



# CAPITALIZE ON THE LATEST TRENDS IN ADVANCED CNC MACHINING TECHNOLOGY

Unlock the full potential for cost savings and revenue boosts

DIGITAL  
MANUFACTURING: A  
RAPIDLY EVOLVING FIELD

THE LATEST TRENDS IN  
COMPUTER NUMERICAL  
CONTROL (CNC)  
MACHINING

THE CHALLENGES OF  
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HOW DELMIA OVERCOMES  
CNC MACHINING  
CHALLENGES

REDEFINE INDUSTRIAL  
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# DIGITAL MANUFACTURING: A RAPIDLY EVOLVING FIELD

Virtual Twins and computer-aided manufacturing (CAM) are rapidly evolving with new trends. According to Gartner, some of the top digital transformation trends in manufacturing in the following years include artificial intelligence (AI) for greater efficiency, robotized CNC machining to accelerate the manufacturing process, the digital twin to bridge the gap between data and actionable insights, and augmented reality for faster and more efficient maintenance services.<sup>1</sup>

Manufacturing industries today face severe talent and labor crises as well as struggle with knowledge and skill development for key personnel. In addition, advanced CNC machining is critical for agility and flexibility in manufacturing to meet customer demands. While these are challenges to some, they also present tremendous opportunities for companies to create value for their customers.

## THE LATEST TRENDS IN COMPUTER NUMERICAL CONTROL (CNC) MACHINING

- 1 **New product development with more axes for greater cost-savings and more advanced software that can handle more complex geometries.<sup>2</sup>**
- 2 **Faster production to market, reduced machining time and increased machining tool lifespan.**
- 3 **Wider adoption of integrated technologies which removes silos and speeds up the manufacturing processes**
- 4 **A rise in cloud-based machining software solutions as there are numerous benefits such as increased productivity, improved accessibility and boosted data safety and security.**
- 5 **New software capabilities to address new challenges such as the talent crunch and labor crisis. For example, machining software must help retain complex machining knowledge.**

<sup>1</sup> Gartner. "The Gartner Predictions for 2023: Top Trends Impacting Manufacturing" (2023)

<sup>2</sup> Fast Radius. "5 CNC Machining Trends to Watch Out for in 2021" (2020)

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# THE CHALLENGES OF IMPLEMENTING CNC MACHINING

CNC machining is suitable for a wide variety of industries—including automotive, aerospace, industrial equipment, defense, firearms, transportation, optical, oil and gas, life sciences and more. However, manufacturers still face challenges in implementing CNC machining.



## Efficiency

The initial setup of CNC machines can be time-consuming, especially for complex operations. Machining can also be slow, depending on the type and hardness of the material used. In addition, once machining is complete, post-processing may be necessary, which can further lengthen production times. Finally, while these machines are highly automated and can operate around the clock, they require frequent maintenance and troubleshooting. This can disrupt efficiency and such downtime impacts a manufacturer's ability to meet production targets.



## Quality

The high degree of precision required in manufacturing demands the use of best-in-class tool paths and CNC machines to achieve superior quality. To achieve this level of precision, manufacturers need to invest in skilled technicians who are trained to leverage the power of CAM systems. With this knowledge, they can program and simulate virtual toolpaths, ensuring the highest levels of quality during production and keeping pace with technological advancements.



## Cost

The precision and accuracy of CNC machining and cutting tools require advanced CAM technology and skilled operators, leading to higher initial costs and ongoing maintenance expenses. However, the cost of quality issues, such as product defects or failure, can be even more costly in terms of lost revenue, damage to reputation, and potential legal liabilities. Finding the right balance between quality and cost is essential for manufacturers using CNC machining to remain competitive in the market.



## Time to market

With a direct impact on revenue, time to market is becoming an increasingly important differentiator for manufacturing companies. Especially in the context of ongoing supply chain disruptions, the race has intensified to be able to iterate quickly from a design change to the finalized product. Balancing these factors with the demand for speedy delivery to market can be a challenge, requiring strategic planning and investment in technology and training.



