CIMdata

PLM Weekly Summary

Editor: CIMdata News Team

30 October 2020

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CIMdata News

Empowering Digital Threads (Commentary)

27 October 2020

Key takeaways:

- Digital threads enable sharing stable configurations of product artifacts throughout the product's lifecycle.

- Without a comprehensive digital thread it is very difficult to manage the complex web of collaborative interactions that happen during engineering processes such as requirements traceability and change control.

- Digital threads support end-to-end traceability (from requirements through verification) within today's prevalent heterogeneous tool ecosystems.

- Managing requirements (allocating, refining, and committing them) as part of a digital thread throughout the product lifecycle improves and accelerates decision making.

- SBE Vision provides solutions for developing, aggregating, and managing product artifacts, starting with requirements, and supporting decision making through digital threads.

Successful companies capture and refine the sequence of product decisions needed to make great, profitable products. The sequence, embodied in the digital thread, in which decisions are made during product development, deployment, and operation, is critical to determining a company's long-term success. It embodies factors like safety margins, compliance, performance, and finances that influence when and how decisions are made. A safety margin example is crash worthiness of automobiles, aircraft, and other products. Decisions for the structure first and foremost focus on protecting the occupants. Performance for certain segments drives sales—whether it is range, acceleration, passenger capacity, or fuel consumption. In this case a lighter car or aircraft can go further, faster. But it also may need expensive materials to maintain structural integrity and protect the occupants. The correct balance between these examples is what drives success. The balance is achieved with a progression of decisions that are heavily influenced by the interactions of requirements linked to the components of the item—the digital thread contains and maintains critical relationships.[1]

Supporting complex decisions during product development and deployment is a systems problem. Systems are best designed around a framework of requirements for a multitude of capabilities,

performance, safety, cost, and many others. The problem is to assure that the requirements are fulfilled and not violated throughout the life of a product. Exacerbating this are that requirements can and do change—which is fine as long as changes are controlled, fit for purpose, then managed through the lifecycle. It is one thing to define requirements before a product is designed and built, but after a product enters service new complications arise. An important issue is how the system's defining constraints are maintained, adhered to, and managed as the product is placed in use, and inevitably changes. This requires the concept of a digital thread of the requirements and other product attributes tied to an ever changing digital twin. Digital threads don't simply exist, they need a managed environment that understands a product's requirements and how those requirements form the basis of the digital product definition and how it transforms over time. SBE Vision is providing a workable solution to the difficult problem of getting from product requirements and other data elements to a sustainable digital thread.

Systems engineering (SE)—is a trans-disciplinary and integrative approach to enable the successful realization, use, and retirement of engineered systems, using systems principles and concepts, and scientific, technological, and management methods. In this definition, the terms "engineering" and "engineered" are used in their widest sense: "the action of working artfully to bring something about." Engineered systems may be composed of people, products, services, information, processes, and natural elements. SE is increasing in use to improve decision making, including those based on requirements which span product lines.

Digital thread—is a communication framework that allows a connected data flow and integrated view of an asset's transformation (i.e., its Digital Twin) throughout its lifecycle across traditionally siloed functional perspectives. The digital thread becomes visible as a context for decisions. Different contexts are needed to see a multiplicity of effects. The thread is the path taken as decisions are made. It is often not known in detail a priori, but rather discovered as innovation and problem solving occur. Too often the digital thread is presented as a flow of items—it is really a flow of decisions.

Ontology—An ontology is a precise definition of objects, their taxonomy, relationships, attributes, and related knowledge. Every company needs a single product and process ontology to effectively manage their enterprise. However, product lifecycle management (PLM) solutions have needs for specific languages to support digital problem solving. It is important that these solutions share a single ontology—said another way a portable ontology enables the exchange and sharing of knowledge amongst applications which leads to better decisions. This ontological effect is as an application language broker, a Rosetta stone, enabling sharing of SE elements from different requirements authoring and management domains.

Requirements discovery (aka learning)—is more than authoring and allocating, it includes refinements to requirements based on experiments and other closed loop learning. The best systems engineering organizations continually understand their requirements' adherences and balances throughout the product lifecycles.

PLM platform—a tools and data management framework, which has services to find contextual data from different sources, while also taking advantage of computing evolution. It is where "digital engineering" really comes from. PLM platforms support many domain specific applications. They need a "live" ontology to support information shared by those applications.

Systems Engineering and Digital Definitions

Systems Engineering as a discipline has existed for decades. Computer-based or digital systems engineering improves
product robustness because it allows designers to see more interactions among requirements and solutions before a product is produced. However, there is confusion in what various terms mean. The

sidebar contains a few key definitions that are used in this paper.

Requirements Use in Decision Making

A monolithic PLM system, which expects a single database of product artifacts for decision making, is neither workable nor practical culturally. Rather a framework of openness and services, coming from many innovative sources, leads us to a different architecture for PLM-enabling tools and services—a PLM platform. Within that platform, services for grouping related sets of objects to make the best decisions is required.

While the effort required for creating requirements, sharing them among tools, allocating them appropriately, and maintaining their initial traceability has been reduced, the substantial workload required to maintain these discourages many from continuing this activity throughout a product's lifecycle, an essential factor for maintaining the digital thread. This undesirable workload when using requirements is typical of computer-based technologies wherein the original focus is on product artifact creation. Search and simulation have improved the use and reuse of these artifacts but still require special expertise and effort to perform completely and properly. Yet, as system complexity and the number of artifacts increases, poor requirements management, especially supporting traceability throughout the lifecycle, becomes a company's Achilles heel.

What is needed is in-context viewing and exploring to improve decision making. With a live, active, and connected ontology and best in class applications, sharing a context of requirements linked to product elements (parts, components, assemblies, etc.) creating stable configurations is critical. A configuration is the mechanism which provides a known correlatable basis for decisions, even when spanning multiple domains and applications. The DoD has described this as the "Authoritative Source of the Truth" as illustrated in Figure 1. This enables more participants, working in their native systems, to provide analysis and applied knowledge as decisions are made. Engineering becomes more simultaneous and the ability to shorten product development time while lowering costs is achieved. This maintains a company's technological advantage.[2]
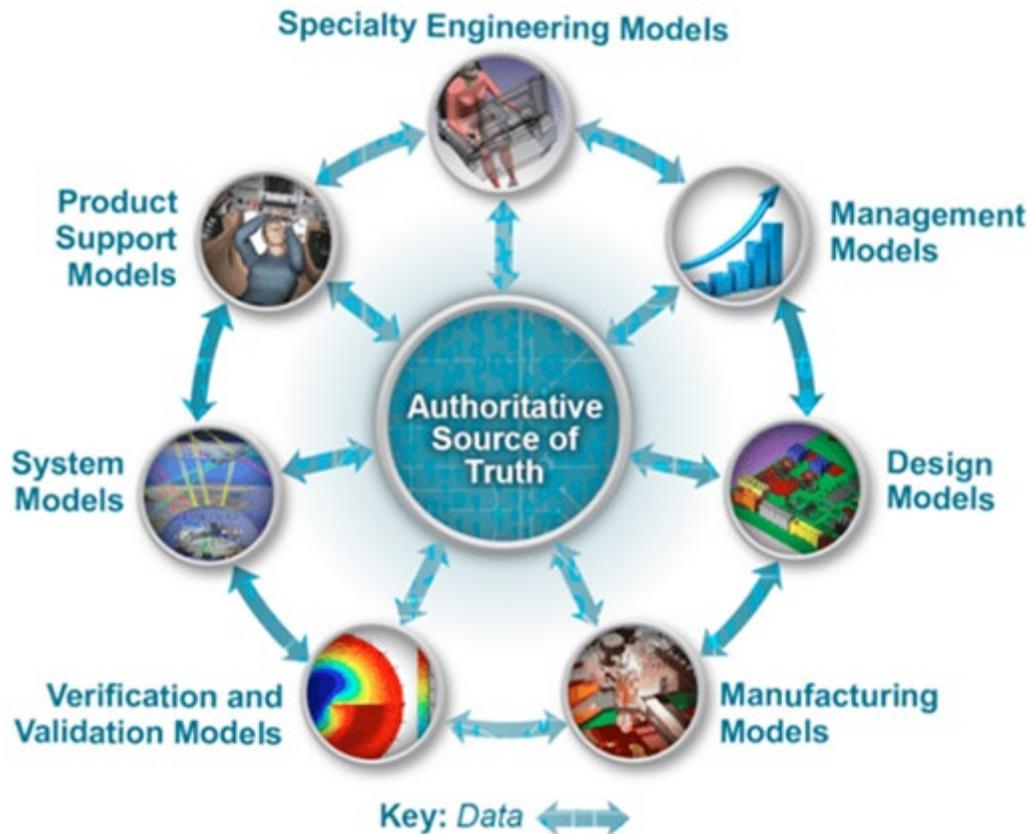
Figure 1—Sources of Data and Insights that Drive the "Authoritative Source of the Truth" (Courtesy of US DoD)

In the past few decades, monolithic PLM ecosystems have evolved in parallel with computing power. However, a problem arises because specific actors within the development and operational processes have codified knowledge and competitive practices inside their specific applications. Removing these capabilities implies a certain loss of knowledge so it becomes imperative to be able to work with those applications in a heterogeneous environment supported by a platform architecture.

PLM platforms delivered as Software-as-a-Service (SaaS) or Container-as-a-service CaaS have emerged providing a more innovative ecosystem. CIMdata research in the past few years has noted the growth of PLM platforms vs. monolithic solutions. This is the Innovator's Dilemma for PLM ecosystems. But a platform with applications exchanging information is just a start. You also need consistent, repeatable contexts in a stable configuration across these applications.

A product ontology and services help create and explore solutions to discover and satisfy requirements, making sure stable configurations are used to exchange knowledge and insights consistently. This enables product system engineers to manage the complex systems emerging from their legacy environments. The result is that effective product decisions occur faster and change management cycle times and quality improve.

The Promise of Digital Engineering

Systems Engineering has improved with the power of computing, whether it is exploring solutions or safety margins of candidate designs. Computing speeds and simulation accuracies continue to advance. But with distributed computing came distributed data which can be difficult to manage. System engineers need stable, readily accessible configurations as baselines to help manage their decisions. File

sharing alone is inadequate, especially when teams work together simultaneously. Given the proliferation of specialty systems used in today's enterprises, PLM data managers also are challenged to link and manage disparate information.

Other engineering and manufacturing disciplines have a similar challenge. Bill of material (BOM) systems from logistics and manufacturing provide known configurations, but too often these are manually maintained. While computers help keep the records, it is still people who manually create BOMs.

Systems engineers often use new types of computing from advanced simulations to the latest advances in machine learning algorithms. Systems engineering is now being challenged with complexities due to increasing features, especially those in embedded software. The same level of automation done for chip design and manufacturing is now needed for all types of electro-mechanical systems. Instead of the BOM or configuration being driven by manufacturing processes today, it is more often driven by accelerating product innovations and changes. As decisions are made, the product/feature configuration must be known, reproduceable, tractable, and explorable all the time.

SBE Vision's Solution

The Internet shares information efficiently via living links (called URLs). This provides a clue on how to proceed. Standards like OSLC and RESTful APIs provide some of the exchange capabilities needed to connect heterogeneous applications. This is critical because it is desirable to use the best requirements management applications with the best of an organization's mechanical, electrical, software, simulation, and verification engineering applications, regardless of differences in structure and format of the data. To provide a stable context, i.e., a configuration, these applications need a service which can broker communications and data flows among them—similar to how the Internet works.

Systems engineers are the human focal point among the engineering disciplines—and with other business functions outside of engineering as well. They need digital engineering services to reveal and explore all requirements' contexts so that customers and executives can make the best decisions for the product.

While remote linking standards like OSLC show promise, focusing on users' views into sets of data also reveals inherent weaknesses: missing contexts, absence of cross-system search, and a lack of consistent user experience. As a result OSLC standards are best employed in specific situations where the links are few in number and the endpoints are not subject to frequent change. A focus on using requirements and designs in different contexts is a key to improving decisions, and, of course, systems engineers would be the guardian of these views, but they need to be delivered to the ecosystem of consumers in the context of their applications, not some SE specific tool. To accomplish this requires the bi-directional transformation of complex engineering data which effectively can only be achieved via semantic transformation.

Product development systems complexities are growing faster than predicted. Only small startup companies may have a monolithic digital engineering applications environment. The more common reality is that the need to use best of breed tools is essential to remain competitive. In this situation large disparate collections of data are available to exchange but putting it in a known context remains a challenge.

SBE Vision is developing solutions to support requirements, model, and verification management in a heterogenous authoring and usage environment, starting with DOORS Next and Teamcenter, and a variety of MBSE and analysis tools such as Cameo and Simulink. Their solution is based on open ontologies where users of any engineering tool can work in their preferred system and can examine

requirements or models authored and managed in foreign systems.

As SBE Vision develops a platform technology to help build and maintain requirements traceability across requirements and model management tools, they realized the ability to establish and share a stable view—the configuration or context, was lacking. They addressed this weakness by providing contexts that can be coherently examined, even when they come from different requirements authoring systems. This capability allows systems engineers to provide views across stable digital thread contexts, thus improving decisions. These stable configurations can link any elements of information in a PLM ecosystem, not just requirements.

SBE Vision realizes that customers may have proprietary tools for engineering. to support company-specific or highly innovative product development. To support these situations, SBE offers a connector Software Development Kit (SDK) that allows companies to quickly create their own integrations to the digital thread. Its open architecture has been used to demonstrate five different engineering tools working together in an effective manner.

Mr. Chris Finlay, SAIC Digital Engineering Lead, has researched the importance of, and challenge of creating simple application user interfaces and the need for a way to integrate different applications using ontologies. "SAIC uses the SBE Vision Semantic Data Broker, because it aligns with our vision to connect DE tools semantically via the ontologies, eliminating tool import/export or remapping, and significantly increasing the efficiency of our DE deployments. It also provides a stepping stone to our planned future DE innovations, which would not otherwise be possible." stated Chris to CIMdata. A few Automotive OEMs CIMdata spoke with are also exploring SBE Vision's technology, wanting to solve the same integration challenge across a PLM ecosystem with heterogeneous applications. This is an important advance to anyone's digital engineering strategy. CIMdata believes this kind of innovation for SaaS is essential for achieving the Authoritative Source of the Truth—the digital thread—on demand, at any point in a product's lifecycle.

Figure 2, is an example of how SBE Vision can support the Semantic Data Broker by linking multiple disparate models without regard to traditional application boundaries. In this illustration traceability is accomplished via a combination of OSLC and Digital Thread subscriptions:

- IBM DOORS Next holds industry requirements interlinked with mission requirements. Both of those requirements sets are satisfied by use cases and activity behavioral models in No Magic's Cameo MBSE modelling tool.
- There is also a logical system architecture in Cameo which satisfies the requirements from DOORS Next.
- There is a physical architecture model in the IBM Rhapsody MBSE tool which realizes the logical architecture in Cameo.
- The Cameo and Rhapsody architectures can be analyzed within Mathworks MATLAB/Simulink which is also connected to requirements and test plans.
- There are design artifacts, authored in ECAD and MCAD tools, managed in PLM systems, which realize the physical architecture from Rhapsody and are also linked to Simulink and Verification models.
- The requirements, use cases, and architectures form the framework of the verification and test plans of the design artifacts, which is done in a verification planning tool.

