

DEVELOPING NEW PRODUCTS AND SERVICES BY
LISTENING TO THE VOICE OF THE CUSTOMER

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Today's intense competitive market environment for products and services demands that companies employ new and more effective means for innovating. New and improved products and services emerge in their final form from the research, development, engineering and/or product development departments of most companies. But the information that goes into those organizations, its origin and content, vitally affect both the volume and quality of the new business ideas.

Years of academic research, consulting practice, and real-world experience in large and small firms demonstrate that listening to the "voice of the customer" is the most productive route for gaining the information required for effective creation of new products and services. In my most recent book, based on a quarter century of research on hundreds of high-technology companies, *Entrepreneurs in High Technology* (Oxford University Press, 1991), I report the preponderance of evidence that demonstrates the critical role of a customer-first orientation. Listening to the customer even at the outset of a new company turns out to differentiate success from failure. This article presents five different approaches for your company, two wholly internal and three involving external outreach to your customers. Each embodies some form of collaborative effort, to better sense your end-customer's needs, preferences, and even their own insights toward solving their problems.

Build Partner-Oriented Internal Organizational Relationships

Many companies organize in ways that limit information flow, especially from the marketplace. The sales or marketing organization often sets itself up as the kingpin of customer relations. Firms often deny their own scientists and engineers access to their customers, fearing that the technical people will be embarrassingly truthful by admitting product

deficiencies, or that they will be insufficiently political by disagreeing with customer ideas. Companies need to appreciate that sales/marketing and R&D/product development are primary partners in serving the end-customer. To be sure this partnership must extend into manufacturing, distribution and field service as well. But the most sensitive organizational bridge is between technologists and marketeers, what frequently seems like a "two cultures" chasm.

Companies often have the opposite of partnership built into their organizational structure. Marketing is set up hierarchically above R&D, especially in consumer goods companies, with control of the budgets and work direction for the technical departments. This stifles a sharing of insights about serving the customer. Effective collaborations cannot be established when resources and power all favor one party. Indeed marketing-trained and experienced people have different skills and viewpoints than technically-trained and experienced persons. If they could find the means to exchange these perspectives, more attractive ways to meet customer desires might be developed.

Hewlett-Packard long ago recognized this partnership requirement by appointing dual managers, one from marketing and one from R&D, to jointly head new product development efforts. Other companies are trying to accomplish internal partnership by creating cross-disciplinary teams that exist throughout the product development cycle, with the team head shifting from one functional area to another as the principal emphasis of the project shifts. An R&D person might be the initial leader as the emerging technology is getting nurtured toward product form; later a marketing individual might take over as customer inputs are being molded into design specifications and the market introduction strategy is being developed; still later perhaps a manufacturing manager or a service professional might take charge, to reflect continuing change in what is most needed to serve the customer effectively.

One facilitating mechanism we have used with various Pugh-Roberts Associates clients is a joint consultation process between R&D and marketing in regard to the contents and priorities embedded within the firm's R&D program. This is aimed at establishing a partnership for at least the planning portion of new product development. The research and development people sometimes resist this perceived invasion of their turf. But in fact such joint consultation is in R&D's self-interest, as it strengthens the rest-of-organization support for the technical activities and it inevitably improves the acceptance and impact of R&D's outputs. One planning tool that we devised to help such collaboration is the "technology/market matrix": the horizontal axis lists the major markets the company serves, the vertical axis displays the key technological strengths of the firm. All of the firm's present

products can be entered into the boxes on the diagram. But most of the boxes typically turn up empty, indicating markets already relevant to the firm that the firm is not presently serving with one of its existing technical capabilities. This visualization is a helpful way of stimulating both the technical and marketing staffs to think creatively about new product and service options that might be desired by customers and are achievable by the firm. 3M has found its highest successes in new business development to occur when it brings products having unique technical features to those markets it is already serving with some other product line. Other companies no doubt share the same experience.

