A Fertile Field

Dr. Ronald L. Hollis, President & CEO, Quickparts.com

What do you do when you design parts that have a specific purpose? What do you do when they're not only critical to operations, but they're expensive, and you only need a few?

Well, the aerospace and defense (A&D) industries have been fighting this battle forever. They have many low-volume high-value manufactured parts that must be managed.

The challenge is quite daunting when a product will only be produced in the low thousands throughout its entire life. In a traditional manufacturing process, you would use a method to efficiently produce plenty of parts, including spares for inventory.

When the dynamics shift to low volume, where every part is expensive and inventory is really not desired, then other options are required.

This problem actually exceeds financial limitations. These programs are mostly funded by the government, which is not known for cost-management or frugality. This problem is a manufacturing and logistics nightmare that is very complicated yet impactful.

The problem actually permeates into the future opportunities for space exploration and battlefield management. Without the ability to efficiently manufacture these parts, the limits are established.

As with many cool things that are produced for one reason only to be re-directed for

other uses (kind of like Viagra [1]), rapid prototyping is the same.

Rapid prototyping (RP) was invented to produce prototypes; however, manufacturers of equipment and materials have always salivated at the prospect of making “real” manufactured parts that could be used in the real world.

Since they are produced only in low volume, high-value parts have such a challenge; this is apparently a fertile field of opportunity. Interestingly, the first step to actually being successful was quite simple – it was to change the name from rapid prototyping to rapid manufacturing. Who wants a high-valued prototype?

Over the past 10 years, companies have focused on building manufacturing facilities that can make parts that can be used in airplanes, tanks, missiles, and the like. In many cases, these are very good applications with huge success.

They are perceivably more successful if you are willing to ignore the non-manufacturing administration to using a non-traditional method of making parts — whoever controls the data controls the story.

Reality check: One of the challenges with using RP technologies for A&D is that most things in the air or battlefield are made of metal.

Plastic planes are probably cool for my son, but I prefer the comfort of smooth, shiny metal when I look out the window.

This has forced the additive manufacturing guys to really focus on how to make metal parts, but this has been much slower evolution with only a few potential success stories in the industry. (Success defined as a company that is focused on making metal parts for aerospace *and* still in business after a few years).

If this approach was mainstream, then the big boys like 3D Systems would have real factories focused on this niche, and generating real revenue that was considered relevant on their profit and loss statement.

The great news is that there are a few low-volume parts in A&D that can be made with plastics, high-value parts that do not have to conform to flight safety requirements. Of course, this reasoning already makes sense to the rest of the world, just not aerospace or defense.

If you would like to know more, check out the Quickparts.com encyclopedia [2] for more information or get a hot copy of Better Be Running! Tools to Drive Design Success *[3]*.

Links:

[1] http://en.wikipedia.org/wiki/Sildenafil
[2] http://www.quickparts.com/Home.aspx
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