



# WHAT'S YOUR ADDITIVE MANUFACTURING STRATEGY?

## 5 Easy Steps to Implementing AM

By Josh Kolcan, Application Engineer, CAM Logic



# WHAT'S YOUR AM STRATEGY?

Does your business have a plan to add an additive manufacturing strategy?

Benjamin Franklin said, "When you fail to plan, you are planning to fail." Over the last couple of years, we have seen what happens when companies are faced with a supply chain disruption with no back-up plan.

Most businesses can agree that one of the greatest challenges they face is staying competitive in today's ever-changing market. The best way to accomplish this is to plan or have a strategy to incorporate new technologies. As the world goes digital your business strategy should plan to follow suite. How do we make these changes, adopt new processes and technologies to speed up production while maintaining your current workload?

One solution that is taking industry by storm is additive manufacturing (AM). On May 6th of this year, President Biden joined five leading U.S. manufacturers to celebrate the launch of Additive Manufacturing Forward (AM Forward). [AM Forward](#) is a voluntary compact among large manufacturers to Improve Supply Chain Resilience and Bolster Small and Mid-Size Firms.

*CAM Logic has been providing additive manufacturing solutions for 5 years and boasts the largest, most diverse fleet of Markforged printers in the Midwest. With a dedicated staff well-versed in designing for additive manufacturing (DfAM), creating software simulations, light-weighting, and manufacturing production tooling with 3D printers, not to mention scanning & inspecting products for optimal performance, we can help you with your additive manufacturing strategy.*

# WHAT IS ADDITIVE MANUFACTURING?

Additive Manufacturing is the process of creating an object by building it one layer at a time. It is the opposite of subtractive manufacturing, in which an object is created by cutting away at a solid block of material until the final product is complete. Technically, additive manufacturing can refer to any process where a product is created by building something up, such as molding, but it typically refers to 3-D printing where we can often run without an operator 24/7.



# DESIGNING FOR ADDITIVE MANUFACTURING (DfAM)

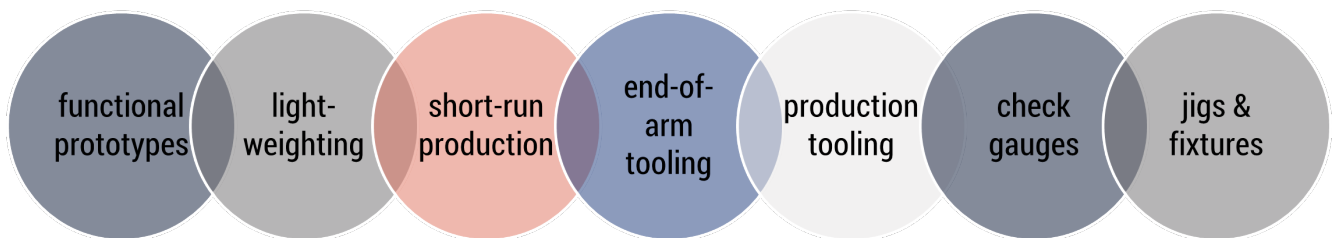


Designing for AM is not a new idea, but it may require a new way of thinking. Since subtractive manufacturing has dominated the world in the past most parts are designed for that technology. With AM we have opened a whole new book to learn from. We like to say the in the AM world complexity is free. What do we mean by this? A printer does not care if parts are complex? Having a part that has been generatively designed would be extremely difficult for a CNC operator. AM overcomes these challenges since we can pretty much design a part without subtractive tooling concerns, such as machine motions and drill bit limitations. This give us the freedom to make complex shapes and designs that were previously almost impossible.

