PLM Vivo:
Rapid Deployment PLM for Food & Beverage

Kalypso White Paper by George Young
Food & Beverage Industry Challenges

Food and beverage companies are facing greater challenges than ever before, striving to deliver sales and profit goals in the current marketplace. To deliver sustainable profitability today, companies must boost innovation efficiency, translate productivity into dollars, manage business complexity, and ensure compliance.

With the food and beverage industry recently named as the second most crisis prone industry (falling only behind banking1), the need to quickly confront urgent challenges in a down economy is unprecedented - not to mention critical to future success.

Specifically, the food and beverage industry is facing the following challenges across the supply chain:

- **Food safety.** Ensuring product safety is critical for consumer confidence and brand protection. Retailers and regulatory bodies are concerned about supplier quality and are enforcing new policies around product and raw material traceability in order to protect the public.

- **Cost reduction.** Bringing products to market at a lower cost is a main focus in a recession, as commodities prices are set by what the market can tolerate. Meanwhile, costs are on the rise for both raw materials and compliance.

- **Fierce competition.** Incorporating global development is necessary to help combat competition across the globe and with private label brands and niche vendors.

- **Consumer insight.** Capturing consumer needs and incorporating them into products is a key driving force to not only creating the next blockbuster but to successfully compete against private labels.

- **Innovation ROI.** Enabling growth in a downturn while managing costs through design and knowledge reuse is required.

- **Mergers & Acquisitions.** Enabling rapid integration of mergers/acquisitions is also a focus.

- **Complexity.** Finding the right balance of complexity that maximizes value while minimizing costs is integral to managing growing supply chains, product proliferation, merged operations, reorganizations, and government mandates.

- **Sustainability.** Sustainability is emerging as a source of differentiation, competitive advantage, and profitability, from both a corporate and product standpoint.

- **Time to market.** Supporting a fast-paced new product development environment with condensed time-to-market and time-to-profit metrics is essential to ensuring competitive advantage and locking in significant profit margins.

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1 Institute for Crisis Management
Arguably, the most pressing of these challenges is the need for food safety, which will be the main focus of this report. The number of recent highly publicized product recalls clearly stresses the magnitude of compliance and traceability capabilities. To limit liability is absolutely vital to ensuring consumer safety, brand protection, and consumer confidence.

**Complexity Demands Traceability**

No company is immune to the growing risks of product contamination. However, in an industry rife with complexity, complete control of the supply chain is a major challenge.

Statistics reveal that the average company has 3,200 unique items, and, notably, small to mid-sized companies ($1-$20 billion in revenue) have 30% more items than larger companies ($20 billion plus in revenue) with a lower likelihood of automation. Inevitably, the importance of product tracking across multiple systems and organizations is escalating, particularly considering that 33% of consumer products are outsourced to third-party manufacturers where over 50% of the ingredients are purchased directly by the contract manufacturer for the brand owner.

The ability to respond quickly and resolve product contamination issues is determined by the ability to trace back through the manufacturer’s supply chain to identify and isolate the ingredient issue. While some manufacturers may have made improvements in their supply chain governance (e.g. with the implementation of consistent sets of standards and terminology for batch control and the interface between enterprise and control systems), they struggle to automate the systems that manage product data from formula or recipe development through manufacturing and out to their raw material suppliers.

ISO standards like ANSI/ISA S88 and S95 drive safety and compliance through the automation of data collection and exchange between different parts of the supply chain. With standards providing both suppliers and manufacturers with a consistent terminology for production and batch control processes, it creates the necessary foundation and a consistent model to bridge their “information worlds.”

However, and rather ironically, most manufacturers still lack internal visibility to trace back from the formula and packaging ingredient statement through to their own plants to identify the source of the contamination. For instance, less than 10% of the fruits and vegetables sold in a grocery store are the product of supply chains with track and trace capabilities.

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3 Cecere, Lora (2009 April 29). Going Bananas. AMR Research.
4 Ibid
A recent example highlighting this issue is the late March 2009 recall of salmonella-tainted pistachio nuts. The FDA has since expanded the initial recall due to a distributor receiving and repackaging the recalled pistachios, launching them back into the food chain instead of destroying them. Over 660 items have been recalled as a result.

The Price of No Visibility into the Supply Chain

As of July 2009, there have already been major recalls of peanut butter, cookie dough, ground beef, pistachios and milk. In 2008 there were 15 major food recalls. With the average recall cost at $20 million and 14% of companies having write-offs in excess of $50 million companies can’t afford to not track their products.

As the largest recall within the last year the salmonella outbreak in the peanut industry cost more than $1 billion and saw sales drop 13%. Kellogg Company alone has reported a recall of more than 7 million cases of product at a cost of approximately $65-70 million.

The loss of consumer confidence is equally impactful. Consumers want to purchase and use products with confidence and expect manufacturers to have and demonstrate complete control of their supply chains. When companies fail to quickly resolve product recalls, consumer confidence is shattered and enormous harm is caused to brand equity and a company’s reputation. This is also true across brands – for example, peanut butter sales plummeted across the board even for brands that were able to guarantee that their products were safe.

