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Reducing the Risks of New Product Development

Companies strive to develop and produce exactly what customers want, when they want it — and to accomplish all of that with no risk of overstocks. But such a manufacturing nirvana has become increasingly difficult to attain, given customers' quickly changing preferences, the heterogeneity of their demands and the resulting microsegmentation of many product categories. Today, many consumer goods companies have been forced to accommodate smaller markets, as these niches often provide the only path to growth and escape from heavy price competition.

At the same time, forecasting the exact specifications and potential sales volumes of new products is becoming more difficult than ever. Recent studies have confirmed the problems of new product commercialization,¹ with newly launched products suffering from notoriously high failure rates, often reaching 50% or greater. The main culprit has been a faulty understanding of customer needs. That is, many new products fail not because of technical shortcomings but because they simply have no market. Not surprisingly, then, studies have found that timely and reliable knowledge about customer preferences and requirements is the single most important area of information necessary for product development.² To obtain such data, many firms have made heavy — but often unsuccessful — investments in traditional market research.

There is an alternative. Some companies have begun to integrate customers into the innovation process, for example, by soliciting new product concepts from them and pursuing the most popular of those ideas. (See “About the Research,” p. 66.) These firms also ask for commitments from customers to purchase a new product *before* commencing any final development and manufacturing. This overall process — called collective customer commitment — can help companies avoid costly product failures. But implementing the methodology requires major changes in the traditional steps of product development.

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To avoid costly product failures, companies can integrate customers into the innovation process and ask for their commitment to purchase early on.

Susumu Ogawa
and Frank T. Piller

How Threadless Does It

To understand how collective customer commitment works,³ consider Threadless, a young Chicago-based fashion company. Started in 2000 by designers Jake Nickell and Jacob DeHart, Threadless focuses on a hot fashion item: T-shirts with colorful graphics. This type of product is typically hit or miss, with success contingent on a company's ability to identify fast-changing trends and the right distribution outlets for specific designs. Despite such challenges, none of Threadless' hundreds of products has ever flopped.

What's the reason behind this success? Interestingly, Threadless has neither sophisticated market research nor forecasting capabilities, and the company does not deploy a complex, flexible manufacturing system. Rather, Threadless relies on a community of customers, including hobbyists as well as professional graphic designers, who submit, inspect and approve all designs.⁴ In this way, Threadless can exploit a pool of talent and ideas that is much larger than the company could possibly afford if it relied instead on an internal process. Moreover, Threadless will manufacture only those designs that have garnered the necessary number of preorders from interested customers, thereby ensuring each product's success.

Each week on the Threadless Web site, customers can evaluate between 400 and 600 new submissions on a scale from zero to five. On average, each design is rated by 1,500 people. In addition,

customers can express their desire to purchase a submission, and Threadless uses that information to determine which products should be developed and manufactured. The company currently produces between four and six new designs each week, and the creators of those submissions each receive a \$1,000 reward. Also, the name of each winner is printed on the label of his or her particular T-shirt. At last count, more than 400 designs have been chosen for manufacturing from among more than 35,000 submissions, and the Threadless community was thriving with more than 120,000 people signed up to submit, evaluate and purchase new designs. Motivated by its success with T-shirts, the company has recently extended its business model to other clothing items, including ties and polo shirts (NakedandAngry.com), and music (15MegsofFame.com).⁵

As Threadless has discovered, collective customer commitment has important benefits. By establishing an open line to customers, a manufacturer gains access to ideas for new products or even complete designs. This process can be particularly effective for companies targeting either specialized customer segments or volatile markets influenced by fast-moving trends. Furthermore, collective customer commitment helps firms to avoid product flops. A manufacturer can determine the minimum volume necessary to produce an item for a given sales price, covering its initial development and manufacturing costs (and the desired margin). If a potential product fails to garner the necessary number of preorders, it can be scrapped before the company has made any major investments in final development, manufacturing, marketing and sales. In essence, collective customer commitment enables firms to serve a market segment very efficiently *without* first having to identify that segment, and it helps convert expenditures in market research (specifically, the process of surveying customers to determine which potential new products they are willing to buy) directly into sales.

