

Value-Based Decision-Making: A Technique for Accelerated Product Development

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„Getting close to the customer“ has long been recognized by developers, manufacturers, and marketers of commercial products as an essential ingredient for success. Customer requirements – integrated with business objectives, product delivery requirements, and applicable regulatory requirements – define the product and provide direction to its development. There are, however, several issues involved in incorporating the voice of the customer into product development: it takes time – where time is in fact money – and it often happens too late in the cycle to permit extensive reengineering. In addition, the way most research is conducted, you don't get true customer requirements, because customers often can't articulate needs or wants for things they haven't yet experienced. Even once the needs are known, there may be a large number of ways to fulfill that need, i.e., in terms of engineering approaches. How do you choose one?

At Arthur D. Little, we have addressed these issues successfully by using a product definition process based on Quality Function Deployment (QFD).¹ QFD is a team exercise that systematically ensures that the customer remains the focus of product decisions. To elicit the consumer input that becomes the basis for product definition in QFD, we use the technique of consumer or user focus groups in our „value-based decision-making“ process. Traditionally, focus groups are viewed as a way of developing qualitative data regarding consumer or user preferences. Especially for mass market consumer products, sold into potentially highly segmented markets, output from focus groups has been considered as indicative of only the direction of product definition – requiring subsequent quantitative market research to support development programs and justify associated investments. This two-step sequential process invariably causes delays, and subsequent distortion of user requirements. Furthermore, unless the overall process is carefully planned to anticipate and include tests of market segmentation, e.g., by region, opportunities will be missed for early decision-making and optimized product rollout strategies.

In the course of our work with clients, Arthur D. Little has „pushed the envelope“ of user groups so they yield statistically meaningful quantitative data, in many cases obviating the need for subsequent quantitative market research. Traditional focus groups are designed to yield qualitative responses in an unstructured format – responses that don't allow for meaningful comparison within the group across products or concepts. We've gone beyond that limitation by structuring both the elicitation of input from focus group participants as well as the treatment of the collected data. Structured properly, i.e., by framing product evaluations and collecting responses within that framework, focus groups can generate quantitative data on the „value“ that consumers place on product benefits. To make money, after all, the product developer and marketer must understand not only what the customer wants and needs but also what he or she will buy and at what price. Understanding not only the tradeoffs users are willing to make, but also what features would get them to buy (purchase triggers) and the relative value of these features, are the enablers of and prerequisites for early decision-making – what we call value-based decision-making – at the product-definition stage of product development. What differentiates our approach are the structured methods and tools we use for identifying, categorizing, and testing product-development approaches while simultaneously eliciting user-need information. The result is a more timely and effective approach for decision-making, which can harness what otherwise might be competing technologies and lead to breakthrough products.

We have applied value-based decision-making not only to consumer products, but also to engineered industrial products such as graphic arts equipment, safety equipment, and medical equipment – products in which the basis for consumer selection and purchase is thought to be nearly purely objective. Such products are much less frequently subjected to the kind of direct customer/stakeholder input that could make the commercial outcome of product development more predictable. *Yet* despite the objective specifications to which such products are built, the fact is that there are often significant subjective elements to the ultimate purchase decision. These subjective elements can make the difference between a „hit“ the first time out in the market and an initial market disappointment.

In this article, *we* will share some specific case examples that show how value-based decision-making can be used by product developers and marketers to:

- Incorporate decisions related to product definition for complex multifunctional engineered products early in the cycle, based on value to customer
- Potentially eliminate product-development iteration cycles
- Understand to what extent a product can be globalized
- Anticipate and preempt potentially „disabling“ technologies

Case 1. A Complex, Multifunctional Engineered Product. One of our long-standing clients was about to invest tens of millions of dollars in a „next-generation“ model of graphic arts imaging equipment. With literally hundreds of field salespeople spread about the globe providing customer input relative to desired features, our client’s marketing and development team had generated a list of 80 „bells and whistles“ to be incorporated into the next new model. However, the client was appropriately uneasy about committing to the development program. In certain markets, our client already enjoyed major market share. Would this new model really achieve the overall market share gains management was expecting? If not, would the return on the investment of tens of millions of dollars ever be realized? The client also knew that the core technology employed in this graphic arts equipment would eventually be displaced by digital technology. Could this new model be good enough to delay the penetration of digital technology? And could one „global“ model be built that would satisfy the client’s customer bases in Europe and the Pacific Rim, as well as in the United States?

