Aberdeen Group
A Harte-Hanks Company

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Lean Product Development for Consumer Packaged Goods

While Lean is a familiar word for the manufacturing organizations of most manufacturers, it is a concept that is just beginning to make headway in product development circles. Organizations have found success in 'Leaning out' manufacturing operations and supply chains, particularly in terms of cost reduction, but bringing Lean to engineering and design organizations is about removing redundancy and wasted effort from a product's critical path from concept to shipment. With its roots in discrete manufacturing sectors, Lean can be largely unfamiliar for Consumer Packaged Goods (CPG) companies. Aberdeen Group's May 2007 *Lean Product Development Benchmark Report* found that only 24% of CPG manufacturers have pursued a formal Lean product development initiative for over a year. These companies are learning from the experiences of their competitors in other industries and applying the successes, and ultimately, CPG manufacturers are taking the considerable opportunity to leverage the business value of Lean product development.

The Emergence of Lean Product Development

Originally popularized by Toyota Motor Corporation, Lean principles have been present in the manufacturing organizations of many companies since the early 1980s. As manufacturers have seen success with Lean programs, the concepts have been applied to areas including new product development as well as supply chain management. Wherever it is applied, the basic tenets of Lean remain the same: the elimination of 'waste' and non-valued added tasks. Lean is a relatively new concept for many product development organizations, but it can be a foreign concept for those in process industries. The need to reduce costs and streamline product development processes, of course, is not. CPG companies that have adopted a Lean product development initiative recognize that those are the same benefits that a Lean program can provide.

Table 1: Pressures Driving Lean Product Development

	Consumer Packaged Goods	All Respondents
Global markets / competition	46%	39%
Market demand for rapid product introduction	34%	37%
Limited product development budgets	33%	34%
Shortened product profitability windows	21%	21%
Demand for increased product performance	20%	16%

Source: Aberdeen Group, May 2007

Sector Insight

Aberdeen's Sector Insights provide strategic perspective and analysis of primary research results by industry, market segment, or geography

Sector Definition

For the purposes of this study, respondents who indicated that they operated within the consumer packaged goods space were isolated and aggregated for comparison against peer manufacturers across industries in Aberdeen Group's performance framework.

The focus on schedules in addition to budgets highlights how Lean principles apply to product development in addition to manufacturing. Within product development, organizations however, where the focus is on bringing new products to market faster, Lean is often about streamlining repetitive and redundant processes as often as it is about decreasing budgets. With the driving factors for these companies split between cost, product profitability, and speed, this is the case for consumer packaged goods companies as often as any other.

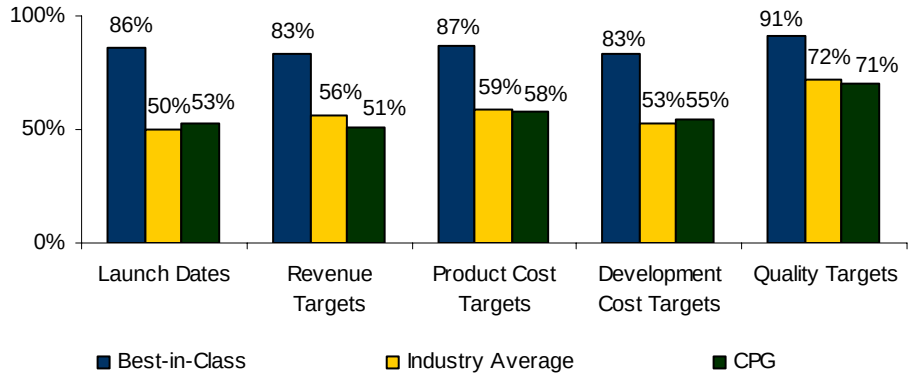
"We have streamlined Product Development (PD) process, decreasing the time required per project, increased the number of projects, all with a very low cost per project and high turnover of projects to sales. Product development is driven by sales and 80% of all product development is customer driven. The impact is that sales increased 300% over five years, and margins increased twofold."

~ Director of Research and Development, Food and Beverage Manufacturer

Aberdeen Analysis

How is Lean impacting the performance of these organizations? To find the answer, Aberdeen's May 2007 *Lean Product Development* benchmark study surveyed participating companies regarding the percent of their products that meet key product development metrics. Interestingly, Aberdeen found that CPG manufacturers report performance that is roughly on par with that of the Industry Average across all sectors (Figure 1). In addition, these companies report that 46% of their time is spent on 'value-added' product development activities rather than on activities that they consider to be 'waste.' This is also on par with the Industry Average, which indicates 45% of time spent on 'value-added' product development activities.

