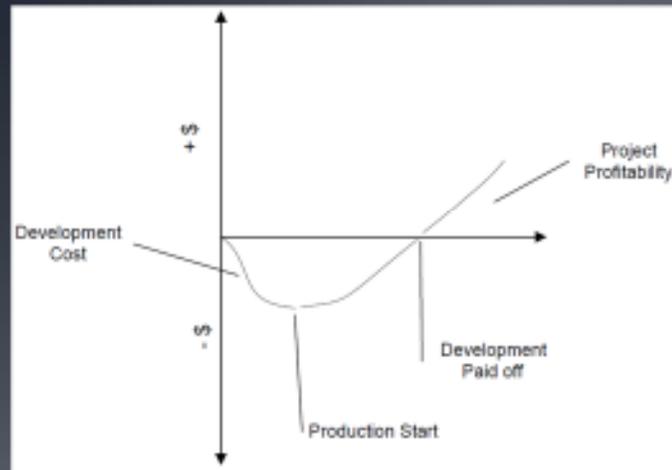
Since project costs are derived from estimates and it is possible our estimates of the cost were errant and the project should not have been accepted

Project Schedule Overrun



Schedule overruns mean we are not delivering when we expected to deliver the product. So the start of our payback of the development money is delayed. We are then extending the time we are not making money on the product we intend to sell. We delay the start of the payback of the money invested.

Product Cost Higher Than Needed

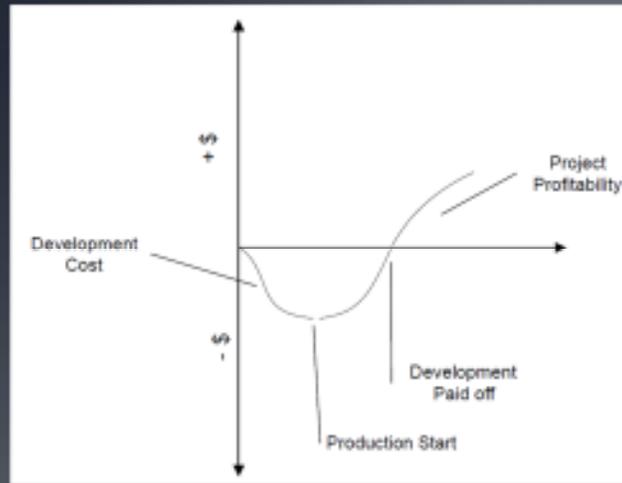


Product cost higher than our planned costs also erodes our profit margins and delays our time until payback. To achieve the same profit from the product we need to either increase the price, or increase the customer base to achieve the originally planned monetary objective.

The point to this project foray is to show how our project management actions impact our profitability. We can improve our project management capability; we can further ensure our products are able to capitalize in the marketplace. Furthermore, the subsequent slides are a means to achieving the product and project objectives.

To be effective, we should consider both the processes and the end product or service. Improving the cost early is the best solution – avoiding unnecessary expenditures.

Costs Met



Delivering as we expect to the costs, time and quality means we have streamlined our costs so that we can make the most of the investment.

Most of the areas of improvement we are referring to in the case of our development and project management domains are process and talent oriented.

Home Grown

- Brainstorming
- Use of decision matrix such as Pugh
- Make or Buy analysis
- Mind Mapping
- Cost of Poor Quality

There are many ways to tackle cost improvement with minimal level of sophistication. I have seen effective cost improvement ideas generated from brainstorming

The brainstorming technique is attributed to Alex Faickney Osborne as explained in his 1953 book, *Applied Imagination*. The technique arose from frustration with the inability of employees to develop creative solutions for problems. Personal experience suggests this is a valuable tool when deployed appropriately and the guidelines are followed. If we populate the team with diverse backgrounds we can see ideas build on other ideas very rapidly.