To answer these questions, we organized and facilitated focus groups involving users and specifiers of the graphic arts equipment in question, both the client’s and the direct competition’s products. Over a period of 5 weeks, we recruited 19 focus groups in 7 countries on 4 continents. Using our value-based decision-making method to elicit input from the individual participants, we narrowed the original 80 desired product features down to 25 benefits desired by the user group. Of those, approximately six were considered purchase triggers. Using information supplied by the participants, in one step we developed statistically significant comparisons between the client’s product and the competition’s models. Again, the comparisons were focused on those benefits and needs discovered to be significant in terms of likelihood of purchase. Function for function, the client’s model was compared with those of its closest competitors, in each of the regions. The focus groups yielded two key findings:

- The client’s existing imaging equipment trailed the leading competing model in only two of the functions considered key as purchase criteria.
- Customer expectations for the emerging digital technology were so strong that no improvements in the trailing technology could delay its market penetration.

Looking at the broad implications of these two key findings, our client decided that an investment of tens of millions of dollars in the next-generation model couldn’t be justified, either in terms of potential market share gain or in terms of delaying the advance of new technology. The company quickly shifted its development focus to commercial introduction of the improvements (already „on the shelf“) in the two key functions that would allow it to succeed short-term relative to its strongest existing competitor. Although our original work program for this client included user focus groups to be followed by broad-based, global primary market research, the results from our value-based user group sessions were robust enough to eliminate the need for the expense and time of the additional market research. As a key member of our highly satisfied client team said, „We never thought we could get this much direction from focus groups!“ Among the advantages of our process that led to this outcome were these:

- Focus group participants were actual users and purchasers of the equipment being studied, and our focus group facilitator was from the industry and understood its language.
- Group participants were led to identify, prioritize, and rank the relative importance of specific product attributes to equipment selection and purchase.
- Competing products were also identified by the participants, and regression analysis was used to develop statistical models that would reveal significant differences among products.
- Product ratings were compared within each group; the differences in results between groups within countries could then be compared with the differences between countries, allowing us to make informed conclusions regarding the feasibility of a „global“ or universal product.

Case 2. Product-Development Iteration Cycles.

In the first case, we saw an example of value-based decision-making that flowed from the user group’s hands-on familiarity with commercial products in competition with our client’s. This familiarity provided a built-in yardstick of performance and preference against which our client’s products, and its improvement options, could be ranked. This second case, involving the development of pharmaceutical equipment, is illustrative of a situation common to highly engineered products: customers are being asked to help define a brand-new piece of advanced equipment, for which existing models cannot offer direct points of comparison beyond the basic functionality of the equipment. For this kind of product, the design criteria can number in the hundreds. Capturing even qualitative trade-offs among these criteria (e.g., throughput, accuracy, precision) requires transforming these choices from abstractions to tangible models illustrating design options. That’s exactly what we did. We showed four mock-ups to user focus groups – composed of pharmacists and technicians who operated and/or made purchase decisions about equipment – and elicited input regarding a broad range of issues,

such as user setup and machine operation, to cut through to what was really important for the users. By establishing tangible links to what could be, we assisted the focus group participants in discovering for themselves, in real time, what their preferences would be and in articulating these to us and our client. One of the important outcomes of this use of our value-based decision-making approach was the subsequent rapid product development with no iteration: the client developed a „looks-like“ model within weeks of the focus group activity and immediately engaged in the engineering activity of developing a „works-like“ model.

Case 3. Global Product Strategy. In this case our client needed consumer-driven recommendations on flavor and packaging for three global beverage brands. This case demonstrates the significance of understanding value-added opportunities across countries, as well as across consumer segments. Value-based decision-making can help companies address a key issue: does it make sense to have a global product strategy, or should strategy be regional, encompassing local flavors and brands?