## Ease of operation

While CNC machines offer a host of benefits, such as high productivity and repeatability, many solutions require extensive setup times and programming. As a result, manufacturers using CNC machines need highly skilled personnel and user-friendly programming applications to operate and maintain the machines, which can increase their operational costs.

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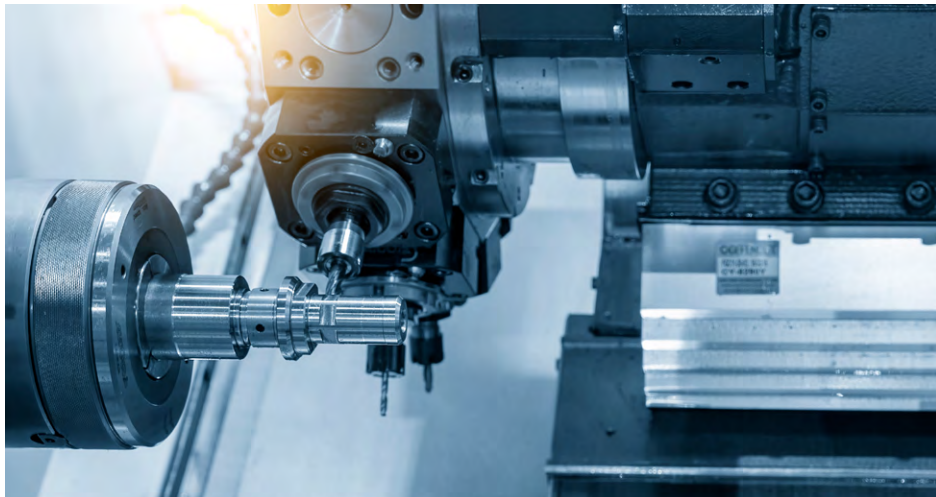
# HOW DELMIA OVERCOMES CNC MACHINING CHALLENGES

DELMIA Machining is a CNC machining software that enables manufacturers to program, simulate, and optimize machining processes, from design to tool path. It provides a complete, integrated 3D simulation of the entire machining process, including the tool assembly, the NC machine and the controller. With it, NC programmers can:

**Instantly  
update  
programs**

**Quickly see  
the impact of  
changes**

**Optimize  
machining  
processes**



At its core, DELMIA Machining helps companies realize significant machining operations cost savings and revenue boost by reducing machining time, improving quality and efficiency, and minimizing time to market. With a portfolio of 11 roles available for users to choose from, DELMIA Machining brings a full suite of capabilities to NC programmers, machine engineers and shop floor operators.

## 1 A better capitalization of knowledge

NC Knowledge Manager lets users define machining operations on specific features on a given part with all details including tool paths, cutting tools, macros and more, which can then be stored for reuse. This know-how is saved in the platform. This can be revised and be lifecycle controlled based on any changes that may be required. Additionally, the NC Knowledge Manager is not restricted to standard computer-aided design (CAD) features. Users can define any machinable geometry on a given part and identify that feature as a template.

## 2 Standardization and re-usable best practices

The NC Knowledge Manager enables the standardization of machining operations. This results in several benefits, including:

- Defining operations
- Reducing the time required to define operation details
- Maintaining the quality and repeatability of tested parameters for toolpaths

## 3 Cloud and on-premise

Adopting a cloud solution brings the full benefits of increased productivity and improved accessibility. However, for those who prefer on-premise solutions, the full suite of functionalities brought by DELMIA Machining is available.

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## How can you benefit from DELMIA Machining?

