

Concurrent Packaging Design: The New Imperative

for

Dassault Systèmes

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Introduction

The power of packaging to drive sales of fast moving consumer goods is becoming better understood, but the process by which packaging is designed may still leave companies with challenges. Perhaps that's not surprising. Packaging success is a careful balancing act between many competing needs and is the result of many groups' efforts.

On the competing needs front, packaging does much more than contain and dispense the product inside, but it certainly must do that well. It must travel through the CPG distribution channel effectively. The package is also the primary marketing at "the first moment of truth" to gain consumer attention and establish or build on the brand. It must also meet legal and regulatory requirements in every country in which it will be sold.

Packaging success is a careful balancing act. The imperative is to shift to a streamlined, transparent and concurrent process.

Many disciplines are involved in package development: design, marketing, branding, regulatory, legal, manufacturing, sustainability, and logistics at the least. Packaging design also involves a complex ecosystem of CPG companies, packaging manufacturers, retailers and designers. Each is very clear about their role, but may not be particularly sensitive to the balancing act. The result is that packaging design is slow and complex. It often includes multiple rounds of rework and still results in sub-optimal packaging designs.

With the complex tangle of competing needs and interests for packaging, how can the packaging design process be a point of leverage and competitive advantage rather than a drag on a company's financial and human resources? The imperative is to shift

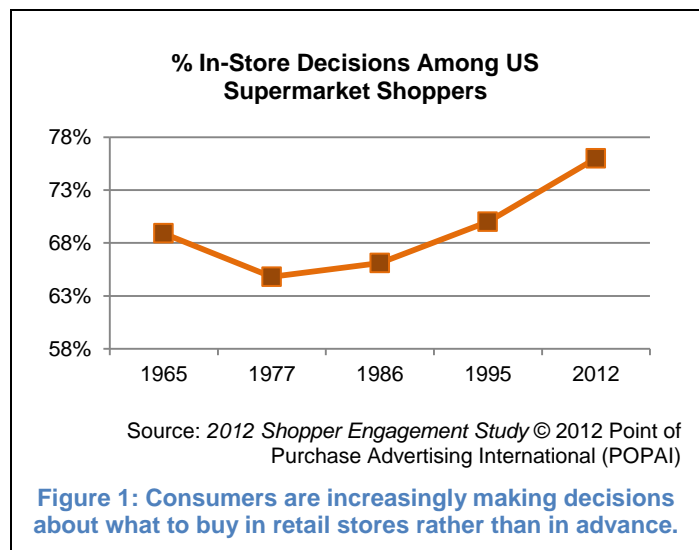
- from a sequential packaging design process where each discipline has little view into the overall balance the packaging needs to achieve
- to a streamlined and concurrent process that is transparent and begins the collaborative trade-off discussion very early

This can be a powerful transformation: saving time and money, plus improving sales and reducing risk.

CPG-Packaging Business Challenges

Packaging design has always presented challenges, but some of the shifts in CPG strategies such as proliferating product line extensions to penetrate new demographic groups contribute to the challenge. Combined with new opportunities, pressures and shifts in consumer markets, these make packaging success both more complex and more critical than ever.

In-store decisions. As advertising's power diminishes, more rests on in-store decisions where packaging's power is strongest.¹ Figure 1 shows the results of a research study of US-based grocery shoppers. The trend since the



¹ 2012 Shopper Engagement Study © 2012 Point of Purchase Advertising International (POPAI); <http://www.popai.com/engage/docs/Media-Topline-Final.pdf>

1970s is quite clear: more consumers are making unplanned purchases and deciding which brands to buy as they see the packages on the shelf. The packaging must grab their attention for them to pick up the product and put it in their cart.

Consumer buying patterns. The buying patterns in established markets are getting less predictable and more emotional, which the study mentioned above suggests. In addition, consumers are famously more cost-conscious than a decade ago, which has led to more openness to try new brands and tremendous growth in private label². Consumers are also using more technology in shopping so a phone-readable 3D barcode matrix might deliver a boost for some segments. Many consumers show concern for environment and family health, selecting for their perception of sustainability and healthy choices.

