CIMdata

PLM Industry Summary

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CIMdata News

CONTACT Elements: A Future-Proof Digital Platform (CIMdata Commentary)

30 May 2019

Key takeaways:

- *Today's complex, smart, and often highly configurable products require an end-to-end digital product innovation platform that can be extended and scaled as the business evolves.*

- *CONTACT Elements is a highly modular product innovation platform that supports the design and operation of smart products by enabling the end-to-end digital thread and resulting digital twins.*

- *CONTACT Elements' architecture is built on a robust set of open and de facto standards, including REST, Python, SQL, HTML 5, XML, and LDAP.*

- *CONTACT Software offers a robust set of proven applications that leverage CONTACT Elements, including its PLM-enabling solution (CIM Database), project and extended enterprise collaboration solutions, and an Internet of Things (IoT) solution that supports high value complex in-field assets.*

For many years, PLM solutions' primary function has been to help develop better products, faster and cheaper. While this is still important, it isn't the only thing that a typical PLM strategy needs to address. Today's PLM-enabling solutions must support end-to-end lifecycle management of the specification, design, manufacture, and maintenance of smart and connected products. These often complex and highly-configurable products require digital threads and twins, which support a host of digital transformation initiatives that are critical for future business success. This end-to-end lifecycle management necessitates the management of product information from conception through the end of the product's useful life. PLM-enabling solutions of the past aren't robust enough to support these requirements in a cost-effective manner. This fact has driven much of the PLM industry to rethink how solutions are architected and delivered to the market; in many ways forcing the platformization of PLM.

The platformization of PLM clarifies the distinctions between strategic and tactical—long- and short-term thinking. At its core, strategic is anything that sustains the extended enterprise and stays ahead of challenges in technology, markets, competition, regulation, etc. In contrast, tactical is concerned with short-term objectives of departments and business units, and is usually focused on tasks and disciplines commonly found within engineering units. Yesterday's PLM solutions were about the tactical, but tomorrow's PLM solutions will be those that act as end-to-end lifecycle management platforms that are strategic and sustainable.

CIMdata defines these end-to-end lifecycle management platforms as providing a foundation upon which functional capabilities, data, and processes are enabled and executed—it is everything users need, when they need it, no matter there they are, all in one place. The near-term goal is to enable the

innovation essential to create digital products, systems, and services. Users and managers know these platforms must be employed globally, sustaining the enterprise and the environment. The long-term goal of end-to-end lifecycle management is sustainability—that is sustainable innovation. These solutions must be inherently:

- Dynamic, helping companies adapt rapidly and innovate continuously across multiple lifecycles in ever-changing marketplaces.

- Seamless, meaning that all the digital bits and bytes of innovation work together to enable collaboration among users anywhere in the lifecycle across an extended enterprise's landscape.

First and foremost, PLM platforms enable and enhance the enterprise's innovation processes. Users get much-needed help to create, manage, share, and reuse product-related information in all its forms and from various sources. Access to these advanced capabilities helps them seize opportunities quickly, as soon as the insights materialize within the lifecycle, and before competitors notice them. In addition, innovation platforms are designed to sustain continuous creativity in products and processes—the breakthroughs, as well as the new-and-improved—across generations of products and product portfolios, and reaching far beyond current offerings.

Finally, these PLM-enabling product innovation platforms must reduce, if not eliminate, dependence on aging applications and fragmented legacy systems. This means users will no longer be constrained by disjointed or out of date workflows that hamstring searches for crucial information. Key information will no longer be inaccessible, for example, and lessons learned will no longer be obscured.

The Product Innovation Platform Defined

According to CIMdata's definition, an organization's product innovation platform is a set of evolving functional domains—process, lifecycle stage, and technical domains such as system ideation, profitability management, and quality and compliance (see Figure 1). They are orchestrated by the platform with a "system of systems" approach that, in essence, makes the platform the enabler of the next generation of PLM-enabling solutions.
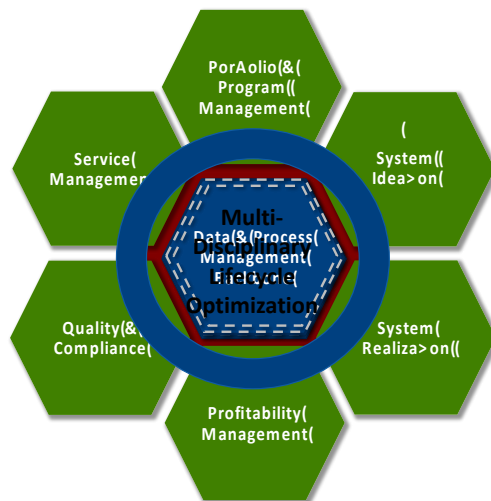

Figure 1—CIMdata's Product Innovation Platform

For authors Mark Bonchek and Sangeet Paul Choudary,[1] successful platforms exhibit three success factors:

- **Connection**: the ease with which others can plug into the platform to share data and accomplish tasks.

- **Gravity**: how well the platform itself attracts those who need information.

- **Flow**: how well the platform fosters collaboration and the shared creation of information.

- Note the emphasis here on connectivity and collaboration. CIMdata adds the following two more Strategic Imperatives to around-out our product innovation platform definition:

- **End-to-End Lifecycle Support**: the ability to support the full product/plant lifecycle, from concept through life. Supporting the entire extended enterprise, including all its disciplines.

- **Openness**: the ability to provide unencumbered access to managed data and related services.

In addition, the Product Innovation Platform is further described by seven strategic characteristics, led by Sustainability. Sustainability means supporting an enterprise's data- and process-management requirements over an extended period of time—at a reasonable cost while business needs evolve. CIMdata defines three key elements of platform sustainability: Adaptability, Extensibility, and Maintainability. This is what future-proof is all about. Sustainability is, of course, only one key Strategic Characteristic, the other seven include:

- **Data Management & Find**: The ability to manage and find data.

- **Through-Life Configuration Management & Traceability**: The ability to manage a product's configuration from concept through its entire lifecycle and provide traceability forward and backwards.

- **Process & Knowledge Management**: The ability to represent business processes and capture process outputs, as well as capture and organize data representing knowledge.

- **Upgradeability**: The ability to easily update to a newer version of the solution.

- **Enterprise Infrastructure Utilization**: The ability to effectively leverage existing and future IT infrastructure to meet a business's requirements.

- **Availability & Stability**: The platform's ability to provide its services when and where needed.

CONTACT Elements, from CONTACT Software, is such a solution—designed to meet these key product innovation platform imperatives and associated characteristics.

CONTACT Elements

CONTACT Elements is at the heart of CONTACT Software's solution stack. Founded in 1990, CONTACT Software, headquartered in Bremen, Germany, is a pioneer and long-time PLM solution provider focusing on the development and delivery of open PLM-enabling solutions. Like other leading PLM solution providers, CONTACT Software has been developing their platform for many years. CONTACT Elements provides the company and their customers a high level of freedom in managing and evolving their solution. CONTACT Elements makes it possible to administer the platform and the

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[1] Bonchek, Mark and Sangeet Paul Choudary. "Three Elements of a Successful Platform Strategy." Harvard Business Review. January 31, 2013.

individual applications that run on it independently. This is critical if one wishes to implement a modern Product Innovation Platform. The advantages include:

- Independent and often significantly shorter release cycles for applications

- Customers can easily deploy new functionality as it becomes available in a modular manner

- Capabilities can be rapidly defined or updated, developed, and deployed without updating the underlying platform

- Improved management of individual adaptations or modules

- Rapid and improved scalability

- Lower total cost of ownership

CONTACT Elements is comprised of more than 50 software components all built on top of a robust technology platform that manages the interaction/configuration of the components, their release-capable adaptation to customer-specific requirements, and secure and efficient system operations. The underlying architecture is built on open and de facto standards, including REST-based Web Services application programming interfaces (APIs), Eclipse, PRC/3D-PDF, SQL, HTML, XML, HTTP/HTTPS, LDAP, Transport Layer Security (TLS), and Python—a sound and open development approach. CONTACT Software is a proud contributor to major open initiatives like CODE of PLM OPENNESS, OSLC, Industrial Internet Consortium (IIC), and the Eclipse Foundation. In addition, CONTACT Software claims that using the Python object framework and an extendable data dictionary makes it very easy to extend their platform with new object classes and functionality.

CONTACT Software emphasizes the importance of the overall integrity and user experience of its software stack. Instead of making the portfolio even more complex for customers through heterogeneous acquisitions, new components within the platform appear to be "from a single source." This was made possible by the synergistic effects of the technology platform and core services (i.e., reuse).

CONTACT Software's strategy is well aligned with CIMdata's Product Innovation Platform definition described herein. CONTACT Elements core services applications include document management, workflow, and enterprise collaboration. Other key features that support product- and process-innovation include:

- Standard interfaces to CAx authoring systems such as Dassault Systèmes' CATIA and SOLIDWORKS; PTC's Creo; Autodesk's AutoCAD and Inventor; Siemens PLM Software's NX and Solid Edge.

- A tight integration with Microsoft Office called OfficeLink, which provides document management and data synchronization capabilities.

- CONTACT's own fully integrated visualization solution "3D Spatial Connect."

- Integrations with electronic design automation solutions, such as EPLAN Electric, Mentor Expedition, Altium Designer, and Zuken E^3-Series.

- Standard interfaces to leading ERP systems, such as SAP, Infor/Baan, Axapta, Navision, Psipenta, and IFS.

- Enterprise search based on Lucene Core, an Apache open source information retrieval software library.

This comprehensive portfolio of prebuilt standard building-blocks in the platform can be readily configured to support an organization's end-to-end product lifecycle management application requirements. CONTACT Elements' building blocks (see Figure 2) are divided into three levels:

- **Infrastructure Technologies**—this basic level includes database and cloud services for data storage, security mechanisms for controlled access to the system right down to individual objects, interoperability with other enterprise systems such as ERP and authoring systems such as CAD, etc.

- **Core Services**—these services include the management of documents, workflows and tasks, discussion in activity streams, the universal classification of objects, etc.

- **Business Applications**—this level is comprised of a comprehensive portfolio of apps that support product management, product architecture, industrialization, scheduling and capacity planning, variants, and requirements management, to name just a few.

Figure 2—The CONTACT Elements Building Block
(Courtesy of CONTACT Software)

It is important to mention that CONTACT Elements can also support the complicated security requirements necessary to control intellectual property in complex global supply chains. Core Services, for example, includes Activity Stream, a social collaboration application that supports discussion threads linked to managed items, all under the security model and access rights governing the development process as defined for each of the applications that leverage the platform. This focus on core services supports CONTACT Software's philosophy that having good authoring tools is important, but enabling more effective collaboration and integration will speed up the innovation process over the long-term, a crucial element to organizational success.

Finally, CONTACT Software's complete solution portfolio (see Figure 3) "powered by CONTACT

Elements" includes:

- **CIM Database** for product lifecycle management

- **Project Office** for the management of engineering projects

- **Workspaces** for collaboration across company boundaries

- **Elements for IoT** for services based on digital twin

Elements for IoT is the latest offering from CONTACT Software built on their Elements platform. This solution has been designed to specifically address customers who require IoT capabilities centered on the enablement of the digital twin. This solution's value is providing data connectivity and management for an organization's smart, connected products and it can be implemented as a standalone product.
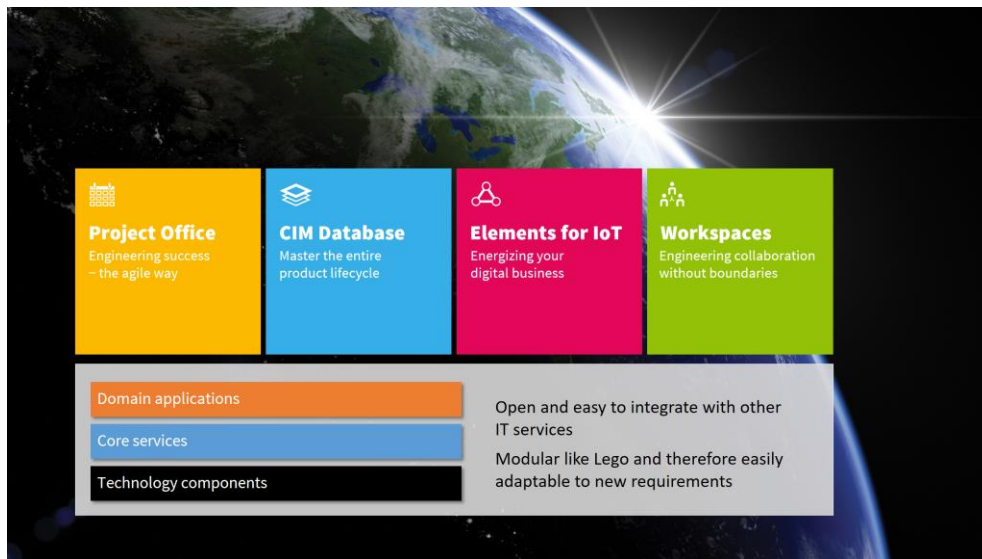
Figure 3—CONTACT Software's Solution Portfolio
(Courtesy of CONTACT Software)

CONTACT Software's client list is impressive, with clients who design and produce vehicle components, wind turbines, machine tools; organizations responsible for major projects (e.g., Gotthard Tunnel and Deutsche Bahn ICE Overhaul Program); and companies leveraging their platform to support predictive maintenance of building technology and systems. It is important to note that while they have primarily focused on Europe, their global reach is rapidly expanding.