- Advanced machining simulation always available to optimize operating costs and boost efficiency of mass production
- Bring virtual workshop with cutting tools, machine and accessories to the desk of NC programmers
- Best in class and high quality tool path: Adaptive Concentric
- Milling for HSM and hard material machining
- Support Mill-Turn, SWISS machines and milling with robots
- Support WireEDM and Laser and water jet cutting machines
- Advanced Machining and automation concept for knowledge capture and skill development
- Drastically reduced NC programming time while re-using captured knowledge

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## MACHINING ROLES

### Define Shop Floor Resources



Machine & Tooling Designer  
(EMR)

Cutting Tool Technologist  
(NTT)

### Program NC Machines



NC Shop Floor Programmer  
(NSR)

NC Prismatic Machine  
Programmer (NPM)

NC Prismatic & Mill-turn  
Machine Programmer (NTP)

NC Mold & Die Programmer  
(NMD)

NC Milling Machine  
Programmer (NTX)

NC Mill-Turn Machine  
Programmer (NTA)

NC Knowledge Manager  
(NPX)

### Simulate NC Machines



NC Shop Floor Reviewer  
(NSV)

NC Machine Simulation  
Engineer (NMN)





## The value of implementing DELMIA Machining

Companies that adopt the latest machining solutions will be able to experience:

**30-40%**

**reduction in  
NC Programming time**

**10-35%**

**reduction in machine time**

**50%-75%**

**quicker search time for past  
projects' data**

**20%-50%**

**increase in capitalization through  
reused knowledge and processes**

These factors contribute directly to operational efficiency, which translates to cost savings. They also result in better customer service and act as a clear differentiator for target customers—driving higher earning potential.

## REDEFINE INDUSTRIAL EXCELLENCE WITH DELMIA MACHINING

Manufacturers have increased their digital investment over the last few years and accelerated the adoption of emerging technologies and processes to cut metals into different shapes, sizes and dimension—capabilities that were unimaginable just a few decades ago.

However, in most cases, manufacturers lack the time and resources to experiment and find optimal machining processes and are often restricted to using older, established methods. Choosing the right machining software helps to implement emerging trends. This lends manufacturers a leading edge as they are able to create that competitive value differentiation before spending precious time and resources in real-world operations.

Through a 3D environment, DELMIA Machining demonstrates real, significant and tangible improvements in key performance metrics. With DELMIA, manufacturing executives are encouraged to accelerate the roll-out of advanced machining capabilities and sustain performance improvements.

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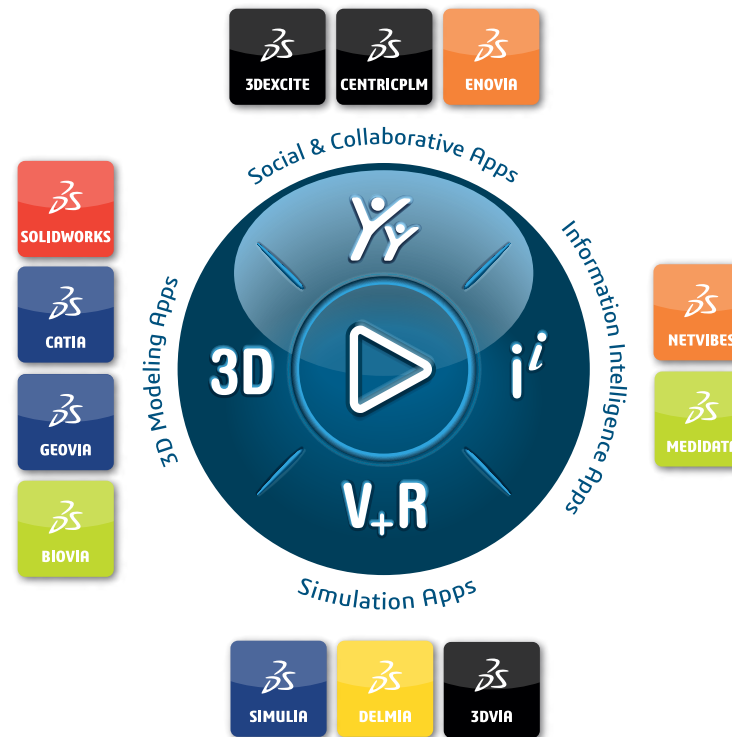
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