



QHSE PERFORMANCE METRICS AND IMPROVEMENTS, WHICH PROVIDE BOTTOM-LINE BENEFITS

BY FORREST W. BREYFOGLE III

This is how QHSE does really enhance business!

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FORREST W. BREYFOGLE III



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CEO and President
Smarter Solutions, Inc
smartersolutions.com

Often work in the Quality, Health, Safety, and Environment functions are not appreciated relative to an overall organization's financials. Businesses may have QHSE strategic statements, but these often good-sounding directives can become silo activities that lose out in their

execution to more pressing day-to-day priorities.

Of the four QHSE components, Quality, Health, and Safety problems can have direct linkage to the business financials; however, this relationship for the environmental component of QHSE is often not as apparent. Many businesses treat efforts in the environmental function as marketing and image factors that are of a minor importance to the bottom line.

This article will illustrate a methodology where QHSE functions, especially environmental activities, can be systematically integrated with other business functions in both operation procedures and their

performance measurements. Linkage will be shown as to the financial benefits that can be achieved from improving QHSE performance metrics. This article will use environmental issues that are generally associated with the "Green Initiatives" to illustrate the concepts; however, the methodology applies equally to other QHSE functions.

Green Initiatives

Why is Green Important?

- It is the right thing to do.
- Benefits our environment.
- Improves the future.
- Helps business success.

The fourth bullet is the one that can be the largest concern for organizations. If there is not a business benefit, Green initiatives are much tougher to implement.

We have all seen organizations state a position that they will be undertaking Green initiatives.

.. will become a leader in Green procurement.

- To achieve carbon neutrality.
- To engender a "spirit of sustainability"....
- To raise environmental sustainability management levels through unique management systems.

Vision statements are brief, catchy inspirational, and believable. These statements describe expected benefits.

These statements describe expected benefits. Strategies are an integrated overarching concept of how the business will meet its objectives.

How does an organization typically benefit from an organizational strategy?

- Drives Sales (revenue) up.
- Reduces operating costs.
- Reduces inventory.
- Improves employee loyalty.

What is needed is a system that introduces Green Initiatives that are positive or neutral to the benefits of revenue, operating costs, inventory, and employee loyalty, while improving the environmental and other Green impacts from the organization.

However, organizations often list possible Green initiatives being adopted by other organizations and pick the ones they would like to do. Others can be more successful when they look for Green initiatives that align with their organizational performance will include the primary financial measures of success (satellite metrics) and business needs to find synergistic initiatives.

Alignment of Green within Organizational Structure

A system for creating Green alignment with other organizational needs is Integrated Enterprise Excellence (IEE) as described in Figure 1.

The first few steps of the IEE business management are:

1. Define your organization
2. Measure performance in key functions
3. Assess performance for weakness
4. Establish financial goals
5. Identify strategies to improve performance
6. and more.....

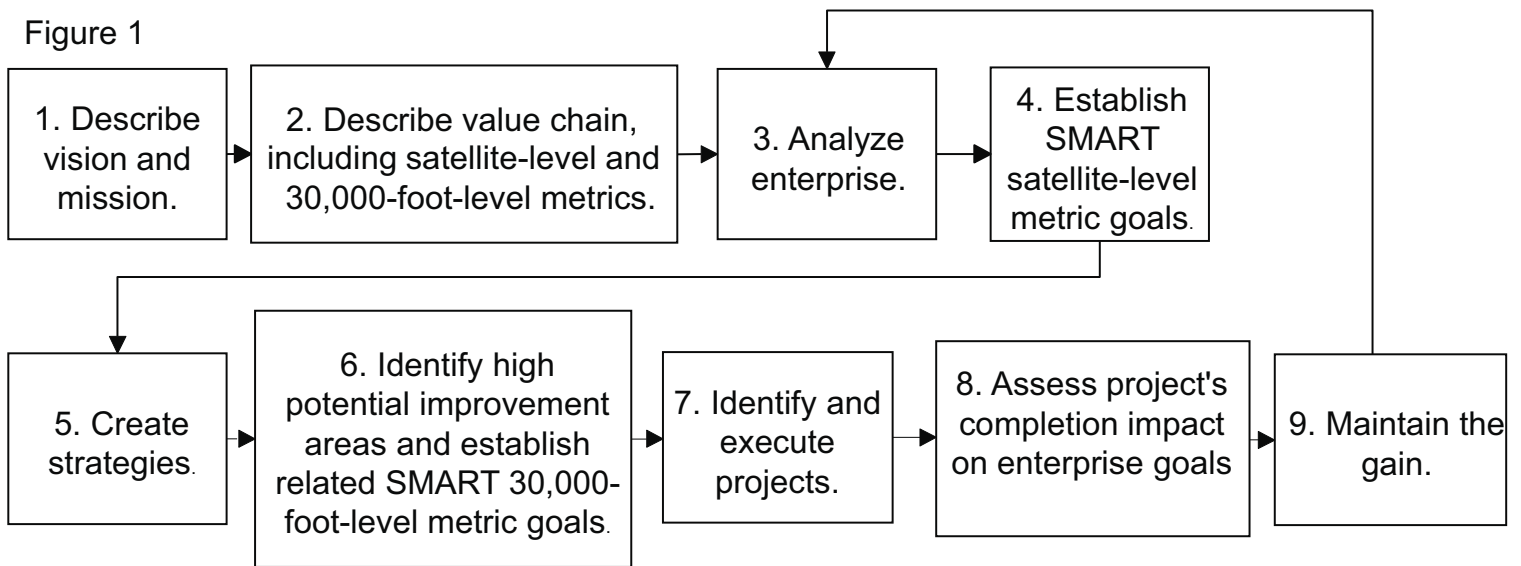
Let's assume that the organizational mission and vision (step 1) is adequate. An organizational IEE value chain diagram (step 2) will include the primary financial measures of success (satellite metrics) and business functions, where every function has identified performance measures (30,000-ft-level metrics). An example IEE value chain is shown in Figure 2, where the rectangular boxes contain organizational functions and the oblong boxes the metrics that are to be tracked relative to quality cost and time for the functions.

