

March, 2011

## Next Generation Formulation: Optimizing on Innovation, Compliance and Profit

The modest recovery in 2010 has many process manufacturers strategizing how to create great products to drive revenue growth. To uncover the most effective steps to improve product formulation and the overall development process, Aberdeen conducted a research study on the practices of top performers. Based on those results, this research brief provides specific recommendations on both the practices and technology needed to help process manufacturers achieve their top goal for 2011: profitable growth.

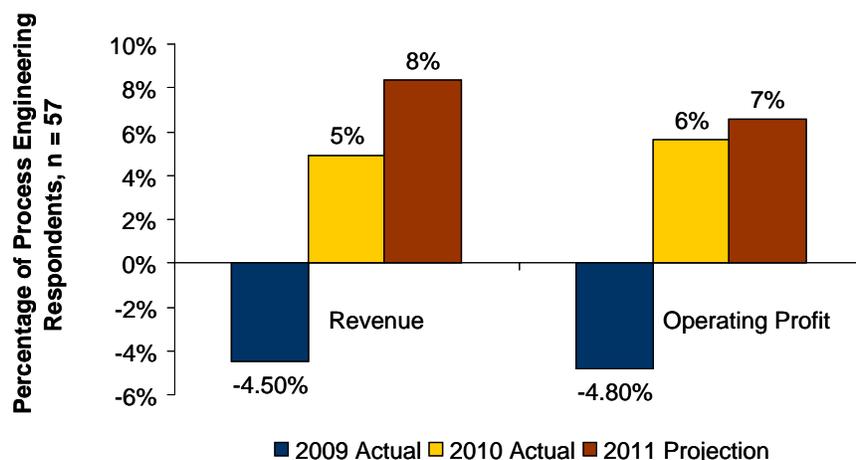
### Research Brief

Aberdeen's Research Briefs provide a detailed exploration of a key finding from a primary research study, including key performance indicators, Best-in-Class insight, and vendor insight.

### The 2011 Challenge for New Product Development

Process manufacturers responded well to challenges in 2010 and many saw improvements. However, it was still a tough year. Given how many of them cut costs and deferred projects to improve margins, hardly anyone would argue otherwise. Findings from the *Aberdeen Business Review* offer some quantitative measurement of the damage and modest recovery everyone felt over the last two years: in 2009 revenues decreased an average of 4.5% and operating margin decreased an average of 4.8%, in 2010 revenues increased an average of 5% and operating margin increased an average of 6% (Figure 1). *Aberdeen Business Review* findings for 2010 show process manufacturers are optimistic again for 2011.

Figure 1: 2009, 2010 Actual and 2011 Projected Performances



Source: Aberdeen Group, March 2011

The *Aberdeen Business Review* found process manufacturers are as equally focused on business execution in 2011 as they were last year, the percent of manufacturers focusing on execution changed from 48% to 49%; however, the percent of manufacturers focused on cuttings costs has decreased 15% compared to 2010, although it is still a top strategy for 2011.

What does this mean for those that lead new product development in process manufacturers? Interestingly, it means quite a bit. The reduced focus on cost cutting combined with the top goal of profitability growth shows that C-suite executives realize that the cost control initiatives of 2009 won't drive revenue growth in the coming years. Instead, c-suite executives realize that great, innovative and compelling products will help them achieve their objectives.

It's clear that those that lead product development will play a critical role in the success or failure of these process manufacturers. To address this challenge, these leaders could pursue any number of initiatives that might logically hold some promise of creating great new products while keeping costs under control. But how do they *really* know those efforts would work? To point these leaders to *proven* initiatives, Aberdeen conducted a survey-based research study between January and February 2010 on new product development for formula-based products. It examined the initiatives, tactics and performance of 127 business including 53 process manufacturers. These findings are presented in this Research Brief.

#### Research Question:

*How do you create great, compelling and innovative products during a cost controlled recovery that will drive profitability?*

## Identifying the Top Process Manufacturing Performers

How do you determine if an initiative or tactic is a good one? Simply, it must correlate with some differentiated performance. To do this, Aberdeen asked a variety of questions about business performance as a measure of successful new product development. After comparing and contrasting the performance of various groups against one another, Aberdeen found that one particular group, categorized based on a number of development practices they utilized, outperformed everyone else.