SBE Vision ties all of these various forms of the system's data together and allows that data to be shared among the disparate tools.
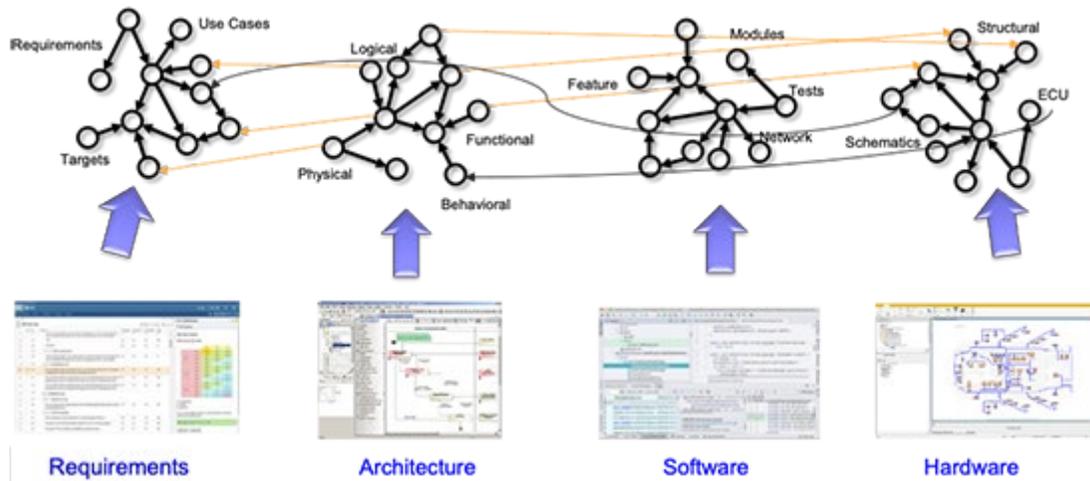
Figure 2—SBE Vision as the Basis for a Semantic Data Broker (Courtesy of SBE Vision)

Summary

SBE Vision and their partners have applied ingenuity and the benefit of Moore's Law to solve a problem inherent in product development systems data exchanges. The configuration is what establishes the context that lets us determine the authoritative truth and embody it in a digital thread. This truth is temporal: as new knowledge is learned the contexts must adjust. Manual methods of requirements and BOM management must become semi-automatic allowing the revelation of knowledge to the systems engineer to explore insights and adjust requirements—engineer them! Digital Engineering Strategies need solutions like the SBE Vision SDK to help build and maintain digital threads, providing long term benefits, even when they have heterogeneous application environments.

Early adopters have started using this technology and are gaining momentum, and CIMdata expects more to do so. The fastest product innovations occur in a diverse PLM ecosystem, which also fosters process and application innovations—a proven and needed ability to maintain technological advantage. SBE Vision is worth your time, evaluate their solution, they are riding the next wave of engineering, engineering systems based on requirements use and product risk reduction across the whole lifecycle.

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Transforming Enterprises: The Mendix Solution for Xcelerator – A CIMdata Commentary

29 October 2020

Key takeaways:

- *Digital transformation is a well-defined trend that is key to long-term business success and COVID-19 is accelerating the transformation process.*
- *A well-developed digital thread that enables a comprehensive, actionable digital twin that can span the full extended enterprise value chain is critical to remaining competitive.*
- *Digital threads and digital twins are most easily accomplished with platform solutions. The flexibility of modern platforms enables companies to innovate faster with fewer IT technology-based limitations.*
- *Xcelerator, Siemens Digital Industries Software's solution portfolio, supports the end-to-end lifecycle and includes Mendix, a modern, innovative low code application and integration platform. Mendix is a graphical modeling solution that enables building enterprise and user productivity applications quickly across the extended enterprise, not just to support product development.*

Manufacturing enterprises in every industry are being challenged to develop smart, connected products while competing for customers who demand these products to be more cost effective at supporting their business strategy. Product complexity and differentiation are being driven by software and electronics. Companies need to implement product development environments that span all the functional domains—mechanical, electronics, and software. Users need to be able to collaborate with data from each of these domains as needed, while business processes ensure configuration integrity and traceability across all domains and lifecycle states. Product complexity is also reflected in the need for more intelligent production environments and in-service management solutions.[1]

Manufacturers looking for ways in which to turn complexity into a competitive advantage must undergo a digital transformation—they need to use digital technologies to change how they operate at all levels. Companies must be able to implement tailored environments that enable personnel at all levels to quickly and easily access the data they need to make informed decisions faster, thereby improving business performance. They must also be able to respond to changes in the work climate driven by initiatives such as Work From Home and the impact of COVID-19, which are forcing faster, more complete digitalization of data and processes. They must be able to adapt their business models to changing circumstances by leveraging smart, connected capabilities.

To be successful companies need to implement extended enterprise integrated value chains built on open ecosystems that span functional domains (mechanical, electronics, software), operational domains (development, production, operations, and service) and include partners, suppliers, and customers.

A modern value chain ecosystem must span the extended enterprise providing a seamless, transparent ability to work within the company as well as with its partners and customers across an integrated heterogenous environment. The ecosystem must be built on a flexible, adaptable, scalable architecture that supports multiple infrastructures—on-premises, cloud, edge—as each participating organization will have made different choices for the technology, solutions, and implementation based on their individual business needs. And because each participating organization is different, it must be personalized to those needs so companies can adapt as technologies and business strategies evolve.

The ecosystem needs to link solutions beyond product definition—it must cover the full lifecycle from inception through removal from service. The ecosystem must enable implementation of a true lifecycle digital thread. A digital thread is a communication framework that connects data flows, which can be used to produce an integrated, holistic view of an asset's data from physical and virtual systems (i.e., its digital twin) throughout its lifecycle across traditionally siloed functional perspectives. It enables traceability and helps speed and improve decision quality.

Enabled by the digital thread, a digital twin is a virtual representation (i.e., digital surrogate) of a physical asset or collection of physical assets (i.e., physical twin) that exploits data flow to and from the associated physical assets and continually evolves as it accompanies its real-world physical companion throughout its lifecycle.

Many different applications and solutions exist within a value chain ecosystem, each of which addresses different business needs and processes. A modern ecosystem needs modern applications. This means applications that are role-related and context-driven to provide maximum ease of use for all people that work with them. Being tailored to user roles reduces training time, speeds adoption, and increases efficiency. Because data is provided in context of the tasks being done, workers are able to focus on the task at hand, not the technology itself. This enables them to make higher quality, better informed decisions, faster.

Effective applications are designed to integrate diverse modern technologies (even legacy technologies) to expose the data and processes each user needs to accomplish their tasks. Simply reporting or providing data is not sufficient. Transforming data to information and knowledge—that is making it understandable and actionable—is where the rubber meets the road and is required for success. Business problems cross domains

and are continually evolving. Modern applications must be built with flexible, adaptable, technologies that enable a company to easily and quickly update their business solutions as changing circumstances dictate.

Mendix, Siemens Digital Industries Software's (Siemens) low-code application development platform, empowers companies and individuals to create business-unique applications or mashups that enable appropriate context for stakeholders so they can make and execute fast, accurate decisions about product development, manufacturing, services, and most important "change." Mendix is used throughout the Xcelerator portfolio and connects with non-Siemens applications so an entire extended enterprise landscape can be supported.

Xcelerator,[2] is a comprehensive, integrated portfolio of software solutions, services, and an application development/integration platform designed to reduce barriers to innovation. Its application development platform provides a robust foundation for collaborative product creation and manufacturing and acts as a catalyst to a manufacturing enterprise's digital transformation.

Xcelerator is both a wide and deep portfolio encompassing technology and solutions that support the full design, realize, optimize extended value chain lifecycle.

- Design—All domains and functions such as mechanical, electrical, electronic, software, formulated/process
- Realize—Manufacturing support, process planning, digital manufacturing, virtual commissioning
- Optimize—Track and analyze in-service use and performance, schedule maintenance

Xcelerator's authoring applications enable domain experts to make actionable, data-driven decisions based on performance analytics and simulations independent of data source—creating a closed-loop data environment of sense-decide-act. Xcelerator's integration and application platform tools enable enterprises to blur the boundaries of traditional stand-alone domains of electrical engineering, mechanical design, and software development by integrating them within a single collaborative environment.

MindSphere is Siemens' IoT as a Service solution used to support IoT and connected, smart devices, and the factory floor. It, with Mendix, enables companies to create closed-loop feedback between service, production, and development.

The entire Xcelerator portfolio, designed so all its services can be consumed by Mendix, helps companies create an extended enterprise value chain digital thread and make a comprehensive digital twin actionable across domains and disciplines. Mendix is a key enabling component of Xcelerator. It enables developers, business analysts, and power users to rapidly create and deploy company-unique multi-experience composite applications across their extended enterprise ecosystem. Mendix provides the tools to create personalized applications and link information to create a digital thread that spans the extended ecosystem and support comprehensive, actionable digital twins.

Mendix, a low code platform was acquired by Siemens in 2018 and already had extensive success in enterprise software. Prior to its acquisition by Siemens, it had a 60,000+ global developer community and supported a wide variety of enterprise solutions, both on-premises and cloud native. Since the acquisition, adoption and use have grown significantly due to its ease of use, and Siemens states there are now over 135,000 developers[3] in the global Mendix community.

Siemens uses the Mendix platform to (1) integrate solutions and develop applications within the Xcelerator portfolio, and (2) connect Xcelerator solutions to the broader extended enterprise. Mendix supports integration, application, and user interface development for both Siemens-developed and third-party solutions including those independent of any Siemens technology. Mendix is used to expose the various components of Xcelerator as resources and microservices, enabling rapid data and user interface integration. Siemens customers can use

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[2] https://sw.siemens.com/portfolio
[3] https://developers.mendix.com/

Mendix to expand their Xcelerator-based solutions, develop in-house business-unique solutions, and connect to data sources across their extended value chain. CIMdata believes this is a significant benefit for customers as they are able to get company-unique business solutions in the hands of their users much faster than is possible with traditional development tools.

Within CIMdata's consulting engagements we often see data stored in silos at both established industrial companies and startups. Even with advanced reporting and analytics tools, users struggle to get the data needed to make decisions quickly and with confidence. The Mendix MX Data Hub, shown in Figure 1, provides a solution to data silos. Mendix OOTB connectors and microservices expose data as a catalog making it easy to find and use, while the Mendix Studio solutions allow analysts and developers to create applications to solve business-unique problems. These are true applications, not just reports from a data warehouse, as they can read and write data from diverse sources and create a rich user experience, while preserving a single logical source of truth.
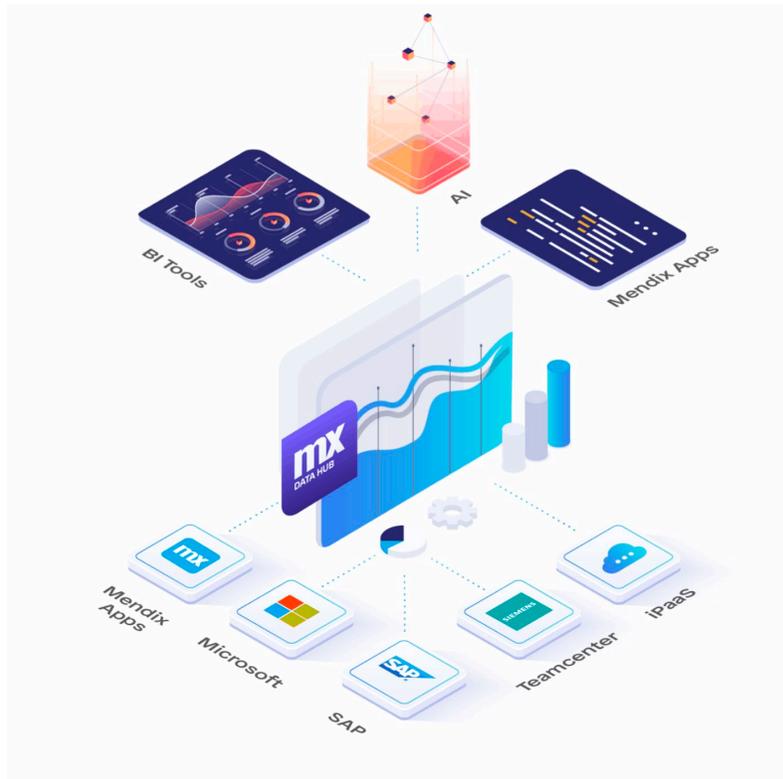
Figure1—Mendix MX Data Hub

EQ Technologic, a long time Siemens partner, has incorporated the MX Data Hub into their solution suite. They have extended their Data as a Service (DaaS) solution to expose industrial data within the MX Data Hub. There are over sixty proven connectors within the DaaS solution adding to the richness of data that can be exposed and acted upon with Mendix.

CIMdata has seen several examples of Mendix applications and one of the more interesting is the integration of Capital, the electrical design solution from Mentor, with the new Teamcenter configurator solution. By enabling Capital with Mendix, the configurator is able to drive both mechanical and electrical data within product configurations.

Modern product development is challenging, and companies must digitally transform across their entire value chain if they want to remain competitive. COVID-19 is accelerating the transformation process. A common digital transformation end state at CIMdata's clients is to have enabled a comprehensive, actionable digital twin leveraging an end-to-end digital thread that spans the extended value chain. Creating the digital thread is a complex problem, due to data models, silos, solutions, and process variations across the extended value chain.

Mendix is a one of the newest solutions within Siemens' Xcelerator portfolio. This solution portfolio spans and integrates the lifecycle domains of design, realize, and optimize with a broad, deep suite of tools, applications, and solutions. Mendix enables the creation of business-specific applications across the Xcelerator portfolio and with third-party solutions. Given their functional breadth and solution enablement capabilities, companies looking to define and improve their extended enterprise value chain and move faster, should include Siemens' Xcelerator portfolio and Mendix in their evaluation and selection process.

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Acquisitions

Ansys and Analytical Graphics, Inc. Sign Definitive Acquisition Agreement

26 October 2020

Ansys announced that it has entered into a definitive agreement to acquire Analytical Graphics, Inc. (AGI), a premier provider of mission-driven simulation, modeling, testing and analysis software for aerospace, defense and intelligence applications. Once closed, the acquisition will expand the scope of Ansys' solution offering, empowering users to solve challenges by simulating from the chip now all the way to a customers' entire mission – like tracking an orbiting satellite and its periodic connection to ground stations. The purchase price for the transaction is $700 million, of which 67% of the consideration will be paid in cash and 33% will be paid through the issuance of Ansys common stock. In conjunction with the transaction, Ansys anticipates obtaining new debt financing to fund a significant portion of the cash component of the purchase price.

AGI has pioneered digital mission engineering, a key component of digital transformation. Once closed, the acquisition of AGI will expand Ansys' simulation footprint into customers' missions, an area of simulation beyond the traditional component or product level. Missions are typically higher-level endeavors that support space, telecommunications, national defense and search-and-rescue initiatives. Mission-driven simulation, integrated with systems engineering, enables organizations to provide the best configuration to achieve various desired mission objectives.

Digital mission engineering empowers organizations to evaluate then optimize the performance of engineered systems across the overall mission. It also helps them effectively respond to evolving mission objectives, which often change during the course of a system's lifecycle. As a result, these missions are more likely to succeed, saving the customer time, money and other crucial resources.

As an example, experts project that more than 10,000 satellites will be launched into orbit in the next five years. AGI's software will help its customers design, launch, and safely operate the next generation of satellite constellations which are critical for navigation, earth imagery, weather and communications. AGI's software models and simulates many important elements, such as a satellite's orbital mechanics, enabling users to design, operate or use space systems with improved efficiency and effectiveness.

Based in Exton, Pa., AGI has a 30-year track record of success across industries, with hundreds of customers around the world, particularly in the government and federal aerospace and defense industries. As an existing Ansys partner, AGI's technology already connects into the Ansys simulation portfolio. Once closed, AGI's strong customer relationships will help Ansys reach new aerospace and defense customers while the Ansys sales channel can drive mission-based simulation to its broader existing installed base.

"Ansys' acquisition of AGI will help drive our strategy of making simulation pervasive from the smallest component now through a customer's entire mission," said Ajei Gopal, president and CEO of Ansys. "It will also expand the use of simulation in the key aerospace sector, where the stakes can be at their highest levels. We are excited to welcome the expert AGI team – and to expand the reach of their world-class technology to industries outside of aerospace, including for autonomy and 5G applications."

