PLM Weekly Summary

Editor: CIMdata News Team

13 March 2020

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Acquisitions

Accenture to Acquire ESR Labs to Help Automotive Companies Drive Greater Value from Software

10 March 2020

Accenture has agreed to acquire ESR Labs, a Munich-based company that develops embedded software for leading German car brands and suppliers. The acquisition will expand Accenture's capabilities to help its automotive clients drive greater value from software.

Embedded software is the code running on the electronic units that control a vehicle's functions. Writing it requires a scarce set of experience and skills that the more than 130 software engineers and software architects from ESR Labs will bring to Accenture. ESR Labs also offers solutions to update the code remotely, helps clients develop connected car and mobility services, such as car-sharing, and conducts research into autonomous driving technology.

ESR Labs will join Accenture Industry X.0, the part of Accenture that uses digital technologies to improve how companies design, engineer and manufacture products and services, and operate industrial facilities. As such, ESR Labs will join forces with two other German acquisitions for Industry X.0, strategic design consultancy designaffairs and technology consultancy Zielpuls. Together, they will develop mobility services for carmakers as well as smart connected solutions for medical technology, industrial equipment and high-tech companies.

Andrew Smith, a managing director for Accenture Industry X.0 in Germany, said: "Manufacturing companies need to put software at the core of their business. They also need to adopt and nurture a technology company-like 'pure developer culture.' ESR Labs will put us in a great position to help our clients accelerate their plans to do just this."

Axel Schmidt, a senior managing director and Accenture's global automotive lead, added: "The automotive industry is at a tipping point. Globally, car sales are declining. Customers are demanding more convenient and customized mobility services. Whoever meets these demands best, will win mobility in the future. With ESR Labs, we can help our clients in the automotive sector embrace and implement new technologies much faster."

Frank Riemensperger, market unit lead for Accenture in Germany, said: "Bringing together ESR Labs, designaffairs and Zielpuls will go a long way in helping clients in our market tackle their digital challenges. Together, we can help them develop some of the world's most innovative and high-quality products and services."

Wolfgang Köcher, CEO of ESR Labs, said: "We're excited to become a part of Accenture Industry X.0, which will allow us to create groundbreaking technology solution for clients faster than ever. Accenture's truly global organization will also offer new opportunities to our people."

ESR Labs will be the latest acquisition that Accenture has made to strengthen Industry X.0. In February, it bought VanBerlo, a Dutch product design and innovation agency. In 2019, it acquired US product innovation and engineering company Nytec and UK innovation firm Happen. In 2018, it bought US embedded software specialist Pillar Technology and US hardware engineering firm Mindtribe.

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Bentley Systems Announces the Acquisition of GroupBC, UK Leader in Cloud Services for Construction Information Management

12 March 2020

Bentley Systems, Incorporated announced the acquisition of GroupBC, a leading UK SaaS software innovator. For over twenty years, GroupBC's and Bentley's software solutions have been deployed for complementary purposes to improve project and asset information management. The transaction results from GroupBC's expansion agenda, and Bentley's investment appetite, for international growth opportunities stemming from the UK's national initiatives for major infrastructure investment and towards infrastructure digital twins.

GroupBC's CDE solutions, BC Projects and BC Enterprise+, have been widely applied in the UK for information management respectively across construction and asset estates. Largely due to the UK's substantiated ROI experience and its global thought leadership, CDEs have become increasingly availed globally in "going digital" for capital projects and resulting assets. In 2019, the UK's (BS 1192) construction project information management guidelines were largely adopted within the global standard ISO 19650.

Also in 2019, in its inaugural study of the overall market for Collaborative BIM, ARC Advisory Group ranked Bentley's ProjectWise system as #1 worldwide. The new opportunity is to build on ISO 19650, and GroupBC's UK information management experience, to advance collaborative BIM, through "evergreen" digital twins, to span infrastructure lifecycles. In combination, Bentley's iTwin Services will now be leveraged to uniquely connect GroupBC CDEs and ProjectWise CDEs. Through semantic alignment and change synchronization, the resulting digital twins cloud services will securely federate – fully enabling 4D mixed reality and analytics visibility – previously separate CDEs for construction and engineering.

Keith Bentley, Chief Technology Officer for Bentley Systems, said, "Our iTwin cloud services, taking advantage of iModel-based solutions for interoperability, are ideal for federating CDEs. This enables us to assure that the users of our BC SaaS services will benefit from further extending the value of their project and asset information through digital twins. With the help of our new GroupBC colleagues, we will now be able to better serve engineers, contractors, and owners by bringing together their collective IT (information management), OT (operational technologies including reality modeling), and ET (engineering models). I am confident that the resulting improvements in project and asset performance will be consistent with the UK's demanding but welcome expectations for new ROI breakthroughs from digital twins."

Simon Horsley, UK regional executive for Bentley Systems, said, "Our many UK users, projects, and owners in common with GroupBC will gain a lot from our joining forces to advance CDEs through digital twins. I have been tasked by Bentley management to help the UK to continue to lead the world in going digital for infrastructure advancement, and our new offerings and colleagues from GroupBC bring essential momentum as we pool resources to meet our market's expanded 'infrastructure revolution' requirements. I particularly welcome to Bentley Systems GroupBC's co-founders Sanjeev Shah and Stephen Crompton, and CEO Wes Simmons."

Sanjeev Shah, co-founder of GroupBC, said, "This is a hugely exciting day for our shared accounts and for both our workforces moving forward. The opportunities which arise from bringing our two companies and their respective product portfolios together are enormous, as is the global reach which Bentley can now add for us. Working together we will be even better able to support, through 'going digital,' construction and asset lifecycles."

Stephen Crompton, CPO and co-founder of GroupBC, added, "Bentley is going to provide a great new home for our products to thrive in. GroupBC have always promoted an integrated, best-of-breed approach, and being able to complement our leading software solutions with existing best-of-breed products from Bentley presents a uniquely exciting opportunity for us and our user organizations, opening the door for unparalleled integration between our solutions and bridging the gaps between design, construction and ongoing asset information management."

