

Autonomous Connected Ecosystems: Hexagon Live 2018

CIMdata Commentary

Key takeaways:

- *Hexagon AB has expanded from their metrology roots to become a major player in the PLM Economy.*
- *Their commitment to invest in recent acquisitions like Vero Software and MSC Software is clearly evident and much needed, particularly for MSC Software.*
- *Hexagon's Autonomous Connected Ecosystems (ACE) vision is consistent with digitalization and Industry 4.0 trends that are impacting a wide swath of industrial companies.*
- *Their organic offerings and recent acquisitions put them in an excellent position to capitalize on these trends and helping them achieve their ACE vision.*
- *Key partnerships with companies like SAP and OSIsoft give them direct access to enterprise and operation technology information that is vital to their vision and to maintaining their digital threads over the long life spans of the target products and assets.*

CIMdata had the pleasure of attending Hexagon Live 2018 in Las Vegas, Nevada on June 12-15, 2018. Headquartered in Stockholm, Sweden, Hexagon AB began by focusing on industrial measurement technologies and has evolved into a global leader in a range of digital solutions, many of which are key elements companies need to support important topics like autonomous vehicles, digitalization, the Internet of Things (IoT), and Industry 4.0. In fact, their new tagline, Autonomous Connected Ecosystems (ACE), “a state where data is connected seamlessly through the convergence of the physical world with the digital, and intelligence is built-in to all processes.”¹ This description is very consistent with the vision for cyber-physical systems as part of Industry 4.0.

While much of Hexagon's product focus is outside of the PLM Economy, CIMdata started following the company with their 2010 acquisition of Intergraph, a major provider of design solutions for the power, process, and marine markets that was long included in CIMdata's global PLM market research. Over the last several years, Hexagon has purchased several other firms in our PLM market definition; Vero Software, a leading Computer-Aided Manufacturing (CAM) software provider in 2014; Forming Technologies, Inc., a simulation firm focused on metal forming processes in 2016; and MSC Software, a pioneer of simulation and analysis (S&A) software in 2017 as shown in Figure 1. Clearly HxGN Live, as the company terms it, was a good place to catch up on these companies and the rest of their vision and portfolio. (Just after the show, Hexagon announced the acquisition of SPRING Technologies, a French provider of CAM and manufacturing solutions.²)

¹ <https://hexagon.com/about>

² <https://hexagon.com/news/press-releases/press-release-detail-page?alertID=1588401>

