PLM Industry Summary

Editor: CIMdata News Team

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CIMdata News

CIMdata to Host a Free Webinar on Data Governance

16 March 2021

CIMdata, Inc., the leading global product lifecycle management strategic management consulting and research firm, announces a free educational webinar, "Data Governance: Avoiding Detours on your Digital Transformation Roadmap." The webinar will take place on Thursday, April 22, at 11:00 a.m. (EDT) and last for one hour.

The success of any digital transformation initiative depends on addressing a host of critical issues. Chief among them is the robustness of the enterprise's data model and the role that Data Governance plays. In today's digital era, organizations must realize that their data is a critical business asset that forms the backbone of any digital transformation. Executives sponsoring a digital transformation must do so with the understanding that the success of their investment in people, processes, and organizational elements are highly dependent on a robust data governance strategy that positions them for long-term success.

This webinar will help attendees:

- Learn how data governance enables digital transformation.
- Understand how to start a data governance journey.
- Manage a governance framework so that it continuously adds value for critical data elements such as intellectual property.
- Learn how to use a roadmap to transform from non-governed data assets to governed data assets.
- Prioritize the key elements driving Data Governance.
- Gain executive "buy-in" for Data Governance.
- Understand how to determine what value will come from Data Governance.

According to webinar host Janie Gurley, CIMdata's Practice Manager for Data Governance, "As digital transformation spreads throughout a business, the need for effective Data Governance is gaining importance, benefiting every task and process where reliable data is indispensable. Today, digital transformation is one of the main drivers of the need for Data Governance. Still, many other changes are sweeping through today's successful enterprises, including fundamental shifts in how products are planned, developed, marketed, and serviced. This webinar will offer useful guidance on this critical topic."

Ms. Gurley has over 28 years of experience understanding and supporting strategic business execution with broad-based expertise in product development solutions within manufacturing. Besides her responsibilities as the Data Governance Practice Manager at CIMdata, Ms. Gurley is also responsible for the management and execution of CIMdata's services delivered to PLM solution providers, including the coordination and execution of CIMdata's Community and associated solution provider strategic management consulting activities.

This webinar will of interest to anyone who wants to further their knowledge of Data Governance.

During the webinar, attendees will have the opportunity to ask questions about the topics discussed. To find out more, visit: https://www.cimdata.com/en/education/educational-webinars/webinar-data-governance-avoiding-detours-on-your-digital-transformation-roadmap-1. To register for this webinar, please visit https://register.gotowebinar.com/register/341959522664846352.

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CONTACT Elements for IoT: An Operating System for Smart Business - a CIMdata Commentary
17 March 2021

Key takeaways:

- Global trends like social computing, cloud computing, mobile devices, analytics/artificial intelligence, and the Internet of Things (IoT) have dramatically changed our personal and business lives over the last 15 years.
- Smart, connected products are being introduced at an increasing pace across a wide range of industries, retrofit kits make older production equipment smarter and enable new and innovative business opportunities.
- The IoT, and its application to industrial use cases (the Industrial Internet of Things—IIoT), have created new business opportunities and companies need a powerful, flexible IoT platform to best take advantage of them.
- CONTACT Software, a leading independent provider of product lifecycle management (PLM) solutions is addressing this need with CONTACT Elements for IoT, adapting their open, flexible, and standards-based platform to meet the IoT requirements of their broad customer base, making their solution applicable to many different industrial applications.

Introduction

Computing has become ever present in the lives and businesses of people around the world. Social platforms sought to connect us and, like many technologies, have had both positive and negative impacts. Those platforms live on and reach our mobile devices, homes, and businesses using cloud computing. Products in a range of industries are smart and connected, making them nodes on the Internet of Things, as are capital assets as part of the Industrial IoT. All of these technologies, and many others, have changed our lives in the last 15 years.

To take advantage of these opportunities, companies need to adopt and deploy flexible IoT platforms that can support new strategies and business tactics that address market opportunities. One of the key attributes of the IoT/IIoT is the range of standards that define it, coming from a variety of sources. Any IoT/IIoT platform must readily support these open standards. CONTACT Software, an independent German PLM solution provider, is addressing this need with their CONTACT Elements for IoT offering, leveraging their open, standards-based platform to meet these industrial requirements.[1]

Business Success in a Smart, Connected World

In today's world most people cannot get away from their computing devices. Phones, tablets, and even their appliances have embedded computers to ease their daily burdens. Products in a wide range of industries are smart and connected, as increasingly are the capital assets and equipment used to make those products. The flood of data available from all of these sources demands new ways of analyzing and benefiting from that information, and advances in artificial intelligence (AI) and machine learning

(ML) are helping ferret out the pearls in those vast seas of information. These are but a few of the technological changes that have dramatically changed our personal and business lives over the last 15 years.

It was precisely those trends that led the German government, working with industry, academia, and the labor unions to define their vision for Industry 4.0.[2] In short, in an Industry 4.0 world all existing and new assets will be smart and connected (at some level), spanning the built world, including factories, infrastructure, and of course, products.

New products often have the "smarts" built in, but much of the built world, including capital assets, are not often quite so gifted. The Industry 4.0 vision recognized the need to retrofit existing infrastructure and industrial equipment to make it smarter and connecting it in new and innovation ways.

The IoT, and its application to industrial use cases (the IIoT) have created new business opportunities and companies need a powerful, flexible IoT platform to best take advantage of them. In our consulting work, CIMdata has seen many good examples. Just having real-time access to real-world data to support decision-making is huge in industries like manufacturing and logistics. Industrial equipment manufacturers are creating new business opportunities by using predictive maintenance to insure effective uptime. Companies are using insights from operations data to support closed-loop, data-driven compliance and process improvement strategies. Others have closed the loop from product use back to product development to both shorten innovation cycles and to tune new releases to real world needs.

What do you need in an IoT platform? In some respects, an IoT platform must support the convergence of information technology (IT) that powers the business, operational technology (OT) that populates the shopfloors and other operation elements of the business, and engineering technology that supports the product lifecycle from idea through life. These platforms should offer a modern user experience (UX), supporting drag and drop low-code or no-code development of user dashboards that "mashup" data from IoT, enterprise applications, and many other structured and unstructured data sources. Analytics are key to reducing the data to more palatable key process indicators (KPIs) and other user-defined metrics. Users will need to act on dashboard information, so there should be support for relevant business processes to support those actions. Data can come from a wealth of sources, many of which conform to published standards. Any IoT platform should natively support the standards of interest to a particular customer which means, in practice, that most IoT platforms need to support a wide range of standards to enhance their market potential. Platforms used for IIoT applications should readily support edge computing, the use of computing assets within the manufacturing environment that can help capture data as well as distill it for better consumption by the platform and its users. In some cases, IIoT platforms also have to accept data directly from the shop floor from programmable logic controllers (PLCs) on individual machines.

In fact, there are dozens if not hundreds of IoT platforms available in the market. Many are from small startups and are just not that robust. Some lack an industry or technical context and are more about mashing up data to support pilots or simple problems. Product manufacturers, particularly those in industrial equipment or other segments producing long-lived assets, really need to have an IoT platform structured around product development and the product lifecycle.

CONTACT Elements for IoT

CONTACT Software is a leading independent provider of product lifecycle management (PLM) solutions with a strong history of supporting industrial clients in a range of industries, with a heavy focus on discrete manufacturing. Their long-time product CIM Database is delivered based on CONTACT Elements, a coherent suite of building blocks that can be configured to address major

collaboration and business needs around the engineering of sophisticated products. Several other recent CIMdata commentaries provide more detail on their company and their platform.[3],[4] More information on CONTACT Software and their offerings is available in the CONTACT Dossier on CIMdata.com.

The CONTACT Elements set of building blocks has expanded over the years as CONTACT has added new capabilities to support customer and market requirements. All of their applications benefit from the underlying platform technologies and services. CONTACT Elements for IoT extends CONTACT Elements, adapting their platform to meet the IoT requirements of their broad customer base. CONTACT is well known in the PLM community for their ardent support of open standards. Thus, their open, flexible, and standards-based platform is a perfect fit in a smart, connected world that relies on a multitude of standards to help realize the Industry 4.0 vision and the convergence of IT, OT and engineering technology. Because CONTACT Elements was designed to support the virtual product, it was straightforward for them to support digital twins, an increasingly important use case related to IoT/IIoT. Figure 1 highlights CONTACT's view of their offering as an operating system for smart business, spanning the various aspects of IoT and IIoT.

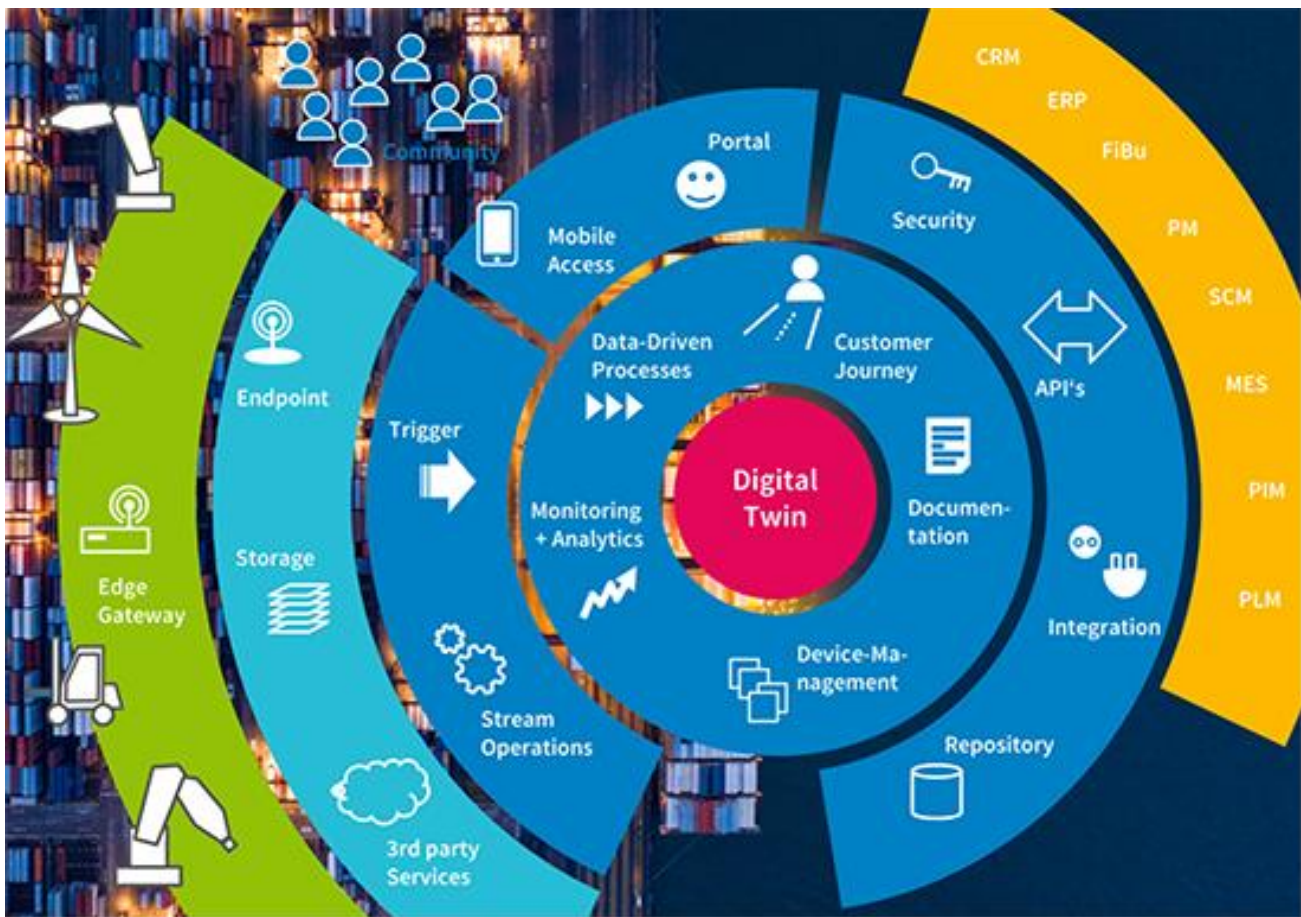*Figure 1—CONTACT Elements for IoT: An Operating System for Smart Business (Courtesy of CONTACT Software)*

While CONTACT has many discrete manufacturers in its customer base, their solution has also been successfully applied in other industries due to its strong project and asset management capabilities. CONTACT Elements for IoT readily supports both IoT use cases around smart, connected products—

the internet of products—and IIoT use cases more typical of the shop floor or other capital asset scenarios—the internet of production.

CONTACT's IoT solution is based on proven, reliable modules. This is important in a market where many IoT platforms come from startups with no track record for reliability. For example, their Closed Loop Engineering and Digital Twin capabilities, essential for companies pursuing product-as-a-service business strategies, leverage their strong xBOM management, CAD data management, and visualization functionality.

CONTACT Elements was designed and implemented to be open. Development is done using Python, a frequent choice for data-science and machine-learning projects that has climbed the programming language rankings to challenge JavaScript and the C language in popularity. CONTACT Elements relies on standard Web services interfaces and REST application programing interfaces (APIs). These are readily available skills in the marketplace for coding talent, helping reduce customer lock-in. Their IoT/IIoT device connectivity is based on standard libraries. Mashups are largely created using no-code function blocks and support for declarative rules. These capabilities allow for flexibility and speed in development, and support tailored for less skilled users. When more complex actions are required users can leverage CONTACT Element's extensive development and programming environment.

Of course, there are many other advantages to being on the CONTACT Elements platform. CONTACT has long experience with standard interfaces for ERP, most notably SAP, and authentication services. This is important because enterprise systems often provided essential data to IoT mashups. CONTACT InSync, their design system to support developing high quality UX, offers strong capabilities for UI development and branding, including multi-language support.[5] According to CONTACT, their average IoT application contains 7 to 11% "new" components, with the rest natively supported by the platform. The maturity of their code base is a differentiator versus many IoT platform market entrants. It can also help customers to more quickly implement value-added applications, a big benefit in a market where many IoT adopters never seem to get past nice pilot applications.

At its core an IoT (or IIoT) platform is about action. You do not gather data for data's sake, you want to take more informed action. IoT platforms need to process and analyze data, using traditional analytics or other means like artificial AI/ML, to trigger action. For example, to support closed loop engineering, digital twins are animated using IoT data, and knowledge must travel back up the digital thread to support decision-making and engineering action.

CONTACT Elements for IoT also includes business process automation (BPA) to specify desired actions. For example, users can schedule triggers at desired intervals, such as for scheduled maintenance. They can also trigger events from the edge or a PLC based on KPIs (device is out of specification or requires a maintenance action) using incoming asset data meeting a desired threshold (useful in both IoT and IIoT scenarios). Finally, actions can also be triggered by an external service (e.g., AI/ML mechanism via REST API). A global manufacturer is using CONTACT's BPA functionality to help standardize their internal maintenance operations. Another machinery provider is offering value-added services: real-time equipment monitoring and provisioning of optimized operating parameters, and including preventative spare part delivery to ensure desired performance.

CONTACT Software has several routes to market for this offering. To date most customers purchased from their direct sales force. The release of a SaaS offering in summer 2021 will expand their reach to both existing and new customers.

In 2019, CONTACT entered into a partnership with Mitsubishi Electric on the e-F@ctory Alliance that includes the use of CONTACT Elements for IoT as part of joint offerings with the Mitsubishi Electric

Factory Automation EMEA division focused on Industry 4.0.[6] Figure 2 illustrates how important CONTACT's platform is to Mitsubishi's offering. An example of this collaboration is düspohl Maschinenbau which digitizes production systems.[7] This partnership illustrates the strength of CONTACT's support for both IoT and IIoT applications.
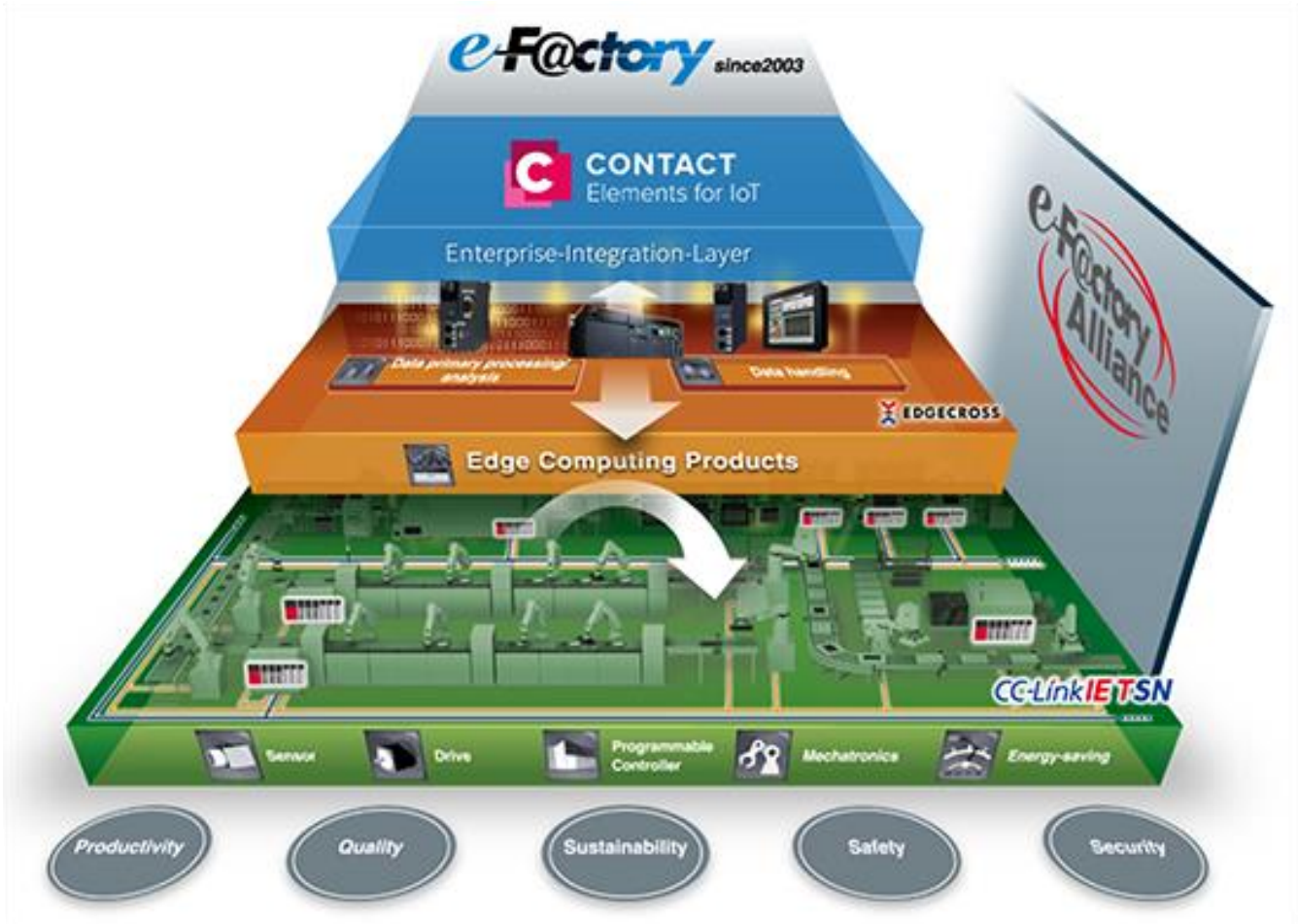
Figure 2—CONTACT Elements for IoT Central to the e-F@ctory Alliance
(Courtesy of CONTACT Software)

Conclusion

Computers are ubiquitous in today's smart, connected world and, based on CIMdata's research and industrial consulting experience, companies from a wide range of industries are leveraging the IoT to achieve both traditional and new business objectives. CONTACT Software, a long-time provider of product lifecycle solutions, created their IoT platform leveraging their CONTACT Elements solution, which is well-suited to both IoT and IIoT applications, in part due to the company's expertise with industrial assets and their support for digital twins. CONTACT Elements gives them a proven, modular platform and makes it easy to leverage other platform elements in IoT/IIoT applications. The company is positioning CONTACT Elements for IoT as a business platform that can offer an end-to-end solution to support the on-going conversations of IT, OT, and engineering technology. Based on their partnerships and success to date, they are well on their way to realizing their vision.