- Objective
- Team members
- Suspend judgment
- Build upon ideas

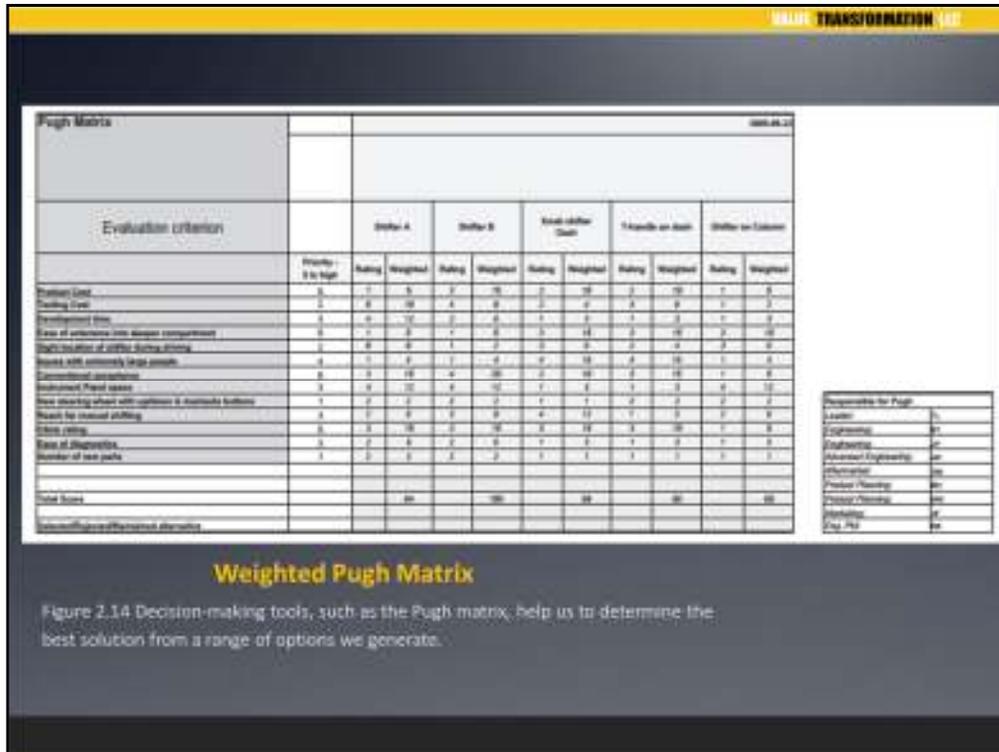
To really find the areas for cost improvement we must let go of our mental impediments to uncovering these opportunities. It is very probable that there are plenty of cost improvement possibilities. However, in our daily work execution we may not find the time to free our minds to consider these possibilities. A brainstorming exercise can go far to fuel the imagination, to open a “space” to think laterally at what may be possible. We have successfully employed this technique to:

- Reduce costs
- Generate intellectual property
- Reduce weight for the vehicle
- Solve product design constraints



As an example, we provide an illustration of what can be achieved via brainstorming.

We know of an automotive company that had a diagnostics tool included within their instrument cluster. The manufacturing staff at this company used the vehicle's instrument cluster to troubleshoot the vehicle during the later portions of the vehicle production process. There came a time when the diagnostics information within the instrument cluster graphics display was deemed to be removed from the instrument cluster. However, the manufacturing team installing the instrument cluster was dependent on the instrument cluster of the vehicle as a diagnostics tool. The manufacturing people searched for a suitable tool to meet this need but this was not possible due to significant proprietary data link communication. During a brainstorming session, idea was presented to create a new product consisting of the existing graphics display and microcontroller including the software. Using an off-the shelf enclosure, the team met this need with minimal development costs in a very short development cycle with limited risk.



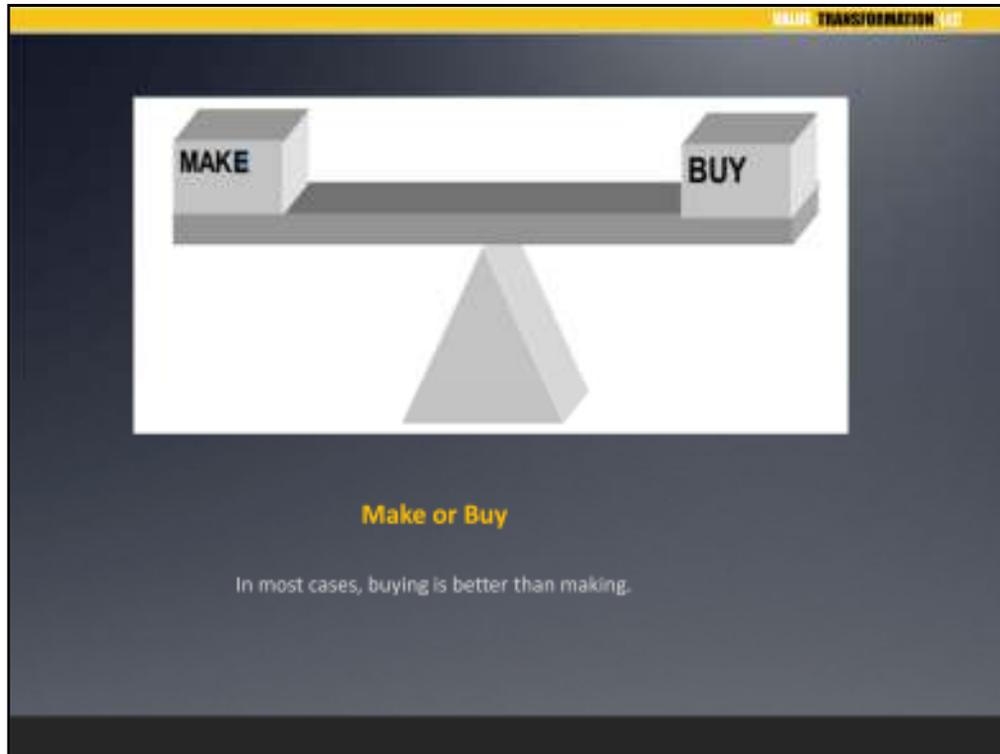
The Pugh matrix is a decision-making tool that allows us to compare a solution to our criteria or a number of possible solutions against the criteria we hold dear. We then evaluate each of the ideas we have generated against these attributes we value, for example:

- Compare single design
- Compare new design to existing solutions
- Compare multiple new solutions

For example:

- Cost to development
- Cost of material
- Cost to maintain
- Cost to update
- Cost to build
- Cost to manufacture and specialty equipment

We will then weigh these individual items essentially prioritizing or ranking these areas of importance. The higher we value the particular element with regard to the product or feature we are developing, the more heavily weighted that particular attribute.



Make and buy analysis like the Pugh Matrix (and other decision matrix) help clarify and refine design approaches. Including whether or not to outsource.

We use a make or buy analysis both at the strategic and operational levels. Anytime the opportunity arises to assess where we really are able to maximize the value.

Make or buy decisions are based on what our organization values or those things that our organization provides the maximum benefit. Make or buy is not necessarily restricted to equipment or hardware development. To be sure, these areas are the most prominent. However, this decision process really boils down to “can we provide maximum value” by doing the product in-house or outsourcing it. In that context, we can see even services can bear the scrutiny of a make or buy analysis.

From the material perspective, what we need to know are the following:

1. How many will be produced (per unit time)?
2. How does the volume of parts produced grow over time?
3. What are the fixed costs (and the total fixed costs)?
4. What are our direct costs for making the product (cost linked directly with the product per unit)?
5. What would be our total cost for purchasing the product (Example: including shipping)?

Make or Buy

- Cost to make < Cost to buy
- Cost to make > Cost to buy
- Cost to make = cost to buy

We can see a number of reasons for making the product, the principal one of which would be that our organization can provide value to our customers. However, that is not the only reason for deciding to make the product rather than purchase. Some of these we list below:

1. Volatility of the purchase price of the product
2. Degree of quality control needed for our customer (dollars lost due to poor
3. quality)
4. Supplier delivery risks
5. Shipping and material handling costs
6. We can do it better than anybody else (intellectual property)
7. Low volume price penalty

There are many reasons for purchasing the product rather than making the product.

Obviously, the main reason would be that we are unable to add value for our customers by internally developing and manufacturing the product. We may have other issues, such as the following:

- We lack the requisite expertise (intellectual property of supplier)
- We lack the capacity to take on the effort (product or service)
- Cost



We should not underestimate the impact of poor quality on our bottom line also. Every one of us in this webinar probably knows of companies that have gone out of business or has come to the brink of failure due to poor quality.