Wes Simmons, CEO of GroupBC, said, "Our founders and I would like to thank our equity partner YFM for their visionary support over the last five years. For our GroupBC team, customers, and partners, joining Bentley Systems ensures a future of continued growth, including beyond construction information management through broadly federated digital twins, and international expansion. Here's to BC CDE and digital twins advancement!"

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Luxoft to Acquire CMORE Automotive, Provider of Data-driven Autonomous Drive Development and Validation Services

09 March 2020

Luxoft, a DXC Technology Company announced an agreement to acquire CMORE Automotive, an independent services provider dedicated to the development and validation of AI-driven mobility systems.

Headquartered in Lindau, Germany, CMORE Automotive acts as a strategic autonomous drive development partner serving major German automakers and their key suppliers in the automotive industry.

Through its network of Advanced Driver Assistance Systems (ADAS) testing facilities in Lindau, Gutmadingen, Böblingen and Eschborn, CMORE Automotive also offers vehicle prototyping and system testing (NCAP, NHTSA) of vehicle active safety features, including those of self-driving cars.

"CMORE Automotive's highly competitive capabilities and services portfolio, along with their development tool chain for autonomous drive, will strengthen Luxoft's capabilities in data-driven development and validation of AD/ADAS for Level 3 to Level 5 autonomous functions," said Dmitry Loschinin, executive vice president, DXC Technology, and president and chief executive officer,

Luxoft.

"We are looking forward to becoming part of DXC and its Autonomous Drive team," said Richard Woller, chief executive officer, CMORE Automotive. "Our combined client base, which is increasingly demanding shorter autonomous drive (AD) software engineering cycles, will benefit from end-to-end AI-driven development and validation of AD/ADAS at scale."

Subject to regulatory approvals and other customary closing conditions, the transaction is expected to close during April 2020.

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OpenText Buys XMedius

09 March 2020

OpenText announced that it has acquired XMedius, a provider of secure information exchange and unified communication solutions. XMedius brings decades of experience and patented technologies to transform secure and collaborative communication, enabling organizations to move more workloads to the cloud and unlock the information advantage.

"With more than 50,000 installations worldwide, the acquisition of XMedius further strengthens OpenText's leadership in secure information exchange, unified communications and digital fax," said Mark J. Barrenechea, OpenText CEO & CTO. "We welcome XMedius's customers, strong partner network and employees to OpenText. The acquisition reaffirms our commitment to Montreal, already a strategic hub for our analytics and AI development teams. Together, we will bring leading cloud and hybrid solutions to enterprises and small to mid-sized businesses."

XMedius also provides innovative technologies to optimize the omnichannel customer experience and the connected business. These solutions will complement OpenText's Customer Experience Management (CEM) and Business Network (BN) platforms. More information on XMedius can be found on www.xmedius.com.

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Company News

Bentley Systems, Microsoft and Schneider Electric re-imagine future workplaces with sensors, sustainability, IoT and AI

13 March 2020

In collaboration with Bentley Systems and Schneider Electric, Microsoft has rolled out a digital twin of its new regional headquarters at Frasers Tower in Singapore, offering a living blueprint for the future of smart buildings.

"The workplace of the future is about embracing innovation into the very fabric of our space, so that we create multiple touchpoints of connectivity, are intentionally inclusive and accessible, while being very mindful of sustainability and the environment. At Frasers Tower in Singapore, we worked closely with Bentley Systems and Schneider Electric to implement sensors and telemetry to create a connected workplace, that allows us to adjust the space based on usage, therefore improving energy efficiency," said Ricky Kapur, VP for Sales, Marketing and Operations for Microsoft in Asia Pacific.

Saving Costs and Improving Productivity with Digital Twins

At the Microsoft offices in Frasers Tower, data is collected using a mix of 179 Bluetooth beacons in meeting rooms and 900 sensors for lighting, air quality and temperature by Schneider Electric. The platform generates nearly 2,100 data points, that are connected to the cloud on Microsoft Azure, enabling the holistic management of the environment.

The sensors enable monitoring of facilities usage, energy and utilities. They optimize space utilization, air conditioning and lighting adjustments. All these provide a comfortable and productive space for employees, while increasing overall energy efficiency. Open, interoperable technology also allows activity detection enabled lighting and room sensors to reflect room bookings on the Microsoft's Smart Building CampusLink app.

Employees and staff use Smart Building CampusLink, an application that is fully integrated with Microsoft Outlook and Microsoft Office 365, taking navigation to the next level by enabling employees to find directions, determine room occupancy and book facilities in real-time. Built on Azure App Services and powered by Azure Data Lake and Office 365 Graph API, Microsoft's regional headquarters in Asia Pacific is the first Microsoft office outside of Redmond, Washington to implement Smart Building CampusLink.

The sensors could potentially also monitor carbon dioxide levels in the air that negatively affect work performance and neural activity, noise levels and energy usage, which can result in savings of up to 25%, as experienced at Microsoft's Headquarters located in Redmond, Washington.

"Smart sensors allow us to collect meaningful data in real time, which enables us to optimize various aspects of our spaces, making them more comfortable, while reducing energy consumption in a sustainable and economical manner. Our partnership with Microsoft offers a real model on how connected devices combined with contextualized sensor processing can deliver smart building systems that do not intrude on the privacy of individuals, and can be applied beyond offices, to buildings, malls and even homes of the future," shared Damien Dhellemmes, Cluster President, Singapore, Malaysia, Brunei, Schneider Electric.

Data driven blueprint

The data from sensors enable the virtual replication of the physical world by modeling the relationships between people, places, and devices in a spatial intelligence graph. The operational insights achieved through the digital blueprint allows for management and measurement, creating uniquely relevant experiences by correlating data across the physical and digital worlds. Developed and implemented in partnership with Bentley Systems, Microsoft's digital twin of Frasers Tower in Singapore is a model for smart offices. It brings together the convergence of artificial intelligence, Internet of Things and productivity tools in a uniquely relevant manner.