"In the three decades since our founding, we have continuously invested in our technology to create and advance digital mission engineering," said Paul Graziani, CEO and co-founder of AGI. "We are thrilled to become part of Ansys so we can dramatically extend the reach of our world-class products and help more customers accomplish their critical missions."

The transaction is expected to close in the fourth quarter of 2020, subject to receipt of regulatory clearance and the satisfaction of other customary closing conditions. The transaction is not expected to have a meaningful impact on the 2020 non-GAAP results. Ansys expects that the transaction will add $75 million to $85 million of non-GAAP revenue to its 2021 results and will be modestly accretive to non-GAAP diluted earnings per share. Non-GAAP projections exclude the effects of acquisition adjustments to deferred revenue, stock-based compensation, amortization of acquired intangible assets and transaction costs related to the acquisition. The corresponding GAAP revenue and diluted earnings per share measures are not estimable on a forward-looking basis at this time, as such measures require a fair valuation to be performed on the net assets purchased, which will be completed subsequent to the closing.

Hexagon enhances its Smart Manufacturing solutions portfolio with the acquisition of D.P. Technology Corp

29 October 2020

Hexagon AB announced the signing of an agreement to acquire D.P. Technology Corp. ("D.P. Technology), a leading developer and supplier of computer-aided manufacturing (CAM) technology. The ESPRIT CAM System, its flagship solution, is the smart manufacturing solution for any machining application. Supporting any class of CNC machine via a common interface and workflow, it provides high-performance CNC machine programming, optimisation, and simulation for a broad range of precision manufacturing applications.

Well known for its machine-optimised, edit-free G-code (toolpath), ESPRIT leverages a digital twin simulation platform to model the finished part, tools, and CNC machine. AI-based algorithms eliminate manual data input and provide machine operators with greater assurance of what will happen on the shop floor. The result - simplified programming, increased tool life and utilisation, reduced cycle times and improved productivity.

"D.P. Technology is an innovator with a strong focus on building smarter, data-driven manufacturing solutions. When combined with our production software portfolio, it cements our market-leading position in CAM, particularly around CNC manufacturing processes, and accelerates the development of our Smart Manufacturing portfolio," says Hexagon President and CEO Ola Rollén. "Additionally, the D.P. Technology team has built excellent working relationships with leading machine tool providers and other manufacturing technology experts, which will prove invaluable in our open and interoperable manufacturing ecosystem approach."

Founded in 1982 and headquartered in Camarillo, California, D.P. Technology employs around 260 people in 27 locations worldwide. The company is also represented by a network of 130 resellers across 44 countries, giving ESPRIT a global footprint and install base. D.P. Technology will operate as part of

Hexagon's Manufacturing Intelligence division. Completion of the transaction (closing) is subject to regulatory approvals. 2019 sales amounted to 35 MEUR.

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Tech Mahindra to buy Momenton and Tenzing

27 October 2020

Tech Mahindra has agreed to acquire Momenton, a digital enterprise technology firm, offering consultancy and implementation services, and Tenzing , a technology consulting company as part of the strategy to enhance business in Australia and New Zealand.
"The acquisition of Momenton and Tenzing are in line with our strategy to strengthen our digital capabilities, and offer end-to-end transformation services. This will enhance our local presence in the markets," Vivek Agarwal, head Corporate Development & Global Head for Healthcare and Financial Services, Tech Mahindra, said.

Jeff Ferdinands, country head – ANZ, Tech Mahindra, said: "The addition of Momenton and Tenzing will strengthen Tech Mahindra's position in the ANZ marketplace, especially in the financial services sector."

Momenton, is a Melbourne-based digital enterprise technology firm offering consultancy and implementation services in enterprise agility, product enablement, engineering and emerging technology to clients across industries with advanced capabilities in digital engineering and cloud native architectures.

Tenzing is a management and technology consultancy offering, business strategy, insurance core system transformation, program management, target operating model design across industries and public sector organizations.

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Company News

Accenture and MIT Team Up to Help Organizations Seize Opportunities from Industry and Technology Convergence

26 October 2020

Building on their trailblazing partnership of more than 15 years, Accenture (NYSE: ACN) and MIT today launched the MIT and Accenture Convergence Initiative for Industry and Technology. The new initiative brings together Accenture's technology, strategy and industry experts and the best minds from across MIT to explore how the convergence of industry and technology will transform global business, what it means for the future of society, and how organizations can uncover and better capture its opportunities.
The five-year initiative will develop forward-looking thought leadership, research, educational programs and other activities to offer industry fresh insights and practical guidance on realizing the full potential of technology. The project is co-sponsored by Accenture's Chief Executive Officer Julie Sweet and MIT President L. Rafael Reif.
"As disruptive technologies and ideas continue to blur the boundaries between industries, moving with speed and designing a future that will benefit all requires a different approach," said Sweet. "Rapid progress will depend on the ability of industries to learn from each other, from technology leaders and

from diverse perspectives across business and academia. MIT, with its strengths across science and engineering, the arts, architecture, humanities, social sciences, and management, and its continuing commitment to interdisciplinary programs, is the ideal partner for Accenture to create breakthrough new research, education and thought leadership programs that can help companies and countries seize the opportunity of the convergence of industry, technology and markets and embrace the change it will bring to create more 360-degree value for all."

"The world is experiencing disruption beyond what any of us have seen in our lifetimes. In that context, it is more important than ever that academia and industry collaborate to address pressing societal challenges and opportunities," said Reif. "Building on MIT's long relationship with Accenture, we are eager to join forces again now to demonstrate how the convergence of industries and technologies is powering the next wave of change and innovation, and how we can harness and shape these forces for positive impact."

The MIT and Accenture Convergence Initiative for Industry and Technology will advance three main pillars:

Research: The initiative will address industry and technology convergence through a portfolio of near- and long-term joint research projects. Topics will range from the long-term impacts of the COVID-19 pandemic and reinventing healthcare with robotics, to the role of artificial intelligence in the workforce of the future, to driving value with digital manufacturing and supply chains. Insights from these activities will be developed into reports and presented at global forums.

Education: New programs combining the unique, leading capabilities of Accenture and MIT will explore areas such as cloud computing, artificial intelligence, bioengineering, 3D printing, robotics, 5G, blockchain, and quantum computing, to better equip industry and business leaders with an understanding of the convergence of forces reshaping business. Programs will be brought to life through novel approaches that allow for digital learning and collaboration at scale targeting business executives, as well as more than 500,000 Accenture people, and will include a C-level executive education program focused on immersing leaders in the foundations and implications of today's and tomorrow's technology.

Fellowships: Innovation is at the heart of this initiative, and innovation is fueled by diversity. To ensure that the initiative enhances diversity across critical disciplines, MIT will designate, and Accenture will provide academic support for, five "Accenture Fellows" each year among its graduate students. These fellowships will be awarded to graduate students working on research in industry and technology convergence who are underrepresented, including by race and ethnicity and by gender.

"Collaborating with MIT on cutting-edge industry research will enhance the value we provide to our clients and elevate our position as a global thought leader on technology and industry convergence," said Sanjeev Vohra, global lead of Accenture Applied Intelligence and Accenture's program lead for the MIT and Accenture Convergence Initiative for Industry and Technology. "This initiative will also give Accenture professionals and MIT faculty and students unique opportunities to explore, ideate and learn."

Anantha Chandrakasan, dean of the MIT School of Engineering and MIT's lead for the initiative, added: "Our new collaboration with Accenture, which will build upon prior mutual efforts, is an obvious and wonderful step forward. I can't wait to see the many incredible educational and innovative opportunities launched through this alliance."

Altair Introduces Modern, Comprehensive, and High-Fidelity Material Database for Simulation

28 October 2020

Altair announced the launch of the Altair Material Data Center, a modern, comprehensive, and high-fidelity material database for simulation. The Altair Material Data Center includes accurate data and data lineage for metals, plastics, and composites, and directly connects with Altair's and other major solvers.

One of the most important decisions in product development is the selection of materials for production. Altair has been investing significantly in the area of material modeling for several years and recently acquired M-Base, a leading international supplier of material database and material information systems with a focus on plastics.

The launch of the Altair Material Data Center, now combined with M-Base's plastic material database, allows Altair to provide the critical comprehensive material information and infrastructure needed to predict and optimize product performance through simulation. It enables designers, engineers, and scientists to explore materials – including structural, fatigue, fluid/thermal, electromagnetic properties, as well as manufacturing process specific data – in a standalone application or through the interface of Altair simulation and optimization tools.

"Altair Material Data Center is yet another compelling solution to help our customers save time, money, and improve product innovation and performance throughout the entire lifecycle of development and manufacturing," said James R. Scapa, founder and chief executive officer, Altair. "We have established strong relationships with material manufacturers and now with the acquisition of M-Base, we've expanded our presence in the plastics industry."

The Altair Material Data Center offers:

Comprehensive material information management system – access to materials data for metals, polymers, and composites, including data sheets, raw data, and solver cards with full traceability back to the supplier source, ensuring valid assumptions and consistency across teams

Flexible accessibility and scalability – customers can seamlessly access the Altair Material Data Center as a SaaS solution hosted by Altair or privately to manage proprietary information within the solution

Intuitive user experience – simple web-based interface to intuitively browse, search, view, and compare material data

Comprehensive simulation-centric data views – material cards can be quickly and easily generated for Altair's and all major solvers

Smooth integration – through an open API, the Altair Material Data Center can integrate with any desktop/solver for non-disruptive workflow

Broad and deep partnerships – strong relationships with material manufacturers, ensuring accurate, high-quality, and up-to-date material information

Collaboration – material experts can collaborate on the material curation process before it is published in the Altair Material Data Center for enterprise-wide domain specific access.

"Baosteel is proud to collaborate with Altair to deeply integrate our material data into the digital development process of automotive industry users while ensuring the data is easily accessible via Altair products and other commonly used CAE software without complex data processing," said Dr. Changwei Lian, senior researcher, Baosteel Group Corporation. "Having our high-quality material data included in the Altair Material Data Center will provide quick and convenient access to our latest research results

and the accurate application data reflecting the performance of Baosteel products."

"We are extremely excited to have SABIC's polymer material data included in the Altair Material Data Center," said Subhransu S. Mohapatra, material data leader, specialties, SABIC. "Altair customers will now have the ability to access SABIC's material engineering data to further enhance the depth and quality of information required for manufacturing simulation."

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Ansys collaborates with Microsoft to enhance cloud engineering productivity for customers

30 October 2020

Ansys is teaming with Microsoft to advance the state of the art in engineering simulation across industries, including industrial manufacturing and automotive. Integrated with Microsoft Azure cloud, HPC, digital twin and IoT services, Ansys' solutions will empower customers to swiftly solve some of the most challenging engineering problems imaginable — substantially increasing productivity, cutting development costs and expediting time to market.

Ansys® Cloud™, the underlying platform for running Ansys products in the cloud, integrates Azure cloud and HPC services with Ansys flagship simulation technologies. Since its initial release, Ansys Cloud continues to add powerful new capabilities. Supporting more physics-based solvers than ever, the new features will enable customers to use their existing software licenses and reduce modeling run times by increasing cores per job. Additionally, the features will deliver tremendous price-performance improvements and incorporate customers' existing Azure contracts. This will make it easier for larger organizations that have traditionally leveraged on-premises HPC to migrate to Ansys Cloud — equipping teams with extra capacity during peak usage.

"As a strategic partner and customer of both Microsoft and Ansys, our engineering teams will accelerate their product development processes with these dynamic new cloud capabilities," said Scot Tutkovics, vice president, engineering operations, Rockwell Automation. "Adding Ansys Cloud to our existing technology infrastructure sped up our simulations by 50% and we have solved larger problems with more accuracy. Together, we are boosting engineering productivity and driving top-line impact, even while our engineers work from home."

Additionally, Ansys is working with Microsoft to integrate Microsoft Azure Digital Twins with Ansys® Twin Builder™ to help customers better understand the current and future performance of operational assets. Employing physics and simulation-based analytics, users can markedly enhance operations — decreasing product maintenance costs and expediting next-generation products to market. Ansys' runtime digital twins will be natively represented in Azure Digital Twins. Feedback from early adopters across several industries is positive and Ansys and Microsoft engineers are working closely together to power the program's success.

Ansys is also collaborating with Microsoft to offer cloud-enabled autonomous vehicle (AV) simulation capabilities to joint customers. Ansys VRXPERIENCE, an AV virtual test platform, can unlock massive scalability when run on Azure, empowering users to test drive millions of virtual miles across countless scenarios in an expedient manner — greatly optimizing safety and development costs. The platform's general availability is planned for January 2021 and Ansys is exploring joint go-to-market opportunities with Microsoft.

"The rise of scalable, affordable, high-powered public cloud computing and IoT breakthroughs runs in parallel with our customers' view of simulation as a strategic differentiator," said Ajei S. Gopal, CEO at Ansys. "Bringing these elements together can significantly boost the impact and reach of simulation and

equip Ansys' vast user community to rapidly design and deliver transformational products on time and under budget."

"Our collaboration brings together Azure's compute and IoT capabilities with Ansys' simulation excellence to help businesses across industries transform at scale," said Scott Guthrie, executive vice president, Cloud + AI at Microsoft. "During a time when autonomous systems are on the rise, Ansys will enable cloud engineers to increase productivity and accelerate the delivery of innovative solutions."

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Capgemini new brand promise: Get the future you want

26 October 2020

Capgemini launches a bold and active brand platform for its clients and its communities: "Get the future you want." The new brand platform reflects the zeitgeist of current times where world events and rapid digital transformation require people to look at how they can leverage technology to define the future they want, a future that is inclusive and sustainable.

"Our new brand platform is more than a tagline. It captures the spirit and energy of Capgemini and conveys our optimistic vision of the future," comments Aiman Ezzat, CEO of the Capgemini Group. "We are conscious that technology is now the critical enabler to almost every transformation of business and society. However, with this potential comes a great responsibility to leverage it in a human way to energize people and businesses. Our clients need to know that they have a business partner at their side, to help them define their future through technology and make it a reality. For our team members, we help them to define their careers and achieve their personal objectives. That is our focus; to help our clients, our people, and our communities get the future they want."

'Get the future you want' appeals to organizations looking for a business partner they can trust, as much as it does to those who want to work for a responsible organization that empowers them. It builds on what Capgemini is recognized for today: its business and industry relevance, its deep and long-term technology experience and its passion for people. It also gives visibility to the Group's commitment to inclusiveness and sustainability.

Virginie Regis, Chief Marketing and Communications Officer and member of the Group Executive Committee at Capgemini explains, "Our new brand platform captures the spirit of our people. The planned creatives will demonstrate Capgemini's ability to understand the key challenges its clients are facing – from the role of technology in their business to the impact they have on the environment. Through our global advertising campaign and integrated communication activities we want our teams, our clients, and our partners, to feel that change can happen the way they want it to, and that we will help them achieve it."

In further development, this platform will showcase Capgemini's industry leadership in advancing the digital consumer experience, accelerating intelligent industry and transforming enterprise efficiency, leveraging its deep expertise in cloud and data. The expression of the brand promise will be represented across a variety of media platforms to reach Capgemini's target market of CxOs and top talent, each and every time with people at its heart. It will be featured in two waves, firstly in a global advertising campaign on CNBC up until the end of the year, complemented by targeted promotion across social media platforms. This will then be augmented by a series of high-profile homepage takeovers in leading media within Capgemini's key geographies throughout November.

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CONTACT Software joins the Edgecross Consortium

30 October 2020

Connected machines, automation and real-time process monitoring are the hallmarks of the smart factory. Edge computing plays a central role at the interface between IoT and the cloud. CONTACT Software now supports an initiative from Japan, which develops industry standards for this technology.

The cloud is the basis for the Internet of Things. However, it is less suitable for IoT applications that require real-time reactions. This is where the Edgecross Consortium, founded 2017 in Tokyo, comes in with its activities. The initiative, which was launched by Mitsubishi Electric, Omron, Advantech, NEC, IBM Japan and Oracle Japan, develops and certifies vendor-neutral edge computing solutions for Industry 4.0.

