

# Data will drive the future of food production

**March 2017**

In manufacturing, normal business operation involves quick decision making, constant changes, and the accumulation and analysis of large amounts of data. For food and beverage manufacturers, where quality, consistency, and compliance are particularly important, intelligent use of this data can be the differentiator that your business uses to get ahead of the competition. This brief will explore the opportunity presented by a data-driven production as well as provide a starting point for improved food production at a lower cost.

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**ANALYTICS BEYOND MEASURE**

## CONNECTING IN MANUFACTURING

The cost of incorporating connectivity into new machines has decreased substantially over the past decade, causing more manufacturers to consider connecting their assets. This rise in connectivity presents both a challenge and an opportunity for manufacturers, with concepts like digital transformation, the Internet of Things (IoT), automated plants, and Industry 4.0 fresh on their agendas. At the heart of it, surviving means being able to manage this new world of connectivity and adapting your business to handle smarter, more data-driven decision making (Figure 1).

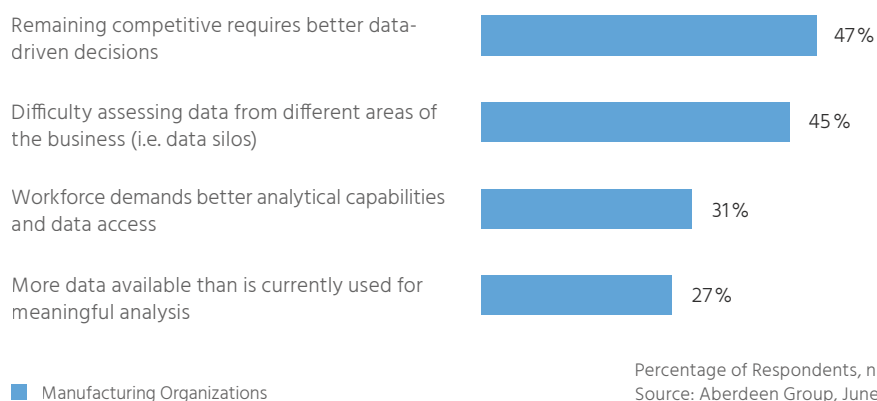
This new approach to manufacturing can have a significant impact on performance by changing how factories operate. Connected industrial devices and assets can intelligently communicate their state, condition, or health, so that service can be performed.

# 47%

**of manufacturers state they must become data-driven to be competitive.**

Managing these operational processes is becoming more of a challenge as the increases in operational complexity carry over to all parts of the business.

**Figure 1: Becoming Data-Driven is Essential to Success**



Companies are starting to recognize that the vast amount of data generated from products and daily operations can be turned into insight, making for a significant competitive advantage. This advantage comes from analyzing the data and rapidly turning it into actionable information, identifying inefficiencies, and driving improvements across operations. By examining successful manufacturers, we can see the steps needed to take advantage of a smart connected factory (Table 1).

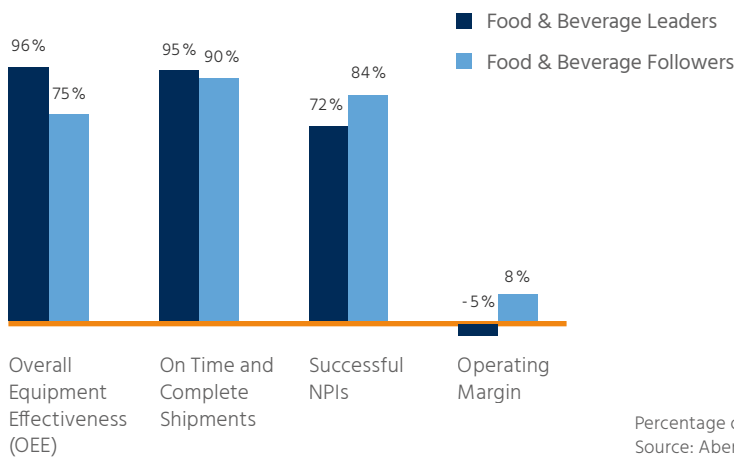
Food and Beverage leaders are outperforming their peers in plant efficiency, customer service, and innovation. This superior operational performance distinguishes Food and Beverage Leaders as they outperform corporate expectations by 15% (see sidebar). This is due to better usage of data for decision-making, as well as increased agility when managing operations. Food and

beverage manufacturers are tasked with delivering higher quality products at lower prices, and the connected factory is the cornerstone of this success.

**"At sites that have made efforts to move away from reactive-based decision making, we have increased capacity utilization by about 20%, decreased maintenance costs by 25%, and reduced spare part inventory by 20%."**

**~ Raymond Castle, Manufacturing Manager, Global Reliability Engineering**

**Table 1: Food and Beverage Industry Leaders Distinguish Themselves**



## BREAKING DOWN DATA BARRIERS

The first step toward becoming a top performer in the food and beverage industry is to deploy enterprise systems. Companies should invest in these solutions to efficiently manage the massive amounts of complex product and operational data (asset performance, testing, configurations, manufacturing specs, suppliers, compliance, etc.) to provide employees and executives with the ability to make connections between the day-to-day tactical operations and the overall strategic business goals.

