SEVEN WOODS AUDIO, Inc.
Concepts, Products, and Circuits for Audio ● Analog/Digital

New Product Development--From Idea to Specification

Application Note AN-2   **by Christopher Moore**

If you take a good idea and refine it with a process that incorporates real knowledge of your customer, you are likely to produce a winning product.

Some believe that the development of successful new products is the province only of gifted, inspired individuals, while others are sure that the methodical application of good business processes will ensure success. The reality, however, is that good products will most often result from blending creativity and methodology.

New Product Development Process

Many companies use a well defined new product development process. Such a process consists of a succession of product development stages separated by gates, or milestones. While the number of stages may range from four to seven, Cooper's five stage process provides a good example (Cooper 1991).

Idea
Gate 1: Initial screen
Stage 1: Preliminary assessment
Gate 2: Second screen
Stage 2: Detailed definition
Gate 3: Business plan review
Stage 3: Development
Gate 4: Post development review
Stage 4: Testing and validation
Gate 5: Pre-commercialization business analysis
Stage 5: Full production and market launch

Although the application of a disciplined process may appear to be bureaucratic and time consuming, it will shorten time to market and reduce development costs. It is exciting and tempting to jump right into the design of a new product, but the product that results is often inappropriate or inadequate. Frequently, the specification changes several times, extending the schedule and increasing the development cost. Taking time up front to create a customer-centered product definition will ultimately pay off handsomely. The fact that there are milestones with specified deliverables leads to a more complete treatment of the design process, and gives the company a chance to abandon a project before it has gotten out of hand.

A staged product development process is suitable not only to large companies, but also to small companies, although it should be scaled down and adapted to their needs and resources.

Given the breadth and depth of this topic, I'll present an overview of the process only through Gate 3. You will find more information in the references cited in the bibliography at the end.

The product idea

The process begins with an idea for a new product. Sometimes the new product idea is technology driven, derived from a new invention or process; sometimes it is customer driven, based on trends in the marketplace. It may be pure invention, may have been inspired by a competitive product, or may have been suggested by a lead user. The strongest new products reflect the fusion of technology and user needs.

Generally, there is a product champion who develops answers to questions such as these in preparation for Gate 1:

What will attract customers to the new product?
How will it improve upon competitive products?
How does the idea fit with company strategy?
Does the product align with the company's business?
Is the market a growing one? How large is the business opportunity?
How feasible is the product development?
Does the company have the resources to develop and manufacture the product?

Gate 1: Initial screen

When ready, the product champion makes his presentation to the "gate keepers," who should include seasoned senior management with experience in the areas of product development, business analysis, manufacturing, and marketing. The possible outcomes of this gate--and the other gates as well--are Go, Kill, Hold, or Recycle. The gate keepers may also make suggestions for the refinement of the idea and will point out key issues that will be examined closely at the next gate.

Stage 1: Preliminary assessment

During this stage, the product champion, now supported by a small team, develops the product idea and its business possibilities in more detail:

Who are the customers?
What are their needs and problems?
What competitive products presently address these needs?
How will the new product improve upon the present ones?
What are the product's features, specifications, and appearance?
How might the product be implemented?

What are the most difficult and uncertain design challenges?
How would the company's core expertise facilitate the design of this product?
What resources are required?
Is the product manufacturable by the company?
How long will the development process take?

In preparing for the second gate, the team should make a concerted effort to get to know its customers. This is a good time to carry out on site customer interviews. These interviews will give the team much more information, both tangible and intangible, about the form the product should take.

After the interviews have been completed, the team will distill the material and identify key product requirements. These can be ranked into categories of must have, nice to have, and "pleasers." With the completion of the list of key product requirements, the team can finally begin to formulate and compare various implementations of the product. This should give enough understanding of the required design work to complete the remaining deliverables needed at Gate 2.

Gate 2: Second screen

The gate keepers will now be presented with more detailed information, some of it provided by representatives from marketing, manufacturing, and sales. If the company finds itself with many new ideas competing for consideration, the gate keepers will not only judge this particular product idea on its own merits, but will compare it to other proposals. They may use weighted scoring of the deliverables to facilitate comparisons.

Receiving a Go at the second gate will move the product into a higher level of company commitment, where greater investments will be made. Because the gate keepers are senior management, they can immediately dedicate the necessary funds and resources as work begins on the next stage.

Stage 2: Detailed definition

The major activity of this stage is to define the product more thoroughly. The team will create a product specification covering all the key features and stating the required performance level. The development team can augment the specification by other activities:

Create an owner's manual. It can be an excellent tool to help the team clearly and accurately articulate its vision of the product. And, in the hands of an end user, a well done manual can provide an excellent feeling for the proposed product and enable early feedback.

Use a questionnaire whose structured questions will help clarify and rank the importance of various features and performance levels. Have the questionnaire completed by the end users interviewed in Stage 1 and by other product stake holders.

Create a "looks-like" model or a rendering to facilitate discussion and refinement of the idea.

Other deliverables of this stage include:

Market research (databases and industry sources) to improve the estimate of market size.
Analysis of the competition and their products.

Exploratory design work to determine the feasibility of the product. The team should work on the tough design areas first.
Business plan, covering development costs, projected cost of sales, and return on investment.
Manufacturing feasibility review.

Gate 3: Business plan review:

This is the most critical gate. Products receiving a Go at this gate will be fully developed and will most likely enter the marketplace. It is the last chance for senior management to stop the product before major spending will occur.

Conclusion

I believe that following a process such as this will help companies develop winning new products. But they should be careful to adapt the process to their particular needs. The process must not become so rigid that it stifles creativity.

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Mission statement of Seven Woods Audio

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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