Edge computing is the collection and analysis of operational data at the edge of a network, i.e. close to the data source or directly within an automation solution. IoT applications can thus continuously monitor and optimize machinery and ongoing production processes in real-time.

Edge computing requires standards for hardware, software and communication protocols. In the global partner network of the Edgecross Consortium, more than 60 members from the IT, factory automation and industrial connectivity sectors contribute to this today. Their cooperation makes it possible to collect data from machine controllers and sensors independently of the supplier and to execute it on various industrial PCs from different manufacturers.

CONTACT Software and Mitsubishi Electric already use the Edgecross Basic Software in their joint IoT projects. This leads to digitally networked plants in which production lines, sub-process plants and components communicate with enterprise IT - the digital twin is the link here. The open software platform forwards all information and signals from the machines to an industrial computer from Mitsubishi Electric and converts them into an MQTT protocol.

"With the Edgecross Basic Software we integrate individual machines and their components into a holistic retro-fit scenario with real-time monitoring", says Sebastian Creischer, Account Manager IoT at CONTACT Software. "And through our Elements for IoT platform we link the operative data analyses with the internal company IT to create consistently digital, event-driven process chains".

Depending on the desired application, CONTACT Elements for IoT triggers, for example, predictive maintenance in service, spare parts ordering in purchasing, optimization of the production environment or product changes in development. "As partners, we can offer coherent concepts for the smart factory that unlock real Industry 4.0 potential and further advance the evolution of the shopfloor", says Stefan Knauf, Division Manager at Mitsubishi Electric. "This is why we want to cooperate even more closely with CONTACT".

Gerber Technology and Alvanon Announce 3D Collaboration to Achieve Unsurpassed Fit and eCommerce Success

30 October 2020

Gerber Technology continues to expand its global network and today announced a collaboration with Alvanon that will further strengthen their powerful 2D-to-3D for fit solution. The new collaboration between Gerber and Alvanaon will allow fashion and apparel companies to accurately simulate their customer's size and fit. As COVID-19 continues to drive an increase in online shopping, it is important

for fashion companies' clothing perfectly fits the body shape and sizes of each of their customers. Through this collaboration, Gerber's AccuMark® 3D users will be able to leverage the Alvanon Body Platform (ABP) to develop production-ready 3D samples and reduce fit errors. The collaboration, which will be demonstrated at ideation 2020, will empower and accelerate digital product development and eCommerce.

"We know how difficult it is for fashion and apparel companies right now as they navigate through the pandemic," said Mary McFadden, Vice President of CAD Product Management. "Digital transformation is now inevitable for companies who want to succeed in the next era and our collaboration with Alvanon will give them the tools they need to fully transform product development."

The COVID-19 pandemic has accelerated challenges within the fashion and apparel industry. Over the past several months, many companies have had to shut down their brick and mortar locations, adjust to working remotely and rely on eCommerce for a majority of their sales. Gerber's collaboration with Alvanon will help fashion companies recover from the pandemic and succeed in the new reality by enabling digital product development and eCommerce. Through the powerful combination of AccuMark 2D/3D and the Alvanon Body Platform, fashion companies will be able to develop perfectly-fitting garments that accurately reflect the sizes and body shape of their customer base, resulting in less returns and more satisfied customers.

"We have an opportunity today, with the technology and tools available to us, to build a new future for the apparel industry," said Jason Wang, COO of Alvanon. "One where the digital and physical are closely connected and work together."

Fashion brands, retailers and manufacturers will be able to go into Alvanon's vast library of over 6,000 3D virtual bodies, each representing a specific brands' fit standards, and download the 3D avatars for AccuMark 3D, use it to test patterns in all sizes and validate fit. Alvanon's library offers both standard (ASTM) and brand-specific avatars.

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Mentor receives 2020 TSMC OIP Partner of the Year awards for EDA solutions

26 October 2020

Mentor, a Siemens business, announced it has been recognized by TSMC as a recipient of two 2020 OIP Partner of the Year awards for EDA solutions. The awards honor TSMC Open Innovation Platform® (OIP) ecosystem partners like Mentor for demonstrating excellence in next-generation system-on-chip (SoC) and 3DIC design enablement over the past year.

The title of OIP Partner of the Year is awarded to partner companies achieving the highest standards of design, development and technology implementation to accelerate silicon innovation. Mentor plans to continue working with TSMC to enable next-generation SoC and 3DIC designs with certified solutions supporting TSMC's latest technologies.

For this year's achievements, TSMC recognized Mentor in the categories of "Joint Development of 3DIC Design Productivity Solution" and "Joint Development of 3nm Design Infrastructure".

"I'm pleased to congratulate Mentor as the winner of these two 2020 TSMC OIP Partner of the Year awards for EDA solutions," said Suk Lee, senior director of Design Infrastructure Management Division at TSMC. "They are a recognition of our continued partnership in addressing customers' design challenges and extending the development of our design platforms for smartphone, HPC, automotive, AI/ML and IoT applications."

Mentor earned the 3DIC Design Productivity award due to its expanded support for TSMC's 2.5/3D offering with Mentor's Xpedition™ software platform, including Xpedition Substrate Integrator for design planning and netlisting, and Xpedition Package Designer for substrate layout, which is now enhanced to meet TSMC's requirements for the latest variant of InFO. In addition, Mentor's Calibre® platform 3DSTACK technology has expanded its support of inter-die port connectivity check for TSMC offerings with support for the latest variant of CoWoS®, as the increasing complexity of customer designs require further analysis capabilities.

TSMC also recognized Mentor for certifying many of its flagship EDA portfolios to run on TSMC's bleeding-edge 3nm process technology. The Mentor offerings now certified for TSMC's N3 process include the Analog FastSPICE™ platform, which provides leading-edge circuit verification for nanometer analog, radio frequency (RF), mixed-signal, memory and custom digital circuits, as well as Mentor's Calibre® nmPlatform, which is the global IC verification industry leader.

"Mentor is pleased and honored that our long history of collaboration with TSMC has once again resulted in OIP Partner of the Year recognition," said Michael Buehler-Garcia, vice president of Product Management for Calibre Design Solutions at Mentor. "As our mutual customers continue to develop higher complexity designs, TSMC and Mentor stand ready to deliver the advanced platforms customers need to bring these increasingly sophisticated designs to life."

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New Workforce Challenges Emerge as Remote Work Expands, According to New SAP SuccessFactors Report

29 October 2020

Human resource (HR) managers across global organizations expect to be faced post pandemic with a bifurcated workforce of remote and on-site workers, creating challenges balancing employee needs, organizational goals, policies and culture, according to a survey released today by Oxford Economics, the Society of Human Resources Management (SHRM) and SAP SE.

The report surveyed HR leaders across 10 countries: Australia, Brazil, Canada, China, Germany, India, Mexico, Spain, the United States and the United Kingdom.

Some 78% of U.S. respondents and 63% of non-U.S. respondents said they expect flexible work policies to be a talent differentiator, according to the report "The Future of Work Arrives Early: How HR Leaders Are Leveraging the Lessons of Disruptions." However, more than half of U.S. respondents and 38% of non-U.S. respondents said that establishing a culture that supports remote employees will be one of the top three challenges when the pandemic subsides.

The report also found that despite employee readiness to learn new skills, few HR leaders are planning to invest in learning programs for reskilling and upskilling over the next 12 months. Outside of the United States, only 38% of respondents plan to invest in these programs. That drops to 22% among U.S. respondents.

"While HR leaders across the globe ranked maintaining productivity as their biggest challenge, it's critical that we not lose sight of long-term strategies around learning and reskilling, and diversity, equity and inclusion," SAP SuccessFactors President Jill Popelka said. "The urgency for more agile processes, easier access to data and the ability to support remote work is accelerating digital transformation. It's critical that leaders develop a culture of continuous learning and inclusion. This will enable workforces to drive needed transformation projects, even during a period of unprecedented change."

More than 80% of U.S. respondents said they were likely to recommit to corporate culture and value, and practice inclusive hiring and promotion. However, when compared with other countries, commitment in the United States to take specific actions toward these goals is less than other countries. For example, only 46% of U.S. respondents said they are likely to adjust wages or salaries to address pay inequities, compared with 85% in China and 64% in the United Kingdom. Furthermore, only 47% of U.S. respondents said they are likely to change structure or benefits to foster inclusion, compared with 73% in Mexico and 67% in Spain.

Additional key findings from the report include:

Challenges to Maintain Productivity Could Delay Long-Term Planning in Reskilling

Maintaining productivity given new ways of working is ranked as the biggest challenge for HR leaders. In Brazil, China, Mexico and Spain, more than 60% of HR leaders cited this as the biggest challenge.

Remote collaboration tools will see the most investment, ahead of analytics, technologies to ease the return to work, such as testing and tracing, and learning programs for reskilling.

Additionally, organizations are taking a buy-versus-build mentality, with most hires in the coming months expected to be new to the organization, rather than promoted within.

Remote Work Persists, Creating a Two-Tiered Workforce

Overall, organizations globally agree that remote work will be a talent magnet in the coming years and is viewed by many as a long-term investment. For example, 64% of U.S. respondents and 57% of UK respondents say they expect to have greater flexibility regarding remote work as a result of COVID-19.

However, respondents in China, India, Mexico, Spain and Germany face different circumstances and were most likely to say their employees can work from anywhere but do not have the technology or environment they need. In these countries, respondents were the most likely to say they are investing in remote collaboration tools and mobile platforms.

Service and field workers, general staff and customer service workers are also less likely to have the environment or technology to work remotely, compared to functions such as HR, sales, marketing and finance.

"This has been a year of dramatic challenges for organizations around the world, and human resource executives have been at the forefront of navigating their organizations through this unprecedented time," said SHRM President and CEO Johnny C. Taylor Jr., SHRM-SCP. "To realize the future of work, human resource executives and their colleagues on the leadership team must accelerate their efforts to establish culture, invest in talent and address diversity, inclusion and equity to drive their organizations forward. While HR executives continue to work through these difficult times, there is a great opportunity to lead meaningful change for the workplace and beyond as the report shows."

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PTC and Rockwell extend Strategic Alliance

29 October 2020

Having already helped almost 250 new customers around the world to achieve their digital transformation goals, PTC and Rockwell Automation announced today the expansion and early extension of their strategic alliance.

This extension will ensure continuity in both companies' sales and product development efforts and expand the agreement to include PTC's product lifecycle management and software as a service

(SaaS) products. This expansion will streamline both companies' commercial efforts to extend a comprehensive digital thread solution, from upfront design through the operate, maintain and optimize-lifecycle stages. PTC will also offer Rockwell Automation's virtual machinery simulation and testing software to its own customer and partner network. Under the agreement, both organizations will continue to leverage each other's resources, technologies, industry expertise, and market presence to seamlessly serve their customers through 2023 and beyond.

The companies' primary joint offering, FactoryTalk InnovationSuite, powered by PTC,is the industry's first comprehensive digital transformation software suite that offers fully integrated Industrial Internet of Things (IIoT), edge-to-cloud analytics, manufacturing execution systems (MES), and augmented reality (AR) – required for the connected enterprise. FactoryTalk InnovationSuite makes it simple to rapidly develop, operationalize, and globally scale innovative solutions to operations.

"Our selection of FactoryTalk InnovationSuite, powered by PTC could not have come at a better time for our company," said Teja Schubert, Director, Controls, Automation and Technology, Norbord, an international producer of wood-based panels. "As the first wave of COVID-19 hit, it became even more important to have a platform that helps us reduce costs, improve our employee's experience, and make better use of our maintenance and training efforts. This ever-important alliance has made it easier for our company to navigate the COVID-19 pandemic so far, and we look forward to leveraging future solutions."

As manufacturers reset their operations, competitive pressures and demands for better financial performance have accelerated the need to digitally transform products, processes, and people across all business levels. PTC and Rockwell Automation's industry-leading digital manufacturing solutions provide manufacturers with robust end-to-end digital thread capabilities, empowering them to continue their digital transformation initiatives amid the global pandemic.

"Over the past two years, PTC and Rockwell Automation teams have combined great innovation to offer our customers the world-class FactoryTalk InnovationSuite solution," said Blake Moret, chairman and CEO, Rockwell Automation. "The expansion and early extension of our contract with PTC signifies the increasing value of this strategic alliance and its importance to the Connected Enterprise."

Jim Heppelmann, president and CEO, PTC, said: "The strategic alliance with Rockwell Automation has expanded our reach and our capabilities as we champion Industry 4.0 initiatives around the world. The powerful impact of our offerings amid the current macroeconomic environment proves the market's need for this collaboration."

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Wipro and IBM Announce expansion of IBM Hybrid Cloud Practice

30 October 2020

Wipro Limited announced its intention to expand its IBM Hybrid Cloud Practice. Supported by technical experts from both organizations, the practice is expected to help Wipro customers modernize their digital operations across hybrid cloud environments by leveraging IBM Cloud Paks, containerized software running on Red Hat OpenShift.

Wipro's IBM Hybrid Cloud Practice unit will help customers innovate at scale by leveraging industry-ready Wipro solutions such as BoundaryLess Enterprise (BLE) and ModernizR. Both of these solutions were built with IBM Cloud Paks on Red Hat OpenShift and can run in any cloud environment, including the IBM public cloud.

BoundaryLess Enterprise (BLE) is a hybrid cloud management platform that offers a comprehensive array of technologies in a single environment that enables customers to run their cloud-native applications from anywhere. BLE leverages IBM's open hybrid cloud capabilities to support containers, IaaS, and PaaS computing models that can help enterprises accelerate their transformation journey to the cloud.

ModernizR is a software-based solution built with IBM Cloud Pak for Applications, a key technology in Wipro's cloud migration and operations portfolio. The solution is designed to help enterprises move their legacy applications to the cloud by leveraging artificial intelligence to mine and analyze customer's legacy applications and data. The resulting insights can be used to assess risk and recommend a migration strategy that includes employing automation to help software developers re-engineer the application.

Bhanumurthy B.M, President and Chief Operating Officer, Wipro Limited said, "Wipro empowers customers across industries to re-imagine their cloud journey with its business-first strategy and industrialized solutions approach. We believe the future will be driven by hybrid cloud hence, the expansion of IBM Hybrid cloud practice is intrinsic to our strategy. It will strengthen our relationship with IBM and help accelerate our clients' transformation journey across hybrid cloud environments."

Bob Lord, Senior Vice President, Cognitive Applications and Ecosystems, IBM said, "The expansion of our relationship with Wipro reinforces our joint commitment to help clients accelerate their journey to cloud across industries, including highly regulated sectors such as financial services, energy and utilities, manufacturing and healthcare. Wipro's industry knowledge, combined with IBM's hybrid cloud and AI platform powered by Red Hat OpenShift, can help enterprises drive real business transformation by migrating and managing their critical workloads across an open hybrid cloud environment."

Wipro is part of IBM's hybrid cloud ecosystem, an initiative to support global system integrators and independent software vendors to help clients modernize workloads with Red Hat OpenShift for any cloud environment, including the IBM public cloud. Red Hat OpenShift is the industry's leading enterprise Kubernetes platform. The IBM public cloud is the industry's most secure and open public cloud for business. With its security leadership, enterprise-grade capabilities and support for open source technologies, the IBM public cloud is designed to differentiate and extend on hybrid cloud capabilities for enterprise workloads.

Wipro recently announced a 5G edge services solution suite that integrates IBM Edge Application Manager and TRIRIGA to address a range of concerns related to deploying and managing distributed services on devices, private edges and telecom operator's Multi-Access Edges globally. The company received the IBM Beacon Award for Best IBM Hybrid Multi Cloud Practice at IBM PartnerWorld 2020.

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Events

OpenText Introduces Enfuse On Air: A new digital conference format for Cyber Resilience and Investigation Experts

29 October 2020

OpenText™ announced the agenda and keynote speakers for OpenText Enfuse On Air 2020. The premier security conference focused on the prevention, detection, and investigation of threats will be hosted digitally from November 10 – December 1. New content exploring emerging trends and scalable solutions will be released live and on-demand every Tuesday over the course of four weeks.