Figure 1: The Maturity Class Framework



Source: Aberdeen Group, May 2007

Meeting these targets about as often as the Industry Average means that CPG companies trail leading performers by 20% or more in all of the measures Aberdeen surveyed, leaving them with considerable opportunity for improvement. In addition to their enhanced performance, the Best-in-Class report that 69% of their product development time is devoted to value-added or productive design activities, 1.5-times that reported by CPG manufacturers.

The Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

Best-in-Class (20%) — practices that are the best currently being employed and significantly superior to the industry norm

Industry Average (50%) — practices that represent the average or norm

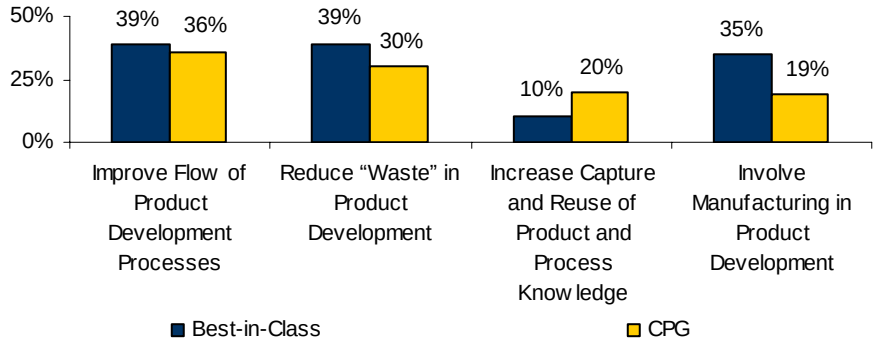
Laggards (30%) — practices that are significantly behind the average of the industry

Lean Strategies of Consumer Packaged Goods

What are the Best-in-Class doing differently than CPG companies? When it comes to the core tenets of Lean, such as reducing 'waste' and improving

the flow of development processes, the answer is, 'not much' (Figure 2). However, the Best-in-Class report a particular focus on aligning manufacturing and product development that is lacking among consumer packaged goods (Figure 2).

Figure 2: Top Four Lean Strategies of Consumer Packaged Goods



Source: Aberdeen Group, May 2007

Both consumer packaged goods manufacturers and the Best-in-Class report a lot of attention to improving the flow of product development processes. For CPG manufactures, this is related to both pressures of rapid product introduction and limited budgets. As mentioned earlier, Lean product development is often about streamlining processes to improve efficiency. The second most often reported action of CPG companies also aligns with that of the Best-in-Class: reducing 'waste' in product development. The reduction of 'waste,' or non-value added activities, is a core principle of Lean, so its popularity isn't surprising.

CPG companies also report a focus on increasing the capture and reuse of product and process knowledge as part of their Lean initiatives that is largely absent among the Best-in-Class. At heart, this strategy is about reusing or basing new products on previously developed formulas rather than repeating previously completed activities. As part of a Lean program, this strategic focus on reuse is often about improving efficiency, freeing designers to focus on value-added tasks, rather than repeating tasks or hunting down information. However, as will be seen in the sections to follow, CPG manufacturers don't necessarily have the capabilities in place to support this sort of program, which provides a possible explanation for why it is currently a strategic focus.

Finally, it appears that CPG companies are missing considerable opportunities by failing to involve manufacturing in product development. The Best-in-Class are 84% more likely than these companies to make this part of their Lean product development programs. Lean product development processes can make little difference if manufacturing organizations can't produce the product. For CPG companies, involving manufacturing in product development can be difficult to accomplish, but it is particularly important. Recipe-based mixtures are less predictable than

the products developed by discrete manufacturers, creating a mismatch between the products that are developed to the capability to produce at a low cost and high quality rate. Making the needs of the manufacturing organization visible and involving them in product development can improve handoffs between the two organizations to complete time to market cycles more quickly and more effectively.

Making Lean Work for Product Development

However, the areas where Aberdeen found consumer packaged goods manufacturers have the most opportunity to make the most of their Lean programs isn't in strategy themselves, but in execution. Before beginning to undertake a Lean product development program or to improve the effectiveness of existing programs, consumer packaged goods manufacturers will profit by looking to the steps taken by these leaders.

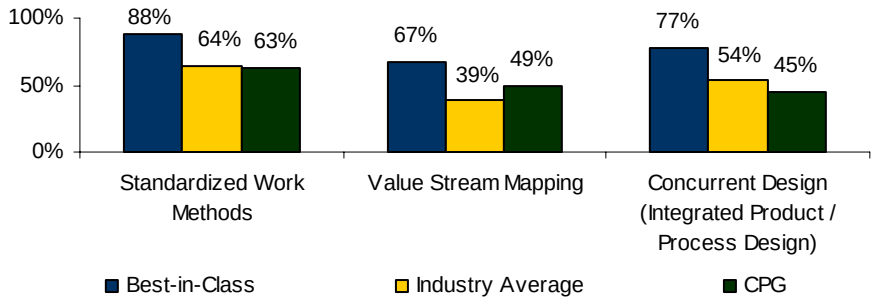
"Lean is about taking the shortest path as possible for the product. Before implementing any process updates we perform studies, it can be with something as simple as direct observation or creating a miniature version of the process. We make sure that we're doing the right thing before we scale up. We have to make sure the quality and the consistency of the product stays the same."

