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Big Box Thinking: Overcoming Barriers to Creativity in Manufacturing

by Peter Clarke and Jeff George

Focusing on the process of package design, Peter Clarke and Jeff George propose several strategies for simultaneously streamlining and improving the outcomes of this important dimension of the product development process. They stress the need for earlier and closer links to end users, an ongoing analysis of design and price trade-offs, and an open-minded review that expands the options in package fabrication.

Too many structural packaging design efforts are, from the start, doomed not to see the store shelf. That's because, historically, designers are sent off to design without a strategic road map that considers true consumer need and manufacturing capability. It is an enormous waste of time and money to create designs that consumers do not want or that cannot be commercialized.

The key to avoiding this pitfall is immersing the design team in consumer and manufacturing reality from the word Go. By defining the "sweet spot" (that is, the alignment of what consumers want and are willing to pay for with what the business can make at a profit), the design team can use real constraints to spark creative innovation.

The strategic exercise of defining the sweet spot and then searching out ways to expand it is what we call Big Box Thinking. Bridging the gap between the conservative in-the-box supply-chain perspective and out-of-the-box unbridled creativity, Big Box Thinking enables the design team to achieve the most efficient and successful design and development process. By starting with viable designs and thinking ahead about their manufacturability, the design team can shorten the distance to rapid commercialization of consumer-validated, actionable innovations.

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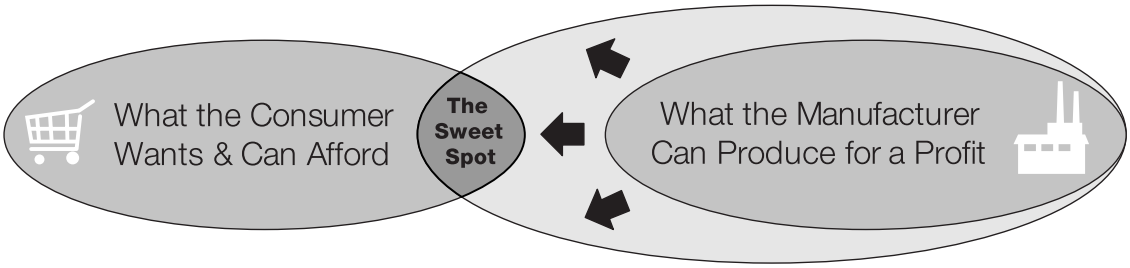
Just Because You Can Doesn't Mean You Should

As designers of mass-produced goods, structural packaging professionals who expect an atmosphere of artistic abandon and creative free-for-all are naive. Just because you are an artistic and revolutionary thinker doesn't mean you should design pigs that fly, if the con-



With the sweet spot defined, the project team can focus its efforts on consumer needs that fall within manufacturing guidelines and financial viability. Ways to expand the design target become evident when the design team defines the business's project goal, timing, cost of goods, flexibility, and overall risk tolerance.

sumer hasn't asked for them.

Similarly, industrial designers are asked to create designs "for business's sake"—meaning that our solutions are expected to achieve bottom-line results. All too often, designers want to create outside-the-box designs that don't consider the conduit to those business results: the consumer.

Certainly, many design firms leverage various forms of consumer research, whether they are self-sponsored or provided by the client. However, the tradition has been to provide third-party consumer profile information in the design brief, or to include live end users downstream, well after design and development has begun to roll unchecked. This leads to one of the most common snares of the traditional design model, to wit:

The design team has assembled a consumer focus group to which it is presenting its three lead concepts, only to learn the group isn't interested in any of them. The ensuing scenario is humbling. Stuck between the proverbial rock and a hard place, the design team has two courses of action from which to choose. First, it can force the consumers to settle for one of the options presented. Or, second, the team must accept the project delays that come with costly redesigns this far down the road.

If the designers go with the first option (coercing consumer consensus on one solution), there is no guarantee that the package will achieve marketplace success. Remember, at first glance, none of the options was appealing. Chances are that the rubber-stamped selection of the focus group will have little shelf impact. Consumers were simply not interested! On the other hand, the second option facing the design team is no better. It will surely result in the loss of credibility with the client. They've just wasted time and money on designer folly, and the process must begin again.

Tapping into the Consumer Early in the Process to Uncover True Needs

A better approach is to define the consumer portion of the sweet spot as early as possible by bringing end users into the design and development process from the start. This is achieved by having the design team conduct ethnographic research of consumers using the package or the product in the context of their daily lives.

All too often, designers want to create outside-the-box designs that don't consider the conduit to those business results: the consumer.