INTEGRATED ENTERPRISE EXCELLENCE VIDEO



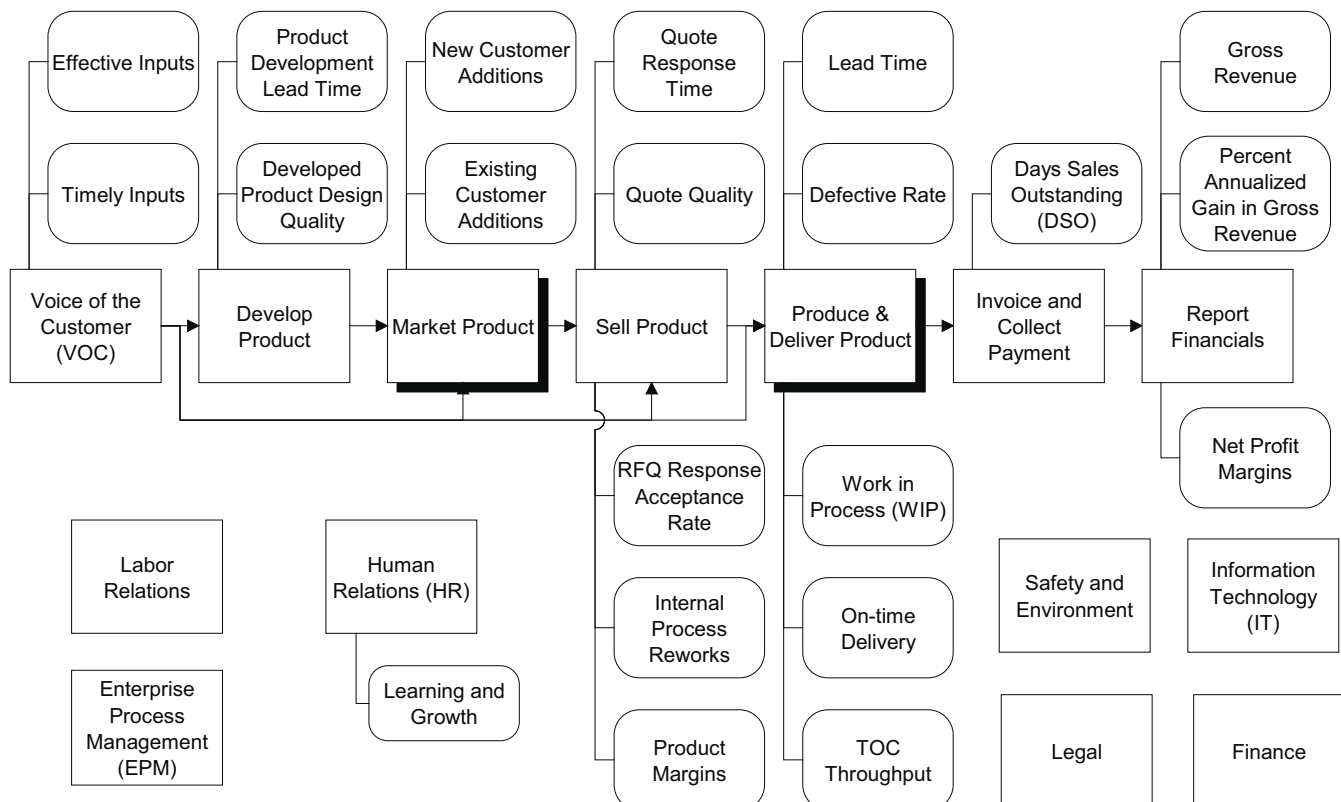
Forrest Breyfogle III
CEO & President, Smarter Solutions, Inc

Figure 1



From Figure 4.7 *Integrated Enterprise Excellence Volume II - Business Deployment: A Leaders' Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard*, Bridgeway Books/Citius Publishing, 2008

Figure 2



From Figure 7.1 *Integrated Enterprise Excellence Volume II – Business Deployment: A Leaders' Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard*, Bridgeway Books/Citius Publishing, 2008

Performance measures that could have a Green impact are highlighted in the IEE value chain shown in Figure 3.