*Additive manufacturing can reduce lead times for tooling and production parts. When many iterations of a part are needed additive manufacturing is a great choice as it reduces cost and production time. This strategy is saving companies a lot of time and money while also reducing waste and your carbon footprint.*

## Applications

Some of the most widely used applications for additive manufacturing are:



*These are very popular applications because they are easy to implement into your existing manufacturing workflow and they yield considerable ROI, quickly.*

## THE HYBRID APPROACH

What is a Hybrid approach, this is a technique that incorporates different technologies to make a custom part? Sometimes we need the light weighting characteristics of plastics but the strength of metal. How we accomplish this is the make parts from multiple 3D printing platforms. A great application for this is end of arm tooling. We can design and produce a of Onyx and Carbon fiber that would make it strong and Then we can use a Metal 3D printed insert or wear pad to extend the life of the parts. This makes the contact area of the arm made from a tool steel to ensure maximum durability while keeping the arm weight to a minimum.



## WHERE TO BEGIN?

A lot of the businesses that we go into want to implement AM into their process but don't know where to start. One of the best places to start is a tool crib and inspection labs. Tool cribs often keeping a large inventory of replacement parts to replace them as they are worn out or broken. We excel at this with digital inventory only producing the parts you need as you need them. Since in most cases a part can be printed in a day or 2 you won't have to wait on your supplier to build and ship parts to you that could take weeks or even months. Inspection labs or QC labs can also greatly benefit from AM since most parts they are inspecting need to be fixtured. Having custom inspection fixtures being made in house can greatly reduce the time it takes to validate your parts.

### ► Invest in 3D Printing Technology

CAM Logic specializes in manufacturing solutions that perform under real-world conditions. We are a full-service provider of Markforged industrial 3D printers, offering a complete line of machines made to create functional parts and assemblies that stand up to the demanding conditions of your manufacturing floor.

### ► Utilize an Additive Manufacturing Partner

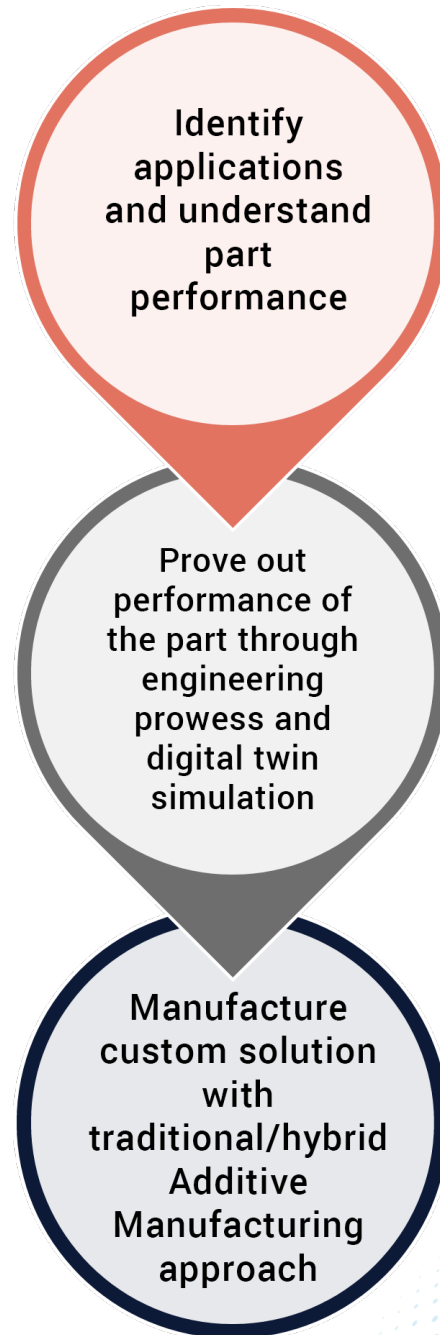
In today's age more and more companies are looking for an edge over the competition and that usually equates to faster lead times. Outsourcing your AM is a great option for some companies.

WATCH AM  
STRATEGY  
WEBINAR

## OUR UNIQUE APPROACH

### Things to Consider When Selecting an Additive Manufacturing Partner

- ▶ Do they have a team of experts in engineering and design for AM?
- ▶ Do they have a fleet of 3D printers?
- ▶ Can they offer inspection on parts and assemblies?
- ▶ Do they have the software to be able to run simulations on parts?