About the Research

Our research utilized a multilevel approach based on in-depth case studies. For each of the cases presented, the manager in charge of the collective customer commitment method was the primary source of information. We also conducted semistructured interviews with other members of management. Muji was studied from 2001 to September 2005, and Threadless was observed from 2004 to September 2005. For both companies, we followed several product development processes in real time, and we retraced numerous others to get information about the origins of the ideas, the evaluation phase, the voting mechanism and the generation of customer commitment. We analyzed customer comments and surveyed members of the communities for feedback and information about their participation in the product development process. This information was supplemented by data from secondary sources, including newspaper and magazine articles as well as interviews with outside experts. To understand product development in the markets studied, we also interviewed industry insiders about the practices at Crate & Barrel, Elephant Design, Ikea, PepsiCo, Procter & Gamble, Sears, Adidas Group, Brooks Brothers, Esquel, Lands' End and My Virtual Model.

The Failure of Conventional Market Research

In the past, companies typically relied on traditional forms of market research, including focus groups, to test new product concepts. But focus groups have a number of severe limitations.⁶ First, the results from a test with a few consumers are not a reliable indicator of the reactions of the broader population. In addition, focus groups lack realism because consumers are often given only verbal descriptions of concepts or renderings of a product, leading them to possibly underestimate the benefits of a new product that is truly unique. Furthermore, focus groups — as well as most other common market research methods — do not measure people's real purchasing behavior. They can reveal information about consumers' attitudes toward (or intentions to purchase) a new product, but they do not provide quantitative estimates of sales, profitability and other information. Test marketing can provide a more reliable and accurate measure, but that

process is expensive, very time-consuming and subject to a high level of noise from competitors' activities and other sources. Finally, most market research methods require background data to calibrate forecasting or to correct for biases in people's stated purchase intentions. Such information might be available in established categories for consumer packaged goods but not for radical innovations or for products that target highly heterogeneous market segments.

A survey of Fortune 500 corporations found that only the focus group method was used by more than the half the companies studied, and only two other methods (limited rollouts and concept tests) were used by more than 25% of the respondents.⁷ From our own experience, we have found that, despite the activities of prominent exceptions like Procter & Gamble Co. of Cincinnati, Ohio, and Unilever, based in London, many consumer goods companies do not regularly survey their potential customers when introducing a new product. This is startling, given the huge risks involved.

One frequent excuse is that the behavior of customers is often impossible to predict: They cannot express what they want; they are internally inconsistent; they require other people, some of whom have different needs, to make the purchase decision; and they are likely to change their minds by the time a product is launched. As a result, many manufacturers develop new products basically by revising their existing offerings. Such an approach might improve a company's ability to forecast the demand for the new variants, but it also places manufacturers in the persistent danger of missing important trends. Moreover, it severely hampers a firm's ability to surprise customers with products that are truly innovative.

Postponement and Mass Customization

Other organizations have deployed the alternative solution of postponement. Studies have shown that companies can increase their forecasting accuracy dramatically after observing just 20% of the initial sales of an item.⁸ Thus, to better cope with the uncertainty in dynamic markets, a firm can purposefully delay certain activities rather than starting them with incomplete information. In such a postponement strategy, manufacturing is split into two phases: First, generic components are built to stock; then, once the company has more information about the market demand, those parts are assembled into the final product.⁹

Related to postponement, but different in nature, is the strategy of mass customization. With postponement, the manufacturer typically predefines the products. With mass customization, this process is reversed. Customers first codesign their own products, using a configuration system to specify their preferences. The individualized offerings are then manufactured on demand.

Postponement and mass customization offer additional flexibility to minimize the risks of product development, but that

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benefit has its costs. Each strategy necessitates a redesign of both products and processes, requiring the creation of modular product family structures and often heavy investments in new flexible manufacturing equipment. In addition, mass customization requires an "elicitation system" for accessing the preferences of each individual customer and for transferring that information into a precise product definition. At the operational level, postponement and mass customization imply higher costs due to less efficient processing. Splitting formerly integrated manufacturing processes increases the complexity of coordination and planning. In addition, smaller lot sizes in manufacturing often require more compound purchasing operations and a higher stock of work-in-process. As a result, although the two strategies are

discussed broadly in the management literature, they have not been widely implemented.¹⁰

Collective customer commitment combines the ideas of postponement and mass customization but adds other characteristics as well. (See "Three Strategies for Reducing the Risks of New Product Development," p. 68.) In contrast to postponement, it starts the full manufacturing cycle only after customers have shown their real commitment to purchase a particular item, eliminating the risk of product flops while still allowing for economies of scale. It also enables manufacturers to avoid having to make risky decisions about what components to prefabricate or about the optimal timing of postponement. In contrast to mass customization, it does not require interactions with individual customers nor does it require running manufacturing lots of one. The costly elicitation process is replaced by the early involvement of some expert customers (to develop and refine their product concepts) and the receipt of preorders from a larger group of consumers.