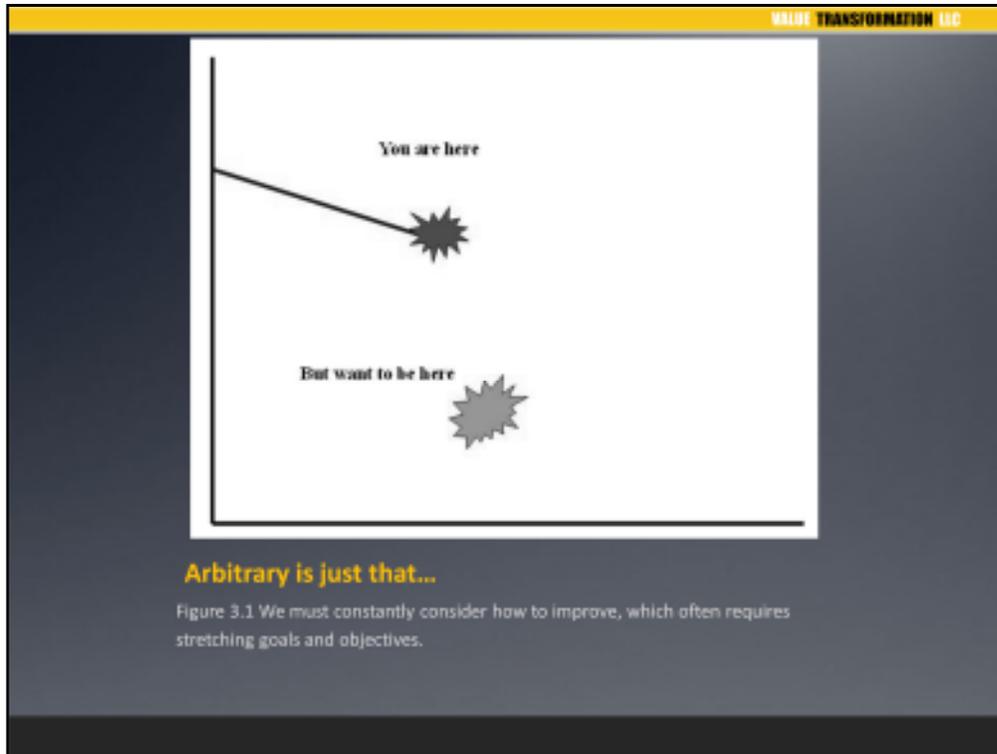
The graphic we provide is a heavy vehicle manufacturer. This vehicle manufacturer makes updates to the product four times in a year. To minimize the quality risk, the organization tests each of these releases. These releases can be tested on vehicles as well as the company's hardware-in-the-loop simulator.

Arbitrary Cost Down

- Just like it says....
- Care must be taken defining the target

With this method of proposing a cost reduction, we set an arbitrary value for the cost reduction; for example, 25% or 50%. We must have some sensitivity towards the people we are asking to accept this challenge—we do not want them to consider the goal unattainable and give up or balk at the idea of working with this concept. I like to make the analogy, imagine walking into work one day and your boss says he wants you to have a space craft that will make it to Neptune and back in 4 days and he wants it in the parking lot tomorrow morning ready for lift off at 0800. Not much point in bothering with that task.

Often, when we are developing a product or a service, we will choose a “vanilla” approach for the first release in order to reduce the risk. That means some components of the product or service may not represent optimal cost, but they do represent lower risk. Basically, we are trying to successfully release a product that will then stimulate some customer feedback, which in turn, will encourage changes that can also lead to substantial cost reductions.



We suggest that an aggressive cost down approach be used only after a successful product or service launch. Exotic solutions introduce significant amounts of risk—we have seen cases where a poorly chosen and new technological component strained customer-supplier relationships and affected the ability of the marketing department to sell the product for years thereafter.

However, as a caveat, we council that usually the best time to make the cost improvement is during the development phase. In that case, you are able to maximize the profits from the product—from day one of the product availability for sale. It always struck us as unusual, that we would have costs to take out of the product immediately after the design has gone to production. When we see this happen, it begs the question, “How much review did we have on the cost effectiveness of the design solutions?” While it is important not to put the product launch at risk with some untried or untested technology, it is always important to start the product life cycle with the best possible value proposition possible for our customers—which translates to the best margins possible for your organization.

VALUE TRANSFORMATION 101

Isuzu Teardown

Teardown type	Description
Dynamic	Studies assembly process
Cost	Detailed study of material costs of each part of our product.
Material	Focuses on the material used for similar components – reviews choice of material and treatments or properties
Matrix	Effort to make parts common – reducing part numbers for sub-assemblies
Process	Process critique usually after we have common parts.
Static	Focus is on visual inspections and use of display boards and baseline of product

The Isuzu approach traces its origins to Mr. Yoshihiko Sato's work experience at Isuzu in the early 1970s. Isuzu had an alliance with General Motors during this period. Mr. Sato came across the teardown method at GM, which he further developed, making it an even more effective method. The method became a part of Isuzu's operating culture and helped increase its global competitiveness. The success of the teardown method led other Japanese companies to adopt it.