A recent study by the International Food Information Council Foundation indicates that only 49 percent of Americans are confident in the safety of the U.S. food supply. When a category has a recall, 57% of consumers reconsider buying the affected product for at least a year.

In this era of growing product recalls and global supply chains, being able not only to contain but also to avoid quality breaches is more important than ever. Food and beverage companies must improve traceability and take responsibility to ensure consistent product quality and safety while adapting to and meeting the demands of changing regulatory and customer requirements.

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5 Cecere, Lora (2009 February 6). Contaminated Peanuts Highlight Need for Prevention Over Recall. AMR Research.
6 Center for Science in the Public Interest
9 Cecere, Lora (2009 February 6). Contaminated Peanuts Highlight Need for Prevention Over Recall. AMR Research.
Call to Action: Drive Innovation with Product Lifecycle Management

In addition to food safety, companies must continually innovate to keep up with other critical industry factors such as meeting consumer and market needs, addressing supply chain and raw material cost fluctuations to optimize products, boosting or maintaining margins, reducing time-to-market and time-to-profit, and optimizing existing resources.

To help navigate these challenges, leading food and beverage companies are increasingly turning to Product Lifecycle Management (PLM) solutions. Deploying PLM can assure product traceability and compliance, improve innovation efficiency, lower cost of rework and redundancy, and create new efficiencies in product development processes.

While the food and beverage industry focuses heavily on product and process innovation, they lag behind other industries in adopting PLM to drive innovation. PLM has been universally embraced and profitably deployed by discrete manufacturing industries, yet the consumer packaged goods (CPG) industry in general has been slow to adopt PLM as a fundamental business process (Figure 1). In fact, only 28% of CPG companies surveyed in an industry benchmark report had centralized product data, and just 17% had integrated automation solutions for data and processes, along with collaboration around projects and products.  

Figure 1: CPG Lags Behind Other Industries in PLM Adoption

Recently however, CPG companies are showing growing interest in the results achieved with PLM. Companies who implement PLM technologies can identify and meet compliance requirements early in the product design

process and achieve significant results, such as a 27 percent product recall reduction and a 31 percent improvement in the number of products in compliance.

The first step in implementing a PLM system is defining the Product Data Record (PDR). The PDR is a logical data model that defines all data elements necessary to fully describe a product, from idea to realization - a single version of the truth for product data (Figure 2). PLM systems and processes have the ability to manage the complex interrelationships between formula, recipe and product design information and packaging artwork and labeling information, while also providing strong program management capabilities and support for regulatory compliance.11

**Figure 2: The PLM Platform**

The PDR provides traceability back and forward from any lifecycle state of a product, ingredient, process, or idea in its development cycle from concept to manufactured product. While traceability can’t prevent problems caused by contamination, it can reduce risk by enabling manufacturers to quickly react during product recalls by creating visibility to product data automatically within a company’s PLM software solutions. This enables a company to identify, isolate, and remedy the issue quickly and/or provide proof that their products are safe, overall minimizing financial and consumer impact.

This full traceability is only possible if a true integration of development data (residing in PLM systems) and manufacturing data (residing in Enterprise Resource Planning, or ERP, and Manufacturing Execution Systems, or MES) exists at the Stock-Keeping Unit (SKU) code level - a unique identifying

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code allocated to distinct products. When enabled at the most granular level, traceability allows companies to track unique items from shelves back to plant lines and even further to the supply chains of food and beverage companies’ ingredient suppliers.

Figure 3 illustrates an example of a company receiving a consumer complaint signaling the potential presence of an allergen in a candy bar, despite the label claim that the product is “allergen free.” With help of the PDR, the company can quickly identify all of the product’s components and identify all of the parties involved in the supply chain, whether they are involved in the manufacturing of the product (i.e. to understand which plant was involved) or in the supply of raw materials. The PDR maps all data generated during product development from the product formula, packaging, art and label, and manufacturing processes and plants. Because the final formula and intermediate formulas are linked to ingredients within the PLM systems, local plants can trace back to suppliers in a matter of minutes. The company can then require all involved suppliers to confirm that none of their products contains the allergen.

**Figure 3: Traceability**

1. Consumer Complaint: Presence of peanuts in an “allergen-free” candy bar
2. Local Plants Investigate: The lot number can be traced back to the correct manufacturing sites (plants 2 and 3) and batch number: “No peanut is involved in manufacturing process.”
3. The Company Investigates its Supply Chain: It lists all raw materials used in the composition of the final formula and contacts suppliers who provided ingredients for the batch.
4. Supplier Identified: Suppliers are contacted and one confirms the possible presence of peanut traces in its wheat flour.
5. Label Claim Changes: from “Allergen-Free” to “May Contain Peanut Traces.”

Customer Unit (SKU Level)
Reduce PLM Deployment Time and Accelerate Benefits with PLM Vivo

Traditionally, PLM implementations cost more than $750,000 and require anywhere from 22 to 35 weeks to deploy. To help address the urgent market pressures food and beverage companies are facing, they need a low-risk, low-cost solution that can jumpstart PLM benefits quickly and cost effectively. That solution is PLM Vivo.