"Digital twins are redefining how we manage infrastructure, from individual equipment installations to large facilities and entire cities. While smart buildings were developed to better manage energy consumption, we have come to realize additional strategic roles of dynamically allocating space, increasing utilization, reducing costs, improving competitiveness, and enhancing collaboration and productivity. With Bentley's OpenCities Planner and Microsoft's Azure cloud platform and Power BI, we have developed a virtual digital twin model of their regional headquarters in Singapore, correlating the data collected across the digital and physical worlds to build domain-specific solutions and unlock new efficiencies, improvements, and opportunities for the modern workplace," said Kaushik Chakraborty, vice president and regional executive for Asia South at Bentley Systems.

Sustainability and inclusivity

In a world where we can expect more than 40 billion devices generating nearly 80 zettabytes (ZB) of data by 2025, organizations and industries will need to adopt new technologies and build capabilities that will enable them to flourish in an innovation-led, cloud first, artificial intelligence focused future.

Asia Pacific is one of the fastest growing regions for Microsoft, which has created a blueprint for organizations to adopt the culture, physical spaces and technologies for a future-ready workplace. Spread across 12,500 sq. meters and six floors, the new Microsoft office at Frasers Tower brings 1,400 people together in an environment that allows the digital and physical worlds to exist in harmony.

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Cadence Collaborates with STMicroelectronics on Networking, Cloud and Data Center Electronics

10 March 2020

Cadence Design Systems, Inc. announced it has been working together with STMicroelectronics to successfully tape out a 56G very short-reach (VSR) SerDes in 7nm for a system on chip (SoC) targeted at the networking, cloud and data center markets. Cadence provided the critical IP architecture, certain IP sub-blocks and relevant design support, leveraging its investments in 56G and 112G PAM4 SerDes technology while ST developed the complete SerDes core, making use of its extensive know-how in this field.

"Cadence's strong 112G SerDes fully hits the requirements relevant to ASICs for networking and communication," said Flavio Benetti, general manager of the ASIC division at STMicroelectronics. "By combining Cadence's silicon-proven IP building blocks with our deep knowledge of SerDes analog and mixed-signal design techniques, we were able to beat our customer's challenging power targets. We value our ongoing collaboration and have selected Cadence as our preferred supplier for 112G long-reach SerDes IP."

"Our successful collaboration with STMicroelectronics exemplifies how Cadence is delivering SoC design excellence through our Intelligent System Design strategy," said Babu Mandava, senior vice president and general manager of the IP group at Cadence. "Our silicon-proven PAM4 SerDes IP portfolio optimized for power, performance and area efficiency, used in conjunction with the Cadence Innovus Implementation System, enabled ST to achieve performance excellence and time-to-market advantage for their innovative designs."

The broad Cadence® design IP portfolio including the 112G Multi-Rate PAM4 SerDes, and the best-in-class digital and signoff technology including the Innovus™ Implementation System, both support Cadence's Intelligent System Design™ strategy, enabling customers to achieve SoC design excellence. For more information on Cadence's broad SerDes IP portfolio, visit www.cadence.com/go/56gserdesip.

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Dover Microsystems and Cadence Partner to Deliver Secure Processing with Silicon-Layer Security for Mission-Critical Applications

09 March 2020

Cadence Design Systems, Inc. and Dover Microsystems today announced a partnership to deliver a solution that enables the development of secure processing for aerospace and defense applications, providing enforcement-level security that protects against the exploitation of software vulnerabilities. Through the collaboration, customers can leverage new runtime security monitoring capabilities that

identify security policy violations and physically block them from making unauthorized changes to the system's memory.

This partnership aims to help secure the national defense technology asset base through the integration of Dover's CoreGuard® technology and the Cadence® Tensilica® Xtensa® LX7 processor. The integration offers customizable security across a wide range of applications, protecting embedded systems from network-based attacks. Dover's CoreGuard technology monitors each executed instruction to ensure it complies with a set of security, safety and privacy rules, called micropolicies. If an instruction violates an existing micropolicy, CoreGuard stops it from executing in real time before damage can be done.

"Our shared vision of providing customizable levels of security delivers immense value to Cadence's aerospace and defense customers as well as their commercial customers in the automotive, industrial IoT, and imaging markets," said Jothy Rosenberg, Dover Microsystems founder and CEO. "Dover Microsystems is the first company to immunize processors against entire classes of network-based attacks. We are thrilled to be working with Cadence to create the next generation of secure embedded processors."

"We're seeing threats to national defense increase in the cybersecurity domain, so it's more critical than ever to deliver solutions that protect against these threats," said Charlie Schadewitz, VP of sales, aerospace and defense at Cadence. "Our partnership with Dover Microsystems delivers upon the need for secure processing and provides the aerospace and defense industry with the utmost levels of security for their embedded systems."

Infosys Joins Qualcomm Smart Cities Accelerator Program to Offer Smart Cities Solutions
10 March 2020

Infosys has joined the Qualcomm® Smart Cities Accelerator Program to offer end-to-end solutions for smart stadiums, smart venues and smart event management. This program is designed to connect cities, municipalities, government agencies, and enterprises with Qualcomm Technologies' ecosystem to help deliver greater efficiencies, cost savings, and broad access to solutions for smart cities' problems today.

Utilizing cutting-edge connectivity and compute technologies from Qualcomm Technologies and Smart Spaces solution from Infosys, facilities managers of stadiums and venues can reimagine the physical spaces by enabling the next generation fan experience, improved energy efficiencies, increased people productivity, and differentiated user experiences through seamless connectivity. Infosys' global network of innovation centers, experience design, and expertise in building connected ecosystems can unlock energy and resource savings by enabling reductions in per capita energy and water consumption, effective recycling and use of renewable energy.

