

How Puritan-Bennett Used the House of Quality,
John R. Hauser, *Sloan Management Review* (Spring
1993), pp. 61-70

Though viewed by some as an overall product innovation process, quality-function-deployment is now coming to be cited most frequently for its House of Quality (HOQ). This step, consisting of one approach to the work that should be done prior to undertaking technical design, can be incorporated into on-going new product processes. The current article shows clearly what the House-of-Quality step is, and how one firm handled it. But this abstract must shortchange both the method explanation and the application details.

Puritan-Bennett (PB) is in the spirometry business, spirometers being the devices used in the medical field to measure lung capacity, inhaling and exhaling. In early 1990 the firm faced disaster—a competitor had just introduced a new product targeted at the growing segment of the market, with a price advantage of over 50%. PB had to meet that challenge very fast, or withdraw to a small, high-price segment.

They decided to try the HOQ approach, in cooperation with the author (an MIT professor and long-time PDMAer) and a Boston marketing research and consulting firm. First, PB formed a standard cross-functional team, and pointed it at the spirometry competitive problem. (Heretofore, PB had been using a traditional, staged, functional hand-off process.) Second, they undertook to prepare the first part of the House, the list of customer needs.

Customer needs are of three types—basic needs (what they assume the product will do), articulated needs (what they want the product to do), and excitement needs (which, if fulfilled, would happily surprise them). They often number well into the hundreds. PB gathered theirs through a series of focus groups and telephone interviews, and had customers also prioritize them, numerically on a one hundred-point scale. Combining these scores with their personal knowledge of the cost of achieving each, they prioritized down to what were *PB's*

primary needs, the ones customers said were important and which the firm knew it might be able to meet.

For each primary need put on the list, the team developed a set of several secondary needs that, if met, would fulfill the primary need. For example, one primary need was “ease of use,” and its secondary needs were “set up first time,” “easy to operate,” “fast to use,” and “easy to calibrate.”

Next, HOQ calls for each secondary need to have design attributes (some call them design parameters) meaning the tangible measurements used to define each of the needs. Design attributes for ease of use might be “time to perform the task,” “initial setup time,” and “time for a new operator to perform the task.” These will drive the technical development work, so it is critical they be right, and complete. Note too that the design attributes are not solutions, they don't specify how technical people will achieve them, or what the product will actually *be*.

Next, HOQ calls for each important competitor in the market to be scored on the design attributes. These are customer perceptions, not factory measurements.

At this point HOQ can get rather complicated if the team tries to relate each design attribute to each need. In this case, what was still not a full set of needs is shown on a two-page matrix, with needs down the left side, and design attributes across the top. Using it assures maximum effect from the attributes and that no need is without a solution.

In the PB case, the firm felt that HOQ “made sure that the right information got to the right people at the right time. In short, it enhanced communication and focused the design process on the customer.” The new product was very successful, in sales, and in time-to-market. Having the targets in place permitted the team to remain focused against the interruptions and diversions typical of a development stage. (Key to the solution was a modular system as discussed in the previous Mass Customizing abstract.)

The article concludes with references to several other firms and industries (including services) where the above process has been used.