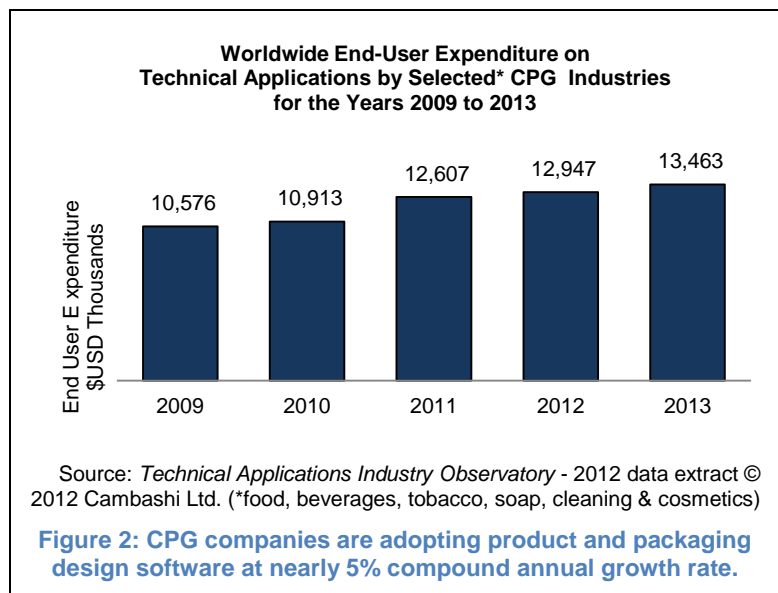
Penetrating emerging markets. Consumer buying patterns in new and emerging markets makes the packaging landscape even more complex. Beyond the differences in consumer patterns, penetrating emerging markets also entails different stores, regulations, manufacturing sites, logistics realities, and partners. Packaging design considerations become even more complex with all of the regional permutations. In short, companies must strive to sustain a brand image while meeting an array of consumer concerns and varying the packaging to meet regional needs.

Inherent packaging contradictions. Packaging serves many purposes and the goals of each purpose may inherently create contradictions in design. Even purely functional needs may conflict in terms of securely containing vs. dispensing or giving access to the product. Instructing the consumer about how to best use the product and meeting increasing regulations about safety, origin and ingredient listings may clutter the label. These requirements then compete with the desire for clean, boldly branded and eye-catching labels. The ability to stack cases and pallets for distribution may conflict with sustainability efforts to minimize packaging material. Manufacturing constraints in both the packaging and CPG plants can prevent some compelling designs from coming to the market.

Consumer shifts, contradictions in design goals, and multi-discipline, multi-company teams often lead to problems when the packaging design process is fragmented and sequential.

Complex multi-discipline, multi-company teams. Packaging design teams typically have many disciplines involved: design, marketing, branding, regulatory, legal, manufacturing, sustainability, and logistics. Each is tasked with optimizing a different aspect of the packaging. The process spans partners as well: CPG brand owner, packaging manufacturer, manufacturing (owned or co-packer), design agencies, label providers, and sometimes retailers may all have a say in packaging design. Today, participants typically work in sequence and often with some degree of isolation, leading to time- and skill-consuming re-work of designs.

Fragmented packaging design process. The process of packaging



² The Rise of the Value-Conscious Shopper – A Nielsen Global Private Label Report © 2011 The Nielsen Company <http://www.nielsen.com/us/en/insights/reports-downloads/2011/rise-of-the-value-conscious-shopper.html>

design is fragmented, sequential, slow, and error-prone today, leaving companies at great risk. Figure 2 shows that increasingly, companies are investing in technology to fight that. These technologies include simulation for realistic packaging design testing, viewing and collaboration technologies, workflow and coherent repositories for all design documentation. These enable a new formulation of the package development process – one that is coherent, data-rich, rapid, and requires minimal manpower, re-work, and manual process. This is an important breakthrough for the CPG and packaging industries.