Improving Green Performance Metrics

Typical areas for Green improvement strategies are:

Reduction in energy costs

- Reduce usage or self generation

Reduction of variable expenses

- Reduce packing materials (less or recyclable)

Transportation cost reduction

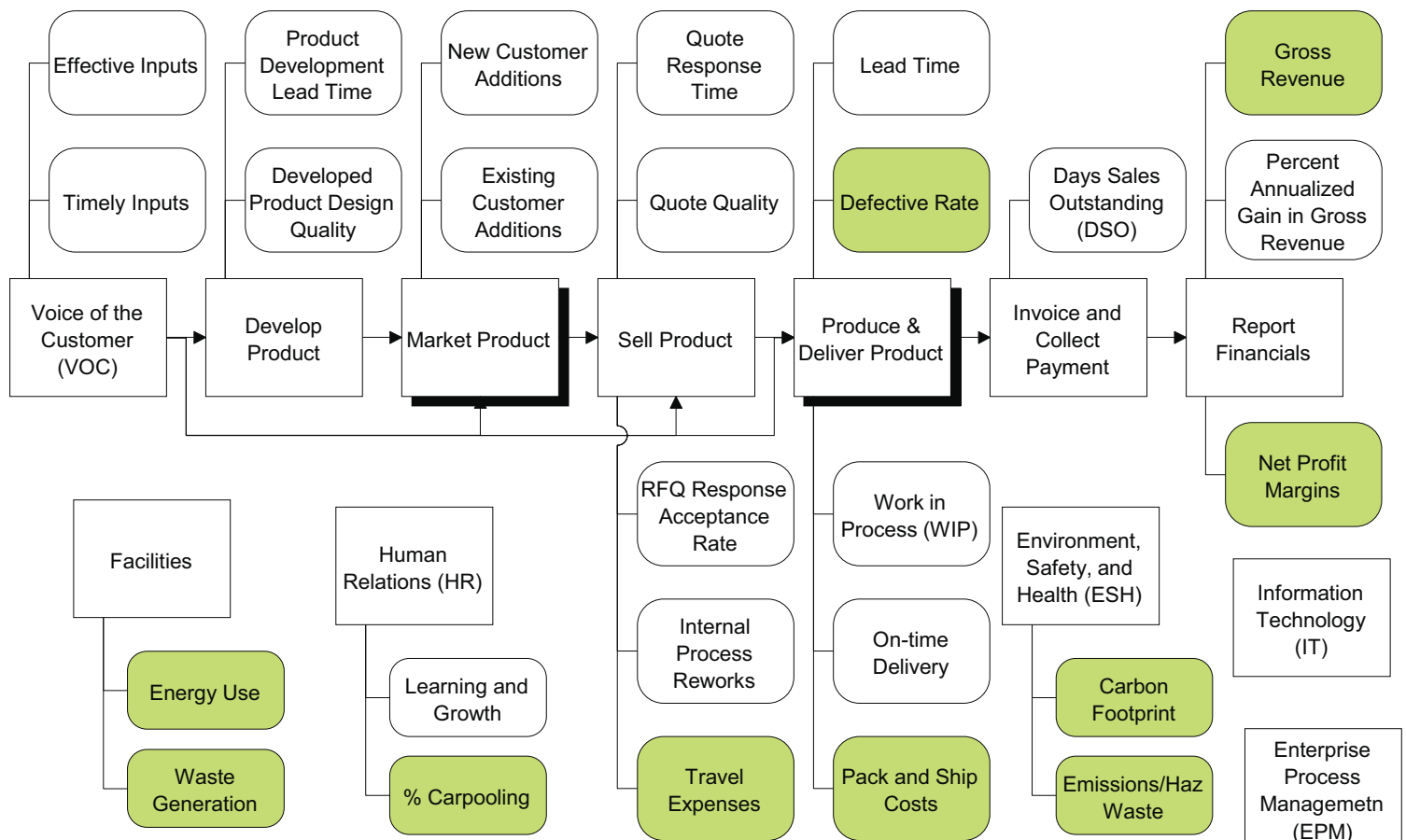
- Use lower carbon impact methods (saves money)
- Less overnight shipping

Waste reduction

- Reduce waste
- Use less hazardous materials, more recyclable materials

Steps 5-7 of Figure 1 describe the path for creating an enterprise business system that provides insight in management and where improvements are best applied, as documented in [Integrated Enterprise Excellence, Volume II – Business Deployment: A Leaders' Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard](#).¹

Figure 3



Application Example

Let now illustrate application of the described IEE techniques for a small manufacturing firm.

- **Step 1 of Figure 1**

Mission: Produce plastic injection molded items for consumer use.

Vision: Become a preferred, Green supplier for all major department store chains (have a branded display section in stores).

- **Step 2 of Figure 1**

Create a Value chain with satellite and 30,000-ft-level metrics.

Focus will now be given to where the impact of Green initiatives can best be recognized relative to the financials, as highlighted in the value chain shown in Figure 4.

With the IEE system, performance satellite and 30,000-foot-level metrics² are assessed for statistical stability. Performance measurements that have a recent region of stability are said to be predictable. If a process is predictable, the next question would be: What is predicted?

For continuous satellite-level and 30,000-foot-level metric data, a probability plot of the raw data from the recent region of stability can provide a prediction statement, as shown in Figure 5. For this illustration, the prediction statement for the stable financial profit margins metric would be a median monthly profit margin of 13.9% and 80% of the months between 10.4% and 17.4%.