[1] Research for this commentary was partially supported by CONTACT.

[2] Recommendations for implementing the strategic initiative INDUSTRIE 4.0," Final report of the Industrie 4.0 Working Group.

[3] https://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/12102-contact-elements-a-future-proof-digital-platform-commentary talks about the overall platform.

[4] https://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/13274-contact-s-insync-helps-deliver-high-quality-user-experiences-commentary talks about CONTACT InSync, their capability to deliver high quality user experiences.

[5] https://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/13274-contact-s-insync-helps-deliver-high-quality-user-experiences

[6] https://www.contact-software.com/en/news/2019/09/smart-factory-contact-software-and-mitsubishi-electric-become-iot-partners/

[7] https://www.contact-software.com/en/news/2020/09/duespohl-maschinenbau-digitizes-production-systems-for-batch-size-1-with-contact-software?L=1

SAP Publishes CIMdata White Paper on PLM

19 March 2021

The CIMdata White Paper, entitled "Connecting the Product Lifecycle Across the Enterprise", highlights technology and product trends in industrial markets and how product lifecycle management (PLM) solutions are helping leading companies better manage their digital assets across the extended enterprise for market success.

The White Paper can be accessed at:
https://www.sap.com/cmp/dg/product-lifecycle-management/index.html?source=social-global-voicestorm-LinkedIn&campaigncode=CRM-YD21-SOC-GETSOC1

TCS's Autonomy Framework—Autoscape - A CIMdata Commentary

16 March 2021

Key takeaways

- Autonomous vehicle development is a complex system-of-systems problem to solve but will have large societal impacts on many of our day-to-day activities.
- Competitive pressures and autonomous technology complexity are driving manufacturers to transform their development strategy, processes, and toolsets.
- Technology will play a key role in defining the future of business, customer experiences, and product or service behaviors of the agile automotive enterprise.
- By leveraging its manufacturing and automotive experience as well as its Neural Automotive Framework, TCS has launched Autoscape™—a comprehensive suite of solutions and services to help customers accelerate their autonomous vehicle development.

Autonomous transportation, while a difficult problem to solve, has the potential to significantly impact not only on our day-to-day activities but also may have big societal impacts. There are many dimensions related to solving this problem including big data, many complex models, and the number of use cases required with an extreme risk profile. The complexity of moving a large, heavy product through streets with living and moving objects requires an enormous amount of testing to validate that the solution will work as designed.

This system-of-systems problem is perhaps as complex as anything ever attempted by humanity. The safety implications are huge, even though automation almost always works better than manual processes, the accidents that do happen with autonomous technology will cause outcry. To succeed, autonomous technology and especially autonomous vehicles must launch virtually accident free. This is a tall order, well beyond the difficult to achieve six-sigma quality level. The resulting systems will also be upgraded in the field, requiring validation to continue even after mass production, to assure robust operations.

The benefits of a functional autonomous solution are huge - whether in driving or autonomous equipment operation, labor and effort will be reduced, improving safety and efficiency significantly. People will be able to make more productive use of their valuable time in the vehicle and as vehicle communication with infrastructure and each other, further efficiencies will be achieved such as improved traffic flow and the mitigation of accidents.

Another interesting opportunity is the ability to reduce the need to own a car, providing mobility solutions without having the labor cost of a driver. This will reduce the number of vehicles needed and maximize asset utilization. Think about how many cars sit idle in parking spaces and garages, and the waste space from all the parking areas in town centers. The vehicles can be stored away from the busy centers and summoned when required, which would mean that car parks can be repurposed for more beneficial uses for the community.

While the automotive and trucking industries get the most attention, autonomy is much broader. It is being used today in mining, manufacturing, and agriculture and solutions are being developed for recreational vehicles such as golf carts, last mile logistics, and even smart cities and infrastructure. While the applications are diverse, all them have similar needs and required capabilities to get functional, cost effective, and safe products to market.

Capabilities Required

To develop an autonomous solution many capabilities are required. The vehicle needs to make decisions based on the performance, operating environment, and objectives (e.g., what is the destination). Sensors are needed to measure position (i.e., GPS), velocity, acceleration, and assess the environment using radar, LiDAR, video, and audio. The data from these sources needs to be synthesized and processed quickly to control the vehicle. The ability to communicate with the infrastructure as well as with other vehicles in a nearby vicinity will further improve the solution.

The data captured during operation is large and complex, containing many data points per second. Data from different sources that needs to be normalized and harmonized so it can be consolidated into a clear view of the current state and forecast of the immediate future state (e.g., will that car ahead be in the way in a few seconds or not). Much of this processing needs to happen locally but may be augmented by cloud data, routing and traffic services, and fleet processing.

While the operating scenario described above is complex, the development capabilities needed to support it are even more complex. A digital twin of the product is a core requirement. Models representing the systems within the product and able to quantify behavior are the heart of the

development environment. An autonomous environment goes far beyond a classical simulation environment. The dynamic behavior driven by steering, braking, and acceleration inputs modeled by classical simulation is only one of the models necessary to develop an autonomous solution.

The real work in autonomous is developing and validating the control algorithms and systems to ensure they function as designed, and all unique scenarios have been accounted for within the validation process. While physical testing is required and critical, it is not possible to physically test for all possible scenarios in most environments where autonomous products operate. Validation needs to happen both to ensure product safety and performance as well as meet regulatory requirements, and virtual validation is becoming an acceptable approach.

Often validation is quoted in number of miles driven, this is not the correct approach. The approach needed is number of scenarios or test cases covered and how complete the scenarios cover the scope of the operational design domain (ODD). Many scenarios need to be run to cover typical driving and many more are needed to cover the edge cases. As one considers the unknown combination of factors which could cause failed operation, the possible number of scenarios and test cases are in the scale of billions.

While automated and virtual testing is common in software products, they become much more difficult once the real world is used as an input. For example, if a dog runs in front of a car can it stop? What if the road is wet, icy, or covered in leaves? Does the vehicle stop or swerve? What if the street is narrow? Each scenario will have many different test cases. Defining the scenarios and test cases manually is not realistic; automation is needed.

Autonomous development is best supported by a platform approach. Capabilities are organized into an environment that enables collaboration across the product lifecycle. Key elements of such a platform include data gathering and management for IoT data, data curation to organize and tag the data so it can be consumed by algorithms, and an ALM environment to manage the algorithm, software, and scenario development. Validation is needed to execute the scenarios using real and synthetic data on virtual models to confirm performance. As the product matures and physical sensors and other product hardware become available, they need to be brought into the loop.

The agile process is the go to choice for autonomous development. The 5 level Advanced Driver-Assistance Systems (ADAS) maturity scale from 0—no automation to 5—full automation provides a solid framework to manage an autonomous development program. As the development program progresses and working software and systems are produced, they can be validated using DevOps concepts. This way product developers get quick feedback and capabilities can be incrementally improved via algorithm enhancement and software advances.

TCS's Approach

CIMdata has written a lot about TCS and their deep technical capabilities. One of the exciting strategies they pursue is known as Neural Manufacturing. They created Neural Automotive by applying this framework to the automotive industry where neural traits of "sense—perceive—act" will be crucial not only as an integral part of products and services but also during product development cycles.

TCS has extensive experience in solving complex problems in a range of areas including infrastructure, analytics, agile, automation (AI/ML), and automotive engineering. Unlike many system integrators TCS also has engineering teams with skillsets across all the domains necessary to develop autonomous products. TCS recently launched its Autoscape™ suite of solutions to help customers accelerate their Autonomous and Connected Programs. The Autoscape suite of solutions contains platforms and services that TCS has productized to support autonomy and is shown in Figure 1.

Figure 1—TCS' Autoscape Solution Architecture

Autoscape's end-to-end approach connects the hardware development platform, data curation, software development, and verification & validation pipeline with agile program management. Autoscape Data Services solutions help customers set up the infrastructure (compute/storage) needed to transport and manage the large volume of data from data loggers and other data sources as well as solutions to optimize, ingest, and manage data lake infrastructure on-premise, in the cloud, or using a hybrid. It also includes search capabilities that enable easy selection of data of interest and support synthetic data generation to fill in gaps in scenarios.

Data captured from sensors and cameras needs to be tagged and curated to train algorithms and validate solutions. TCS launched the Autoscape—Data Annotation Studio platform to address these requirements. It is a configurable, open framework that enables users to generate high quality annotations at scale with a high degree of automation. Customers can integrate their choice of annotation visualization tools if needed. The annotation engine features a custom training and inferencing capability to leverage specialized models in the annotation pipeline.

The software development environment for Autonomous Driving (AD) and ADAS work has evolved over the last 10 years. While the AD software development is critical, validation in both real and virtual worlds is where the rubber meets the road. The validation element of the Autoscape suite is branded as SIMPLE and is focused on providing simulation-based validation. It is a behavior-based, coverage driven solution that uses scenarios to validate product behavior. The scenarios are based on OpenSCENARIO 1.0.0 and can be executed across multiple simulation engines to test particular areas of interest. SIMPLE's Cognitive Engine utilizes AI to identify the interactions with scene elements including the environment, vehicle, traffic, and sensors to identify edge cases. The execution of the test suite is automated by the simulation engine and as SIMPLE is simulation engine agnostic it can easily integrate with multiple engines via the open API framework. SIMPLE also includes a library of scenarios that can be utilized to help kickstart a validation program.

TCS' solution is open which is critical when technology is moving fast. The ability to use current toolchains and leverage Autoscape capabilities when needed makes adoption easier. And, if an internally developed or best of breed solution is needed, it can be integrated. Openness is a critical characteristic of the platform approach and CIMdata sees Autoscape's openness as a big benefit to customers.

TCS worked with a US based automotive OEM to support their autonomous development initiative, leveraging TCS capabilities in the connected and autonomous space. Their focus was on building a data platform to manage huge volumes of data, provide decision analytics, and make the right data available to product developers. The OEM was able to speed time to market by leveraging agile, develop automation that improved productivity, use templates that standardized data management, and enable monitoring to track traceability, a critical process to support compliance. Another US based OEM is currently working with TCS leveraging TCS Autoscape Data Management and Data Annotation Studio to curate and annotate autonomous data at scale.

Conclusion

Autonomous products are becoming mainstream and are having an impact on consumers today with automotive early adopters. Autonomy goes far beyond self-driving cars and can be applied across many industries and domains including transportation, agriculture, manufacturing, recreation, and smart infrastructure. As it becomes prevalent in those areas it will have big impacts on society. Before autonomous products can be released to the public, they need to be proven safe and meet many requirements—not a trivial task.

TCS Autoscape, based on TCS' Neural framework is a holistic development platform for creating

autonomous products. It includes advanced capabilities for managing large scale data pipelines, data curation solutions, and a toolchain to accelerate simulation led validation with real and synthetic data for safe deployment of autonomy capabilities. This capability to assess autonomous systems robustness within a chaotic operational environment is needed to achieve passenger safety. CIMdata is impressed with the scope Autoscape covers and the available customer case studies show how it can be applied to effectively solve real world issues and get safe functional products into production. Companies developing autonomous products should review Autoscape and discuss their needs with TCS.

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Wipro's Digital Inventory-as-a-Service – a CIMdata Commentary
18 March 2021

Key takeaways:

- The cost of inventory is a significant and well-understood issue. While statistical models can help manage inventory, end customer satisfaction can be at substantial risk especially in the case of high value and low volume items.

- Technology evangelists often promote additive manufacturing machines that use metal or resin to create parts on demand to meet MRO requirements, but, while important, it only addresses a single dimension of the multi-dimensional inventory management for service parts.

- A robust, profitable solution addressing high-value, low volume inventory issues with digital technology must connect domains across the lifecycle to ensure speed, quality, and cost are repeatable and profitable.

- A practical, sustainable inventory solution is beyond any single enterprise or supply chain's ability and requires many cooperating participants.

- Wipro recognized that to be sustainable, the solution platform needed to focus on the industry level. Wipro has taken a proper integrator role and is acting as a liaison, platform integrator, and solution provider to implement digital inventory-as-a-service focused initially on the oil and gas and marine industries.

Introduction

Industrial domains such as marine, oil and gas, machinery and A&D are based on long-life capital equipment that generate revenue and value over years and even decades. The equipment is often complex and contain many unique purpose-built components and sub-systems. Downtime can be incredibly expensive, dangerous, and in some cases life threatening.[1]

To address the risk of downtime, the customers, OEMs, and service partners use several strategies to ensure maintenance, repair, and overhaul (MRO) is done effectively. Service contracts are common, and maintenance programs such as condition-based maintenance and predictive maintenance are becoming mainstream. In all cases access to spare parts is a critical element. The sad reality is that much of the inventory often goes obsolete and is scrapped before ever being used.

Additive manufacturing (AM) capabilities have reached production-level performance and promise to revolutionize spare parts management. While the 3D Printing/AM advocates had the correct vision and worked hard to increase their technology performance, they over-simplified the issues. Spare parts management is a complex system of systems problem and the additive manufacturing equipment is but

one element. CIMdata is starting to see approaches that bring production worthy additive manufacturing into the product lifecycle where it can have significant impact on inventory management issues and ultimately reduce risk and downtime while improving satisfaction and profitability.

Physical Inventory Techniques Will Be Changing

Physical inventories of spare parts reduce the risk and impact of downtime, but at a cost. Given the pressures today on companies from globalization, competition, and regulatory changes that increase costs and drive prices down, cost savings are critical. While innovation is the long-term solution, cost reduction is the way to survive long enough to innovate. 100% of a cost reduction goes directly to the bottom line.

To shorten time to repair and reduce risk, companies keep spare parts in inventory, and OEMs or service providers have local and regional depots for spare parts. Spare parts management commonly uses statistical analysis of historical demand to forecast stock requirements. This works well for high volume items, but low volume items are more difficult to forecast. A cluster of failures can create demand that exceeds the number of spares available. "Out of stock" is a phrase that maintenance and service technicians don't like to hear.

When a part is out of stock, and unavailable from a depot, it must be procured from a supply chain. If the part needs to be manufactured it can take weeks or even months to get a replacement. Delays caused by out of stock events add cost and reduce customer satisfaction.

Creating and managing spare parts drives the majority of physical inventory related costs. Supply chain issues include lead times, volumes, and safety stock. Low volume orders typically cost more, but perhaps even more critical is lead time. If a replacement part is out of stock it can take weeks or even months for one to be found or manufactured. High value asset owners can't afford downtime, so they often buy their own replacement spare parts to minimize downtime. This is almost always done when the original machines go out of production and the few remaining parts needed get special ordered.

Ultimately much of this inventory ends up unused and adds significantly to overhead costs. For example, commonly the initial spares make up some 2 to 3% of the total purchasing costs of petrochemical and oil producing plants.[2] Within aerospace, inventory cost is estimated to be 25% per year, so for every US$100,000 of spare parts, the annual costs to hold them in inventory are US$25000.[3]

Additive manufacturing allows low volume or even single parts to be made on demand, which can be faster and less expensive than finding and shipping a replacement part from a warehouse. Older equipment operators will benefit from AM replacement parts delivered in a few days. Some predict that auto parts stores may in fact become replacement part manufactures for out of stock parts. But making the part reliably with alternative machines and equipment requires the inventory management technology to also track and reliably communicate properties beyond just dimensions and serial numbers.

As AM becomes proven, the digital record containing physical attributes of parts and manufacturing machine characteristics will need attention. To be sustainable, the solution platform needs to expand the collection of knowledge for reliably making replacement parts with AM. With adequate knowledge about the part, replacements can be made within a week or less. The need for inventories will decrease including their associated wastes.

Digital Inventory and Additive Technology

A modern lifecycle approach to developing products can support a different strategy for managing spare

parts. Additive manufacturing is becoming mainstream and parts made using the various technologies are robust enough to meet difficult regulatory requirements such as those in medical devices and A&D. The production technologies have advanced to where product quality is predictable. Automakers and others are now making low volume parts with AM; gaining valuable production experience.[4]

The design and manufacturing technologies in use today are easily able to generate the data needed to produce products using additive techniques. For spare parts, especially those with complex shapes, additive is a boon. In subtractive processes such as machining, material removal can require extensive processing time, multiple manufacturing steps and setups. For molded, stamped, cast or forged parts, complex tooling is required. With additive a machine builds the part directly from a raw material, plastic, liquid resin, or metal powder, and the production rate is primarily dependent on the rate the material can be added.

With a modern lifecycle approach to product information, it is possible to maintain an end-to-end digital thread that ensures accurate parts can be produced on demand. Product designs are created as 3D models. Manufacturing software converts the 3D model geometry into a series of planar slices that get stacked together to control the build on the additive machine. Once the data for the part and manufacturing process is validated the digital files can be transferred to be built anywhere. The build sites can be distributed and only need to keep the machines and supplies of the appropriate raw materials on hand. These materials can be for processed into any shape required.

Digital Inventory-as-a-Service

While the ingredients for digital inventory-as-a-service are available, it's a complex system of systems that is difficult to bootstrap into a sustainable solution. Elements of the solution include product design and manufacturing software, the digital product and process definition including quality requirements and verification, additive machine and material providers, and equipment operators. Getting all these system elements to work at the productivity, quality, and reliability levels needed for critical industries is not trivial.

CIMdata views this system of systems as requiring a platform approach. CIMdata has published a lot on platforms, usually in the context of a product innovation platform but platforms can also be developed for products such as automobiles and for services.[5] The original Harvard business review article written on platforms[6] identified connection, gravity, and flow as critical elements for a successful platform and also noted value creation for all platform participants. Digital inventory-as-a-service has both the requirements and solutions elements for a successful platform.