Optimizing Design at Each Phase

As with any other design, the ideal approach is to leverage information from each stage throughout the lifecycle and across all of the disciplines involved. In theory, this makes sense and creates the opportunity to “reduce, reuse, and recycle” in the packaging design process.

Figure 3 shows a simplified concept of the packaging lifecycle, moving from upper left concept around clockwise. In major chunks, the development phases (concept / design / testing) are at the top, the distribution phases (production, distribution, in-store) are at lower right, and consumer phases (initial opening, use, and recycling or disposal) are in the lower right.

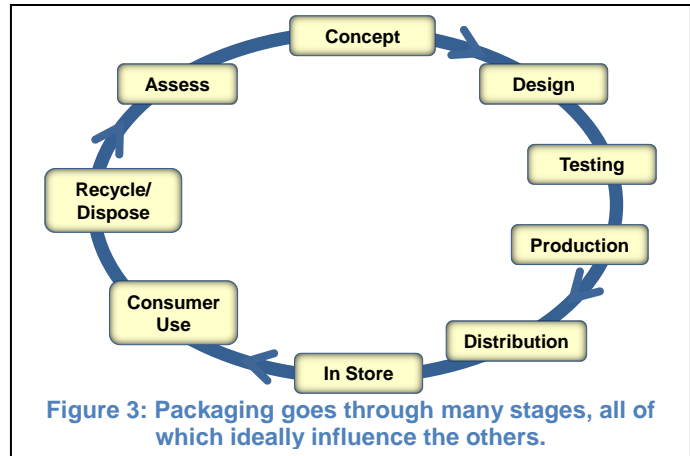


Figure 3: Packaging goes through many stages, all of which ideally influence the others.

For many companies, this holistic approach to packaging design is just a nice concept. To compete effectively, companies must begin to execute with a connected approach across the lifecycle. This requires some technology to support information sharing across the disciplines and phases of the lifecycle. There are technologies CPG companies can use to get started on any particular phase of this lifecycle. By putting those specific technologies together with a workflow platform and a common information repository that delivers context for each packaging design can actually begin to optimize the packaging lifecycle. First we'll explore each phase of the lifecycle and technologies for improving those.

To compete effectively, companies must begin to execute packaging development with a connected approach across the lifecycle.

Concept

Packaging concept development is based on creative hunches plus very diverse information. It springs from ideas about the markets the product is to serve, and is informed by shopper research about how consumers buy, their preferences, what captures their attention, and how they react. Some of this information feeding the packaging conceptual design process is non-traditional. Many companies cannot today effectively manage and collate the outputs of brainstorming sessions, syndicated and POS data, shopper research eye scan data, brand research results, and social media feeds. Fortunately, there are systems available that can put all of that into a useful context for making decisions about each packaging concept.

Design

The delicate balancing act of all of the competing interests makes packaging design complex, as we explained above. Having a repository for packaging and label information allows sharing specific needs for branding, regulatory, manufacturing, sustainability, logistics, and consumer use. With a historical record, companies can see patterns and build on past experience. This also enables companies to confidently re-

A packaging information repository enables building on past experience and re-using package and label elements.

use elements that must be used even as the design changes such as contact and brand logo images. Those with collaboration technologies can further allow all of the disciplines to participate from early in the process and minimize the need for re-work.

Qualification and Testing

The qualification and testing for efficacy of a new design can be even more complex. Tests for suitability for product, distribution, and user conditions are fundamental and diverse. The package must also qualify as achieving sustainability metrics, capturing consumer attention, and meeting both regulations and brand standards. Each of these has its own criteria and mechanisms for qualification. If the company can perform these on a digital model of the product prior to a physical prototype being developed, the process can be faster, less expensive, and create a much better outcome. By doing as much in a virtual environment as possible, physical and chemical testing is performed only once and has a very high probability of qualifying. Fortunately, simulation is now possible for nearly every aspect of packaging testing, including the shopper reaction.