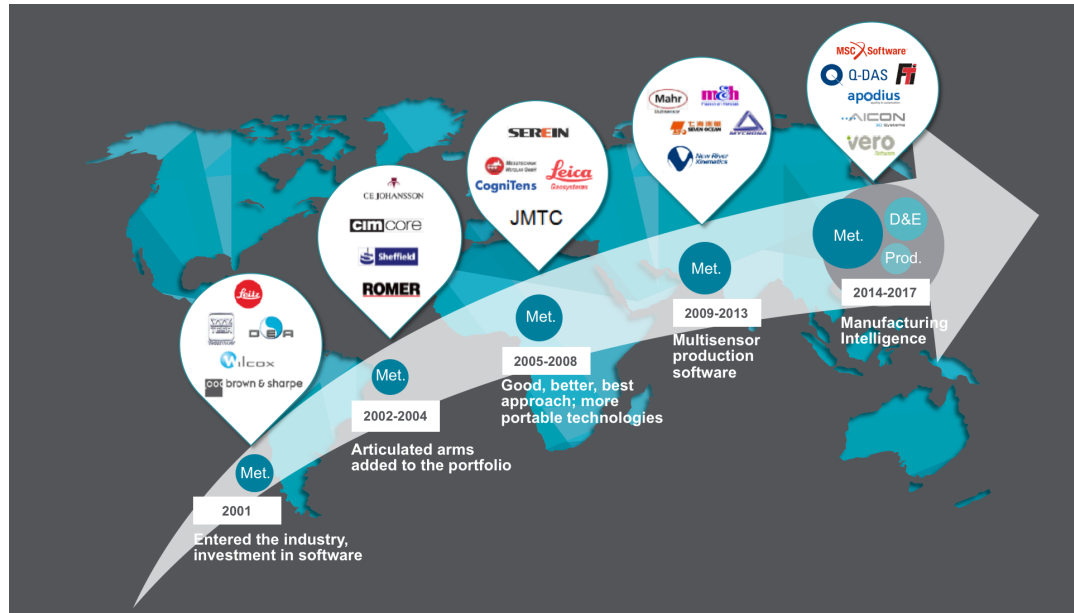


Figure 1—Hexagon Manufacturing Intelligence's Acquisition History
(Courtesy of Hexagon)

At the end of the day Las Vegas time on June 12, Mr. Ola Rollén, Hexagon's President and CEO, started his keynote, with the theme "The Big Leap." Part of the big leap is letting machines help you, as much via augmented intelligence as through artificial intelligence (AI). Xalt is Hexagon's branding for a range of technologies, like AI/machine learning, cloud orchestration, edge computing, communications, and integration.³ Many of these technologies began in different Hexagon business units and a few years ago the company brought them together internally to nurture them for consistent use in their offerings. They also added a few acquisitions to this mix, including Catavolt, a provider of cloud applications for data integration, in 2017. Mr. Rollén stated that Xalt will help Hexagon achieve their ACE vision, their focus for the next few years. This level of business process and technology will indeed be a big leap both for most industrial firms and for the firms that provide them solutions like Hexagon. Companies are starting in very different places, and the offerings and consulting provided to them must assess that state quickly and determine a reasonable path forward that balances the need to optimize the lifetime value of existing physical plant while also introducing new technology and processes so that they can make that leap...and make it safely to the other side. Many systems integrators are investing in Industry 4.0 practices and technologies that could help, and indeed at the meeting Hexagon's executives did emphasize that bringing in more SI partners is on their to-do list.

The 'A' in ACE is autonomous, which to Mr. Rollén dictates machine-to-machine communication. Autonomous is an important concept in both sides of Hexagon's business. About half of their revenues come from their Geospatial Enterprise Solutions (GES) business, which includes reality capture, positioning intelligence, and geospatial offerings that will empower autonomous vehicles. But Hexagon can also support autonomous, machine-to-machine interactions in their metrology businesses, part of the Industrial Enterprise Solutions (IES) business, the other half of Hexagon AB by revenue. About half of IES is Hexagon Manufacturing Intelligence (MI), where Vero Software, Forming Technologies, SPRING, and MSC Software are key additions, and the other half is Process, Power, and Marine (PPM), the

³ <https://hexagon.com/news/press-releases?page=/en/hexagon-announces-xalt-radical-new-approach-harnessing-untapped-potential-iiot-data>

domain of the former Intergraph. During our time at HxGN Live CIMdata tried to cover both MI and PPM sessions.