Conclusion

CONTACT Software's CONTACT Elements platform is robust and an excellent example of a modern and future proof digital platform. Over the last few years, CONTACT Software has continued to build out and strengthen its platform, as well as building out applications and business solutions that leverage it. The platform's architecture supports the use of prebuilt standard components for modeling the virtual product, project and process management, and CAx data management. CONTACT Elements' building block architecture delivers agility and flexibility to maintain and extend a PLM and collaboration infrastructure. CIMdata is impressed with CONTACT Software's Product Innovation Platform and recommends industrial companies consider it to support their future proof Product Innovation Platform needs.

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.

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Innovate, Transcend, Realize—Aras ACE 2019 (CIMdata Commentary)

30 May 2019

Key takeaways:

- *Aras' mission is simple—Great, Good, Important—great for shareholders, good for stakeholders, and solving important problems.*

- *Recent investments of $110M from top tier investors are helping support Aras's 55% annual growth rate, acquisitions, headcount increases to almost 500 people, and internal process retooling.*

- *Customer presentations from Microsoft and GM described the scale and scope of problems that can be solved with Aras Innovator.*

- *Aras continues to focus on the product lifecycle from requirements and systems engineering through simulation, design, manufacturing, to MRO.*

CIMdata attended the Aras ACE 2019 user conference in Phoenix from April 15-18. It was a new location but with the same format and energy as last year. The two and one-half-day agenda had up to eight parallel tracks including two Aras training tracks and new this year, True North training from Mr. Joe Anderson of IpX, the Institute of Process Excellence. There were about 500 attendees, and the best parts from previous events such as Aras In the Round where CEO Mr. Peter Schroer and Chief Architect Mr. Rob McAveney take questions, and the pre-conference developer meeting were repeated. Presentations from top tier customers including GM and Microsoft, and others, augmented lots of product info on released and upcoming modules.

Aras Keynotes

As usual, Mr. Peter Schroer, CEO of Aras gave the opening keynote which included a high-level review of milestones achieved over the past year. Perhaps the most notable was the $70M investment round led by Goldman Sachs on top of 2017's $40M round led by Silver Lake. CIMdata believes that these top-tier firms are attracted to the large deals Aras won over the past few years, and the repeatable annual growth of over 50% that Aras has achieved. The money is being used to grow the organization, including a new customer success organization, global expansion in China and Belarus, moving Aras

operations to Scaled Agile Framework® (SAFe), new partners, and more acquisitions.

Mr. Schroer noted that Aras is up to almost 500 people with about 45% in R&D. This is quite a bit larger than the handful that started the company in 2000 when CIMdata first started following them. In addition to adding people, Aras made two acquisitions in the Maintenance, Repair, and Overhaul (MRO) and Simulation Process and Data Management (SPDM) areas, Impresa and Comet Solutions. These acquisitions help Aras expand the breadth and depth of their platform. Rather than just integrating the acquired solutions Aras is incorporating them, that is rewriting the solutions as web services on their platform. This methodology ensures the new capabilities will be able to leverage the existing services such as security and workflow while maintaining application consistency across the platform. Solutions developers are able to incorporate the new functions and capabilities into their solutions expanding and enhancing lifecycle coverage.

Aras's updated mission "Great, Good, Important" was explained by Mr. Schroer. The story behind it is:

When Silver Lake Partner Mr. Adam Grosser visited Aras for the first time, he had a two-hour conversation with the founder, Mr. Schroer. After that conversation, he concluded that Aras was "great, good, and important." What did he mean by that?

- According to Mr. Grosser, a great company is not only one that someone will write a book about, one that has achieved something significant and survives their dumb mistakes—but it's also a company that has great financials.

- When Silver Lake chooses to invest in a company, "great" is not enough, they also want good. That means a company with good morals and a conscience—one that's honest in everything they do and, in all interactions, treat their employees, customers, and partners fairly.

- There are many companies that are both great and good, but Silver Lake backs companies that also do something important—that are changing the world. Aras is helping customers reduce costs, improve product quality, and design safer products, and that's certainly something important.

According to Mr. Schroer: "Great, good, important—at Aras it's the standard we are committed to." CIMdata sees this concise mission as appropriate for a PLM mindshare leader.

The other major piece of Mr. Schroer's keynote was on myths about digital transformation (DX) shown in Figure 1.

Figure 1—Digital Transformation Myths According to Aras
(Courtesy of Aras)

The opening myth "most succeed," is countered by research published by IDC and Forbes, that states 64% to 84% of digital transformation projects do not succeed. The final myth "Most Digital Transformation projects focus on the core operational lifecycle," supports the premise that not focusing on core operations such as product data and related processes, and especially lack of robust configuration management are not root causes of failures. CIMdata wholeheartedly agrees with the premise that proper configuration management of product data and effective business processes are the foundation for successful digital transformation. Mr. Schroer stated he is doubling down on support of best in class configuration management which is the foundation of core operational lifecycle management and absolutely necessary for companies to own the lifecycle of their product.

Mr. John Sperling, Senior Vice President Product Management, talked about Aras's internal operations and how they have transitioned the company to the Scaled Agile Framework (SAFe).[2] He positioned SAFe as a methodology and noted Aras has built a supporting tool on their platform to accelerate improvements while maintaining quality of their product innovation platform. CIMdata believes this is a great investment to ensure that Aras Innovator remains a sustainable platform long into the future.

Mr. Sperling also reviewed the status of the latest application development projects including Requirements Engineering, Systems Architecture, an Application Lifecycle Management (ALM) prototype, Graph Navigation to visualize complex structures, Simulation Process and Data Management based on the technology acquired from Comet Solutions, and a major user interface refresh in Version 12. Incorporation of last year's acquisition of Impresa MRO is in process and prototypes are in use at lead customers. CIMdata views incorporation as a critical Aras strategy. While growth by acquisition is common in the enterprise software industry, Aras does not follow the common model of integration and reselling legacy code. They incorporate the acquired technology into new platform services so capabilities can be used in solutions across the platform. The platform service strategy enables Aras to reuse common services such as security, effectivity, and configuration when incorporating new capabilities and ensuring compatibility with existing implementations. An example is enabling the new effectivity service within Product Engineering. In addition to the major developments, Mr. Sperling also presented a plethora of minor enhancements that existing customers will appreciate. CIMdata is looking forward to next year's ACE to see how much more SAFe enables Aras to bring to market.

Customer Keynotes

Mr. Boris Cononetz Jr. Director, PLM and Product Compliance Systems and Ms. Erika Klein Director, Azure Hardware Engineering, from Microsoft, gave an update on the latest Aras use at Microsoft. The Azure based implementation has moved beyond the Microsoft device group that develops hardware such as the Surface computer and Xbox gaming system into managing the Azure cloud infrastructure. Microsoft designs, configures, deploys, and manages all the hardware associated with Azure's 150 data centers with 3 million services in 140 countries. Ms. Klein provided the key metrics of her group stating that they improved from 39% on-time delivery to 90%, an impressive feat, by adopting a lifecycle-based approach supported by Aras Innovator. While Aras innovator was the core technology used, a big part of her presentation was reviewing the organization change management (OCM) approach used to support the implementation. OCM is often overlooked and must be a part of any complete PLM strategy.

General Motors (GM), perhaps Aras's largest customer to date, has kept a low profile in the Aras

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[2] https://www.scaledagileframework.com

community. This year GM presented some results of the Aras Innovator implementation efforts. A team that included Mr. Peter Swartz, Mr. Carlo Guigliano, and Mr. Randy Klinefelt, from GM along with Mr. Mark Saraceno from Aras gave an overview of GM's implementation entitled "A Journey to Change Management on the Aras Platform." GM did most of the work inhouse, noting that they were a leader in outsourcing IT 25 years ago, and started insourcing 7 years ago. Aras's consulting group was one of the few outside providers included in the project. Key drivers for GM's project included the need to manage change early in the design process, a strong desire to support digital twins, and 50-year data retention requirements. Unique technical aspects of the solution include complex access control requirements, a classification driven ECR creation process, custom data, submittal validations, and large scale inbound and outbound data interfaces. 5,000 users are live on the solution today and that number will grow rapidly as new programs come online over the next 2 years. CIMdata found the stated scale of 15-20 million records coming from legacy programs astounding.

Systems Thinking

In addition to enabling the Digital Thread and Digital Twins by providing an open and resilient platform, "Systems Thinking" is one of the core pillars of the Aras solution vision and product strategy as enumerated by Mr. Rob McAveney, CTO. Over the past 2 years, Aras has been devoting considerable R&D thought and resources to the areas of requirements management and systems architecture design which support the functional, logical, and physical dimensions of systems engineering (often referred to as RFLP). With the ever-increasing value add and volume of electronics and software in today's complex cyber-physical systems, a systems engineering approach that enables interdisciplinary design collaboration across the domains of mechanical, electrical/electronic, and embedded software engineering is becoming an absolute necessity for market success and enterprise survival. Aras is addressing this industry challenge with two new major capabilities to be released during 2019.

Requirements Engineering, available in the Innovator v11R1 release in May, is the next generation of the current requirements management capability. This will provide new capabilities in the areas of improved usability and flexibility for editing requirements including document comparison and language translation support. Future enhancements are planned in the areas of customer requirements capture and parametrized requirements flow down.

The new System Architecture application, targeted for release in Innovator v12R1 in the fall of 2019, will become the foundational backbone for enabling systems thinking for Model-Based Systems Engineering (MBSE), Product Line Engineering (PLE), and Variants analysis. This new application provides a high-level graphical representation of the system design from within the Innovator GUI that bi-directionally connects with and manages the systems design information that is authored in external systems design tools such as IBM DOORS, No Magic Magic Draw (now part of Dassault Systèmes), IBM Rational Rhapsody, internal custom-developed tools, or MS Excel spreadsheets. At the same time, systems engineers will have continuous access to the latest physical BOM and parts information within the Innovator platform. Since many new systems are variants of previous designs with a large number of carryover components, this enables the systems architect to leverage "approved" design data at a finer level of granularity for use in conceptual trade studies to define the optimal physical aspects and costs of the conceptual design.

In addition, design engineers and managers, as well as supply chain partners who are not familiar with requirements engineering or systems engineering tools and modeling languages such as UML/SysML, AADL, or Capella, can visually understand and collaborate with systems engineers through a "single source of truth" system model that takes advantage of all the core services of the Aras Innovator

platform (i.e., multi-CAD visualization, change management, configuration management, roles and data, access and permissions, effectivity, requirements management, etc.).

CIMdata anticipates that this new approach to integrating the currently disconnected engineering silos within the SE, PDM, and ALM domains via the Innovator Systems Architecture will be a major step forward in enabling the emerging Digital Thread vision for Aras customers.

Simulation Management

Although access to simulation tools and their high-performance computing requirements has always been limited by the deep domain and technical knowledge required, the greater barrier to mainstream use of simulation has been the limited adoption of existing simulation process and data management (SPDM) tools. Without an effective SPDM capability, design teams are not able to efficiently incorporate simulation into existing design processes or connect the evolving product configuration to validate results during development, much less simulate and predict the performance of an asset in service (i.e., a digital twin) that is intended to operate for many decades such as ships, power and process facilities, off shore structures and aerospace and defense systems.

Based on the abstract modeling approach and technology acquired from Comet Solutions, Aras is in the process of creating an open, scalable and readily extensible simulation data model within the Innovator platform that will be augmented with a simulation process automation environment to capture, refine, and share simulation best practices within multi-disciplinary engineering work groups as well as across the virtual enterprise including with supply chain partners. The stated goals for this new SPDM capability are to:

- Embrace heterogeneous COTS 3D CAD and performance simulation tools including Excel via direct connectors as well as in-house custom tools via an open API.

- Support simulation use cases throughout the product lifecycle; especially those that cross lifecycle stages such as from design to manufacturing and operational feedback to design based on simulation of in-service performance (a digital twin).

- Enable and support multi-discipline scenarios, mixed-fidelity models, and different data types that comprise the range of system, subsystem, and component level simulation activities.