Simulation can test for all design needs plus operational, logistics and consumer impact.

Distribution (Production, logistics, in-store)

Simulation can also show what happens during every phase of the packaging's journey in its physical form. Simulation can show how a particular package design will perform:

- in the packaging company's plants
- during the CPG production process of filling the package
- in the logistics process, in conjunction with all layers of packaging at unit, case, pallet, and load
- in the shelf and aisle context, with virtual shopping to test the new package design and any display packaging in a realistic 3D environment

So in addition to testing for the operational needs of the company, the simulation process can test for consumer interest and whether typical shoppers will find it appealing.

Consumer (opening, use, recycling and disposal)

Any number of breakthroughs in CPG packaging occur every year. Juice boxes were developed in the 1960s and not only protect the product without refrigeration, but give children a fun and spill-minimizing way to become more independent, and the square shape was far more cost-effective for logistics. In another example, the "upside down" ketchup bottle plus larger sizes drove more consumption for Heinz. Personal care products increasingly benefit from airless pumps and rolling applicators that protect the product and make use easy. Completely new concepts like this can be developed and tested in an entirely virtual environment before they go to physical testing.

The consumer penchant to buy green is driving innovation as well. A recent study shows that approximately 94% of the urban Chinese consumers are prepared to pay a 45% premium for certified green products and services. More packaging is now in recyclable containers to make it easy for consumers to work with local recycling sites. Advances are using recycled materials for the packaging, such as Ball's recycled aluminium aerosol can. Some are taking it further: in developing food packaging for use in Africa, WikiCell developed edible packaging. Because consumers care so much, companies are setting goals for sustainability up front, and the packaging design must meet these metrics.

Because consumers care so much, companies are setting goals for sustainability that packaging designs must meet.

Concurrent Design: Coherence for the Packaging Lifecycle

Each phase has supporting technology, but to execute a truly efficient and effective packaging design, the process should be concurrent. What if, instead of a sequential cycle, you were able to consider all of these elements at the same time? What if the designs and decision background from the packaging for each product line, product or SKU were available for all other designs? What if all of the stakeholders could work from the same understanding of the goals and current state of the design?

Technology is available today to allow CPG and packaging companies to do that. The main technologies involved are already proven and in use for product design in a wide variety of industries. Current design processes can feed information into a repository that correlates design information to each package, as well as to the product, product family, and entire product portfolio.

Beyond a repository, these systems must have capabilities to support and enforce workflows that ensure all parties have contributed and signed off on a design. Feedback from stakeholders outside the design process, notably the consumers and retail customers, can become part of the package's context in the repository.

With the squeeze on profits and industry leaders already taking action, concurrent packaging design is becoming the new imperative for the next decade.

Often called product lifecycle management, this type of system is finding increasing use in CPG and packaging companies. By leveraging simulation technologies fully, the company can revolutionize the process. By developing and testing a complete experience that meets all of the needs through that package's lifecycle companies can drive significant value. Figure 4 shows the technologies at the core and the experience in the outside ring, surrounding the actual process.