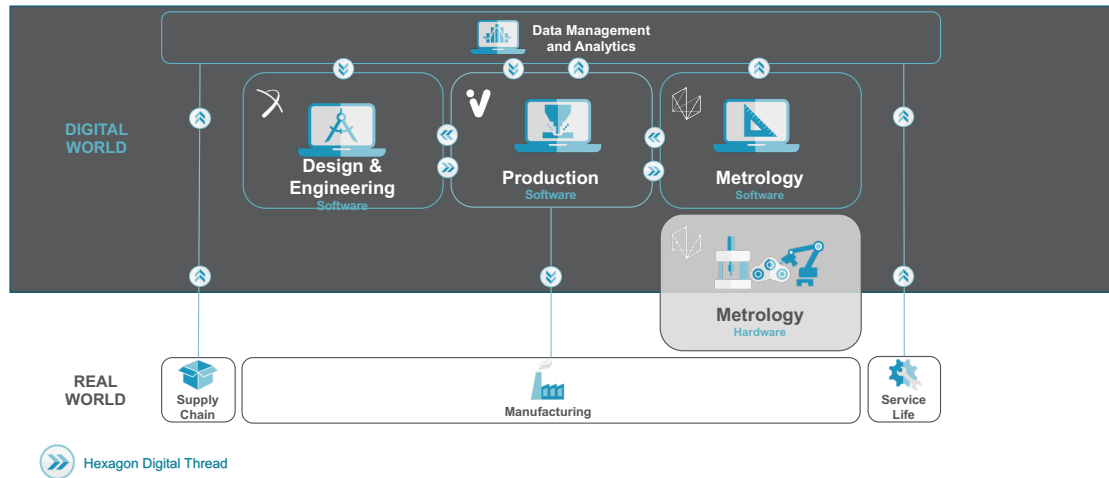


Figure 2—Hexagon’s View of the Digital Thread in Manufacturing
(Courtesy of Hexagon)

The digital thread and digital twin are core to the Hexagon MI strategy. As shown in Figure 2, they too see the digital thread as spanning the lifecycle from design and engineering through manufacturing and into service, including the supply chain. The MSC acquisition is a big part of that vision, with its connections to the design and engineering process with MSC solutions combining with Hexagon’s metrology strengths to provide rock-solid validation and verification. With the MSC acquisition barely closed at the time of HxGN Live last year the crowd was looking forward to learning more about MSC and their offerings.

The MSC Software Strategy Update session was filled to capacity, not surprising for this important new addition to the Hexagon family. In fact, the session turned into a de facto MI business and strategy update, as Vero Software and metrology took up about half of the time slot. The metrology connection is important because validating simulations requires real world data which Hexagon is a world leader at collecting. When MSC took center stage the audience was not disappointed. Under their previous management MSC did not have adequate resources to support product development or mergers and acquisitions that could have helped them keep up with their acquisitive S&A peers. Things will be different under Hexagon, welcome news to MSC customers and market watchers like CIMdata. There will be a lot of focus on Apex, MSC’s “unified CAE environment for virtual product development.” Direct modeling tools help users prepare geometry in a consistent way for multiple solvers addressing a wide variety of simulation problems. The company started work on this important initiative several years ago but Hexagon’s investment will help it move faster, something CIMdata heartily endorses. Hexagon is also investing in Marc, MSC’s nonlinear solver, making it consistent with their Liquid Engineering Application Framework (LEAF), a nice turn of phrase to describe how they are trying to make the user experience easier and more consistent across their products. Just before they were snapped up by Hexagon, MSC Software acquired Software Cradle, a Japanese provider of computational fluid dynamics (CFD) solutions, a hole in their portfolio that needed filling, particularly given the actions of their competitors. Hexagon is investing in expanding the reach of their Japanese offerings and expertise, again welcome news that will help MSC Software in their competitive battles to expand their footprint in existing clients. They also mentioned plans to refresh Adams, their multi-body dynamics solution. The goal is to provide more real-time simulation. It will also get the LEAF treatment and be

supported by Apex next year. Even areas like materials, where their Digimat offering is well positioned, will benefit from the increased investments discussed in the session. They will need the money, as additive manufacturing is making deep materials knowledge even more important. Hexagon will also seek to combine MSC's Simufact process simulation capabilities with their CAD/CAM offerings.

Vero Software is also looking at a major refresh across their product lines. Prior to its acquisition by Hexagon, Vero Software was bulked up by a series of acquisitions of mainly non-competing CAM providers. As a result, they have a large portfolio that does not have a common look and feel, work the same, or have the same technology underneath the covers. Vero Software plans to do some hard work on the plumbing, combining elements where they can to get economies of scale in R&D. They are also planning to work on a more consistent look and feel across their applications. This is the type of investment that Vero discussed with CIMdata just before their acquisition by Hexagon, spending that CIMdata believes is warranted and long overdue. Many large software providers in the PLM Economy have the same issue: multiple offerings that serve the same general market but share none of the code powering the applications. This type of spending may not be visible to the user but it will simplify development and support for Vero in the long term; worthwhile objectives.