Figure 4

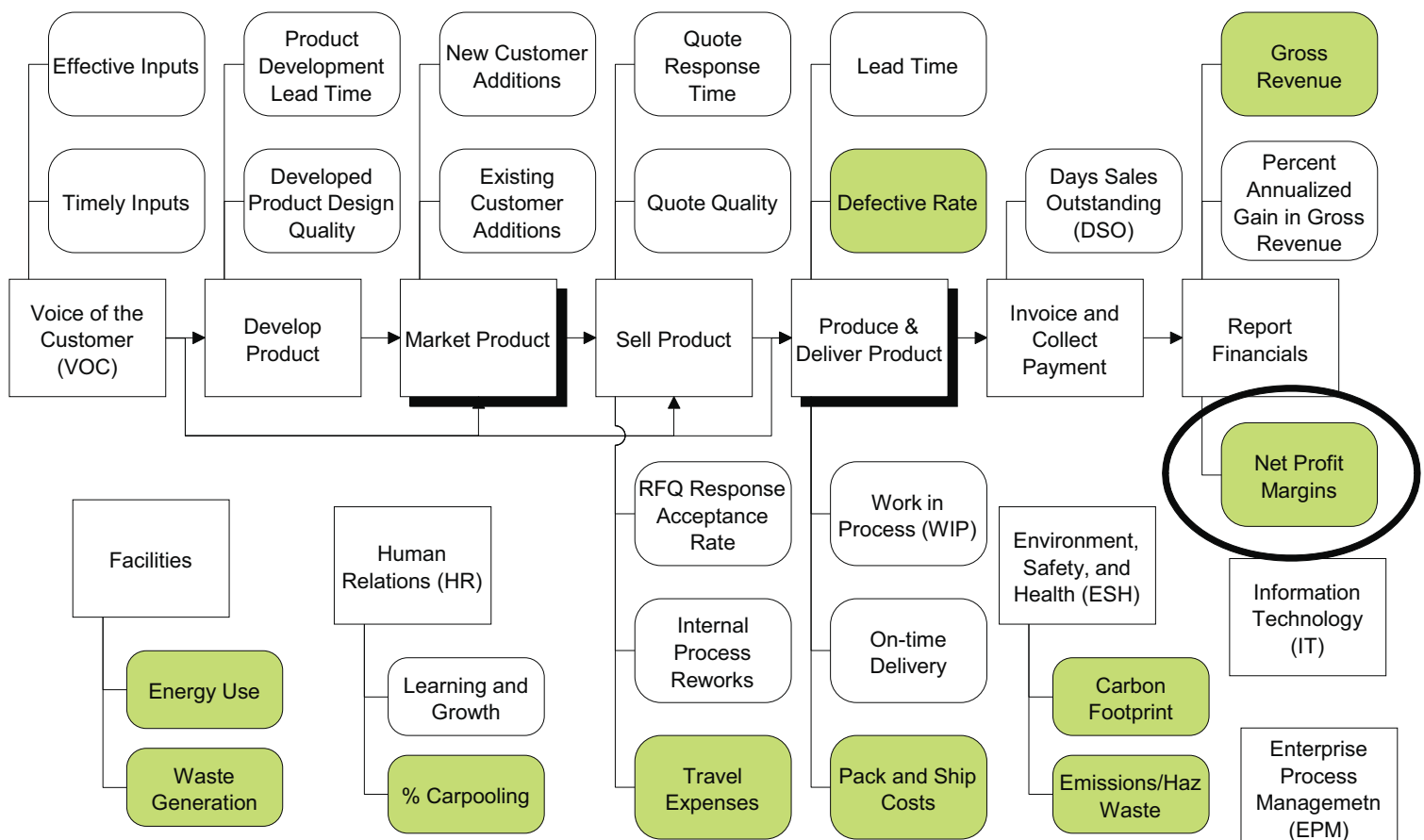
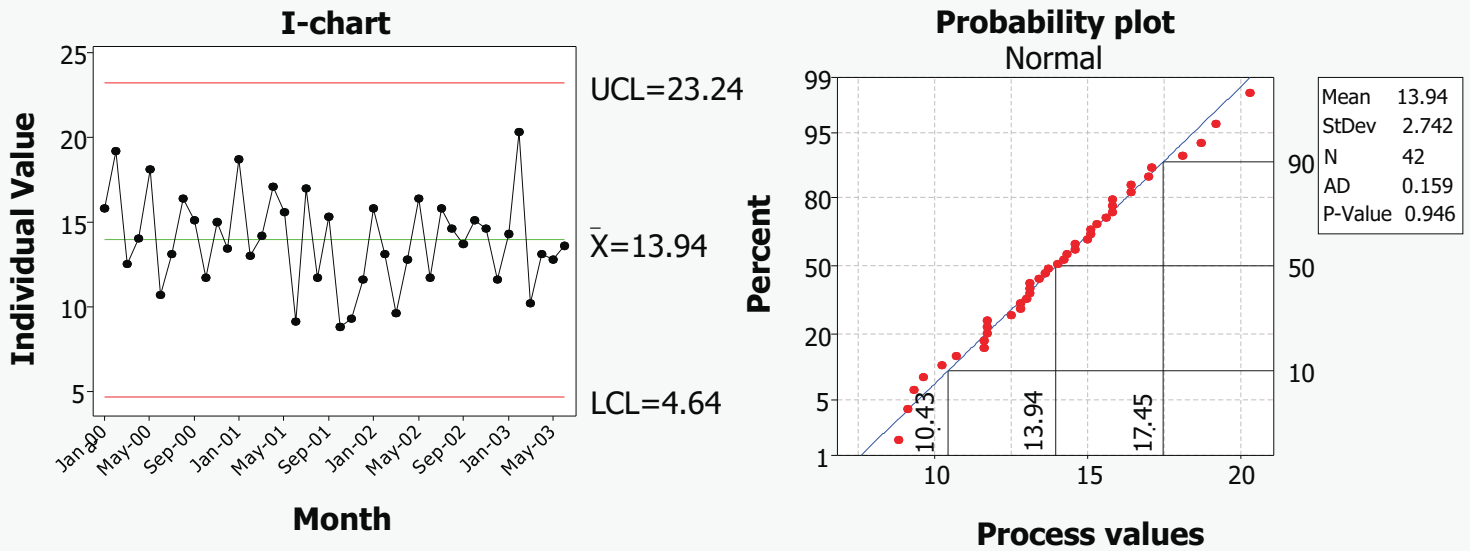


