

SUCCEEDING WITH INNOVATIVE PRODUCT IDEAS

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SUMMARY

Developing successful products requires sound ideas and proper execution. Some of the critical steps in turning a product idea into a profitable product are outlined here. This is done in the context of the author's long career as an engineer and inventor. Besides having good business plans, it is essential to do all of the critical engineering, assuring that a product having high commercial viability results. The engineering can be carried out more quickly and effectively due to the availability of powerful software such as Matlab®, CAD (computer-aided design) and FEA (finite-element analysis) programs.

THE NEED TO INNOVATE

Innovation is a well-recognized key to business success. Innovation, as used here, is the creation of new products with the aim of providing business advantage and profit. In a more general sense, business innovation is finding new ways of pleasing customers.

Ideas can come from anyone. The CEO of a company or a factory worker may have the idea; it could be a customer; it could be an entrepreneur; it could be a professor or a student; or it could be a homeowner. Innovative ideas may originate from a variety of individuals, but they require a dedicated and expert group of people to turn them into successful market-ready products.

The idea of newness is key to innovation, but most new ideas have little or no commercial merit. The ability to screen, refine, and capitalize upon ideas is what makes winners. Engineers are well suited to this for reasons such as these:

- Analytical, rational method of problem solving
- Knowledge of scientific principles
- Knowledge of design, fabrication, and production arts
- Strong computer skills
- Often highly motivated and profit oriented
- Many engineers have business management skills
- Many engineers have diverse interests

It's important to think beyond the obvious, getting results without excessive expenditures for screening and failed efforts. There is a need to cultivate ideas that appear good and suppress those that will go nowhere. This is a difficult process.

SCREENING IDEAS

At some level, everyone has the ability to screen ideas. What's addressed here is the screening of ideas for potentially profitable products, using methods that have proven effective. The screening is done in the context of investment: will the expended resources provide an adequate return? When dealing with a technically advanced product, it is essential to determine the following:

1. Will it work as intended?
2. Will it result in a viable business?

Both questions must be answered. The second question is the main issue, but the first question is an absolutely necessary condition. Repeatedly during his career the author has witnessed situations in which an unworkable product was being pushed to market. Failure in product innovation does occur. It is a risky business, but a huge amount of money can be saved by good, *upfront* technical work. Before spending the money to commercialize a product, the following three steps are essential.

Preliminary Business/Economic Plan

Commercial viability of a product idea must be assessed. This is based on assumptions of having the fully developed product and then putting it on the market. In a formal preliminary business/economic plan it must be shown that commercial viability is a reality before continuing. This type of plan is arguable because it is based on many assumptions. Certainty is developed using the following process.

Feasibility Analysis

Feasibility analysis needs to be done by an engineer or engineering team. The preliminary plan is often based on a "back-of-the-envelope" design. At this stage, especially with availability of powerful computer programs such as Matlab®, CAD and FEA programs, feasibility can be established more quickly and with less expense than previously. These are powerful tools that require skillful use. Past experience has shown that marginal ideas not subjected to thorough scrutiny have led either to high product development costs and/or abandonment.

Now that the product design has been "roughed-out" at this point, does it provide advantages over competing products? Knowledge of the market is essential. Further, a patent search is often desirable. Patent attorneys can be retained at this point. An alternative approach is to have the patent search done by the engineer carrying out the feasibility study. This can be done economically using the Internet. The United States Patent and Trademark Office (www.uspto.gov) is a good place to begin. Free, high-quality patent information can be obtained by adding a \$19.95 browser plug-in from Cartesian Products, Inc. (www.cartesianinc.com). More costly, but more convenient, is Micropatent (www.micropat.com). A search of literature other than patents may also be justified.

Product Vision

A product needs to be championed to succeed. Promoters must be able to explain to others what the product is about, since product introduction is a team effort requiring many skills. Financial backers and other supporters need to be convinced that the proposed product has sufficient merit to justify risk. The product plan spells out the essentials: the product design, its merits, the risks, the costs, and the returns. A product “hallucination” is to be avoided.

PROOF OF CONCEPT

A proof of concept is highly desirable. At this point something concrete will be designed and implemented. It could, for example, be a model of a new and wondrous toaster that works perfectly each time. You’ve seen many toaster designs, yet how many work really well? Or, it could be a product never seen before. Either way, a working model is essential to reducing financial risk.

The proof-of-concept product stage should include a concept review to determine if product development is justified. This review must include more than demonstration of a model to investors. A thorough review must include affirmative answers to all of these questions:

1. Based on final product requirements, does the model demonstrate all essential features?
2. Is the functioning of the product thoroughly understood, as evidenced by analyses and engineering reports?
3. Does the demonstration prove that further “invention” is not required during development?
4. Can the product be made at competitive cost, be safe, be reliable, meet environmental requirements, and please the customer?

Lack of affirmative answers to any of these questions indicates trouble. Expenditures to this point are relatively minor; however, without affirmation of the product concept one must decide whether it requires further conceptual work or abandonment. Sufficient effort at the formative stages of a product is critical.

INTEGRATED PRODUCT DEVELOPMENT TEAM

The use of integrated product development teams is an established method. It makes sense to have all of the parties—the development team, the production group, and sales team—working together. Assuming a well-staged product at the proof-of-concept point, an integrated team is an especially vital component to ensure commercial success.

GETTING IT DONE

The steps defined here are the most basic to succeeding with innovative product ideas. All of these steps could be carried out in-house by a large organization. However, even a large organization may want to use experienced consultants for

specialized skills and perspectives. Also, a product idea may suit a company's business objectives, yet not be aligned with most of the engineering and production skills available in-house. This situation is more likely for smaller firms. Use of consultants teamed with a specialized manufacturing company may be the most effective way to achieve an organization's business goals. Individual inventors who are not technical specialists may seek the services of an engineering consultant to define their product idea to the point of patentability and subsequent licensing to a manufacturer.