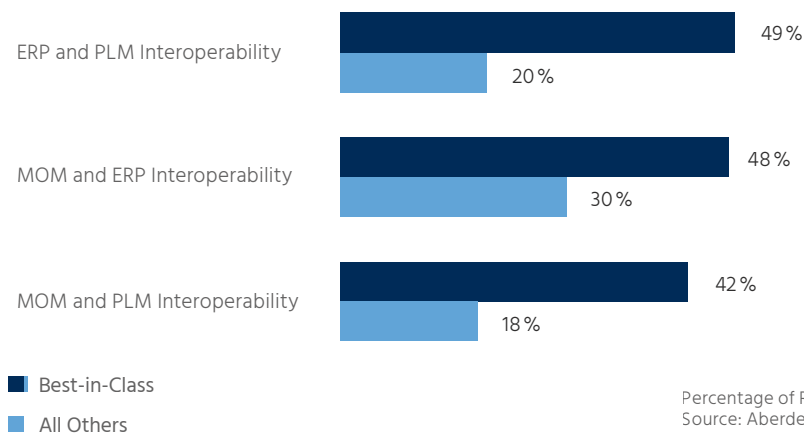
### IMPROVING THE BOTTOM LINE

**Operating Margin vs. Corporate Plan:**

- Best-in-Class: +15 %
- All Others: +1%

Essentially, top performers have digitized their operations to benefit from the resulting data. As seen earlier, one of the major roadblocks is the adoption of technologies that function independently. This tends to form data-silos in an organization, making it difficult to access data from different areas of the business. The real difference between the top performers and their peers shows up in providing interoperability between these systems (Figure 2). This digitizes the business processes from product design, to manufacturing process planning, and manufacturing execution.

**Figure 2: Interoperability is Key to Success**



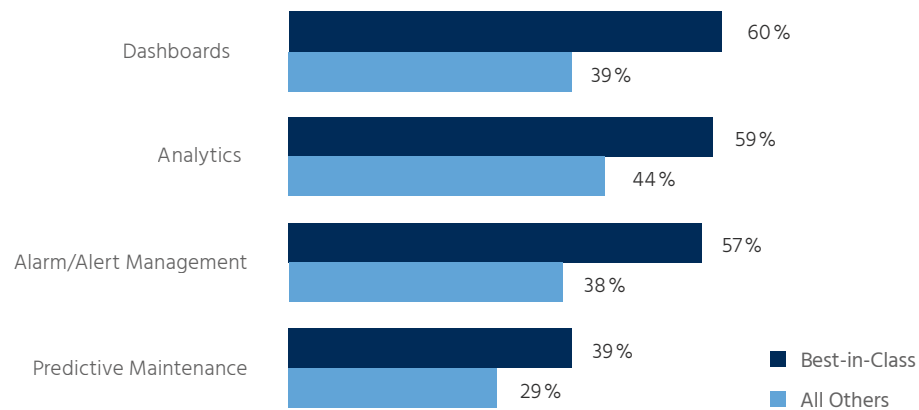
Percentage of Respondents, n = 127  
Source: Aberdeen Group, June 2015

## MAKING DATA ACTIONABLE

It takes more than connectivity and breaking down data barriers to succeed. That's why successful companies take it a step

further by providing their employees with the tools they need to turn that data into actionable intelligence (Figure 3).

**Figure 3: Tools for Effective Decision Making**



Percentage of Respondents, n = 127  
Source: Aberdeen Group, June 2015

## INTEROPERABLE ENTERPRISE SYSTEMS

The Best-in-Class are leading the way when it comes to utilizing enterprise systems to manage the complexities of product development and manufacturing:

- **Enterprise Resource Planning (ERP):**  
 Best-in-Class: 80 %  
 All Others: 81 %
- **Product Lifecycle Management (PLM):**  
 Best-in-Class: 55 %  
 All Others: 41 %
- **Manufacturing Operations Management/Manufacturing Execution System (MOM/MES):**  
 Best-in-Class: 53 %  
 All Others: 36 %

Once a company has standardized the way information is collected, the next step is wrapping intelligence around the information using analytics. Analytics provide decision makers with intelligence around when and where a problem may occur, but more importantly, provide direction on how to resolve the issue. Best-in-Class companies are also 90% more likely than All Others to implement tools like dashboards and alarms to better respond to operational needs. The combination of analytics, alerts, and dashboard modules automates data collection, analyzes and monitors data, and escalates events to the appropriate decision makers. And all this is done at the right time and in the right format to prevent or reduce the impact of incidents like equipment failure.

These applications summarize data from multiple business units and enable organizations to plan their purchasing, production, delivery, and maintenance more efficiently. It also enables them to act in an agile manner to predict problems before they occur. There are many operational applications for the technology tools employed by Food and Beverage Leaders that directly correlates to the superior performance in OEE, asset downtime, on-time complete shipments, and NPI success rate, highlighted earlier in Table 1.