These Smart Space solutions build upon Infosys' proprietary SCALE (Sustainable-Connected-Affordable-Livable-Experiential) framework for smart spaces. SCALE offers a rich set of features for building and resource management, physical assets management and occupants' safety and security. It uses digital technologies to deliver an enhanced user experience for personal comfort, wellness, collaboration and convenience. Integrated with a command center, it delivers actionable insights through predictive capabilities to optimize resources for easy maintenance and improved efficiencies. By deploying SCALE, building managers can achieve significant savings in space utilization, energy, and water consumption, reduction in net carbon footprint, and better user experience.

Sanjeet Pandit, Senior Director, Business Development and Head of Smart Cities, Qualcomm Technologies, Inc. said, "Infosys has been a global leader in driving new Smart Spaces technologies. We are excited to have them join the Qualcomm Smart Cities Accelerator Program to further share their solutions expertise, enrich the ecosystem of smart cities solutions, and unlock new potential for smart cities' customers around the world."

Corey Glickman, Vice President and Head - Strategic Design Consulting, Infosys, said, Physical spaces are the latest in adopting digital transformation. We are excited to join the Qualcomm Smart Cities Accelerator Program to offer leading solutions in Smart Spaces to ecosystem partners building devices with Qualcomm Technologies' edge compute solutions, with its cutting edge processors and connectivity solutions including 5G. As a member of the program, we will accelerate sustainable solutions that are secure and interoperable to release immediate operational efficiencies for our customers and innovate to deliver solutions at scale."

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SAP.iO Foundry Berlin Launches Industry 4.0 Startup Acceleration Program

11 March 2020

SAP SE announced that SAP.iO Foundry Berlin kicked off its second Industry 4.0 program earlier this month, with six international business-to-business startups focused on manufacturing, logistics, supply chain management and process optimization.

The SAP.iO Foundries program enables startups to develop technologies to help existing businesses go beyond digital manufacturing and seamlessly connect all aspects of an entire company — from design to operations to sales and service. The program helps SAP customers to find and adopt these disruptive technologies.

"SAP is committed to our customers' successes, and innovation and collaboration are key to this commitment," said Thomas Saueressig, member of the Executive Board of SAP SE for SAP Product Engineering. "We see this program as an important step in accelerating SAP's Industry 4.Now initiative with new and innovative solutions, which capture and integrate data into business processes to drive outcomes."

SAP.iO Foundry Berlin, part of SAP's strategic business unit, is designed to accelerate innovation and drive new business models for SAP. This zero-equity-ask program provides startups with curated expert support from within and outside of SAP, exposure to SAP technologies, and opportunities to meet and collaborate with SAP customers.

The following startups are joining the SAP.iO Foundry Berlin Spring 2020 program:

Agranimo produces software and microclimate monitoring equipment that turn soil and climate information into a management strategy.

Fretlink connects shippers to the largest hubs of local carriers in Europe through a new standard road-freight organization.

Soley saves millions of dollars by optimizing complex product portfolios.

LiveEO analyzes satellite data to monitor large-scale infrastructure grids.

Wandelbots allows everyone, even those without technical experience, to teach robots quickly, easily and inexpensively.

3DQR has developed a very simple and flexible solution to work with augmented reality (AR) and thereby merge digital 3D experiences into any industrial environment.

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Events

PERSISTENT @ AeroDef 2020X

12 March 2020

Global Supply Chains have been recently disrupted by multiple factors including trade constraints and spread of unexpected viruses. As a result, manufacturers can't get the components and/or materials they need to build their products and companies are looking to readjust their inventories to fulfill only portions of the demand. What suppliers and OEM's alike really need is the ability to adjust with agility and flexibility. Now more than ever is the time for making the leap to digital and crossing the chasm. Collaborative Intelligence in manufacturing is especially relevant in these times where more adaptative supply chains are needed.

Persistent Systems, Innovation IIoT Leader (Zinov Zones 2018) and Global Digital Engineering integrator announced will be speaking at AeroDef 2020, Fort Worth, TX, the premium conference for Aerospace and Defense attended by more than 2,600 global industry in. Lewis Breeding, industry Solutions Architect with +20 years of experience will speak about Collaboration and Digital Continuity for disruptive Supply-chain times. Manufacturers are looking to adapt faster to unexpected disruptions in the supply chain as well as be able to respond to changing demand. As an exhibitor at the conference, Persistent Systems will be showcasing all the capabilities that make them the best partner for Industry 4.0. Persistent Systems facilitates the A&D companies Industry 4.0 agenda by orchestrating confluent technologies like ALM/ELM, PLM, Digital Manufacturing, MES/MoM systems, IIoT, AI/ML and Analytics, helping OEMs and Suppliers with integrations end-to-end from Bid to design to operations to delivery.

Persistent will also have available promotions to join their exclusive A&D Suppliers Program, opening the door to a fast and convenient easy to start and accelerate the digital journey. The program includes short assessments and jump start services according to the digital maturity and Industry 4.0 roadmap recommendations for implementations of Digital Collaboration platforms. This program is designed to build bridges between design, manufacturing operations and execution. Other promotions will include joining the Simulation program for existing CATIA and ANSYS users with unique benefits for product consumption and consulting.

"The need for digitalization is more urgent these days than ever now that confidence in global supply chains is been tested. OEMs have to promote and contribute to create more digital collaboration hubs across the globe and locally, and suppliers need to be digitally connected and improve their internal process with steady digital improvements. This way suppliers will be ready to respond to the new demand. Every crisis brings opportunities, there is a window of opportunity in today's environment, the time for change is now."

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TECHNIA Announces 1st Online, Global and Sustainable PLM Conference and Exhibition - PLM Innovation Forum 2020

10 March 2020

TECHNIA will deliver the first PLM Innovation Forum (www.PLMIF.org) of the decade; it's 100% online, puts the delegate in the driving seat and it's sustainable. The PLMIF is traditionally a biennial event held locally around the world to bring together visionary professionals from multiple industry verticals to share and discuss the latest developments in Product Lifecycle Management.