- Integrate simulation processes with model-based engineering processes to create and maintain the digital thread for today's complex cyber-physical systems.

- Be transparent and "invisible" to users in managing the pedigree of a simulation model and any associated metadata and data including CAD geometry, key simulation performance parameters, summary results, and reports.

Aras is currently working with early adopter "beta" customers to develop and refine the Innovator simulation data model requirements as well as the user interaction environment that will empower simulation experts by reducing the overhead associated with using a formal data management system as well as extending the power of using more simulation in the design process to engineers who are not experts in creating simulation models. The Comet third-party tool integration and process automation technology for creating standard "best practices" templates is being re-authored on the Aras Innovator platform to enable this goal of "democratization of simulation."

The first release of the new Innovator SPDM capability is currently planned for mid-year 2020 and CIMdata will be monitoring closely the progress of Aras in this important area.

Conclusion

Aras ACE 2019 was their largest event to date. Aras continues to grow their sales and mature their organization and product. CIMdata has written a lot about Aras because they are an important part of the PLM market segment, and while smaller in revenue than their major competitors, we recognize them as a mindshare leader based on the impact they have had on the market.

Top tier financial companies such as Goldman Sachs, Silver Lake, and GE Ventures have invested in Aras and it appears that Aras has put these funds to good use. They have had a massive growth in headcount but are investing in systems such as SAFe to ensure the new- hires' contributions add value.

Perhaps most important they are recognized by their customers, including some of the largest and most important manufacturers on the planet, as having technology they can use to produce their products. Airbus, GM, Microsoft, Audi, BMW, and Lord, as well more than 300 other companies. Aras continues to be exciting to watch and CIMdata looks forward to their next moves.

About CIMdata

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Next Generation Design with Siemens NX (CIMdata Highlight)

28 May 2019

On May 8, 2019, CIMdata met with Siemens Digital Industries Software marketing leadership to be briefed on the latest and coming capabilities for NX—Siemens' flagship mechanical computer-aided design (MCAD) solution. During the briefing, Siemens focused on what they consider to be six major areas of differentiation:

- Productive modeling environment
- Generative design & integrated validation
- Electromechanical design
- Collaborative design management
- Industrialized additive manufacturing
- Immersive visualization

CIMdata was impressed with the current NX capabilities and their planned future evolution. Already in

place is "NX Continuous Release." Siemens' objective is to eliminate the current distinction between a major release and maintenance releases. Instead, functional enhancements will be released continuously and will be designed for ease of adoption. CIMdata views this change as strongly positive for users who can now receive improvements sooner or wait to adopt them on their own timetable. Importantly, future NX releases will be compatible with all actively supported Teamcenter releases as well as continuing to maintain compatibility with previous NX releases—all the way back to 1984.

To facilitate a productive modeling environment, Siemens is adding machine learning to the NX user interface. Based on usage, NX will predict the commands users will most likely use next and present them prioritized by applicability to task and usage criteria. Users can also personalize the command list to their preferences. In addition, Siemens stressed increased attention to model-based definition given the release of ISO 10303 STEP AP242 Edition 2. They will also continue to improve assembly performance (claiming up to 2X improvement in the current release over the previous release).

They presented their emphasis on generative design with a comprehensive solution for the complete workflow from requirements-driven design to 3D printing and part finishing. CIMdata views this plan for generative design together with NX's Convergent Modeling (which allows a mix of precise and facetted geometry) and integrated simulation capabilities, as providing an industry-leading complete solution.

Other new capabilities to design, engineer, and validate structures suitable specifically for additive manufacturing are being rolled out, including build orientation, trapped supports, and a seamless connection between design for additive manufacturing and simulation.

Continued improvements in the integration of Mentor's electrical applications provide NX users with a broad electromechanical solution that meets the demand for product innovation and differentiation driven by the increased importance and prevalence of electrical, electronics, and software.

Siemens virtual reality solution, which is central to their focus on Immersive Visualization, will provide users with a better understanding of their product's digital twin and require fewer iterations of design change and analysis.

CIMdata was pleased to see Siemens openness and acumen in offering their users the business flexibility of perpetual versus subscription licensing either on-site or cloud-based. With a new emphasis on the Siemens side to promote NX to the SMB market, that flexibility should bode well and give them a new front in the competitive high-end MCAD market.

About CIMdata

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Siemens US: Making a Difference for America's Veterans (CIMdata Highlight)

29 May 2019

CIMdata is very pleased to learn how Siemens US is supporting veterans as they return to civilian life after their dedication and service in the United States armed services. During the recent Siemens Spotlight on Innovation, Ms. Barbara Humpton, CEO Siemens US, described Siemens programs and initiatives for training and hiring U.S. veterans. These include:

- The Siemens PLM USA Veterans Initiative Program, which provides free PLM training to veterans of the US Armed Forces.

- An application that helps veterans determine how their military skill classifications can be applied to civilian jobs and careers.

- A commitment to hire US military veterans.

With demand far outstripping the supply of qualified technology employees, enabling veterans to apply their Science, Technology, Engineering, and Math (STEM) skills is critical to meeting private sector workforce needs and the needs of veterans retuning to civilian life. Siemens is offering a job training initiative focused on digital skills for US military veterans with an engineering and manufacturing background as part of a nationwide effort to assist veterans transitioning to the civilian workforce.

The Department of Veterans Affairs Veterans Vocational Rehabilitation & Employment Program (VR&E) and Siemens have joined forces to offer PLM training courses at no cost to veterans. This program is offered to current active duty veterans enrolled in the Department of Veterans Affairs (VA) VR&E program. They must be a United States veteran (served in any branch of the United States military), have prior education or experience in engineering, drafting, machining, logistics, or supply chain management, and meet the minimum prerequisites for each course prior to registering.

For non-VR&E eligible veterans who are transitioning from the military to the civilian workforce or who are currently unemployed, Siemens will provide scholarships to cover the cost of instructor-led training classes executed at Siemens Digital Industry training centers. Prospective students are admitted on a space-available basis following the registration process. Tuition will be waived assuming the program participation eligibility criteria are met.

To date, approximately 500 veterans have elected to use this resource since 2013.

For more information about these programs you can call +1.248.982.8360 or email Ms. Diane Ryan (diane.ryan@siemens.com) to receive approval to begin the registration process.

Over 2,500 US military veterans are already part of Siemens and the company has committed to hire an additional 300 US veterans annually over the next several years.

CIMdata salutes Siemens for their aggressive actions to help US veterans and encourages eligible veterans to take advantage of these programs.

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.

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Acquisitions

Schneider Electric Acquires Stake in AutoGrid to Accelerate AI Adoption in the Power Sector

28 May 2019

Schneider Electric announced an investment in AutoGrid, the leader in flexibility management software for the energy industry. The investment makes Schneider Electric a major shareholder in the company and establishes a co-innovation partnership focused on driving new AI and machine learning solutions for the utilities and commercial and industrial companies.

Most immediately, Schneider Electric will leverage AutoGrid's Energy Internet and Flex platforms to add artificial intelligence-driven solutions for customers' distributed energy projects. This will accelerate new capabilities for Schneider Electric's leading microgrid and behind the meter solutions, as well as advance its ability to better serve the utility segment as the grid becomes more distributed and prosumers demand greater participation and control over their energy usage.

AutoGrid has a differentiated approach and scalable solution that allows utilities and distributed energy resources like microgrids to connect, allowing commercial and industrial clients to monetize their renewable energy assets. This strategic investment reinforces our commitment to help our clients adopt new technologies like AI and machine learning to transition to a new energy future.

"The combination of AutoGrid's software driven strategy, with Schneider Electric's global footprint and expertise in a variety of end-user segments is a win-win for both companies, and both companies can co-innovate throughout the energy value chain," said Heriberto Diarte, Schneider Electric Head of External Innovation & Ventures.

The investment is led by Schneider Electric Ventures, part of Schneider Electric's newly formed Innovation at the Edge Program. Innovation at the Edge is focused on incubating, investing, and partnering with start-ups and other innovative companies outside of Schneider Electric's core business to nurture ideas that will achieve a sustainable energy future.

"We're at an inflection point in the energy industry. We've seen the promise of clean technologies and need focused partnerships, investment and innovation to drive the promise forward," said Amit Narayan, Founder and CEO, AutoGrid. "A closer relationship with Schneider Electric as an investor, partner and board member creates a path toward our common goal of creating a more sustainable energy future."

Schneider Electric Ventures has close to 40 strategic active alliances with startups and incubation projects. For more information please visit: https://www.schneider-electric.com/en/about-us/ventures/

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Company News

Analytical Graphics and ANSYS Launch Joint Technology Partnership

23 May 2019

ANSYS is integrating mission analysis into the engineering design process thanks to a newly formed technology partnership with Analytical Graphics, Inc. (AGI), the global leader in systems and mission simulation. Through the partnership, AGI expects to enable satellite, aerospace and defense customers to create more precise and reliable modeling and mission simulations with greater accuracy for complex scenarios, including aircraft missions through contested airspace and satellites orbiting the Earth.

Today, systems engineers perform large-scale mission and system simulations with parametric or reduced-order models to incorporate electronic, fluid and mechanical components. Next-generation physics-based modeling creates component models with improved fidelity, precision and dependability to enable more sophisticated levels of simulation and systems-of-systems simulation.

AGI and ANSYS are streamlining processes and interfaces by incorporating highly accurate, ANSYS-generated engineering physics component models within complete, large-scale mission simulation scenarios in AGI's multi-domain mission analysis software, Systems Tool Kit (STK). Engineers conducting concept development and mission engineering activities will gain insights from simulation generally only accessible during test and measurement processes. Similarly, design engineers will now be able to simulate and predict component performance within the system design at every step in the design process.

"AGI is pleased to join forces with ANSYS as embedding physics-based component models within large-scale mission simulations delivers a major technological leap for our mutual customers," said Kevin Flood, vice president engineering at AGI. "Our marketplace is demanding radical reductions in time to market. This partnership addresses important root causes. Specifically, we are eliminating the tool and process gaps between the concept-development, systems-engineering, detailed-design, and system-operations phases of large-scale programs. This step alone can dramatically accelerate the timelines for the delivery of large-scale systems."

"This partnership tightly integrates our cutting-edge, industry-leading physics simulation products with AGI's mission-level systems applications," said Shawn Carpenter, senior product manager for high frequency, ANSYS Electronic Business Unit. "We are committed to helping streamline the use of ANSYS component models within AGI's next-generation simulations, supporting our mutual customers in the space, air, land and sea domains."

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CHA Appoints Jim Stephenson Chief Strategy Officer

24 May 2019

CHA Consulting, Inc. (CHA) announces the appointment of Jim Stephenson as Executive Vice President and Chief Strategy Officer. Based in Boston, Jim will lead CHA's strategic development, acquisitive growth initiatives, and go-to-market strategies.

"Jim Stephenson is the perfect addition to the CHA leadership team. He will bring new dynamic and strategic thinking that will help propel CHA into a future marked by growth and the attainment of our aspiration of being the best company in the industry," said Mike Carroll, President and CEO of CHA. "As the Chief Strategy Officer in a competitor firm, Jim was key in leading that firm from a roughly quarter billion-dollar business to a top 20 player in our industry. Jim brings a strategic and experienced mind to our executive team which will clearly contribute to our continued progress on CHA's path to a top firm and power player in the AEC industry."

Jim brings more than 20 years of financial and corporate development experience to CHA. Prior to joining CHA, he was the Chief Strategy Officer at TRC Companies, ranked #20 on the ENR Top 500, where he was responsible for structuring a five-year strategic growth plan focused on executing acquisitive growth and strategic investments, and also co-led TRC's successful public to private sale transaction to New Mountain Capital in 2017. Jim was also a director at Huron Consulting Group, Inc. directing financial restructuring and operational turnaround efforts in a variety of industries. He has been awarded the Environmental Business Journal – Large Company M&A Award four times, most recently outstanding achievement in M&A in 2018 and is a frequent panelist at industry events.

"CHA is poised for unprecedented growth and I am looking forward to the opportunity to work with its talented leadership team and financial partner First Reserve to bring the firm's best in class design work and services to new clients, geographies and market sectors," said Jim Stephenson.

Jim earned his MBA in financial and international business at American University – Kogod School of Business in Washington, D.C. and his B.A. in business management at Clark University in Worcester, MA.

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CherryCircle Software Makes Austin Chamber's 2019 Austin A-List for Business Innovation

28 May 2019

CherryCircle Software announced today that the Greater Austin Chamber selected the company as part of its 2019 Austin A-List. The list includes 24 local companies in various stages that demonstrate business innovation. CherryCircle Software was recognized in the Startup category for its mission to reduce the amount of time and expense it takes to bring drugs and medical devices to market.

