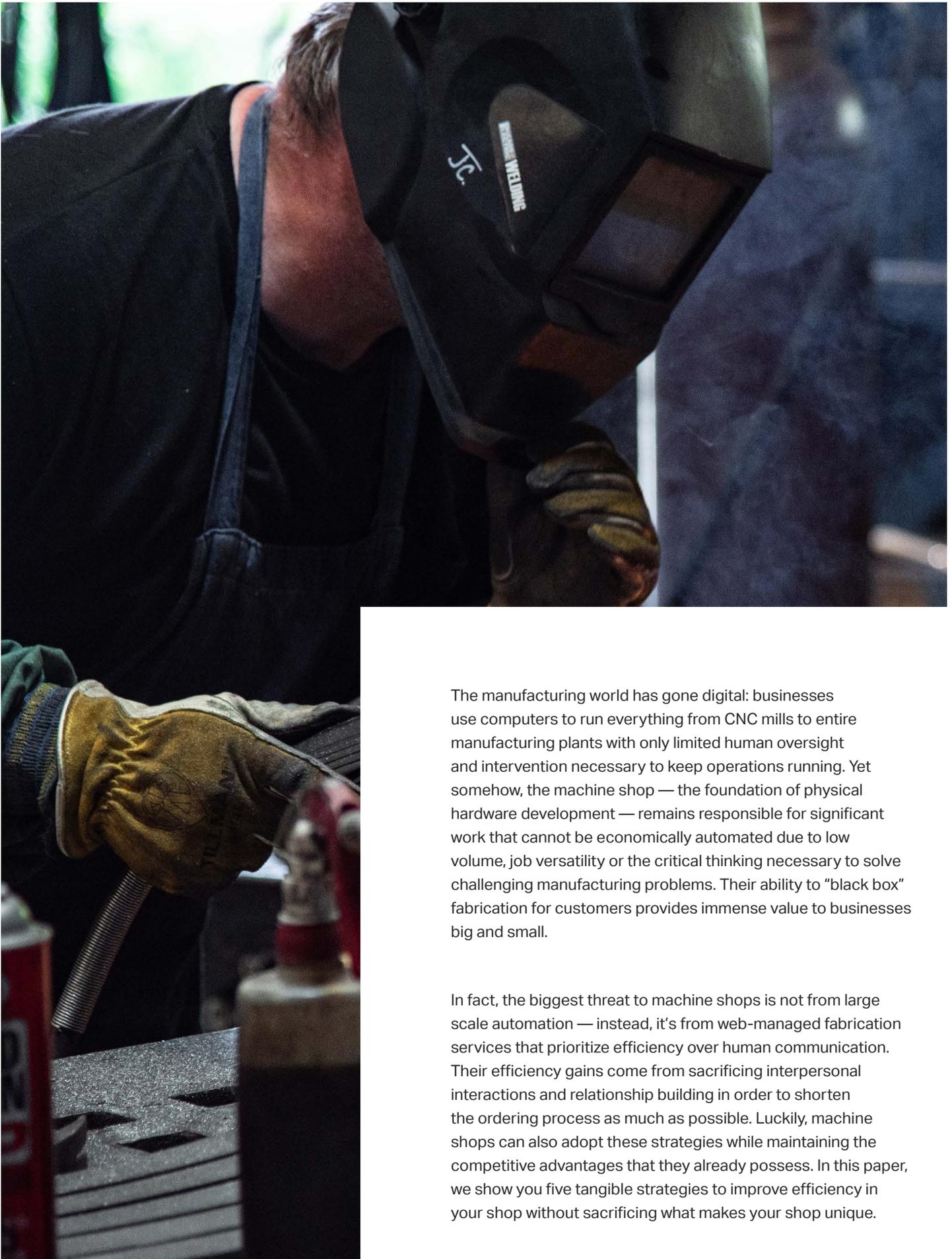




 **Markforged**

WHITE PAPER

5 Ways to Keep Your Machine Shop Competitive in the Digital Age

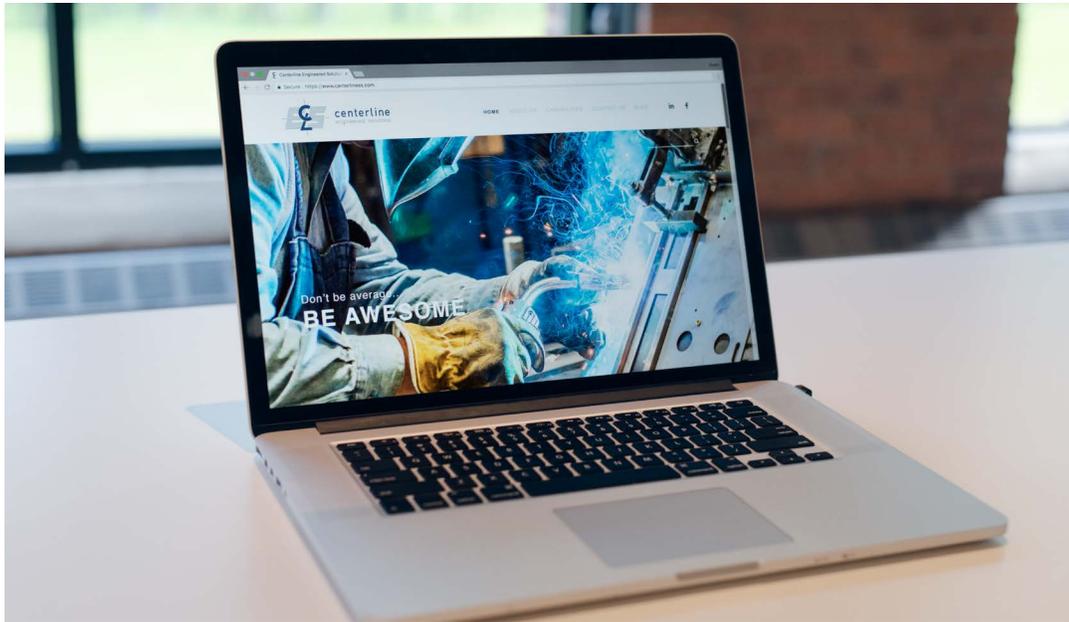


The manufacturing world has gone digital: businesses use computers to run everything from CNC mills to entire manufacturing plants with only limited human oversight and intervention necessary to keep operations running. Yet somehow, the machine shop — the foundation of physical hardware development — remains responsible for significant work that cannot be economically automated due to low volume, job versatility or the critical thinking necessary to solve challenging manufacturing problems. Their ability to “black box” fabrication for customers provides immense value to businesses big and small.

In fact, the biggest threat to machine shops is not from large scale automation — instead, it’s from web-managed fabrication services that prioritize efficiency over human communication. Their efficiency gains come from sacrificing interpersonal interactions and relationship building in order to shorten the ordering process as much as possible. Luckily, machine shops can also adopt these strategies while maintaining the competitive advantages that they already possess. In this paper, we show you five tangible strategies to improve efficiency in your shop without sacrificing what makes your shop unique.

1

Cultivate new clients with a smart web presence



Your website should have one goal: inspiring trust in potential customers that you can make their part accurately, quickly, and cheaply. These days, many customers may never see your physical shop, so it's important that your website presents your business in the way you want your customers to remember. Focus on two main aspects: machining capabilities and customer testimonials.

Accurately defining your machining capabilities is a simple but critical step in improving your shop's website. Keep an up-to-date, easy-to-read list so that visitors to your site can quickly determine if your shop can make their part. Include photos of your machinists operating your machines, if possible, as it lends credibility to your operation.