Figure 5

IEE Scorecard for Profit Margins



The process is predictable

The est. median is 13.940 with 80% of the occurrences from 10.426 to 17.454

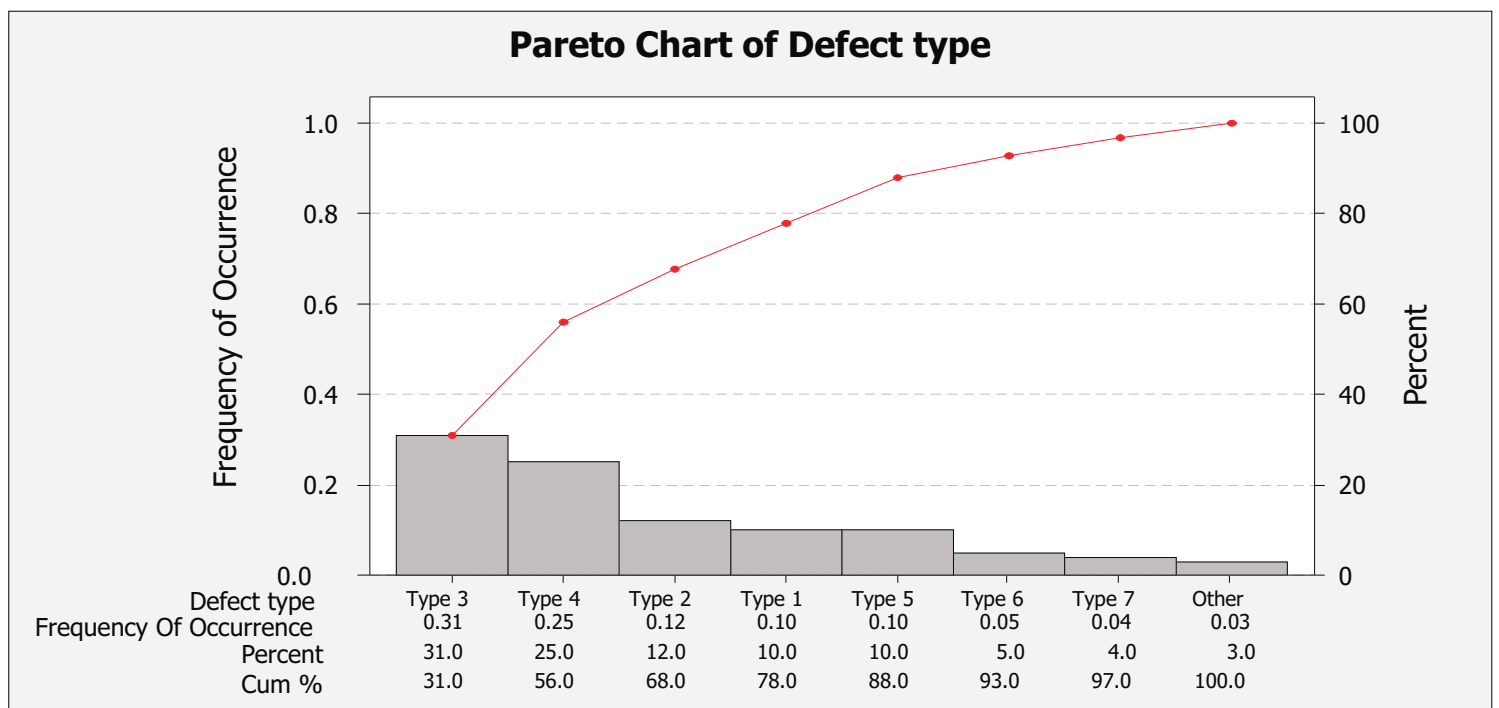
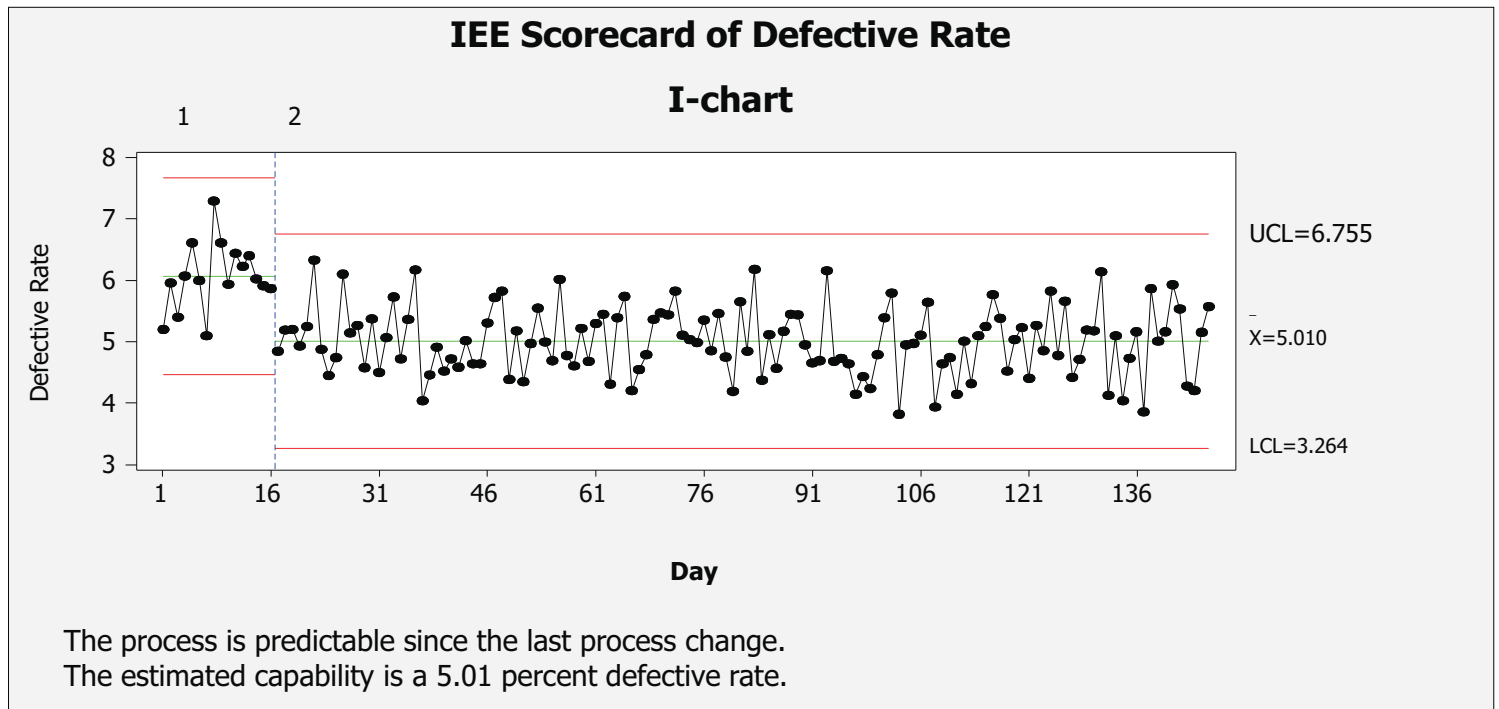
Step 3 of Figure 1

