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10 Things

You Need to Know When Replacing Your CAM System

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A software executive who was once a machinist and CNC programmer was asked, What is the best CAM system? He said: The one that works best with your parts, your people, and your machines. That system will lower your cost of production.

That sounds simplistic, and it is, because he was forcing a look at the big picture, emphasizing that the one variable you can control is cost, and that the best CAM system will help you reduce that cost. His reasoning went like this:

> You get and deliver jobs to generate revenue.
> Your profit is equal to revenue minus cost.
> ***So, if you lower your cost, you increase your profit.***

Therefore, the best CAM system is the one that will help you lower your overall costs. And that system is the one that works best with your parts, your people and your machines.

That's straightforward. Working best with your parts means it will be the most efficient at programming them and generating efficient CNC programs to machine them. Working best with your people means that it will make programmers' and machinists' jobs easier, and let them do better work, faster work, more reliable work. Working best with your machines is where many systems fail, because it means generating accurate, efficient programs for all your machines.

Your CAM system may have been the best for your operations when you bought it, but you're sensing that this is no longer the case. You outgrew it, or machine technology got ahead of it. Now it's time to find a replacement.

Seven Reasons Why You Might Be Changing CAM Systems

There are several good reasons for a machining operation to replace its CNC programming system, or to add a new system without replacing anything.

Common reasons include:

1. Addition of a CNC machine that the current system cannot program
2. Lack of updates to keep the CAM system current with CNC technology
3. The realization that CNC programming has become too cumbersome for you to be competitive
4. Introduction of a new CAD system or new customer whose files the system cannot read
5. Poor service from the current CAM software provider
6. Realization that post processed output does not optimize machine performance
7. A need to consolidate programming to a single shop-standard CAM system to achieve consistency, reduce support, and provide programmer portability

Whatever the reason, there are various things you should know or do to ensure a successful acquisition and implementation of your new best CAM system.
Here are some of the most important.

1

A complex system is not necessarily a powerful system.

If you are accustomed to seeing your CNC programmers struggle to get jobs done, you may be thinking that a system that overcomes their challenges must be even more complex and more difficult to use. This is a misconception. A complicated system is just that, complicated. Complexity does not indicate capability or power. It may just mean poor design, or it may indicate that features were shoehorned into software that should have been redesigned. It's the ten pounds of stuff in a five-pound bag problem. So, when you find a powerful system that is easy to use, you have found a company who did it right, and a system that is probably easy to learn. Make a note of it, and investigate further. Remember: ease of use and learning contribute directly to cost reduction. If new people are hired for programming, a system that is easy to learn and easy to use can save significant training time. It also saves the real and opportunity costs of extra training.

2

Before you schedule a demonstration, have a written list of criteria specific to your needs.

There are things you want from the new system, the must have, and the good to have. Don't rely on memory to remember them. One can be easily distracted with something in the software, and forget something important.

Be thorough. If you gave the list to a sales person, do not assume that the person who demonstrates the system has seen it. For evaluation, it is more important that the demonstrator know what you need and what you want, not just what the salesman wants you to see.

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3

A good system has broad capability, and is extendable for future requirements.

Resist the temptation to get a system that just solves an immediate problem. You will have to live with the snap decision, and may soon be looking for its replacement if you don't look ahead. For the solution you choose today, there should be options you can add later, in case you need to program a more complex machine or begin getting files from a different CAD system.

Make sure that the software can easily program your parts for machines you have today, and parts or machines that you plan to purchase next week or next year and beyond. Modular software can help you solve today's problems and provide options for a new machine that has more options, a different configuration, or more axes of motion. If there's a possibility that more of your current business, or new customers, may justify other types of machines in the future, choosing a system that covers those types of machines today may be advisable. Expertise, or even leadership, in programming those machines today is likely to be a characteristic they'll maintain as machine tool builders introduce advancements and new configurations.

If your facility has the potential for growth, or plans reorganization of equipment, the CAM system should be configurable for licensing within a network, with fixed or floating license. This gives you flexibility for adding workstations or software options at the most convenient location on the shop floor.

4

A good system provides interoperability for all major CAD systems.

You probably get files from old CAD systems as well as new. Parts developed two or three decades ago, are still being made from old, unmodified CAD files, while new parts are delivered in the latest CAD formats, such as SOLIDWORKS or Autodesk Inventor. If your customers are larger companies, you may get files from PTC Creo Elements/Pro, CATIA or Siemens NX systems. And if you are part of the current trend, you are probably using a modern CAD system for design and modeling and leaving your CAM system strictly for part preparation and CNC programming. For all these reasons, you probably need your new CAM system to be able to receive files from any CAD system, not married to a single CAD system. CAM software should be agnostic about CAD. You want flexibility for interoperability.

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5

Watch some CNC programming; see if the software is shop-friendly, powerful and efficient.

Several companies seem to develop their CAM software from the viewpoint of CAD developers or CAD users. This results in obscure or non-standard terminology, cumbersome menus, and inefficient CNC programming and machining. Vague icons, imprecise terminology, excessive menus, mouse clicks and page switching all kill time and concentration, as do illogical procedures. It is worthwhile to take the time to watch some programming on the CAM system, and determining if the system is efficient and shop-friendly.