Whether at home, in the store, or on the go, contextual observation of end users uncovers what one-on-one interviews or surveying may miss. One reason for this is that consumers often inaccurately recollect their own behavior. For example, during a toothbrush redesign project, consumers were surveyed on brushing habits. The majority responded that

Whether at home, in-store, or on the go, contextual observation of end users by designers uncovers elements that traditional one-on-one interviews or surveys may miss. Often, the compensatory behaviors that speak volumes about true needs go unnoticed by conventional consumer researchers and never make it into the design brief. Observing the consumer within the shopping experience identifies opportunities for improved packaging communication and differentiation.

they brushed for the recommended two minutes. In truth, when in-home observations were conducted, the average brushing time was less than a minute. This confirmed that perceived use and actual use are often different. Imagine the impact of inaccurate data on the final design.

In another example, the initial design brief for a chilled beverage bottle prioritized the importance of refrigerator door storage. Design teams went on in-home observations and found that no consumers currently stored this bottle on the door. More notably, none expressed an interest in doing so. In fact, consumers tended to keep the beverage on the top shelf of the fridge—prime real estate for frequent use. If the designers were to pursue the design of a bottle for door storage, it could actually *reduce* consumption by making the product harder to find, remove, and replace. As a result of in-home immersion, the door storage requirement was removed from the design scope and replaced with one that called for enhanced shape equity branding, making the product even more recognizable on the top shelf.

In addition to consumer value, the design must have business worth. A beautiful design for the sake of being attractive is not a compelling reason to increase the cost of goods.

As this example illustrates, first-hand observation of consumer behavior by the client and design team spotlights true end user needs. It also helps determine which features provide the greatest bang for the buck in terms of what's most meaningful to the consumer experience. What do consumers need but aren't getting from the current offerings? The answers are not always spoken responses, but they often reveal themselves as compensatory behaviors. For example, how many of us, if we were to be interviewed about our use of squeezable yellow mustard, would remember to say that we shake the bottle before dispensing (to eliminate that unsightly, liquidy stuff that would've come out first if we didn't shake the product)?

Designer-led interviews are also vitally important, because they open the minds of consumers to ways of improving a less-than-perfect scenario. Consumers often resign themselves to poor packaging because they don't realize that the experience can be better. To improve the possibilities, the design team must be skilled at bringing in the appropriate stimuli to gain consumer consideration. For example, in a focus-group setting, if you ask consumers what the ideal container for milk would be, more often than not, they would indicate the package the milk comes in *today*. But by showing them physical embodiments of other options, and asking them to interact with these in their kitchen, they begin to freely express features and needs that could improve their lives.

In a departure from conventional research collection, designer participation in contextual observation is mandatory. Often, the compensatory behaviors that speak volumes about true needs go unnoticed by traditional consumer researchers and never make it into the design brief. With designers in on the research, nothing gets lost in translation. Because of their training, industrial designers are uniquely qualified to render what they observe into features that solve usage challenges throughout the packaging journey, from store shelf to disposal. The goal is to design a solution that becomes the consumer choice by creating a competitive difference and providing lasting value.

In addition to consumer value, the design must have business worth. A beautiful design for the sake of being attractive is not a compelling reason to increase the cost of goods. The design team must define a business-grounded reason for creative direction, such as:

- Promoting "counter-worthiness," which can drive consumption by being on-hand, visible, and top-of-mind
- Communicating the item's distinct use or positioning
- Providing clear functional benefit cues for easy storage, use, and handling
- Delivering real or perceived secondary use/value

Bright Ideas that Can Be Commercialized

Equally important is an in-depth understanding of the business' manufacturing capability. Too often the creative process begins without a full disclosure of constraints to the design team. This is caused by a fear of hampering creativity. Well-intentioned but misguided, this tactic gives designers carte blanche to be inventive, only to

With a clear understanding of manufacturing capability, the design team can use real constraints to spark creative innovation. Starting with viable designs and forethought about manufacturability allows the team to streamline the path to rapid commercialization of consumer-validated, actionable innovations.

have the resulting projects grounded by the company's inability to deliver them. The bottom-line, in-the-box thinkers on the operations side are driven by the realities of achieving high production-line speeds and efficiencies with limited capital investments. This explains how they can catalog reasons why proposed designs won't work.

Therefore, before a single resource is spent on design, the design team must precisely understand the business limitations. This includes challenging manufacturing constraints to separate the real from the perceived, making sure they are truly insurmountable, even with additional investment or work-arounds. Anyone with a hand in delivery (all job functions, experience, and talents) should be engaged at this point to brainstorm solutions to manufacturing obstacles.