Let's now examine the green-metric 30,000-foot-level defective rate for the function "produce and deliver product," as shown in Figure 4. For attribute 30,000-foot-level metrics, the centerline of a stable process that has a consistent

subgroup size is a measure of process performance.² Defect rates impact Green objectives through, for example, the creation of waste, additional processing, and additional shipping return of defective units. Reducing defectives saves money by increasing profit through the reduction of operating cost.

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Figure 6



Step 4 of Figure 1

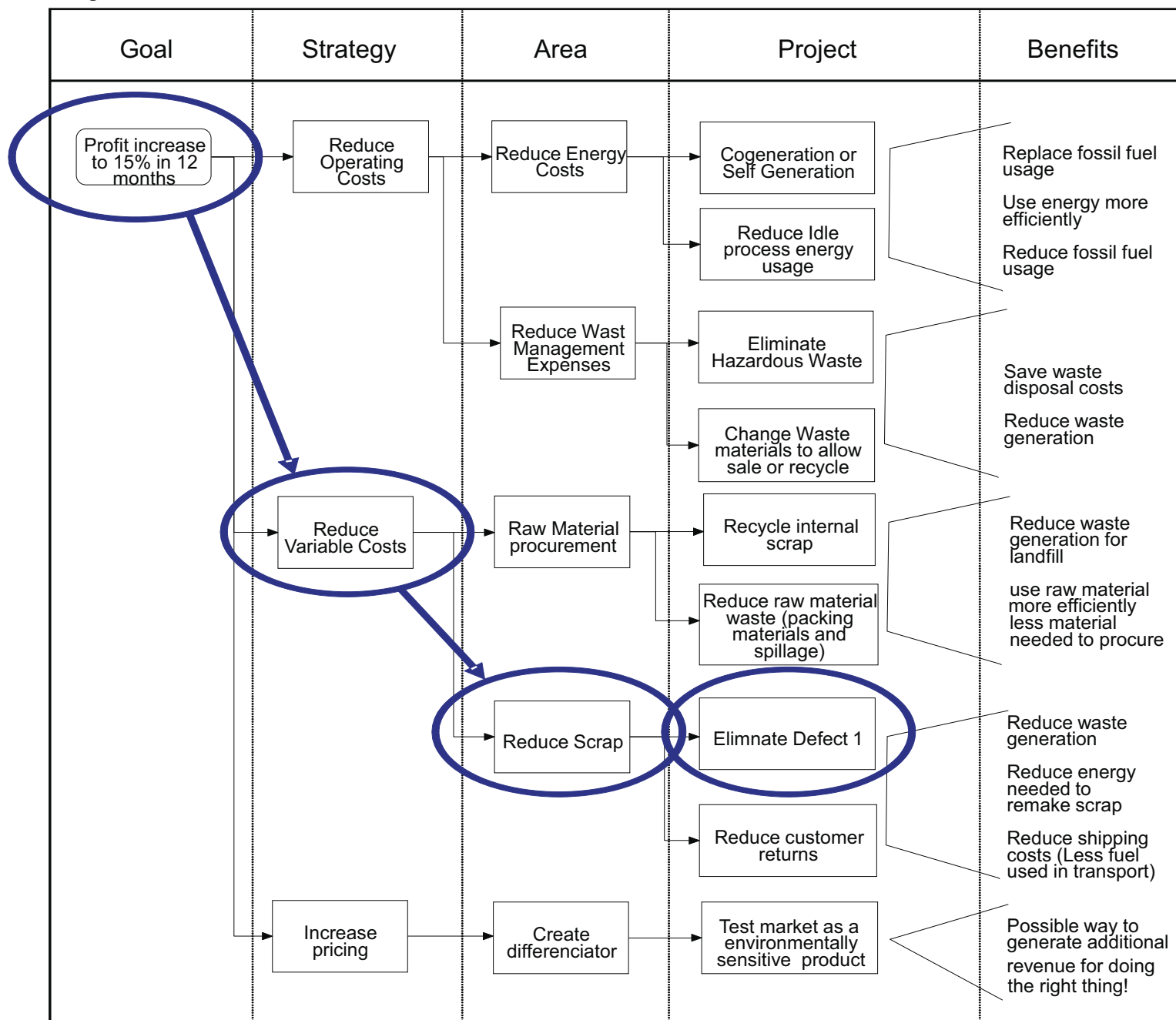
Set SMART (Specific, Measurable, Actionable, Relevant, Time-based) goals for the satellite metrics. For this illustration, consider that the industry sector average for profit margins is 16%, and our organization has a mean of 14%. A goal is set to reach a monthly mean of 16% within 12 months. Note how this metric is SMART and not arbitrary.