"In a year of unprecedented change, work from anywhere and digital acceleration, cyber-crimes are increasing faster than ever," said OpenText CEO & CTO Mark J. Barrenechea. "OpenText Enfuse On Air will bring together a community of experts to help organizations build cyber resilience and protect against the current and next generation of vulnerabilities."

At Enfuse, practitioners and industry experts in cybersecurity and data protection will come together to review best practices and find new opportunities with OpenText solutions. Attendees will be able to access keynote presentations, live and on-demand sessions from OpenText experts and industry leaders, and interactive virtual labs and CPE accredited training sessions. Each week will have a specific theme and provide opportunities for attendees to hear from law enforcement, government, and enterprise experts tasked with solving emerging problems and better managing risk.

Five Powerful Keynotes
To kick off Enfuse On Air on November 10, General Nadja West will deliver a keynote on effectively leading teams through times of uncertainty and crisis. As the first African American Army Surgeon General and first African American woman 3-star General in the Army, West brings more than 20 years of experience in executive leadership, crisis management, and disaster response. Instrumental in crafting the DOD medical response to the Ebola crisis, she will provide insights and experience that are especially relevant today.

Week two of Enfuse will feature keynotes from OpenText Chief Product Officer Muhi Majzoub and Craig Stilwell, EVP & General Manager SMB and Consumer. Muhi's keynote will highlight the latest OpenText solutions for digital investigations, incident response, endpoint security, and data discovery. Later that morning, Craig will speak to the latest threat trends and emerging opportunities, showcasing how OpenText can strengthen business security and data protection in an ever-changing landscape.

On November 24, Tarah Wheeler will speak to the future of cyberwar and share her perspective on threat modeling during the current era of rapid technology change. As the former cybersecurity czar at Symantec and the Head of Offensive Security & Technical Data Privacy at Splunk, Wheeler is a global leader in keeping private citizens and corporations safe from cyberattacks, and she will share her insights on how to best adapt limited security resources to meet the challenges presented by COVID 19 and the evolution of remote work.

To close Enfuse On Air, OpenText CEO & CTO Mark J. Barrenechea will deliver a closing keynote on December 1, focused on the critical role of security - especially digital investigations - to the safety, security, and core function of our society, governments, and businesses.

Four weeks of original, themed content available live and on-demand for digital attendees
OpenText Enfuse On Air will host keynotes, on-demand sessions, and lab training opportunities every Tuesday between November 10 and December 1, 2020, with a different focus each week. For a full list of sessions, please click here.

Tuesday, November 10 – Digital Investigations Part I: Kicking off with a keynote from General West, this week will focus on the need to "investigate everywhere." Key topics will include emerging investigation trends and techniques such as Apple Filesystems (APFS), advancements in mobile and social media investigations, and the impact of ransomware on law enforcement. Attendees can join sessions like, "AMA with OT Forensic Solution Consultants" and "Holding the Public for Ransom."

Tuesday, November 17 – Discovery and Cyber Resilience: The second week will focus on the need to rethink data discovery. OpenText experts, customers, partners and industry experts will host sessions dedicated to managing data discovery as an efficient, repeatable and cost-effective process. Sessions will include customer-led best practice talks, recent trends in legal and regulatory matters – with courses like "Mobile Device, Cloud and Social Media Investigations" – and strategies to mitigate legal risk, cost, and reputational damage.

Tuesday, November 24 – Security and Incident Response: Week three will be anchored by a keynote from Tarah Wheeler, and will include labs and break-out sessions on threat detection techniques and tactics, incident response workflow automation, and lessons learned from real-world compromises. For students looking to enter the security field, OpenText will offer courses such as "Breaking into Security" and "The Super Powers of Super Computers."

Tuesday, December 1 – Digital Investigations Part II: To close Enfuse On Air, OpenText CEO & CTO Mark J. Barrenechea will outline the OpenText vision on information security & protection. Content for the week will focus on the role of forensic hardware in the investigation workflow, advanced data recovery techniques, and optimizing EnCase for the best and fastest possible experience. This will include insights and tips for security professionals dealing with the current crisis. Attendees can join sessions like "Incident DFIR, Triage, and Scope Assessment with EnCase Endpoint Security."

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Financial News

Capgemini posts marked recovery in activity in Q3 2020

27 October 2020

Capgemini Group achieved consolidated revenues of €4,008 million in Q3 2020, up 15.6% year-on-year at current exchange rates and 18.4% year-on-year at constant exchange rates*.

Aiman Ezzat, Chief Executive Officer of Capgemini Group, said: "The quarter, which came in better than expected, brought a significant performance improvement over Q2 across all our regions and businesses. Digital and Cloud continues to expand, up more than 10% year-on-year, and bookings remain strong. We expect Q4 to confirm this favorable trend and record a further but limited improvement, due to recent developments in the health situation. In this framework, our performance for 2020 should exceed the mid-point of the range announced, both for growth and operating margin, and we remain confident in the prospects for further improvement in 2021.

In addition, Altran integration is developing as planned. A 5G & Edge offering was launched, the first of a series of Intelligent Industry offerings.

Finally, the quarter was marked by the adoption of the Group's Purpose: "Unleashing human energy

through technology for an inclusive and sustainable future." Developed in collaboration with all of the Group's stakeholders, this Purpose is founded on our belief that technological innovation should benefit all of humanity".

The Group's Q3 performance improved significantly on Q2, both for growth at constant exchange rates* and organic* growth. As in the previous quarter, Capgemini benefited fully in Q3 from the consolidation of Altran Technologies ("Altran") in the Group scope.

With Q3 2020 revenues of €4,008 million, growth at constant exchange rates was +18.4% year-on-year, a considerable improvement on Q2 growth of +13.4%.

The improvement in organic performance (i.e. adjusted for the impacts of currency fluctuations and changes in Group scope) was also substantial, with Q3 revenues contracting only -3.6% year-on-year, compared with -7.7% in Q2.

All Group businesses and regions contributed to this improvement. It also reflects demand, which accelerated once again in Digital and Cloud services. With growth of more than 10%, these activities accounted for over 60% of the Group's activity in Q3 20201.

For the first nine months of the year, Capgemini growth reached +10.6% on a reported basis and +11.3% at constant exchange rates. Group organic growth saw a limited decline of -3.5%. In the face of the Covid-19 crisis, this demonstrates the resilience of Capgemini's revenues, strengthened in recent years by the sector and geographic diversification of the Group's client base and the development of a portfolio of innovative offerings.

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ESI reports Third-quarter 2020 sales

28 October 2020

ESI Group releases its sales for the third quarter of 2020 (period from July 1st to September 30th).

In Q3 we report similar trends as presented since the start of the pandemic crisis: a strong resistance with a slight growth in Licenses Repeat business together with a serious decrease in Services and New License activity, driven by customers' own need to pause some activities. We thus continue to very carefully manage costs. Yet, we observe a growing readiness from industrialists to engage in or pursue their digital transformation, from existing reliance on real testing for validation to increasingly anchor more on iterative and virtual testing and collaborative methods. Because of ESI's unique ability to deliver highly realistic and predictive simulation models they are shifting budgets from real testing to virtual prototyping – propelling it beyond the R&D departments to being used on a real-time basis, in design, manufacturing and operations with high proven benefits. For ESI, this means continued robustness of the existing business and a revival of innovative new business, thanks to local and global initiatives. Cristel de Rouvray,Chief Executive Officer of ESI Group

Third quarter year-over-year comparison

In Q3 2020 ESI Group generated sales of €21.8m (-12.0% at current exchange rates), impacted by unfavorable exchange rate trends (-8.6% at constant exchange rate – cer). This third quarter lies in the same dynamics as the first half of 2020.

Q3 Licenses sales decreased to €17.0m (-7.8%, -3.9% cer) and represented 77.7% of total sales (vs. 74.2% in Q3 2019). Both Repeat Business (€11.0m) and New Business (€2.6m) show some

improvement compared to the first part of the year. Repeat Business grew by 2.2% cer compared to 0.5% cer in H1. New Business in Q3 decreased by 22.8% cer compared to 53.2% cer in H1.

Q3 Services sales, in continuation of the trend observed in H1, decreased to €4.9m (-24.1%, -22.2% cer).

9-month comparison

ESI Group's sales for the first 9-months of 2020 amounted to €102.6m (-9.3%, -9.0% cer) compared to the same period last year.

Licenses decreased to €86.2m (-6.1%, -5.8% cer). The momentum was strong on the installed base, with a good level of licensing recurrence (85.5% over 9m 2020) and the stability of Repeat Business (€81.2m, +0.7% cer), and more particularly among key customers.

9-month 2020 sales geographical breakdown by region splits as follows: EMEA represents 48.8% (vs. 49.9%), Asia/Pacific represents 36.6% (vs. 36.0%) and the Americas represent 14.6% (vs. 14.1%). In the EMEA region, sales decreased by -11.2%, (-11.0% cer), mainly in France and Southern Europe. This situation ties with the slowdown in key industries for the Group, especially in Aeronautics and Services, and is being cautiously managed.

The sales breakdown for ESI's four focus industries accounted for approximately 90% during the period (vs. 90.6%). The Automotive & Ground Transportation activity, the Group's leading industry sector, remained relatively stable, despite a difficult economic context. While other industries also suffered from the pandemic crisis, the most significant slowdown goes to the Aerospace industry.

Business highlights: Growing customer excitement

In the current uncertain global context, the Group relies on strong resilience of its business model and the ability of its team to revitalize new business with compelling solutions responding to customers' key "Outcome Value". Significantly and recently:

Nissan's Breakthrough in 'Carbon Fiber Reinforced Polymer' (CFRP) parts production for Safer and Lighter Vehicles. The challenge was to industrialize the production process of this very time-consuming and expensive manufacturing activity to reduce costs and development time. ESI supports them in reaching the expected level of productivity, namely: 50% reduction of the lead time and about 80% reduction of the cycle time for molding, compared with conventional methods.

JMDA won the coveted "Red Dot Design Award" for their innovative, cutting-edge child restraint systems for Tinyseats Europe AB. Their partnership with ESI enabled rigorous testing without the need of any 'real' prototypes, very early in the design process, de-risking compliance challenges. This award demonstrates the successful ability to navigate trade-offs among cost, design, safety and performance with the appropriate expertise, solutions and trust-based relationship. More here

Committed to continue shaping the future of industry, ESI relies on its research and innovation global teams to develop solutions answering to specific industry problematics, for instance guiding manufacturers in their decision-making process for their products in operation:

In the AMPLI project, ESI Group and its European partners (Whirlpool, IPC, ENSAM and LMS) are collaborating to improve manufacturing efficiency, address skill gaps and retain young talent on shop floors by equipping machine operators with real time information and knowledge derived from domain specific numerical models delivered in Augmented Reality. More here.

Since the beginning of the pandemic crisis, ESI has been demonstrating its ability to sharply pivot and adapt by establishing new ways of communication and marketing of its value to the global ecosystem. Illustrating this emphasis, on September 27th, Cristel de Rouvray hosted a digital keynote to position the Group and its Hybrid Twin™ solution during the Sino-German "World New Energy Vehicle Congress" in front of +44,000 attendees.

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Nemetschek SE shows favorable business development in the third quarter and raises outlook for the full year 2020

29 October 2020

The Nemetschek Group raises its outlook for the full year 2020 in terms of revenue and profitability levels following a favorable development in the third quarter. Even though the impacts of the global corona crisis continue to be felt, and may well intensify again in several regions, the Nemetschek Group posted a slight increase in customer demand in the third quarter. As a result of business activities which exceeded original expectations and cost management which was implemented at an early stage, the executive board of the MDAX company now anticipates revenue growth in the mid-single-digit percentage range with an EBITDA margin of 28% to 29% for the full year 2020. After a temporary, corona-related restraint, Nemetschek will now be investing more in order to secure future growth.

Major indicators of the Group's success in the third quarter / 9-month period of 2020

- Compared to the previous year, Group revenue rose by 7.5% (currency-adjusted: +10.3%) to EUR 148.6 million in Q3. The increase in revenue is as a result of solid organic growth of 4.5% (currency-adjusted: 7.1%) as well as the revenue contributed for the first time by the Red Giant acquisition in the Media & Entertainment segment. In the first nine months of 2020, revenue rose by 7.6% (currency-adjusted: 7.8%) compared to the same period in the previous year, while organic growth amounted to 4.7% (currency-adjusted: 4.9%).

- Recurring revenues from software service contracts and subscriptions were up by 18% (currency-adjusted: 20.8%) and remained a major growth driver in Q3. In the first nine months, revenue even rose by 22.0% (currency-adjusted: 22.3%). Thus the proportion of recurring revenues in Group revenue rose to 60.8% in the first nine months (previous year's period: 53.6%).

- The license business recovered in Q3 and posted a considerably slighter decline in revenue compared to the previous quarter (Q2 2020). License revenues amounted to EUR 51.8 million, a decline of -5.7% compared to the same quarter in the previous year (currency-adjusted: -2.9%). In the first nine months, these were -9.2% (currency-adjusted: -9.0%) below those of the previous year, amounting to a total of EUR 152.0 million.

- As a result of the positive revenue development and high levels of discipline in terms of cost management, consolidated operating earnings before interest, taxes, depreciation and amortization (EBITDA) rose to EUR 46.7 million (+9.1%) in Q3. At 31.4%, the EBITDA margin was above the previous year's level (Q3 2019: 30.9%). In the first nine months, the margin thus improved slightly, rising to 29.6% (previous year's period: 29.4%). The above-average margin is mainly due to the reluctance to invest, such as new hires, and lower travel and marketing expenses since the beginning of the corona pandemic. However, Nemetschek is planning to increase investment again in the following quarters.

- Earnings per share in Q3 amounted to EUR 0.22 (previous year's quarter: EUR 0.21, adjusted for the positive one-off effect arising from the sale of DocuWare). In the first nine months, earnings per share

rose to EUR 0.59, an increase of 2.7% compared to the adjusted value of the previous year (EUR 0.57).

The four segments of the Nemetschek Group were affected to varying degrees by the impacts of corona in the first nine months due to their regional focuses (see table). In the Design segment, with its focus on Europe, revenues stabilized in Q3 after a slight decline in the first half of the year. As expected, the Build segment, with its focus on the USA, felt the effects of the crisis with a time lag. In the Manage segment as well, the negative effects were only felt after a delay and are expected to continue due to cautious investments by the important customer group of facility managers. The Media & Entertainment segment was significantly strengthened by the acquisition of Red Giant. The integration of the US company, which has been consolidated since January 2020, into the Maxon brand continues to proceed according to plan.

"As a result of our close customer relationships, broad diversification with regard to target industries and regions and the growing proportion of recurring revenue, we have so far overcome the corona crisis better than initially expected," sums up Dr. Axel Kaufmann, Spokesman of the Executive Board and CFOO of the Nemetschek Group. "Even though we are currently seeing slight signs of recovery in the market, we must assume that the global Covid-19 pandemic with its strong resurgence in infection figures will continue to influence our business development in the short term. Caution therefore remains the top priority. In the medium and long term, however, we still see great potential in our end markets. We will therefore increase our investments in order to support our customers with our innovative solutions in the course of their digital transition."

Outlook 2020 for the Group adjusted upwards
As a result of development which was better than expected in the first nine months of 2020, ongoing increases in the proportion of plannable revenues and wide regional and market-related diversification of risk, the executive board raises the revenue and profitability targets for the full year 2020 despite an environment which continues to be uncertain. The executive board now anticipates an increase in Group revenue in the mid-single-digit range and an EBITDA margin of between 28% and 29%. The forecast in March was made in expectation of stable development or a slight increase in Group revenue with an EBITDA margin of more than 26% of Group revenue.