~ Mike Opperman
Engineer
Bolthouse

Streamlining Product Development Processes

While CPG manufacturers indicate roughly the same focus on improving the efficiency of product development process on a strategic level as the Best-in-Class, they tend to fall around the Industry Average when it comes to the adoption of the capabilities of that the Best-in-Class adopt to 'Lean out' product development processes (Figure 3). For those CPG companies that haven't, applying these concepts to their own product development departments can help CPG companies to increase the time spent on value added tasks and improve overall efficiency.

Figure 3: Process Capabilities of the Best-in-Class



Source: Aberdeen Group, May 2007

At the heart of the approach taken by the Best-in-Class are two hallmarks of Lean process improvement: value stream mapping and standardized work methods. Value stream mapping is often an initial step of Lean, by which the steps of a process are scrutinized for inefficiencies and wasted effort. Activities that do not contribute to achieving customer value are redefined or removed in order to streamline the overall product development process. Once efficiency is removed, the next step is often to standardize these processes across an organization. CPG manufacturers report adoption of standardized work methods about on par with the Industry

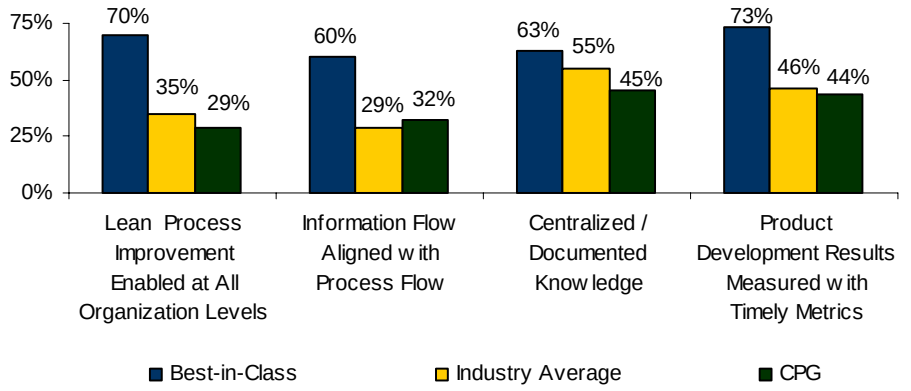
Average and value stream mapping more often. This relatively high adoption suggests a healthy foundation for Lean in CPG.

An area that stands out as a significant opportunity for improvement for CPG manufacturers is the adoption of a concurrent design approach that integrates the development of the product and the processes required to mass produce the product. The Best-in-Class are 71% more likely than CPG companies to adopt a concurrent design approach. At a strategic level, CPG companies have the opportunity to improve efficiency by involving manufacturing in product development. This is the tactical capability that supports that strategy by beginning manufacturing process planning while a recipe is still being formulated.

Supporting Lean Development

Despite the unfamiliarity of the term, CPG manufacturers have gained a good start to their Lean programs as a result of their focus on streamlining processes. However, truly 'Leaning out' the product development requires more than attention to processes. The Best-in-Class adapt their organizations in a way that supports the implementation and effectiveness of Lean concepts (Figure 4).

Figure 4: Support Capabilities of the Best-in-Class



Source: Aberdeen Group, May 2007

A key component of the success of the Best-in-Class is the recognition that it is the individuals performing a task who best understand it, and thus, how to best improve it. To this end, the Best-in-Class are twice as likely the Industry Average to authorize Lean process improvements at all levels of the organization. This places responsibility for Lean directly in the hands of the people with the most insight into how a process can be improved, increasing employee buy-in and driving the continuous improvement programs that improve the efficacy of a Lean product development organization. The same is true of the measurement of product development results with formal metrics. The Best-in-Class are 66% more likely than CPG manufacturers to report this capability, which helps them to identify areas they need to continue to improve.

A more critical step for improving the efficiency of processes with a more short term impact is the alignment of information flow with process flow, which may be a more critical step. Improving the flow of product development processes is the top strategy of CPG companies, and they have begun to find ways to streamline and standardize processes. However, streamlining processes without similarly adapting the flow of information through the organization to match it, they are creating what are often unseen roadblocks to organizational efficiency. The Best-in-Class are twice as likely as both the Industry Average and CPG manufacturers to align information flow to process flow. Ensuring that individuals at all steps of the process have the right information to do their jobs without waiting, excessive searching, or rework of data has the potential to reduce cycle times and improve overall product development efficiency.

