Tying it all Together: Lean, TCO, DFx, VAVE and Supply Chain & Operations

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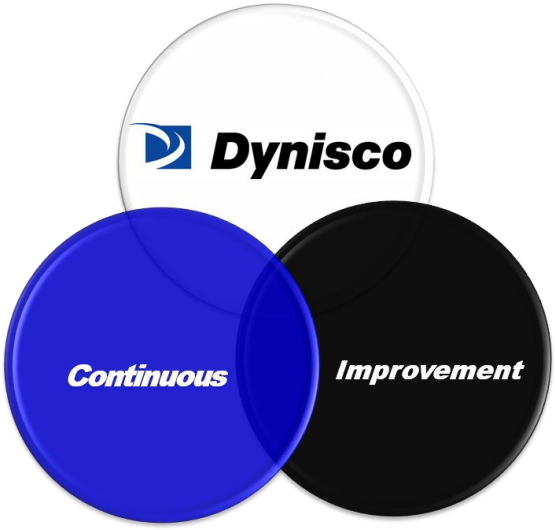


Introduction

As you have seen from the presentations and papers presented at the 2012 Forum, DFMA simply works. Moving from a small tactical win on a product to a business altering result is not as hard as you would think. It's more about committed actions and partnering with resources outside of Engineering.

For Dynisco, the concept of the Director of Product and Process Improvement was a new job that spanned multiple disciplines – Engineering and Operations. The Process Improvement portion focuses on the 20% of the design that can be addressed using the Lean toolset and Strategic Sourcing practices. This launch point freed up cash that could now fund larger projects addressing new product development, the impact of which controls 80% of the costs going forward. As you read through the LEAN, TCO, VAVE and DFMA sections you can see how, "the whole is greater than the sum of its parts."

LEAN & DFMA

A great start for any company to begin with, is applying the Lean toolset and philosophy. As I have stated previously, Lean and Strategic Sourcing impacts the 20% of the design that can be optimized once it has been released. Beyond its role as the creator of quick wins, Lean also ties directly into the goals of DFMA.

Traditionally Lean can be summed up in 5 key principals;

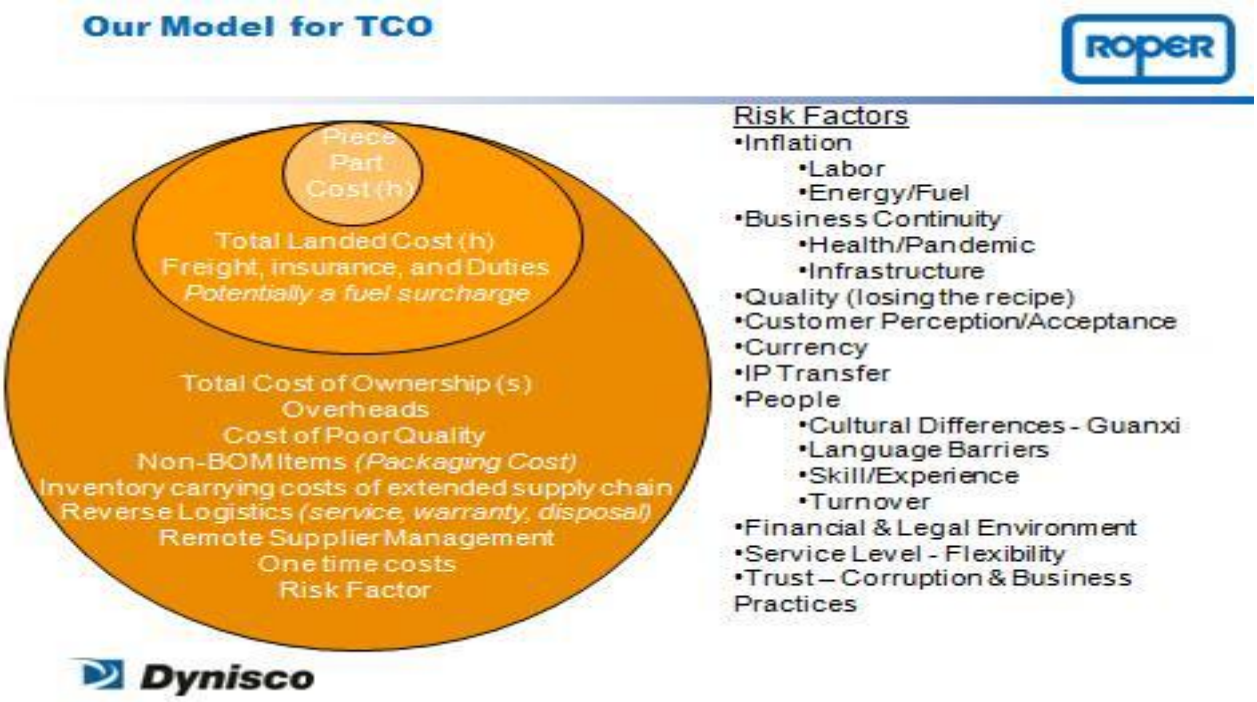
- Understanding value in the eyes of the customer
- Mapping out all of the steps within the value stream map
- Making the steps flow
- Using pull methods versus push everywhere within the flow
- Continually identifying and eliminating wastes