The teardown method was not a concept developed from scratch by Mr. Sato. U.S. automakers were already using a form of product analysis and dissection before Sato developed his method. The method of dissecting a product to find out why it clicked in the market was not something new. Manufacturers were already incorporating some of the teardown approaches in their operations. However, Mr. Sato succeeded in making this a systematic and structured way to excel in operations. He is of the opinion that teardown methods which came from the U.S. are basically an "overall examination" type approach while the Isuzu approach was a comparative analysis, which had to be applied to competitor's products.

In his book 2005, *Value Analysis Teardown: A New Process for Product Development an Innovation*, Mr. Sato has defined the value analysis teardown method as "a method of comparative analysis in which disassembled products, systems, components and data are visually compared; and their functions determined, analyzed and evaluated to improve the value by adding characteristics of the project under study."

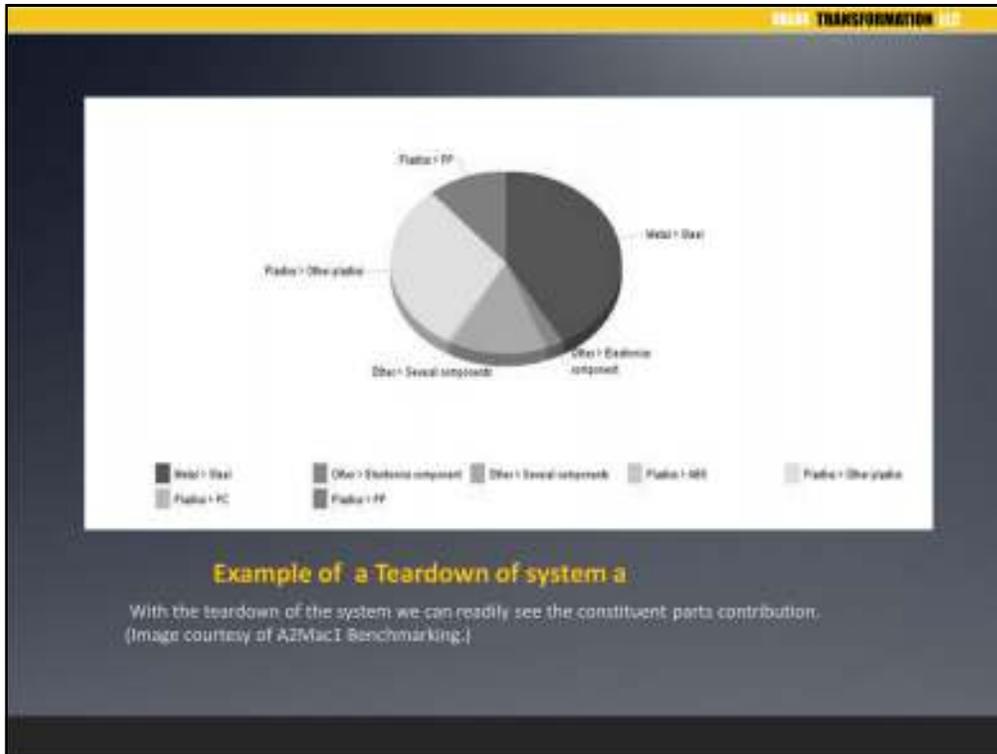
We see from the list of teardowns we have a wide array of cost improvement targets possible.

For example, if we are an assembly organization we can learn about our assembly or our competitors assembly methods via a dynamic teardown