This year, TECHNIA are taking this prestigious event online and opening it to a Global audience with the announcement of the PLMIF Virtual Experience 2020. The event, which will launch on April 28th and run on throughout the month of May, is a departure from the traditional standard of a physical event. With growing pressure on organisations to address climate concerns and the impact of manufacturing on our environment, TECHNIA are enabling businesses across the world to share valuable insight, improve processes and to do so with the minimum carbon footprint.

Product suppliers, industry leading users and visionaries are being encouraged to partner this new format to reach and influence the widest of audiences and accelerate the change process.

"In renewing our mission statement, 'Making Product Creation Sustainable,' with the launch of the PLMIF Virtual Experience 2020, we at TECHNIA are encouraging our customers and peers to take on sustainable practices within business and manufacture. We want to demonstrate that business can gain insight, inspiration and knowledge without the cost, travelling and interruption to their business life a traditional event can cause. Sustainable business is as much about adjusting our daily organisational practices as it is about long-term strategic goals to substantially reduce the environmental impact of manufacturing." Jonas Gejer | CEO TECHNIA

"The pace at which we are able to improve our technology and our practises will no doubt prove integral to the fight against climate change." Rebecka Carlsson, Climate Activist & Entrepreneur | Guest Speaker at PLMIF 2019

"Previous PLM Innovation Forums have really been a big help for us to understand some things about our own implementation journey. And so, when I was asked to speak at PLMIF 2019, I was glad to be able to share some of my experiences." Chris van Oijen, Manager Workflow Systems, Vanderlande. | Guest Speaker at PLMIF 2019

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Financial News

Global Fab Equipment Spending Poised For 2021 Record High

09 March 2020

Global fab equipment spending promises to rebound from its 2019 downturn and see a modest recovery this year before a sharp uptick drives record investments in 2021, SEMI reported today in the latest update of its World Fab Forecast report.

The report shows a slow recovery in 2020 – 3% year-over-year (YoY) growth to US$57.8 billion –

owing in large part to an 18% expected slump in the first half of 2020 from the second half of 2019. The picture should brighten in the second half of this year as a recovery starts to take hold.

The Coronavirus (COVID-19) outbreak has eroded fab equipment spending in China in 2020, prompting downward revisions to the World Fab Forecast report published in November 2019. Despite continuing headwinds from the virus, China equipment spending will grow about 5% YoY to over US$12 billion this year and surge 22% YoY, or US$15 billion, in 2021. Investments by Samsung, SK Hynix, SMIC and YMTC will drive the growth.

Powered by TSMC and Micron investments, Taiwan will be the top region in spending in 2020 with nearly US$14 billion in equipment investments but drop to third in 2021 with over US$13 billion in spending, a 5% decline. In 2020, Korea will rank second in fab equipment spending on the strength of investments by Samsung and SK Hynix, logging 31% growth, to US$13 billion, before jumping to the top with a 26% advance, to US$17 billion, in 2021. Southeast Asia (mainly Singapore) will also register robust growth (33% YoY, to US$2.2 billion) in 2020 and 26% in 2021.

Of all regions, Europe/Mideast will show the strongest equipment spending growth with a surge of more than 50%, to US$3.7 billion, in 2020 and match that gain in 2021 on the back of investments by Intel, STMicroelectronics and Infineon.

In Japan, fab equipment spending growth will be negligible at almost 2 percent in 2020 and bump up to nearly 4% in 2021, with investments by Kioxia/Western Digital, Sony and Micron leading the way.

Lagging the pack, the Americas will spend less in 2020 than in 2019, with fab equipment investments plunging 24% to US$6.2 billion, and extend the downturn with a 4% decline in 2021.

The latest update of the World Fab Forecast report, published in late February 2020, covers quarterly spending for construction and equipment from 2019 to 2021. The report lists 1,339 fabs and lines and 111 facilities (including low probability) expected to start volume production in 2020 or later. The forecast also provides quarterly totals for capacities, technology nodes, 3D layers, product types and wafer sizes.

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Oracle Announces Fiscal 2020 Third Quarter Financial Results

13 March 2020

- Q3 FY20 GAAP EPS up 4% to $0.79 and Non-GAAP EPS up 11% to $0.97
- Total Revenues of $9.8 billion, up 2% year-over-year and 3% in constant currency
- Cloud Services & License Support Revenues of $6.9 billion, up 4% year-over-year and 5% in constant currency
- Fusion ERP Cloud Revenues up 37% year-over-year and 38% in constant currency
- The Board of Directors increased the authorization for share repurchases by $15.0 billion

Oracle Corporation announced fiscal 2020 Q3 results. Total Revenues were $9.8 billion, up 2% in USD and 3% in constant currency compared to Q3 last year. Cloud Services and License Support revenues were $6.9 billion, up 4% in USD and 5% in constant currency. Cloud License and On-Premise License revenues were $1.2 billion.

GAAP Operating Income was up 4% to $3.5 billion, and GAAP Operating Margin was 36%. Non-GAAP Operating Income was up 2% to $4.4 billion, and non-GAAP Operating Margin was 44%. GAAP Net Income was $2.6 billion, and non-GAAP Net Income was $3.2 billion. GAAP Earnings Per

Share was up 4% to $0.79, while non-GAAP Earnings Per Share was up 11% to $0.97.

Short-term Deferred Revenues were $7.8 billion. Operating Cash Flow was $13.9 billion during the trailing twelve months.

"We had an extremely strong quarter with Total Revenues growing 3% in constant currency," said Oracle CEO, Safra Catz. "Subscription revenues, made up of Cloud Services and License Support revenues, grew 5% in constant currency. These consistently growing and recurring subscription revenues now account for 71% of total company revenues, thus enabling a sequential increase in our operating margin, and double-digit non-GAAP Earnings Per Share growth in Q3."