Wipro's Solution and Role

Wipro has developed a digital inventory-as-a-service platform shown in Figure 1 which is currently focused on the oil & gas and marine industries. Wipro organized the platform to provide the underlying solution so appropriate stakeholders, consumers, and producers of spare parts, as well as the technology, regulatory, and material suppliers could exchange information and get product in a repeatable process. For example Wipro recruited DNVGL, an internationally accredited registrar and classification society headquartered in Norway that supports the target industries to support the alliance regulatory role. By focusing on an industry, Wipro was able get industrial customers to commit to the platform so there is enough demand for the platform to operate efficiently. The facilitation role played by Wipro to bootstrap the platform is a critical success factor that can't be over stated.

Figure 1—Wipro Has the Role of Platform Integrator Within their Digital Inventory-as-a-Service Approach (Courtesy of Wipro)

Wipro has assumed the role of platform integrator and matchmaker as they connect the platform participants. They have developed the relationships with all the stakeholders and developed solutions to enable digital inventory-as-a-service. The core of the service is the digital passport shown in Figure 2. The passport collects all the data necessary to produce a part quickly, reliably, and with proper certification.
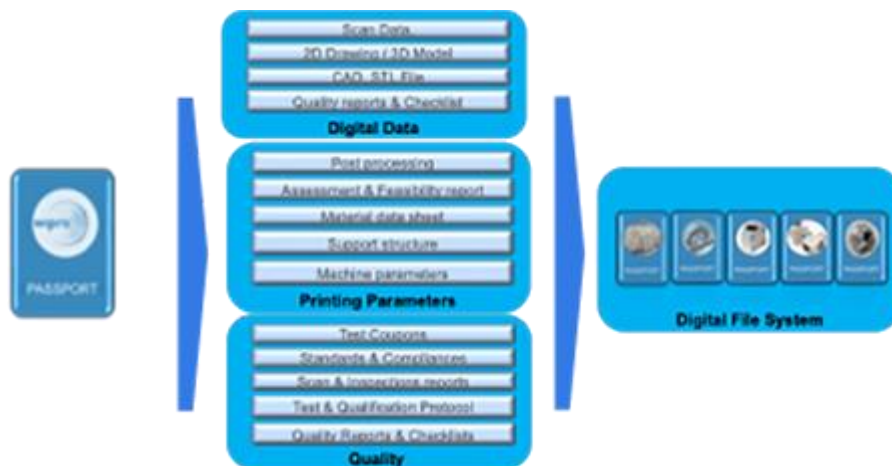
Figure 2—Wipro's Digital Passport Captures and Manages all Relevant Data to Ensure Compliant Parts are Produced (Courtesy of Wipro)

By connecting the industrial companies' product data with certified contract manufacturers around the globe with the support of additive equipment providers and material suppliers everyone wins. Industrial companies can get critical parts made on demand and the additive manufacturing industry gets more business and improves technology.

While the platform is what most of enterprises are looking for, details matter. When companies connect to a spare parts platform, they have many enterprise solutions that need to be connected to operate efficiently such as SAP Ariba or other supply chain platforms. Wipro has the skills and solutions to manage not only the platform but solution integration from any of the platform participants.
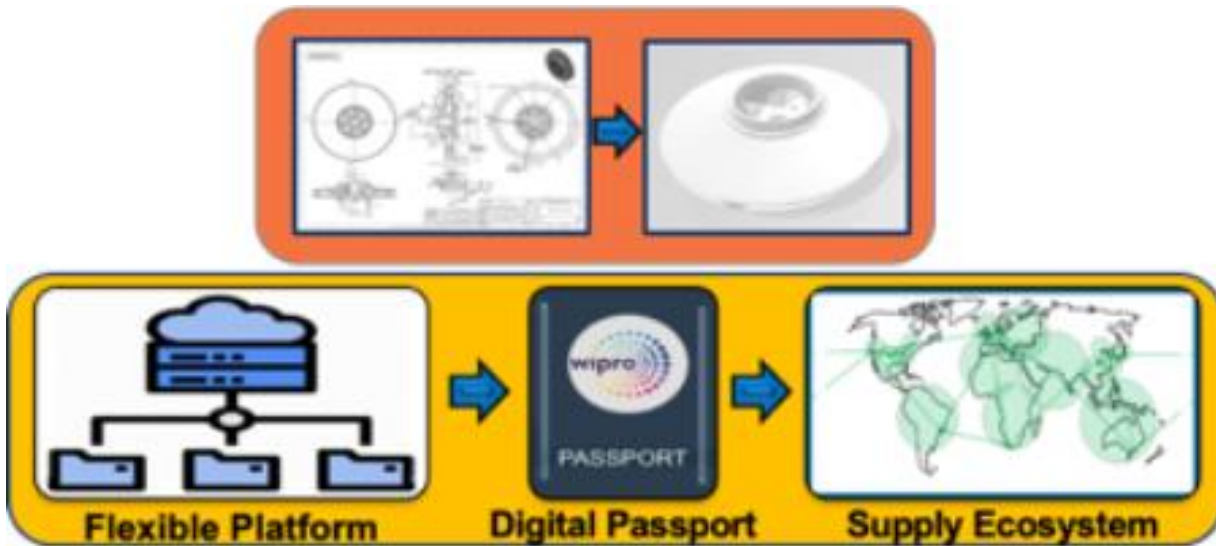
Figure 3—Wipro's Digital Inventory Differentiators (Courtesy of Wipro)

Figure 3 shows the critical elements of Wipro's digital inventory solution. The platform that supports all participants, the digital passport which carries the details necessary to get certified parts produced and the supply ecosystem connecting equipment, materials, and contract manufacturers in a flexible network designed to optimized inventory management.

Conclusion

The spare parts inventory management process is ready for digital transformation. While many companies still have an opportunity to improve using existing spare parts management approaches, additive manufacturing is a new element that can drive significant improvement in the process. Leveraging AM requires many technologies to be organized, and the scale required for efficient operation is beyond that of any single company. Wipro's industry focused digital inventory-as-a-service solution pulls together a consortium of stake holders to increase the business viability and adds technology to support validated part production by ensuring part identification, traceability and also ensuring that certified parts are reproduced reliably. CIMdata recommends that companies looking to transform spare parts management check out Wipro's approach. The oil & gas and marine industry program is underway and other industries are in process.

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[1] Research for this commentary was partially supported by Wipro.

[2] https://www.researchgate.net/publication/326718559_Spare_parts_inventory_control_-_an_overview_of_issues_for_a_large_industrial_complex

[3] https://www.conklindd.com/t-whatdoesinventoryreallycost.aspx

[4] https://www.hagerty.com/media/news/cadillac-blackwing-models-will-use-3d-printed-parts-like-this-shifter-medallion/

[5] https://www.cimdata.com/en/resources/about-plm/a-cimdata-dossier-plm-platformization

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

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Acquisitions

Aurecon acquires renowned consultancy Digital Node

10 March 2021

Aurecon has announced its acquisition of boutique digital construction consultancy and training provider, Digital Node in a move that further strengthens the digital transformation capability of the engineering, design and advisory company.

Digital Node provides strategic and technical solutions to support the built environment in its digital transformation with extensive project delivery experience in Australia, New Zealand, Asia, the UK and North America.

Recently named Australasia's Most Innovative Company in the prestigious AFR BOSS Most Innovative Companies list for 2020, Aurecon Chief Executive Officer, William Cox, stated, "Aurecon's latest acquisition is reflective of our commitment to innovation and advancing the digitisation of our engineering and advisory practices."

Aurecon Chief Digital Officer, Dr Andrew Maher said "Modelling, information management and software solutions are a crucial part of the digitally enabling services our clients are demanding, and Digital Node is at the forefront of best practice digital standards. Together, we will be able to help organisations and governments across the world develop and deliver their digital enablement strategies by transforming infrastructure, impacting the design and performance of asset portfolios."

Digital Node founder, Rebecca de Cicco, is an internationally recognised Building Information Modelling (BIM) subject matter expert with experience across the world in delivering, educating and supporting clients in developing strategies around their digital future.

Rebecca said she chose to join Aurecon, a market leader in digital engineering and advisory, at a time that it is investing in building the workforce of the future and felt that Aurecon's ambition, future blueprint and digital future aligned perfectly with her current and future ambitions.

"BIM and digital information management are fundamental to the performance of infrastructure and projects. Traditional methods without innovation are not enough to ensure sustainable, transformative change. Embedding digital ways of working and driving digital literacy across the workforce of the future is essential, and that's what Aurecon's enhanced BIM and digital strategy capability will deliver."

As Founder and Chair of global not-for-profit 'Women In BIM', Rebecca has established a global community of female professionals supporting diversity in the construction industry. "Aurecon's commitment to diversity and inclusion means that I'll be supported in continuing my work in Women in BIM to engage the next generation of women on a global scale in what is an exciting and challenging field."

As Aurecon collaborates with clients on building their workforce for a digital future, Dr Maher stated: "Digital Node and Rebecca de Cicco will play an important part in our future success."

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Company News

Accenture Invests in Arabesque S-Ray to Expand Analytics Capabilities for Clients Seeking Growth from Sustainability

17 March 2021

Accenture is bolstering its sustainability services and analytics capabilities with a strategic investment from Accenture Ventures in Arabesque S-Ray GmbH, a leading global provider of environmental, social, and governance (ESG) data and insights.

Research from Accenture Strategy and United Nations Global Compact (UNGC) found that over three-quarters (76%) of global CEOs say citizen trust will be critical to business competitiveness in their industry in the next five years, and two-thirds see technology as the single most critical accelerator of the socio-economic impact of their companies to achieve the UN Sustainable Development Goals by 2030. To accomplish this, leaders must be able to confidently look beyond traditional measures or trends, and better understand how non-financial metrics, like ESG criteria, can drive real change and create value for all their stakeholders — from investors and customers to their people and communities they serve.

"Sustainability transformation must be both technology-driven and linked to value to be successful. Creating shareholder value, while also tackling some of the world's greatest challenges, requires rewiring the global economy with new levels of data, insights and action," said Peter Lacy, chief responsibility officer and global Sustainability Services lead at Accenture. "We are pleased to expand our relationship with Arabesque S-Ray to help our clients lead with better decision making, more informed investment prioritization, and accelerated realization of overall business value from their sustainability efforts, goals and ambitions."

Under the agreement, Accenture will have full access to Arabesque S-Ray solutions and analysis of transparent, non-financial and sustainability performance metrics to enhance its existing and highly differentiated sustainability capabilities. Using big data and machine learning models, Arabesque S-Ray capabilities draw on more than four million ESG data points daily from over 30,000 sources to drive key insights for Accenture clients seeking to accelerate their journey to make responsibility and sustainability a competitive advantage.

Accenture has previously leveraged Arabesque S-Ray data and analytics to offer clients insights that help them both serve society and manage environmental impact in their communities, while also achieving better financial performance and growth. As an example, for The Bottom Line on Trust — a first of its kind analysis of more than 7,000 companies around the world operating across 20 industries — Accenture Strategy used S-Ray data to co-develop a proprietary "trust score" to prove that trust is a critical component of competitiveness, as important as growth and profitability.

Through the agreement, Accenture will further enable Arabesque S-Ray by supporting its data and processing capabilities. Together, the companies will also develop new tools and methods for capturing, analyzing and reporting ESG data.

"The demand for access to and analysis of ESG data has only been increasing. We're excited to expand our working relationship with Accenture, and to offer more companies around the world the ability to gain insights into their sustainability efforts and drive real success together," said Dr. Daniel Klier, incoming CEO of Arabesque S-Ray.

Arabesque S-Ray is the latest addition to the investment portfolio of Accenture Ventures, which is focused on investing in companies that create or apply disruptive enterprise technologies. This investment reinforces Accenture's ongoing focus on sustainability and reducing its own environmental impact, including: setting industry-leading net-zero, waste and water goals, signing the UN Global Compact's Business Ambition for 1.5° Pledge, reducing its emissions in line with its existing science-based target and committing to RE100's global initiative to use 100% renewable electricity by 2023.

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Altair Announces Completion of CFO Transition

17 March 2021

Altair, a global technology company providing software and cloud solutions in the areas of simulation, high-performance computing, data analytics and artificial intelligence, today announced the completion of its previously announced CFO transition. Matthew Brown, who joined Altair in January 2021, has succeeded Howard Morof as Altair's chief financial officer.

Altair also announced today that Brian Gayle, a senior vice president with more than 5 years of service with Altair's accounting team, has been designated to succeed Mr. Morof as Altair's principal accounting officer.

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Ansys Appoints Jim Frankola to the Board of Directors

15 March 2021

Ansys announced that Jim Frankola accepted an appointment to the Ansys Board of Directors, effective March 12, 2021 – bringing with him more than 25 years of business transformation, corporate governance and financial experience.

Frankola is the chief financial officer (CFO) of Cloudera, an enterprise data cloud company. He previously served as CFO of Yodlee, Inc., a data aggregation and data analytics platform company, and CFO of Ariba, Inc., a software and information technology services company. In addition to his CFO roles, Frankola has held various senior positions in financial and business management at global industry-leading companies including IBM and Avery Dennison Corporation, and served on the board of ActivIDentity Corporation, a credentials management and authentication company.

Throughout his career, Frankola's expertise has helped businesses innovate to accelerate growth. Under his leadership, Cloudera and Ariba transitioned into software-as-a-service business models, re-platforming core technology and innovating go-to-market strategies, resulting in double-digit improvements in operating margins and organic growth.

"We are proud to welcome Jim to the Ansys board," said Ronald W. Hovsepian, Ansys chairman of the board. "He has a decades-long track record of solving difficult business challenges as well as driving data-driven growth and business transformation. His proven ability to incorporate governance and financial know-how into strategic decision-making makes him an ideal addition to the Board's Audit Committee."

"Jim is an accomplished leader with an exceptional background in business strategy, development and

cloud-based transformation," said Ajei Gopal, president and CEO of Ansys. "His skillset and experience will help to lay the groundwork for Ansys to meet our aggressive growth targets."

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Aspen Technology, L&T Technology Services Partner to Deliver Engineering Solutions Through Managed Cloud Hosting Services

17 March 2021

L&T Technology Services Limited, a global leading pure play engineering services company, has partnered with Aspen Technology, Inc., a global leader in asset optimization software, to offer a complete suite of digital engineering solutions across global enterprises which will empower customers to optimize the performance of their assets and achieve operational excellence through cloud hosting and virtualization.

Cloud services is being increasingly adopted by organizations for new projects or to replace existing programs. According to Verified Market Research, the current global cloud engineering market is estimated to grow at a CAGR of 22.13% from 2019 to 2026.

The partnership between LTTS and Aspen Technology will enable enterprises to "bring their own licenses" for AspenTech's aspenONE® Engineering software suite to be run via LTTS' managed cloud. This will help accelerate customers' Industry 4.0 adoption and help them align rapidly with the changing market conditions. By offering AspenTech's engineering desktop suite via cloud, capital-intensive organizations will improve on operational efficiency and boost margin by leveraging the speed and scale of cloud technologies. Furthermore, this collaboration will reduce the total cost of ownership and improve the customer's business agility especially during uncertain and volatile market conditions.

As an AspenTech Managed Hosting partner, LTTS' cloud engineering services will provide design, delivery and support for compute, storage and virtual network infrastructure in the cloud. As an AspenTech Implementation Service Provider, LTTS will also bring its proven digital engineering capabilities and domain expertise across the entire engineering and manufacturing life cycle to leverage artificial intelligence, machine learning, IoT services and analytics.

Antonio Pietri, President & CEO, Aspen Technology said, "The process manufacturing industry is undergoing a significant change as more companies take advantage of advanced technologies like AI, machine learning and the cloud to better operate their critical assets. Our partnership with LTTS is about giving our joint customers the capabilities they need to optimize their operations and improve their engineering capabilities, so we feel that this partnership will help process manufacturing companies accelerate their digital transformation journeys and adapt to changing conditions when needed."

Amit Chadha Deputy CEO & Member of the Board, L&T Technology Services said, "As the world's leading engineering R&D services provider, LTTS brings to the table conceptual engineering design, enhanced security features and digital tools that can facilitate remote and agile operations on the shopfloor. LTTS' partnership with AspenTech will provide holistic, end-to-end solutions in delivering asset performance and enhancing operational efficiency. LTTS is excited to combine its engineering domain expertise across critical industries with AspenTech's purpose-built software platforms to deliver higher returns over the entire asset lifecycle".

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AVEVA and SHELL Provide Perspective on How Industry 5.0 Will Connect Human Elements to Smart Production

16 March 2021

AVEVA, a global leader in engineering and industrial software, and the Shell Oil Company joined forces to discuss the future of Smart Production recently. Brent Kedzierski, Head of Learning Strategy and Innovation at Shell, and AVEVA's Vice President for Process & Simulation, Ian Willetts, explored how more personalized solutions will empower workers to take greater control over their work experiences creating, more adaptive, on demand experiences which will increase worker confidence, resulting in greater workforce creativity, autonomy and performance. According to Kedzierski, "Industry 5.0 will be characterized by mass personalization and greater workforce collaboration."

Human Intelligence to Work in Harmony with Cognitive Computing Capabilities

The discussion highlighted the need to accelerate the movement to better blend Industry 4.0 connected technologies with the humanistic practices and expectations of Industry 5.0 to deliver even more personalized worker experiences characteristic of higher concept and touch designs. "Combining the power of Industry 4.0 connected technologies with the human element of Industry 5.0 will pave the way for human intelligence to work in greater harmony with cognitive computing capabilities," says Kedzierski.

While Industry 4.0 was about smart production, IoT, sensors and drones, the discussion highlighted that Industry 5.0 will be differentiated by mass personalization and experience design. Kedzierski is hopeful that Industry 5.0 will be a turning point for the human condition at work as physical and environmental safety competence is mastered and industry can shift to addressing psychological safety. "Industry 5.0 will offer greater opportunity, prosperity and sustainability for our workforce," commented Kedzierski.

AI Infused Micro Learning will Pinpoint a Learner's Strengths and Weaknesses

The speakers agreed that the need of the hour is to make the operator training environments more mobile, on-demand and collaborative to drive personalized worker experiences. The goal is to have an OTS where operators can come and build their own training exercises and easily share, test, and even gamify those with their colleagues.

In this regard, Willetts revealed that AVEVA has now integrated operator training simulators with a learning management system (LMS) so that the competency set that must be developed as part of a classroom, lesson or experiential learning exercise can be managed and tracked by the LMS. "We've also integrated AI infused micro learning that can build upon that learning profile and identify an individual's strengths and weaknesses," Willetts said. "We can also absolutely use the behavioral digital twin in experiential learning scenarios. The Digital Twin is not just a data representation of an asset, it provides insight and knowledge that helps companies better understand the behavior of the process." Kedzierski added, "We have witnessed this evolution reflected in the design of our operator training simulators (OTS) as well as the industry award winning behavioral based VR learning solution that Shell created with AVEVA for frontline staff.