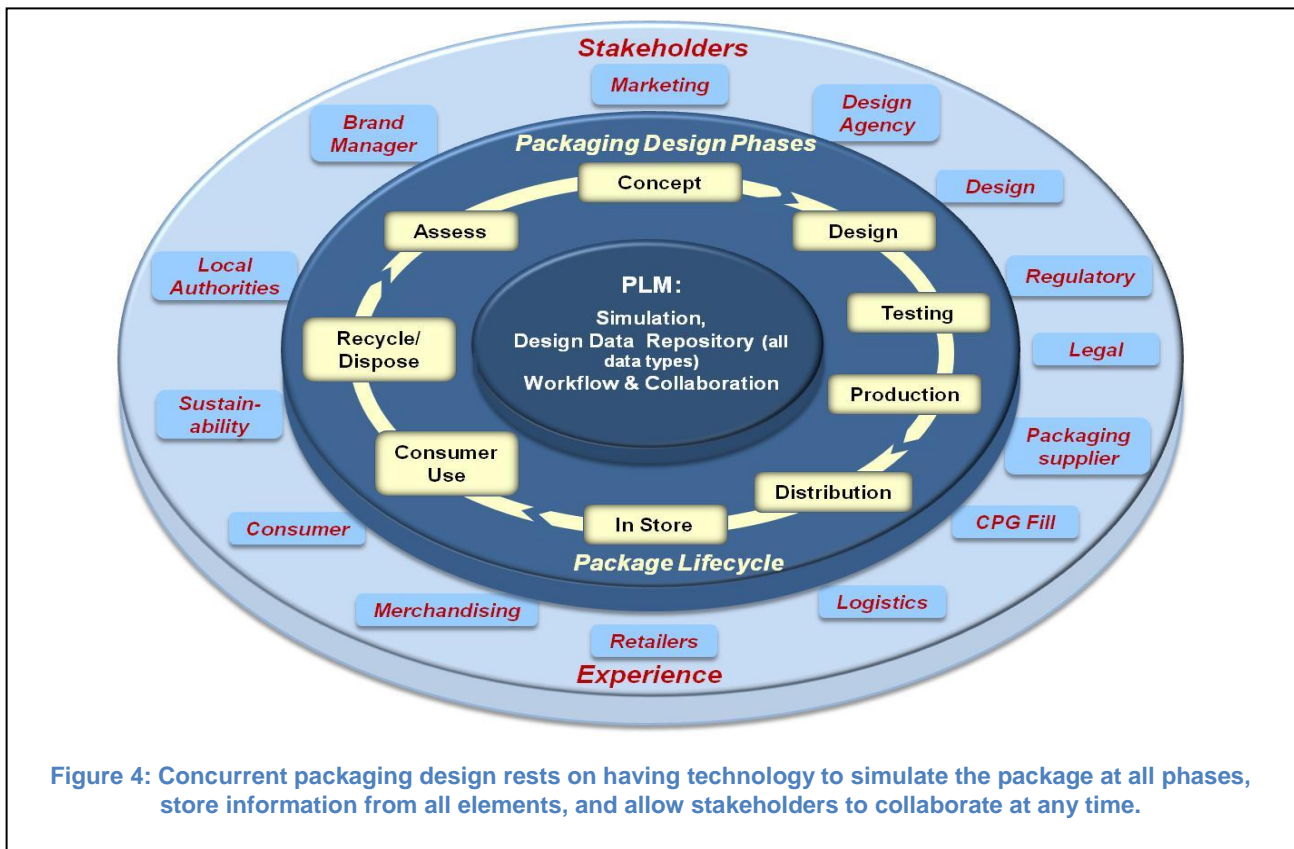


Figure 4: Concurrent packaging design rests on having technology to simulate the package at all phases, store information from all elements, and allow stakeholders to collaborate at any time.

The result is a concurrent packaging design process. Every phase is linked to other phases. All participants in the design cycle can access consistent information with the appropriate security clearances without waiting for others to hand off to them.

The companies starting to adopt such concurrent and coherent processes are finding some significant benefits. These include:

- speeding up overall package development and thus time to market
- leveraging history on packaging and making it straightforward to re-use packaging elements
- creating communication that minimizes misinterpretation by the many stakeholders
- reducing costly and time-consuming physical testing
- improving consumer reaction to new and re-designed packages

A critical factor to achieve streamlined processes is that having people involved from the early stages results in the ability to consider more options early, with less rework and better results in the market.

Taking time and cost out of the packaging design process is a goal everyone can support. With the squeeze on profits and industry leaders already taking action, concurrent vs. serial packaging design is becoming the new imperative for the next decade.



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