"This award is recognition that our innovative products not only seek to improve the efficiency of manufacturing in the pharmaceutical industry, but that they also serve a greater mission to provide patients with access to new therapies faster and at a lower cost without sacrificing quality," said Yash Sabharwal, President and CEO, CherryCircle Software. "With our technology, we are seeking to fundamentally change how the pharma industry thinks about manufacturing within the broader product lifecycle. Being a part of the thriving Austin community provides us with a network of innovators and

partners to support us as we pursue this mission."

More than 165 companies were nominated and considered this year by a panel of independent judges. The companies reflected three categories: Startup, Mid-size, and Scale. Now in its ninth year, the A-List continues to highlight Austin's most promising and cutting-edge innovators to support the addition of venture capital and talent to the city.

"This year we are honoring a diverse set of companies, including bootstrapped and women-led businesses, and three new Culture Award winners," said Austin Chamber Senior Vice President, Global Technology and Innovation, Leigh Christie. "Each nominee and winner represent what makes Austin's innovative and entrepreneurial community unique and successful. We look forward to a yearlong celebration and relationship with our winners and thank all 165 nominees for everything they do for our community and economy."

CherryCircle Software, Inc. builds cloud-based solutions to help the pharmaceutical industry reduce the time and cost of development, and increase the availability and affordability of essential therapies for patients. Its flagship platform, QbDVision®, provides the pharmaceutical industry with simple, yet powerful tools to facilitate robust manufacturing process development and product lifecycle management driven by data and science, enabled by people, and powered by innovation and automation.

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DEVIL-DOG Dungarees Brought Back to Life Thanks to Gerber Technology's Integrated Software Solutions

30 May 2019

When General Sportwear, a Gerber customer for over 30 years, decided to develop and produce its own brand, Gerber's innovative CAD and PLM software was instrumental to its creation. Gerber's product lifecycle management software, YuniquePLM, and pattern design software, AccuMark, made it possible for the 92-year-old company to relaunch its legacy brand, DEVIL-DOG Dungarees.

"Gerber Technology's solutions are very integral to General Sportwear and our ability to execute down to the finest levels," said Jeff Rosenstock, President of General Sportwear. "We are very proud of the product we're making, and Gerber's solutions are what enable our factories to create such high-quality jeans."

Originally established in 1948, DEVIL-DOG Dungarees featured the highest quality denim with superb workmanship and stood proudly as a staple of iconic Americana. The brand relaunch, while holding true to its timeless vintage roots, will offer men's jeans with an updated modern aesthetic and performance fabrics with unrivalled comfort at a great value.

In order to take the brand to the next level, General Sportwear needed innovative solutions at their disposal. Gerber's AccuMark and YuniquePLM make it possible for the company to achieve great efficiency. From concept and design, to cutting, sewing, laundering, finishing and shipping, General's vertically integrated manufacturing facilities convert efficiency into value. This exceptional value will be passed directly to their DEVIL-DOG customers.

"Gerber is leading innovation and offering the best customer experience for the last 50 years," stated

Gerber's Ketty Pillet, Vice President of Marketing. "We are very proud to partner with General and enable them to bring DEVIL-DOG Dungarees to life in a very short period of time. By delivering regular product updates to our fully-integrated digital solution, we make sure our customers have the unique, cutting-edge solutions to be able to meet their market challenges."

General utilizes YuniquePLM to ensure the design and quality of the jeans. They were able to capture and manage all data which allowed them to control the entire design process to be sure that the jeans were developed exactly as they wanted. With YuniquePLM's powerful Design Suite plugin, General created all of their DEVIL-DOG images in Adobe® Illustrator® and easily integrated them into YuniquePLM for style creation.

"There's a lot of details that have gone into these jeans and all that detail is something that we capture in YuniquePLM," Rosenstock stated. "It's our bible and how we make sure everything remains consistent and true to brand from concept through production."

Gerber's software solutions play a critical role in the DEVIL-DOG project by giving the brand the agility, speed and repeatability it needs to create its superior denim styles. The seamless connectivity between YuniquePLM and AccuMark has helped General stay true to their commitment to quality while reducing lead time and minimizing costs.

DEVIL-DOG Dungarees is set to be available July 1st with 16 styles of jeans. As the brand grows, they will be looking to add new technology to their workflow in order to improve on every step of the process and enhance their product line even further.

DEVIL-DOG is also supporting its community, explains Rosenstock. "My Grandfather and founder, Louis Rosenstock, originally named the brand after the Marines, who earned the Devil Dog nickname in 1918 for their tenacity and bravery in World War I." In keeping with its heritage, DEVIL-DOG Dungarees is a proud partner of Wounded Warrior Project ("WWP"). WWP is committed to honoring, empowering, and helping America's injured veterans achieve their highest ambitions.

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Eagle Point adds Hong Kong partner, Spatial Technology, as Pinnacle Series continues to grow

29 May 2019

Eagle Point Software announced they have added Spatial Technology Limited of Hong Kong as a strategic partner for their Pinnacle Series platform.

This agreement adds Eagle Point's robust Pinnacle Series platform to Spatial Technology's BIM training and productivity portfolio.

With concentrations in BIM Training, BIM Coaching, BIM Implementation and BIM Integration Services, Spatial Technology will utilize the Pinnacle Series to streamline their clients' BIM processes.

"It is my pleasure to announce that our Pinnacle Series platform will now be available to Spatial Technology's clientele. Spatial Technology is known for their BIM services concentrating on learning, knowledge management and productivity and this aligns perfectly with the common problems that Pinnacle Series solves. We are excited to help streamline the AEC efficiency of Spatial Technology's customers and to extend our problem solving to Hong Kong." John Biver, President & CEO at Eagle Point.

"We are delighted to strike this strategic partnership with Eagle Point Software in adding Pinnacle Series into our BIM solution offering. We believe that Pinnacle Series would be a value-added e-Learning solution for our existing BIM training customers, helping them overcome daily roadblocks & access to immediate support via knowledge database. Andy Cheung, General Manager of Spatial Technology Ltd, said "We also look forward to strengthening the cooperation through customizing this e-Platform so as to deliver unique workflows & training content to our major customers in this region."

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ESTECO turns 20 years old

27 May 2019

ESTECO celebrates the twentieth anniversary since its foundation. The company today totals 120 employees distributed in three locations: Italy, India and the United States. It was founded in 1999 based on the idea of three engineers - Carlo Poloni, Luka Onesti, and Enrico Nobile - who decided to transform their knowledge, acquired during a European optimization project, into a successful commercial product.

"When we founded ESTECO, multiobjective optimization was a virtually unknown topic: we pursued our vision ahead of time. I believe that, along with a certain amount of luck, this was the key to our success," said Carlo Poloni, president and co-founder of ESTECO. "We have been exploiting artificial intelligence and neural networks for 18 years within our flagship software, modeFRONTIER. We have been dealing with evolutionary algorithms since 1995, when we organized a workshop with the experts who were already working on this topic at that time."

Over the years, ESTECO has grown steadily, gaining numerous recognitions and awards both in Italy and abroad. Today it boasts a direct presence in the United States and India as well as a distribution network that relies on local sales partners in Europe, Brazil, Japan and in South East Asia.

ESTECO counts more than 300 international industrial customers including Alenia Aermacchi, Bombardier Transportation, Ferrari, Embraer, Ford, Honda R&D, Jaguar Land Rover, Landi Renzo, Piaggio, Volvo Car Corporation, NASA. Moreover, around 200 prestigious universities use the software for educational and research purposes.

Since its foundation, the company has maintained its headquarters in Trieste, Italy, within AREA Science Park, a science and technology hub where research, development, and innovation find a stimulating environment.

"Even after 20 years I continue to consider ESTECO a start-up: aside from our core business, we continue to learn and are always searching for new ways to innovate," said Poloni.

ESTECO is an independent software provider, highly specialized in numerical optimization and simulation data management with a sound scientific foundation and a flexible approach to customer needs. Our technology brings modularity, ease of use, standardization, and innovation to the engineering design process. ESTECO's smart engineering suite brings enterprise-wide solutions for design optimization, simulation and process data management (SPDM), and process integration and automation. With 20 years' experience, the company supports over 300 leading organizations in

designing the products of the future, today.

VOLTA is a web platform for multidisciplinary business process optimization and the management of enterprise simulation data.

modeFRONTIER is the platform for process automation and optimization in the engineering design process.

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IMAGINiT Technologies Receives Three New Autodesk Partner Awards

21 May 2019

IMAGINiT Technologies has earned recognition as the inaugural winner of Autodesk's new Partner Business Innovation, Partner Sales Representative Collaboration and Partner Technical Representative Collaboration Awards. Autodesk personnel nominated IMAGINiT for these awards in recognition of their commitment to deliver unique value to their customers and for enhancing the success, adoption and experience that they have when using the Autodesk products. These new awards come on the heels of six consecutive wins of the annual Autodesk Platinum Club Awards.

"IMAGINiT is always pushing the envelope to improve the customer experience through the innovative use of technology, people and processes," says Jim Quanci, senior director, Autodesk Developer Network. "Their Clarity software harnesses the power of Autodesk Forge to provide project teams with time saving dashboards, automation and insights and to augment the capabilities of Autodesk BIM360. Building Clarity on the Forge platform, ultimately gives IMAGINiT a unique ability to win more BIM360 business while giving their customers a unique path to success."

As members of the Autodesk Developer Network, IMAGINiT was one of the early adopters of the Autodesk Forge platform upon its release in 2014 when they integrated its capabilities into the IMAGINiT Clarity product. As the Forge platform evolves, so too have the powerful integrations that IMAGINiT is able to create between Clarity and tools such as Revit and BIM360 giving customers using both BIM360 and Clarity, an effective means to collaborate across all stakeholders and increase team productivity. With Clarity and its integrations to BIM360 made possible by the Forge backbone, IMAGINiT gives customers a unique tool that gives them confidence that they can adhere to their established data policies in the BIM360 environment while experiencing the benefits of doing business in the cloud.

"We remain sharply focused on increasing the value our customers receive by embracing Autodesk technology to develop our own powerful software products and processes," says Larry Rychlak, president and chief executive officer, Rand Worldwide. "This unwavering focus and years of software development have earned us these three prestigious Autodesk awards and we are thankful for this recognition of our commitment. We're also very proud to see the IMAGINiT team recognized for their hard work and we are especially proud of Janet Vrotacoe and Jamey Dempsey for earning the Partner Sales Representative Collaboration Award and Cory Gallaugher and Vince Daniele who captured the Partner Technical Representative Collaboration Award."

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Microsol Resources, an Autodesk Platinum Partner, Welcomes Jeremy Godenzi

29 May 2019

Microsol Resources, an Autodesk Platinum Partner with offices in New York, Boston, and Philadelphia, is pleased to announce that Jeremy Godenzi has joined the company's New York office as an Account Executive.

Jeremy will be responsible for supporting all architecture, engineering, and construction (AEC) clients in the New York metropolitan area. Prior to joining Microsol Resources, Jeremy was a Territory Sales Manager, Market Development Representative, and Campaign Director for technology and building products manufacturers. Jeremy holds a Bachelor of Arts from Western Connecticut State University in Danbury, CT, with a major in Psychology and a minor in Broadcast Journalism.

"Jeremy thoroughly understands the importance of a positive customer service experience, and its value to Microsol Resources. His background in the building industry and online technologies is a great fit with our firm," said Emilio Krausz, President of Microsol Resources, "We look forward to having Jeremy assist our architectural clients with their decisions about acquiring best-in-class technology solutions."

For more information about Microsol Resources and the team, please visit https://microsolresources.com/about/

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PTC Leaders Recognized for Achievements in Innovation, Culture, and Technology

22 May 2019

PTC today announced that five members of its leadership team have received prestigious industry awards, showcasing successes in their individual fields and in advancing the company's mission to deliver cutting-edge augmented reality, industrial IoT, and other productivity-enhancing digital solutions for businesses.

Award-winning executives include:

- **Hillary Ashton, Executive Vice President and General Manager of Augmented Reality (AR)** – Hillary was named to the National Diversity Council's (NDC) annual list of the Top 50 Most Powerful Women in Technology. The list recognizes female executives, influencers, and achievers who are shaping the future of technology with their impactful insight and leadership. Under Hillary's direction, PTC's AR business has expanded around the world, a testament to her strategic thinking, results orientation, and ability to assemble a high-performing team.

- **Steve Dertien, Managing Director, Office of the CTO & CTO for CAD and PLM** – Steve was shortlisted to *Insights Success Magazine*'s 2019 list of the 30 Most Influential Business Leaders in Technology. *Insights Success* portrays exceptional leaders worldwide who have contributed to the evolution of business solutions through the advancement of technology. Steve's team of world-class researchers and thought-leaders are at the forefront of innovative technologies, which are being incorporated throughout the PTC portfolio.