Collaborate on Competitive Product/Service Profiling

Another opportunity for an innovation-enhancing internal linkage between marketing and technical people is their joint execution of what we call "competitive product (or service) profiling". For each of your major product lines, you collaboratively identify the key characteristics that seem to influence customer purchase decisions. This list might come from routine market research, readily done for most consumer goods, or might be generated by less-well-defined methods that are typically used with industrial goods. We often start such analyses from our generic list of seven product/service characteristics: functional performance, acquisition cost, operating cost, ease of use, reliability, serviceability, and system compatibility. Each of these generics might suggest one or two possible specific aspects or measures of your product or service that seem instrumental in affecting a customer's choice of your product versus your competitors'. These candidate measures should be narrowed down to six to ten items for evaluation. IBM has traditionally used a limited variant of this approach for its internal product appraisals, examining RAS -- reliability, availability (e.g., up-time of a computer), and serviceability.

Next you compare your key products against those of your two or three major competitors, in terms of these several customer purchase-influencers, always being cautious to take the customer's point-of-view. We array this information to help find possible clusters of strengths and weaknesses in your appeal to your customers, relative to your competition. Are you typically strong on product performance and reliability, but weak on acquisition cost and ease of use? Is one competitor as good or better than you on most characteristics of importance to the customer? The resulting profiles provide strong direction for where you should be allocating attention and technical resources for improvements and new developments.

Competitive profiles become even more powerful when carried out for three generations of products or services: the present product line, your prior generation of this same line, and your "expected" next generation. Trying to

assess characteristics of the next generation's products or services for both you and your key competitors is a wonderful exercise that reveals the weaknesses in your own internal product planning as well as in your technical and market competitive intelligence. But the three generation comparisons are really powerful in uncovering trends in your own strengths of serving your customers vis-a-vis your competitors' capabilities. It is an important supplement to the conventional market share analyses that tend to dominate most approaches to competitive analysis.

Today many companies, including Xerox and Ford in the United States, are beginning to employ a technique called QFD, Quality Functional Deployment, first used extensively by Toyota for its new car design. The QFD approach tries to capture the wishes of the customer in terms of design features for each and every aspect of the product or service. I believe that a full-blown QFD effort is tedious and will not be rigorously used for long by the engineers and product planners of most American firms. The competitive profiling approach outlined here gets at similar issues, but at a more macro level, and seems to me to be an acceptable compromise between seeking out the voice of the customer and expressing it in useful ways.

Add "Market Gatekeepers" to R&D

A third way to improve sensing of customer needs goes beyond these two wholly internal approaches: the R&D organization begins to utilize what I call a "market gatekeeper", a "boundary-spanner" who is useful especially in relating to your major customers. A market gatekeeper is a technically-trained and competent person who devotes perhaps one-fourth to one-third of his or her time to being well-informed as to developments affecting customers, competitors and regulators, the key actors of the marketplace, and to bringing that information back to the attention of appropriate product/service developers in your company. In particular, for each major customer your firm should employ at least one market gatekeeper to interface on an ongoing basis.

My MIT colleague, Professor Thomas Allen, has done extensive research on so-called "technical gatekeepers", those who stay aware of outside technical developments and share that information with their internal co-workers. He points out that "technical gatekeepers" behave in a manner that is second-nature to them, so long as they are not stymied in that role, and they do not need to be appointed to the "tasks" of reading the literature and attending technical meetings. But the market gatekeeper's job of focusing in on a specific customer or set of them, and maintaining up-to-date information on their needs and activities, is not so natural. It is incidentally an important piece of a company's technological intelligence system, whether formally established or not. And the market gatekeeper's task of translating

from observed market-dimension behavior to technological implications is difficult. The individual who carries out this critical role needs to be carefully selected from those who combine technical skills with a market sensitivity, and the job assignment needs to be made an important part of the person's workload and basis for performance evaluation and rewards. The person might already be a technically-trained member of the marketing organization, but this might stifle the desired informal interchanges with the company's technical staff. This new gatekeeper source of market information for technologists will help generate streams of ideas and answers to customer interests.

Know and Work with Your Lead Users

The two final approaches are also external in nature, seeking explicit new ties outside the company boundaries. In every industry some users have needs that arise earlier than the rest of the industry. Those users are not necessarily major customers, but they are what another MIT colleague, Professor Eric von Hippel, has labelled "lead users".