Knowing these constraints ahead of time, the team can regard them as part of the creative challenge in the design process. In the greater scheme of things, full disclosure ensures a much more time- and cost-efficient approach. By doing homework upfront on how to manufacture, the team has accelerated the timeline to commercialization.

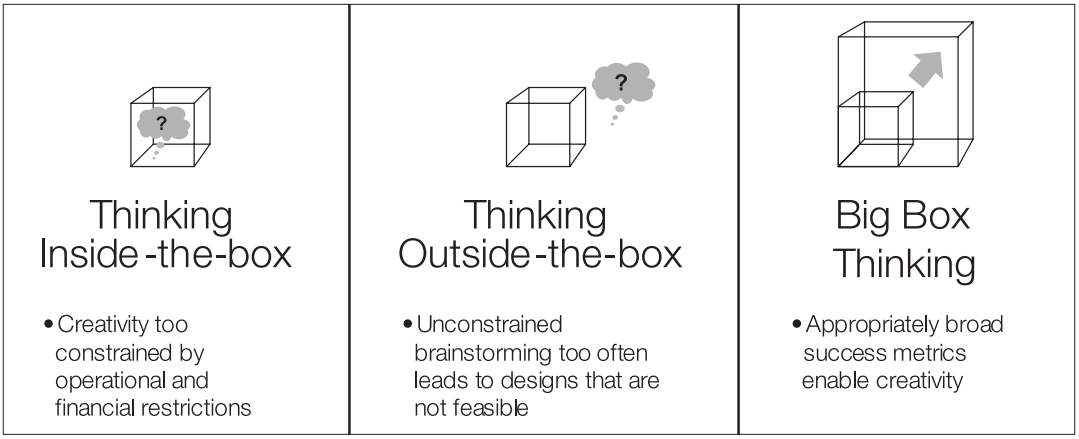
Big Box Thinking Expands the Sweet Spot

Defining the sweet spot harmonizes the two opposing mindsets industrial designers encounter when delivering business solutions. Marketing, with its focus on consumers, and manufacturing, driven by production at the lowest cost, come together over a common goal: delivering consumer delight at a price both the buyer and business can afford.

This methodical approach is an evolved way of thinking about business design. It's neither the in-the-box thinking of the sometimes-cautious supply-chain mindset. Nor is it the unchecked out-of-the-box brainstorming that can lead to undeliverable designs. It's Big Box Thinking—a philosophy that sets guide rails by applying broad success metrics and enables actionable creativity by actively seeking out opportunities to expand the sweet spot. Ways to expand your design target become evident when the design team defines the business' project goal, timing, price point, and overall risk tolerance.

Timing Is Everything

Project timing influences sweet-spot size. In a need-it-yesterday world, initiatives regularly begin behind schedule, constricting design and development as a result. Short timetables should



Big Box Thinking is an evolved way of thinking about design for business. It's neither the "in-the-box" thinking of the sometimes-cautious supply-chain mindset. Nor is it unchecked "outside-the-box" brainstorming that can lead to undeliverable designs. Big Box Thinking sets guidelines by applying broad success metrics.

be assessed according to whether they are realistic, given the defined packaging goal. Is there an underlying business reason that justifies the rush? For example, is the short timeframe a response to competitive activity? Is your competitor providing a value-added point of difference?

Instead of being a business that's reactionary in its tactics, the business should strive to become the strategic trendsetter, planning for the lasting win. This sets the sights on ownable innovation that provides lasting value to the consumer.

For this reason, extended timetables offer longer-term strategic advantage. These allow for capital investments in new technologies and an opportunity for the business to gain economies of scale advantage. Through technical insulation, the business builds barriers to entry, putting the competition in a position of perpetual catch-up.

A notable example of this is in pouched juice drinks. Early on, market leaders in this industry created significant barriers to entry with pioneer capital investment and intellectual property protection of pouch designs. The result of this strategy is majority market share through high volumes and economies of scale, further reinforcing competitive barriers.

Bells and Whistles Don't Come Cheap

The design team must consider what it will cost to provide each feature consumers find meaningful. Does an increase in cost of goods and resulting higher price create a design the consumer can't afford? Sometimes, concepts are shared with consumers only in their ultimate embodiment, with all the frills and features but with no understanding of cost-of-goods tolerance. The consumer is thrilled with a package the business can't possibly afford to deliver. And once consumers discover the resulting out-of-reach price point, the design no longer provides sufficient value. Alternately, if the design is compromised to lower the cost of goods, it may no longer be attractive to the consumer.