- **Kathy Cullen-Cote, Executive Vice President & Chief Human Resources Officer** – Kathy received the [2018 HRLF Bob Gatti HR Leadership Excellence Award](#) for her exemplary work in the human resources (HR) industry. A true change agent who has championed culture-transforming initiatives, she leads the way through transparency and authenticity, instilling trust in her team and across the entire company.

- **Jesse Coors-Blankenship, Senior Vice President of Technology** – A graduate of Columbia University's Graduate School of Architecture, Planning and Preservation, Jesse was named Columbia's 2019 Entrepreneur of the Year for his innovation in generative design technology. Jesse and his team incorporated artificial intelligence and novel mathematical representations of geometry to advance software, providing designers and engineers with the tools needed to design for higher complexity products with ease.

- **Varun Mani, Vice President of Advanced Research for PTC's AR Division** – Varun was listed as an honoree in [Forbes' 30 Under 30 Enterprise Technology Asia 2019 list](#) for his work in the field of augmented reality. Varun and his team pioneered revolutionary technology to chronicle the real-time movements of a person wearing an AR headset through advanced monitoring – and then create step-by step instructions for hands-on training and task guidance. He's currently working to scale the deployment of PTC's AR solution suite to enterprises worldwide.

"PTC's success is driven by our talented leaders and employees who bring a variety of backgrounds, skills, and experiences to our company," said Jim Heppelmann, president and CEO, PTC. "As we push the boundaries with technologies such as AR and IoT, it's imperative that we recruit the best candidates in every facet of our business. These five individuals are great examples of our extraordinary team."

SoftwareReviews Names the Application Lifecycle Management Data Quadrant Award Winners

29 May 2019

[SoftwareReviews](#) has published its 2019 Application Lifecycle Management Data Quadrant [Awards](#), naming three gold medalists in the space:

- Visure
- ALM Works for Jira
- Azure Devops

Application Lifecycle Management (ALM) is the specification, design, development, and testing of a software application. ALM covers the entire lifecycle from initial planning through to retirement.

Applications exist in one of four lifecycle stages; to effectively operate each application, you must know to which stage it belongs. Each lifecycle stage presents unique challenges and unique questions that must be answered. Failing to appropriately recognize the lifecycle stage for each application means the organization will ask the wrong questions to drive application functionality, and you will be unable to provide the right answers.

SoftwareReviews' Data Quadrant is based entirely on real user feedback and provides unprecedented

levels of insights into data points per product within the category, making it the most comprehensive enterprise software review and assessment in the market today.

IT leaders, business professionals, and end-users evaluate vendors via a detailed online survey, examining relative performance across two axis: Product Features & Satisfaction and Vendor Experience and Capabilities. The reviews are then carefully validated through a robust quality assurance process, beyond checking for LinkedIn authentication.

Another key differentiator of SoftwareReviews, which also helps set the gold medalists apart, is the "Emotional Footprint" (EF) scoring. SoftwareReviews' EF tracks replies across 25 emotional response areas that span five categories: Purchasing, Service Experience, Product Impact, Vendor Strategy, and Conflict Resolution.

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Events News

CONTACT Open World 2019: from smart product to smart service

28 May 2019

On June 26 and 27, 2019, the 9th CONTACT Software User Conference will take place in Munich. Under the motto "Energizing your digital business," international industry experts, practitioners and pioneers will highlight the potential of digital value creation in product development, production and service.
Digital transformation is the biggest growth driver for innovations and new markets. At CONTACT Open World 2019, leading experts from industry, science and the technology sector will discuss current trends and developments in digitization. The focus is on new and innovative ways for the interaction of people, machines and IT systems.

"The product development and service tasks grow together when it comes to smart products," says CONTACT CEO Karl Heinz Zachries. Digitalization drives the individualization of products and services. Companies are interested in how they can align their processes holistically to this. In his opening speech, Zachries looks at business development and presents CONTACT's strategies, roadmaps and current developments to support customers in facing these challenges.

The open technology platform CONTACT Elements with its flexibly combinable, coordinated software modules provides companies with the basis to optimize their added value along the entire product life cycle - from the development of smart products to improvements based on their operating data to the realization of IoT applications in conjunction with data analytics and artificial intelligence. CONTACT development manager Frank Patz-Brockmann presents in his lecture the most important innovations of CONTACT Elements for CIM Database PLM, Project Office, Elements for IoT as well as Workspaces and introduces the technology and product roadmap.

Peter Bilello, President of CIMdata, will give a keynote on current developments in the industry and the challenges facing companies as they move towards future-proof business platforms: "Beyond PLM? The Future of PLM Platforms". David Gram, Partner at LEGO Ventures, explains in his presentation "Radical Innovation Through Intrapreneurship" why companies should be more willing to experiment with the development of future customer offerings together with partners and users.

At Open World, renowned users and partners will give an insight into their projects and the use of CONTACT's solutions. Harald Kurz, Manager Virtual Engineering at MANN+HUMMEL, will present how the company combines established methods in the product development process with new agile approaches under the title "Agile Project Management in Practice - Operational Excellence in Change". Dr. Martin Dräxler, Project Manager PLM at Weidmüller, explains how Weidmüller models the product lifecycle in CIM Database PLM and thus drastically accelerates the processing of customer orders. Matthias Tölle, Managing Director at MIXACO Maschinenbau, shows in his practical lecture the use of CONTACT Elements for IoT. In addition, Bosch, Mitsubishi, T-Systems, Eurotech, BearingPoint, the Eclipse Foundation and many others will shape the 2019 industry event.

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KwaZulu-Natal Industrial Technology Exhibition (KITE) 2019

30 May 2019

KZN's premier industrial technology exhibition.

24 Jul - 26 Jul 2019 | 9am - 5pm

Durban Expo Center

The leading Industrial Exhibition for the KZN REGION

Boasting the largest display of industrial technology equipment in the KZN region, the KwaZulu-Natal Industrial Technology Exhibition (KITE) takes the legwork out of finding best-of-breed light to heavy industrial technology, as well as packaging and printing solutions.

Providing an industry networking forum, KITE also offers a roundup of trending topics at the SAIMechE free-to-attend seminars, the LEEASA conference and the (Manufacturing Enterprise Solutions Association) special interest group.

For more information and registration, please visit https://www.kznindustrial.co.za/

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Minerva is official Gold sponsor of ACE 2019 France

30 May 2019

Minerva, Aras Certified Gold implementation partner and developer of Aras Innovator-solutions for the Medical Device and Electronic High-Tech industries, is pleased to announce that the company is official gold sponsor of the ACE 2019 France conference held in Paris, France on June 4th to 5th.

ACE France is the annual event that brings together the Aras community and encourages collaboration and exchange between users of the Aras PLM solution.

Participants can choose from over 20 presentations from thought leaders, members of the Aras community, industry leaders and experts, participate in exclusive trainings and attend memorable sessions to launch transformational initiatives. digital.

Aras enables leading global manufacturers of complex, connected products to transform their lifecycle processes and gain competitive advantage. The PLM Aras platform is open, flexible and scalable. It connects users across all disciplines to critical product information and extended enterprise processes.

To read more about the event and for booking inquiries, please visit here.

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Financial News

Autodesk, Inc. Announces Fiscal 2020 First Quarter Results

23 May 2019

Autodesk, Inc. reports financial results for the first quarter of fiscal 2020.

All growth rates are compared to the first quarter of fiscal 2019 unless otherwise noted. A reconciliation of GAAP to non-GAAP results is provided in the accompanying tables. For definitions, please view the Glossary of Terms later in this document.

- Total ARR increased 33 percent to $2.83 billion;

- Billings were $798 million; adjusting for adoption of ASC 606, billings increased 40 percent;

- Total revenue increased 31 percent to $735 million; recurring revenue represents 96 percent of total;

- GAAP operating margin was 3 percent, up 13 percentage points;

- Non-GAAP operating margin was 18 percent, up 13 percentage points;

- GAAP diluted EPS was $(0.11); Non-GAAP diluted EPS of $0.45;

- Cash flow from operating activities was $221 million; free cash flow was $207 million

"We are off to a strong start in fiscal 2020 with billings and free cash flow coming in at or above expectations and great momentum across the entire business," said Andrew Anagnost, Autodesk president and CEO. "We are particularly pleased with the performance of our Construction portfolio, where we have started realizing both the sales and technology synergies we envisioned when we acquired PlanGrid and BuildingConnected. Overall, we are on track to achieve our fiscal 2020 ARR and free cash flow guidance and are reaffirming our fiscal 2023 targets."

"Our solid execution during the growth phase of the business model transition drove 33% ARR growth and enabled significant margin expansion," said Scott Herren, Autodesk CFO. "All product categories and geographies made solid contributions to our strong start in the first quarter, and market demand remains robust. Over the last 12 months, we have generated $550 million in free cash flow, positioning us well to hit our fiscal 2020 target of $1.35 billion."

First Quarter Fiscal 2020 Financial Highlights

Total ARR increased 33 percent to $2.83 billion as reported, and 32 percent on a constant currency basis. On a sequential basis, total ARR increased 3 percent as reported, and on a constant currency basis.

Subscription plan ARR increased 70 percent to $2.38 billion as reported, and 69 percent on a constant currency basis. On a sequential basis, subscription plan ARR increased 8 percent as reported, and on a constant currency basis. Subscription plan ARR includes $505 million related to the maintenance-to-subscription (M2S) program.

Maintenance plan ARR decreased 38 percent to $448 million as reported, and 40 percent on a constant currency basis. On a sequential basis, maintenance plan ARR decreased 18 percent as reported, and 19 percent on a constant currency basis.

Core ARR increased 29 percent to $2.65 billion. On a sequential basis, core ARR increased 1 percent.

Cloud ARR increased 164 percent to $181 million. Excluding fourth quarter acquisitions, cloud ARR increased 43 percent to $98 million. On a sequential basis, total cloud ARR increased 43 percent.

Net revenue retention rate was within the fiscal 2019 range of approximately 110 to 120 percent.

Total revenue increased 31 percent to $735 million as reported, and 30 percent on a constant currency basis.

Total recurring revenue in the first quarter was 96 percent of total revenue, compared to 95 percent in the first quarter last year.

GAAP operating income was $25 million compared to a loss of $(55) million in the first quarter last year. GAAP operating margin was 3 percent, up 13 percentage points year-over-year. The increase was driven by an increase in revenue, operating leverage, and lower restructuring costs.

Total non-GAAP operating income was $132 million compared to $29 million in the first quarter last year. Non-GAAP operating margin was 18 percent, up 13 percentage points year-over-year. The increase was driven by an increase in revenue and operating leverage.

GAAP diluted net loss per share was $(0.11), compared to GAAP diluted net loss per share of $(0.38) in the first quarter last year.

Non-GAAP diluted net income per share was $0.45, compared to non-GAAP diluted net income per share of $0.06 in the first quarter last year.

Billings were $798 million; adjusting for adoption of ASC 606, billings increased 40 percent.

Deferred revenue increased 19 percent to $2.15 billion. The increase is primarily related to the increase in subscription plan billings as well as recent acquisitions. Unbilled deferred revenue at the end of the first quarter was $589 million, a decrease of $2 million compared to the fourth quarter of fiscal 2019. The decrease is primarily due to the normal seasonality of EBA billings. Total deferred revenue (deferred revenue plus unbilled deferred revenue) was $2.74 billion, an increase of 24 percent compared to the first quarter last year.

Cash flow from operating activities was $221 million, an increase of $238 million compared to the first quarter last year. Free cash flow was $207 million, an increase of $240 million compared to the first quarter last year.

Click here to view full results, including tables: https://investors.autodesk.com/news-releases/news-release-details/autodesk-inc-announces-fiscal-2020-first-quarter-results

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Implementation Investments

Chinese Sportswear Brand LI-NING Powers Performance with Centric PLM

28 May 2019

LI-NING, the Chinese sportswear company, has selected Centric Software's Product Lifecycle Management (PLM) solution.

LI-NING is named after its founder, champion gymnast Li Ning. Founded in 1990, LI-NING's original goal was to provide Chinese athletes with clothing for the Olympics. By 2016, LI-NING was producing apparel and footwear for 21 national teams and athletes across 11 different sports. LI-NING's activities span brand marketing, research and development, design, manufacturing, distribution and retail.

Always an early adopter of technology, LI-NING first implemented a PLM solution in 2009. However, by 2018 the system was outdated in technology and performance. LI-NING's strong growth had established the brand principle of focusing on consumer demands, but traditional production methods could no longer adapt to the rapidly changing needs of consumers, new product development modes such as flexible supply chains and the requirements of e-commerce.