This group, designated as **Formulation Best Practices (FBP)** process manufacturers, is composed of respondents that have incorporated two specific formulation best practices that are used across the product development process. First, these process manufacturers build product formulas in a structured manner out of material, substance, and ingredient lists. Second, these process manufacturers also utilize formulation optimization. This allows them to determine target specification and characteristics and even regulatory compliance and the formulation applications determine the materials and quantities of those materials are used. All of the process manufacturers within the FBP group of respondents utilize both of these technology enabled procedures. This FBP group outperformed all other companies in several significant metrics (Table 1).

**Table 1: Performance Differentiation across Benchmarked Groups**

Definition of Maturity Class	Mean Class Performance
Formulation Best Practices (FBP) Process Manufacturers	<ul style="list-style-type: none"> <li>▪ +27% net change in product revenue over past year</li> <li>▪ 20% of revenues come from new products (&lt;2 years old)</li> <li>▪ 17% margin advantage on new products (&lt;2 years old)</li> <li>▪ 67% of development projects hit cost of goods targets</li> </ul>
All Other (AO) Process Manufacturers	<ul style="list-style-type: none"> <li>▪ +12% net change in product revenue over past year</li> <li>▪ 15% of revenues come from new products (&lt;2 years old)</li> <li>▪ 14% margin advantage on new products (&lt;2 years old)</li> <li>▪ 59% of development projects hit cost of goods targets</li> </ul>

Source: Aberdeen Group, February 2010

## Capabilities and Enablers of Top Performers

With a clear advantage in a variety of business performance metrics, the question that comes to mind is obvious: what are they doing differently? Some specific characteristics of the FBP group's new product development process provide advantages in innovation, time to product launch as well as control of operating and product costs. These characteristics fall into four categories.

1. Parallel and automated product formula design for optimization, reuse and compliance
2. Centralized formula and specification management for global development
3. Using PLM to integrate formula design with the overall development process
4. Accelerating PLM time to value with deployment templates

The following sections analyze the relevant research findings as well as explain their advantages for each of the categories described above.

### **Parallel and Automated Product Formula Design for Optimization, Reuse and Compliance**

When it comes to the process and procedures of formula design and overall product development that the FBP group utilize, it all starts with the core of a process product: its formula (Table 2).

**Table 2: Product Formulation Procedures**

	All Others	Formula Best Practices
<b>Formal Development Process</b> (such as stage-gate, waterfall or other similar approaches)	62%	75%
<b>Structured Formulation:</b> Formula created in a structured manner out of materials / substances lists	88%	100%
<b>Search and Reuse:</b> Search for existing whole or partial formula for reuse	81%	92%
<b>Formula Optimization:</b> Formulator defines specification, characteristic and regulatory constraints that the application uses to find optimal set of materials / substances for the formula	71%	100%
<b>Banned Material Notification:</b> Formulator is automatically notified about materials / substances they should not use during formulation	50%	82%
<b>Automated Characteristic Calculation:</b> Resulting characteristics of formulas are calculated automatically for the formulator (% moisture / % solids, tally up weights and volumes, etc.)	68%	85%
<b>Automated Specification Generation:</b> Product specification automatically generated from formula	64%	91%
<b>Formula Change Drives Specification Change:</b> Changes to formula / recipe result in real time update to product specification	62%	92%

Source: Aberdeen Group, February 2010

- Reuse and optimization for structured formulation.** A key trait of how those in the FBP group design their products is to formulate them in a structured manner out of predefined lists of materials, ingredients or substances. This enables them to explore more formula iterations in less time. Additionally, those in this group don't start from a blank sheet, but instead leverage existing formulas as the basis for the start of new products through search and reuse. This approach, as well as the use of formula templates, accelerates the development of the product by bypassing the non-value add activities of formulation. Furthermore, FBP respondents are utilizing formula optimization to automatically reach the right balance between cost, specification and regulatory constraints. If done manually, the formulator would instead take far longer to reach the same optimal formula or end up creating a sub-optimal formula.
- Tracking costs and compliance during formulation changes.** Ultimately, the formulator must track costs as well as compliance against claims and regulations while the formula is changing rapidly. Keeping up through manual methods is often impossible resulting in one of two scenarios. In the first, the formulator must take an inordinate amount of time to recalculate specifications and characteristics, delaying the overall development cycle. In the second, the formulator simply doesn't update them resulting in a lack of visibility into the implications of a formula change, increasing

the chance of undesirable yet unforeseen errors. Alternatively, those in the FBP group use technologies to not only automate the generation of overall product characteristics, specifications and track compliance but also automate their update as the core product formula is changed.