"The Oracle Autonomous Database, the world's only fully autonomous data management system, can automatically patch security vulnerabilities while running; it keeps your data safe," said Oracle Chairman and CTO, Larry Ellison. "Oracle Autonomous Database is also both serverless and elastic. It's the only database that can instantaneously scale itself to an optimal level of CPU and IO resources. You only pay for what you use. Security and economy are two fundamental reasons why thousands of customers are now using the revolutionary new Oracle Autonomous Database in our Generation 2 Public Cloud."

The Board of Directors increased the authorization for share repurchases by $15.0 billion. The Board of Directors also declared a quarterly cash dividend of $0.24 per share of outstanding common stock. This dividend will be paid to stockholders of record as of the close of business on April 9, 2020, with a payment date of April 23, 2020.

Implementation Investments

Accenture Helps Changi Airport Group Establish and Operate a Digital Factory to Drive and Sustain Continuous Innovation

09 March 2020

Accenture has helped Changi Airport Group (CAG) which operates the world's seventh busiest airport for international traffic establish and operate a digital factory to continuously re-invent the airport's passenger experience and transform operations.

Known as DIVA — for digital, innovation, ventures and analytics, the factory is designed to help CAG develop, experiment and launch new digital products and services — from conceptualization to market launch, using new ways of working.

Staffed with professionals from both CAG and Accenture, DIVA leverages the latest innovative technologies and capabilities — including artificial intelligence (AI), digital marketing, big data / analytics, predictive maintenance and the internet of things (IoT). Managed like a factory, DIVA focuses on delivering business outcomes at scale, with lines of production, predictable delivery schedules and quality controls. This model uses and enables new ways of working — with design thinking, rapid prototyping and experimentation at the core.

"Picture a start-up environment where employees begin by thinking about what the customer wants and

work backwards from there — experimenting rapidly to develop innovative products and services," said Fabio Vacirca, the market unit group lead responsible for managing Accenture's business across Australia and New Zealand, South East Asia, India, Africa and the Middle East. "DIVA is enabling CAG to re-evaluate how the airport operates and develop digital solutions to ensure that it remains a world-class leader."

As part of its work creating and managing DIVA, Accenture has helped CAG develop an AI-powered virtual assistant for airport operations, a predictive maintenance solution for engineering, and next-generation commercial digital marketing campaigns, powered by Accenture Applied Intelligence solutions and accelerators.

"By establishing DIVA with Accenture, we hope to continue to foster a culture of innovation and experimentation, by injecting new ways of working within our organization," said Jeffrey Loke, a senior vice president at CAG. "DIVA is helping CAG implement digital innovations, at speed and at scale, at the enterprise level, serving all CAG departments, including commercial, operations, engineering, IT, and corporate marketing & communications."

Singapore Changi Airport is committed to continually raising the bar for its performance and delivering a real-time customer experience. The airport has been voted the "Best Airport in the World" 10 times by Skytrax respondents; and has also won the DFNI Award for Travel Retail Excellence nine times[1]. Jewel Changi Airport, the lifestyle destination situated at the heart of Singapore Changi Airport that opened last April, received the Special Jury Award at the MAPIC Awards 2019[2], a prestigious industry event that honors the world's most outstanding retail real estate projects.

Aligned to Singapore's Smart Nation vision, DIVA is a reflection of CAG's efforts to keep pace with the ongoing disruption of business operations and an important milestone not just for CAG, but for Singapore. DIVA is the first such capability that Accenture developed in ASEAN.

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Atos on track with Network Rail private cloud upgrade contract
12 March 2020

Atos has signed a four-year contract worth £12 million with Network Rail to design, deliver and manage a new digital private cloud platform that will underpin the operations of Britain's rail infrastructure provider.

The agreement sees Atos migrate all applications from Network Rail's legacy data centers into a new digital private cloud. The new data centers will provide a highly secure, robust and cost-effective digital foundation for Network Rail's business while ensuring agility in a technologically converged environment.

The operation and support of the data centers, delivering state-of-the-art and cost-effective hosting capability for the UK's rail infrastructure provider also comes under the management of Atos.

Simon Goodman Head of IT support services, Network Rail, said: "Our agreement with Atos to deliver a new digital private cloud forms a key element of our ongoing program of digital transformation. We recognize we must continue to evolve to continue to meet the needs of passengers and rail operators and moving to a secure and high-performance private cloud is fundamental to this ambition. The new data center will offer a strong platform from which to meet our needs now and into the future, while

continued Atos management helps ensure we achieve best value for our investment."

Commenting on the agreement, Clay Van Doren, Atos CEO UK & Ireland, said: "This contract signals a deepening of our relationship with Network Rail and allows legacy systems to coexist with innovative cloud applications while enhancing security and ensuring future scalability, helping power the digital transformation of our nation's rail infrastructure operator with rail users across Britain increasingly benefiting from an agile, digitally-empowered organization."

The agreement adds to Atos' expertise and heritage in delivering digital transformation solutions to clients in the UK's transport sector including IAG, DVSA, Transport for London and Highways England. The company's role in UK rail stretches back over decades of sweeping commercial and technological changes, having consolidated and modernized legacy systems both in the rail operations domain and in retail and customer information systems.

The Atos Digital Vision for Mobility paper sets out how digital technology has transformed the UK's transport sector and considers how new advances will determine the mobility solutions of tomorrow for road and rail, broader public transport and logistics.

Atos provides advanced satellite monitoring solution to Arabsat

09 March 2020

Atos has been chosen by Arabsat, one of the world's top satellite operators and leading satellite services provider across the Middle East and Africa, to provide a state-of-the-art satellite monitoring solution to mitigate interferences in Arabsat's satellite services and ensure the highest quality of service to its end-users.