Customer testimonials should document the customer's problem, the part you made, and the customer's reaction to the part. Make sure to take plenty of photos of the part and the customer, as they help convey the value you provide. Try to have a good variety of customer testimonials that represent your machining capabilities well. Pick a select few of the best testimonials and feature them on the front page of your site, and add the rest in the form of blog posts.

A straightforward design that exhibits your work, outlines your capabilities and provides contact details and a form for job submission can contribute to a huge boost in your online presence. Often you can provide future and current customers all the information they need to choose your company with a one- or two-page website.

How to do it: Website design sites like Squarespace and Wix allow you to easily populate a predefined template. They make creating appealing, functional websites quick and simple.

2

Minimize barriers to entry with online ordering



Now that you've optimized your website around building trust with your potential customers, make it as easy as possible for them to place an order. Configure your business to accommodate this by:

- Setting up an email address to handle incoming orders in an organized fashion.
- Adding a form on your website where customers can also submit their jobs.

Automating orders has several benefits: you can respond to customers at your convenience, orders are now instantly trackable and searchable from the moment that they're requested, and customer's time expectations can be managed.

Adding online ordering doesn't need to affect your relationships with existing customers or completely eliminate phone calls; it's totally fine to schedule follow-up calls to clarify online orders or take orders from trusted customers exclusively over the phone. If maintaining an active phone presence is important to you, try using a phone management service. With one, you can set up a call forwarding system that routes potential customers to someone able to answer. In addition, most phone management services automatically transcribe and email voicemails to you, allowing you to maintain a centralized location for order collection.