When Collective Customer Commitment Makes Sense

Taking preorders before production commences is hardly a new way of doing business. In many specialized industrial markets, manufacturers develop and produce customized solutions for specific buyers under strict contractual terms. In real estate, new condominiums are often sold like Threadless T-shirts. The devel-

Three Strategies for Reducing the Risks of New Product Development

Collective customer commitment combines ideas of postponement and mass customization but adds its own characteristics as well.

Postponement	Mass Customization	Collective Customer Commitment
New product development by manufacturer based on market research input	Development of product architecture and customization options by manufacturer	Development of new product design by some (expert) customers
Prefabrication of (some) components	Customer codesign process (elicitation)	Evaluation and refinement of design by manufacturer and customer community
Access to better market information based on market research input	Placement of orders by individual customers	Presentation of selected design concepts and solicitation of commitment from potential customers
Final assembly of product variant	Custom (on-demand) manufacturing	(Mass) production (but only if minimum lot size is presold)
Mass distribution	Custom distribution	Mass distribution

oper will start construction only when a given number of buyers have shown their willingness to purchase a unit by placing a down payment. But what has been an approach for very costly products like condos is now passing downward to fast-moving consumer commodities. There are several reasons why.

For one thing, customers are now empowered with greater access to information — thanks, in part, to the Internet — so that many want to have a greater say about the products they purchase. This reflects the larger trend toward an open innovation process, in which manufacturers like Adidas, BMW, Procter & Gamble and 3M have recently created platforms to incorporate user innovation into their product development systems. Such collaborations between companies and their customers have become increasingly easier to facilitate because of advances in IT and decreasing communication costs. In fact, firms such as Threadless have been able to automate almost their entire process for collective customer commitment.

The use of collective customer commitment can be particularly effective for two types of situations: (1) testing really innovative products for which little customer experience exists and thus market research is fuzzy, and (2) developing products for relatively small and very heterogeneous market segments. An example of the first situation is provided by Yamaha Corp., the Japanese manufacturer of musical instruments. The company's design team was trying to envision a product based on the feedback of hobby musicians who wanted to play an instrument without having to spend countless hours practicing. The team came up with an innovative electronic guitar that, after being fed a particular song, would cue users with small lights on the fingerboard to indicate where they should place their fingers. At first, Yamaha considered the idea too risky to be developed through the company's conventional system, so it relied on its

existing user community.¹¹ Customers were intrigued by the product concept and provided suggestions for improvements, such as adding an amplifier and making the device battery-powered. When the final design was posted, Yamaha was quickly able to obtain the minimum quantity of orders, motivating the company to proceed with manufacturing. To date, more than 20,000 units have been sold — five times the average product sales in this category of musical instruments.

The second situation occurs with increasing frequency because of fast-changing market trends and increasingly diverse customer needs.¹² In addition, the borders of many local markets are diminishing as customer needs become more broadly distributed over geographic regions. Markets that are both heterogeneous and distributed result in large information asymmetries between individual customers and manufacturers, which greatly increase the costs for the latter to access all the required information.¹³ Particularly in such environments, customers can be a valuable source of innovation. Consider the business operations of Muji, a large Japanese retail chain. Not widely recognized in the United States yet (although the company has been selling its products through the Museum of Modern Art in New York and is opening a flagship store there as well), Muji is a household name in Japan for a variety of consumer commodities, including apparel, household goods and food.¹⁴ The company positions its “no frills” products, which bear no brand name or label, at prices 20% to 30% lower than other brands, similar to the strategy of U.S. retailer Target Corp. of Minneapolis, Minnesota. Although Muji is famous for its powerful internal design capability,¹⁵ some of its most successful recent products have been the result of its move toward collective customer commitment.¹⁶

The practice relies on Muji's existing online customer community: Approximately 410,000 members submit and preeval-

ate new designs, some representing radical concepts. For the highest ranked ideas, Muji creates a professional design spec and estimates the expected costs of the first production batch, given a minimum number of orders. With this information, Muji can determine the possible sales price of the item. If commercialization is deemed feasible, the refined design is published and customers are asked to place preorders. Once the minimum order quantity is obtained, Muji proceeds with manufacturing and distribution. If a design fails to garner the necessary number of preorders, however, it is discarded.