## DATA-DRIVEN MANUFACTURING EXAMPLE

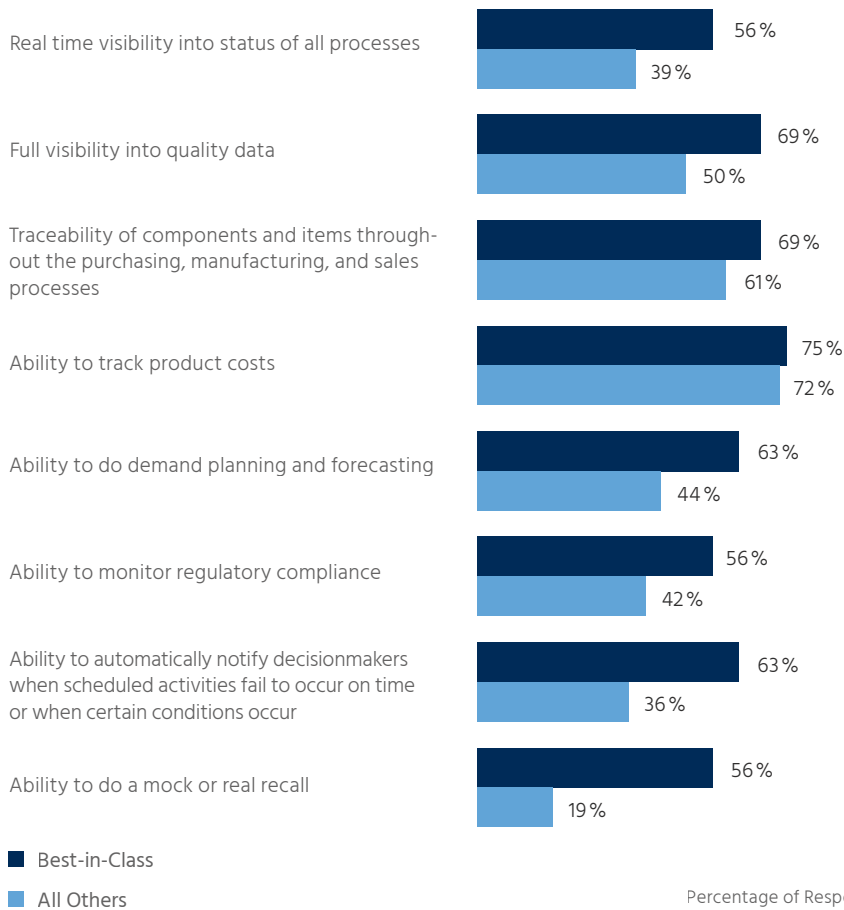
A half-billion-dollar bread maker was able to produce an additional 180,000 pounds per day – an amount doubling their previous output. This increase was due to the installment of 11 connected machines into a new factory. These machines were linked to software that provided remote access to historical and real-time data. Product dashboards enabled a comprehensive view of the whole system so that performance on the factory floor could be monitored.

The end result was a faster time-to-market, improved asset use, lower total cost of ownership, increased workforce efficiency, and smarter expenditures.

For Food and Beverage manufacturers, the future is a connected factory supported by automation. The benefits of a connected factory, with more access to and utilization of quality data, include increased control and the ability to make decisions that will positively impact profitability (Figure 4).

## **In Practice: Top Performers Improve Quality, Compliance, and Profitability through Digital Transformation**

**Figure 4: Control and Visibility Promotes Quality and Profitability**



For example, due to the technologies noted above, Leaders are more likely to have full visibility in the status of all processes and data across their operations. This includes information related to quality, compliance, and costs. For a food and beverage manufacturer, this can help them get more out of the commodities used in their

production, thereby improving output and margins. Since digitalization and the intelligent usage of data enables better planning and forecasting, Leaders are 43% more likely to have less waste and better use of resources that may be scarce, resulting in lower costs and improved profitability.

Another benefit of a connected, data-driven factory in food and beverage is to improve the quality and consistency of products while enforcing compliance. Due to the data generated, Leaders are 33% more likely to have the ongoing ability to monitor regulatory compliance. They can use this information, enabled through automatic notifications, to make timely adjustments to ensure quality when deviations are detected. This gives food and beverage manufacturers the control they need to produce products that will satisfy customers. And if things go wrong, top performers can react promptly to recall products as needed.

These capabilities are just a few examples of how the smart connected factory can improve performance for food and beverage manufacturers. By creating a centralized source of information through digitalization, these organizations can be agile to ensure compliance, quality, and profitability.

## BECOME SMART AND CONNECTED

The only way to survive in the increasingly complex world of manufacturing is to become data-driven. Good products and operational efficiency are still incredibly important, but a critical differentiator will be taking advantage of the data that a company already has inside their organization. Don't fight this increasing complexity – embrace it – and adapt your capabilities to become a data-driven manufacturer.

The future of the food and beverage industry is to be smart and connected. You, as a manufacturer, must digitally transform to fully take advantage of this new opportunity in food production.

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