

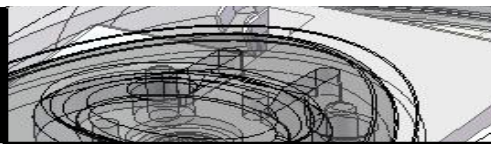
# Product Development 101

Common sense advice about invention, product development and design consultants.

## Inventor Action Items



- 1 Research your idea.**  
Have a basic understanding of the playing field, its technologies and trends, and the main players.
- 2 Create a NDA (Non-Disclosure Agreement) first.**  
Inventors must protect their intellectual property (IP) when talking to anyone. Consult a patent attorney.
- 3 Seek out smart advice.**  
Find competent, knowledgeable and objective professionals – more devil's advocates than yes-men.
- 4 Estimate up to 80% of product development costs.**  
Intelligent expertise saves significant sums of money.
- 5 Complete your business plan now.**  
Critical data from the business plan drives financial decisions regarding product volumes and investment.
- 6 Understand why utility patents are better than design patents.**  
Know the difference. Then consult with a patent attorney to determine if a patent is right for your product.
- 7 Learn about the cost of injection-molded tooling.**  
Can be the biggest expense. Know the risks.
- 8 Define your unique, core competitive advantage.**  
Stay within your area of expertise and know your niche. Can your product be easily knocked-off?
- 9 Be clear about good vs. bad product development.**  
Bad problem definition results in costly mistakes. Good problem definition results in a workable, cost-effective solution.
- 10 Understand how sales, not the idea, drives success.**  
If you don't know how to sell your product, why invent it? Distribution – not manufacturing – wags the tail.



## Product Development Complexity Levels

**High Complexity**

**Bizzy Bee**  
Infant Data Monitor  
Product involves electronics, software, and an expensive, high-volume, injection-molded, plastic enclosure.



**Medium Complexity**

**The Mineral Case**  
Cosmetics Storage  
Clamshell product with a multi-part, high-volume, injection-molded, plastic enclosure with emphasis on aesthetics.



**Basic Complexity**

**Painter's Pyramid**  
DIY, Craft & Painting Assistant  
A simple, non-articulating product design with a one-piece, high-volume, injection-molded, plastic part.



## Inventor Advice

*"My main recommendation is to trust the expertise of a proven design consultant who has a track record. The development of a new product is a very expensive bet, and you must get it absolutely right."*

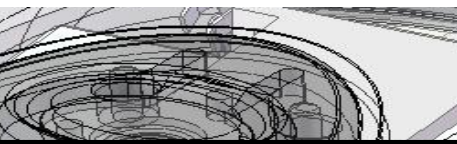
Barbara Bennett  
President  
The Mineral Case

## Product Development A-Z

# Product Development A-Z

**Product Development Defined**

- The use of design & engineering tools to transform a concept – through refinement and prototyping – into a 3-D CAD design.
- An iterative, linear process – with checks and balances – driven by a defined set of design criteria, milestones and budget.




**Inventor Wisdom**

*"Invention is not for the faint of heart or those who want to cut corners to save a few dollars. It requires an indomitable spirit to make a plan and see it through."*

## PROCESS

- 1 CONCEPT**  
Whether an idea is a sketch or a "functioning" prototype, SPARK's design team first explores design options in a responsible manner, then commits to objectives and criteria.  
**Key: Design Criteria & Creativity**
  - N Checklist of action items such as components, specifications, operation, performance, and materials.
  - N Brainstorm and sketch ideas to improve performance, quality, features, usability, and perceived value.
- 2 DEVELOPMENT**  
Once a single concept is chosen, the design is refined into a "working" 3-D CAD, mechanical drawing (visual database) and a design rendering (digital-based, photo-realistic image).  
**Key: Finalize overall design, features and details**
  - N Design the best product at the best price balanced by quality, features and tooling investment.
  - N 3-D CAD modeling and design renderings refine the product form, function and assembly methods.
- 3 PROTOYPING**  
First "test run" of the design. SPARK hand-assembles one functioning unit to assess form, function and aesthetics. Prototyping can be an iterative process (costlier) to refine the design before making an often sizable tooling investment.  
**Key: Mimic one production-like, working product**
  - N Rigorous assessment of assembly methods and processes for efficiency and cost-reduction.
  - N Check assembly of parts and tolerances, then install internal components. Conduct basic, limited testing.
- 4 REFINEMENT**  
The time to commit to expensive injection-molded tooling – and start selling. Final design must be right. You only get one shot.  
**Key: Sign-off on tooling investment**
  - N Based on changes from prototyping, the final product design is specified and checked in 3-D CAD.

## Product Development Activities

- Microsoft Project**  
Scheduling tool
- 
- Analysis**  
Problem definition
- Hand Sketches**  
Rough, black & white and color sketches
- 3-D CAD – Modeling**  
Sophisticated part design and simulated assembly
- Digital Renderings**  
Photo-realistic product images
- Prototyping**  
Fabricate one working unit(s)
- 2-D CAD Drawings**  
Final documentation for production

## Free Consultation

**Contact**  
Bruce Ferris, Managing Principal

**Phone**  
804 440-5700

**E-mail**  
bferris@sparkpd.com

**Website**  
www.sparkpd.com

## Product Development 101