

How to Get Your Idea turned into a Prototype



PROTOMATIC

Life-saving precision.

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You've got a great idea. Now what?

Maybe it was a brainstorm. Maybe it was something you've struggled with for years before it all came together. Whatever it was that made lightning strike, you've got an idea that has monster success written all over it.

Congratulations! Now what?

Unfortunately, you're not ready to begin production tomorrow. Probably not for a whole lot of tomorrows. This book will break down the steps you need to take before your dream becomes a reality.

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I. Is it feasible? Does anybody care?

The first step in getting your idea to market is to undertake a feasibility study. This is where the basic research has to be done to ensure that your idea actually makes economic sense.

When you visit a prototyping specialist, such as Protomatic, we will start really digging into the feasibility of your product. Can it be made? What are the limitations? Is there a viable market for it? Questions such as those must be answered before you move forward.

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I. a

Edison had a bright idea.

Everybody knows that Thomas Edison invented the light bulb. What most people don't know is that he had done major feasibility studies BEFORE he actually made the very first one.

To see if the light bulb was, in fact, a marketable idea, he first needed to confirm that it could compete with the oil and gas lamps of the day. That was far from an easy undertaking.

He did a cost analysis of generation plants to find what it would take to power his invention. He researched the infrastructure that would be required to get the power to homes and businesses, and what it would take to implement it. He did an in-depth economic analysis to see if all that would pay for itself through the sale of the bulbs (and energy).

Edison knew that there were tons of great ideas bouncing around. But if they weren't marketable, they were destined to fail. He did all the heavy lifting to ensure that his idea was a winner. Same goes for you.

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I. b

Protect yourself with a patent.

Protecting your idea with a patent is absolutely vital. Remember though, that the rules of the patent game keep changing. That's why at Protomatic, we keep up with the latest developments in patent law, and keep our clients informed on how to best protect themselves.

Sometimes, before you even apply for the patent, you'll want to have the backing of scientific fact from physics or perhaps biology. This is particularly true in the medical field.

Let's say you want to make a medical device that incubates cells for harvest that can then be put back into the original donor. In your application, you'll have to present the basic biology and research to confirm that this is possible. This is a good time to outsource to a research university. At Protomatic, we're fortunate to have the University of Michigan close by. But chances are, there is a similar institution not too far from you. Use them to do the basic research **BEFORE** you begin to develop your product to make sure your idea isn't just a pipe dream.

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I. c

Do these guys know what they're doing?

Be sure to check the background and experience of the prototyping shop you'll be using. For instance, at Protomatic, we have staff with physics and electrical engineering backgrounds. Many people have asked why that is needed for in a machining shop. Well, if you run into a corrosion problem, a misfitting problem, or a radiation reflection, we can help right on the spot.

When you have a problem, you want your prototype specialist to brainstorm with other experts, do the tests, and have the experience and knowledge to eliminate the problem. You want them to be technically competent to give you the guidance you need for your product to be successful.

One of the most prevalent attributes about entrepreneurs is they don't realize all the things that can go wrong. Doing all your homework, and a feasibility study upfront, is the best way to make sure you don't run into a dead end down the road.

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II. Does your idea mean business?

It's hard to see the forest for the trees if you're a tree. So a good first step in developing a business plan is to look outside your core group. Many communities have economic development agencies or organizations that can help you get off on the right foot. You may even want to consider attending a weekend workshop for accelerated learning regarding business plan development.

In doing your business plan, you'll have to ask yourself more questions than you ever imagined. Just remember, the harder and tougher the question, the more important the answer. Your business plan will be your map to profitability. Without it, you're lost.

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II. a

Box? What box?

The term, “thinking outside the box” has been so overused that it’s almost become trite. OK. It has become trite. But the truth remains. By looking in a different, unexpected direction, you could open a whole new world of opportunities. By encouraging you to look at a variety of market segments, a good business plan will help you see possibilities you didn’t know existed.

Here’s an example. Let’s say you have a medical application. You have an idea for an amazing blood cell counter. You’re convinced that your idea makes sense; you’ve done a feasibility study and it can be made at a reasonable cost. Let’s press “go” and watch the money roll in. Wait a minute. What if there’s even a better use for your idea?

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II. b

Blood or water?

Let's think outside the box. What if you turned your blood cell counter into a water-checker? What if, instead of counting blood cells, it measured the cellular counts of bacteria in the water? All that would be needed is to add a fluorescent agent so when the bacteria cells are hit with a laser, they fluoresce. And you can count every cell going through the machine.

By thinking outside the box you had already built, you've just discovered a bigger application and a much bigger, more mainstream market. After all, there are a lot more city water systems than there are hospitals. It just makes sense to go after the mainstream market first.