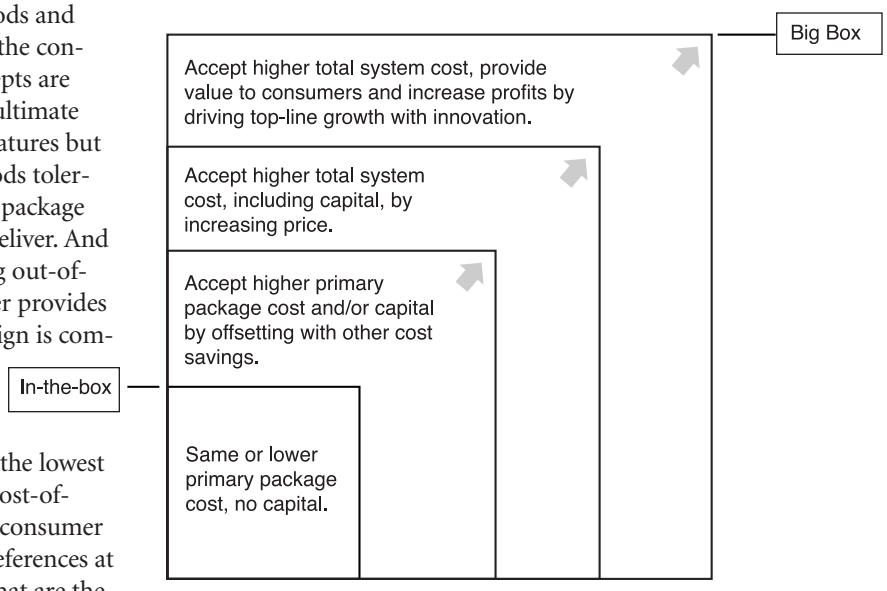
To deliver consumer preference at the lowest cost, the design team needs to run a cost-of-goods assessment early. This involves consumer discussion to identify their feature preferences at each stage of the package lifecycle. What are the elements of desire across all the functional parameters that move consumers to purchase the package: on-shelf, transportability, handling, storage/inventory, open/dispense/reseal, and disposal/recycle? During this discovery process, consumers interact with tangible concept embodiments and help identify the decisive moment when a concept becomes the preferred solution. This careful analysis results in a list of must-have features the business can afford to incorporate in the design.

Higher Tolerance for Risk Means More Design Possibilities

High-speed, high-efficiency production lines tend to have limited flexibility. This constraint often serves to shrink the sweet spot between consumer preference and manufacturing capabilities. An investment in new technology would bridge the gap, but this requires the business to take on some risk. In fact, greater willingness to tolerate risk often leads to a high return on investment. Those who are willing to put money on the future reap the rewards of market leadership. To assess risk tolerance, the business should ask itself:

- How much can I invest?
- When do I need to reap the reward?
- Am I a leader or a follower?
- Am I willing to invest in new technologies/equipment?
- Can I afford to try new things?

Understanding the goal, timing, cost, and risk



Big Box Thinking looks for ways to expand the sweet spot by bridging the gap between consumer preferences and manufacturing capabilities. Businesses willing to invest in the future in order to keep up with evolving technology and consumers will reap the rewards of market leadership.

will put the business in a better position to make a strategic decision about sweet-spot expansion. Does the business accept a higher primary package cost and/or capital by offsetting with other cost savings? For example, the package structure may provide added "top-load" strength and thus doesn't require a carton or corrugated dividers. Or is the answer one of accepting a higher total system cost, including capital, by increasing price? In other words, providing a point of difference in the marketplace can justify a higher cost consumers are willing to pay.

Finally, is the brand willing to increase cost and accept a lower per-unit margin if it means significant top-line growth via packaging innovation? Recent dramatic examples of packaging innovation in paint, coffee, and coffee creamer illustrate how Big Box Thinking can evolve traditional forms into exciting new packaging directions that are both cost-effective and able to drive consumer consumption.

Extending Creativity Beyond Design to Manufacturing

While practitioners of most manufacturing disciplines are not usually expected to be right-brain thinkers, they can nonetheless be creative about production problem-solving. This comes from years of cleverly troubleshooting everyday issues on the fly to keep production lines up and running.

With Big Box Thinking, the goal is to harness this ingenuity for eradicating manufacturing obstacles. Constraints are positioned as issues and brainstorming begins to solve them. For instance:

Issue:
How can we run a taller package?

