



Vigilistics, Inc.

14 Bunsen
Irvine, CA 92618
(949) 900-8380
www.vigilistics.com

Strategies for Sustainable Food and Beverage Processing

*By Craig Gunther
Sustainability and Strategy*



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Introduction

Today, more than ever, the food industry is looking for smart strategies and best practices to assure sustainable production. Effective management of water, chemical use and other utilities is a good place to start. Longer term, companies need to be strategic about how to enable innovative choices and the critical thinking that is required to achieve sustainable development goals.

Enterprise Manufacturing Intelligence (“EMI”) solutions transform large amounts of manufacturing data into real knowledge used to drive business results. Businesses that make decisions using this intelligence can achieve superior operating performance, make better use of capital, and improve employee collaboration. They will innovate more rapidly, and can also use this information to communicate better and more efficiently with customers, investors and regulatory authorities.

Going Green: Beyond the Marketing

The goal of sustainable development is to “meet the needs of the present without compromising the ability of future generations to meet their own needs.” (World Commission on Environment and Development. Our Common Interest. 1987)

Customers and consumers are increasingly interested in knowing how companies will achieve this. Shareholders are taking an active interest in the social and environmental performance of their investments.

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Studies show that when choosing between two brands of equal quality and price, global consumers rank social purpose as the number one deciding factor, ahead of design, innovation and brand loyalty. That’s why virtually every major company in this sector now has a sustainability program with emphasis on reducing use of water, utilities and chemicals. Proper identification and execution on these types of sustainability initiatives means higher profits, and higher trading multiples.

As sustainability initiatives such as carbon and water management become more widespread, management

will be called upon to develop and report sustainability performance indicators (KPIs), especially those with direct and material financial implications. These performance indicators are critical not only because they are required to effectively manage sustainability programs; experts predict that they will also be needed to fulfill disclosure requirements. (Deloitte 2009)

For a processing plant, sustainability indicators should be key areas of impact that are used in to drive operating results.¹ Additionally, because branding plays such a major role in financial performance, they should offer early indicators of a failed inspection, product recall, or quality issue. They should be defined to aggregate intelligently across multiple plants and product lines, to provide corporate level reporting that is material using bottoms-up data. This creates a closed loop management system for corporate goals.² (Global Reporting Initiative 2010)

For these and many other reasons, the experts advise that sustainability indicators adopted by a processing plant should be measured and managed at **the most granular level** that's practical to implement. (Deloitte 2009)

Business Intelligence Creates a Competitive Advantage

So why should organizations invest now in manufacturing intelligence solutions that focus on sustainability KPIs? Because many of these indicators are not just a measure of sustainability performance; they're actually indicators of inputs and outputs that identify significant savings (or in some cases revenues), and that contribute meaningfully to enterprise cost reduction and value.

¹ The performance indicator at the plant level is used to drive performance results in the plant. For example, it is not enough for a processing plant to know how much water, chemical, energy and raw material is used in operations. If the performance indicator will be used to drive results, then the plant needs to know where and how it is being used, and be able to quickly identify and eliminate excesses.

² The performance indicator at the corporate level must be material to corporate performance. Corporate goals will be established top down. If they map into plant level performance indicators, then the company has a closed loop management system, with a bottom's up reporting.

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For example, to a finance department, knowing a company's energy footprint can be vital to unlocking government sponsored tax credits and incentives for improvements that reduce the company's energy costs. To the marketing department, it is crucial data that drives value with customers and investors. To operations, eliminating unnecessary use of resources is key to controlling costs and improving margins, and every penny saved hits the bottom line with an enterprise valuation multiple. Understanding use within a plant and across an enterprise allows strategic capital investments to be made smartly. It fosters innovation through critical thinking based on real business intelligence and shorter decision cycles.

In selecting an Enterprise Manufacturing Intelligence solution for a food or beverage processing plant, the customer should consider the following criteria:

- **Data Collection.** Real time data pulled directly from the plant floor. This is required by the scale of data needed for next generation quality, compliance and process management solutions.
- **Process Standardization.** Consistent process definition across the enterprise, with a unified data schema, and highly repeatable collection.
- **Business Intelligence.** Dashboard reporting and business intelligence analytics tools that are built around key process indicators.
- **Data Management.** Intelligent integration with enterprise resource planning, accounting and information services; repeatable data collection.
- **Product Lifecycle Management.** The lifetime cost of maintaining the product, including installation, maintenance, and interfaces.

Aligning Business Intelligence Solutions with Strategic Business Goals

Business Intelligence used in food and beverage processing plants should be forward looking and encourage innovation. After all, the entire purpose of

business intelligence is to enable more effective decision making. For processing plants, that means decisions about products, processes and plant equipment.

Historically, companies that needed real time data from the plant floor addressed it tactically by programming a SCADA based platform that served the primary purpose of plant automation control. This can be a daunting task that requires the customer to define the business intelligence goal, identify the KPIs, design the software, code the software, and provide ongoing support and product innovation. As a result, even if there is a strategic goal in mind, practical considerations drive the project toward a very specific and tactical conclusion.

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Today the state-of-the-art in technology has advanced to the point where processing plants have more options. New EMI solutions provide the business intelligence logic and KPIs. They will integrate into a SCADA based platform for those who have created one. They will also function stand-alone, and they offer a single point interface for corporate ERP. These choices allow processing plants and their business enterprise to strategically align their technology with evolving sustainability goals, because they install a forward looking product.

