



## New Product Development--The Fuzzy Front End

Application Note AN-10

by Christopher Moore

### Introduction

New products, innovative products, successful products—these are what we want to create. Most companies have a process to guide teams through the various stages of new product development, but what process can help in the initial creation of innovative products? This, the earliest of the development stages, is often called the fuzzy front end, for it is indeed the hardest activity to reduce to a process. In the fuzzy front end, ideas flow freely, and various concepts are explored in a non-judgmental atmosphere. People are enthusiastic, excited, tolerant of unreasonableness, and willing to live in chaos. They are on an exciting quest, a quest where individual effort is important.

Even if the initial creative activities can't be reduced to a crank-turning process, surely we can identify some techniques, some attitudes and organizational traits that will help.

### An organization committed to innovation

To a large measure, the fuzzy front end is about innovation. Leaders at the highest level in a company should articulate in concrete terms the role that innovative new products are expected to play. Ideally, the CEO asks for innovation, encourages it, and makes it a key part of the company culture so that teams will feel empowered to innovate.

Innovation is difficult to achieve in large groups; keep groups on the small side. If the company gets large, organize it into smaller groups.

### An organization with strategic vision

Company leaders should also promulgate a corporate strategy. Everyone should know the company's preferred markets, applications, core technologies, and product types. Management should state this vision clearly, change it only when needed, and keep it in view at all times. This vision should cover the new product development strategy, company objectives and growth paths, and acceptable risk levels. It may also indicate where not to go.

Develop what Cooper calls a Product Innovation Charter (Cooper, 1987). Articulate how the company expects new products and product innovation to support its strategy, and clearly describe the market arenas in which the products will be sold. Ensure that the corporate strategy and PIC inform, focus, and delimit the new product innovation process.

### Involve your customers

Organize your marketing group so that the most imaginative and most experienced people are focused on in-bound marketing. Form a partnership with engineering and carry out a program of face-to-face customer interviews, being sure to involve technical people. Persons with deep technical background and experience are often best at discovering deep customer needs. The best products are shaped both by new technology and customer needs. The best teams to do the fuzzy front end work consist of visionary technologists and visionary marketing persons.

Sure, customers don't know the technologies as you do and they generally can't see new product possibilities as well as you. But hearing and seeing their fantasies and frustrations will inspire you. Watching customers at work using existing products also can be an eye opener. Ask customers about what works, what doesn't work, what's missing, and what they'd change. Really listen, openly and non-judgmentally—and don't jump into solution space right away.

You should seek an understanding of how your new product will help customers live, work, and achieve their goals. What changes might they have to make in order to use your new product? How would your new product fit in with their environment? What can they afford? Learn what your customers value and what their values are. How do they balance cost against performance? What would delight them?

Break your customers into segments and consider what you might do to customize products for each group. For example, baby boomers now passing through middle age constitute a large customer segment that might respond favorably to products emphasizing simplicity and usability.

Show the product to a few key customers while it's still in development and get their reaction before it's too late to respond. Early in the development process, develop mockups, simulations, a product data sheet or brochure, even an owner's manual, and use them to get customer reactions.

Another powerful technique in some product areas is the inclusion of a lead user in the design team. Von Hippel defines a lead user as someone who has articulated her needs ahead of the general user community. A lead user may even have cobbled together solutions to those needs from existing equipment. If you are lucky enough to identify a bright and cooperative lead user in your product area, treat him/her as a valuable and respected resource.

### **Customer product design--a little far out, but maybe—**

Ciccantelli and Magidson (1995) present an interesting technique that I've never tried. They suggest that in certain situations a program of customer product design can be fruitful. After carefully laying the ground work, a company brings a select group of customers together for a day long session. In that session they imagine and specify a new product. They are encouraged to make it versatile and better than what they currently use. It sounds like fun.

### **A potpourri of techniques for finding and refining new product ideas**

Conduct a brainstorming session with your team and selected persons likely to contribute. Be sure to have a focus and to maintain an environment free of ridicule and criticism.

Watch for opportunities created by advances in underlying technology. Key components--hard discs, DRAM, AD/DA converters, DSP, and FPGA--become less expensive and more capable each year. Watch for reductions in size and power consumption and increases in speed that open up new opportunities in product development. Think of new product categories that can be realized due to these developments.

Review the competition and their products, not so much looking for product ideas, but for features to include or leave out. You want to be better than the competition, so it's necessary to make a candid appraisal of their products. Regularly scan the products of your competitors at trade shows, in magazine ads, and on their web sites.

Go to the stores or businesses where your customers shop for products like the ones you'd like to create. Observe sales persons and customers interacting while sales are made. Pay attention to the products on sale and how they are presented. Go to trade shows and spend time in the exhibit area. Use the web and its search engines.

Track R&D activities in universities. Read the relevant professional journals, paying attention to presentations of new research and theses in process. Keep up with the patent literature relevant to your company.

Pay attention to new product developments in related but distinct markets that could signal a shift in your market.

Take some time off and scan back issues of relevant professional journals and patent databases (for audio products, the Journal of the Audio Engineering Society, Journal of the Acoustical Society of America, etc.) or conference proceedings. Look for interesting ideas and techniques which were presented but never commercialized because they were explored before enabling technologies were in place. If you've got the time, delve back 20, 30, even 60 years. You will be surprised how many "new" ideas have earlier roots.

Bring in an outside expert in your field for brainstorming or tutorial sessions. There are also individuals and groups which sell their services as "invention on demand." Some of these are made up of technologists with varied specialties. The cross fertilization resulting from these varied backgrounds can produce interesting results.

Create a new product category by taking an existing category and transforming its products with revolutionary usability and industrial design improvements.

Explore the fine grained components explicit or implicit in existing products and bring these together in new and useful combinations not presently offered.

### **In conclusion—**

Many ideas, some silly, some impossible, will surface; the critical few will be chosen, developed, and go on to be a success.

Don't run too far with a new idea without beginning to test it against a business model.

Know that drudgery will need to follow the exhilaration of the fuzzy front end. Perseverance and hard work constitute the 98% of perspiration that the development of a new product typically involves.

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I am an electrical engineering consultant specializing in the conception and design of products and circuits used in audio applications. My company, Seven Woods Audio, is committed to helping manufacturers quickly create digital or analog audio products that generate a good return on investment, work right the first time, sound excellent, and please the end user. Seven Woods Audio works with manufacturers of professional audio, consumer audio, broadcast, telecommunications, and computer equipment.

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