Kedzierski concluded that delivering more personalized worker experiences as we progress is necessary to serve the new industrial agenda of achieving the goals of both the enterprise as well as the welfare of humans. "Industry 5.0 will be about connecting human cognition, collaboration and creativity to smart production. Progress will be judged on not just the connection of data between the Internet of Things (IoT), but how connectivity enhances the human experience. The age of mass personalization will be

about achieving large-scale impact, one individual at a time.”

“Working on projects with innovative companies such as Shell is placing AVEVA way ahead of the curve. Our mission is to help the people behind complex industrial processes with information and solutions that combine data, AI and smart analytics to optimize efficiency and will help to shape a sustainable future,” Willetts also concluded.

AVEVA OTS solutions combine dynamic process simulations, virtual control systems and replicated interfaces to match the look, feel and behavior of the actual plant – and can be deployed even before a plant is built. The high-fidelity simulation can expose control issues and procedure problems before start-up, so you can fix it fast and ramp from first feed to full production with no surprises.

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European Consortium Targets Zero Defect Manufacturing
14 March 2021

ModuleWorks, a leading supplier of CAM software components, announces its participation in the EU-funded InterQ project. Coordinated by the IDEKO research centre in Spain, the InterQ project unites 25 partners from 11 European countries to develop an integrated data management platform for zero-defect manufacturing.

Digital manufacturing unlocks a vast amount of data on the production chain, but without the right processing and management technologies, it is not possible to turn this data into accurate, reliable, secure and relevant information for optimizing the efficiency and quality of industrial processes. The InterQ project is addressing this issue by developing a data management platform that enables full control over the data emanating from the production process.

InterQ proposes a new generation of AI-driven tools, digital twins and machine learning algorithms to measure, predict and control the quality of products, manufacturing processes and data in smart factories. The reliability of gathered data will be checked in real time using historical and statistical analyses. The end-to-end approach traces quality across the entire production chain to eliminate waste associated with defects, improve production efficiency and bring production closer to the ideal of zero-defect-manufacturing.

As part of the consortium, ModuleWorks is developing new CAD/CAM software algorithms for automated manufacturing. The new developments arising from the InterQ project are expected to result in greener technologies and more efficient, high quality production that will boost the competitiveness of European companies in key sectors such as aerospace, energy and automobility.

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Eurostep is pleased to announce a collaboration with Active Building Centre (ABC) in the UK
16 March 2021

Committed to delivering ShareAspace solutions for the AEC & Plant markets, Eurostep is seeking organizations that can help share ideas, as well as prioritize and verify the scope and functionalities of ShareAspace for the AEC & Plant industry. In this effort, Eurostep reached an agreement with Active Building Centre Ltd to assist with the testing and verification based on real data.

We will share ideas on where we envisage the AEC industry going and the capabilities a BIM Level 3 solution should have, says Håkan Kårdén, Director of Eurostep's AEC & Plant industry vertical. *With ShareAspace we have an open software platform based on standards, on which we welcome ABC to contribute with their great expertise to help us build the first ShareAspace implementation targeting AEC & Plant*, ends Mr Kårdén.

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Kelsey DeBriyn Joins Ansys As Head of Investor Relations And Government Affairs

17 March 2021

Ansys announced that Kelsey DeBriyn has joined the company to lead investor relations and government affairs, effective today. In this role, she will deepen the investment community's understanding of Ansys' strategy, competitive differentiation and financial outlook as well as manage stakeholder engagement with investors and policymakers. Annette Arribas, currently serving as senior director, investor relations is leaving Ansys to pursue opportunities outside of the company.

DeBriyn has 15 years of experience in investment banking, equity research and investor relations, most recently as vice president of investor relations with Raytheon Technologies. Prior to that, she served as a buy-side equity research analyst at BlackRock covering industrial sectors, and at Goldman Sachs, as a sell-side equity research analyst and investment banker.

"Kelsey has an impressive and accomplished background in finance, strategy, industry and banking," said Nicole Anasenes, Ansys chief financial officer and senior vice president of finance. "Her expertise in communicating company strategy and financial information to capital markets transparently and credibly will benefit Ansys as we continue to position the company for its next chapter of growth."

"I'm excited about the opportunity to join Ansys, a company leading the industry in engineering simulation innovation and quality," DeBriyn said. "I am proud to be a part of this world-class community of talented people."

DeBriyn holds a bachelor's degree with a double major in Applied Economics and Management and Communication from Cornell University and a Master of Business Administration degree from Harvard Business School. She is currently a vice chair on Harvard Business School's Fund Council and a mentor with American Corporate Partners, an organization that helps veterans with career development.

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Mastercam Makes Channel Changes to Better Serve Educational Customers

16 March 2021

CNC Software, Inc., developer of Mastercam, the world's leading CAD/CAM software platform, has announced that its U.S. industrial channel will now also serve its educational customers throughout the country. This move brings the company's global distribution channel into alignment and supports efforts to bring educational customers and industrial manufacturers closer together for mutual benefit.

Mastercam Resellers outside of the U.S. have always serviced both industrial and educational customers within their regions, so fully committing to that model in the U.S. brings the channel into alignment worldwide. CNC Software has successfully tested this approach in the U.S. for many years in states such

as Ohio, Michigan, and Iowa. Now, the company has moved all states under the same model.

With this change, educational institutions gain the benefit of greater connection with the industrial network of manufacturers using Mastercam. They gain direct access to the industrial channel's deep knowledge of the Mastercam product, advanced technical support, post integration, training, and onsite assistance. Additionally, the Resellers form a much-needed conduit between educational and industrial customers. This connection will enable better partnerships between schools and their local industry, which can lead to more effective and successful job placement for students.

"Our industrial Mastercam Resellers provide a valuable connection between manufacturing firms and educational institutions tasked with preparing students to join the workforce, and they have the talent and expertise to support both. We identified this channel realignment as a way for us to help U.S. schools better prepare students with strong technical skills in CAD/CAM and CNC machining, to meet the immediate needs of industry," shared Doug Nemeth, Director of Sales for the Americas, Mastercam.

The company maintains an education department dedicated to supporting the educational market through sponsorships and involvement with organizations such as WorldSkills, SkillsUSA, Project MFG, National Robotics League, First Robotics, NASA HUNCH, and SAE International, as well as a partnership with TITANS of CNC Academy. The department also manages the Mastercam Educators Alliance, connecting instructors with each other, training opportunities, and subject matter experts in support of teaching excellence.

"This is the next step in Mastercam's commitment to engaging with the next generation of CAM users," said Peter Mancini, Education Product Manager, Mastercam. "We consider the needs of schools and educators teaching Mastercam in all of our business and software development decisions, so that students receive the skills they need to fill rewarding jobs in industry—and industrial users gain a supply of skilled workers for a growing number of vacancies."

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MSC Software partners with Ingeciber to improve safety and innovation in major infrastructure projects with simulation
16 March 2021

MSC Software Corporation and Ingeciber S.A., a specialised civil engineering CAE company with more than 30 years of experience in civil engineering, have extended their long-established technology partnership to offer customers easier access to simulation software that helps civil engineers deliver innovative, sustainable and safe infrastructure projects.

CivilFEM, powered by Marc – MSC's nonlinear structural analysis solution – is a powerful and versatile program used for advanced analysis in all construction sectors. Its rich set of tools and unique capabilities streamline the creation of analysis models for construction, dams, forensic structural analysis, seismic design, geotechnics, soil-structure interaction, ans rock and soil mechanic analyses. It is used by civil engineering teams to validate innovative new designs and analyse the safety of major infrastructure projects from foundations, tunnels, mines to oil and gas assets, power plants and skyscrapers.

Used by companies such as **BASF**, **SACYR**, **STI Norland** and **TransNet**, the solution makes it easier for civil engineers to apply nonlinear Finite Element Analysis (FEA) to simulate their designs in various scenarios, including normal use and situations such as earthquakes that affect the integrity of structures,

extreme loading and long-term degradation and wear. Using the CivilFEM interface and tools, engineers apply the highly advanced Marc nonlinear solver to assess the feasibility, safety and durability of new structures and the materials used to build them without needing to a simulation expert.

Ingeciber's *CivilFEM powered by Marc* software suite is now available through the MSCOne token-based access system, enabling customers to use CivilFEM and other simulation software through a common pool of tokens. In this way, customers globally can purchase the solution from a single vendor. The partnership also opens new avenues for joint solution development, including modelling the effect of wind flow on structures such as skyscrapers, using Cradle CFD, which can also be accessed through tokens.

José Miguel Moreno, CEO of Ingeciber, said, "We are delighted to offer customers easier access to CivilFEM. We look forward to building on our partnership to offer new solutions that apply Marc's broader simulation capabilities to provide new insights to civil engineers."

John Janevic, COO of MSC Software added, "CivilFEM is a compelling solution for civil engineering, combining the power of our nonlinear simulation technology with Ingeciber's deep knowledge of structures and the underlying mechanisms that can lead to failure. We are delighted to extend our partnership through MSC**One**XT, making it easier for our mutual customers to build solutions that help them understand complex problems with simulation insights."

The CivilFEM product suite is available from MSC Software globally.

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New BIMcollab partner BIM6x ready to help professionals get started in the United States
17 March 2021

Great news for American BIM professionals: BIM6x will become the newest addition of the BIMcollab global partner network. As a representative in the Unites States, they will start offering BIMcollab services and local expertise. Helping customers to reach the highest quality of BIM and starting their professional issue management journey.

'We make sure you know how to use it'

At BIM6x, they make sure everything they do leads to creating buildings better. But not without a personal touch. As they state: "We don't just sell you a box of software, we make sure you know how to use it. We offer many services to ensure your successful BIM journey." And that's exactly what makes BIM6x a great BIMcollab-partner. American professionals interested in cloud-based issue management, integrated model validation and BIM requirement sharing, can contact BIM6x for local expertise, demos and support.

"We're excited to have BIM6x on board, helping BIM professionals get started in the United States. It's exactly the right timing, now that more and more AEC-companies in the United States start to embrace Open BIM."
Erik Pijnenburg, CEO of BIMcollab

Gaining popularity worldwide

With the BIM revolution in full swing, BIMcollab's acclaimed issue management and model validation solutions are gaining popularity. With over 90,000 Cloud users and over 20,000 ZOOM users

worldwide. Together the software solutions form a highly effective power package. Checking models, communicating issues directly to your team and keeping track of progress, all in one ecosystem. Resulting in top notch model quality and project overview.

"We love that through our new partnership with BIMcollab, BIM6x can contribute to higher quality BIM across the US. We look forward to working with the BIMcollab team, our existing & new clients, and expanding the Open BIM market!"

Chris Clark, Solutions Director of BIM6x

Need for local expertise

With a rapidly growing number of companies worldwide trusting the BIMcollab products, the need for local expertise becomes higher. Through dozens of partnerships, BIMcollab enables high quality services to customers in a growing number of regions in the world. No longer restricted by languages or time zones.

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Rand Simulation Earns Ansys Elite Channel Partner Status

18 March 2021

Demonstrating an unmatched aptitude for solving simulation challenges, Rand Simulation, a division of Rand Worldwide, has advanced to the top tier in the Ansys North American channel with the recent attainment of Elite Channel Partner status. This designation was achieved through a combination of technical expertise, extraordinary growth and a team focused on helping customers use Ansys technology to improve their design processes and product innovation.

"We've reached the pinnacle of the Ansys partner ecosystem through our continuous investment in people who provide our clients with a rock-solid support system to help them overcome their toughest business challenges," says Jason Pfeiffer, vice president, Rand Simulation. "The sole purpose of our rapidly-expanding team of engineers and business professionals is to empower informed insights that enable the innovation of our customers. As an Elite Channel Partner, we look forward to this recognition further strengthening both our partnership with Ansys and our customers."

The Rand Simulation team helps engineers innovate, optimize and validate designs in a virtual environment by combining best-in-class engineering simulation solutions, technical resources and strategic business practices. This unique and collaborative business model has been proven on thousands of design projects across North America. The Rand Simulation team has deep expertise in Computational Fluid Dynamics (CFD), Structural Finite Element Analysis (FEA) and electromagnetics (EMAG) and provides first-hand knowledge to virtually any field of engineering simulation that a design process requires.

"We are pleased that Rand Simulation has so quickly achieved Elite Channel Partner status," says Bob Thibeault, senior director of worldwide channel business development, Ansys. "They have consistently demonstrated that they can unlock massive customer value through their deep understanding of Ansys products and how to strategically use them to solve the most challenging problems. Elite Channel Partners are measured on partner contribution, customer satisfaction and development of staff and I am happy to say that Rand Simulation has quickly exceeded all requirements."

As an Elite Partner and simulation thought leader, the Rand Simulation team shares industry insights on

their popular blog. Rand Simulation will also play an important role as an Ansys partner at the world's largest engineering simulation virtual event, Simulation World 2021.

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TCS Expands Ohio Footprint with Plans to Hire 800+ Employees

16 March 2021

Tata Consultancy Services (TCS) a leading global IT services, consulting and business solutions organization, announced plans to expand its operations in Ohio by hiring more than 800 local employees at its Seven Hills Park campus outside of Cincinnati and other offices across the state by 2022, to meet the evolving needs of its customers.

Additionally, to meet the increasing demand for IT talent and address local community needs, TCS will invest more than USD $518 million in Ohio over the next two years and expects to double participation in its award-winning STEM and computer science K-12 education programs by 2022.

"*This investment in the greater Cincinnati region demonstrates TCS' commitment to training and growing Ohio's workforce,*" said **Ohio Governor Mike DeWine**. "*TCS' plan to double its commitment in STEM programs will positively impact the lives of young Ohioans and prepare them to enter this growing industry.*"

"*I'm pleased that Tata Consultancy Services will be furthering its investment in Ohio's world-class workforce with this new investment in the Cincinnati and Columbus regions, which will create more than 800 new jobs,*" said **Senator Rob Portman.** "*The kind of STEM education TCS provides is essential for ensuring our students get the skills to fill the jobs of today and tomorrow, and I am proud to support these kinds of efforts to help develop the innovators and the workforce our economy needs to thrive. I want to thank TCS for their commitment to helping our teachers develop a truly 21st century educational curriculum.*"

"*The pandemic changed the way companies view technology, requiring them to demonstrate their purpose and value to consumers. Our strong relationships with the greater Cincinnati business community ensure that we will continue to deliver innovative transformation solutions to meet evolving customer expectations*," said **Surya Kant, Chairman of North America, TCS.** "*Ohio is also an integral location for TCS to recruit and train the best local talent and our dedication to provide STEM and computer science education to local schools demonstrates our commitment to the local community.*"

"*Ohio has an outstanding partner in TCS, which launched its North American STEM education efforts in Cincinnati more than ten years ago,*" said **J.P. Nauseef, President and CEO, JobsOhio**. "*As a global leader in IT consulting, TCS can grow wherever it chooses in the North American market, and it chose to expand and bring 800 new jobs to Ohio.*"

TCS' Cincinnati center, one of 30 locations the company has in the U.S., serves more than 160 customers across the state of Ohio and has hired 1,337 employees locally since 2017. Furthermore, TCS hired 244 students from local universities in Ohio for jobs across the U.S. over the last five years, including 18 area graduates in 2020 who participated in a virtual internship program.

Investing in the Future:

According to Code.org, Ohio currently has more than 12,000 open computing jobs, two times the average job demand rate in the state. However, only 42 percent of all public high schools teach foundational computer science courses, and teacher preparation programs in Ohio did not graduate a

single new teacher prepared to teach computer science as recently as 2018.

With its roots in volunteering and community engagement, TCS recognizes the need for STEM and computer science education in schools across Ohio and the nation. TCS launched its first nationwide STEM curriculum called goIT for local K-12 schools in Cincinnati back in 2009. The program focuses on design thinking, problem solving and career readiness, and has engaged more than 30,000 students across the country. Since 2014, goIT has positively impacted nearly 1,900 students in Ohio, and is closely connected to TCS' Seven Hills Park Bringing Life to Things™ IoT Lab. The goIT program is on track to nearly double participation in Ohio over the next year.

TCS' Ignite My Future in School program, a pioneering, transdisciplinary approach for K-12 education designed to embed computational thinking into core subjects such as math, science, arts, and social studies, has empowered 1 million students and nearly 20,000 teachers in the U.S. In Ohio, the program has benefited more than 4,500 students with plans to double participation over the next five years by hosting annual teacher trainings.

Evolving Customer Expectations:

In the wake of COVID-19, companies have been forced to embrace new ways of doing business to survive. According to the TCS COVID-19 Impact Survey of 300 executives, 90 percent of organizations are maintaining or increasing their digital transformation budgets amid the pandemic. In tandem, disruption caused by the pandemic has changed the expectations of consumers, who now expect their favorite brands to align with their values and reflect a greater purpose rather than simply offer a product or service.

To meet rising consumer expectations, businesses across industries are turning to disruptive technologies such as artificial intelligence, cloud computing, IoT and even drones to help them deliver customer experiences that make their company reflect the unique value of their brands. For instance, while all insurance companies sell policies, they may want to be associated with values such as "wellness" or "security." Insurers also want to use technology such as drones to assess residential damage from fires and storms, enabling faster resolution while keeping adjusters safe. New TCS employees in Ohio will develop and deploy technologies that help companies deliver customer experiences that better align with their mission and purpose.

Business and Community Commitment:

TCS' Seven Hills Park Delivery Center in the Cincinnati suburb of Milford, Ohio sits on 223 acres of wooded land, and combined with two other buildings in Cincinnati, supports 1,000+ employees in over 300,000 sq ft of office space, and 2,300+ employees in Southern Ohio. The center includes a drone research lab to address the rapidly expanding demand for unmanned aerial vehicles, the TCS Bringing Life to Things™ IoT Lab, which develops new IoT solutions and products using connected devices and analytics software, and the TCS Analytics and Insights Lab to help organizations view, understand, and reimagine their business through an intelligent data-centric approach.

TCS' North America employee training center is located at TCS Seven Hills Park. Since 2018, more than 200 employees from top universities throughout the country have completed a six-week training program there as part of TCS' Initial Learning Program (ILP). TCS' ILP is unique in the industry with training that includes a mixture of business and technical courses with a focus on integration into TCS and delivering innovative customer experiences. The ILP training also includes a session on Corporate Social Responsibility, reinforcing the importance of giving back to the community and ways to get involved.

TCS' employee volunteers also support local communities in Ohio. Since 2008, more than 10,000 TCS

employees across the state volunteered approximately 38,000 hours of their time to TCS programs like goIT and to organizations such as the American Heart Association, the American Red Cross, Freestore Food Bank, Matthew 25 Ministries, and the U.S. Marine Corp Reserves – Toys for Tots. Furthermore, in 2020, TCS expanded its Grow+ garden program on the campus. More than 50 employees developed a 3,500 square foot garden and since inception in 2018 have harvested more than 2,000+ pounds of food that has fed more than 1,000 families through HealthSource of Ohio, MercyWorks, Clermont County Community Services, and the James Sauls Homeless Shelter.