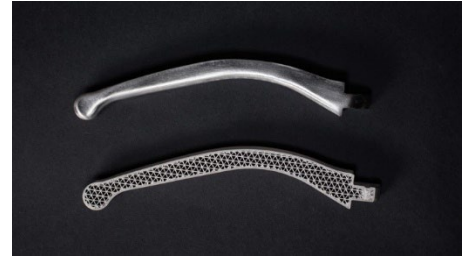


## Holistic Solutions to Product Challenges

### *Light weighting*

Light weighting is always a challenge for traditional manufacturing as the more time you take to machine material off the cost of that part goes up.

This not only drives up the cost of the parts but also produces more waste or scrap.



### *Identifying applications*

We have developed a keen eye to spot right-fit applications for AM. Not all parts should be AM and knowing when to implement AM and when to stick with traditional manufacturing is crucial for maximum benefits. AM is not going to replace traditional manufacturing, but they can be used together to speed up your time to market. We can use customer work holding fixtures that are used in CNC machines, Lathes, drill presses and more.



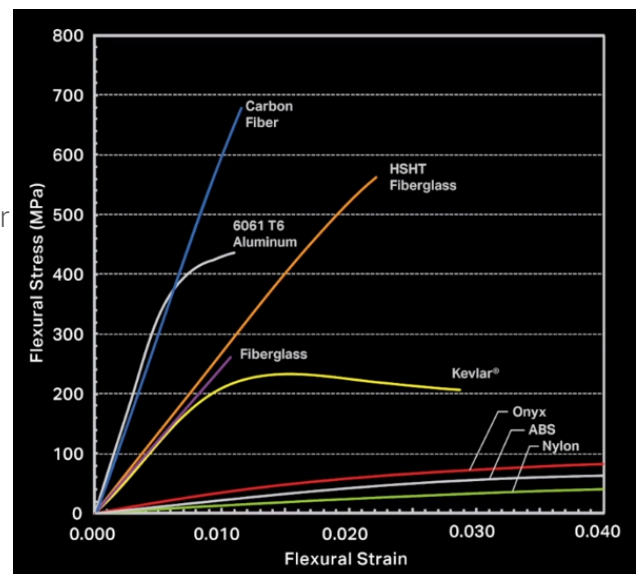
### *Lead times and Logistics*

Lead time challenges and logistical disruptions are among the most useful cases in justifying a 3D printer. In the last couple of years everyone has been affected by supply chain issues. Whether it is waiting for raw material stocks or replacement parts from your vendor, shipping times have increased greatly. This is where the digital inventory comes into play and being able to produce parts in-house with short lead times can be the difference in awarding a project or losing it.

### *Material Selection*

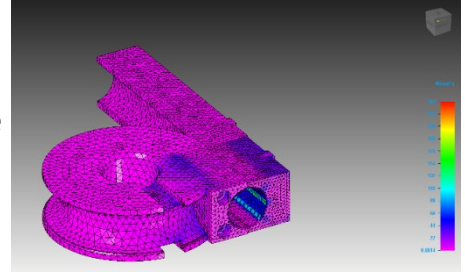
While there are many different 3D printing technologies in the world every one of the these requires a different approach. The first thing that needs be looked at is your platforms capabilities and limitations. The strength-to-weight ratio of the Markforged Carbon Fiber allows us to reduce mass and weight when 3D printing a part.

This greatly reduces the amount of composite material we use, overall, making the parts smaller without sacrificing strength.



### *Simulation*

As an engineering business we have been trained to predict part movement and the strength needed to ensure part survival. When we are not 100% sure of a particular application, we run a Finite Element Analysis (FEA) on the parts using Solid Edge software from Siemens. This software allows us to import part material data and load conditions onto our CAD model. We can then take that data and run a simulation to see where the stress will be applied to the parts. We can tell if the design and material properties are going to make successful parts before we ever actually produce the part.