By knowing the market you're going after, you'll be able to design your product with specifications that match what the product needs to do.

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III. Design for success.

Now things are beginning to take shape in your mind, and it's time to actually design the product. There are several ways to go here. You can work with the designers in your prototype shop, you can hire a design firm, or you can use a combination of both.

At Protomatic, we had a client who wanted the product to be very urban and dynamic. Because they felt it was important that the product look "sexy," they hired a design studio for that part. Then they hired us to do the hardware — the part that makes the part work. What matters depends on your application. The design team, or teams, you choose will follow accordingly.

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III. a

What on earth can go wrong?

One of the best tools we use is something called a DEFMA — Design Failure Effects Mode Analysis. It will help you analyze the potential failure modes of the functionality of the component.

Time for another example. In this case, you want a coffee cup designed. We could design it to be made of ceramic. But because of the environment where it will be used, it could easily be dropped, fall, or get knocked over. Since ceramic breaks easily, perhaps metal or plastic is a better solution.

Of course, if it is going to be used on a military vessel with salt spray all over the place, the metal will corrode. OK, sounds like plastic is the answer. Oops, will the plastic withstand freezing temperatures without breaking?

See the process? And why a DFEMA is so important? To help tighten the focus on the idea, a scoring system is used to determine the risks and the best alternatives.

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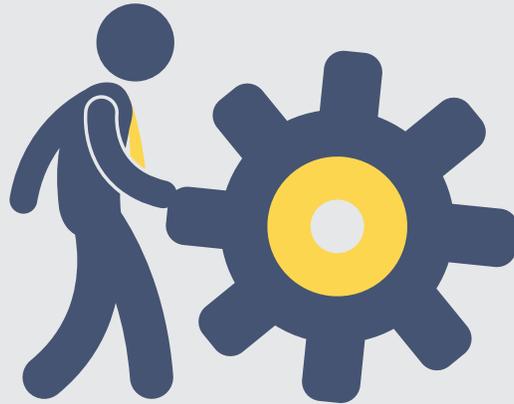


III. b

Patent review.

Once you have a design in place, here's the next step. A patent review. Chances are, the original design, functionality and application have changed since your first patent-pending application was filed. A full-fledged patent can cost \$50,000, so you definitely don't want to go there until you are sure you can recover the money. Reviewing and updating any changes, especially to Intellectual Property, is vital to keep you protected.

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IV. Want to make something of it?

OK. Let's roll up our sleeves and start manufacturing.

But first, yep, more questions. Remember the DFEMA in the design stage? Well, before manufacturing, we need a PFEMA — Process Failure Effects Mode Analysis. After the design is completed, the PFEMA will make us aware of what could potentially go wrong in manufacturing.

When Protomatic manufactures something that we've never manufactured before, we list every mode of possible failure in our process. It could be the wrong material, it could be treated wrong, there are about 300 modes of failure. Depending on the complexity of the product, we will see which of those modes come into play and then make sure we mitigate them.

The old saying, "Measure twice, cut once." is truer than ever in manufacturing a new product. And adhering to PFEMA is the best measuring stick around.

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IV. a

It takes deep pockets to be a do-it-yourselfer.

From the entrepreneur to the machinist, everyone brings something to the table. Unfortunately, the entrepreneur, while a great visionary, often comes with blinders on. They may know what they want, but don't necessarily know how to get it done. They need very, very technical expertise to get them where they want to go.

So they hire a chemical engineer, a mechanical engineer, an electrical engineer, and on and on. They pay \$100,000 or more for each, and before you know it, there's a million tied up in salaries.

You are much better off outsourcing: you are protected in the design, you are assured a great prototype, and can move into low-volume production much more easily.

Importantly, because outsourcing to a prototyping specialist is less expensive and more cost efficient, the entrepreneur may well not have to depend on venture or angel capital, and the lack of control that comes with it.

Bottom line? If you're going to keep it in-house and do it yourself, you better have deep pockets. Real deep.

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V. ···· Have an idea? Let's get together.

Protomatic is the CNC contract manufacturer with the people and equipment it takes to develop precision medical and aerospace components that can save lives.

We know that our medical CNC machining and aerospace CNC machining results in parts that are mission critical. So we take personal ownership in every project.

Turning ideas into reality has always been our cornerstone. Whether we are actually manufacturing a component or going from a napkin sketch to CAD and CAM files that lead to manufacture, you'll get the same standard of quality: Life-Saving Precision.

As you go about choosing a CNC machine shop, we ask that you consider us. For an introductory discussion, please contact our Vice President and General Manager, Doug Wetzel.

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