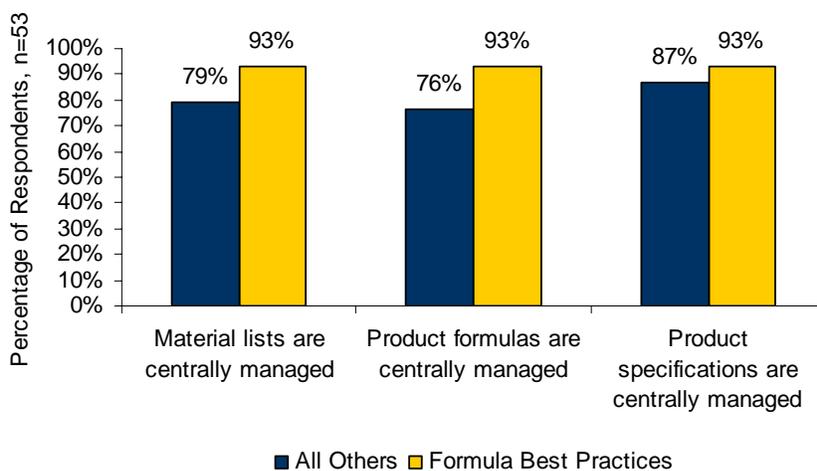
- **Formalized development process ties it all together.** While product design is a creative process, it must be done in a timely manner in order for the company to beat competitors to market, capitalize on seasonal markets or meet contractual deadlines with clients. To stay on schedule, those in the FBP group utilize a structured and formal development process such as stage-gate to not only ensure all the right steps are taken but also to make sure the product will be launched on time.

Overall, the top performers use these practices to successfully exceed what are often competing constraints: to developing better and compliant products in less time with existing resources.

### Centralized Formula and Specification Management for Global Development

In this second category of practices leveraged by those in the FBP group, the focus isn't on process and procedure as much as it is on how and where key product information such as material lists, formulas and specifications are managed within the company (Figure 2).

**Figure 2: Centralized Management of Formulas and Specifications**



Source: Aberdeen Group, February 2010

Why is centralized management of these items so important? The answer lies in today's reality of global product development. Without centralized access to a single source of truth for material lists, product formulas and specifications, globally distributed development stakeholders would be forced to manually coordinate their changes, a practice that often results in

errors at incorporating changes. These errors would incur both delays in the schedule and unnecessary costs such as lab tests on the wrong formula. Furthermore, those in the FBP group gain advantages beyond just error and cost avoidance. The automated generation of characteristics and specifications is based on structured formulas built from centralized material lists. Also, leveraging existing product formulas or templates for reuse is dependent on easily finding them. All in all, centralized management of material lists, formulas and specifications is critical to enabling global product development for process manufacturers.

### **Case in Point: Beverage and Dairy Goods Producer**

A semifinished goods producer for the beverage and dairy industry develops a wide variety of ingredients and food components. To support these processes, the organization has been evolving its use of PLM solutions from Selerant since 1999. Initially, the organization deployed Selerant's WinCHEM to provide formula and compliance management capabilities. In 2006, the organization expanded on these capabilities with Selerant DevEX® to provide workflow management and additional regulatory compliance capabilities.