Operational Constraint:
The equipment is not capable. Need new filler, new line, etc…

Solution Brainstorming:
Joe Smith from the third shift suggests: "Well, if we lower conveyors three inches and adjust the guarding, we can eliminate most change parts on the filler, and then we could…"

By including all levels of the supply chain, the team increases the chances of uncovering a clever solution. Time and again, the best ideas come from those closest to the production line,

Big Box in the Marketplace

Companies that embrace Big Box Thinking are distinguished by two key characteristics: They see the long-term strategic value of taking a risk and making an investment in new manufacturing opportunities to expand the scope of package design possibilities; and they make sure these investments are in sync with consumer needs, by listening to users throughout the packaging design process.

From the hardware store to the dairy case, you'll come across examples of Big Box packaging:

- International Delights coffee creamer bottles are the result of a commitment to innovation by Dean Foods. In an October 2002 *Dairy Field* magazine article, CEO Gregg Engles commented that a key strategy for the company to keep consumers happy is "…through innovation and investment in technology, product development, and brand expansion." Accordingly, the company invested in technology and consumer insight to deliver a novel packaging proposition in a fast-growing category. Shedding the tired paperboard archetype, the redesigned package has an ergonomic shape that allows for convenient one-handed open, pour, and store. The tableworthy aesthetic and user-friendly features make the coffee occasion a special event.
- Consumer insight and the quest to improve the consumer experience through packaging innovation also compelled Sherwin-Williams to go Big Box with its plastic Twist & Pour paint container. Research showed that women predominately influenced paint purchasing decisions in the DIY market, and that there was a strong dislike for the round metal paint can. So, despite highly standardized metal-can filling lines and the cost efficiencies of existing infrastructure, Sherwin-Williams decided to take the plunge and develop a high-end package for their high-end products. The up-front investment also required changing paint shakers in retail outlets to service the new package shape. "We accepted the fact that any new container was going to increase costs, and we were willing to take an initial hit in productivity," says Jim MacDonald, package engineer at Sherwin-Williams. "But our CEO backed the project 100 percent, because he believes that we are the innovators in the coating industry." Since the introduction of its revolutionary solution, the company has enjoyed increases in both sales and market share.
- A third example can be found in the coffee aisle. Procter & Gamble saw an innovation opportunity with its Folgers brand and ran with it. After 150 years, consumers were saying they wanted another option for storing coffee. Metal cans are heavy, unwieldy, and unsightly. Like all Big Box innovators, P&G was also prepared to forgo the economies of scale derived from existing capital investments. Its willingness to consider alternative manufacturing processes, platforms, and materials expanded the range of package design possibilities. The plastic canister the company decided on provides benefits and value-added features consumers said they wanted, but which were not possible with a metal can. These include easy product access (no sharp edges) and a carrying handle for improved portability. As Folgers's market share keeps growing, P&G's Big Box exercise continues to pay off. On March 28, 2005, *Crain's Chicago Business* reported that "…observers credit clever new packaging for the 36 percent to 34 percent lead Folgers now holds over Maxwell House…"

such as operators and mechanics. This is an opportunity for the supply-chain nay-sayers to become powerful can-do problem solvers. When evaluating solutions, the team should weigh the advantages of clean-sheet manufacturing layout versus retrofitting existing equipment. The primary focus is on exploring the reasons why the business is constraining itself to what it has.

So many times a team is forced to shoehorn an idea into the existing factory. However, Big Box Thinking calls for a revolutionary shift in approach: Consider building the factory around your idea instead. This may be an optimal time for the business to evolve. Technology is improving, consumers are changing, and the business should too. As with restoring an old house with outdated infrastructure and hidden problems, it is often less expensive (both up-front and ongoing) to start from scratch. A new production line built specifically to run the new package with high speed and efficiency may be the answer.

Preferably, creative production problem solving will run in parallel with design and development, with learning shared between efforts. As creative concepts are realized, the manufacturing professionals can leverage fast prototyping to validate proposed new technologies.

Use a Proven Innovation Process to Deliver the Right Design to Market, Fast

While manufacturing works to bridge the production gap, the design team can leverage a development process that has consumer-driven rapid innovation at its core. In addition to tapping consumers at the project kick-off, user insight drives selection and validation of design direction at key stages of the process. This ensures that from project start to final concept, there is a laser focus on delivery against user needs. Through hands-on consumer interaction and rapid prototyping capability on-site at the creative agency, the design team can solicit, incorporate, and confirm consumer desire in real time. What results is a final concept that is consumer-approved and aligned with business reality, delivered to market faster and more efficiently. ■

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