Step 5 & 6 of Figure 1

Set strategies and 30,000-ft-level performance goals through an Enterprise Improvement Plan (EIP), as shown in Figure 7, with noted benefits for each project. Defective rates are currently at 5.0%. A goal was set to reduce the defective rate by half in 8 months.

Through the EIP we have identified nine initiatives that will both support a Green Issue and improve the organization in a positive manner.

Figure 7



• Step 7 of Figure 1

Execute the improvement project using the most appropriate approach:

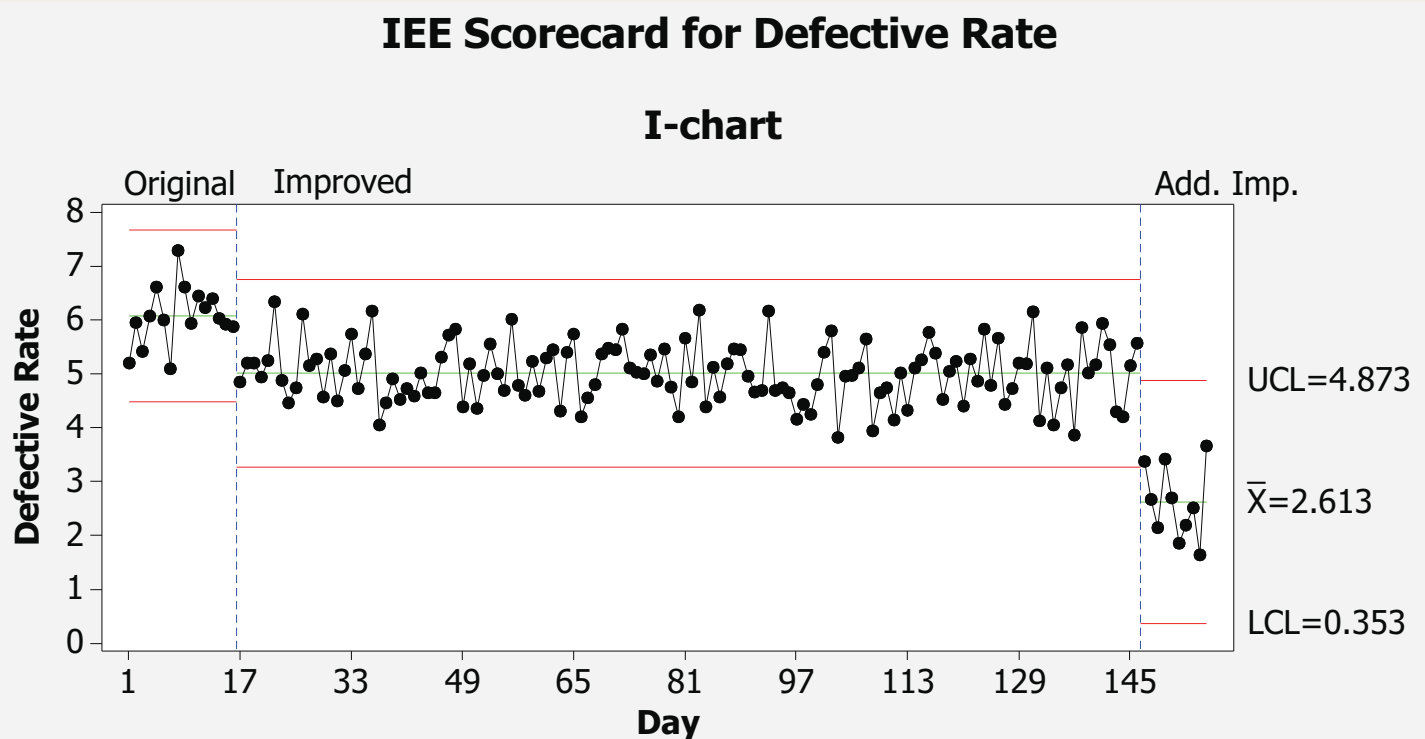
- Lean Six Sigma process improvement techniques to address common-cause or special-cause problems.
- Root cause analysis when a clear special cause exists.
- Plan-do-check-act (PDCA) continuous improvement process when targeting a series of small incremental changes that could lead to improvement.
- Just go do it, for the obvious changes.