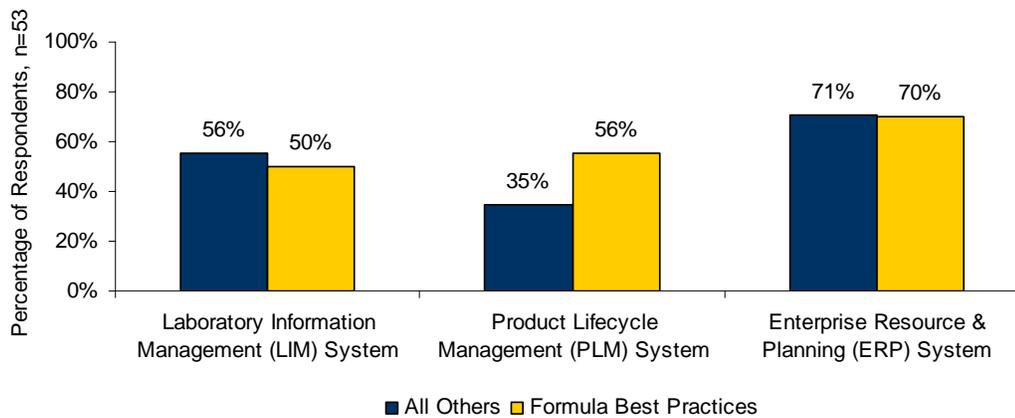
DevEX® has become critical to how product development is managed by this company. As such, DevEX® is used to manage processes including: new product development, introduction and verification of new raw materials, change management of raw material and formula data, and regulatory compliance process including the issuing of documents for the customers. Across these processes, DevEX® provides complete visibility to the development history of a product.

A Process Designer for Product Development and Regulatory Compliance with the company explains, "DevEX® plays a leading role in inventing new products and the changes made to existing ones. The key words are: transparency, security, and time. The processes around new product development have become more transparent and therefore more secure. The same can be said of the change management of formulas. As a result of this transparency we gain also time, because everybody involved in the progress is aware of where we are."

### **Using PLM to Integrate Formula Design with the Overall Development Process**

When it comes to technologies that can be used to manage product formulas, there is a wide variety of options to consider including Laboratory Information Management (LIM) systems, Enterprise Resource Planning (ERP) systems as well as Product Lifecycle Management (PLM) solutions. However, top performers find advantages in leveraging PLM solution over other types in managing formulas and a whole lot more (Figure 3).

**Figure 3: Applications or Solutions Used to Manage Formulas**



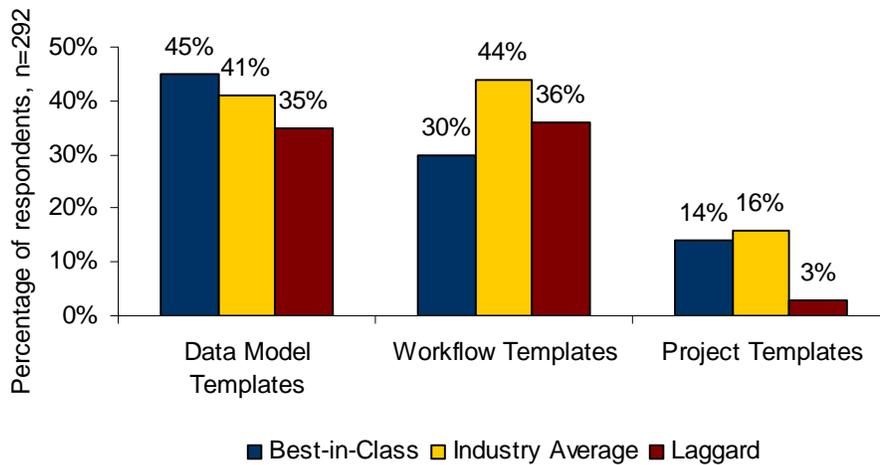
Source: Aberdeen Group, February 2010

Specifically, the biggest difference between these types of solutions is their treatment of the product development process. While LIM and ERP solutions can offer strong formulation or centralized management, they do not provide extensive capabilities to track and manage the product development process, unlike PLM systems which directly support them. This becomes important as one of strongest findings from this research shows that those in the FBP group use a formalized product development process to launch products on-time. The core concept here is that a connection between the formulation capabilities and the structured product development process is what provides insight into the status of the development project, such as compliance with multiple regional regulations and updated information from suppliers about material specifications. It is also what enables executives to take corrective action when a development project is behind schedule. Overall, the integration of formulation capabilities and the capabilities to run and execute the product development process is critical.