Small enterprises and single plants are not exempt from regulatory and competitive pressures. They share common operating needs, even if the tactical considerations for implementing business intelligence may differ. For example, small companies may place a higher strategic value on “cloud” based offerings that relieve the burden of hosting software, offer benchmarking visibility into best practice at a larger set of plants, offer a pricing structure that

increments based on their tactical deployment goals, and is bundled with consulting.

Large companies have more choices, and more complex decisions to make. They will have an enterprise resource planning solution to integrate. They may have legacy SCADA based information collection points already established in the enterprise that need to be unified. Since their long term strategic view will have a significant and lasting impact on competitiveness, it should be consciously developed and discussed within the organization.

The tactical decisions made by the organization toward achieving the long term vision are varied and difficult. Conscious checks are required to ensure that unintended consequences from these choices do not sabotage the ability to realize the strategic goal. For example, if the control code and business intelligence code are intertwined, then the complexity of both will increase dramatically.

The ongoing technology support resources should also be known. Will a new software project be required at every plant, each time a product, equipment process improvement change is made? Over what period will the software project resources remain available to the company, and what are the implications of changing that resource? What is the risk to plant interruption and compliance validation when the business intelligence changes? These and other factors contribute to the lifetime ownership costs and they can implicitly work against the goal of innovating.

Dependence on a single control automation platform for both business intelligence and control automation needs may not always be aligned with the long term needs of the company. Companies should consciously evaluate the costs required to switch vendors, and to modify their unified data model work if multiple vendors are required, or if they become unsatisfied with the vendor.

Likewise, bundling proprietary technology with an equipment purchase to provide a partial business intelligence solution that cannot scale to achieve the goals of the enterprise presents alignment issues. Will it influence future equipment purchase decisions in a negative way? Will it create new information islands, and new interface requirements?

Most importantly, even large companies lack the focus required to properly design, develop and support an enterprise class software application. They may not even have the skill required to address the complex intersection of process, compliance, and technology demanded to do so. Regardless of their internal skill set,

the strategic sustainability goals of a food and beverage company will be achieved sooner by the companies who focus their efforts on using technology, when compared to the companies who are focused on software development.

Practical Steps that Processing Plants Can Take Now to Improve Sustainability

Processing plants have discovered opportunities to execute a wide range of “green” initiatives using EMI, such as managing utilities, improving yield and reducing shrink. Water, chemicals and natural gas, in particular, are often used in abundance in older plants.

Some areas of focus are:

- CIP Management
- Variable Cost Management
- Product Loss Management
- Yield Management
- Advanced Quality Management
- Overall Equipment Efficiency
- Automatic Compliance Alerts

Some examples of steps that processing plants have taken based on this business intelligence to improve sustainability follow:

- Understanding process variances by KPI allows companies to meet compliance risk tolerance using less resources (e.g., less over-wash, less over-heat, less over-treat, less over-fill, etc.).
- Making KPIs (and results) transparent increases accountability and pro-active engagement by employees in driving results.
- Identification of best results leads to sharing of best practices and more collaboration across the enterprise.
- The cost (dollars and time) of discovery studies by consultants and employees is completely eliminated with EMI, and the time to realize goals with information is decreased.

- Engineers use performance indicators to target areas for high impact capital investments, and to measure results.
- Start-up cost to integrate new equipment and processes is reduced, using aggressive management of prior baseline as a target.
- Range based performance indicators, combined with mobility alerts, mean pending issues are addressed before they become major problems.
- Quality variances decline, and yields improve, as a result of intelligence captured from advanced database techniques.
- Maintenance becomes proactive and planned, increasing system utilization and performance efficiencies (e.g., comparing multiple lines reveals information about equipment reliability).
- Demand-side management and off-peak usage (e.g., reducing utilities in operations at particular times of the day) to control costs and fines.
- Engineers re-design a vacuum cooling operation, recirculation loop, or other element of a physical plant to improve a performance indicator. The goals and return are measured.
- A recall is avoided because an inspection failure was observed in real time, and the product was never delivered to customers.
- Results of a sustainability indicator lead to increased sales due to more accurate and relevant results communications (e.g., water, carbon or chemical footprint by product type).

Summary

In today's economy, more than ever, the food industry is looking for smart strategies and best practices to assure sustainable food production. Business Intelligence Solutions for processing plants can provide dynamic, real time data, offer an immediate solution for plant and enterprise sustainability KPIs, and provide highly granular yet automatic data collection. These capabilities enable smart capital deployment, advanced quality, traceability and process management, and they fosters innovation and collaboration, providing a significant competitive advantage to their users.

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About Vigilistics

Vigilistics, Inc. is a leader in providing real time business intelligence solutions to manufacturing plants. Its patented vEMI Suite combines powerful analytics tools with intuitive graphical visuals, and a smart architecture that installs quickly and easily to any existing plant hardware and software. The vEMI Suite may be licensed as a comprehensive solution or as one or more separate modules, including: Product Loss Management, CIP, Equipment Efficiency, Variable Cost Management, and Traceability.

Transform the Way You Use Manufacturing Information

Vigilistics, Inc. 14 Bunsen, Irvine, CA 92618, USA. www.vigilistics.com
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