

# Weaving the Digital Thread

## Hexagon Nexus, a Cloud-Native System of Engagement

### Key Takeaways

Most industrial companies have one or more digital solutions that support the lifecycle of their products from idea through life but those data and process management solutions are complex to purchase, implement, and use.

Nexus offers an open digital platform for customer engagement applicable to a broad range of manufacturing customers supporting key use cases in design, production, and metrology.

Some of the early Nexus cloud-native offerings focus on improving machine shop efficiency, including Design Review for Manufacturing, Paperless Traveler for CABINET VISION, Nexus Cutting Tool Library, and ProPlanAI with Copilot.

### Introduction

Using digital technologies to support the product lifecycle dates from the 1950s, but use rapidly expanded in the 1970s and 1980s due to more ready availability of commercial offerings.<sup>1</sup> At present, most manufacturing companies rely on digital technologies across their business and value chains. However, gains from legacy solutions were hard won, both in cost and time. Today's dynamic business environment requires agile offerings that can leverage those legacy capabilities and expose them to broader uses in the extended enterprise. Hexagon Nexus, a cloud-native system of engagement for manufacturing companies, offers a new approach.

### Optimizing the Digital Diaspora

Over the last decade, a wave of digital transformation has swept up companies in a wide range of industries. CIMdata believes that some were captivated by the Industry 4.0 vision that described a "smart, connected" future and some parts of that vision are being realized. Business success in this new environment demands digital transformation to enable the smart factories needed to economically produce the smart, connected products available in almost every industry. This has resulted in an

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<sup>1</sup> Research for this commentary was partially supported by Hexagon.

increased desire to use digital data across the value chain, to power digital twins and to populate complex digital threads.

Recent CIMdata research on cloud and digital transformation shows that industrial companies have an expansive, heterogeneous view of their digital threads, listing dozens of applications on recent surveys, spanning mechanical computer-aided design (MCAD) with computer-aided manufacturing (CAM) and simulation and analysis (S&A), and other core authoring tools. Much of CIMdata's industrial consulting includes helping industrial companies reach their digital thread objectives. Many see the digital thread both enabling collaboration across value chains, as well as for capturing the results of those interactions. In a survey sponsored by Hexagon Manufacturing Intelligence, collaboration was found to be a major challenge with anticipated benefits for increasing product quality but also achieving sustainability targets and improving employee productivity.<sup>2</sup>

In CIMdata's industrial consulting work with large industrial organizations we find that most have implemented a commercial data and process management solution to support lifecycle development and collaboration. While cloud adoption is growing, most of those systems are on-premises. Even in these large companies, there are groups who still rely on network drives, Microsoft Excel, and email to collaborate on complex product data just as many small firms still do.

Over the decades, independent software vendor (ISV) data and process management offerings have evolved from simple file management to complex platforms supporting use cases well beyond engineering. As part of this trend, they are improving their user experience (UX), in effect turning their "systems of record" into "systems of engagement" applicable to more than just authoring tool users.<sup>3</sup> While their platform approaches support offerings from multiple providers they are optimized for in-house solutions.

At the same time, ISVs have moved platform solutions to the cloud, which eases some deployment issues, but enabling cloud-delivery does not reduce the complexity of adoption and use. Even these expansive platforms have functional and data siloes, often due to their legacy solutions and brands, and process gaps for supporting value chain collaboration.

Hexagon is taking a different approach with their cloud-native Nexus platform. They are empowering manufacturers by connecting functions through a data-driven approach that enables collaborative manufacturing.

## **Connect, Collaborate, and Transform the Shopfloor with Hexagon Nexus**

Hexagon is a multinational industrial technology company headquartered in Stockholm, Sweden. At the end of 2024, the company had approximately 24,500 employees in 50 countries and net sales of approximately €5.4 billion. Hexagon divisions include:

- Manufacturing Intelligence
- Geosystems
- Asset Lifecycle Intelligence
- Autonomous Solutions

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<sup>2</sup> <https://hexagon.com/advanced-manufacturing-report>

<sup>3</sup> <https://www.forbes.com/sites/joshbersin/2012/08/16/the-move-from-systems-of-record-to-systems-of-engagement/>

- Safety, Infrastructure & Geospatial

Introduced in 2023, Nexus is an offering from the Manufacturing Intelligence (MI) division.<sup>4</sup> The company describes Nexus as “an open digital reality platform<sup>5</sup> for manufacturers...designed to connect people, technology and data, accelerating innovation and time to market.”<sup>6</sup> CIMdata has long believed that companies must consider people, process, and technology issues when planning and executing technology investments, and Nexus embodies much the same view.