Our research in this case supported a global approach to both flavor design and package design, with brands targeted to consumer „price“ segments. All of the wines selected for this survey (over 40 red and white varieties) were priced below \$20, purposely targeted to a „mass market.“ Price classes were based on the typical purchase of a middle- to upper-income purchaser with higher-than-average volume purchases. There is an element of „snob appeal“ that corresponds to price segments, especially if the wine is purchased as a gift or for dinner guests, but our research revealed that there is also a strong relationship between price and „flavor quality“ for red wine.

For the research, we segmented consumers based on self-reported levels of interest and knowledge about wine flavor, because the same consumer will purchase wine in different price classes depending on the occasion. Further segmentation included distinctions between consumer preferences for red versus white wines. Consumers within each segment received the same set of wines for evaluation so that products could be compared within groups. We also tested packaging concepts with groups from similarly defined consumer segments. With respect to package design in the high-end segment, we noted and captured a quantitative price relationship to classical design elements and package execution. At the low-end segment, our numbers supported a simple tradeoff between quality perception and price. Also, there were geographic differences in how consumers responded to „attraction“ elements – that is, design elements intended to get the consumer’s attention, hi Germany, for example, color coordination among label, closure, and bottle was a high-rated attraction element, hi the United States, label and bottle image, as well as label/bottle color, were key attraction elements.

Case 4. Anticipating Potentially Disabling Technologies. A disabling technology is one that can rapidly and with little warning render an existing technology obsolete. Cutting-edge technology in one industry can become disabling technology for another. To preempt significant loss of market share, companies can systematically look for cutting-edge technologies that could disable their own and, where possible, incorporate elements of these new technologies that their existing customer base could/would value.

In this case, we helped a client that makes protective clothing to do just that by taking radically new technology developed for the military and assessing its potential attractiveness to the company’s core customer base of firefighters. The military is developing a broad range of rugged, field-ready, integrated systems, e.g., integrated computers and radios, and helmet-mounted displays for system control, maps, and infrared imaging. Furthermore, military environments and situations have many parallels in firefighting. Our focus-group objective was to identify those integrated capabilities most valued by the group. The focus-group panel was given sufficient background on the military prototypes to brainstorm ideas for parallel uses in firefighting. We also employed group scenario development to help the users imagine the possible use and value of capabilities discovered during the brainstorming. Rankings flowed from the choices the group members made among competing option sets. The results helped our client determine how to use new technologies to create optimum feature sets and how to price them.

In principle, a company could create a portfolio of product development projects extending as far out as 10 years, hi essence, you could potentially convert disabling technologies into enablers of discontinuous product development!

Is Value-Based Decision-Making Right for You?

The „value-added“ of our value-based decision-making approach is most evident in situations in which consumers are unable to articulate their needs and desires and/or the product developer is faced with multiple levels of complexity in terms of integration of product features to provide functionality for the various market segments, hi such circumstances, the user lacks the tools (mental concepts, words) to create the desired or needed product, so the developer lacks the necessary information first to understand and then to generate product specifications to meet those wants and needs. The typical approach to product development in these situations has been to employ an iterative process, i.e., give the user a prototype, see what she/he thinks of it, and then go back to the drawing board to try again. When the variety of technical approaches is large, the typical response is

to reduce the number of technical approaches to a short list rather quickly, substituting experience and educated guesses for user input. The problem with the typical iterative approach is that even when product developers do select the „right“ small set of factors key to purchase decisions (often less than 1 percent of all possible factors), there is still a high probability that the product features chosen to respond to these key factors are off target.

In either case, structuring the elicitation of customer input must effectively deal with these complicating factors to avoid multiple cycles of iterations, resulting in delayed or unsuccessful product introductions. Use of the approach has allowed companies to accomplish timely introduction of on-target products, all within the real-world constraint of limited product-development resources.

¹ „*Integrated Product Definition: Using QFD for the Business of Product Development*‘, John M. Collins and Arthur D. Schwoppe, *Prism*, -Fourth Quarter, 1994.

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