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PTC Announces Fiscal Fourth Quarter And Fiscal 2020 Results

30 October 2020

PTC today reported financial results for its fiscal fourth quarter and fiscal year ended September 30, 2020.

"Continued solid execution by our global team overcame challenges related to the ongoing pandemic, leading to strong bookings in our fourth quarter. The pandemic has helped customers recognize the value PTC can unlock through our digital transformation solutions – from enabling global team collaboration across the product development process, to remote asset management, to remote support and front-line worker training, to the growing importance of SaaS-based technologies," said James Heppelmann, President and CEO, PTC.

"We believe that our fourth quarter performance and robust pipeline points to a promising start to our fiscal 2021, despite ongoing macro uncertainty. While consensus around the timing and shape of a broader economic recovery remains uncertain, it is clear that PTC is very well positioned to continue to drive new innovations across our product portfolio, enable significant customer value in the new normal, and deliver strong sustainable growth," concluded Heppelmann.

Fourth quarter and fiscal year 2020 highlights1

Key operating and financial highlights are set forth below. For additional details, please refer to the prepared remarks and financial data tables that have been posted to the Investor Relations section of our website at investor.ptc.com.

ARR was $1.27 billion. Year-over-year growth of 14%, or 11% in constant currency, reflects solid performance in our Core and Growth businesses, in our global channel, and, as expected, contribution from our Rockwell Automation Strategic Alliance.

Revenue was $391 million in Q4'20 and $1,458 million in FY'20. Q4'20 growth of 17% compared to Q4'19, and FY'20 growth of 16% compared to FY'19, was driven by strength across our Core and Growth businesses, as well as the impact of ASC 606 and related business policy changes.

Cash flow from operations was $34 million in Q4'20, compared to $55 million in Q4'19, partly reflecting the impact of interest payments in Q4'20. For FY'20, cash flow from operations was $234 million, compared to $285 million in FY'19. Free cash flow was $29 million in Q4'20, compared to $50 million in Q4'19. For FY'20, free cash flow was $214 million, compared to $221 million in FY'19, and guidance of approximately $210 million.

Operating margin was 17% in Q4'20 compared to 14% in Q4'19; non-GAAP operating margin was 32% in Q4'20, compared to 24% in Q4'19. Operating margin was 14% in FY'20, compared to 5% in FY'19; non-GAAP operating margin was 29% in FY'20, compared to 20% in FY'19.

Total cash, cash equivalents, and marketable securities as of the end of Q4'20 was $335 million; total gross borrowings as of the end of Q4'20 was $1.0 billion.

1 We include operating and non-GAAP financial measures in our operational highlights. The definitions of these items and reconciliations of Non-GAAP financial measures to comparable GAAP measures are included below and in the reconciliation tables at the end of this press release.

Fiscal 2021 Outlook

"PTC's solid financial performance throughout this challenging economic environment reflects the value our customers see in our solutions coupled with the benefits of our subscription transition, which is now officially in the rear-view mirror. Looking forward, we remain committed to delivering attractive FY'21 ARR with significant operating and free cash flow growth." said Kristian Talvitie, EVP and CFO, PTC.

Fiscal 2021 Guidance

Our fiscal 2021 financial outlook includes the following assumptions:

Macroeconomic conditions related to the COVID-19 crisis remain stable near-term with conditions improving in the second-half of FY'21.

Churn improves approximately 100 bps at the midpoint of guidance.

ARR growth includes a ~2% headwind from lower backlog for FY'21 exiting FY'20, resulting primarily from COVID-19-related bookings pressure in FY'20.

ARR YoY growth rates, on a constant currency basis, are expected to be approximately linear each quarter throughout FY'21.

Revenue growth decelerates in FY'21 reflecting the impact of ASC 606 and related business policy changes that benefited revenue in FY'20.

FY'21 operating expense growth of approximately 10% YoY, reflecting headcount additions, higher

variable compensation, travel, and marketing expenses.

GAAP tax rate is expected to be 20%, Non-GAAP tax rate is expected to be ~19%.

Operating cash flow and free cash flow tailwinds of approximately $60 million, reflecting lower restructuring, interest-related, and acquisition-related cash expenditures.

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SAP Announces Third Quarter and First Nine Months 2020 Results

26 October 2020

SAP SE announced its financial results for the third quarter 2020 ended September 30, 2020.

Strong Double-Digit Growth in EPS and Cash Flow
SAP Accelerates Transition to Cloud, Targets More than €22 Billion
in Cloud Revenue by 2025

Current Cloud Backlog of €6.6 Billion, Up 16% At Constant Currencies

IFRS Cloud Gross Margin Up 1.8pp; Non-IFRS Cloud Gross Margin Up 0.7pp At Constant Currencies

IFRS Operating Margin Down 2.2pp; Non-IFRS Operating Margin Up 1.3pp At Constant Currencies On Strong Prior Year Comparison

IFRS EPS Up 26%; Non-IFRS EPS Up 31%

Operating Cash Flow Up 54%, Free Cash Flow Up 79% Year-To-Date

Updates 2020 Outlook and Mid-Term Ambition

Targeting Significant Expansion of Cloud Revenue to More than €22 Billion, Share of More Predictable Revenue of Approximately 85%, Non-IFRS Cloud Gross Margin of Approximately 80% by 2025

Targeting Double-Digit Non-IFRS Operating Profit Growth from 2023 to 2025

COVID-19 has created an inflection point for our customers. The move to the cloud combined with a true business transformation has become a must for enterprises, to gain resiliency and position them to emerge stronger out of the crisis. Together with our customers and partners we will co-innovate and reinvent how businesses run in a digital world. SAP will accelerate growth in the cloud to more than €22 billion in 2025 and expand the share of more predictable revenue to approximately 85%.

Christian Klein, CEO

In Q3 we continued to improve our operating margin against a strong prior year comparison amidst a challenging environment. Earnings per share and cash flow grew even more rapidly. This allows us to raise our 2020 free cash flow outlook even beyond the target communicated last November. Our expedited move to the cloud will ensure we continue our path as a cloud growth company while we remain focused on cost efficiency. These actions and our resilient business model position us well to meet our new ambition targets as uncertainty recedes.

Luka Mucic, CFO

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Implementation Investments

Altair Named Official Supplier for Luna Rossa Prada Pirelli Team
29 October 2020

Altair announced an agreement with Luna Rossa Prada Pirelli, one of the challengers in the PRADA Cup and the 36th America's Cup presented by Prada. Under this agreement, Altair is named an official supplier for the Luna Rossa Prada Pirelli team and will provide the engineering team of the sailing boat, AC75 Luna Rossa, with simulation software and engineering services.

Altair's simulation solutions have been applied to design, develop, and optimize most of the boat's components, and used to study the structural side of fluid structure interaction (FSI). With this type of analysis, the Luna Rossa Prada Pirelli engineers investigated the response of the boat's overall structural model to its impact with water, obtaining important information on how the composite structures of the hull, deck, and interior would react under dynamic conditions. The engineers also evaluated the shape of the components immersed in water under load, taking into account the orthotropic elastic properties of composites and connecting structures. Finally, the team applied topology optimization on many metal components to fully exploit the design flexibility provided by additive manufacturing. These optimizations resulted in organic structures with optimal material distribution at maximum stiffness.

"We are delighted to welcome Altair as an official supplier," said Alessandro Franceschetti, head of structural engineering of the Luna Rossa Prada Pirelli team. "Altair provides one of the most advanced and efficient composite design platforms on the market. The optimization of composite structures with Altair OptiStruct has allowed us to automate the ply-by-ply structural sizing processes of all primary structures of the boat, reaching an unmatched level of detail. This systematic and detailed approach to composite optimization has opened the door to a radical approach in the construction of components in the yard. It has also resulted in significant weight savings with the same structural efficiency while also improving the weight distribution of the boat."

"Altair empowers innovation," said Pietro Cervellera, Altair's senior vice president of EMEA. "We are proud to support the Luna Rossa Prada Pirelli team on its way to the next America's Cup and are dedicated to providing the team with cutting edge solutions, which will give them a competitive advantage, leading to a successful race in Auckland. We wish the team the best of luck."

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Boeing Qualifies Stratasys Antero 800NA Material for 3D-Printed Flight Parts
29 October 2020

Boeing has qualified the Antero 800NA thermoplastic to its repertoire of 3D printing capabilities, Stratasys Ltd. (NASDAQ: SSYS) announced today. The qualification means the high-temperature material can now be used on flight parts for Boeing planes.

Antero 800NA is a PEKK-based polymer developed specifically for production-grade Stratasys FDM® 3D printers. Boeing has released specification BMS8-444 and added the 800NA material to the Qualified Products List (QPL) after an extensive evaluation of the material's performance. It is the first material from Stratasys qualified by Boeing for use in applications with elevated chemical resistance or fatigue requirements.

"Boeing has recognized the tremendous utility of Antero to meet applications that couldn't have been 3D-printed before," said Stratasys Aerospace Vice President Scott Sevcik. "Additive manufacturing has

tremendous benefits for simplifying aerospace supply chains both in original equipment and MRO, but robust materials for meeting challenging flight requirements have been needed."

The Antero family of materials includes 800NA as well as Antero 840CN03, which is an electrostatic dissipative (ESD) variant. Stratasys provides these materials both for customers who use the Stratasys F900 and Fortus 450mc 3D printers and as a material option for on-demand customers through Stratasys Direct Manufacturing.

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Continental AG Migrates PLM Data with Prostep OpenPDM

27 October 2020

Continental AG has been using PROSTEP's OpenPDM product suite for a year now. Use of the world's leading platform for PLM integration, migration and collaboration not only reduces the time and effort involved in migrating data in the context of the carve-out of the subsidiary Vitesco, but also helps Conti harmonize its heterogeneous PLM landscape. Some of the group's divisions are still working with SAP PLM software, which is to be gradually replaced by PTC Windchill, the most widely used PLM system at Conti.

With a workforce of over 241,000 and sales of 44.5 billion euros in the 2019 financial year, Conti is one of the largest automotive suppliers in the world. The company has carved out the entire Powertrain division, including electric drive technology, and created an independent subsidiary, which is to be floated on the stock exchange under the name Vitesco Technologies. To ensure that the carve-out is not delayed by a long system selection process, it is intended that Vitesco, if possible, uses the same systems and configurations as before.

Within the framework of the carve-out, PROSTEP took on the task of extracting the product data relevant to drive technology from the existing Windchill installation at Conti and migrating it to a separate instance at Vitesco. It was possible to automate this process with the help of OpenPDM and the standard connectors to PTC Windchill. The logging of all exchange processes also ensured that the data arrived in the target system with a controlled level of quality.

Conti is also using the PLM integration platform in the context of replacing the SAP PLM installation with Windchill. Although an engineering service provider has already migrated the majority of the company's inventory data in the course of a bulk migration, sovereignty for processing the data was not always transferred to Windchill. There is sometimes still a need to use SAP PLM and to allow the users to decide when they want to transfer the data together with sovereignty over the data to Windchill. PROSTEP has created an OpenPDM-based integration between SAP PLM and Windchill that provides users with the functions they need to perform ad hoc transfer.

"At Conti, OpenPDM is being used in two different scenarios that show how flexibly our integration platform can be adapted to accommodate and meet different requirements," says Bernd Döbel, Head of Sales at PROSTEP. "While Windchill-to-Windchill migration in the run-up to the carve-out involved a highly automated process, transfer of data from SAP PLM to Windchill is managed by the users themselves. In both cases, however, the data is transferred in a fully-automated asynchronous process that runs in the background."

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Equinor Collaborates with TCS to Accelerate its Transformation into a Digital Energy Company

28 October 2020

Tata Consultancy Services has been selected as a strategic partner by Equinor, the Norway-headquartered global energy company, to accelerate its digitalization journey and help realize its vision of becoming a digital energy company.

TCS will leverage its deep domain knowledge of the energy sector, expertise and scale in digital technologies and investments in research and innovation, to achieve data democratization across Equinor's core operations and harness the power of machine learning and advanced analytics to help Equinor achieve its growth and transformation objectives.

An initial focus area will be sub-surface data and analytics, where TCS will work with Equinor's teams to make available high-quality datasets anywhere, anytime, to different stakeholders, by populating Equinor's sub-surface data lake. This will act as a single source of truth for all subsurface data within the enterprise. Insights derived using machine learning and advanced analytics will enable Equinor to accelerate a more data driven approach to key business areas such as exploration, field development, and operations, to improve hydrocarbon recovery rates and reduce extraction costs.

TCS will also help Equinor leverage data better in the area of safety, security and sustainability, to drive superior outcomes by correlating various safety reports and datasets, identifying relevant patterns and trends to predict and prevent incidents, and help improve its safety and sustainability outcomes.

TCS will use its proprietary DATOM™ framework to assess data maturity levels, identify gaps, develop a roadmap to simplify operating models, set up data governance models, and build technology patterns and architectures to help Equinor fully leverage data and analytics to drive superior business outcomes. Additionally, TCS will use its Location Independent Agile™ model to deploy innovative ways of working that will help enhance speed to market, while helping align outcomes closely with business objectives.

"Enterprises are increasingly realizing that the first step in a successful digital transformation journey is to become a data-driven organization. Data and analytics are today central to enterprises' ability to discover new value creation opportunities, and are becoming core to the enterprise operating model," said Dinanath Kholkar, Global Head, Analytics and Insights, TCS. "TCS is proud to partner with Equinor to create a strong data and analytics foundation, leveraging its capabilities in advanced analytics and AI solutions, and help accelerate their insights-driven transformation journey to become a digital energy company."

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Honeywell Driving Digital Transformation Through Strategic Initiative with Ansys

28 October 2020

Honeywell is leveraging Ansys technology to kickstart digital transformation initiatives that will benefit customers by lowering development costs and cutting down the time it takes to bring products to market.

Through a multiyear agreement, Ansys is providing Honeywell with solutions that span the engineering design chain and help optimize the testing and simulation processes that are critical to taking products from the concept phase through to completion. Honeywell customers will see products come to market faster than before and reduced costs in the long run as cycle times shorten.

"This agreement will allow Honeywell to drive process improvement and digitization across the company — signifying a tectonic shift in the way our talented engineering teams design new products,"

said Suresh Venkatarayalu, chief technology officer at Honeywell. "This work with Ansys will improve efficiencies, reduce costs and help our customers get the products they need quicker."

Ansys solutions can digitally simulate product testing that would have previously taken years in some cases. For example, a valve in a Honeywell aircraft engine that regulates pressure in a pipe or duct can be modeled in new ways. Through digital modeling, engineers can vary the pressure and temperature of the valve to gauge its strength and discover failure points more quickly. Engineers would no longer need to build several different configurations and proceed with costly tests of each.

"Through this agreement, Honeywell engineers can spark the next wave of innovation, minimize the costly expense of creating physical prototypes and increase their production velocity," said Rick Mahoney, senior vice president of sales, marketing and customer excellence at Ansys. "Our solutions reinforce a clear digitization strategy for Honeywell, powering broad simulation sharing and collaboration between geographically dispersed engineering teams and throughout functional silos."

This collaboration standardizes Ansys' full portfolio of high-fidelity simulation solutions as Honeywell's common simulation platform across its global organization. Incorporating Ansys solutions improves Honeywell's simulation process and can significantly cut development cycle times. Ansys technologies will help Honeywell engineers confirm data integrity, create consistent and standardized processes, and establish common architectures and platforms across Honeywell's globally distributed engineering teams.

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InterDesign Invests in Innovative Product Lifecycle Management Solution

28 October 2020

Centric Software® is delighted to announce the release of a success story about its customer, InterDesign.

Established in 1974 and based in Solon, Ohio, InterDesign is a housewares company that makes bath, kitchen, laundry, closet and other innovative storage solutions. InterDesign currently sells to 100+ countries with distribution in Ohio, Europe, China and Japan.

Due to the growing complexity of their business and the need to manage higher volumes of product at faster speeds, InterDesign enlisted Centric 8 PLM.