### **Accelerating PLM Time to Value with Deployment Templates**

So far, we've seen the importance of using a PLM solution to manage product formulation and the overall product development process. And given the sizeable impact this type of technology can have on the success of the company, many manufacturers gain a real sense of urgency to deploy such a solution as fast as possible. However, because company's processes can vary widely, there's often a need to modify the PLM solution to more closely fit that company's processes. As such, Aberdeen conducted a study from August to December 2009 called the *Deploying and Integrating PLM* to understand how top performers are getting value faster of their PLM solutions. One practice leveraged by top performers in that study was to use templates that include industry best practices to accelerate the modification of the PLM solution (Figure 4).

**Figure 4: Use of PLM Deployment Templates**



Source: Aberdeen Group, December 2009

- **Data model templates** allow for quick modification of the objects within the database on which the PLM solution operations. It includes not only standard object definitions but also the parameters used to describe it.
- **Workflow templates:** Workflows automate processes by creating tasks for users, which when completed automatically progress to the next stage of the process. These templates allow teams to deploy standard processes or to use them as a baseline on which they can further customize the template to their own needs.
- **Project templates:** Many PLM solutions offer project management capabilities for both planning and execution of a sequence of interconnected tasks. Because projects are often repeatable, use of standardized templates are valuable so that the sequence of tasks do not have to be recreated for each projects.

The purpose of these templates is simple: accelerate the deployment of the PLM solution so new practices can be adopted and, as a result, the business performance of the company is improved.

### Case in Point: Parmalat International

Parmalat, a €4bn Italian food group active in the milk and dairy products and fruit-based beverages industries, had long used excel spreadsheets and access databases to build formulas in a structured manner. The challenge was recalculating labeling and regulatory compliance at the end of development projects. “We would input the ingredients in quantities but it was an extra work to generate labeling information, specifications and to check against regulations,” explained Alessandro Bozzano, the company's R&D Manager. “That approach was very time consuming.” As a result, time

was spent generating information instead of working on other product development projects.

In response, Parmalat adopted the PLM solution DevEX® from Selerant, to automate and track many of the calculation and tracking activities in a single place. "It's been valuable to not only have the specification, labeling and regulatory compliance status generated in an automated fashion at the end of the project, but also throughout," continued Bozzano. This has enabled real time visibility of the state of their product, an ability that is useful even for those outside of development. "It's important, for example, because marketing sometimes likes to check nutritional information between two formulas in the middle of the development cycle," Bozzano concluded. "In the past, it would have been very time consuming. With DevEX®, it's tracked automatically for us."

## Recommended Actions

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Based on projections for 2010, confirmed again in its most recent quarterly *Aberdeen Business Review* survey (Q3 2010), Aberdeen believes that 2011 offers real reasons for cautious optimism in revenue growths and operating margins. However, the cost control initiatives of the last year won't drive that growth. Great, compelling and innovative products will. And in fact, some process manufacturers have already experienced success over the past year. Findings from Aberdeen's recent research show that top performers are outperforming all others in several areas including:

- A 15% advantage in year-over-year net product revenue increase compared to last year
- A 5% advantage in percent of revenues from new products
- A 8% advantage in percent of development projects that hit cost of goods targets

These top performers are driving these business advantages by employing a number of development practices and leveraging enabling technologies. In conclusion, we recommend adopting these practices including:

- Implement a formalized development process (such as stage-gate)
- Adopt practices and technologies to reuse existing formulas as the basis for new products, to build structured formulas and to optimize them against development constraints
- Centrally manage materials lists, formulas and specifications
- Deploy a PLM solution to tie together formula design activities with overall product development tracking and management
- Deploy a PLM solution utilizing deployment templates for the data model, workflow and projects

For more information on this or other research topics, please visit [www.aberdeen.com](http://www.aberdeen.com).

Related Research	
<p><a href="#"><u>The State of PLM for Process Goods: Profitable Products, Regulatory Compliance and IP Protection;</u></a>                      February 2010</p> <p><a href="#"><u>Managing the Innovation Portfolio: Enabling Engineering Success to Boost Profits;</u></a>                      August 2009</p>	<p><a href="#"><u>Materials Compliance for Green Product Development: Balancing Social Responsibility with Profitability;</u></a>                      November 2009</p> <p><a href="#"><u>PLM Solutions for the CPG Industry: The Impact of Formula Management and Specification Management;</u></a>                      October 2008</p>
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