Following a competitive selection process, LI-NING chose to replace their legacy system with Centric 8 PLM.

"Centric PLM is functional and easy to use," explains Mr. Zhu Yuangang, IT director of LI-NING. "The platform covers core processes including product planning, design and development, fabric and trim management, cost control and quality control. It is very flexible and scalable and can effectively meet LI-NING's needs."

"The Centric team is professional and reliable," he continues. "Centric is focused on the apparel and footwear retail industry. Their local consultants have extensive project implementation experience and comprehensive industry knowledge and can provide professional advice for LI-NING's future business upgrades. We fully expect long-term cooperation with Centric in the future," concludes Mr Zhu.

"We would like to welcome LI-NING as our 45th customer in China," says Chris Groves, President and CEO of Centric Software. "LI-NING has always been at the forefront of innovation in China's sportswear industry, and we look forward to supporting the next stage of the brand's digital transformation."

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Product News

Autodesk BIM 360 Docs Update

24 May 2019

The latest BIM 360 Docs release delivers the ability to view and edit Microsoft® Office files directly within BIM 360. In addition, we have released powerful new model viewing and navigation capabilities for both web and mobile.

View and Edit Microsoft® Office Files in BIM 360

The new Microsoft Office 365 integration with BIM 360 provides the ability to view, create, edit, and distribute specifications, spreadsheets, reports, proposals, and other Microsoft® Office documents associated with your projects. All project members can view Microsoft Word, Excel, PowerPoint, and Visio files that are managed in BIM 360. Any project member that has "edit" permission on the folder and also subscribes to Office 365 can directly edit Microsoft Word, Microsoft Excel, and Microsoft Power Point online documents from within the BIM 360 Document Management module.

To view the full release with multimedia, please visit https://blogs.autodesk.com/bim360-release-notes/2019/05/24/bim-360-docs-update-may-23-2019/

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C3D Labs Updates 3D Model Viewer for 2019

27 May 2019

C3D Labs announced that it has released C3D Viewer 2019, an update to its free application for viewing 3D CAD models. The viewer handles standard CAD (computer-aided design) formats, such as JT, STEP, X_T and X_B, SAT, IGES, STL, and VRML, and its own C3D format. C3D Viewer 2019 incorporates some of the geometric modeling, data conversion, and model visualization functions found in C3D Modeler, C3D Converter, and C3D Vision – all components of its C3D Toolkit.

The model viewer, first released by C3D Labs in 2017, gives users full control over displaying 3D models, such as navigating and orientating models, setting standard views, changing perspective projections, and adjusting levels of detail. It also plays back animations at varying speeds. This made C3D Viewer useful to both CAD and non-CAD users who access 3D CAD models.

In its update for 2019, C3D Labs extends the capabilities of C3D Viewer by delivering the following advanced, high-performance tools:

NEW! DYNAMIC SECTION TOOL

The new dynamic section tool lets users view and analyze internal parts of 3D models through sections made with one or more planes. Through the use of OpenGL, C3D Viewer gives results quicker than CAD systems, which typically create sections by modifying the topology of solids.

NEW! MEASUREMENT AND CALCULATION TOOLS

C3D Viewer 2019 now measures the most important aspects of geometric models: angles, distances between objects, edge lengths, surface areas, and so on. The resulting linear, diametrical, and angular dimensions are displayed clearly in the model window. The viewer also calculates masses, volumes, surface areas, centers of mass, and moments of inertia.

PRICE AND AVAILABILITY

C3D Viewer 2019 is free, and is available for downloading as of today from https://c3dlabs.com/en/products/viewer/ .

C3D Viewer Enterprise 2019 is for software developers and is also shipping now. It generates lightweight representations of CAD data and is designed to be embedded in PDM (product data management), PLM (product lifecycle management), and ECM (enterprise content management) systems. Pricing available upon request.

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China Mobile International launches iSolutions

29 May 2019

China Mobile International has launched a new cloud network integration solution in Hong Kong designed to provide multinational enterprise customers with self-service deployment capabilities.

The new iSolutions offering will also allow customers to manage all their cloud and network products on a single platform for enhanced visibility, accessibility and manageability.

It will allow customers to self-deploy and manage cloud network products from major providers including Microsoft Azure, Google Cloud, Alibaba Cloud, Huawei Cloud, Tencent Cloud, Baidu Cloud Engine and UCloud.

The solution initially covers 60 Cloud Connect points of presence across 47 cities worldwide to enable the management of global cloud and network products from the one platform.

Customers will be able to use the platform to purchase new cloud services and deploy them within seconds, track and monitor service status and usage, troubleshoot problems and manage the product lifecycle.

The iSolutions Cloud Network Service leverages China Mobile International's global footprint to provide 99.99% guaranteed uptime, and the operator's fiber infrastructure in China to provide value-added services.

"Our cloud service provider partners represent the highest level of service in the global cloud market. CMI has recently increased its investment in cable systems, PoPs and data centers," China Mobile International CEO Dr Li Feng said at the launch event in Hong Kong.

"In collaboration with the world's finest cloud service providers, we will leverage our combined advantages to provide global enterprises with a one-stop carrier-grade cloud-network solution and customizable attentive professional services."

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CMS IntelliCAD 9.1 PE Easy Run

23 May 2019

CAD-MANUFACTURING SOLUTIONS, INC. announces the release of **new CMS IntelliCAD 9.1 Premium Edition Easy Run through application streaming**.

CMS IntelliCAD® 9.1 is a major release that includes many new features and improvements extending the previous 9.0 version.

One of the new major capabilities of CMS IntelliCAD 9.1 is **attaching digital signatures to .dwg** files and validating them. The interface on how to do it has been reworked with CMS IntelliCAD 9.1. Another is the **new Block Editor** that makes it easier to create and edit blocks. One more is **creating palettes that contain blocks**, similar to using a stencil for easily adding shapes to a drawing. There is

also a **new type of selection grip** for users working with schematic drawings where precise scale or sizing is not required.

More CMS IntelliCAD 9.1 features include: **print and publish drawings directly to PDF**, click keywords at the command prompt, use a **Start Page** when the program launches, single-click to hide many user interface items at once and increase the drawing area, **synchronize viewports**, convert to mesh, convert to surface, show and hide edges of three-dimensional entities, view and edit system variables in the **new System Variables Manager**, and much more.

CMS IntelliCAD PE and PE Plus are now also able to **attach version 2019 .rvt/.rfa files**. CMS IntelliCAD PE Plus, only available as standalone, is also able to draw **more AEC entities** such as stairs, railings, and steel.

Vitor Neves, CMS President, stated, "We're now streaming the **latest CMS IntelliCAD 9.1 technology** users that have an Easy Run standalone license or subscription license. CMS IntelliCAD 9.1 extends even further the advanced new features included in CMS IntelliCAD 9.0 **allowing true CAD productivity increase**. Users and prospectors can experience how CMS IntelliCAD 9.1 CAD Software is **easy to download once, run and use** at their machines."

CMS IntelliCAD 9.1 is supported on Microsoft® Windows® 10, Windows 8, Windows 7 (64-bit only).

Trial available at http://uscloud.intellicadms.com
Username: **demo**
Password: **demo**

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Creaform HandySCAN 3D Scanner Meets Boeing's Requirements

28 May 2019

Creaform announced that its HandySCAN 3D™ metrology-grade 3D laser scanner can now be used for recording physical attributes of aircraft dents and blends on all models of Boeing commercial airplanes.

Boeing has released a service letter with guidance on the use of 3D scanners for measuring dents and blends on airplanes. The SmartDENT 3D™ solution and the flagship HandySCAN 3D scanner were used in the process of guiding Boeing's quality requirements for the service letter.

"Creaform is proud to see leaders such as Boeing, turn to 3D scanning solutions for surface defect inspection. With SmartDENT 3D, our goal is to provide the most accurate damage assessment to our customers, so they can make informed and safe decisions, while getting their aircraft back flying with minimal down time," said Jérôme Beaumont, Global NDT Business Manager at Creaform.

Overview of SmartDENT 3D benefits:

- **Speed**: 80 times faster than the pit gauge technique. It is the fastest and most reliable aircraft surface damage inspection tool available on the market.

- **Metrology-grade measurements for aircraft maintenance:** The scanner is accurate to 0.025 mm (0.0009 in.) and has a resolution of up to 0.100 mm (0.0039 in.) with high repeatability and traceable certificate.

- **Intuitive pass/fail assessments:** With its intuitive design and real-time software visualization, Creaform's NDT solutions ensure short learning curves and minimal operator experience influence on the accuracy of results.

- **Live visualization and portability**: Weighting less than a kilo, the handheld scanner is the perfect tool for work in hangars or directly outdoors. Users can easily perform 3D surface inspection of any part of an aircraft on which they would use manual techniques—including on and under wings.

In addition to complying with Boeing's service letter, Creaform HandySCAN 3D scanners are listed in the Airbus Technical Equipment Manual, which is referenced in its Structure Repair Manual. Quality engineers and MRO operators looking to improve their turnaround times and profitability can contact Creaform to find out more about its NDT solutions.

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Deliver "smarter" faster: Mentor introduces new AI/ML toolkit, adds AI/ML power to Calibre tools to speed smarter IC innovation

24 May 2019

Mentor, a Siemens business, has announced an artificial intelligence/machine learning (AI/ML) development kit and added AI/ML enhancements to two tools to help its customers deliver smarter, AI/ML-powered ICs to market faster. The new Catapult™ software High-Level Synthesis (HLS) AI Toolkit and HLS ecosystem are designed to help customers jumpstart the development of complex machine learning IC architectures. Meanwhile, Mentor has also announced it is adding AI/ML infrastructure throughout the Calibre™ platform, and is launching the first two of these AI/ML-powered technologies: Calibre Machine Learning OPC (mlOPC) and Calibre LFD with Machine Learning – both of which leverage machine learning software for faster, more accurate results.

These new offerings further expand Mentor's fast-growing portfolio of AI/ML-powered solutions. Last year, Mentor acquired Solido, a pioneer in AI/ML-enhanced EDA tools. Solido's customers include 15 of the world's 20 largest global chip design firms. More than 3,000 design engineers use Solido's AI/ML-powered tools to drastically speed development for many of the world's most popular and sophisticated semiconductor designs in production today.

"It's becoming evident that a vast majority of products being developed for the foreseeable future will incorporate AI/ML in some capacity – what's smart today will become smarter with AI/ML," said Joe Sawicki, executive vice president of IC EDA for Mentor, a Siemens business. "Mentor is committed to developing solutions with functionality that will help our customers more easily integrate AI/ML into their products. In addition, Mentor is incorporating adaptive machine learning into our own tools, and as a result, customers are seeing vast improvements in runtimes and accuracy, which in turn further enable our customers to deliver their smarter, AI/ML-powered technologies to market faster."

"Samsung has been collaborating with Mentor on Calibre LFD with Machine Learning to improve full-chip accuracy and performance, in addition to other ML-powered solutions from Mentor such as Tessent YieldInsight™ software, the Solido Variation Designer and the Solido ML Characterization Suite," said JY Choi, vice president of Foundry Design Technology Team at Samsung Electronics. "With the new Calibre LFD with Machine Learning, we realized a dramatic boost in performance and a 25 percent

improvement in accuracy over earlier Calibre LFD solutions."

The New Catapult HLS AI Toolkit

Mentor's new Catapult HLS AI Toolkit is designed to help customers developing AI/ML-based accelerators for edge applications get to market faster. Based in easy-to-use HLS C++, the toolkit provides an object detection reference design and IP to help designers quickly find optimal power, performance and area implementations for neural network accelerator engines – a task not possible with hand-coded register-transfer level (RTL) designs. The solution also includes a complete setup to build an AI/ML demonstrator platform, with live HDMI feed on an FPGA prototyping board. The toolkit is a key component of an expanding Catapult HLS ecosystem for AI/ML applications, which also includes open-source HLS IP, TensorFlow integration, easy system integration with interconnect that implements the Arm® AMBA® 4 AXI interface, and HLS On-Demand training and consulting.

"As a provider of high-performance, high-quality video and computer vision IP, incorporating deep neural networks (DNNs) enables us to deliver differentiated quality and functionality to our customers," said Mickey Jeon, chief technical officer for Chips&Media. "For these DNN-based IP cores, it is key to have a hardware architecture that is highly optimized for power, performance and area (PPA). Mentor's HLS technology enabled us to do this extremely efficiently. Our project was an outstanding success, and we plan on deploying an HLS flow using Catapult on our next project."

Enhancing Calibre Platform with AI/ML

In addition to the Catapult AI Toolkit introduction, Mentor's Calibre group is diligently integrating machine learning on a massively scalable architecture targeting full-chip manufacturing databases. These capabilities are being leveraged across the existing Calibre tool base to increase performance, accuracy and capacity while also enabling advanced customers to craft custom applications. The first of these AI/ML-powered Calibre tools commercially available and in use today are Calibre mlOPC for optimized optical proximity correction and Calibre LFD with Machine Learning for advanced lithography simulation.