PLM Vivo is a pre-configured PLM solution designed for rapid implementation for the food and beverage industry, enabling companies to reduce the time, investment, and effort to deploy PLM by up to 66 percent.

With the average cost of a PLM Vivo implementation at $250,000 and the ability to go live with the first product line in as little as 13 weeks, PLM Vivo provides a very targeted, rapid return on investment. The reduced demands on time and resources made possible by PLM Vivo open the door for mid-size food and beverage companies to gain the same PLM advantages already being realized by Global 1000 corporations.

PLM Vivo combines Kalypso’s world-class PLM expertise and implementation methodology with the most complete food and beverage functionality of any available PLM software - Oracle’s Agile PLM for Process. PLM Vivo is built on Agile PLM for Process, which manages all aspects of innovation, from product and portfolio management, to management of specifications, suppliers, formulations and bills of materials, packaging and labeling, compliance, and quality. The software is designed specifically for food and beverage businesses, with deep functionality including:

- **Single specification repository.** Complete product record and genealogy for ingredients, packaging, formulas, consumer trade specifications, commercial trade specifications and workflow/version control.

**PLM Vivo Pre-Configuration**

- Pre-populated security model
  - Pre-defined organizations, roles and privileges for users
- Data work templates
  - Excel-based templates simplify identifying data requirements
- Pre-defined workflows
  - Pre-defined workflows represent best-in-class processes
- Specification templates
  - Represent basic specification types needed for F&B companies
- Nutrition profiles
  - FDA/USDA nutrition profiles pre-populated for immediate application to ingredients and formulas
- Online Training modules
  - Used to support user training of basic business processes
• **Formulator’s workspace.** Experimental formulations considering compliance, quality, labeling and nutrition objectives and constraints; formulation with integrated process specifications; and integrated label ingredient ordering.

• **User-defined compliance screening.** Proactive compliance.

• **Other capabilities.** Add-on capabilities include approved manufacturers/sourcing relationships, electronic questionnaires, supplier portals, and new product development management.

**Implementation Methodology**

The PLM Vivo Implementation Methodology is a comprehensive blend of strategy, technology, people and process skills focused on business objectives to drive early stakeholder alignment and faster benefit realization. To ensure a successful implementation, the Kalypso team guides key people, processes and changes throughout the process, working with a cross-functional core team from Product Development, Packaging, Regulatory, Quality Assurance, and IS.

PLM Vivo is pre-configured with Kalypso templates, workflows, core data, and profiles specific to the food and beverage industry that are based on best-in-class implementation practices [Figure 4]. This not only reduces setup time, but also provides a straightforward path for legacy data migration, enables rapid business process documentation, and facilitates swift user adoption. To further enable seamless user adoption and to streamline data migration, Excel-based configuration work tools guide users through required, company unique data.

Additionally, PLM Vivo is designed to support and train new users with an eLearning education platform to deliver real, sustained results. Kalypso uses Oracle’s UPK training development tool to deliver best practice user training. Alternatively, the training materials can be customized for a particular organization’s environment.

By implementing PLM Vivo, companies will realize significant benefits such as:

- Developing a single version of the truth for all product data
- Increasing traceability
- Significantly reducing the cost of regulatory compliance
- Reducing time to market by 50-80%
- Decreasing label and package rework
- Designing new products more efficiently
- Collaborating across functional and company boundaries
- Reusing existing knowledge, recipes and formulations
Jumpstart Your PLM Journey

By pre-populating Oracle Agile’s PLM for Process solution, Kalypso dramatically reduces the complexity, time, and effort to roll out PLM to food and beverage companies with PLM Vivo. With the Product Data Record at the heart of PLM Vivo, companies can obtain full traceability to enable compliance and data integrity assurance, as well as identify business improvement opportunities to simplify and accelerate the product development process to drive products to market faster.

To learn more about PLM Vivo, contact Fred Brown at fred.brown@kalypso.com.
About the Author

George Young is a Founding Partner of Kalypso with over 20 years of professional experience in business management and consulting roles. He leads Kalypso’s Consumer Packaged Goods (CPG) industry practice. Prior to founding Kalypso, George was a partner with Deloitte Consulting where he focused on Product Development and Lifecycle Management. He also held R&D, plant management and business management positions with BFGoodrich. He holds four US patents and was named the 1994 Northeast Ohio Inventor of the Year. Additionally, he is the author of numerous publications on product development and commercialization. George holds a PhD in Organic Chemistry from The Ohio State University and an MBA in Finance and Strategic Planning from Rice University.

Contact George Young at george.young@kalypso.com

About Kalypso

Kalypso is a consulting firm serving the world’s most innovative companies. The firm helps clients to deliver on the promise of innovation. Service offerings encompass all aspects of innovation including product strategy, development, introduction, commercialization, lifecycle management, and PLM systems selection and implementation. In addition to the firm’s deep industry, technology, operational, and training expertise, Kalypso provides a flexible, collaborative approach to deliver unparalleled client satisfaction.