In essence, Nexus is an ISV-agnostic platform that provides a “system of engagement” for Hexagon products, as well as products from other partners, to support a wide variety of digital thread uses cases for value chains of industrial companies.<sup>7</sup> Co-engineered with Microsoft, Nexus enables workflows that expose digital tools to manage data in a simple, collaborative environment. Current Nexus partners include Microsoft, NVIDIA, Altium, MachiningCloud, and Moldex3D.<sup>8</sup> Nexus is also a customer engagement platform for Nexus customers, offering ready access to user and developer help and documentation, training, communities and forums, and much more. The complete Nexus offering includes a range of services, some related to Hexagon’s software offerings in design, analysis, manufacturing, and metrology and inspection, as well as more general enterprise and process consulting. Many of the Nexus offerings are available on the Microsoft Azure Marketplace.<sup>9</sup> Nexus leverages Hexagon’s strengths in design and engineering, production, and metrology and inspection, as shown in Figure 1.

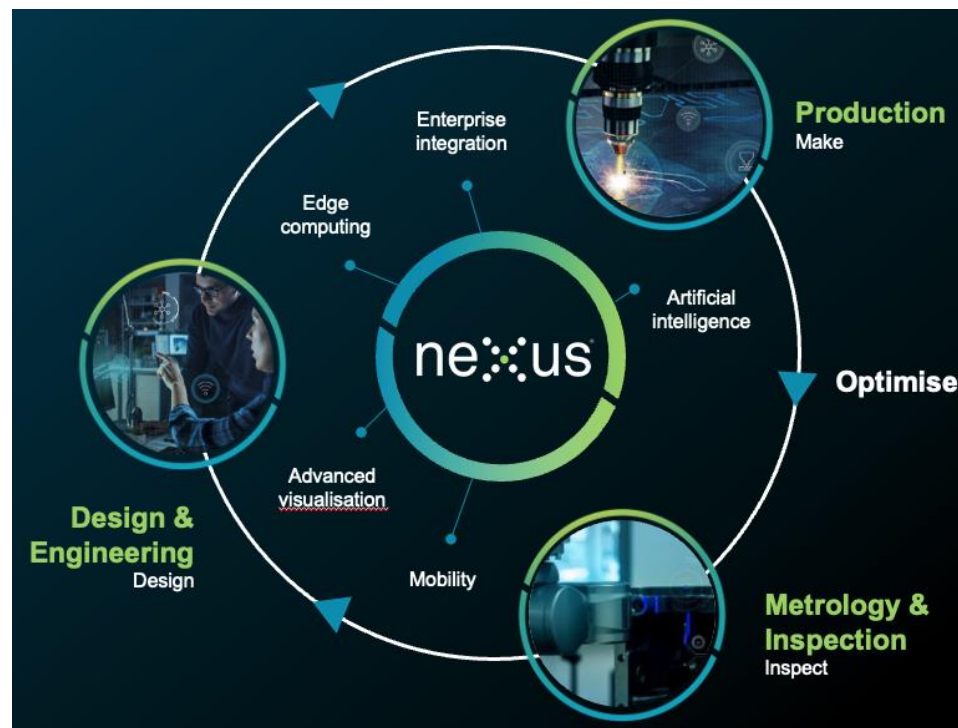


Figure 1—Nexus Expands Reach of Hexagon Solutions  
(Courtesy of Hexagon MI)

<sup>4</sup> For more information on Hexagon Manufacturing Intelligence, please see <https://www.cimdata.com/en/resources/solution-provider-profiles/plm-dossier-hexagon-manufacturing-intelligence>.

<sup>5</sup> Digital reality is a term for technologies that combine the physical and digital worlds, including augmented reality (AR), virtual reality (VR), and mixed reality (MR). The company believes Smart Digital Reality is “vital for the future of business.” <https://investors.hexagon.com/en/strategy>

<sup>6</sup> <https://nexus.hexagon.com/>

<sup>7</sup> <https://nexus.hexagon.com/home/product/category/software/>

<sup>8</sup> For more information on Hexagon’s Nexus partners, please see <https://nexus.hexagon.com/home/product/category/software/?productType=partner>

<sup>9</sup> <https://azuremarketplace.microsoft.com/en-us/marketplace/apps/hexagonmanufacturingintelligence1586372099540.hmi-nexus?tab=Overview>

The complete Nexus offering also includes a range of solutions, some related to Hexagon’s offerings in engineering, manufacturing, metrology and inspection, as well as more general enterprise and customer process-focused solutions. For example, Figure 2 shows a complete solution for reverse engineering.

