

Manufacturing ENGINEERING

April 2010 Vol. 144 No. 4

Newsdesk

Software

CAM Software Keeps Manufacturers Competitive

Chuck Mathews is vice president at DP Technology Corp. (Camarillo, CA), developer of the Esprit CAD/CAM software.

Manufacturing Engineering: What are some key trends in CAD/CAM software today?

Chuck Mathews: CAM software is strongly influenced by ongoing advances in machines tools, cutting tools, and fixturing, as well as computer hardware, workpiece materials, and CAD systems. Direct requests from customers for specific productivity-enhancing functionality that helps programmers create programs as quickly and accurately as possible, and to help the machine cut the workpiece as efficiently as possible, also influence CAM vendors. Each of these influencers places demands on CAM companies to continually update their software in order to keep pace. From a commercial and economic point of view, the pace of the demands placed on product R&D has grown beyond the scope of what can be accomplished by the existing group of CAM vendors. The market must consolidate a smaller number of suppliers and products to provide an economic balance between the expenses required to fund the R&D with the income that can be earned by a given company and product. Upon close inspection, one will find considerable consolidation is actually already underway. For example, DP Technology, among others in the industry, has made two significant international strategic acquisitions over the last several years. In selecting a CAM product, the financial position of the supplier helps the consumer understand that if the company and/or product has the strength and commitment to survive the ups and downs of the current economic reality, it's a strong and viable force.

Current trends in computer technology that stand out are those brought on by the expanding use of multicore computers and the Windows 7 operating system. CAD-to-CAM data exchange is evolving to include more design, features, and tolerances, expanding its role beyond geometry. Manufacturing technical trends are currently driven by increasing demands for more sophisticated postprocessing and machine simulation to keep pace with the increasing complexity and numbers of mill-turn, Swiss-turn, and five-axis machines installed around the world.

ME: What can new technologies like multicore processor support do for users?

Mathews: Due to the inability of computer manufacturers to significantly improve the performance of microprocessors, they are now offering computers with multiple cores [or microprocessors] to achieve the performance gains that we are used to seeing year-after-year. However, for CAM software to actually benefit from this latest generation of multicore computers, the software needs to be re-written to be multithreaded—that is, to be able to perform several parallel tasks instead of performing tasks in traditional one-by-one sequences. This poses a significant challenge to CAM suppliers, as well as the opportunity to

PASSWORD

"Manufacturing technical trends are currently driven by increasing demands for more sophisticated postprocessing and machine simulation to keep pace with the increasing complexity and numbers of mill-turn, Swiss-turn, and five-axis machines installed around the world."



Chuck Mathews

provide significant benefits to end users in the areas of toolpath calculation for complex three and five-axis machining, and in machine simulation verification and collision detection.

ME: How is the migration to the new Windows 7 operating system going?

Mathews: Our customers are reporting a good level of satisfaction with their use of Esprit on the Windows 7 operating system. We recommend the use of 64-bit computers, large amounts of RAM—8GB and larger—and higher-speed drives, along with the 64-bit version of Windows 7. The result for our users has been a significant increase in performance and speed of execution, and the ability to access larger amounts of memory to complete far more complex jobs in one workspace. This success is a combination of both upgrades to customer hardware and the new operating system. The one problematic area we have seen relates to a lack of software drivers required by Windows 7 to support certain printers and similar peripherals.

ME: What does Windows 7 offer specifically for CAD/CAM users?

Mathews: From our point of view, Windows 7 appears to be a secure, stable platform on which to run a CAD/CAM system—one that allows users to obtain optimum benefits from their hardware investments. Windows 7 is what Windows Vista should have been. While we can't easily identify specific technical features of Windows 7 that are of great benefit to CAM operators, we believe that the overall experience is excellent due to improvements in ergonomics, a number of new time-saving gadgets, and the elimination of many frustrating quirks within the previous versions of the operating system.

ME: How critical are CAD/CAM data interoperability issues still today?

Mathews: Today, CAD-to-CAM interoperability is an expected component of every product. We view this interoperability as being similar to utilities, like the flow of water or electricity: You expect them to work and you do not want to think too much about it. However, we must point out that one significant development of CAD-to-CAM data exchange is the evolution toward including more design features and tolerances along with the geometry within the CAM system, to aid the part programmer in selecting machining processes and cutting conditions.

ME: What can machining directly off solid models do for improving user productivity?

Mathews: Esprit FX is the latest in CAD-to-CAM feature exchange technology included in our software, allowing users to automatically capture the original design intent, clearly define what the user is machining, and program parts quicker and more accurately. Going beyond transferring just the part geometry, this technology provides portions of the original CAD feature tree inside the Esprit user interface, thereby including the complete original design intent—features, tolerances, material properties, surface finishes, administrative data, etc. Using the FX technology, the CAD features and associated properties are mapped into machinable features, providing a complete definition of 'what' is being machined. These manufacturing features and associated properties are then fed into the Esprit Knowledge-Base, which aids users in automatically selecting how to machine parts based upon existing best practices.

ME: What new capabilities will users see in the new Esprit 2010 package?

Mathews: Esprit 2010 has been optimized to fully embrace the capabilities of the latest multicore computers, a time-saving characteristic for three and five-axis programming. Our software runs on Microsoft Windows XP, Windows Vista, and Windows 7, and every customer will benefit from an all-new graphical user interface (GUI) used to define machining operations throughout the system. This new tree-style GUI is used to define machining parameters used for cutting parts in milling, turning, and wire EDM programming.

With the new multithreaded stock automation engine in Esprit 2010, customers benefit from instantly starting the part program simulation at any time and at

any point in the program. This feature eliminates the need to simulate all operations from the beginning or to save the results of previous simulations. Customers can start a simulation with the stock that results from the completion of all previous operations, without first waiting for the simulation of the previous operation. The use of multithreading technology—with which stock calculations are done in the background—doesn't slow the programmer down. Machining pockets has just become easier with the new software due to advancements in feature recognition. The upgraded advanced feature recognition automatically recognizes pockets with any combination of open and closed walls, fillets, chamfers, and tapered walls. In addition, undercut areas that can't be reached with the given tooling are automatically excluded.

ME: What's the current business climate look like for manufacturing?

Mathews: We are certainly living in changing times. What many people don't realize is that the rate of change is also increasing. For example, estimates from IBM posit that the amount of digital information is now doubling every 11 hr. The good news is that change creates opportunity for companies brave enough to adapt. Our view is that US manufacturers who want to thrive in these changing times need to adopt technological and business practices aimed at doubling productivity over the next two to three years. We suggest that they look to improved processes and faster material-removal rates by utilizing advances in machine tools, cutting tooling, CAD/CAM software, and other modern and rapidly advancing technologies available to them.

Updates

CGTech Corp. (Irvine, CA) announced that it is shipping the next major release of its Vericut Composite Programming (VCP) and Vericut Composite Simulation (VCS) software packages. Developed in response to requirements from **The Boeing Co.** (Chicago), the Vericut composite applications are used to program and simulate machining done on automated fiber placement machines fabricating composites for the Boeing 787 aircraft program.