The PPM keynotes on June 13 started with Mr. Mattias Stenberg, President of Hexagon PPM, talking about how "The Future is in Beta." The term beta denotes not only an initial attempt, but also a promise of something better. During his talk, Mr. Stenberg provided some examples of products that should have never come out of beta. BOFORS Toothpaste, developed by a weapons manufacturer, that cleansed your teeth using microscopic plastic balls. The product cleaned well, but the balls stayed in the body for months. The Rejuvenique Facial Mask promised to reduce wrinkles, if you would wear a frightening mask to bed that jolted your face with electricity. Not a good look for your partner, suggested Mr. Stenberg. The moral of the story is that innovation can seem like a good idea at the time but not turn out as we plan. We have to innovate more and learn to fail fast, all the while moving forward. If we are going to innovate and modernize, let's not optimize the status quo claimed Mr. Stenberg. Digitalization is one current trend driving all kinds of modernization and innovation, which might even be coming to the engineering, procurement, and construction (EPC) business. Hexagon PPM is a leading solution in that space, one that Hexagon has tried to continually evolve. Last year at HxGN Live they introduced Smart Digital Asset Strategy, enabled by their HxGN SDx Platform, which got some more press this year.⁴ According to Hexagon, HxGN SDx is a modular cloud-based asset lifecycle information management solution targeted at the power, oil, and gas industries. Of course, the platform can manage the design data created using Hexagon solutions, the HxGN SDx Platform is intended to be the single source of truth for the project and asset lifecycle. Others in the EPC and AEC space have noted this problem, with many authoring and collaboration tools creating content that needs to be managed. For example, Dassault Systèmes is using its 3DEXPERIENCE platform to be that information nexus for EPCs. But Hexagon is going farther, integrating not only with SAP around their asset management and maintenance planning capabilities, but also leveraging a partnership with OSIsoft, the global expert on capturing and leveraging operational data (OT) from the plant or shop floor. This is another place where Xalt technologies will play a key role. According to Mr. Tim Johnson, the Director of Partnerships and Alliances from OSIsoft, 65% of the Fortune 500 license OSIsoft PI. They have been gathering and digitizing operations data throughout their 35-year history. Hexagon saw them as a great partner to help animate their digital twin. During the session they showed an integration of the PI Vision user interface with hyperlinks directly

⁴ <https://hexagon.com/news/press-releases/press-release-detail-page?alertID=1587655>

to related Hexagon-managed data. CIMdata has been briefed by OSIsoft in the recent past and they are indeed the leader in this space. This was a good move by Hexagon.

Another thing that the PPM side of the business has in common with MI is their emphasis on the digital twin. Hexagon pitches HxGN SDx as a SaaS offering that creates and maintains the digital twin of an industrial facility. They see digital twins as an ideal way to leverage their data to more effectively manage the complete facility lifecycle, while raising efficiency and reducing risk.

Getting to the ACE vision is about more than technology. Just as in CIMdata's PLM practice, technology is often not the limiting factor, it is the ability of people to leverage this technology and make the process changes necessary to optimize its value. Recognizing this fact, Hexagon's Digital Transformation practice works as much on the soft side, looking at skills and competencies, doing risk mitigation, getting executive buy-in, and developing organizational confidence in the change process and its results. CIMdata applauds this effort but this is another area where link-ups with large SIs could be mutually beneficial, something that Hexagon stated is in the works. More people need to be promoting a consistent message about the benefits of Hexagon's vision and what their solutions have to offer.

In conclusion, Hexagon AB has become a force to be reckoned with in the PLM Economy. Their digital thread and digital twin definitions place them squarely in line with other leading PLM firms and their metrology strength and ubiquity certainly places them centrally in the PLM strategies of discrete manufacturers worldwide. This commentary was only a small taste of what HxGN Live had to offer and CIMdata looks forward to learning more in the weeks and months ahead.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at <http://www.CIMdata.com> or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.