The results have been impressive. Muji's customers have co-designed a number of products that have generated sales far beyond comparable items developed with conventional methods. The most successful of these is a type of beanbag sofa with a special filling that combines stability with comfort and takes up less space than a traditional sofa. The annual sales of this product exceeded ¥1.3 billion in 2004 (compared with ¥24 million for the average product in that category). Other successful user-developed items include a stylish portable lamp and the "Freedom Shelf" — a bookshelf with an innovative hanging mechanism that doesn't damage the wall and enables the shelf to be set up in different arrangements.¹⁷ The Freedom Shelf received 300 orders (the required minimum lot) in just one day, prompting Muji to commercialize the product.

Implementing Collective Customer Commitment

Various alternatives exist for implementing collective customer commitment, depending on the desired level of customer interaction. (See "Options for Implementing Collective Customer Commitment.") For example, a company might offer early customers a special preorder discount, or it could decide against such incentives. It might set its minimum order size based on a predefined number that takes into account the development and manufacturing costs of the first production batch, or it might follow a less rigid approach and use the number of purchase commitments as a screening mechanism to identify the most promising product concepts. Basically, a company must decide whether it wants to use collective customer commitment to supplement or replace its conventional product development. Most companies find that a mixture of the various alternatives will provide the most appropriate solution for their operations.

But all collective customer commitment practices must share one characteristic: full disclosure of the entire process, from initial consumer comments to final product commercialization. Often, designers develop their products in secrecy, fearful of the prying eyes of competitors, for an ideal customer who may not actually exist. But collective customer commitment requires the integration of customers in an open innovation process. If product development is kept confidential, companies will find it

Options for Implementing Collective Customer Commitment

Companies that implement collective customer commitment have various alternatives. Those on the left require less interaction with customers. Those on the right demand deeper interaction but provide additional benefits.

Parameter	Alternatives	
Source of new product designs	Company ideas	Customer ideas
Connection with customers	Cooperate with external existing community (such as customer opinion platforms)	Build a community for cocreation of new products
Preselection of ideas	Company panel	Customer competition
Minimum order size	Predefined: Decisions are based on the development and manufacturing costs of the first production batch.	Predefined: Decisions are based on the development and manufacturing costs of the first production batch.
Commitment	Monetary: Customer has to pay at moment of preordering.	Good practice: Customer promises to buy product.
Incentives	None for participating customers	Special preorder prices for early customers and awards for user designers
Reorders	Determined by conventional planning and forecasting	Dependent on continuous commitment from community
Organization	Project- or competition-based process	Ongoing process
Relation to conventional product development and market research	Supplement the conventional process for developing radical new product concepts.	Replace the conventional process and serve as the underlying business model for entire company.

impossible to keep developers and consumers on the same page. For example, customers need information about the prototype as early in the design process as possible so that they and the developers will have the same mental picture of the product concept. This demands a type of transparency that is contrary to the conventional practices of product development. Switching from a closed to an open mode of innovation will be extremely difficult for many companies, but that transformation is crucial for implementing collective customer commitment.

That said, collaboration has its limits and management must retain the final word. Specifically, companies must always combine the collective input of their customers with their internal knowledge of the market. At Muji, for example, product developers use their tacit knowledge about technical constraints and market reception to interpret customer evaluations. In this process, Muji has discarded some ideas that customers had scored highly because the concepts were regarded as just novelties that would be unable to sustain sales. Other new designs have been dismissed because their manufacturing costs were prohibitive. At Threadless, the winning designs are chosen from among the top-scoring submissions, but the final selections are not necessarily the highest scorers. The company also looks at other important factors, such as the quality of the design (is it original and timeless?), legal considerations (does the design raise any copyright-related issues?) and the existing catalog (how will the design contribute to Threadless' wide assortment of products?).¹⁸