### *Quality Control & Inspection*

Once we have physically produced the part it will go through a quality control process. This process will ensure that the parts are dimensionally accurate for optimal performance.



## STEPS TO IMPLEMENTING A SUCCESSFUL ADDITIVE MANUFACTURING STRATEGY

Identify your application

Select vendor or technology to meet your production needs

Predict material behavior and performance

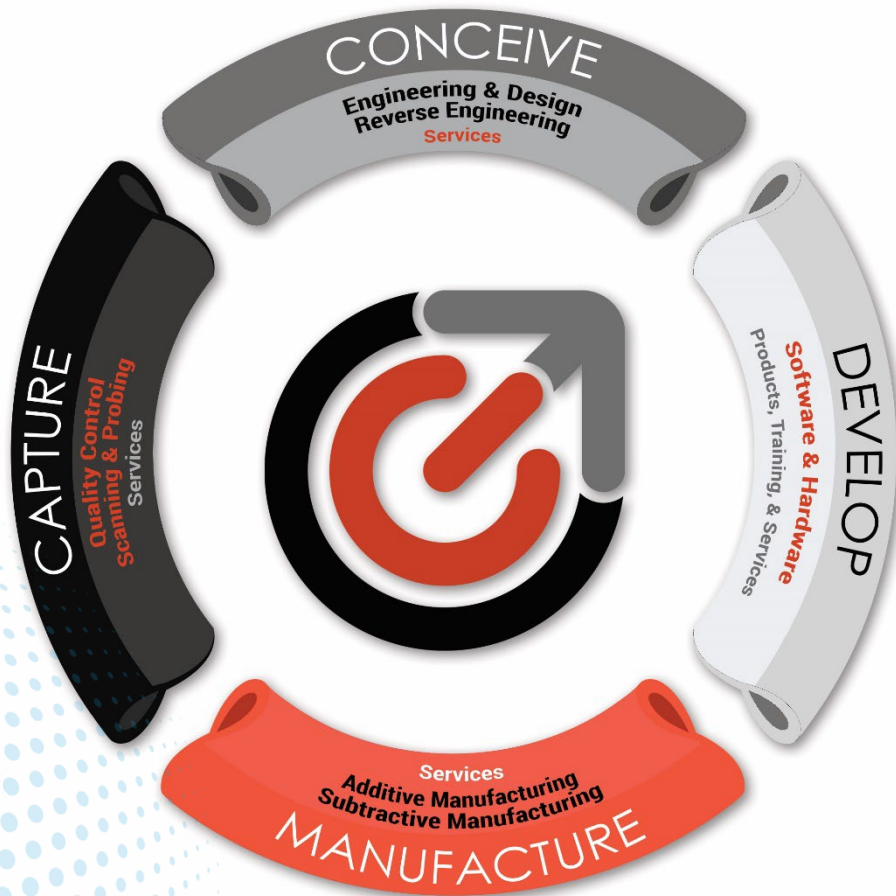
Determine best solution for production using specific technologies

Inspect product to ensure dimensional accuracy and tolerances are met

Whether you are considering investing in services or hardware, CAM Logic can help with your seamless transition into Industry 4.0.

# #EMPOWERINGINNOVATION

CAM Logic, Inc. is a holistic engineering solutions provider utilizing PLM software, additive and subtractive manufacturing, and quality control. Leveraging over 25 years of CAD/CAM/CAE expertise to provide unparalleled products & services to develop and support design through manufacturing. With a unique approach to design, engineering, and manufacturing, plus, unmatched craftsmanship, CAM Logic aims to provide you with the right methodology and technology to fit your needs.



CAM Logic, Inc. ➤ 1751 Harmon Road, Auburn Hills, MI 48326 ➤ 248.969.9201 ➤ [www.camlogic.com](http://www.camlogic.com)

CERTIFIED  
**WOMEN  
OWNED™**