Get’er Done for High Level Return: Using Structured Problem Solving to Attain Significant Value

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Introduction

The past few years have taught us many things; one of the most important of which has been that one must continually challenge their system’s status quo for improvements in performance. Since 2008, The Puratone Corporation (TPC) has re-focused its Continuous Improvement (CI) process to focus on key drivers affecting overall performance. As a result of developing a culture of CI, TPC has been able to achieve significant bottom line benefits in the amount of $7/hog or $3M annually. The key to this success has been due to the focused use of the structured problem solving methodology of Six Sigma. This presentation will outline why one needs to look at utilizing a structured problem solving approach, outline the problem solving approach of Six Sigma and review specific projects that have helped achieve significant bottom line success for TPC.

Why Do We Need to Use a Structured Problem Solving Approach?

As demonstrated in Figure 1, hog production companies have seen significant variability in revenue over the past two years. Hog producers such as Puratone saw their balance sheets decimated by substantial losses in the $40-$50/hog territory in 2009. Recently we have seen better times, but there will need to be many months of positive returns to make up for the substantial losses of 2008-2009. Using the benchmarking platform of Agri-Stats, Puratone was able to understand that they were initially (2008) $24-$25/hog offside from the top 25% of producers in North America in net margin/hog. Puratone
quickly realized that waiting for market recovery was not a strategy for long-term success. As of 2008, Puratone renewed its focus on Continuous Improvement by utilizing the structured problem solving approach of Six Sigma as a means of closing this gap in performance with the best hog producers in North America. Puratone believed that if they were able to achieve top 10% status in net margin, they would be able to be one of the last companies hurt by down cycles and one of the first to recover, enabling their shareholders to achieve the highest level of returns vs. industry competitors.

Figure 1. Ontario Producer and Packer Net Margins (Source: CPMR, George Morris Institute)

![Graph showing Ontario Producer and Packer Net Margins]

- **What is Six Sigma?**

  Six Sigma is:
  
  - a structured problem solving methodology used in cases where a gap in performance exists between a current state and expected state, and where root cause and a solution to the problem is unknown.
  - a team-based approach to problem-solving
focused on meeting and exceeding your customer’s needs
bottom-line driven, both focusing on cost reduction as well as revenue growth
a repository of all known and proven problem solving methods including both Six Sigma methods as well as Lean methods.
a **Continuous Improvement methodology** of choice for thousands of organizations around the world. It is quickly becoming the methodology of choice by most institutions and businesses.

Six Sigma utilizes the DMAIC methodology outlined below, starting with a problem statement that defines the gap in performance between a current state and an expected state of performance. One of the key powers DMAIC has brought to Puratone is structure and accountability. The methodology has ensured teams are set-up correctly at the outset, not attempting to implement a perceived solution, but rather determine the actual root causes driving poor process performance and find solutions to achieve much higher levels of performance.

**DMAIC Methodology**

**Define**
- Write project charter
- Define voice of customer (VOC)
- Define critical to quality (CTQ) characteristics
- Define (as-is) process

**Measure**
- Determine how we will gather baseline CTQ data (data collections plan) and that we have reliable measurement process
- Gather and graph baseline CTQ data

**Analyze**
- Develop hypotheses of root causes of performance gap though:
  - Analysis of data
  - Brainstorming
**Improve**
- Prove/disprove hypotheses of root causes through:
  - Experiments and/or
  - Pilot tests and/or
  - Simulations
- Achieve sustainable improvement

**Control**
- Write, communicate, train and implement the control plan
- Update process map
- Standard operating procedures, instructions
- Ongoing performance score

Not unlike other organizations, resources are finite and limited in their ability to handle ever more Continuous Improvement projects. As a result, TPC utilizes a structured approach to project ideation, selection and completion of projects. This is outlined in Figure 2.

**Figure 2. Project Ideation and Selection Process at Puratone**
TPC ensures all individuals from across the organization are provided opportunity to suggest possible projects to be addressed by the methodology. TPC then uses its Operations Management Team to prioritize and select key projects to be initiated that will add to future growth in net savings/pig.

- **What Projects Have Helped Achieve Significant Value for Puratone?**

Puratone initially focused on areas where quick, significant wins could be found. In 2008, Puratone focused on completing the Full-Value Pig (FVP) project. This project addressed two key elements in Puratone’s marketing of hogs: determining the optimal weight to target to optimize net margin and reduce the variability in hog weights shipped by assessing the process of marketing pigs out of a finishing barn. As a result of completing this first project, Puratone now receives anywhere from $1-$2 in net benefit per pig shipped.

Puratone’s second focus was on its Finishing Feed Cost. A team was formed in 2008 to look for ways to reduce this cost, which made up 60% of the cost of raising a hog. After brainstorming and testing of many different factors, Puratone was able to improve both the diets, and how pigs were fed to reduce the cost by upwards of $4/hog. An analysis by Agri Stats information (Figure 4) showed that Puratone was able to move from an average performer in finishing feed cost/ cwt (x 2.6 to get total per pig), to number one in finishing feed cost/cwt in a period of only two years.

**Figure 4. Puratone’s Finishing Feed Ingredient Cost/cwt Variance vs. Average Agri Stats Performance**

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<table>
<thead>
<tr>
<th>Feed Ingredient Cost, variance from average</th>
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<tbody>
<tr>
<td>$1.00</td>
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<tr>
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<tr>
<td>11/06-10/07 Dec 07 Mar 08 Jun 08 Sep 08 Dec 08 Mar 09 Jun 09 Sep 09 Dec 09 Mar 10 Jun 10 Jul (m)</td>
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</tbody>
</table>

- Puratone
- Top 25%
- USA
- CAN
These are only two examples of many projects that have been completed at Puratone with actual results achieving a total of $7/hog and anticipated results of another $8-10/hog in projects just about to be rolled out.

- Conclusion

Puratone has been able to utilize the structured problem solving approach titled Six Sigma to achieve significant results over the past two years. TPC’s goal is to attain top 10% performance in net margin versus North American hog producers. As a result of this drive to continually challenge status quo, Puratone is well on its way to achieving this goal.