Over the past 40 years, TCS has partnered with more than a third of the Fortune 500 companies to help them digitally transform and grow their businesses. It has been among the top three U.S. recruiters of IT services talent, hiring more than 21,500 employees in the past five years alone. With industries looking to recover amid COVID-19, TCS expects to hire an additional 10,000 local employees in the U.S. by 2022.

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TCS to Open New Montreal Hub, Hire 500 Employees in the Next Three Years
18 March 2021

Tata Consultancy Services (TCS), a leading global IT services, consulting and business solutions organization, is expanding its presence in Montreal by opening a new IT delivery center in the city, with plans to hire over 100 new employees immediately, and more than 500 in the next three years.

"*We are growing strongly by partnering with some of Canada's largest and most dynamic corporations in their digital transformation initiatives, helping them harness new technologies to power their innovation. Our new center in Montreal is part of the investments we are making to support this growth,*" said **Soumen Roy, Country Head, TCS Canada**. "*With its wealth of talent, artificial intelligence research ecosystem and reputation as a digital innovation hub, Montreal is the perfect place for us to expand. The new center will help us serve our customers better, recruit and develop the best local talent, and invest in the community.*"

The new Montreal facility will offer services and solutions around advanced technologies such as cloud computing, advanced analytics, machine learning and AI. TCS plans to use the center to support new and existing clients across the transportation, retail, and financial services industry verticals. Construction of the new 9,500-square foot facility in the heart of downtown Montreal is already underway and is expected to conclude in April.

As part of its ongoing investment in the region, TCS is also introducing its popular Ignite My Future in School program to Montreal. The pioneering training program gives educators the tools they need to integrate computational thinking into their curriculum. Computation thinking – a foundational 21st century skill – enables students to figure out how to solve real-world problems by learning how to express them in a way that a computer can solve.

"*Ignite My Future employs a transdisciplinary approach that integrates computational thinking concepts into all core subjects, including math, science, language arts, and social studies,*" said **Lina Klebanov, North America Head, Corporate Social Responsibility, TCS**. "*According to the World Economic Forum, 65 per cent of kids entering primary school will be in jobs that don't exist yet. By helping teach them to use creative thinking to figure out how problems can be solved with technology, we are helping prepare students for the jobs of the future.*"

TCS is one of the Top 10 IT services providers in Canada and has been operating in the country for 30

years. TCS Canada currently serves more than 100 large Canadian enterprises from coast-to-coast, and has additional offices in Toronto, Calgary, Regina and Vancouver. With more than 5,500 employees, an established campus hiring program, and progressive workplace policies, TCS Canada has received several workforce awards. It was ranked the Number One Top Employer in Canada by the Top Employers Institute and won a gold Stevie award for its CSR strategy.

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Trimble and VayaVision Establish Alliance to Make Intelligent Automation Even Smarter
11 March 2021

Trimble and VayaVision, a LeddarTech Company, announced an alliance that will bring advanced perception technology to the agriculture, construction and mining markets. The integration of VayaVision's raw data sensor fusion and perception software platform with Trimble's existing industry-leading machine control technology can enable intelligent automation in complex work environments. Together, Trimble and VayaVision expect to provide an innovative hardware and software portfolio, improving autonomous machine performance for a variety of industries.

The alliance is focused on advancing data fusion for multi-sensor systems such as LiDAR, cameras and GNSS. These sensors are used to produce reliable environmental mapping, which is critical for autonomous solutions. The result is expected to enable improvements in the performance of autonomous machines operating in challenging work environments or when supporting safety-critical applications.

Both companies will collaborate to advance autonomous development and adoption with a customizable portfolio that can potentially benefit agriculture, construction and mining professionals in several ways by:

- Improving operational efficiency, decreasing labor costs and reducing project timelines
- Helping customers scale their automation efforts—from driver assistance features to fully autonomous solutions
- Offering a flexible, customer-centric approach to product engineering and implementation
- Reducing customer development costs and accelerating time to market with machine automation
- Augmenting or replacing human control to create a safer work environment through path optimization, obstacle avoidance and situational awareness
- Improving sustainability by optimizing vehicle functionality and utilization with automation to reduce idle time, fuel consumption and environmental impact

"Our business model is to collaborate with strategic partners to integrate our core technologies into their platform products which, in turn, can be used across multiple end applications. The alliance positions Trimble to deliver a highly capable path planning and autonomous system for the agriculture, construction and mining industries," said Youval Nehmadi, director of Perception Engineering of LeddarTech, Israel. "Our LeddarVision perception software delivers advanced, flexible and robust 3D environmental solution for off-road and passenger car applications today."

"Trimble has been connecting the physical and digital worlds with our best-in-class automation technologies for more than 20 years—whether it is in agriculture, construction or mining," said Finlay Wood, business area director for Trimble"s Autonomous Solutions Division. "We see the demand for operator assistance, autonomous machines and workflow optimization accelerating dramatically and

alliances such as this are a critical part of how we will bring added value to our customers in all levels of autonomy."

Vertex Software Awarded New US Patent for 3D Object Visualization & Manipulation Across Multiple Devices

17 March 2021

Vertex Software, the premier visualization platform for 3D-powered digital twin applications, announced today that the U.S. Patent and Trademark Office issued U.S. Pat. No. 10,950,044, titled, "Methods and apparatus to facilitate 3D object visualization and manipulation across multiple devices." This is a comprehensive foundational patent that covers the core of the Vertex platform. It is the first of an extensive portfolio that is under development.

"We have solved a longstanding problem in our industry that no other company has been able to address in decades, and we did so by thinking differently and building something nobody thought possible," says Dan Murray, Founder and CEO of Vertex. "To have our creativity recognized by the USPTO is a source of pride for the entire Vertex team and should be very comforting for our customers, partners, and investors."

Vertex's patent describes a distributed computing method for interactive visualization of 3D models at scale. Specifically, Vertex has invented an ultra-low-cost approach for remote 3D rendering that is based upon the subdivision of 3D models, spatial indexing of geometric primitives, and a scalable fan-out/fan-in architectural computing pattern. Vertex's architecture is built on four tenants:

- Sharding subdivides 3D models into equally sized sets of geometric primitives based upon spatial proximity. The shard datastore accommodates a large number of concurrent users rendering massive 3D models simultaneously. This makes the platform extremely responsive. Sharding also forms the cornerstone of the data security model.

- Spatial indexing of shards provides for rapid lookup of shards needed to render a 3D scene.

- Rapid view frustum culling uses spatial indices to determine the jobs to be performed by the fan-out process. This supports fast and affordable rendering by reducing the scope of 3D shards to be rendered for a given scene.

- High-speed laminate compositing assembles 3D images generated concurrently by a large network of CPU-based workers during the fan-in process. The resulting image is delivered to the end user device at a high frame rate to provide fluid interactivity and responsiveness for the end user.

The manifestation of this patent is the Vertex 3D Visualization Platform, a cloud-native digital twin platform that makes it easy to build and deploy low-code industry 4.0 applications. The Vertex platform runs on CPUs making it the most cost-effective approach for remote 3D rendering available.

By rendering 100% of the 3D data in the cloud, Vertex securely delivers fully interactive digital twin experiences to any device, anywhere—instantly. This approach solves for the lack of specialized hardware and tools for distributed teams and customers outside of engineering.

Vertex customers—including category-leading Fortune 500 manufacturers—use the platform for use cases such as:

- Factory assembly instructions and defect reporting
- Field service training and service instructions
- Sales configuration reviews
- Engineering design reviews and supply chain collaboration

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Event News

Toyota Motor Europe, Cubic Corporation, United States Department of Defense, Insitu, and CIMdata to Keynote Aras' ACE Conference

16 March 2021

Aras, the only resilient platform provider for digital industrial applications, today announced that Toyota Motor Europe, Cubic Corporation, the United States Department of Defense, Insitu, and CIMdata will keynote ACE 2021, the global conference for the Aras community, which will take place digitally April 19-21. Attendees at this year's conference will hear directly from some of the world's leading companies about how they are empowering their enterprise to take advantage of opportunities in a world of increasingly accelerating transformation.

ACE 2021 will unite product engineering experts and leaders in technology from multiple industries, including automotive, aerospace and defense, high-tech, heavy industry, and medical device to highlight the progress made and lessons learned from their digital transformation initiatives. During the three-day, all digital event, attendees will hear from dozens of Aras community members, executives, and industry experts, including:

- **Toyota Motor Europe: Empowering Digital Transformation Across the Digital Thread. The Challenges of People, Process, and...**
  During this session, David G. Sherburne will interview Bill Halliden, Senior Manager, Digitalization & Service Operations at Toyota Motor Europe (TME) about how TME is empowering digital transformation across their digital thread.

- **Cubic Corporation: Data-Driven Actions and Analytics**
  Dan Hedstrom, VP & CIO at Cubic Corporation, will share his company's journey leveraging Aras Innovator's flexibility and ability to integrate with other systems to provide focused, actionable data analytics that enable their executive steering committee to view metrics on overall ECO cycle times, project team utilization, process bottlenecks, and more to make business critical executive decisions.

- **United States Department of Defense: Digital Engineering Implementation**
  For the Department of Defense, the digital engineering focus has shifted to implementation. Philomena Zimmerman, Deputy Director, Engineering Tools and Environments at United States Department of Defense will discuss some focused efforts to enable the use of digital engineering techniques.

- **Insitu: Insitu's Agile Approach to Transforming Their Engineering Value Stream**
  Jacqueline Bono, PDM Product Owner at Insitu, will review the organization's four-year journey using the agile scrum methodology and limited team resources to incrementally expand the

capability of its Aras implementation, with a key focus on improving efficiency within product engineering.

- **CIMdata: Digital Thread - The Key to Transforming Your Future**
  The benefit of joining the digital twin to its digital thread is a competitive advantage. In this presentation, Peter Bilello, President & CEO of CIMdata, will make the case for how and why the digital twin and its digital thread are in fact inseparable and key to transforming your organization's future.

Attendees can customize their conference experience by attending multiple industry-specific sessions and tracks focused on digital thread enablement, systems thinking, cloud, digital twin, supplier collaboration, and more. The program will also feature breakout sessions led by customers including Airbus Helicopter, Grammer AG, Haulotte Group, Microsoft, Nidec, Nissan, SAIC, Sandia National Labs, Seaspan, United States Air Force, and many more. Attendees will hear about the latest software functionality to empower them to meet digital transformation goals and will also get a look into the future as they hear how Aras is adapting and driving new platform capabilities.

"The past year has shown that a business' resiliency, agility, and innovation are of the utmost importance. At ACE 2021, we're looking forward to highlighting the success our customers have had despite the challenges we have all faced," said Peter Schroer, Founder & CEO of Aras. "In a world of increasingly accelerating transformation, Aras is committed to serving as a partner for those who want to build a sustainable path forward."

There is no fee to attend ACE 2021, and most sessions will be recorded and available on-demand after the event is over.

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Financial News

Accenture Reports Very Strong Second-Quarter Results and Raises Business Outlook for Fiscal 2021
18 March 2021

Accenture reported financial results for the second quarter of fiscal 2021, ended Feb. 28, 2021, with revenues of $12.1 billion, an increase of 8% in U.S. dollars and 5% in local currency over the same period last year. Revenue growth for the quarter was reduced approximately 2 percentage points by a decline in revenues from reimbursable travel costs.

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Bechtle continues to grow
19 March 2021

Despite the difficult general economic conditions in the financial year 2020, Bechtle AG set new records. Revenue grew 8.3 per cent to €5,819.2 million. Earnings before taxes (EBT) increased 14.6 per cent to €270.7 million. The EBT margin increased from 4.4 per cent in the previous year to 4.7 per cent. At the same time, year-end liquidity and cash flow recorded new records. Bechtle also reported positive developments with respect to staff numbers: As of 31 December,

12,180 people were employed at Bechtle, which is 693 more than in the previous year.

Organic sales growth amounted to 7.1 per cent. One of the key drivers was the public sector. Revenues in this customer segment exceeded the €2 billion mark for the first time ever in 2020. However, across the Group, development in the regions and segments varied considerably. Outside the DACH region in particular, measures to combat the COVID-19 pandemic were more restrictive in many countries, which took its toll on the regional Bechtle companies. "Our very pleasing growth in the past year is, on the one hand, an expression of our robust business model, but it is also the result of the outstanding work, great drive for success and solution focus of our employees," says Dr Thomas Olemotz, CEO of Bechtle AG. To honour the extraordinary performance of staff, the Board has decided to pay all employees throughout the Group a bonus of €500.

System House business sees double-digit growth

The IT System House & Managed Services segment saw double-digit growth in 2020 as it increased revenue 10.9 per cent to €3,863.6 million. Organic growth amounted to 9.1 per cent. The companies in Austria and Switzerland performed particularly strongly with growth of 22.8 per cent. Domestically, the growth rate was in the high single-digit percentage range at 8.9 per cent. The most pressing needs of customers from industry and the public sector as a result of the pandemic particularly affected the strategically important areas of Modern Workplace and IT Security, as well as Multi-Cloud Solutions, which Bechtle has expanded considerably in recent years. Thanks to its broad range of expertise, decentralised structure, customer proximity and close contacts with vendors, Bechtle was able to position itself very successfully here. EBIT increased 19.8 per cent to €179.5 million. The EBIT margin increased from 4.3 per cent to 4.6 per cent.

E-Commerce has a high margin

The IT E-Commerce segment increased its revenue in 2020 3.5 per cent to €1,955.7 million. In the reporting year, Germany was less heavily affected by the pandemic than other European countries. For that reason, domestic companies performed considerably better. Their revenue increased 17.0 per cent to €415.9 million. In other countries, companies recorded a growth rate of 0.4 per cent. However, following an extremely challenging second quarter of 2020, all companies were able to catch up in the two subsequent quarters and achieve their goals. EBIT in the segment increased 6.5 per cent to €97.5 million. The margin improved from 4.8 per cent to 5.0 per cent.

Strong increase in cash flow and liquidity

In 2020, Bechtle continued to successfully implement measures for optimising cash flow and working capital. This is a huge success, in particular given the difficult economic conditions in the reporting year. Working capital increased only 0.8 per cent, a disproportionately low level. In relation to revenue it fell pleasingly from 12.1 per cent to 11.2 per cent. This positive development was also evident in cash flow. As of the balance sheet date, the cash flow from operating activities increased to €316.3 million, and free cash flow is almost €100 million above the previous year's level at €202.9.

Dividend set to increase 12.5 per cent

Due to the excellent results and the extremely comfortable liquidity situation, Bechtle AG is proposing to the General Meeting that the dividend be increased by 12.5 per cent to €1.35 per share. This would be the eleventh increase in succession, evidencing the reliable dividend policy and appropriate involvement of shareholders in the company's success.

The financial year 2021 will be challenging

While the general economic picture is more positive at the start of 2021 than it was in the reporting year,

there continues to be great uncertainty in relation to further economic development, both in Germany and in Europe. The continuation of the pandemic and the associated effects on the economic environment cannot be reliably predicted. In addition, the supply situation throughout the IT sector is very strained. Nevertheless, the Executive Board expects the business performance of Bechtle to remain positive and above the industry average. Revenue and results are set to increase considerably, while the EBT margin is expected to stay at the high level of 2020. "Our goals for the current financial year are ambitious. We saw considerable cost savings in 2020 as a result of the pandemic, which are not sustainable to this extent. We are nevertheless optimistic about the current financial year. Bechtle is very well positioned to achieve profitable growth even in economically challenging times," says Dr Thomas Olemotz.

Bechtle key figures 2020

		2020	**2019**	**+/-**
Revenue	€k	5,819,243	5,374,453	+8.3%
Domestic	€k	3,660,955	3,336,529	+9.7%
Abroad	€k	2,158,288	2,037,924	+5.9%
IT System House	€k	3,863,574	3,485,037	+10.9%
IT E-Commerce	€k	1,955,669	1,889,416	+3.5%
EBIT	€k	276,955	241,370	+14.7%
IT System House	€k	179,451	149,832	+19.8%
IT E-Commerce	€k	97,504	91,538	+6.5%
EBIT margin	%	4.8	4.5	
EBT	€k	270,705	236,320	+14.6%
EBT margin	%	4.7	4.4	
Earnings after taxes	€k	192,547	170,484	+12.9%
Earnings per share	€	4.58	4.06	+12.9%

		31.12.2020	**31.12.2019**	**+/-**
Operational cash flow	€k	316,254	185,973	+70.1%

Liquidity*	€k	403,173	272,197	+48.1%
Equity ratio	%	43.2	42.4	
Employees		12,180	11,487	+6.0%

*incl. capital and security investments

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ESI Group FY 2020 Results

16 March 2021

Building a foundation for improved growth and profitability

• Adjusted EBIT at €3.7 million; Net result at €1.4 million
• Gross margin rate increased to 74.5% vs 73.4% in 2019
• Clear roadmap aligning all Group efforts to accelerate revenue growth
• Committed to continuing to manage costs in 2021
• Q1 revenue currently expected to be in the range of €52m to €55m

ESI Group releases its results for the financial year starting on January 1st and ending on December 31st, 2020, approved by the Board of Directors on March 15th, 2021.

2020 was a cornerstone year for Industry and ESI Group. During this unprecedented year, ESI had the opportunity to accelerate its multi-year transformation and demonstrate both the resiliency of its business model and the adaptability of its costs. We contained the impact from revenue decrease with a pro-active management of costs, and the benefit of these decisions will be further seen in 2021 and beyond. We stand on a solid foundation, aiming for sustainable gains in both topline growth and profit, as the unique value we bring to industry becomes further recognized. ESI is the essential partner for digital transformation for our key customers. Through focus and best-practice execution, we aim to expand the impact and number of these mission critical engagements, via our unique combination of predictive simulation software and industry specific application knowledge built over the past 48 years.

Cristel de Rouvray
Chief Executive Officer of ESI Group

Control of costs and good resilience of results

Full-year sales were €132.6 million thanks to the very significant proportion of recurring revenue and an increase in the share of licenses in sales. Given the revenue challenge created by the COVID crisis, ESI Group took action to reduce costs to EBIT by 6.6% to €128.9m vs €137.9m in FY19. The full benefit of many of these cost management steps will be realized in 2021.
Gross margin rate increased to 74.5% vs 73.4% in 2019 due to licensing gross margin rate at 86.9% and relative weight of licenses in total revenue (82,4% in FY 20 vs 79.3% in FY 19). Operating costs (R&D, S&M & G&A) decreased by 4.2% at €95.1 m. Despite decrease in EBIT, net result remains positive (favorable forex result and lower income tax) at €1.4 million.