The Atos solution, the SkyMon carrier monitoring system (CMS), is now operational at Arabsat's ground stations throughout the region, including a main site in Riyadh, Saudi Arabia. It monitors all payload signals and traffic within Arabsat's satellite fleet, in different locations, 24 hours a day, 7 days a week – to detect interferences in real time and help Arabsat eliminate service interruption. This is a key asset to deliver the optimal quality and ensure the reliability of Arabsat's satellite services to its customers.

More specifically, the Atos solution performs spectral, radio frequency and quality of service (QoS) measurements to detect interferences, unwanted signals, transmission breaches or unknown satellite carriers – whether they are hidden or visible on the spectrum, continuous or intermittent. All of these can be identified on one single solution in order to take prompt counteractive measures.

"Thanks to Atos' radio frequency traffic monitoring system, we make sure to quickly identify all irregularities and rapidly coordinate response actions when the slightest problem occurs. This allows us to provide the highest quality of service to our customers, which is our most important objective." said Khalid Balkheyour, President & CEO at Arabsat.

"We are delighted to support Arabsat in its day-to-day mission to deliver satellite-based, public and private telecommunications services to tens of millions of homes in more than 80 countries across the Middle East, Africa and Europe." said Bruno Milard, VP, Head of Business Unit Aerospace & Defense Electronics at Atos. "To gain precious time in solving interference-related issues, Arabsat can rely on SkyMon's fully-integrated comprehensive geolocation system."

Black Cat Engineering Partners with TCS to Drive its Digital Transformation and Co-innovation Strategy

13 March 2020

Tata Consultancy Services has been selected by Black Cat Engineering & Construction (BCEC), Qatar's largest EPC and maintenance contractor for the upstream oil and gas industry, as the strategic partner to drive the latter's digital transformation and co-innovation strategy.

As part of the digital transformation, TCS is enabling BCEC to reimagine its end-to-end business processes from tendering to construction, incorporating EPC industry best practices, to design and implement an agile and intelligent multifunctional and multiservice solution on Oracle Cloud ERP. The seamless enterprise-wide system integrates multiple disparate business functions and eliminates data duplication and redundancy.

The new cloud-based platform leverages AI, advanced analytics and predictive capabilities to help BCEC improve decision-making around its capital investment and vendor selection, reduce costs per invoice, shorten delivery cycle time, and enhance HR data analysis and reporting capabilities with greater control and traceability. The significantly higher level of automation will drive up productivity, allowing employees to focus on more strategic and innovative work.

Additionally, as BCEC's co-innovation partner, TCS created an AI-powered solution for the procurement department that uses a combination of state-of-the-art deep learning models to automatically raise purchase requisitions by reading and processing data from complex process and instrumentation diagrams and piping classes.

"Guided by the Business 4.0™ framework, BCEC has embarked on a digital transformation journey that will help it build competitive differentiation. We are proud to partner them on this journey and will bring our technology expertise, industry experience, proprietary solutions, and innovation ecosystem to make BCEC an industry benchmark," said Devashis Goswami, Country Head, TCS Qatar.

"BCEC is in the process of a 360-degree transformation journey with our trusted technology partner, TCS. Our partnership embarks on bringing the best value to our clients. BCEC is excited to continue its growth and expansion journey along with TCS through their deep contextual knowledge, experience and commitment to the partnership. We look forward to overcoming the sector's productivity and risk management challenges," said Paolo Borchetta, Chief Executive Officer, Black Cat Engineering & Construction WLL.

"I am pleased with the team deployed for this engagement and their consistent interactions with the various stakeholders of Black Cat during this complex implementation that involved integration between various Oracle cloud services and a few legacy applications of Black Cat," said Roland Koury, Chief Information Officer, Black Cat Engineering & Construction WLL.

EDF Pioneers Low-Carbon Power Generation Technologies with Ansys Multiphysics Solutions

10 March 2020

The EDF Group (EDF) is digitally transforming to drive the development of safe, dependable and affordable low-carbon power generation technologies by collaborating with Ansys. Through a new multi-year agreement, EDF will use Ansys to design state-of-the-art nuclear power plants and deliver unprecedented nuclear energy efficiency.

Using Ansys multiphysics solutions to enable digital transformation, EDF will drive the development of advanced plant instrumentation and controls significantly faster and more affordably than traditional physical prototyping and testing approaches.

The agreement follows Ansys' support of the EDF-led ConnexITy digital R&D program, a French initiative to improve the process, optimize the performance of nuclear facilities and extend their operating life beyond 40 years. A key technological partner to ConnexITy since 2017, Ansys helped design a highly advanced control room for a next-generation nuclear power plant. The program also leverages Ansys Twin Builder™ to create digital twins of plant turbo-alternators, enabling predictive maintenance and reduced repair expenses.

"Collaborating with Ansys to design leading-edge nuclear power plants accelerates the creation of renewable energy with unmatched efficiency and unparalleled customer accessibility," said Levesque Benoit, project manager at EDF. "By digitally transforming our manufacturing processes, we can minimize emissions, slash maintenance costs and maximize our share of the power generation market while remaining in full compliance with strict international regulatory standards."

"EDF is global leader in low-carbon energy production. Digital transformation enables EDF to usher in a new era of clean, cost-effective and cutting-edge low-carbon power plants, with operational lives spanning over four decades," said Eric Bantegnie, vice president and general manager at Ansys. "By leveraging Ansys multiphysics simulations, EDF engineers devise designs that push boundaries and meet challenging regulatory requirements, providing unequalled power output for its worldwide customers."

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Infosys Wingspan to Drive Learning Experience for Siemens
12 March 2020

Infosys announced that it has been selected by Siemens to deploy Wingspan, Infosys' Digital Learning and Talent Transformation Platform. The company-wide deployment will provide employees a personalized learning experience and make it possible for them, among many other useful features, to track their progress and successes.