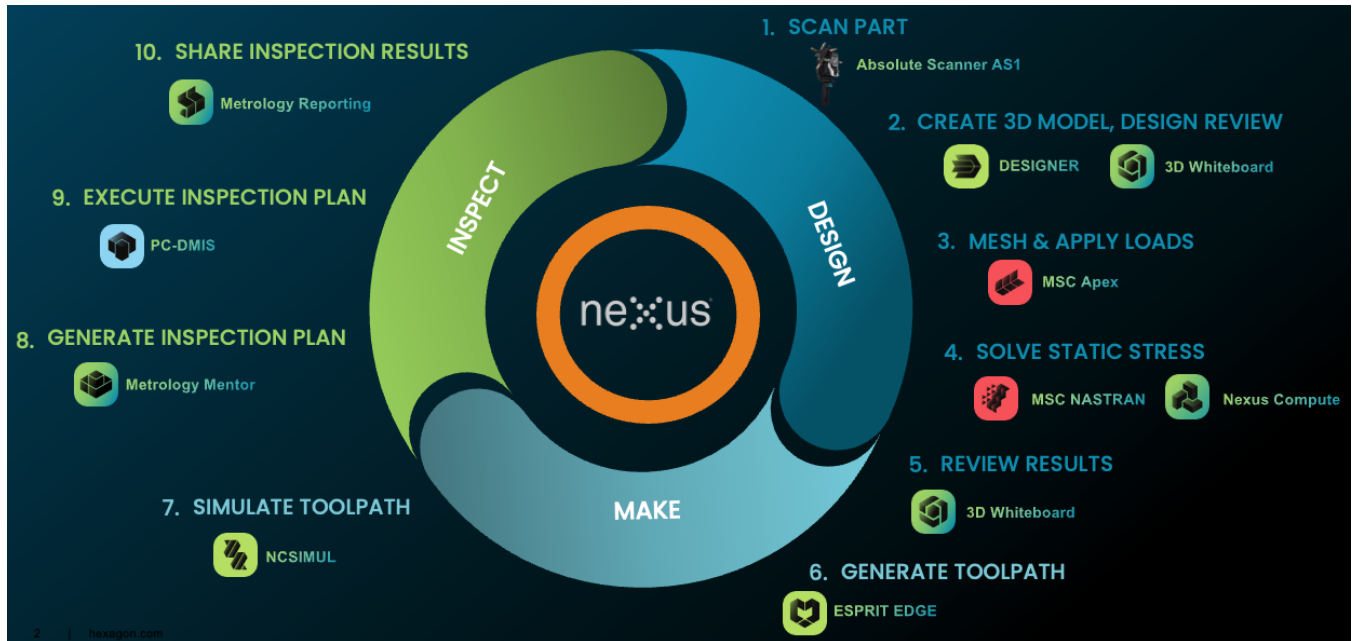


Figure 2—Nexus Connected Reverse Engineering Workflow (Courtesy of Hexagon MI)

Since its launch, Nexus has built out a number of high-value offerings that focus on key issues in design, manufacturing and quality. This commentary focuses on new solutions for smart machine shops, including Design Review for Manufacturing, Paperless Traveler for CABINET VISION, Nexus Tool Library, and ProPlanAI with Copilot. These new Hexagon offerings help their clients move from digitalization of their vital intellectual assets, then gaining insights to drive automation and autonomy, as shown in Figure 3.



Figure 3—Shopfloor Workflows from Digitalization to Autonomy (Courtesy of Hexagon MI)

## Design Reviews for Manufacturing

CAM workflows often require modifying native MCAD files to improve product quality and process efficiency. Industrial companies adopting Hexagon's MCAD application for smart manufacturing, DESIGNER, a single-user application, could greatly benefit from an ability to collaborate with stakeholders on design changes. The Nexus solution enables collaborative design reviews by connecting DESIGNER with the Nexus 3D Whiteboard to support the desired communication, reducing errors and improving efficiency. This visual collaboration solution allows users to comment and mark up design data using remote live collaboration in a web browser or in Microsoft Teams. All comments and markups can be synced and stored as a shared Nexus document. Nexus brings these important design review capabilities to new classes of users in a managed environment, an important capability for their CAM customers.