That is, does it look like it was designed from the perspective of machinists?

CAM software affects a job from the moment you receive a CAD file to the second that the last part is ready for shipping. The wrong answer to any of the questions below means that a programmer will kill time with the process or with concentration. It may mean that the CNC programs won't be as efficient as they could be, or that more work will be needed for each part after machining. It could also mean that it will be more difficult to learn and use the system.

Things to watch for:

- Does programming with the system look complex and difficult to learn? Remember that complexity does not mean powerful or capable, and it will cost you in learning, and then cost you with every job.
- Is the user interface consistent from one function to another, like moving from milling to turning to rotary milling, or do screens look different as you move among them? Consistency reduces confusion and speeds up learning and using the system.
- Is there mode-less access to all functions so that users don't have to step through menus? For example, can the user jump from toolpath verification, to toolpath generation, to tool definition and back to verification without stepping through menus? When all functions are accessible from a single main screen, programming is faster and easier.

- Is there a flat menu structure, or does the user have to step through a hierarchy of menus? Again, this is about getting work done faster, with minimal confusion.
- Does the terminology reflect that of your machining operations, and are icons easy to understand? Shop-friendly terminology and icons speed up learning and use.
- Can you save a machining process (style, tools, parameters) and recall it for another job? This feature can save hours of programming every week, especially when machining many different parts with similar part features from the same material.
- Does the software have several options for different processes, or is the programmer locked into a narrow choice? The programmer/machinist needs different approaches for different geometries and situations. If choices are limited, jobs may take longer to machine, and tools may wear faster.
- Would an experienced machinist think the process you are watching is similar to his thought process when machining? If not, it will slow down the programming, and could result in less efficient toolpath.
- Would a machinist find the system to be versatile, with many tools for each job, or just a set of rigid tools for every job? Flexibility allows the user to approach jobs in ways that are most efficient for the required material, and available tooling and machines at that point in time.
- How many mouse clicks does it take from the end of modifying geometry to selecting a tool, then back to geometry, and then generating toolpath? How many mouse clicks from toolpath generation to verification, and back? Some functions are used dozens, or even hundreds of times, when programming complex parts, or parts with many features, so the time it takes to navigate among functions accumulates rapidly.

In other words, you need to determine if the CAM system is shop-friendly and efficient for your people, your parts, and your machines. The system should be powerful, fast and easy to use, and flexible. It should help you reduce costs and increase your profit.

Errors on the screen are never as expensive as errors at the machine.

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6

You will need realistic visualization for higher productivity.

Many CAM vendors falsely claim "what you see is what you get," so it's not unreasonable to ask for proof. If your programmer is deceived about surface finish, or doesn't see tiny gouges or extraneous cuts, there will be waste at the machine. This is more critical for multi-axis milling and multi-tasking millturn, where lack of accuracy could cause a severe problem and expensive down time and repair. To test for accuracy, simulation of a multi-task machining job is a good test. Simulation is best if it includes fixtures, tooling and other workholding, because this is even closer to the real, on-machine simulation. Full simulation of every thing on the actual machine also allows greater optimization of CNC programs, because you can see inefficient motion. Accurate visualization, precise toolpath rendering and exacting kinematic machine simulation reduce errors, reduce scrap, and increase productivity at the machine because they catch errors and inefficiencies before these can get to the machine.

7

Investigate post processor development and flexibility with post processor options.

CAM software developers dedicated to their customers will have a dedicated corporate post processor team, so that customers need never concern themselves with post processor development. However, they will have a universal post processor available so that customers who so choose can develop their own posts, as they need them. A more advanced CAM software developer will offer two levels of universal post processor, one that serves for general use and common knowledge of CNC controls, and one that provides all that general capability, but also allows programming all the sophisticated functions of higher level controls and the most complex machine tools.

8

Determine the availability, quality and depth of customer support.

Your CAM software should be backed by experienced customer support from a local representative, and reinforced with support from the corporate developer. Response to technically difficult questions is often faster when your primary support can rely on equally strong support.

9

Test for continuing software support.

Testing for software support may be a difficult thing to do. The total number of installations only proves a vendor's ability to sell. Two things that can tell you a lot are: references within your local area, and the number and type of post processors the software developer maintains for legacy and new machines. The local references can provide insight into both reseller and corporate support, while the number and type of posts can show dedication to long-term support. A variety in type (mill, multi-axis, lathe, millturn, multi-task, Swiss-style) and brands of controls can show continuing flexibility and breadth of product.

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10

Wait! Are you sure?

Before you sign, how certain is the vendor that his software will work for you? And how certain are you? Post-purchase surprises can be very costly. Finding out that the software does not perform in the real world of your operation, after you buy it, can be a huge problem. Finding out that some piece of software you ordered or were going to add will cost more is also a budget-breaking disappointment. The easy solution is to return it ... but only if there is an easy return policy. So check for an unconditional return policy. Will the vendor accept a full money-back return of the software, no matter the reason? Is it in writing? This demonstrates their level of confidence, and should give you peace of mind about your choice.

For information on why GibbsCAM should be your next CAM system, check out our website, www.gibbscam.com/