ESI has a strong cash position

ESI Group has demonstrated its capacity in a tough FY20 global environment to maintain a strong

balance sheet. The net financial debt decreased to €24.9 m vs €29.4 m in 2019, with a gearing to 28.4% (Net debt/Equity) vs 34.2% end of December 2019. The Group has a strong cash position end of year at €22.5m including a new government guaranteed loan of €13.75m (PGE State guaranteed loan) versus €20.2m end of December FY19. It did not used its short term RCF (Revolving Credit Facility) end of this year versus a usage of €10m last year.

A roadmap to align all Group efforts to accelerate revenue growth

ESI was built on its ability to tackle the complex challenges of engineers across domains and across industries. During the past 18 months, the Group made a strong transformation effort to align its teams across the globe, to adopt best practices in systems, processes and tools, and to focus its strategy on its core business. The Group organization and roadmap are now set to tackle long-term objectives: deliver strong top-line growth while significantly improving the bottom-line.

Communicated a year ago, ESI has organized its value-proposition around 4 main industries and 4 main customer outcomes.

Development roadmaps are now defined for each industry. These roadmaps are used to align the multi-year investments priorities and guide the teams. ESI delivers compelling solutions in mission critical applications that enable its customers to make the right decisions at the right time. Some success stories that the Group shared in 2020 illustrate this:

- With ESI's help, Nissan Motors succeeded to create the right methodology and took the right engineering decisions in order to industrialize a new material – the CFRP (Carbon Fiber Reinforced Polymer); a key strategic milestone to reach their CO_2 reduction targets.

- Thanks to ESI's human centric solution, Latécoère reduced its industrialization lead times while involving all stakeholders early in the development process to obtain their feedback and train operators in other regions of the world.

- A world leading heavy machinery OEM remained productive during the COVID-19 crisis while using from home ESI's virtual reality solutions.

On the sales side, capitalizing on its strong installed base, the Group has defined a go-to-market strategy based on customer segmentation to, on one hand, strengthen the relationship and increase the business with existing top accounts and, on the other hand, drive new business opportunities globally.

This alignment has also allowed the Group to rationalize some elements of the Group's cost structure (align software development to return-on-investment, fewer facilities, global and streamlined events and marketing) the benefits of which were partly visible in 2020, and will continue to materialize in 2021 and future years.

The Group currently expects Q1 2021 revenue, to be in the range of €52 million to €55 million, compared to €54.9 million in Q1 2020.

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Implementation Investments

ASRY Modernisation Continues with Infor Cloud-Based Digital Transformation Platform
17 March 2021

Infor announced that ASRY, the Arabian Gulf's leading maritime repair and fabrication facility based in Bahrain, has signed a contract with Infor to implement a new state-of-the-art facility-wide enterprise resource planning (ERP) system, Infor CloudSuite Industrial Enterprise, to spearhead its digital transformation.

ASRY (Arab Shipbuilding & Repair Yard), which was established in 1977, handles the repair and conversion of ships, rigs and naval vessels, in addition to fabrication and engineering services covering onshore and offshore industrial components. The company has more than 2,000 employees and operates large-scale facilities including a 500,000-deadweight drydock, two floating docks, 15 repair berths, and a 250,000+-square-meter fabrication area. ASRY completes around 250 projects annually.

As a pillar of the region's maritime sector, ASRY's directors were keen to streamline and automate processes across every department in the company and upgrade ASRY's digital integration to industry best practices. The company selected Infor CloudSuite Industrial Enterprise, which will run on Amazon Web Services (AWS), delivering high performance, scalability and security to replace the existing ERP system.

Given the large scale of its operation and the high volume of complex projects it is working on at any one time, ASRY also opted to deploy Infor Birst, allowing it to gather, analyse and extract value from data generated across all areas of its business and operations. This will provide powerful insights from the boardroom to the shop floor, supporting sound decision making, particularly in terms of understanding which areas of the business may require improvement and where to best allocate resources.

Infor's solutions will help ASRY improve the quality of service for its global customer base, and help it tap into a global marine port and service market that is expected to reach $97 billion by 2025, according to research from Lucintel.

"As part of ASRY's modernisation, this project is a digital overhaul of the entire company's processes and procedures," commented ASRY Managing Director Mazen Matar. "It is the most wide-reaching administrative transformation in the facility's 44-year history, and after an extensive feasibility investigation, we have chosen Infor CloudSuite Industrial Enterprise. ASRY completes over 250 projects per year across four industrial sectors, and once this cloud-based system is deployed, these operations will be simplified and digitised, bringing agility to the business, and ultimately streamlining our ability to serve customers, maximise ASRY's contribution to the Bahrain's Economic Vision 2030 and boost the region's maritime sector."

"ASRY's use of AWS for the new ERP also creates further integration with the kingdom's burgeoning ICT sector," continues Matar. "We are the latest in a wave of businesses and government entities tapping into the advanced and secure technology infrastructure being developed and expanded throughout Bahrain, and we join an elite list of global firms that have also chosen Infor's services."

Amel Gardner, Infor vice president MEA, said: "Infor helps organisations improve productivity, efficiency, and visibility across their operations, enabling management to make better-informed choices. We're thrilled to be working with ASRY on its digital transformation, and we look forward to helping it

achieve its business goals in a dynamic industry."

ASRY and Infor aim to complete the deployment of the first phase of Infor CloudSuite Industrial Enterprise within 11 months. The platform will incorporate all divisions of the yard, including commercial, supply chain, production, finance and general services. As well as a simplified IT architecture, streamlined and automated processes, and end-to-end visibility of key aspects of the business, there will also be modules for a new cloud-based human capital management (HCM) capability to help ASRY deliver streamlined workforce processes, and a new customer relationship management (CRM) module.

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Campfire Interactive and Plante Moran Announce Strategic Relationship

16 March 2021

Campfire Interactive, Inc. (Campfire), provider of a leading solution for portfolio profitability management in the automotive sector and Plante Moran, one of the nation's largest certified public accounting, tax, consulting, and wealth management firms, are announcing their strategic relationship to provide automotive industry clients with world-class software and consulting services for measurable and sustained improvements in profitability and related business practices.

Delivering unprecedented accuracy and insight into profit metrics, Campfire software turns data into information for fast, informed, and confident business decisions. Revenues and costs are integrated in a single system for immediate transparency on the impact of changes in volume, cost, price, capacity, timing information, and many other variables that affect profitability. The company's product offerings include solutions in business opportunity management, sales forecasting, market share management, quoting, costing, pricing, change cost management, capacity visibility, and program and issues management.

Plante Moran's automotive value chain team and cost & margin intelligence consulting practice will support the growing demand for and application of Campfire software. Services available to Campfire customers include software implementation and various consulting services on business and product strategy, strategic cost and pricing analytics, and business and operational process optimization.

Driving Value

With digital transformation and restructuring of business functions becoming essential to innovation, competition, and growth in today's dynamic automotive market, this collaboration provides Campfire clients with a unique opportunity to pair market-leading software solutions with proven implementation services and industry-specific business consulting solutions.

"Our automotive market knowledge sets us apart and allows us to solve complex and costly problems within the industry," said Campfire President and CEO, Pradeep Seneviratne. "Identifying a partner whose offerings and expertise complement that of our own was critical in allowing our customers to maximize their software investment while realizing opportunities for improved profitability. Plante Moran has earned their reputation in equipping clients to respond to the industry's transformation and we are excited to introduce this expertise to automotive suppliers seeking to take control of their profitability."

"Accurate cost and price analytics are essential to optimizing supplier profitability," explained Plante Moran partner and automotive practice leader, Daron Gifford. "Campfire captures all of the cost and

price inputs, enabling automotive suppliers to better formulate and manage their product portfolios and streamline complex business processes. We're excited for the opportunity to introduce Campfire to our clients and offer Plante Moran's extensive auto expertise and capabilities to deliver even greater value to Campfire customers."

Successful Roots

The relationship stems from an engagement between Plante Moran and Neapco, a leading global supplier of automotive driveline solutions. Plante Moran was retained to assist the manufacturer in a program to:

· Understand current quoting, costing, and change management processes

· Document inefficiencies and desired improvements

"Our work with Plante Moran included the assessment of our processes for sales forecasting, quoting, costing and capacity visibility," said Erik Leenders, Neapco Vice President of Sales, Marketing, and Strategy. "Once we had a clear vision for this process, it was also apparent that our current tools would not be sufficient. Our evaluation process for third-party software was extremely thorough, and Campfire was among several solutions assessed. While software features and capabilities were obviously important, a number of other considerations such as implementation methods, customer support, best practices, and of course customer feedback would factor into the decision. Ultimately, this led to the selection of Campfire in late 2020."

He added, "Plante Moran's software-agnostic process improvement recommendations reflecting industry best practices, along with our internal evaluations, recommendations from other customers, and the ability to implement the software without outside resources having to be on-site especially in the midst of a pandemic were determining factors in our selection of Campfire."

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Classic Prep Childrenswear Structures Data and Manages Growth with Centric PLM
17 March 2021

Classic Prep Childrenswear, the traditional children's apparel company, has selected Centric Software®'s Product Lifecycle Management (PLM) solution for emerging brands, Centric SMB. Centric Software provides the most innovative enterprise solutions to fashion, retail, footwear, outdoor, luxury and consumer goods companies to achieve strategic and operational digital transformation goals.

Classic Prep Childrenswear (CPC) was founded in 2016 by partners, Ginger Drysdale and Josh Jewett. Based in Rowayton, Connecticut, the company designs and manufactures comfortable, easy-care children's apparel with classic, preppy styling that goes from frolicking to formal occasions.

The company has enjoyed rapid growth over the past year and a half, especially after placing new focus on their direct-to-consumer business. They recently ramped up their in-house staffing to more than double their pre-COVID-19 levels. This stressed the need to have a system that allowed collaborative and simultaneous work, to eliminate the issues around using Dropbox and spreadsheets.

Says Jewett, "I've been very frustrated about how we manage and communicate with our data. Developing tech packs, purchase orders and trying to do things like calculate fabric utilization, that theoretically should just take a couple of days to do, takes weeks. We're having to constantly go back and forth into Dropbox because a spreadsheet didn't get updated properly, and we were running into

issue after issue related to just this data problem, which in 2021 shouldn't even be a consideration."

The CPC team laid out all their requirements for a digital solution, which included having the design, merchandising, and planning teams benefit from it. Also, meeting the company's current needs but being able to grow with them. They did a search for solutions, sitting through numerous demos.

CPC ultimately chose Centric SMB, a SaaS, cloud-based PLM solution tailored for emerging businesses. The powerful out-of-the-box functionality met all of their needs, with Centric's responsiveness and expertise sealing the deal. Jewett says that referrals were an important part of their decision-making process. "Steve (from Centric) put us in touch with a current Centric customer that had literally just switched from the other system that we were considering. We could actually talk through their decision and why they had made the move, which were all the same reasons that we had, so it was perfect."

Says Jewett, "I foresee it being tremendously helpful to make us much more efficient. We'll be able to create POs and templates for our different factories in a matter of days instead of weeks. We'll create component lists for an entire line that's going into production and be able to quickly export and identify what our testing requirements are going to be, instead of having to pour through excel tech packs to make sure we captured everything."

Chris Groves, President and CEO of Centric Software says, "It is a pleasure to be able to partner with this fast-growing, children's apparel company. We are privileged to contribute to the continued success of Classic Prep now and moving forward."

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Ecopetrol Extends Investment in Aspen Technology Solutions to Accelerate Digital Transformation Initiatives

18 March 2021

Aspen Technology, Inc., a global leader in asset optimization software, announced that Ecopetrol, the largest petroleum company in Colombia, has selected Aspen GDOT™ dynamic optimization software as part of its digitalization initiative to improve refining margins at its two refineries in Cartagena and Barrancabermeja, and upgrading to Aspen DMC3™ advanced process control software in Barrancabermeja refinery.

"Optimizing production and increasing margins in today's downstream business environment requires digital technology that enables refineries to see the entire process and make adjustments based on real-time data," said Francisco Trespalacios Vergara, digital downstream champion at Ecopetrol. "This combination of AspenTech solutions gives us unparalleled visibility and control so that we can respond to changes in market conditions and align our planning, optimization and control strategies at our Cartagena and Barrancabermeja facilities with our global models. These solutions also fit in with our corporate digitalization initiative that we call 'Best of the Best,' which is an effort to deploy the ideal technology solutions to meet our needs across the organization."

Aspen GDOT and Aspen DMC3 join other AspenTech solutions currently used by Ecopetrol, including Aspen PIMS-AO™ for planning, aspenONE® Engineering for process optimization, Aspen Petroleum Scheduler™ and Aspen Refinery Multi-Blend Optimizer™ for scheduling, and Aspen Operations Reconciliation and Accounting™ for mass balance reconciliation. With Aspen GDOT, Ecopetrol aims to improve performance and margin by closed-loop coordination of multiple refining

units in real time. Ecopetrol will use Aspen DMC3 to sustain optimal performance with adaptive process control technology that enables simultaneous process optimization, background model maintenance and testing.

"Ecopetrol is applying a truly innovative, state-of-the-art approach to production optimization and closing the gap between planning, scheduling and operations," said Alex Muro, Vice President of Regional Sales for Latin America at Aspen Technology. "These solutions will give these Ecopetrol facilities the agility and operational flexibility they need to adapt to customer demands and will allow Ecopetrol to achieve greater time to value by integrating with the AspenTech software already in place."

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HALLHUBER Simplifies Operations and Accelerates Decision Making with Centric PLM
15 March 2021

Leading German women's fashion company HALLHUBER has successfully implemented Centric Software®'s Product Lifecycle Management (PLM), increasing productivity in just four months. Centric Software provides the most innovative enterprise solutions to plan, design, develop, source and sell products such as apparel, footwear, sporting goods, furniture, home décor, cosmetics, food & beverage and luxury to achieve strategic and operational digital transformation goals.

For over 40 years, Munich-based fashion company HALLHUBER has been renowned as a stylish and feminine fashion brand, aiming to counter the trend of disposable fashion with its long-lasting garments. Offering high-quality and contemporary collections, special emphasis is placed on the high standard of the products, which are available through its online shop and in almost 200 stores and retail spaces across seven countries, including its own stores and concessions.

The brand launched Centric PLM at the beginning of October in 2020, a move perfectly timed to start the planning processes for the upcoming season. Previously, the company was using spreadsheets, e-mail and a very old-fashioned PDM system, and it required one 'single version of the truth' to streamline design processes, save time and minimize mistakes.

Centric PLM was the obvious choice for HALLHUBER due to its features and functionalities tailored specifically to the fashion and lifestyle industry, as well as its constant development of new product features and effective growth strategies. HALLHUBER went live in under four months.

"By incorporating information from previous collections, Centric PLM saves teams hours usually spent searching for crucial data. Increased visibility and efficiency at every stage of product development maximizes time to value, ensuring quantities and quality are on track to meet promised delivery and fulfilment commitments," says Junior Project Manager at HALLUBER, Annika Storck.

"The greatest benefits of Centric PLM for us include increasing productivity by simplifying operational activities, minimizing errors by running everything in one system, creating greater transparency and digital documentation, accelerating decision making as well as enlarging evaluation possibilities."

HALLHUBER's teams are now enjoying the benefits of working in one tool that is shared across divisions among designers, sourcing and merchandisers. These teams are now communicating digitally, conducting meetings and documenting information – a feature especially valuable in times where more and more hours are spent working remotely.

"We hope to further develop our system by implementing modules such as direct supplier integration

and calendar management," concludes Storck.

Chris Groves, President and CEO of Centric Software, comments, "We are delighted to be working with HALLHUBER to support its exciting digital transformation journey. We are proud of the trusting relationship and remarkable results we have achieved together so far and look forward to continuing this dynamic partnership together."

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Louisville Water Company Taps Oracle to Improve Operational Efficiency

17 March 2021

Louisville Water Company has tapped Oracle Utilities to deliver on its promise of providing unmatched value and service to customers. Founded in 1860, the utility provides nearly one million people in Kentucky with safe, high-quality water. To improve efficiency, Louisville implemented Oracle Utilities Work and Asset Management. With the new platform, the utility improved on-time arrival for customer appointments, cut manual data entry by 530 hours per month, and increased work order throughput by 23%. Despite the pandemic's challenges, the project was completed on time and budget.

Oracle Utilities Work and Asset Management helps companies optimize asset maintenance and operations, improving asset performance and extending asset life through advanced data management, visualization, and analytics capabilities. With the application, utilities can save money and streamline services by better understanding and managing their critical assets.

"We manage a billion dollars' worth of assets across our portfolio and its essential to be able to know how each one is performing at all times. A failed asset means a customer may not be getting the water they need," said Obe Everett, Director Program Management and Business Systems Support at Louisville Water Company. "Oracle Utilities Work and Asset Management has enabled us to build a strong, data-driven asset program. We now have the visibility we need to forecast asset costs, perform predictive maintenance before failures occur, and ultimately extend the life of our assets."

With data flowing seamlessly between Work and Asset Management and the company's existing Oracle Utilities Customer Care and Billing system, Oracle E-Business Suite, and Advanced Metering Infrastructure platform, Louisville Water Company now has a single source for all of its asset data.

Applying predictive indicators to this information, Louisville Water Company can anticipate its asset replacement needs and reliably forecast maintenance costs. This includes whether it is more cost-effective to repair or replace an asset. The system also allows the company to predict and mitigate failures before they occur to improve system reliability, reduce failures, and even analyze asset energy usage across facilities to reduce costs.

Work and Asset Management has also significantly improved the company's ability to respond to field incidents by enabling users to capture current valve status at the time of an incident. Direct integration between the system, Louisville Water's field service application, and ESRI's Geospatial Information System enables this data to be rendered in a map view in near real-time. With this capability, Louisville Water Company can visually monitor the water distribution system's current status and affected customers.

Along with Louisville Water Company's third-party mobile workforce application, the new solutions have empowered the company's workforce with cross-application analytics that support process improvement, error prevention, and provide a better employee experience.

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Model-based impact analysis of product changes

16 March 2021

Today, manufacturers can often only evaluate the functional and financial consequences of product changes with enormous effort. Making design decisions easier in the future is the goal of a new research project. To this end, the consortium will implement an end-to-end system architecture for impact analyses in product development based on the CONTACT Elements platform.

Artificial intelligence (AI) and new methods such as model-based systems engineering (MBSE) offer great potential for optimizing the development process in companies. A consortium led by the Heinz Nixdorf Institute (HNI) at the University of Paderborn wants to take advantage of this. In the project ImPaKT, the research partners are developing an integrated IT solution that will deliver reliable key figures for a more efficient engineering change management via a model-based impact analysis.

One of the initiators of the project is Claas Industrietechnik. Together with its suppliers, the company manufactures products with many variants, such as crawler tracks for agricultural machinery. During development, the various IT systems used internally and by external partners lead to media disruptions and incomplete data. This makes reconciling product changes a time-consuming and error-prone process.

"With ImPaKT, we want to enable companies to evaluate technical changes and their costs more quickly and reliably," says MBSE expert Christian Muggeo, who heads the Engineering Transformation Team at CONTACT Software. "To do this, we look at the entire value chain, including customers and suppliers."