• Step 8 of Figure 1

Monitor the impact on the organization. If the amount of improvement is not considered large enough, the enterprise will be analyzed for additional opportunities.

Figure 8 indicates that improvements were made to the defective rate. Figure 9 describes how the projects' bottom-line improvement goal of achieving a 16% median monthly profit margin was achieved within the twelve-month time-frame objective.

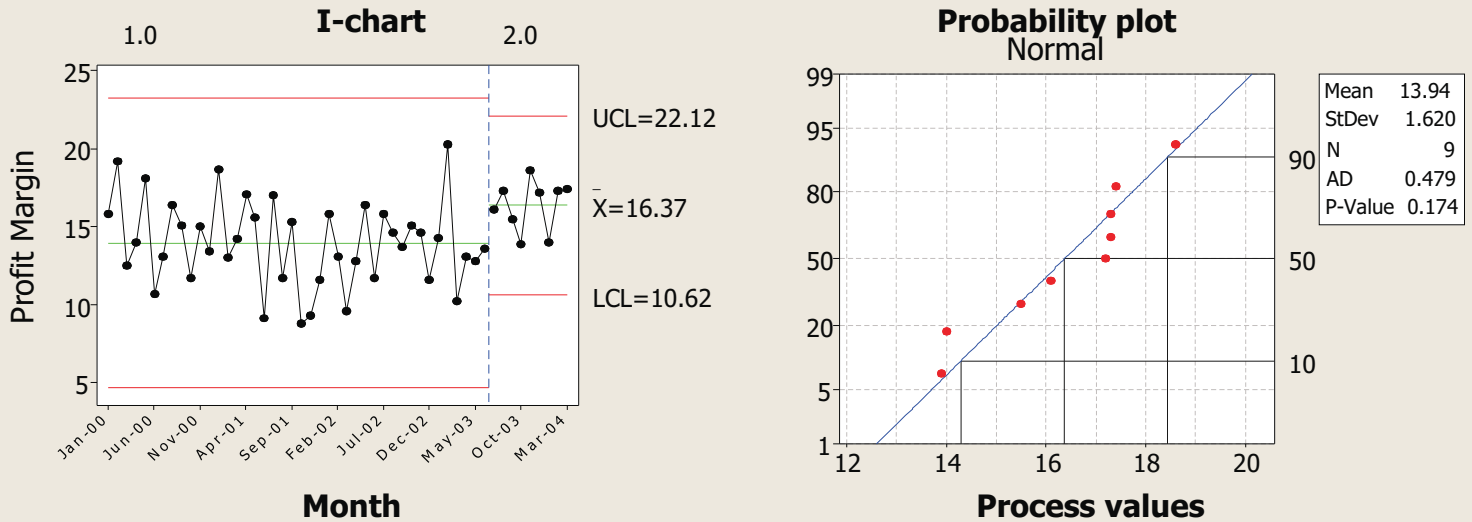
Figure 8



The process is predictable since the last change
 The estimated capability is a 2.613 percent defective rate.

Figure 9

IEE Scorecard for Profit Margins



The process is predictable since the last process change.

The est. median is 16.366 with 80% of the occurrences from 14.290 to 18.443

• Step 9

Maintain the gains and continue executing the IEE business system to continue improving!

Summary

With the described approach, the following was done:

- Green target areas were not selected based on strategies grounded on intuition or emotion. Areas were selected that would benefit the business.
- Business performance was base-lined so that it could assess the impact of any changes.
- Strategies were set after measuring performance.

Through the described IEE approach, the environment was improved without risk to the business, noting again that a similar approach could be applied in other QHSE areas.

References

1. Integrated Enterprise Excellence Volume II - Business Deployment: A Leaders' Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard, Forrest W. Breyfogle III, Bridgeway Books/Citius Publishing, Austin, TX 2008.
2. Integrated Enterprise Excellence Volume III - Improvement Project Execution: A Management and Black Belt Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard, Forrest W. Breyfogle III, Bridgeway Books/Citius Publishing, Austin, TX, 2008
3. Figures were created in this document using Enterprise Performance Reporting System (EPRS) software

About Forrest W. Breyfogle III:

CEO and President of Smarter Solutions Inc., www.smartersolutions.com. Forrest W. Breyfogle III is the creator of the Integrated Enterprise Excellence (IEE) management system, which takes lean SixSigma and the balanced scorecard to the next level. A professional engineer, he is an ASQ fellow who has served on the board of advisors for the

University of Texas Center for Performing Excellence. He received the 2004 Crosby Medal for his book, Implementing Six Sigma. In 2011, Mr. Breyfogle was selected by Quality Magazine to be Quality Professional of the year. In 2012, Missouri University of Science and Technology presented Forrest with its alumni achievement award. E-mail him at forrest@smartersolutions.com.