Radu Ghiorghie, Design Director at InterDesign says, "The evolution of our processes is a mirror of our growth as a company from both the employee footprint and the complexity of our operations. With that growth, comes a cultural shift and in parallel, being cognizant of the continuous advancement of technology made us realize that we needed a strategic goal around digital transformation tools, which led us to PLM."

Today, all their product information is in one digital, accessible repository, roles and responsibilities are clearly defined and there is total product definition at the front-end.

Ghiorghie says it is important to have "the ability to see where everything is at any point in time especially at the front end, where we really nailed the product definition and categories. All that information is now very well organized for product development. We are seeing these benefits immediately."

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Ottobock Modernizes Product Innovation with the Aras End-to-End Platform

27 October 2020

Aras announced that Ottobock, a global market leader in prosthetics, has selected the Aras platform to streamline research and development (R&D) processes and systems across the enterprise, setting a foundation for the next phase of organizational growth.

Ottobock embarked on an IT digital transformation initiative, with a product lifecycle management (PLM) strategy being at the forefront. As part of this effort, it underwent an assessment that looked at their current business landscape in R&D and identified key areas to strengthen the organization. Ottobock had been managing documents and data in a several different systems, with most processes being document based – whether that be physical paper documents or documents stored in several shared databases. Ottobock was looking for a more sustainable way to move forward by eliminating manual processes, transforming non-digital data, and breaking down both data and organizational silos.

The Aras platform will provide full lifecycle traceability, strong data integrity, and overall increased operational efficiency. By basing its digital transformation strategy on an open platform, Ottobock can make decisions throughout every aspect of the product lifecycle and improve communication and collaboration across the enterprise – resulting in the development of better products with a shorter time to market.

Design History Files (DHF) and Device Master Records (DMR) are key factors to ensuring strong design control traceability and reduced compliance risk. Aras' partner Minerva played a significant role in the selection with its industry trusted, out-of-the-box medical device templates for both DHF and DMR. A second Aras partner, XPLM, leveraged their expertise integrating application, processes, data and information to enable seamless cross-domain system integrations.

"At Ottobock, we work hard every day to improve the quality of life of our patients and users. To achieve this goal now and in the future, our focus is on innovation and outstanding technology," said Erik Albrecht-Laatsch, Director Engineering at Ottobock. "The Aras platform provides us with a resilient way forward by migrating our data and processes into one central system, allowing us to accelerate product innovation and growth."

"Ottobock develops solutions and strategies that help people master the challenges of everyday life," said Andreas Mueller, SVP European Operations at Aras. "By selecting the Aras platform, they now have a foundation that allows them to continuously build upon to be prepared for the future as their business initiatives evolve and become more complex."

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Shell and AVEVA Strategically Partner to Deliver Engineering Data Warehouse to Drive Asset Reliability, Enhance Efficiency and Reduce Unplanned Downtime

28 October 2020

AVEVA announced that it has signed an agreement to help accelerate Shell Global Solutions International B.V's digital transformational strategy by deploying AVEVA's cloud software solutions.

AVEVA will provide Shell with its Engineering Data Warehouse technology, which is one of the building blocks of the digital twin. This will enable a common digital thread across Engineering, Operations and Maintenance and the ability to securely deliver information in context from a single source to decision makers across these critical functions.

AVEVA's Engineering Data Warehouse will enable Shell through its Digital Twin to drive asset

reliability, enhance efficiency and reduce unplanned downtime. The solution will also support in providing actionable insights right from the site operator to the Asset Leadership Team.

Empowering workers with trusted, timely information

AVEVA's solution supports Shell's ambition to empower staff across Shell's manufacturing sites and to keep frontline industrial workers safe while ensuring business continuity and operational resilience.

"Empowering workers requires access to all the information as today's new normal entails remote access to monitor, manage and optimize production facilities," commented Johan Krebbers, GM Digital Emerging Technologies / VP IT Innovation at Shell. "We are already witnessing the benefits of our strategic collaboration with AVEVA through our fully aligned vision for digital transformation". This has enabled us to conduct operations remotely as well as seamlessly access the necessary applications to provide the insight, guidance and tools to ensure safe, effective and consistent work output, specific to each role.

End-to-End Cloud Based Services to Power AVEVA's Engineering Data Warehouse Technology

AVEVA's Engineering Data Warehouse brings together engineering information across the lifecycle of the asset, supported by powerful and proven applications that enable visualization, analysis, prediction and guidance. Its vast experience across multiple industries provides the domain content to address industry specific scenarios and use cases.

"We are delighted that Shell has chosen to extend its long and robust existing strategic partnership with AVEVA to support in enabling the digital twin cloud-based services," commented Ravi Gopinath, Chief Cloud Officer and Chief Product Officer, AVEVA. "This deployment is part of Shell's recently announced strategy to deploy digital twin technology across its manufacturing sites. Implementing new technologies like IIoT, extended reality, and artificial intelligence has huge advantages with the digital twin of an operating environment and this cutting-edge technology is guaranteed to deliver immediate improvements for Shell's operations."

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SteraLux improves their flexible and error free offer-order-process with VariSuite and Salesforce - 27 October 2020

"Our journey with Variantum is quite fresh. Some of our people were familiar with the benefits that Stera had derived from configurable products, and especially from the mass customization of complex and parametric product families. We wanted to get the same benefit with SteraLux products added with sales pipeline improvement with Salesforce CRM. We knew that Variantum's product portfolio was grown over the years to cover cooperative VariCPQ sales configurator with VariPDM and VariProd. We understood that sales configurator that uses product model would be the optimal solution to scale our sales in future. The whole implementation project was carried out remotely because of the COVID-19 pandemic. Despite this exceptional global situation, our implementation project and co-operation went well and surprisingly effectively." - Ville Saarinen, Product Manager, SteraLux

SteraLux in brief

Long experience & high-quality products - We have more than 60 years of experience in electronic manufacturing, audited manufacturing (ISO 9001, ISO 14001) and FI-approved products. Optimized solutions - We can tailor made LED-lighting solutions for our customers according to their needs. Reliable deliveries - Large, international companies trust us. We have 100% product testing and state-of-the-art machinery. Sustainability - SteraLux LED-lighting is environmentally friendly and energy

efficient solution. We take the environmental effects in to consideration throughout the product´s life cycle when planning our manufacturing and products.

"We customize the lighting according to your needs. You can modify features like beam angle, control systems, colour temperature, and mounting method. We provide lighting as a total solution, as we also offer design and installation services. We only use the best components, and we make the luminaries ourselves. Our long experience in electronic manufacturing guarantees that our products are of high quality."

"We were familiar with the benefits that Variantum delivers to automate order-to-manufacture process and we extended that to support also sales with VariCPQ - integrated to Salesforce."

- Ville Saarinen, Product Manager, SteraLux

"On the basis of our earlier experience with Variantum, we believe that our benefits will be:

Flexible and error free offer-order-process

The benefits of mass-customization

The possibility to extend system with other features and external organizations, such as resellers"

Solution delivered: VariSuite (VariCPQ, VariPDM and VariProd) integrated to Salesforce CRM and IFS ERP

For further information please contact sales@variantum.com / www.variantum.com

Tank Stream Design Selects DESL For End – to End Digital Transformation

30 October 2020

Discover e-Solutions (DeSL) partners with Tank Stream Design as they continue their innovation journey.

Founded over 20 years ago, Tank Stream Design has been one of Australia's leaders in resort wear, outdoor lifestyle apparel, and giftware. The already innovative company knows the importance of an all-encompassing approach to digital transformation, which is why they have chosen DeSL's software to provide an end-to-end solution. DeSL's modules will form the backbone that links all their departments and business processes together, from Design through product development, Sourcing, and into Sales.

Tank Stream Design wants to leverage technology in order to drive growth and efficiency and have already invested in ERP, B2B, and B2C. However, they lacked a web-based, real-time solution which would deliver full digital transformation from initial product concept, to procurement and finally through to sales and marketing. From DeSL's extensive suite of software solutions, Tank Stream Design selected, Product Lifecycle Management (PLM), P.O. Management, Product Information Management (PIM), and BI Reporting, to expand their capabilities and integrate all new and pre-existing software.

James Neumann, CEO and Founder, commented, "Tank Stream Design of Australia has chosen DeSL as the software to streamline our 'Design-to-Market' process. Tank Stream is a perfect candidate for software modules such as PLM as we constantly struggle with the inefficiencies and inaccuracies of working in multiple software applications and spreadsheets across all departments." He continues by saying, "After an extensive search, and receiving demonstrations by all major PLM providers, our research team found DeSL to be a holistic solution for our end-to-end 'Design-to-Market' cycle. Equally

as important, we found DeSL's software simple to navigate, allowing easy buy-in from our team of users. DeSL has a team of true professionals who are a pleasure to work with, are very knowledgeable in the PLM space, and are not playing catch up like many of its competitors."

Neumann sums it up for DeSL and Tank Stream Design when he says, "We can't wait to finish the project and realize the benefits that the software will bring to the business." With DeSL's software and guidance, Tank Stream Design will achieve massive efficiency gains from a digital transformation perspective.

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TRAK Machine Tools Chooses ModuleWorks Adaptive Roughing Technology

30 October 2020

TRAK Machine Tools (Southwestern Industries, Inc.) has integrated ModuleWorks adaptive roughing software into its ProtoTRAK RMX CNC control. The adaptive roughing algorithms enable the ProtoTRAK RMX to achieve faster and more accurate cutting with less wear on the tool.

The ProtoTRAK RMX CNC is specially designed for efficient one-off and small lot machining. It uses touchscreen programming with convenient tool selection for fast job setup together with onboard toolpath verification and cutting simulation to quickly verify jobs on the shopfloor. The ModuleWorks adaptive roughing technology further optimizes the overall production process by delivering faster and more precise machining and, therefore, lower part cycle times.

Integrated into the ProtoTRAK RMX CNC, ModuleWorks adaptive roughing engages almost the entire cutter. This speeds up machining because features such as pockets and islands are machined to full depth in just one cut instead of multiple cuts. Moreover, the tool stays fully engaged all the time, even under high chip loads, to ensure optimal cutting and a high-quality finish. Less power is required for cutting which means less wear on the tool, and the workpiece stays cooler which improves the accuracy of the finished part.

"With our touchscreen CAM programming, we'd already reduced setup time by around 25%. With ModuleWorks adaptive roughing, we now also accelerate the cutting process and further increase the profitability of high-mix, low volume machining".

Steve Pinto, President of TRAK Machine Tools (Southwestern Industries Inc.)

"It's great to see the extended adoption of the ModuleWorks shopfloor solutions, consisting of both simulation and toolpath generation technology, and we are delighted that our adaptive roughing toolpath cycle boosts the productivity of Southwestern's machines to the next level."

Mark Foti, Head of Digital Factory at ModuleWorks

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Product News

Ansys Multiphysics Solutions Certified for Samsung Foundry Entire Line of FinFET Process Technologies

27 October 2020

Ansys achieved new certifications of its leading-edge suite of semiconductor design solutions for all Samsung Foundry FinFET process nodes. This empowers mutual customers to verify and satisfy

increasing power and reliability goals for highly advanced semiconductor applications.

Samsung's next-generation silicon processes require tools with larger capacities to accommodate huge designs and innovative capabilities — including statistical electromigration (EM) budgeting and thermal reliability analysis — to overcome complex design issues. Ansys Redhawk-SC was added to the certified suite to help Samsung's customers design energy efficient and highly reliable chips for markets including 5G mobile, AIML, HPC, automotive and IoT. Additionally, Samsung's design teams have deployed RedHawk-SC to optimize performance, power and reliability for their advanced process node designs.

Samsung certified Ansys Redhawk-SC and Ansys® Redhawk™ for its entire line of FinFET process nodes — including 14nm, 11nm, 10nm, 8nm, 7nm, 5nm and 4nm — and will collaborate closely with Ansys on upcoming nodes. This certification includes power integrity EM and IR-drop, statistical EM budgeting, thermal analysis and multiphysics solutions for multi-die integration. Redhawk-SC verifies massive 4nm designs by executing signoff algorithms on its underlying Ansys® SeaScape™ infrastructure — reducing simulation time from weeks to hours, while boosting modeling fidelity. Ansys® Totem™ is correspondingly certified for transistor-level custom designs.

"The certification of Ansys Redhawk-SC, Redhawk and Totem supports our joint customers in rapidly completing new designs with improved confidence by managing increased power integrity, reliability and thermal challenges," said Sangyun Kim, vice president at Samsung Electronics. "Through the long, trusted alliance between Ansys and Samsung, our customers build cutting-edge silicon innovations, satisfy demanding performance objectives and are primed for winning the race to market."

"Industry-leading FinFET processes enable customers to innovate faster, smaller and lower-power applications. However, new technology challenges require an advanced simulation-driven analysis platform to maximize performance and reliability," said Vic Kulkarni, vice president, strategy, semiconductor business unit at Ansys. "This newest certification reflects Ansys' deep, ongoing relationship with Samsung Foundry, enabling our mutual customers to continue to signoff and verify breakthrough products with confidence."

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CMstat Announces Availability of EPOCH CM

28 October 2020

Independent software solution provider CMstat announces the release of EPOCH CM, the company's next-generation Asset Configuration Management software product. EPOCH CM offers a rapidly deployable, instantly usable, easily extensible, and swiftly affordable web-based solution for managing the live "As-X" configurations of deployed in-service products, equipment, systems, and other assets along with their digital twin representations.

EPOCH CM was developed for use by OEMs and supply/service chain contractors working in high-tech industries such as aviation, aerospace & defense, marine, transportation, rail, heavy equipment, and energy. These industries design, build, deploy, commission, support, maintain, refurbish, repair, and retire or recycle high-value assets. Such assets are often deployed with complex mission-critical configurations that can vary by lot, serial number, owner-operator, location, contract, date, and operating environment.

These long-life assets, which are often far removed from the OEM's original engineering PDM or enterprise PLM systems, go thru many "As-X" configuration changes over their lifecycle. These include

As-Built, As-Delivered, As-Installed, As-Tested, As-Certified, As-Provisioned, As-Maintained, As-Refurbished, and even As-Retired.

EPOCH was designed for use not only by CM specialists and certified experts but also by occasional users and managers who are downstream consumers of configuration data. These roles include those working in program management, engineering services, project management, procurement, supply chain, logistics, quality, test, provisioning, compliance, aftermarket service, sustainment, and MRO. EPOCH CM provides the most comprehensive yet easily usable Configuration Management capabilities available today for managing, documenting, tracking, and reporting changes to the past, present, and future configuration states of products, equipment, systems, and other assets that may operate in the field for years or even decades.

CMstat's Vice President of Development, Lisa Fenwick comments: "The development of CMstat EPOCH CM has allowed us to take advantage of new technologies and an improved architecture to create a product that is a step-function improvement for both CM and DM professionals along with the IT specialists who support them. Our customers structure configuration-related data and create relationships that model their product information in the way that is best for them without limitation. At the same time, they have the confidence that comes with working within an environment that enforces basic accepted practices and maintains the integrity of their data."

EPOCH CM was implemented with strict adherence to the most rigorous industry standards and best practices for CM including those from EIA-649 and CMPIC. Cynthia Hauer, President of the Association for Configuration and Data Management (ACDM) and Founder Owner of High Mountain Data Management, shared her observations:

"We found EPOCH to be highly intuitive to use and based on fundamental standards that promote data integrity, provenance, and source. It transforms data from these fundamental principles into knowledge and then into information that provides actionable insights. EPOCH aids collaboration by providing a common language to practitioners."

EPOCH CM is part of the larger CMstat EPOCH product portfolio which includes EPOCH DM. EPOCH DM provides for data management of the deliverables associated with government and commercial contracts in the aviation, aerospace, and defense industries. EPOCH DM helps data managers to aggregate, track, review, audit, and secure the many interdependent data handling tasks the perform. It does so by managing contract data deliverables and automating workflow processes in the context of their associated programs, contracts, projects, and compliance requirements.