Documenting and centralizing engineering knowledge is a related area of concern, and is one where CPG manufacturers lag the Industry Average dramatically. Industry Average performers are 22% more likely than CPG companies to report that they have centralized management and access to product knowledge, while the Best-in-Class are 40% more likely. Central access to information is a critical step to removing waste from product development. Engineers who spend time searching for information, or who are not aware that the information exists, are not focused on productive design tasks, and may even be repeating steps that have already been taken. A central location that is accessible by all design stakeholders can significantly improve the efficiency of product development processes. It will also help CPG manufacturers more successfully capture design knowledge for later reuse.

The Role of Technology

Further, the Best-in-Class are taking advantage of technology tools as part of their Lean programs. The solutions they are using range from knowledge based engineering to Product Data Management (PDM), and product portfolio management (Table 2).

Many of these enablers stand out as particularly relevant to CPG manufacturers' focus on reuse of product development knowledge, while also having applications to broader Lean mandates to streamline processes and reduce waste. Not the least of these is the use of PDM to centrally manage and access data. The Best-in-Class are 48% more likely than CPG companies to take advantage of PDM. The use of PDM can go a long way to helping CPG companies to capture and reuse product development knowledge. It can also help eliminate non-valued added tasks in product development, centralizing product knowledge to eliminate potentially time consuming search activities.

Table 2: Technology Enablers Supporting Lean

	Best-in-Class	Industry Average	CPG
Product portfolio management	72%	53%	41%
Specialty tools for lean	61%	21%	43%
Knowledge Based Engineering (KBE)	62%	25%	22%
Advanced search technologies	53%	23%	16%
Product Data Management (PDM)	67%	48%	42%

Source: Aberdeen Group, May 2007

The Best-in-Class further improve their efficiency by leveraging advanced search technologies that search by specific elements of a design or formula. They are 2.3-times as likely as CPG companies to use these tools. Searching for previously created design information is part of any product development project, so much more so when an organization is actively seeking to reuse prior data. But time spent looking for information is not time developing products. The Best-in-Class keep these activities to an absolute minimum through the use of centralized data and sophisticated search tools.

At the most advanced level, the Best-in-Class have not just captured prior design knowledge for reuse, in some cases they are automating its use. To this end, the Best-in-Class are 2.8-times as likely as CPG companies to leverage tools to capture engineering knowledge and use design automation applications to standardize and automate routine or complex engineering tasks. Because these simple tasks are automated, errors and variability are reduced and more focus can be placed on value-added product development tasks. They are also using specialty Lean tools which automate business processes to execute process improvement, communicate standardized work processes, or promote consistent execution of Lean activities. The Best-in-Class are 41% more likely than CPG manufacturers to take advantage of these kinds of specialized solutions.

Finally, the Best-in-Class are 75% more likely than consumer packaged goods companies to leverage Product Portfolio Management (PPM) solutions. These tools allow the Best-in-Class to apply Lean to product development from a planning perspective. PPM tools are used to target resources and efforts on products that are best aligned to customer needs and business value, effectively 'Leaning out' the portfolio to allow these organizations to focus on projects that will provide the greatest value.

Recommendations

Lean is largely a new concept for product development organizations in general and for CPG manufacturers specifically. For those companies looking to either begin to go Lean or expand on their current programs, they will benefit from adopting the following steps of the Best-in-Class:

- **Centralize product knowledge**. Improving the capture and reuse of design knowledge is a greater strategic priority for CPG

companies than for other industries. Their ability to execute on this strategy effectively will be enhanced significantly when supported by centralized access through a dedicated product data management tool. The Best-in-Class are 48% more likely than CPG companies to take advantage of PDM, which can also help eliminate time spent on non-value added tasks such as searching just required information or the latest version of a formula. They are also 2.3-times as likely to use advanced search tools to minimize time wasted when searching this information.

- **Empower Lean decision makers at all levels of the organization**. Often the individual with the best insight into how to improve a process is the one who performs it. The Best-in-Class take advantage of the experience of their staff and empower the engineers who are responsible for a process to determine how it can be best improved. Additionally, by locating ownership of Lean programs at all levels of the product development organization, the Best-in-Class stimulate greater enthusiasm for Lean because everyone feels a part of the process and more empowered to make a difference.
- **Involve manufacturing in the product development process.** This is an area where CPG manufacturers have considerable opportunity for improvement. The Best-in-Class are 84% more likely than these companies to involve the manufacturing organization in product development as part of a specific Lean initiative. By doing so, the Best-in-Class are able to streamline the handoffs between engineering and manufacturing as well as head off potential problems in the manufacturing environment.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research	
The Engineering Executive's Strategic Agenda; June 2008	*The Lean Product Development Benchmark Report;* May 2007

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