How to do it: Set up an *orders@yourdomain.com* email address that can handle incoming orders. Add a simple order form on your site that directs to the same email address. Try affordable phone clients like Grasshopper to manage calls.

3

Allow customers to submit parts in native CAD platforms



As CNC machining and CAD have become the centerpiece of most engineering operations, more people fabricate parts without ever creating or reviewing a drawing. Many online part fabrication services have emerged — with these services, customers can submit a file online and have the machined part mailed to them. Cutting out drawings greatly speeds up the customer's development time, especially for prototype parts, where the accuracy of a CNC machine is often more than sufficient to hit the required tolerances for these parts. A local machine shop has the advantage of being able to build a much stronger personal relationship with a customer, but in the age of rapid innovation, customers prioritize ordering through the path of least resistance.

Set yourself up for success by allowing your customers to submit their jobs in their native CAD formats, or a widely-supported 3D file standard such as STEP (.step) or IGES (.iges) files. Set expectations correctly by advertising that orders submitted without an engineering drawing will be fabricated with the average precision of your CNC mill or other CNC equipment. If you need to view or edit these files, you can use one of many free CAD platforms.

Some parts will require drawings to specify tolerances or special processes, but for most parts, giving your customers the opportunity to easily submit files for fabrication will make both yours and their lives easier.

How to do it: Set the expectation that users should submit CNC parts as .step files instead of drawing files unless they have special tolerancing requests. On your website, note that key tolerances will all hit CNC tolerancing (+/- .002"-.005") if submitted without dimensioning. Use free software like Onshape or Autodesk® Fusion 360 to process files if required and you don't have a CAD platform already.

4

Use project management to distribute jobs effectively



Machine shops often work on many jobs concurrently, each with different levels of complexity and deadlines. Managing these jobs effectively is the most critical step towards delivering jobs on time. The scale, prioritization, and execution of manufacturing jobs typically require that the shop leadership devotes a significant portion of its time to ensuring that employees are completing the right tasks, particularly in larger shops that handle complex jobs. With free online tools, you can manage projects easily and spend more time on higher value tasks.

An online project management tool allows you to break down a job into representative tasks and assign them to your employees. They then take responsibility for the work under their control — with a well-run system, machinists and technicians will always know the project they should be working on, as well as what to work on next when they finish that job. If multiple personnel are working on sequential parts of a project, a management system makes it easy for them to work together to coordinate production schedules. While there is some management overhead required to maintain the organization of the planning tool, the resulting benefit is on-time delivery of customer jobs, clarity of responsibility on the shop floor, and clear visibility into the current state of your shop.

How to do it: Try incorporating tools like Trello or Asana into your workflow. They're free project management tools that allow collaboration. If you work on larger scale projects that have many moving parts, consider implementing a tool like JIRA, which is affordable for small companies.

5

Add a 3D printer to support critical machine shop operations



Most machine shops are built around a fleet of expensive capital equipment. As the most versatile machine in a shop, no machine is more valuable than a CNC mill with a skilled machinist operating it. That versatility comes with incredibly high demand and hard decisions: should you use the mill to make only the highest leverage parts, or also on tools and fixtures that make your shop run better? Scaling your CNC mill operation is often difficult, as the machines are expensive and skilled machinists are in incredibly high demand.

Machine shops that own a 3D printer can manage this problem more effectively. These shops can use 3D printers to produce one-off gauges, non-marring fixtures, drilling jigs, soft jaws, custom workholding and much more, while offloading work from other in-demand machines. With fast overall turn-around times, new high-strength materials, and recent improvements in machine precision and accuracy, 3D printers have become a cost-effective tool for machine shops looking to keep pace with modern product development cycles.

How to do it: Learn more about Markforged 3D printers on the following page to see how a 3D printer could improve your shop's operations.

Keep up with the times

A 3D printer can be an easy, cost-effective way to significantly increase the efficiency and throughput of your shop. No matter the goals of your shop, the right 3D printer can help you make more money and maintain your edge on the competition. Markforged makes composite 3D printers which produce industrial strength parts, such as tooling and fixtures, without the machine and operator time costs associated with CNC machining. These machines use continuous carbon fiber, fiberglass and Kevlar® composite materials to reinforce parts to nearly aluminum strength. Designed to be a precision engineering tool, Markforged machines are easy to use and help machine shops realize ROI on their CNC equipment faster. By offloading tooling and workholding manufacturing from CNC machines, machine shops can use Markforged printers to free up these tools for customer production and increase business bandwidth.

Interested in a test drive? Request a demo
of a Markforged 3D printer today at:
<https://3d.markforged.com/request-a-demo/>