Calibre mlOPC

The new Calibre mlOPC product provides 3x faster OPC run time compared to the prior Mentor optical proximity correction technology. mlOPC utilizes fast, intelligent feature extraction and machine learning algorithms to predict the OPC output to within a single nanometer of accuracy, and in the process eliminates up to 75 percent of OPC run time.

Calibre LFD with Machine Learning

Mentor has also added a machine learning option for its lithography simulation tool. The new feature is engineered for high accuracy and improved performance on large blocks as well as full-chip analysis. The feature's predictive capability focuses on high-risk layout patterns for detailed lithography simulation, removing low-risk patterns from this compute-intensive step. The result is a 10 to 20x performance improvement over full chip-model based simulation while maintaining optimal accuracy.

Building on a foundation of AI/ML leadership in EDA

These new solutions add to an already deep portfolio of AI/ML-powered tools from Mentor, including:

- Solido Variation Designer, which incorporates adaptive machine learning for variation-aware custom IC design. Used by analog/RF, memory and standard cell designers, Solido Variation Designer can improve design performance, power, area and yield, giving accurate, full corner and statistical variation coverage in vastly fewer SPICE simulations. Variation Designer helps customers speed SPICE simulation cycles between 10 to 1,000,000x faster than traditional brute

force approaches.

- Solido ML Characterization Suite, which uses machine learning to perform comprehensive validation of characterized Liberty files, and accelerates the generation of Liberty models and statistical data for standard cell, custom cell and memory cell libraries. The solution's analytics tool uses machine learning to identify outliers and critical issues in characterized data, and visualizes library information while enabling the debugging of issues using an interactive environment. The suite's Generator tool uses machine learning to speed up characterization time by 2-4x.

- Tessent YieldInsight software, which uses machine learning to identify and understand the root causes of yield loss from scan test data. This helps operations teams identify systematic yield limiters, prevent wasted physical failure analysis (PFA) on known issues and eliminate costly physical localization in the PFA process.

To learn more about how Mentor is leveraging AI/ML technology for the benefit of its customers, please visit the Mentor booth (#334) at the 2019 Design Automation Conference.

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Gerber Technology Makes On-Demand Fashion Real with the Waldrip Collection

28 May 2019

It's challenging for a designer to compete and maintain pace with the speed of change in fashion today. Many are dependent upon traditional development cycles, supporting creativity but slow in moving from inspiration to finished garment. This model has become increasingly risky, as consumer trends shift quickly leaving brands with inventory exposure and business practices that are not sustainable. To demonstrate how integrated technology can support the ability to produce fashion on demand in a sustainable way, Gerber Technology is collaborating with Stephanie London, a high-end women's wear designer, to develop a collection of garments, the Gerber by Waldrip Collection. The collection demonstrates how traditional processes that historically take months, can be transformed to bring a line to life within days. "We have been driving innovation in this space," said Ketty Pillet, Vice President of Marketing, Gerber Technology. "The Gerber by Waldrip Collection shows how technology makes purchase-activated fashion real, so you can design and produce based upon demand, staying on trend, optimizing inventory and minimizing markdowns."

"Working with Gerber Technology, opened my eyes to a whole new way of doing things," said Stephanie London, Owner, Designer Waldrip NYC. They made everything quick and easy." Waldrip's typical process would have included paper patterns, a team of partners and a binder to manage and build her tech pack. She would typically go through multiple rounds of physical samples before finalizing a garment ready for production months later. "I was really amazed that within a matter of hours I could see a 3D virtual sample that was well on the way to a final product. Gerber held my hand and educated me on all the technologies they have to help, from design through a personalized bespoke concept all the way up to small batch on-demand or mass production."

For the past 50 years, Gerber has been transforming data flow and connectivity from cloud-based YuniquePLM® and AccuMark® 2D/3D software solutions sending data to Industry 4.0 enabled GERBERcutter® Z1 or Gerber Paragon® cutter to power efficient on-demand or mass production

processes. To sustain this model of transformation, Gerber recently patented two solutions which provide unique advantages for an on-demand digital print workflow. Within its industry leading AccuMark software, they have patented a unique ICC color profile to ensure design integrity through the print process. Secondly, Gerber's latest concept, PrintSync™, is a device which allows a hands-free and continuous workflow from printing through the final cut parts, synchronizing the material from any digital printer to the speed of the cutter.

"Our collaboration with Stephanie shows how an end-to-end solution is just the beginning of how Gerber can help brands and manufacturers transform into agile organizations and meet the on-demand challenge," said Ketty Pillet. Gerber plans to continue to demonstrate how its suite of end-to-end solutions support agility from design to production workflows with the opening of its Innovation Center in New York City scheduled later this year.

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Mentor's new Calibre Recon functionality methodically analyzes "early draft" IC designs for faster verification

29 May 2019

Mentor, a Siemens business, introduced Calibre Reconnaissance ("Recon") functionality, representing the first of many new "easy button" features Mentor is adding to its Calibre™ platform IC physical verification portfolio to help design companies get to tapeout faster. The Calibre Recon functionality enables physical design and verification teams to rapidly perform physical verification for blocks and IC designs in their early development phase, when large counts of DRC errors are common, to methodically find and quickly fix selected classes of errors early in the IC design cycle. Now shipping with Mentor's Calibre RealTime Digital platform and Calibre nmDRC tools, Calibre Recon helps companies streamline their design processes and speed time-to-market for demanding end-markets such as the IoT, AI, autonomous driving, and 5G communications spaces.

Early customers have experienced on average a 6x runtime improvement while requiring 4x less memory when analyzing early designs using Calibre Recon functionality. Calibre Recon accelerates debug cycles by showing only results associated with systemic issues common in early design development. The functionality provides designers with histograms, an SoC "heat map," filtering/sorting capabilities, and other features that make it easier to quickly identify and address systemic issues. In addition, Calibre Recon is engineered to deliver all these capabilities from the very first run using any foundry/IDM Calibre sign-off design kits "as is," and on any process technology node.

"Extending market and technology leadership in the EDA space requires constant improvement and deep understanding of the specific challenges customers face in their daily work," said Michael Buehler-Garcia, vice president of Product Management for

Calibre Design Solutions at Mentor. "The introduction of Calibre Recon functionality underscores Mentor's ongoing commitment to ensuring customers have the very latest technologies they need to quickly deliver world-class silicon products to market."

Design engineers typically use the Calibre RealTime Digital tool alongside place and route software for successive layout refinements, while the Calibre nmDRC tool is used by physical verification engineers to perform meticulous batch-mode checks on entire blocks and chips. Instead of laying out their design

and then running full-chip (batch) design rule checking (DRC) on "early draft" versions of their designs, users of the Calibre RealTime Digital and Calibre nmDRC tools can now leverage Calibre Recon functionality to help clean up these designs before they are run in full batch mode. This helps design teams shave hours, and in some customer experiences, even days off the IC verification process.

Using Calibre Recon functionality with the Calibre RealTime Digital tool

Design engineers can use the new Calibre Recon functionality in the Calibre RealTime Digital tool to find specific classes of errors for those areas in which initial design and layout is complete. Likewise, they can disable checks that are not useful at early stages (e.g. cells, blocks, macros) or layers of the design that are still works in progress. Calibre Recon gives designers complete control over which checks they want enabled and disabled, and which parts of the design they want checked. By running only specified DRC checks on the areas of the design where checking is needed, Calibre Recon helps designers avoid wasting unnecessary compute cycles on areas unrelated to the task at hand.

Using Calibre Recon functionality with the Calibre nmDRC tool

Calibre Recon functionality working with the Calibre nmDRC tool enables verification teams to implement a more methodical approach to running batch verification. For example, with extremely early designs, verification engineers can use the Calibre Recon functionality to find particular classes of errors across the entire chip, then assign specific design team members to fix these errors, speeding up the overall verification process. Similarly, they can use the Calibre Recon functionality to better inform place-and-route vendors and design teams of error creation, enabling them to refine their methods and/or tools.

The Calibre Recon functionality has been in use with select customers and is expected to be widely available in the 2019.3 release of the Calibre family update in June of 2019.

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NVIDIA Launches Edge Computing Platform to Bring Real-Time AI to Global Industries

27 May 2019

NVIDIA announced NVIDIA EGX, an accelerated computing platform that enables companies to perform low-latency AI at the edge — to perceive, understand and act in real time on continuous streaming data between 5G base stations, warehouses, retail stores, factories and beyond.

NVIDIA EGX was created to meet the growing demand to perform instantaneous, high-throughput AI at the edge — where data is created – with guaranteed response times, while reducing the amount of data that must be sent to the cloud.

By 2025, 150 billion machine sensors and IoT devices will stream continuous data that will need to be processed — orders of magnitude more than produced today by individuals using smartphones. Edge servers like those in the NVIDIA EGX platform will be distributed throughout the world to process data in real time from these sensors.

"Enterprises demand more powerful computing at the edge to process their oceans of raw data — streaming in from countless interactions with customers and facilities — to make rapid, AI-enhanced decisions that can drive their business," said Bob Pette, vice president and general manager of Enterprise and Edge Computing at NVIDIA. "A scalable platform like NVIDIA EGX allows them to easily deploy

systems to meet their needs on premises, in the cloud or both."

Scalability

EGX starts with the tiny [NVIDIA Jetson Nano](#)™, which in a few watts can provide one-half trillion operations per second (TOPS) of processing for tasks such as image recognition. And it spans all the way to a full rack of [NVIDIA T4 servers](#), delivering more than 10,000 TOPS for real-time speech recognition and other real-time AI tasks.

Enterprise-Grade

NVIDIA has partnered with Red Hat to integrate and optimize NVIDIA Edge Stack with OpenShift, the leading enterprise-grade Kubernetes container orchestration platform.

NVIDIA Edge Stack is optimized software that includes NVIDIA drivers, a CUDA® Kubernetes plugin, a CUDA container runtime, CUDA-X™ libraries and containerized AI frameworks and applications, including TensorRT™, TensorRT Inference Server and DeepStream. NVIDIA Edge Stack is optimized for certified servers and downloadable from the [NVIDIA NGC™ registry](#).

"Red Hat is committed to providing a consistent experience for any workload, footprint and location, from the hybrid cloud to the edge," said Chris Wright, chief technology officer at Red Hat. "By combining Red Hat OpenShift and NVIDIA EGX-enabled platforms, customers can better optimize their distributed operations with a consistent, high-performance, container-centric environment."

An "On-Prem AI Cloud-in-a-Box"

EGX combines the full range of NVIDIA AI computing technologies with Red Hat OpenShift and NVIDIA Edge Stack together with Mellanox and Cisco security, networking and storage technologies. This enables companies in the largest industries — telecom, manufacturing, retail, healthcare and transportation — to quickly stand up state-of-the-art, secure, enterprise-grade AI infrastructures.

"Mellanox Smart NICs and switches provide the ideal I/O connectivity for data access that scale from the edge to hyperscale data centers," said Michael Kagan, chief technology officer at Mellanox Technologies. "The combination of high-performance, low-latency and accelerated networking provides a new infrastructure tier of computing that is critical to efficiently access and supply the data needed to fuel the next generation of advanced AI solutions on edge platforms such as NVIDIA EGX."

"Cisco is excited to collaborate with NVIDIA to provide edge-to-core full stack solutions for our customers, leveraging Cisco's EGX-enabled platforms with Cisco compute, fabric, storage, and management software and our leading Ethernet and IP-based networking technologies," said Kaustubh Das, vice president of Cisco Computing Systems.

Enables Hybrid-Cloud and Multi-Cloud IoT

NVIDIA AI computing is offered by major clouds and is architecturally compatible with NVIDIA EGX. AI applications developed in the cloud can run on NVIDIA EGX and vice versa. NVIDIA Edge Stack connects to major cloud IoT services, and customers can remotely manage their service from AWS IoT Greengrass and Microsoft Azure IoT Edge.

"Azure IoT Edge helps customers deploy cloud service to their IoT devices quickly and securely," said Sam George, director of Azure IoT Edge. "We look forward to supporting NVIDIA's EGX edge platform on Azure IoT Edge devices so that customers can deploy AI workloads targeting EGX-compatible hardware."

Widespread Developer Support

NVIDIA EGX is optimizing AI at the edge for a growing ecosystem of software solutions.

These include video analytics applications, which are ideal for large retail chains and smart cities, from software vendors such as AnyVision, DeepVision, IronYun and Malong Technologies, as well as healthcare-specific software offerings from 12 Sigma, Infervision, Qunatib and Subtle Medical.