My own experience years ago on the Board of Directors of the Philips Screw Company illustrates the issues involved. Philips designed and developed the Philips-head screw and many other types of advanced fasteners. It was totally a technology innovation company, engaging in no manufacturing of its own but rather licensing its fastener developments worldwide to screw manufacturers. To be at the vanguard of the fastener industry from an innovation perspective, it soon became clear that Philips needed to work closely with the aerospace industry. Aircraft and spacecraft requirements demanded fastener performance in regard to temperature, stress, exotic materials that made aerospace firms the lead users. But perhaps five to seven years later similar needs would be found in the automotive industry, which by far is the largest market for fasteners. Thus a focus only on its major customer, automobiles, would have provided Philips with little information useful for advanced technology development. To capture the new waves of product requirements demanded close working relationships with the lead aerospace users.

IBM seemed to appreciate this concept early in the history of computing. Its marketing organization established a group of small Applied Science Centers in locations near clusters of advanced computer hardware and software users. The job was to work closely in support of these lead users to gain insights as to where various fields of application were headed. What were the new problems users were trying to solve with computers? IBM's unexpected benefit came from the realization that some of these lead users were also innovators in solving their own problems. Thus IBM's closeness to MIT, both physically through its Cambridge Applied Science

Center and in terms of the collegial relationships developed between IBM technical staff and their MIT counterparts, permitted IBM to transfer from the MIT Computations Center the first operating prototype of a computer time-sharing system and to move it out to IBM's broader market quickly and inexpensively.

The usefulness of trying to identify lead users in your own industry is transparent. Lead users can help assess the direction of future industry requirements, critical for your own creation of new products and services. But they also might solve their own problems, thus giving you further help in reducing the product development cycle from recognition of need to market implementation of solution. Lead users become obvious candidates for possible product development alliances.

Every part of your organization can help in identifying who are the lead users and what their potential value might be. For example, due to their own research needs scientists and engineers are frequently lead users of measurement devices, and therefore are the dominant source of innovation of new instrument systems. Sales personnel often learn of customer needs that cannot be met by your present product capabilities. Instead of merely being frustrated at the lost sales opportunity, sales staff should be given incentives to move this information to your company's technology and marketing people who are concerned with new product concepts. In addition service personnel are daily exposed to customers who are stretching your present products into conditions and applications for which they were not intended, thus creating frequent service calls. This should not produce merely voided customer warranties, but rather should cause the service people to become proactive partners in the loop of new product idea generation.

Build Partner-Oriented External Relationships with Your Customers

Just as internal partnerships between technology and marketing are critical to initiating innovative activities, so too are external partnerships with customers critical to success. You should consider undertaking both formal and informal partnerships with selected major customers during the early stages of new product development programs.

According to Abe Cohen, who shepherded most of the successful ventures that launched DuPont's multi-billion dollar photosystems and electronic chemicals business, early informal partnerships with potentially key customers, like IBM, were critical. Internal opposition argued that going outside for a relationship prior to having finished and protectable products would be very dangerous. Surely competitors would learn of DuPont's intentions. And DuPont would also lose the ability to extract monopoly profit margins at product launch, if it had been collaborating closely with a key

account. Despite these forebodings close informal ties were forged in several ventures that not only clarified customer priorities but also ended up changing product specifications. And when the products were introduced they were targeted to well-developed customer plans and schedules, thus providing rapid and smooth ramp-up and market acceptance. Successful innovation is achieved here by getting closer to an important customer sooner to help you serve that customer's needs better.

Listening Effectively

The five broad approaches described above are but a few of many possible alternatives for stimulating new and improved products and services. They emphasize having technical organizations think and act like marketing organizations, or at least in close collaboration with them. Beginning with the right attitudes of senior management facilitates the creation of partner-like organizational bonds inside your company. These enable marketing and technology views to be expressed in complementary fashion on behalf of satisfying customer needs, current and anticipated.

Efforts aimed at objective assessment of your products' competitive strengths and weaknesses from your customers' perspectives provide additional useful guidance to new product/service development. Establishing outreach to key customers makes more effective your company's attempts at listening. Market gatekeepers for technology developers can gain current and honest representations of customer desires. Identifying and developing informal and even formal alliances with lead users adds both insights to emerging customer needs and possible technology for meeting those needs. Finally, creating partnerships with major customers during the early phases of development programs significantly increases the likelihood of customer acceptance of your product/service innovations.