The goal is to build an IT architecture for model-based system development that enables well-founded impact analyses through a shared knowledge base. The consortium also wants to use AI algorithms and introduce standards for integrating the new methods into process management and cross-company collaboration. The primary task of the industry partners will be to validate the project results using three real-world case studies.

ImPaKT was officially launched with a kick-off in January and will run for three years. In addition to Claas Industrietechnik and CONTACT Software, other partners are the Institute for Machine Elements and System Development at RWTH Aachen, Itemis and Prostep, Eisengiesserei Baumgarte, Hadi-Plast Kunststoff-Verarbeitung, Hofmann Mess- und Auswuchttechnik, Knapheide Hydraulik-Systeme and Schaeffler. Prof. Dr.-Ing. Iris Gräßler, holder of the Chair of Product Development at HNI, is heading the project.

The German Federal Ministry of Education and Research (BMBF) is funding ImPaKT with 4.2 million euros. The German Aerospace Center (DLR) is the project sponsor. The results will be presented to a broad public in professional organizations such as prostep ivip, International Council on Systems Engineering (INCOSE), Object Management Group (OMG), the associations of German Engineers (VDI) and mechanical engineering industry (VDMA).

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Numaligarh Refinery Limited Implements Hexagon's Operations Management Solution as Part of its Digital Transformation Initiative

16 March 2021

Hexagon's PPM division announced that Numaligarh Refinery Limited (NRL) has implemented j5 Operations Management Solution (j5 OMS) to ensure safe, efficient and compliant operations of its industrial sites. The j5 OMS inauguration ceremony took place at NRL's refinery site in Numaligarh in December 2020.

The event was hosted by NRL and led by Managing Director Mr. S. K. Barua and the rest of the management team, including Director Technical Mr. Bhaskar Jyoti Phukan and Director Finance Mr. Indranil Mittra. The senior leaders and the j5 OMS Core Team members from NRL Operations Team were also present.

The inauguration ceremony marks the acceleration of NRL's digital transformation journey as the j5 OMS adoption helps the company create a digital shift logbook and digitalize shift operations. The new j5 OMS combines the data collected by the employees with the information from historians, providing NRL's Operations team with a single source of truth for Operations.

NRL will follow a phased approach for the j5 OMS deployment and has started the implementation with five refinery units: hydrocracker, solvent de-oiling, power and utilities, diesel hydrotreater and the Numaligarh Refinery Marketing Terminal (NRMT). A refinery-wide implementation of the solution is planned in first half of this year.

Hexagon's j5 OMS combined with the j5 Connector for AspenTech will empower the NRL team with advanced business operations and technology transfer capabilities. This will improve shift-to-shift communication and help NRL reduce the risk of hazardous incidents, equaling industry-wide shift handover recommendations by experts. NRL's personnel also will be able to collect measurements or observations in the field with industry-standard mobile devices.

Mr. S. K. Barua, MD at NRL, said,"Hexagon solutions will accelerate and support our digital transformation journey by enabling us to optimize our business operations. Hexagon solutions provide us with efficient, intelligent, and data-centric work processes with auditable traceability, supporting the entire facility lifecycle."

"This partnership between NRL and Hexagon marks the first public service company j5 OMS adoption in India. Digitalizing the Operations workforce at the NRL refinery will enable NRL to not only see major advancements in the management of their daily operations but also ensure the best in market safety and sustainability standards. We look forward to successful adaptation of the technology," said Mr. Chanpreet Sahni, Vice President for Hexagon's PPM Division in India, following the inauguration ceremony.

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Rockley Selects Synopsys for Silicon Photonics Design Solutions

15 March 2021

Synopsys, Inc. announced that Rockley Photonics, a leading global supplier of integrated optical chips and modules, has adopted Synopsys solutions to accelerate the design and verification of silicon

photonics for sensing and datacom applications. Rockley is using tools from Synopsys' Photonic Solutions platform, including OptoCompiler™, OptoDesigner, OptSim™ Circuit, RSoft™ Photonic Device Tools and IC Validator. Rockley plans to use Synopsys solutions to design and optimize photonic devices, create process design kits (PDKs) and tape out photonic ICs.

Rockley was an early adopter of Synopsys' OptoCompiler tool following its commercial launch in September 2020. OptoCompiler is the industry's first unified electronic and photonic design platform, combining mature and dedicated photonic technology with Synopsys' industry-proven custom and analog-mixed signal tools to enable engineers to produce and verify complex photonic IC designs quickly and accurately.

"Rockley's unique photonic chipset technology with silicon photonics at its core is driving the growth of integrated optical components in healthcare, machine vision and data communications," said Andrew Rickman, chief executive at Rockley. "The PDA platform Rockley has created by utilizing OptoCompiler allows our engineers to define, simulate, lay out and verify Photonic ICs quickly and efficiently to meet our quality and schedule goals. Synopsys' technical support has been instrumental in ensuring Rockley met its tape-out goals. We look forward to additional efficiency gains by expanding our use of Synopsys' Photonic Solutions tools."

The Synopsys OptoCompiler design platform is a schematic-driven layout flow that speeds design time with automated features such as assisted waveguide routing and auto-alignment of photonic circuits. OptoCompiler helps ensure accuracy through the use of comprehensive photonic layout versus schematic (LVS) checking and native photonic simulators that work in conjunction with industry-standard SPICE electrical simulators.

"Rockley is a valued partner and this purchase is the latest step in a longstanding relationship," said Tom Walker, group director of Synopsys' Photonic Solutions. "Rockley's choice of Synopsys validates our model of providing a unified design platform and expert support. Our intuitive photonics design flow integrated in a familiar EDA environment allows traditional IC designers to be productive in the emerging field of integrated photonics."

Product News

ADAPT-PT/RC Version 20.0 is now available!

12 March 2021

Updated Design Codes: ACI 318-19

ADAPT-PT/RC has been updated to include applicable provisions from ACI318-19: Building Code Requirements for Structural Concrete. The provisions in the latest design standard that have been included in ADAPT-PT/RC include but are not limited to:

- Reinforcement strain limit has been revised for all criteria and system types (beam, one-way and two-way slabs for RC and PT mode) according to Section 7.3.3.1.
- Minimum flexural reinforcement for non-prestressed, reinforced one and two-way slabs shall meet a minimum area of flexural reinforcement of $0.0018A_g$ according to Section 7.6.1.1.
- One-way shear strength provisions for non-prestressed members in relation with Vc for non-

prestressed members have been modified

- The requirements for Av,min for non-prestressed and prestressed beams are given in Section 9.6.3.1 and 9.6.3.2. The provisions have changed from older version of the code.

- For two-way shear of slabs, a new size effect factor, lambda is introduced in the allowable concrete shear stress, Vc,without shear reinforcement.

Licensing

ADAPT-PT/RC now supports cloud based licensing similar to other RISA software products.

Lateral Load Defaults

The lateral load input window includes new notation stating that lateral joint moments are to be inserted as centerline moments, not those at face of support. Additionally, the lateral load reversal is now set to YES for enveloping inclusivity.

BETA CAE Systems announces the release of the v21.1.1 of its software suite
16 March 2021

Known issues resolved in ANSA

General

In case the "Offsets and conflict resolution" policy for a category is set to "Offset", the resolution of conflicts between defined/undefined and undefined/undefined entities will now be effectively enabled, before offsets are applied. This is achieved thanks to the successful introduction of ANSA.defaults setting "Conflict resolution for offset mode", affecting the behavior of both File > Merge and File > Input, as well as all DM > Load functions.

Compare

ANSA could terminate unexpectedly, when the Compare Tool was executed on 2 models, in 2 windows, via script –in specific, via *base.CompareTool()* or *base.Compare()*.

Data Management

Unexpected termination could occur under Compare Tool > Compare selected items function of DM Browser, when the option "Overwrite current model" was by default activated in the Input/Merge Parameters settings.

Connections & Assembly

Unexpected termination might occur when selecting as connectivity of a GEB or Connector a Model Container with hundreds of thousands elements, having the "highlight " mode enabled.

Shell Mesh

Unexpected termination could occur when the Collapse Small Heights function, under Mesh Generation menu, was used in large STL models.

Volume Mesh

The generation of tetra Layers is now sped-up by approx. 80 %. On top of that, cases where Layers generation would create hanging edges with the side area have now been fixed.

Furthermore, under the broader area of Structured Mesh, the Map function now correctly creates solid

elements in light volume representation and ANSA will not unexpectedly terminate during Volume Meshing on machines with many threads.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Known issues resolved in EPILYSIS

Elements

Differences in Eigenmodes would be produced due to the CQUAD8 bending curvature evaluation, whereas –focusing on SOL103– differences in Eigenmodes would be produced due to the CTRIA6 with deleted edge nodes.

Contacts

Wrong displacements would be output for constrained nodes with enforced displacements for intermediate load steps with NLPARM >INTOUT = ALL/YES.

Output Results

If elements of a fluid solid mesh consist of grids with the same coordinates, a fatal error would wrongly be issued and the elements would be listed in the .f06 file.

SPCFORCES and MPCFORCES resultants would be incorrect in case of a grid with CD.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Known issues resolved in META

General

Several Settings issues have been resolved, including:

Certain unit systems in FRF Assembly and in Modal/FRF Correlation were not stored in META.defaults correctly.

Unit settings from "Results" card and "Global Unit System " were not saved in META.defaults at all.

Modal Response unit systems and "Nodal Local System" setting, as well as CORD2R settings in "Modal Model Builder", would not be updated correctly from META.defaults.

Settings in Read results tab would reset to values different from the ones saved in META.defaults file via Ctrl+N.

In a similar manner, the "Ignore Failed Elements" option would not reset to the default value when Ctrl+N was pressed with the "Reset Settings" option enabled.

Collaboration Tool

META would not allow full include sharing of Pam-Crash models, while in Collaboration.

Graphics

Hardware acceleration is now functional, when launching ANSA/META via XRDP.

Read Results

Template Manager would terminate unexpectedly, while loading Nodal Point Stress results from an ADAMS .res file.

Math Operations on Field Data

Unexpected termination occurred when performing Linear combination > Fourier transformation on 3D

results after Ctrl+N.

Report

Focusing on Statistics, upon the creation of a report in PDF format, the .metadb would fail to be included as 3D model.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Known issues resolved in KOMVOS

Data Management

Under Product Tree Editor > Input model definition, users can now distinguish whether to keep the current ANSA units or the units of the input file, thanks to the new " Units " setting. As a consequence, the ANSA units and transformation matrices will be converted accordingly.

Machine Learning

The speed of the feature extraction process for feature-based Machine Learning training has been accelerated. Specifically, time requirements have been reduced by 5-10"', depending on the size of the models.

In addition, it is now possible to successfully see and save predicted results as KeyValue Reports in My Experiments list of the DV Based Prediction window.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

New Documentation in ANSA

Plugins

- ECAD Importer

Tutorials

CFD:

- Optimization with ANSA OpenFOAM

New Documentation in META

Toolbars

Crash and Safety:

- Human Body Models Post
- EU-NCAP Far Side

NVH:

- Bush Sensitivity
- RSS dB(A)

Compatibility and Supported Platforms

ANSA files saved by all the first and second point releases of a major version are compatible to each other. New major versions can read files saved by previous ones but not vice versa.

META Project files saved from version 21.1.1 are compatible and can be opened by META version 16.0.0 or later. To be readable by META versions earlier than v16.0.0, they have to be saved selecting

the option "Version 16.0.0" or "Version <16.0.0".

Support for Mac OS has been discontinued.

Support for 32-bit platform has been discontinued for all operating systems.

Download

Customers who are served directly by BETA CAE Systems, or its subsidiaries, may download the new software, examples and documentation from their account on our server. They can access their account through the "sign in" link at our web site.
Contact us if you miss your account details. The Downloads menu items give you access to the public downloads.
Customers who are served by a local business agent should contact the local support channel for software distribution details.

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CAD Design Software Introduces Four New Electronics Packaging Designer (EPD) Suites Powered by AutoCAD OEM

16 March 2021

CAD Design Software (CDS), a leader in Electronic Design Automation (EDA) software solutions, announces the creation of four new Electronics Packaging Designer (EPD) suites, EPD for Windows Suites, powered by AutoCAD OEM. The AutoCAD OEM platform and graphics engine provides designers a more powerful and CAD-agnostic solution. The EPD Suites will give designers the option to have a complete printed circuit board (PCB) design solution, or just focus on specific tasks such as bond wire exporting or translation of Gerber or GDS files. CAD Design Software will also release a final 'plug-in version' of EPD for AutoCAD to support Autodesk AutoCAD software versions 2018-2021.

"We saw an increasing need from our customers to have a complete solution that included its own graphics engine, and eliminating the need for a separate CAD package," said Tom Dlouhy, Technical Director at CAD Design Software. "The simplicity of working with the AutoCAD OEM platform has made a significant difference in our ability to evolve our EPD solutions to meet the needs of our customers and address the entire design and manufacturing process."

The **EPD Professional Suite for Windows** is the most complete solution to address the EDA design process and incorporates many tools for ease of processing thick film ceramic designs, such as an enhanced dynamic masks generator, panel generation, ODB++ output, and bondwire data export to support bondwire machines. These tools, in addition to nibbler data for removing cavity material in bulk or in steps, control of the Gerber, hole, and punch data for correct output to manufacturing, are beneficial for low and high temperature co-fired ceramic designs.

The **EPD Standard Suite for Windows** enables the creation of prototypes by allowing designers to skip the schematic process and build their prototype directly as a board design. This gives designers the freedom to create a layout, test it and if it works, then hand it off to a team to generate a schematic.

The **EPD Basic Suite for Windows** is a design solution for PCB, RF, and Flex with bi-directional Gerber translator, GDS translator, and includes schematic capture as well as 3D, advanced routing, automatic documentation, and the module of commands that allow designers to clean up the file in order to achieve the desired final result.

EPD Starter Suite for Windows is a design solution for simple PCB designs that require only light design rule checking (DRC) with Gerber output. Schematic capture is included for electrical checking. Also included is a module of commands that allow designers to clean up the file in order to achieve the desired final result.

For designers who want to create graphic representations of a chip design only, CAD Design Software is also launching a standalone Bond Wire Exporter solution that allows designers to start with a simple DWG file that has lines, arcs, polylines, etc., representing bond wires from a chip to a substrate. The Bond Wire Exporter would then "intelligize" the DWG and the file is then output to a bond wiring machine.

"Helping partners such as CAD Design Software create powerful applications that meet the complex needs of their customers has been our focus from the beginning," said Dave Grieve, Director, OEM Partner Management at Tech Soft 3D. "AutoCAD OEM is the gold standard in OEM CAD applications, and Tech Soft 3D is proud to help our partners make the most of this powerful platform."

Hutchinson Le Joint Français uploads the CAD catalog for its sealing solutions to the TraceParts.com platform

17 March 2021

Hutchinson Le Joint Français has chosen TraceParts to give its customers and prospects access to the CAD models for its products.

Hutchinson Le Joint Français specializes in manufacturing O-rings, X-rings, bonded seals, and more besides. Its skills span the entire chain, from product design and fabrication through to development and production. Its technical expertise in industrial markets and its zero-defect quality policy guarantee customers reliable seals boasting superior safety.

Ever since it was created over 70 years ago, Hutchinson Le Joint Français has consistently placed its customers' needs at the top of its priority list. In a bid to meet the sealing needs of manufacturers, industrial firms, OEMs and industrial maintenance companies, Hutchinson Le Joint Français decided to offer access to the CAD models for its range of products.

The teams at Hutchinson Le Joint Français can now keep a close eye on the CAD files downloaded and the popularity of its catalog with the information-packed reports from TraceParts Analytics®. Whenever engineers, designers, buyers or technicians download a CAD model, Hutchinson has all the necessary information (name, email address, company, business line, country, etc.) for contacting them and thereby improving its leads conversion strategy.

Our choice focused on the TraceParts solution due to its strong reputation in industry. In addition to raising our brand's profile and attracting new leads, TraceParts allows us to provide industry professionals with a service for better incorporating our solutions into their environment. Once prospects have shown an interest in our product range, we can contact them, provide them with advice and guide them towards a future purchase, explains Coralie Weislinger, Communication Director at Hutchinson.

We're really happy to welcome Hutchinson Le Joint Français into our 3D content library and promote their products among the millions of engineers and designers registered on our platform, says a delighted Anne Jeannot, Sales Account Manager at TraceParts.

KeyCreator Pro 2021 Service Pack 1 Released

17 March 2021

Kubotek3D, a leading supply chain software provider, today announced the 2021 SP1 service pack release of the KeyCreator software products. This release provides updates to many CAD file translators, several new functions and options, and dozens of fixes.

Updated CAD Translators

Reading of CAD files in KeyCreator Pro software has been updated to support the latest versions of seven major CAD file formats:

- Dassault CATIA V5 R2021x (R31)
- Dassault SolidWorks 2021
- Spatial ACIS 2021
- Siemens NX Series 1926 (through 1946 build)
- Siemens Solid Edge 2021 (and DFT drawing file support added)
- STEP AP 242 (Export support added)
- IFC 4

Drawing Layout Enhancements

The 2021 SP1 release of KeyCreator Pro has added a new Un-Align function to break the alignment lock between view instances in a drawing layout. This capability is useful for moving a dimensioned section view out of the projected location at which it was created. A highlighted phantom line has also been added to indicate which views have an alignment relationship which each other.

A valuable new option has been added to the definition of view instances which allows view orientation to remain locked on an associative display view from model mode. This feature supports rotation of part geometry in model space without any re-orientation occurring in drawing views.

Additional Enhancements

A new Transparency option has been added to Trim Planes which allows visualization of the sectioned model behind the trimming plane. With this option combined with transparency settings on solids or part references, users can see details inside a complex assembly.

The Un-Stitch function has also been enhanced, based on a customer request, to support selection of faces of bodies which are in a part reference entity. This allows creating a quick copy of part or tool faces, saving the steps of opening the part reference for editing.

A new function button has been added to toggle a setting named Foreground Selection. With Foreground Selection enabled cursor selection is prevented from accidently selecting edges and faces in the interior or backside of a solid.

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MathWorks Introduces Release 2021a of MATLAB and Simulink

16 March 2021

MathWorks introduced Release 2021a of the MATLAB and Simulink product families. Release 2021a (R2021a) offers hundreds of new and updated features and functions in MATLAB® and Simulink®, along with three new products and 12 major updates. New capabilities in MATLAB include dynamic controls in live scripts as well as a new task for adding plots to live scripts without writing any code. Simulink updates enable users to import C code as reusable Simulink libraries and to speed up simulations. R2021a also introduces new products in the areas of satellite communications, radar, and DDS applications. More details are available in the R2021a Release Highlights (2:10).