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Kubotek Announces KeyCreator 2021

28 October 2020

Kubotek3D announced the availability of a new major release of KeyCreator 3D CAD software. The 2021 release provides improvements to Model-based Definition capabilities, productivity enhancements to various functions, and updates to CAD translators.

KeyCreator MfgCAD software has been designed to maximize productive re-use of CAD data. In the 2021 release the materials system has been enhanced in numerous ways to better support definition of what each face color means and quickly apply or copy those colors to appropriate faces.

For complex tooling design, face color attributes on features of the 3D model are commonly used as a form of MBD to signify manufacturing information such as surface tolerance and hole type. These

colors are later converted to cycle parameters in the NC program. When this process can be automated, it follows the strategy called preserving the digital thread. This increasing popular concept saves time and errors over a human reading a drawing or evaluating a file and re-entering the details into manufacturing software.

"The color tools available in the 2021 release of KeyCreator are a game changer." said Bill Bechard, Designer, Superior Tool and Mold in Windsor, Ontario. "I have used premium CAD software that can't deliver this automated face color manipulation. Our CNC cutting automation is reliant on face colors, so these tools will save many hours on every job we process. I am eager to start using the software."

Since specific colors have different meaning for different shops, KeyCreator 2021 now stores material definitions in design and template files and allows loading and saving sets of materials from configuration files. An update to the selection filtering system allows quick access to faces with a specific material from any function. To extend support for design data from any source, KeyCreator 2021 recognizes unique face colors on imported models and automatically creates matching material definitions. This feature speeds up the process of defining a standard set of colors to be used on future jobs headed to a specific shop.

Kubotek proprietary readers for STEP (ISO 10303) files have been expanded to cover AP 242 to support customers using a full, standard-based MBD approach. STEP AP 242 defines critical manufacturing annotations including Geometric Dimensioning and Tolerancing (GD&T) and their relationship to the faces of the 3D model. These annotations and the nominal size and position of the precise geometric model provide an unambiguous part definition. This form of MBD can provide process efficiency by eliminating the need to translate the design into detail drawings and better support automation of downstream activities such as NC machining and inspection.

A second STEP enhancement has added to the 2021 release to open and export compressed ASCII STEP files which use the extension ".stpZ". Compressed STEP files are around 20% of the size of uncompressed STEP files. The stpZ format has been gaining in popularity since originally released in 2013, especially in the aerospace and automotive industries.

KeyCreator 2021 also provides several other user-driven time-saving enhancements.

Auxiliary drawing views defined perpendicular to a line/edge

Significant speed improvement re-opening the Detail Style Editor

Axis indicators selectable for vector direction or position

Create 2D section slice geometry from part reference geometry

Interoperability with other CAD software has been updated with the latest versions of two major CAD file formats:

Autodesk Inventor 2021

PTC Creo 7.0

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Rethink Digital Transformation with OpenText Cloud Edition 20.4
26 October 2020

 OpenText™ announced the release of Cloud Edition (CE) 20.4. This release delivers innovations in the OpenText™ Cloud, that make it faster, easier, and more cost-effective for customers to adopt new

capabilities, reinvent business processes and seize emerging opportunities.

OpenText CE 20.4 delivers updates, enhancements, and new features across OpenText products and services. These include new SaaS applications, new cloud services, customer-driven features, and a completely new developer cloud with documented APIs, connectors to leading business applications, and a developer community for customers and partners.

"Work models are in flux, endpoints are proliferating, consumer behavior is changing, global supply chains are being disrupted and security systems are under siege," said Mark J. Barrenechea, OpenText CEO & CTO. "To help our customers navigate these challenges, we have released OpenText Cloud Editions 20.4, the most comprehensive and complete Information Management platform in the market. OpenText is committed to delivering all our software as a service, helping our customers accelerate business innovation and digital transformation at massive scale."

The OpenText Cloud provides flexible deployment options with managed service expertise and run-anywhere software, amplified through partnerships with the major public cloud providers. This helps remove barriers to innovation and smooth the flow of information across organizations.

"The increased agility and resiliency provided by a connected cloud architecture effectively meets the changing needs of a distributed enterprise," said Frank Della Rosa, IDC Research Director, SaaS, and Cloud Software. "Businesses that are charting a course to become digital-first use connected cloud architectures to create a resilient and adaptable model that supports the changing needs of the business while laying the groundwork for future growth and prosperity."(1)

Cloud Edition 20.4 provides updates across the five OpenText Clouds that will empower organizations to respond to a changing business environment.

The OpenText Business Network Cloud connects any business, person, system, or thing to build adaptive, ethical, and sustainable trading networks. Key updates in CE 20.4 include:

40 new connectors to key business applications added to Trading Grid to accelerate the deployment of hybrid integration projects.

New applications like IoT Shipment Tracking Reference and Ecosystem Viewer that deliver actionable insights into operations.

Freeway Cloud enables small and mid-sized companies to accelerate digital trading across a global supplier network.

The OpenText Content Cloud connects content to digital business to improve user productivity while meeting legal compliance and governance requirements. Key updates in CE 20.4 include:

New SaaS applications like Core for Building Information Modeling and Core Signature.

New standalone early case analysis and investigations applications with front-loaded analytics like OpenText Axcelerate Investigation.

Deeper integrations with Microsoft, SAP, and Salesforce, adding robust content management capabilities seamlessly into the context of work. Integrations include:

Extended ECM for SAP Solutions has full support for SAP S/4HANA Cloud Extended Edition.

Extended ECM for Office 365 adds improved lifecycle management for Teams, archiving for Team

chats, and mapping of OpenText folders to Teams.

Full integration of Teams with eDOCS for enhanced user productivity and collaboration.

Advances in Information Governance, with Core for Federated Compliance adding full records policy support for Content Suite and Extended ECM, plus selected records policy functions for SharePoint and File Systems.

The OpenText Experience Cloud delivers an omni-channel personalized experience to customers at scale. Key updates in CE 20.4 include:

Exstream enhances cloud input and omnichannel output support and streamlines personalized content creation and delivery.

New Exstream Managed Services integration with Core Experience Insights and OpenText Notifications for cloud-based communication.

Added AI-assisted communications design and authoring for personalized content.

Media Management consolidates the visual review process with new native tools and expands to more users with added capabilities for Digital Hub.

New native review and annotation capabilities, including no-code workflow design, deep zoom review for high-resolution media, complex microsite management, Google Cloud Certification, and improved REST APIs and Adobe Creative Cloud Connector.

Voice of Customer solutions deliver the ability to rapidly respond to customer and contact center agent needs.

Qfiniti adds real-time speech processing and sentiment analysis to live conversations, plus real-time guidance for agents with Optimize Guide.

New CX-E Voice web client with stand-alone directory, automated attendant, and updated speech recognition engine technology.

The OpenText Developer Cloud enables developers to build applications and solution extensions quickly and cost effectively using service-based capabilities in the cloud. Key updates in CE 20.4 include:

The OpenText Developer Cloud is a new cloud platform for application development based on OpenText Content Services. It provides a platform for developers to create custom solutions to manage information, building a community of innovators that can create better enterprise applications.

A broad collection of cloud capabilities to manage information, consumable via API.

Consolidated access and authorization across all OpenText Cloud services including: capture and digitize, store and manage, analyze and report, process and automate, search and discover, integrate and access, view and communicate, and protect and secure.

Access via the Developer Portal to resources, such as training documentation, blogs, code snippets, and a community of developers, to help developers be successful.

The OpenText Security & Protection Cloud provides organizations with the tools they need to keep intellectual property, customer records and sensitive financial information protected. Key updates in CE 20.4 include:

Full-feature EDR aligned with MITRE ATT&CK to simplify and streamline incident response to advanced and complicated threats, which includes over 250 out-of-the-box detection rules aligned with the 2020 MITRE ATT&CK matrix.

Expanded OS and artifact support to ensure security, legal and law enforcement professionals have unrivaled data visibility and investigation tools.

Tableau TX1 Forensic Imager adds support for unlocking encrypted Microsoft BitLocker and Apple APFS volumes with known user credentials.

EnCase Forensic and Endpoint Investigator introduce preview and targeted file collections for Microsoft OneDrive, and support for the upcoming release of Apple macOS 11 Big Sur.

Enhanced support for remote forensic collections and investigations.

EnCase Endpoint Investigator adds preview and collection of distributed endpoints off the corporate network.

Bringing Carbonite and Webroot into the Enterprise.

Carbonite solutions available to the Enterprise to protect from data loss on endpoints, Microsoft 365 applications, and ensure critical systems availability.

Webroot BrightCloud Threat Intelligence services strengthen the reputation capabilities offered by EnCase Endpoint Security in the Enterprise.

Underpinning the OpenText Cloud are our AI and Automation solutions. OpenText Magellan provides pre-built components that can be individually deployed, and the OpenText AppWorks platform enables business and technical users to rapidly build applications that improve efficiency, optimize employee skills, and provide insights. Major enhancements for AppWorks in CE 20.4 include the launch of AppWorks Integration framework for Robotic Process Automation (RPA) and new Solution Accelerators that accelerate the development of case management.

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Shapr3D reaches 20k PRO users, announces macOS expansion

29 October 2020

Shapr3D, the world's first professional CAD (computer-aided design) tool for the iPad and recent winner of Apple's Design Award, today celebrates reaching their 20,000th iPad PRO user. Launched in 2016 as a disruptor of the CAD industry with their mobile-first, intuitive solution for 3D modeling, this milestone represents a huge achievement for the company and the CAD industry.

With over 100,000 app downloads every month, Shapr3D is one of the fastest growing CAD applications for Apple's iPad Pro. The company is also adding macOS availability by the end of 2020, making it a CAD tool which rivals the functionality of static industry giants but on a cutting edge, on-the-go platform. By adding macOS access to the package, Shapr3D is also repositioning themselves in the CAD software market - which is predicted to surpass $18.7 billion revenue by 2030 - as a multi-platform tool, and providing their existing users with an additional device to optimize their workflows.

Other exciting feature updates this quarter, like 3D Alignment and their Augmented Reality tool - which enables users to export models to Apple's Reality Composer and visualize their models and designs in a real world setting - act in tandem with the macOS release to continuously update their offering based on the needs of their audience and potential new users.

"Being one of the fastest growing CAD companies in just a few short years and the first iPad PRO solution for a world that is working more remotely, proves that there is huge demand in the industry for next-gen innovation and for new tools that are designed for the 21st century," says István Csanády,

founder and CEO of Shapr3D. "Reaching 20,000 PRO users and our latest feature updates is an amazing milestone, and I couldn't be more excited about this next hyper-growth phase for Shapr3D."

Based on Parasolid's geometric modeling kernel, Shapr3D's app empowers people all over the world to create professional 3D models, no matter where they are or what industry they hark from. Its intuitive UX and subscription-based model make it easier to start using than traditional CAD tools which typically have a high barrier to entry due to their complexity and significantly higher price tag. Shapr3D's mission is to put fluid creativity back into the design process by allowing engineers and designers to bring their ideas to life with rapid prototypes, concepting, and designs.

"Cutting-edge and intuitive 3D tools are a must in the CAD industry," remarks Kálmán Kéménczy, Head of Product at Shapr3D. "Designers and product managers have stringent expectations and need 3D CAD tools that allow them to do their best work. Shapr3D offers an innovative product, with the freedom to express design creativity."

"The ability to quickly and accurately model parts and materials in 3D has opened up a whole new world for us. It saves us many hours of 'in-shop' fabrication time by allowing us to explore multiple solutions to different custom car building challenges. It's exciting to combine this kind of technology with traditional hands-on craftsmanship," says customer Kyle Harder of Harderbuilt Solutions, LLC.

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Synopsys and Samsung Foundry Collaboration Delivers Portfolio of Optimized iPDKs and Methodologies for Advanced Custom Design

27 October 2020

Synopsys, Inc. announced that in collaboration with Samsung Foundry, more than 30 new interoperable process design kits (iPDKs) have been jointly developed, validated and support the Synopsys Custom Design Platform. These iPDKs provide broad coverage for Samsung Foundry's portfolio of advanced and legacy nodes. The Synopsys Custom Design Platform is a faster and more productive design and verification solution that delivers up to 5X faster layout and 2X faster design closure, providing maximum productivity to users of a wide range of Samsung Foundry process technologies.

The Synopsys and Samsung collaborative effort included developing and validating a complete set of Samsung iPDKs, methodologies and design flows. Synopsys and Samsung also collaborated on implementing a comprehensive iPDK development and validation solution, based on Synopsys Custom Design Platform, that leverages the Custom Compiler™ design and layout environment. This environment includes HSPICE® circuit simulator, FineSim® circuit simulator, CustomSim™ FastSPICE circuit simulator, Custom WaveView™ waveform display, StarRC™ signoff extraction, and IC Validator physical verification.

"We are committed to addressing our customers' needs of deep expertise in technologies and complex custom designs. Samsung Foundry sees a growing request for Synopsys' Custom Design Platform and its design and verification solutions," said Jongwook Kye, vice president of Design Enablement Team at Samsung Foundry. "In close collaboration with Synopsys, the industry leader providing comprehensive custom design and innovative EDA solutions, we have set a new bar of optimized flows and iPDKs based on our process technologies. Samsung Foundry certified Synopsys' differentiated design and verification flows and solutions that will help designer efficiency at our various nodes."

The broad library of over 30-plus Samsung and Synopsys iPDKs range from advanced gate-all-around or FinFET nodes including 3nm to 14nm, and many legacy nodes from 65nm to 130nm, enabling designers to access advanced features. The iPDKs enable designers to leverage analog and mixed-signal

integrated circuits and IP using the latest Synopsys suite of custom implementation solutions. Each iPDK includes documentation and design infrastructure elements such as: simulation models for various devices, layer map and technology files, design rule check and layout versus schematic runset files for physical and electrical design rules verification, parasitic extraction deck, schematic symbol library, and parameterized cells, as well as power and performance optimizations used to help customers make the best chips.

"Today's IP and analog design community face increasing challenges from complex layout rules, stringent analog closure requirements and aggressive design schedules. Instead of depending on a set of point tools, they need a robust custom design platform that integrates signoff technologies and simulation workflows to deliver higher productivity," said Aveek Sarkar, vice president of Engineering, at Synopsys. "With our deep collaboration with industry leaders, such as Samsung, we're driving key innovations for our methodologies, reference flows and iPDKs. We look forward to our continued opportunities for excellence with Samsung to fuel further technology innovation for high-growth markets and our growing customer ecosystem."

Learn more details about the best-practices for efficient design and verification, leveraging broad and robust iPDK support, design flow methodologies and enablement optimized for Samsung Foundry process technologies, as Ravi Rao, group director of Applications Engineering at Synopsys, will be presenting on October 28 at the upcoming Samsung Advanced Foundry Ecosystem (SAFE) Forum. For more information regarding Synopsys products, visit: https://www.synopsys.com/implementation-and-signoff.html.

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Ultra Librarian and Zuken Work Together to Create a Seamless User Experience for PCB Design

27 October 2020

Ultra Librarian®, the world's largest free cloud-based CAD library provider, announced its collaboration with Zuken Inc. to provide eCADSTAR users with a seamless process to search and download parts.

"Ultra Librarian's goal is to provide resources to engineers that will allow them to increase productivity in the design phase," said Manny Marcano, president and CEO of Ultra Librarian. "This new integration is another step towards achieving that goal by providing eCADSTAR users seamless access to the time-saving resources available in Ultra Librarian directly within the tool."

eCADSTAR provides a borderless electronic design environment that connects the engineering desktop with comprehensive online design, manufacturing services, and online educational content. Now, with a direct Ultra Librarian integration, users can browse parts, download, and design directly within eCADSTAR.

"We're excited to announce eCADSTAR's direct integration with Ultra Librarian," said Jeroen Leinders, global eCADSTAR solutions leader. "Users will now have access to all the information they need to make intelligent design decisions and expedite the design process with Ultra Librarian's part information and CAD models."

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