Adoption by World's Top Computer Makers
EGX servers are available from global enterprise computing providers ATOS, Cisco, Dell EMC, Fujitsu, Hewlett Packard Enterprise, Inspur and Lenovo. They are also available from major server and IoT system makers Abaco, Acer, ADLINK, Advantech, ASRock Rack, ASUS, AverMedia, Cloudian, Connect Tech, Curtiss-Wright, GIGABYTE, Leetop, MiiVii, Musashi Seimitsu, QCT, Sugon, Supermicro, Tyan, WiBase and Wiwynn.

NVIDIA EGX servers are tuned for NVIDIA Edge Stack and NGC-Ready validated for CUDA-accelerated containers.

Support from 40+ Companies, Organizations
Early adopters include more than 40 industry-leading companies and organizations.

Among them is BMW Group Logistics. Drawing from NVIDIA's EGX edge computing and Isaac robotic platforms, they are able to bring the power of AI directly to the edge of its logistics processes and handle increasingly complex logistics with real-time efficiency.

Other industry leaders adopting EGX include:

"Foxconn PC production lines are limited by the speed of inspection because it currently requires four seconds to manually inspect each part. Our goal is to increase the throughput of the PC production line by over 40 percent using the NVIDIA EGX platform for real-time intelligent decision-making at the edge. Our model detects and classifies 16 defect types and locations simultaneously using fast neural networks running on NVIDIA GPUs, achieving 98 percent accuracy at a superhuman throughput rate."
— Mark Chien, general manager, Foxconn D Group

"AI is fundamental to achieving precision health and must be pervasively available from the cloud to the edge and directly on medical devices. NVIDIA's EGX enables GE Healthcare to deliver rapid MR acquisition times, improves image quality and reduces variability by embedding NVIDIA T4 GPUs directly into our medical devices — all to further our goal of improving patient outcomes. Real-time, critical-care use cases demand AI at the edge. This is why we created our Edison intelligence offering and partnered with NVIDIA to bring AI into our medical devices and Edison edge appliances — and why we are working with ACR AI-LAB to democratize AI."
— Jason Polzin, Ph.D., general manager of MR Applications, GE Healthcare

"Hospitals are increasingly using AI to predict adverse patient events, support clinical decision-making and operate more efficiently. However, these AI applications rely on patient data. NVIDIA's EGX AI edge computing platform provides hospitals easy AI infrastructure to keep patient data secure, deliver real-time AI and scale to thousands of AI applications that are needed to improve patient care and reduce the cost of care delivery."
— Keith Dreyer, D.O., Ph.D., chief data science officer at Partners Healthcare and associate professor of radiology, Harvard Medical School

"At Seagate we have deployed an intelligent edge GPU-based vision solution in our manufacturing plants to inspect the quality of our hard disk read-and-write heads. The NVIDIA EGX platform dramatically accelerates inference at the edge, allowing us to see subtle defects that human operators haven't been able to see in the past. We expect to realize up to a 10 percent improvement in

manufacturing throughput and up to 300 percent ROI from improved efficiency and better quality."
— Bruce King, senior principal data scientist, Seagate Technology

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PROCAD Releases 3DSMART 2020

28 May 2019

PROCAD released 3DSMART 2020. This flexible 3D modeling software will help improve plant design and ensure projects are completed on-time and on-budget.

3DSMART 2020 is add-on to existing AUTOCAD 2020 thru 2015.

PROCAD subscriptions start at less than $2 a day.

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Varjo Announces XR-1 Developer Edition, A Video-Pass-Through Headset for Engineers, Designers and Researchers on the Cutting Edge of Mixed Reality

29 May 2019

Varjo™ (Shadow in Finnish) Technologies, (Helsinki) announced it has delivered on its promise of making virtual indistinguishable from reality with the company's new headset named XR-1 Developer Edition. Shipping XR-1 to cutting-edge mixed reality developers, designers and researchers is expected in the second half of 2019.

The XR-1 is the world's only headset capable of delivering photorealistic image quality with integrated eye tracking. It is the culmination of two and a half years of intensive R&D. The XR-1 enables the real and the virtual to achieve true visual parity – with the XR-1, the dream of 'Hard AR' (where you can no longer tell apart what is real and what is virtual) has at last been achieved in a professional product.

The XR-1 upgrades Varjo's human-eye resolution headset (VR-1) with a front plate featuring dual 12 mpx cameras. The core technology making photorealism possible is video-pass-through. It means that the device uses cameras to digitize the world in real time, and then multiplexes it inside the GPU with the virtual content to show the combined result to the user. The Varjo VR-1 is the only device with the high resolution to make the seamless visual blending possible, and the XR-1 has the only camera technology capable of producing high resolution with unperceivable latency (< 15 ms).

Unlike competitor devices that are delivering mixed reality with ghost-like, semi-transparent renderings in limited view, the XR-1 enables examining photorealistic mixed reality in a full field of view. With the XR-1 virtual objects appear as real as anything in the physical world and can themselves cast shadows or even illuminate reality. Black objects appear truly black, opaque objects indeed block real or virtual light, and semi-transparent objects will refract the light from the real world behind it. With the industry's most advanced color matching technology, the colors are perfectly rendered for product trials and show cases.

For the first time, users can also switch seamlessly between mixed reality and full virtual reality modes. The depth sensors in XR-1 allow mapping real-life objects and environments for building natural

occlusion. Examples of industrial applications for the device include UX design, collaboration with photorealistic 3D models, training and simulation, as well as unique research and data analytics across real and virtual environments with XR-1's 20/20 Eye Tracker.

"XR-1 brings all the convenience of seeing your body as well as the real world around you and being able to look at your colleagues while designing a virtual object or environment," said Urho Konttori, Chief Product Officer and co-founder of Varjo. "The XR-1 can show mixed reality with true-to-life fidelity you can only achieve using video-pass-through. Lifelike mixed reality is quite literally impossible to achieve with optical-see-through systems like HoloLens."

One of the closest partners working with Varjo to take advantage of the XR-1 is Volvo Cars® (Gothenburg, Sweden), which is using the device to test-drive virtual car designs on the road. The work is groundbreaking, and Volvo Cars have used XR-1 prototypes for this new workflow since the summer of 2018.

By adding virtual elements to the interior of the car, Volvo Cars designers are able to perform design-studies of future cars before they are even built. Volvo Cars engineers have also been test-driving a real car with the driver wearing an XR-1 headset. Adding photorealistic virtual elements or complete features to the test scenarios while driving (world first) enables UX concepts to be quickly iterated. The car designers can add virtual automobiles or unexpected road hazards (such as a virtual moose) to the road for realism, resulting in faster turnaround times and ultimately safer cars.

Volvo has been sufficiently impressed by Varjo's technology that it is no longer just a partner. As of May 2019, Varjo will receive an investment by the Volvo Cars Tech Fund, the Swedish car maker's venture capital fund that invests in high-potential technology start-ups.

"With Varjo XR-1, we can start evaluating designs and technologies while they are literally still on the drawing board," said Henrik Green, Chief Technology Officer at Volvo Cars. "Instead of the usual static way of evaluating new products and ideas, we can test concepts on the road immediately. This approach offers considerable potential cost savings by clearing bottlenecks much earlier in the design and development process."

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Vision Engineering & CADENAS enable the display of digital components with revolutionary 3D display technology

28 May 2019

As an "innovation company", CADENAS is continuously in search of the latest developments and trends for its customers. The German software manufacturer now has a new highlight to offer through its cooperation with Vision Engineering. The Deep Reality Viewer (DRV) by Vision Engineering creates high-resolution 3D stereo images without the need for an external monitor or special glasses. This revolutionary technology offers manufacturers of technical components numerous new possibilities for their products to be perfect eyecatchers.

3D viewer without 3D glasses, shutter glasses or VR headsets

The DRV Z1 was originally developed to optimize quality control and production requirements in the sectors of electronics, aerospace, automotive and medical technology. Thus, enlarged objects can be

viewed in 3D and in detail as never before without the use of additional glasses or viewing devices. The images "float" in front of a viewing mirror and impress with an incomparable depth effect.

In times of more and more high demanding digital applications this technology can also make a decisive contribution to interpret 3D constructions or to improve 3D models. The worldwide patented digital stereoscopic 3D viewing technology, launched by Vision Engineering for the first time, is designed to support companies or organizations that model and test components in 3D.

"Over the past 60 years, Vision Engineering has built its reputation and success on innovation, quality, performance and ergonomics of visual inspection and measurement systems. DRV Z1 offers an enhanced and improved 3D visualization and overcomes the current problems of other viewing systems. By merging our existing technologies, we are providing a completely new concept and opening up numerous opportunities in entirely new markets," explains Mark Curtis, Managing Director of Vision Engineering.

Digital twin of technical components as an eyecatcher at any trade fair

In combination with an Electronic Product Catalog powered with CADENAS' eCATALOGsolutions technology, the DRV technology offers manufacturers of components entirely new possibilities for product presentation, for example at trade fairs. As digital twin, the presented products leave a lasting impression with the visitors of the booth. The DRV can also be used if, for example, the product in question has not yet been in series production and thus is not yet available as a physical component.

"It is our motivation not only to be a reliable partner for the creation of digital 3D parts catalogs, but also to assist our customers with competent support and inspiration for their marketing and sales activities," says Jürgen Heimbach, Managing Director of CADENAS GmbH. "CADENAS has often shown in the past that an electronic product catalogue is not only ideally suited to convince engineers with a technically mature online catalogue, but can also play to its strengths in marketing. Innovative products require a progressive product presentation today in order to stand out from the crowd."

Further information about marketing opportunities with eCATALOGsolutions can be found at: www.cadenas.de/en/products/ecatalogsolutions/tradeshow-entertainment/motivation

Information about the Deep Reality Viewer by Vision Engineering can be found at: www.visiontriteq.com

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ZW3D 2019 SP is Here: More Robust and User-friendly CAD/CAM

28 May 2019

Today ZWSOFT announced the launch of ZW3D 2019 SP. It introduces new features and enhancements that directly respond to users' requests and satisfy the needs of complex product development, delivering more robust and user-friendly CAD/CAM solution.

CAD

1) Enhanced Catia®/Solidworks®2D Drawing Import

The improved Catia®/Solidworks® 2D drawing import is the star in this version. When importing the 2D sheets, more line types and dimensions types can be recognized to display more precise geometry,

line types, dimensions, text, etc., enabling you to enjoy smoother interaction with 2D data. Want to try this excellent tool? Now you can take it for free! From June 1st to August 31st, buy or upgrade to ZW3D 2019 SP, then you can get a free plug-in for Catia®/Solidworks® 2D drawing import.

Besides, JT import and export are also supported now. ZW3D translator is stronger than ever before.

2) Friendlier File Management

In this version, friendlier file management is ready for you. For file import, you can search subdirectories under an assembly to import 3D CAD files, preventing you from missing some of the parts. For file storage, working folder allows you to define the default file storage path, enabling more efficient file storage.

3) Multi-Export: From Multiple Objects to Multiple Formats

After finishing design, Multi-Export allows you to export multiple objects to multiple formats at the same time, accelerating your exporting work.

4) More Flexible and Efficient Modeling

In this version, some features were upgraded to deliver higher modeling efficiency and flexibility. For example, when dealing with the 3D BOM, the attributes used frequently can be inherited simply by right-clicking. Also, modeling rules for the Parent and Child operations in Suppress feature have been optimized to help you make regenerative results more correct.

What's more, operations related to assembly have also been improved, such as the datum of components, which can now be displayed when inserting the components, making it convenient for you to edit. Moreover, Pattern feature can be applied to the assembly hole, speeding up your assembly process.

Mold

Mold module was polished to help you finish mold design with ease. When handling region analysis, the regions which are not connected with each other can now be detected, realizing correct region analysis result.

Ejector pins will be trimmed at the assembly level and part level, bringing you more accurate BOM table. Moreover, moldbase can be applied to single-object files now, offering more flexibility to your mold design.

CAM

CAM module has also been optimized to deliver higher efficiency. Firstly, more types of arc output, including Helical Arc and Spacial Arc, have been added to extend the machining capabilities.

Secondly, when conducting Chamfer operation, the lead-in toolpath will be automatically adjusted to helical lead-in when the cutting space is smaller than the lead-in arc.

Besides, you can define the hole drilling sequence either by yourselves (Pick Order) or by default (Auto).

Thirdly, "XY Arcs" is selected as default in Flat Finish operation, increasing the efficiency and quality of machining.

Also, more link types are provided in Ramp to offer you more choices for ramp cutting and enhance the machining efficiency.

Get a Full Scoop on ZW3D 2019 SP

There's still more to be explored. Take a try to learn more about all the new tools and enhancements in ZW3D 2019 SP?

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