New products introduced in R2021a include:

- **Satellite Communications Toolbox**

As the number of low earth orbit (LEO) satellites increases to serve the high-speed mobility market, Satellite Communications Toolbox is designed to help equipment makers and operators model, simulate, analyze and verify satellite communications systems and links. The new toolbox provides a flexible environment in MATLAB for developing standards-based satellite communications signals, and configurability and extensibility for multi-domain simulation and verification of satellite communication, navigation and remote sensing systems.

- **Radar Toolbox**

Radar Toolbox includes algorithms and tools for the design, simulation, analysis and testing of multifunction radar systems. As a result, radar system designers and integrators can assess system design trade-offs before radars are built or procured. Starting with R2021a, radar specific capabilities and examples previously found in Phased Array System Toolbox will be found in the new Radar Toolbox.

- **DDS Blockset**

The new Simulink add-on, DDS Blockset, gives system and algorithm engineers developing software for DDS-based embedded systems a full Model-Based Design experience featuring modeling, simulation, verification and code generation. As a result, engineers find errors much sooner while performing faster design and coding iterations.

In addition to the new products, R2021a includes major updates to Polyspace, Stateflow and other products in the areas of Autonomous Systems, Computational Finance, Control Systems, Image Processing & Computer Vision, RF and Mixed-Signal, and Test & Measurement. R2021a is available immediately worldwide

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Nanosoft announces the release of nanoCAD Construction 20

12 March 2021

Nanosoft announces the release of nanoCAD Construction 20 – a new version of CAD application for construction engineers.

nanoCAD Construction is based on the updated nanoCAD Plus 20.1 platform and provides users with new possibilities for modern design.

nanoCAD Construction was developed to support 2D parametrical design useful for different AEC specialties. Key features of nanoCAD Construction are based on Library of parametrical design elements. It includes 2D parametrical items.

Some of new features and improvements of nanoCAD Construction 20:

- Automatic enumeration of objects
- Text formatting control in tables.
- Implemented a new dimension type – Offset dimension
- Addition functionality for manipulation with IFC-data
- Improved Space Object

A full list of changes can be found in "What's new" section.
Price of nanoCAD Construction license starts from $260. Owners of valid subscription for nanoCAD Construction can upgrade to a new version free of charge.

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NTT DATA launches Platea Banking – a new Digital Banking platform that helps banks compose innovative open banking propositions
11 March 2021

NTT DATA, a recognised leader in consulting and IT services for the banking and financial services industry, today announced the launch of Platea Banking, a new digital banking platform. Platea Banking helps banks to address transformation challenges with their legacy technology, and to launch new services or innovative new business models faster.

Banks are slowly adapting to modern banking, hindered by legacy systems and a lack of resources to create the digital experiences that consumers demand. As long-term partners to some of the world's largest retail banks, NTT DATA has experienced these challenges for traditional banks first-hand and witnessed changes in the structure of banking created by the Open Banking era. As a result, Platea Banking has been built to help banks around the globe move away from monolithic models and enable them to create new operational models through a platform-based approach, which facilitates a more customer-centric focus to banking.

Built with modern cloud-native banking architecture, Platea Banking is an open banking platform that brings an extensive integrated partner ecosystem and a set of functional modules that enables banks to build their own digital platforms. The modules include a full suite of services, from customer onboarding to lending, planning and financial management, card issuing and processing, and payments, among others. This cloud-focussed approach grants both elasticity and flexibility, so banks can use Platea Banking to grow their digital offering at a pace that suits them, without being locked into a specific vendor.

Manuel Romero, Global Head of NTT DATA's Open Banking Practice, commented: "Technology plays a central role in helping banks innovate and deliver next-generation banking services to their customers. With consumers demanding digital banking experiences, it is imperative that banks act accordingly to respond their needs. Platea Banking has been built to empower banks, providing them with a path to

incorporate cloud-native technology to expand their business, as well as the ability to overcome obstacles such as scalability issues, legacy IT and compliance."

NUM adds power skiving to its portfolio of gear production CNC solutions

15 March 2021

CNC specialist NUM has further extended the functionality of its renowned NUMgear family of gear production technology with the addition of an extremely flexible software option for power skiving.

NUM's new power skiving option provides the enabling technology for CNC machine tool companies to address a key market opportunity in the nascent compact gearbox manufacturing industry. It is now possible to create an entirely new generation of gear production automation that offers combined hobbing and skiving capabilities on a single machine.

Gear manufacturers currently employ a variety of machining processes, including hobbing, shaping, broaching and grinding. To a large extent, the processes that are used are dictated by the type and size of the gears and splines being produced. Hobbing is ideal for external gears, while shaping and broaching are best suited to the production of internal gears – but the latter is only really practicable with small gears. Power skiving, on the other hand, is potentially a much faster and more efficient way of creating external and internal gears of any size.

However, despite being developed and patented more than 100 years ago, it is only recently, with the advent of multi-axis machine tools capable of precision high-speed synchronisation, that the technique of power skiving has become a practicable proposition for industrial-scale use.

Based on NUM's high performance Flexium+ CNC platform, the new power skiving solution forms the latest addition to the company's NUMgear suite of gear production software. Originally developed specifically for gear hobbing applications, NUMgear is continually enhanced to meet industrial requirements and nowadays offers solutions for a broad range of gear manufacturing processes; it is used by many leading manufacturers of gear production machines.

The new power skiving software capitalises on the speed and precision of NUM's advanced multi-level electronic gearbox (MLEGB). This very high performance unit is capable of unprecedented speed and accuracy – it can handle up to 25,000 rpm on the leading axis, and uses look-ahead algorithms to predict both the speed and the acceleration of axes, in order to minimise synchronisation time.

The characteristics of the MLEGB are user-defined in the part program. Any axis can be nominated as leading or following, linear or rotary, and the ratio between the leading and following axes can be controlled by a user-defined fixed parameter or a dynamic machine-cycle variable (curve table). Flexibility is even further enhanced by the fact that multiple MLEGBs can be cascaded, a following axis in a dynamic gearbox can be used as a leading axis in another MLEGB, and either the leading or following axis in an EGB can be real or virtual.

A single multi-role CNC machine tool that offers gear manufacturers the ability to hob large gears and to power skive smaller gears on one shaft whenever tool space is constricted – such as in a compact gearbox – would almost certainly enjoy rapid industry take-up. Thanks to NUM, the CNC control

technology, together with the necessary precision servomotors and drives, is now a reality.

NUM's new power skiving software option can be installed and used on any Flexium+ CNC system running Flexium software version 4.1.00.00 or higher.

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OpenBOM™ Continues Accelerated Growth With New Annual Subscriptions And New Onboarding Program

16 March 2021

OpenBOM™, a leading SaaS digital network-based platform, continues accelerated growth during the first months of 2021 after introducing new annual subscriptions and a new customer onboarding process. The new business model allows OpenBOM to improve the process of customer adoption and to improve the customer experience. For the first two months of 2021, upsells increased 100% compared to the same period last year.

OpenBOM provides a comprehensive, SaaS network-based platform that provides a single data management platform for engineers, prototyping teams, and manufacturing companies, connecting manufacturers to their suppliers, contractors, and customers. During the last 12 months, OpenBOM made 10 product releases introducing a large scope of new functionality to support multi-disciplinary product development process, integrating engineering and purchasing processes and providing a comprehensive and robust data platform to manage product information connected to multiple tools and organizations.

OpenBOM recent customer wins and public stories include the following companies:

Gaius Automotive, manufacturer of a three-wheeled electric vehicle with a blend of maneuverability, capacity, and efficiency. Gaius Automotive is achieving a single source of truth between teams working in multiple locations across the globe using OpenBOM View Mechanism and real-time data sharing.

FlyPyka is a leader in autonomous electric airplanes. The Pyka autonomous crop duster is a thing of beauty on the outside and a sophisticated engineering accomplishment on the inside. FlyPyka is replacing Google Spreadsheets with OpenBOM managing one source of truth for autonomous electric airplane development.

Gates Underwater Products is a pioneer and leader in underwater cinematography for over 50 years! Gates delivers the reliability and innovation their customers have come to expect. Gates Underwater Products uses OpenBOM to connect design engineers, manufacturing and supply chain teams together.

FF Robotics develops a proprietary gripper coupled with a twelve-arm multi-axis robot to pick a harvest-ready fruit from its tree and place it perfectly on an automated conveyor which carefully transports it to its final 800lb harvest bin. FF Robotics uses OpenBOM to save time and money by standardizing 16K individual components and optimizing BOMs.

"What we saw during the first three months of 2021 was that customers are recognizing the value of OpenBOM and entering into longer-term relationships with OpenBOM because we are not simply another PLM tool, but a unique technology and trusted partner in improving their new product development processes," said Oleg Shilovitsky, CEO and co-founder of OpenBOM. "The customers are

confident in OpenBOM's ability to help to develop complex products and connect distributed teams located in multiple locations across the globe.

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Ortman Fluid Power launches all-new on-demand configurator tool with 3D CAD downloads and live pricing

18 March 2021

Ortman Fluid Power has added a 3D CAD catalog of configurable NFPA cylinders, built by CADENAS. The new tool provides on-demand access to design NFPA cylinders as well as Ortman's 101 series cylinders online. This tool empowers customers to find, configure, download, and generate pricing for products directly from the Ortman website.

Best known for their Spacesaver line, Ortman Fluid Power is known as an innovator in the cylinder industry. The Spacesaver line is smaller and provides a rebuildable cylinder option where a standard NFPA design will not fit.

"This 3D CAD configurator is one of the most efficient and full-featured front-end tools we could give to our customers," says Scott Paxton, Owner and President of Ortman Fluid Power. "The new tool built by CADENAS empowers customers to make product changes on-the-fly, as their design evolves, or their project requirements adjust."

Engineers can find, design, and download Ortman products in more than 150 native and neutral CAD formats, including 3D PDF datasheets. A built-in, dynamic pricing module shows an engineer the exact price as they change their cylinder design. No matter the mount, bore, or stroke selected, the pricing tool is active, giving the updated price with each unique configuration made.

Paxton adds, "We want to be responsive to our customer's needs. Our tool delivers what an engineer, purchasing agent or project manager needs, including online pricing, when it's most convenient for them."

The Ortman cylinder configurator is now live for engineers to access CAD downloads from the Spacesaver line, as well as NFPA hydraulic and pneumatic cylinders.

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Siemens' Veloce Virtual Network App Certified for IxVerify 3.0

17 March 2021

Siemens Digital Industries Software today announced that its Veloce™ Network (VN) App is now certified for use with the Keysight IxVerify 3.0 software pre-silicon test solution. Siemens' Veloce hardware-assisted verification solution has provided integration with the virtual solutions from Keysight for years, and now this support has been extended to many advanced features of Keysight IxVerify3.0. With this certification, customers can now seamlessly leverage Keysight's world-class pre-silicon test technology within a highly advanced emulation-based verification flow.

The integration takes advantage of the high-performance co-model channel bandwidth of Veloce™ Strato emulation hardware together with the virtual IxVerify-VN App solution for deterministic, full-system verification. The Veloce VN App integration with IxVerify enables mutual Ethernet networking

customers to accelerate their lab-based validation infrastructure using a high-performance pre-silicon environment on Veloce emulation hardware.

"Our virtual network traffic generation set-up brings the advantages of IxVerify together with the Veloce emulator via sound engineering at the integration level," said Udupi Harisharan, engineering manager at Cisco. "The IxVerify GUI helps clients control and monitor traffic in the Veloce VN App, and also enables porting the same test scripts used at pre-silicon to the lab to test post-silicon."

"Pre-silicon verification with IxVerify and the Veloce VN App has continued to evolve and create increasing value for mutual customers such as Cisco," said Razvan Arhip, IxVerify solution manager at Keysight. "Expanding support for advanced traffic generation and measurements now provides powerful new capabilities to test chip features and complete early performance testing."

"The networking market has driven significant innovation in the virtualization of hardware emulation," said Jean-Marie Brunet, senior director of product management and marketing for the emulation division at Siemens Digital Industries Software. "The validation of Veloce for IxVerify 3.0 is based on a long-term collaboration at the technical integration level to satisfy mutual customers like Cisco."

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TCS Launches Automated Vulnerability Remediation Platform to Secure Enterprises from Cyber Risk

16 March 2021

Tata Consultancy Services (TCS), a leading global IT services, consulting and business solutions organization, announced the launch of its SaaS based Automated Vulnerability Remediation platform that helps enterprises stay one step ahead of malicious attacks by identifying and prioritizing vulnerabilities in their software libraries and proactively fixing them.

The Automated Vulnerability Remediation platform helps enterprises build and execute a contextual, risk-focused and effective vulnerability management program, helping them decide on the right remediation approach across assets, across common vulnerabilities and patching. The platform also helps enterprises set vulnerability tolerance levels.

The platform provides inventory analysis, building a business and technical context around assets and driving consolidation; helps prioritize risks and vulnerabilities according to the business unit, location and asset type; tracks SLAs and KPIs, identifying and analyzing assets which don't comply with internal SLAs; and automates vulnerability remediation. It helps enterprises map their business functions and processes, set SLAs for vulnerabilities and take appropriate mitigation measures.

The platform provides role-based access to C-suite and board level executives, who can directly leverage the real time insights received through the user-friendly dashboard and reports, to review and fine tune the risk strategy.

The SaaS-based delivery model offers enterprises a quick start to a robust and scalable remediation program with minimal upfront capex investment. It is built on a plug-and-play API driven architecture with out-of-the-box integration capabilities with leading asset inventory systems (both on-premise and cloud), commercial and open source security controls, patch management tools, and ticketing systems.

Santha Subramoni, Global Head, Cyber Security, TCS, said, *"Customers embarking on a legacy modernization and cloud migration journey need to remediate pre-existing vulnerabilities and put in place processes and controls to mitigate new ones. TCS' SaaS based Automated Vulnerability*

Remediation platform provides risk-based remediation analytics to help security and IT operations teams quickly and efficiently mitigate known risks, and orchestrate vulnerability remediation – using the right patches, the best configuration scripts, and compensating controls."

TCS offers a full suite of security services around areas such as cognitive threat management, identity, and access management, governance, risk and compliance, data privacy and protection, digital forensics and incident response, enterprise vulnerability management, cloud security, and IoT security services. Customers are partnering with TCS to proactively defend their digital estate from cyber-attacks and vulnerabilities.

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Trimble Announces Release of Tekla 2021 Structural BIM Software Solutions
17 March 2021

Trimble introduced the latest versions of its Tekla® software solutions for constructible Building Information Modeling (BIM), structural engineering and steel fabrication management—Tekla Structures 2021, Tekla Structural Designer 2021, Tekla Tedds 2021 and Tekla PowerFab 2021. New Tekla software features and enhancements continue to power data-driven, collaborative and connected workflows across all project phases.

Tekla Structures 2021 introduces three new subscription options, which can reduce the upfront investment and provide flexibility to balance license needs with an annual subscription of the software solutions. With flexible subscription options, users can choose the appropriate Tekla Structures subscription based on their needs:

- **Carbon**: for viewing models and collaborating with project stakeholders
- **Graphite**: for creating constructible, intelligent BIM and structural documentation
- **Diamond**: for design, detailing and fabrication

The latest version of Tekla Structures also delivers enhancements, improvements and new features that simplify the user experience for more efficient workflows, increased productivity and collaboration across project teams, including:

- Simplified change management with enhanced clash detection and cloning tools
- Better usability with in-product guidance and localization
- Faster, more accurate modeling with drawing and object handling improvements, and new extensions for various modeling tasks including modeling scaffolding
- Increased interoperability with improvements for IFC and other formats, deeper integration with the Trimble Connect™ collaboration platform and continued enhancements to Tekla Model Sharing

Tekla Structural Designer 2021 structural analysis and design software introduces the "design-to-detail workflow" for more efficient modeling of reinforced cast-in-place concrete and transferring reinforcing bars, including slabs, foundations, beams, columns and walls, to Tekla Structures. A new carbon calculator provides the ability to understand a structure's embodied carbon impact during design and compare alternative schemes to identify the most effective, sustainable and affordable option.

Tekla Tedds 2021 structural analysis and design calculation software offers new and improved calculations, including base plate, precast hollow core slab, concrete foundation and timber racking

loads, to satisfy multiple design codes.

Tekla PowerFab 2021 steel fabrication management software delivers visual dashboard reporting, enhanced options for filtering and organizing data, and continued improvements for automated machine instruction on the shop floor.

In addition, extended integration with Viewpoint's [ViewpointOne](#) connected construction management suite streamlines the flow of purchasing and inventory data from Tekla PowerFab to Viewpoint for North American users.

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VOLTA and modeFRONTIER Release 2021 | Spring is now available
10 March 2021

The new VOLTA and modeFRONTIER Release 2021 Spring is now available. With the latest update, modeFRONTIER introduces an all new Sensitivity Analysis tool equipped with a powerful dashboard to perform variable screening more effectively. Among other new features and improvements, VOLTA expands its Planner environment capabilities. You can both run various configurations for the same engineering project and easily change design exploration and optimization scenarios.

ENGINEERING DATA INTELLIGENCE

Introducing the new Sensitivity Analysis tool

Identify the most important design variables a priori is even easier with the new Sensitivity Analysis tool available in modeFRONTIER.

You can now benefit from a more **intuitive interface** to perform a variable screening and exclude those variables with negligible relevance from optimization or RSM projects.

In addition, you can experience new methodologies to train several sensitivity models with different factor/response combinations at the same time. As an alternative to SS-ANOVA, we also add a **new proprietary sensitivity algorithm** based on the Polynomial Chaos Expansion to cover a wider range of specific use cases.

The sensitivity analysis tool also features a new **Effect table chart**. This helps you to better visualize the results of a sensitivity model and reduce engineering problem complexity. You can display the contribution of each factor and immediately exclude the unimportant inputs for your RSM training and exploration.

OPTIMIZATION-DRIVEN DESIGN

Configure multiple simulation plans and switch optimization scenarios easier.

When dealing with complex engineering problems, you need a certain flexibility to fine-tune simulation models in order to find innovative new designs.

With the VOLTA Planner, you can now create, reuse, and **apply multiple plans on top of the same simulation workflow**. This means executing various configurations of parameters, constraints, and objectives for the same engineering project.

Also, you are able to **create your own plan** from scratch directly from the VOLTA Planner web interface. This is another step forward in **detaching the simulation automation workflow** from the

execution strategy. As a result, you gain more time to focus on your optimization scenario and collaborate with other colleagues. Indeed, they can reuse your plans to perform further analysis and consequently reduce the whole product development time.

For each simulation configuration, the VOLTA Planner now also guides you to **easily change the strategy**: from design exploration to optimization scenarios according to your specific needs.

Imagine the opportunity to decide whether opting for a single run to see how your model behaves, exploring your problem with Design of Experiments, or adding objectives for optimization campaigns. Then, all your experience acquired during the **optimization studies can be easily saved** in the VOLTA Planner and **shared with other team members** involved in the next step of the engineering design process.

For all other new features please refer to the release notes included in the software update.

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