PRODUCT DEVELOPMENT, LIKE ANY OTHER MANAGEMENT TASK, requires important decisions about tradeoffs as managers choose what to do (and what not to do). Some situations favor a manufacturer-dominated innovation process with little participation from customers, for example, in utility markets or when a firm wants to surprise loyal customers with a novel technology. But at many companies, customer integration has been playing an increasing role in the product development process. For these organizations, collective customer commitment offers substantial opportunities for reducing the risks of new product development and for overcoming the limitations of conventional market research. The method is well-suited to producers of items such as fashion wear, household utensils, sporting goods, home appliances and consumer electronics. Other possibilities include high-ticket items such as prefabricated houses, automobiles and machinery for specialized applications. The beauty of collective customer commitment is that innovative ideas can be explored at relatively little cost. If customers reject a particular design, it can easily be scrapped. This experience might be disappointing, but it is far less expensive than manufacturing and distributing high volumes of a product that ultimately no one wants — unfortunately, a familiar situation for many companies today.

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REFERENCES

1. See R. Balachandra and J.H. Friar, "Factors for Success in R&D Projects and New Product Innovation," *IEEE Transactions on Engineering Management* 44, no. 3 (1997): 276-287; G.L. Urban and J.R. Hauser, "Design and Marketing of New Products," 2nd ed. (Englewood Cliffs, New Jersey: Prentice Hall, 1993); J. Poolton and I. Barclay, "New Product Development from Past Research to Future Applications," *Industrial Marketing Management* 27, no. 3 (1998): 197-212; W.H. Redmond, "An Ecological Perspective on New Product Failure: The Effects of Competitive Overcrowding," *Journal of Product Innovation Management* 12, no. 3 (June 1995): 200-213; and K. Tollin, "Customization as a Business Strategy: A Barrier to Customer Integration in Product Development," *Total Quality Management* 13, no. 4 (July 2002): 427-439.
2. J. Henkel and E. von Hippel, "Welfare Implications of User Innovation," *Journal of Technology Transfer* 30 (January 2005): 73-87. Refer also to M.E. Adams, G.S. Day and D. Dougherty, "Enhancing New Product Development Performance: An Organizational Learning Perspective," *Journal of Product Innovation Management* 15 (September 1998): 403-422; G. Bacon, S. Beckman, D. Mowery and E. Wilson, "Managing Product Definition in High-Technology Industries: A Pilot Study," *California Management Review* 36 (spring 1994): 32-56; and R.K. Teas, "Expectations as a Comparison Standard in Measuring Service Quality: An Assessment of a Reassessment," *Journal of Marketing* 58 (January 1994): 132-139.
3. The origins of the idea can be traced back to Kohei Nishiyama and Yosuke Masumoto, industrial designers from Tokyo. In the 1990s, they pioneered the idea with their company Elephant Design. The core element of the company is its Web site www.cuusoo.com (*cuusoo* means "ideal" or "daydream" in Japanese). Here consumers can post ideas for desired products. One idea, for example, came from a copy editor who used his home as an office and wanted a discrete microwave, a plain white box. That seemed to be an odd request, but when the company showed a virtual prototype, many users expressed interest. A similar system, called "custom mass production," is described by G. Eloffson and W.N. Robinson in "Creating a Custom Mass-Production Channel on the Internet," *Communications of the ACM* 41 (March 1998): 56-62. Here, users first negotiate on a particular product design, find consensus about a solution that fits the desires of all and auction the resulting design to interested manufacturers.
4. For a good review of research on customers as sources of innovation, see E. von Hippel, "Democratizing Innovation" (Cambridge, Massachusetts: MIT Press, 2005). These customers are often organized in communities by a manufacturer or intermediary; see M. Sawhney, E. Prandelli and G. Verona, "The Power of Innomediation," *MIT Sloan Management Review* 44 (winter 2003): 77-82; and F. Piller, P. Schubert, M. Koch and K. Moslein, "Overcoming Mass Confusion: Collaborative Customer Co-Design in Online Communities," *Journal of Computer-Mediated Communication* 10, no. 4 (2005), <http://jcmc.indiana.edu/vol10/issue4/piller.html>
5. A company with a very similar business model is Buutvrij from Utrecht, Netherlands (www.buutvrij.com).
6. For a good review of the inefficiencies of traditional market research, see R. Burke, "Virtual Shopping: Breakthrough in Marketing Research," *Harvard Business Review* 74 (March-April 1996): 120-129.
7. See M.E. Adams, G.S. Day and D. Dougherty, *Journal of Product Innovation Management* 15: (winter 2002) 403-422; and V. Mahajan and J. Wind, "New Product Models: Practice, Shortcomings and Desired Improvements," *Journal of Product Innovation Management* 9, no. 2 (June 1992): 128-139.
8. M. Fisher and A. Raman, "Reducing the Cost of Demand Uncertainty Through Accurate Response to Early Sales," *Operations Research* 44 (January-February 1996): 87-99.