I think you can say that the idea of eliminating unique part count directly correlates to identifying and eliminating wastes. At Dynisco we always talk about "eliminating the need" when looking at bad processes that someone might be trying to automate. The same goes for all of those fasteners – eliminate the need! The idea of Poka-Yoke or mistake proofing is supported in DFMA's goal of 100% symmetrical or 100% asymmetrical design. When we do cell layouts and look for the proper flow of material it is completely dependent on the design of the assembly. Assemblies that have standard parts, that do not have special tooling required, allow for the easiest Standard Work to be created. These are not all of the similarities, but one must consider that Lean training for Engineering resources could and should be a prerequisite of DFMA training.

TCO

Piece Part Cost, traditionally this is where Supply Chain lives – in the world of Purchase Price Variance. A world of black and white captured within the standards of an MRP/ERP system. Unfortunately, Piece Part Cost doesn't capture all of the costs associated with a strategic sourcing decision. There are other factors including freight, duties, insurance and fuel surcharges. This brings us to TLC or the Total Landed Cost. The Total Landed Cost captures all of these additional costs along

with the Piece Part Cost. Unfortunately this still doesn't represent all of the costs associated with a part. You must look to the Total Cost of Ownership to truly understand all of the impacts.



Dynisco has taken the approach that all new products must undergo a full TCO analysis before we decide where it is going to be built in the short term and most likely in the long term. It starts with a holistic review of all of the cost and risk factors associated with the product as listed above in the TCO model. These costs are captured in spreadsheets with known (cost of quality data, piece part cost, etc…) and also forecasted/unknown data (product volumes over time). A separate spreadsheet is utilized to come up with a risk factor score that is input into the spreadsheet. (One is listed below for reference.) Overall, the process is captured within a framework that is repeatable, measured, reviewed and tweaked as core data that impacts the decision making process changes over time. The TCO decision while calculated at a point in time actually takes into account the forward projections of cost data via third party sources. The TCO analysis is also revisited 6 months after product launch to confirm whether or not the assumptions made within the tool are correct or need to be modified. The important fact is that the process is consistent in nature and captures the who's, how's and why's around the decision.

Because Dynisco has facilities in the U.S. and overseas locations, this analysis is critical as we try to minimize the distance between where a product is demanded and where it is ultimately supplied from. When possible, manufacturing and distribution within the region of demand minimizes risks associated with a majority of the risk factors listed above. It also reduces lead times, inventory pipelines and increases speed of delivery – a critical order winner in many businesses.

Risk Factors – Calculating Risk

Risk Factors	Weight 1-17	% Probability	Risk %
Inflation (general)	4	100%	4.0%
Labor	12	20%	2.4%
Energy/Fuel	11	75%	8.3%
Business Continuity (general)	3	50%	1.5%
Health/Pandemic	13	100%	13.0%
Infrastructure	2	80%	1.6%
Quality (losing the recipe)	17	100%	17.0%
Customer Perception/Acceptance	1	25%	0.3%
Currency	8	100%	8.0%
IP Transfer	15	100%	15.0%
People (general)	5	75%	3.8%
Cultural Differences - Guanxi	6	75%	4.5%
Language Barriers	7	95%	6.7%
Skill/Experience	10	75%	7.5%
Financial & Legal Environment	14	75%	10.5%
Service Level - Flexibility	16	100%	16.0%
Trust – Corruption & Business Practices	9	75%	6.8%
Overall Risk Factor			7.5%