- Dynamic
- Cost
- Material
- Matrix
- Process
- Static

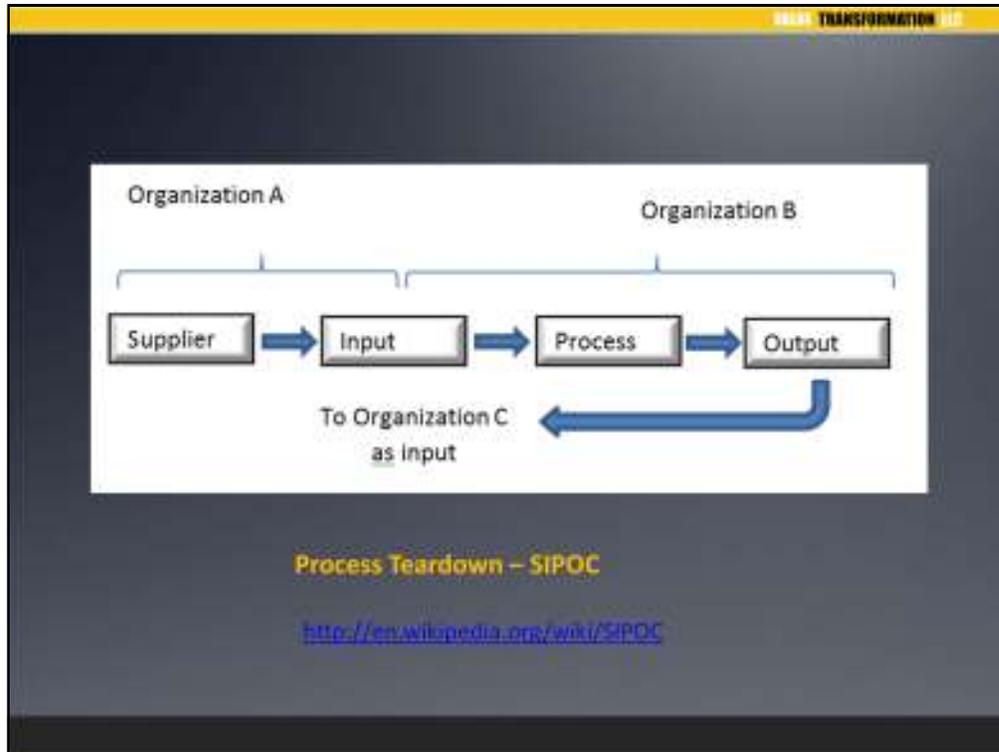


Here is an example of the documentation of a static breakdown. In this case the product was disassembled and the parts handled and assessed culminating in this graphic.



We show another breakdown - a material breakdown. This view provides an illustration of the material composition of the product and makes it possible to assess other forms or materials that can be used to achieve the product objectives.

Perhaps during the teardown we find proprietary material or a large portion of the component material has a high cost associated with it. We can already consider what sort of material could serve as a substitute



Another ready source of savings occurs when we are able to analyze our processes and eliminate entire tasks out of the sequence by streamlining the operation.

Analogous to a teardown of product is the deconstruction of the processes we employ in our company. In this case, we are critiquing how we work to understand where cost is high and value is low.

Our first slides illustrating the project management aspects of product development are implicated here as well as our cost of poor quality

By reviewing how our project management and product development processes improve our ability to achieve our cost targets and ultimately our profitability targets. We can use techniques such as breaking down our way of working using SIPOC (supplier, input, process, output). This technique originates in TQM and found also in Six sigma

Pay close attention to the exchanges between the output of one area and the input of another. Identify metrics that prove the quality of the deliverable in the eyes of the customer or receiving organization.

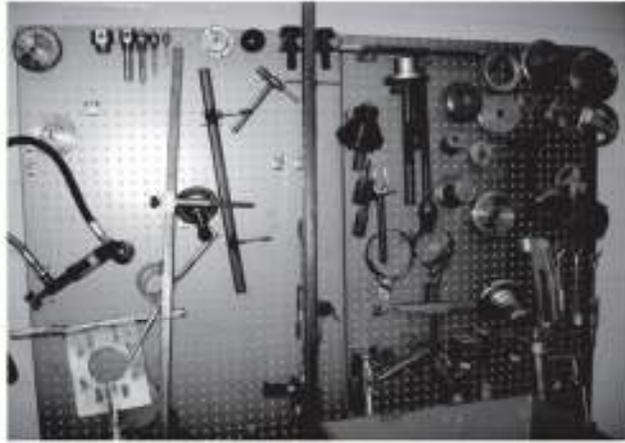
Lean Manufacturing Techniques



In the end, we can reduce the waste as much as possible, saving the earth and our company

If our organization is going through a “lean” transformation, we can often secure some profit improvement by selling redundant equipment.

At no point should we ever take the easy path of trying to throw away this material—either recycle it, repurpose it, or sell it. Any one of these options will produce savings, either in the form of profit improvement or by way of avoided cost (again demonstrating good stewardship of enterprise monies).



Efficient access of equipment

Figure 2.4 Ease of access of the tools we need for the job helps reduce waste in time

How we handle, store and use our tools make a difference also. We can be efficient in the selection of the tools we need (few uni-tasking tools as possible)

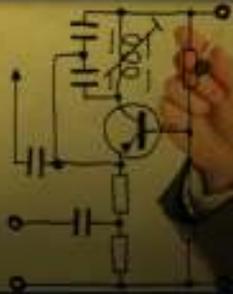
Questions?

Additional material on cost improvement techniques can be found in our book: Reducing Process Cost with Lean, Six Sigma and Value Engineering Techniques found at:

www.valuetransform.com



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THANK YOU