9. D.M. McCutcheon, A.S. Raturi and J.R. Meredith, "The Customization-Responsiveness Squeeze," *Sloan Management Review* 35, no. 2 (winter 1994): 89-99.

10. With regard to postponement, see D. Gupta and S. Benjaafar, "Make-to-Order, Make-to-Stock, or Delay Product Differentiation? A Common Framework for Modeling and Analysis," *IIE Transactions* 36 (June 2004): 529-546; and H. Skipworth and A. Harrison, "Implications of Form Postponement to Manufacturing: A Case Study," *International Journal of Production Research* 42, no. 10 (May 15, 2004): 2063-2081; with regard to customization, see M. Agrawal, T.V. Kumaresh and G. Mercer, "The False Promise of Mass Customization," *McKinsey Quarterly* 38, no. 3 (2001): 62-71; P. Zipkin, "The Limits of Mass Customization," *MIT Sloan Management Review* 42 (spring 2001): 81-87.

11. Yamaha teamed up with Engine Inc., a competitor of Elephant Design (see reference 3). Engine focuses on fashion items and the merchandizing of movie and comic characters (its 2004 sales topped ¥570 million). Registered users can submit "please, make this" posts, that is, ideas for new products, on the company's Web site, www.tanomi.com (the name derives from the Japanese term *tanomikomu*, meaning requesting, referring both to the consumers' requests to produce a design and the manufacturers' requests that consumers purchase the product before production). Once copyright and production feasibility are cleared by a company board, the idea is published to the entire community for evaluation, together with a price and minimum order quantity for its commercialization. In addition, Engine allows other manufacturers to post innovative product concepts directly to its community.

12. For an analysis of the reasons that markets are becoming more heterogeneous, see S. Zuboff and J. Maxmin, "The Support Economy: Why Corporations are Failing Individuals and the Next Episode of Capitalism" (London: Viking Penguin, 2002).

13. Domains with large information asymmetries between individual users and manufacturers have been called "low-cost innovation niches," that is, fields where information held locally by individual users strongly motivates them to contribute actively to a new development; see E. von Hippel, "Democratizing Innovation." With regard to the problem of information transfer, see E. von Hippel, "'Sticky Information' and the Locus of Problem Solving," *Management Science* 40 (April 1994): 429-439; and S. Ogawa, "Does Sticky Information Affect the Locus of Innovation? Evidence from the Japanese Convenience-Store Industry," *Research Policy* 26, no. 7-8 (July-August 1998): 777-790.

14. Muji is the retail brand name of Ryohin Keikaku Co. Ltd. of Tokyo. Once a part of the Seiyu department store chain, it is now independently listed on the Tokyo Stock Exchange. Muji has expanded globally, with 148 stores in Japan, 16 in the United Kingdom, five in France, six in Hong Kong and one in Italy. Muji sales in fiscal 2004 totaled ¥127 billion with operating profits of ¥12 billion.

15. For a good review of conventional product development practices at Muji, see P. Reinmoeller, "Dynamic Contexts for Innovation Strategy: Utilizing Customer Knowledge," *Design Management Journal* 2, no. 1 (2002): 37-50.

16. The application of the collective customer commitment method was facilitated by Elephant Design (see reference 3).

17. The "Freedom Shelf" has annual sales of ¥70 million, and the portable lamp has annual sales of ¥69 million (compared with average sales of ¥24 million for comparable conventional products in this category). The project was conducted in the period from September 2002 to December 2003. Ultimately, eight themes were considered; among those, three were commercialized. Retail prices were set at ¥1,000 to ¥19,000, and the minimum required lot sizes were between 50 and 300 units.

18. The Threadless team also goes through each short-listed design to ensure that no cheating was involved by analyzing the IP addresses and IP chains for voters and the respective scores given.

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