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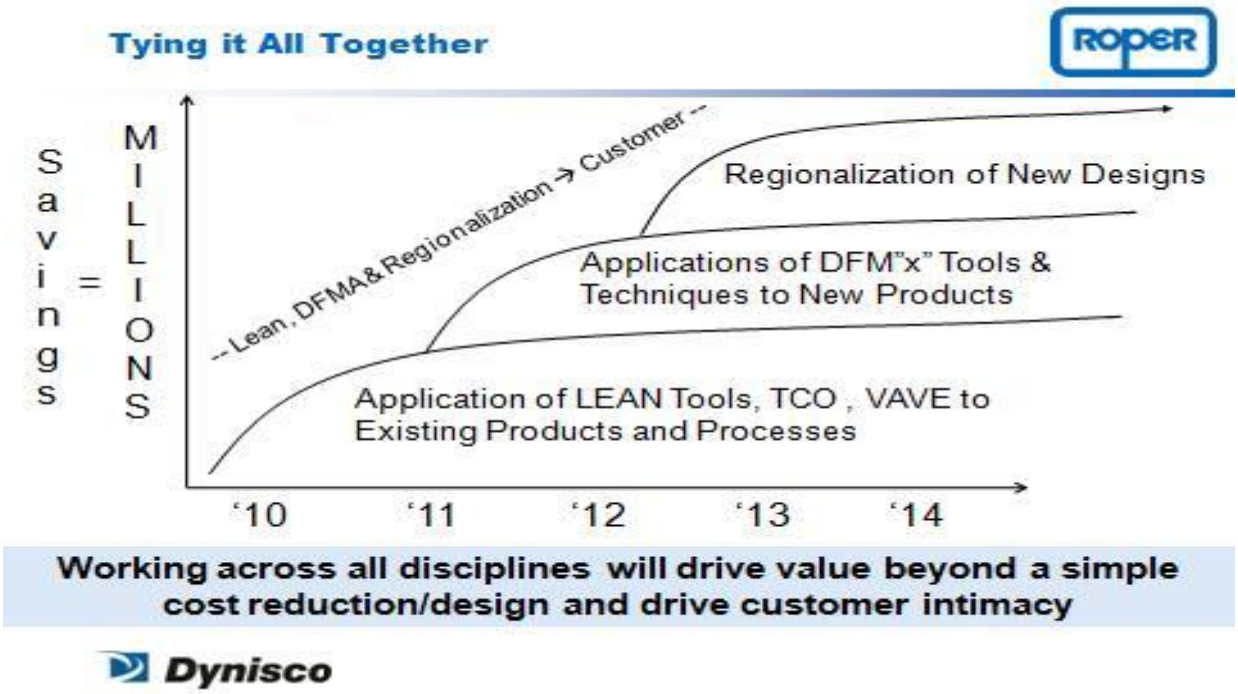
VAVE

Similar to Lean, VAVE is the toolset by which opportunities for cost savings on existing designs are identified and, when using a DFMA tool, validated. The savings identified and validated are then sourced and realized, again allowing money to be freed up for investment in new products that have had DFMA injected into the product development process from the start. By doing so you can radically reduce your overhead structures, increasing Gross Margins, all while producing something that is unique to the customer (potentially through postponement) but standard to you (via modularity). Enough about the long term vision, let's understand why it's so important to appreciate the VAVE model in an asset light environment.

Simply put, we cannot have ***"go to Gemba"*** anymore. In an asset light model we have become detached from the knowledge of the processes that our suppliers use to build out our parts and subassemblies. Ideally, the production processes would be within short travel distances so that we could understand the impact our designs have on them in achieving process capability but that is most likely not the case. We have become a world filled with low cost geography sourcing and outsourcing. We have become commercial negotiators, where if today we paid $1 for an item and tomorrow we paid .85 cents, we would celebrate the 15% reduction. Utilizing the VAVE tool set we can move beyond commercial negotiations and regain the process knowledge that would allow us to understand that the supplier economics for that $1 item. Suppose as we build up the cost structure for the $1 item and found that all costs and a fair profit margin equaled .30 cents. Would we celebrate the 15% reduction??? **Most likely not.**

The knowledge that we bring by capturing the "should cost" contained within a tool that models processes that we no longer have direct knowledge of will bring a step function reduction in our cost structure of our parts – knowledge equals bargaining power. Dynisco began using this technique in 2011 and has seen savings as high as 40%. We also believe that through the application of these tools we can attain 25% savings on the addressable spend.



Tying it All Together…

Matt Miles looked at me the other day and asked "How did we get where we are today...?" I said, "It started with a 3 hour drive." It's amazing how little it takes to begin change. For Dynisco, a decision to force the conversation about what we were going to do differently began with a drive between our Alpha facility in Akron, Ohio and Viatran in Wheatfield, New York. Two people, three sequestered hours and a commitment to go forward and walk the walk, immediately.

For all companies/people it comes down to a decision to commit - from exercising, to not sitting in front of the TV – from bulk buying (over production), to small frequent trips to the local store (single piece flow) – from focusing on piece part cost, to understanding and implementing TCO - change begins with committed actions. This is not rocket science; it's the application of multiple tools and frameworks from varied disciplines applied to a business's product portfolio. That's it. From what you have seen today you need to start now. Time is the enemy and the absence of committed action is its talisman.

Dynisco is well into its journey and it has not taken a long time to have immediate impacts on our business metrics. The early success of the Lean initiatives helped fund the expansion into the 2nd and 3rd waves of strategies for understanding and providing value to our customers. They in turn have rewarded Dynisco with continued business and increased market share.

Thank you

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