## Paperless Traveler for CABINET VISION

Even in today's digital world, small manufacturers still rely too heavily on "travelers," traditionally a (paper) document that accompanies a part or job as it moves through the production process, containing all the necessary information for each stage of manufacturing, including materials, operations, and instructions. Nexus offers a better (digital) way. Their initial offering focuses on CABINET VISION, the most widely used CAD/CAM solution for the cabinet and closet industry with 6,000+ customers in over 50 countries and 35,000 active users. The Nexus Paperless Traveler helps transition these customers to a digital workflow that enhances process adherence and data traceability, two attributes lacking on today's woodworking shopfloors. This Nexus offering supports task and job status tracking and helps optimize customer's overall manufacturing process. Hexagon has operated a small pilot program for the Paperless Traveler for CABINET VISION since December 2024. Based on the solid feedback to date Hexagon is making improvements targeted for the next release. The adage "a chain is only as strong as its weakest link" applies here. Many large companies rely on smaller, less sophisticated firms to produce vital components. Technologies that can make these "value chain links" stronger will benefit all. This paperless traveler solution provides Hexagon an excellent template to support this approach with their many CAM customers in other industrial segments.

## Nexus Cutting Tool Library

Many companies are seeing the benefits of digital twins beyond design, looking to develop twins of manufacturing. Building digital twins of CAM processes relies on accurate, up-to-date 3D information about cutting tools, adapters, and assemblies, and should leverage real-world cutting data. The Nexus Cutting Tool Library puts this information at the fingertips of CAM users. The first Nexus offering focuses on their WORKNC product, with support for ESPRIT EDGE and EDGECAM coming soon. The Nexus solution imports data from tool OEM websites or consumes standard Generic Tool Catalog (GTC) packages of the needed information (that are compliant with ISO 13399). It provides a ready "single-source of truth" for tool information supporting the key stakeholders for this information: programmers, tool crib managers, and machinists. High-end data and process management solutions are overkill for this application and too expensive to deploy as broadly as collaboration is needed, particularly at smaller firms. This Nexus offering fills that gap.

## ProPlanAI with Copilot

In the over 30 years that CIMdata has published market research on the CAM market, industrial companies have long complained about the lack of competent CAM programmers. As CNC machine tools have gotten more and more complex, these limited programming resources are stretched further. It is hard to institutionalize knowledge to help shorten programming time and improve program quality. Traditionally programming automation used a rule-based approach, and it could take a dedicated person weeks or

longer to write these rules. ProPlanAI with Copilot self-learns using closed-loop machine learning and generative artificial intelligence (AI) to rapidly deliver high quality, efficient toolpaths. Hexagon's initial customer feedback is very positive.<sup>10</sup> Hexagon currently plans to release ProPlanAI for ESPRIT EDGE in Q2 2025.

These are just some of the manufacturing innovations Hexagon is bringing to market. They continue to add new partners and create new Nexus offerings incorporating both Hexagon solutions and partner offerings. This approach offers the best of both worlds. Their cloud-native platform leverages proven technology while enhancing its usability and reach. CIMdata believes that companies large and small can benefit from this right-sized offering.

## Conclusion

Most industrial companies support their product lifecycles using multiple digital solutions, including data and process management solutions. Historically, data and process management offerings were on-premises and complex to purchase, implement, and use. Nexus offers an open, cloud-native digital platform for customer engagement applicable to a broad range of manufacturing customers. The Nexus platform and many Nexus offerings are available on the Microsoft Azure Marketplace, making it easier for Azure users to try Nexus using credits from their Azure subscription. These new offerings support key use cases in design, production, and metrology. This commentary focused on several Nexus manufacturing offerings including Design Review for Manufacturing, Paperless Traveler for CABINET VISION, Nexus Cutting Tool Library, and ProPlanAI with Copilot. These solutions bring much needed digital capabilities to shop floor workflows typical of manufacturing companies in a range of industries. Nexus offers a right-sized system of engagement that can stand-alone or readily link with other digital solutions used by their customers. CIMdata looks forward to seeing how Nexus can breathe new life into Hexagon's software portfolio for the benefit of their many customers.

## About CIMdata

CIMdata, a global strategic management consulting firm, provides services designed to maximize an enterprise's ability to design, deliver, and support innovative products and services. For more than forty years, CIMdata has provided industrial organizations, providers of digital technologies and services, and investment firms with world-class insight, expertise, and best-practice methods on a broad set of product lifecycle management (PLM) topics and the digital transformation they enable. CIMdata also offers research, subscription services, publications, and education through certificate programs and international conferences. To learn more, visit [www.CIMdata.com](http://www.CIMdata.com) or email [info@CIMdata.com](mailto:info@CIMdata.com).

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<sup>10</sup> For more information, please see <https://hexagon.com/company/newsroom/press-releases/2024/hexagons-new-ai-powered-automation-slashes-machine-tool-programming-time-by-75-per-cent>