Siemens is on a digital transformation journey and has become one of the ten biggest software companies in the world over the last 10 years. To maintain and extend market leadership, new digital technologies like AI, IoT, Automation, Cyber Security or Additive Manufacturing are critical for Siemens' and its customers long-term success. It's vital for every employee at Siemens to get easy access to upskilling and reskilling opportunities. Infosys will support Siemens to stay ahead of the curve through a highly effective learning experience platform, while leveraging and simplifying the existing learning technology ecosystem.

Infosys Wingspan will provide a next generation, cloud-based talent and learning experience platform with features like mobile access to enable learning anytime and anywhere. It will use AI-powered search through concepts like topic spiders, navigators and personalized homepages to create a powerful and personalized interface for employees. The platform, which is named My Learning World at Siemens, will be a single-entry point to access learning content across multiple sources (internal and external), thereby leveraging investments in existing systems.

Pravin Rao, Chief Operating Officer, Infosys, said, "We are delighted to partner with Siemens to further

develop the learning experience of its employees. To survive the impact of digital disruption and to navigate these digital times, it is imperative for enterprises to ensure effective talent development. Wingspan, a robust Open-source stack-based platform, will provide Siemens' employees an innovative learning experience that will set new industry standards."

Thomas Leubner, Chief Learning Officer, Siemens AG, said, "Digitalization is at the core of our strategy for the future. We are excited to have found an effective partner in Infosys who can support us to further improve our employee's growth journey with My Learning World. This is an important partnership for Siemens, and we look forward to a new learning experience for our employees."

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Klättermusen Climbs Onboard with Centric SMB

10 March 2020

Leading Swedish alpine mountaineering brand Klättermusen, 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.

Klättermusen has been making the world's most refined mountaineering equipment for outdoor enthusiasts since 1975. Founded by a tightly knit band of local mountaineers in the north of Sweden, the company prides itself on producing the most durable and long-lived equipment on the market, alongside a global commitment to sustainability. Klättermusen's hands-on approach has resulted in the development of proprietary materials and techniques to create sustainable high-performance fabrics.

Sara Hult, Global Production Manager at Klättermusen, explains the company's drive for a software solution to gain a competitive advantage by improving products and streamlining processes. Klättermusen decided to implement Centric SMB, a cloud-based PLM solution tailored for small to medium businesses, "We're entering new markets, widening our product assortment and increasing the number of suppliers, so we really need scalability. With Centric SMB's out-of-the-box solution, we can add users, modules and processes as our business changes and grows."

Available on a subscription basis (SaaS), Centric SMB is designed to speed product development, optimize product costs and increase brand responsiveness. With access to the same proven technologies and industry know-how as big players, emerging brands set the foundation for future growth.

With a growing base of information centralized across the company, the Klättermusen team benefits from a market-leading collaboration platform. "Our team liked the fact that Centric SMB is user-friendly but highly configurable for our most specific needs. In addition, the installation process did not require extensive training and consulting services," adds Sara.

Centric's local support team in Sweden, as well as the desire to make a long-term commitment, were central to Klättermusen's final decision. "Centric came out as an ideal partner as it already provides solutions to other market-leading outdoor brands that face similar challenges," says Sara. "With this partnership, we can focus on value creation for our customers by reducing the time spent on data management."

"We are thrilled to be partnering with Klättermusen, a company that has both a wonderful history and an innovation-driven future," says Chris Groves, President and CEO of Centric Software. "With Centric SMB, Klättermusen can move swiftly toward its ambitious future plans for growth and explore new

territories while continuing to drive high quality innovation for outdoor enthusiasts."

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Synopsys Custom Design Platform Secures Full-flow Displacement of Legacy Design Tools at Alphawave

11 March 2020

Synopsys, Inc. announced that silicon IP provider Alphawave has adopted the Synopsys Custom Design Platform to accelerate the design of multi-standard connectivity solutions. Alphawave chose Synopsys to replace its legacy design system based on superior overall design productivity.

As part of the flow migration, the companies collaborated to build a customized regression system that automatically generates simulation jobs, compares results with previous runs, and reports failures. Alphawave also deployed Synopsys' Custom Compiler™ Quick Start Kits to optimize the productivity of its layout team with process-specific flows and tool settings.

"Synopsys gave us a superior solution for advanced node custom design, which helped us meet aggressive power, performance and area targets for our high-speed connectivity IP," said Tony Pialis, Alphawave founder and CEO. "Through close collaboration, we were able to complete our first tapeout with the Synopsys solution within three months of deploying it."

The Synopsys Custom Design Platform is based on the Custom Compiler design and layout environment and includes HSPICE® circuit simulator, FineSim® circuit simulator, and CustomSim™ FastSPICE circuit simulator, Custom WaveView™ waveform display, StarRC™ parasitic extraction, and IC Validator physical verification.

"Leading-edge custom design teams, such as Alphawave, are looking for an alternative to the outdated design solutions of the past," said Aveek Sarkar, vice president of engineering at Synopsys. "The Synopsys Custom Design Platform is a proven solution that delivers better designer productivity and has been adopted by thousands of designers worldwide across a broad range of mature and advanced node process technologies."

Key features of the Custom Design Platform include reliability-aware verification, Fusion Technology for extraction and visually assisted layout. Reliability-aware verification ensures robust analog/mixed-signal (AMS) design with signoff-accurate transistor-level EM/IR analysis, large-scale Monte Carlo simulation, aging analysis, and other verification checks. Fusion Technology for extraction with StarRC parasitic extraction reduces design closure time by enabling accurate parasitic simulation before layout is complete. Visually assisted automation is a pioneering approach to reducing layout effort that is proven to deliver higher productivity.

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U.S. Army, L3Harris and Ansys Collaborate to Improve Aviation Performance and Affordability

12 March 2020

The United States Army, L3Harris Technologies and Ansys are advancing the performance and affordability of next generation aviation and missile system applications. The U.S. Army Combat Capabilities Development Command (CCDC) Aviation & Missile Center (AvMC) evaluated commercially available solutions to seamlessly support rapid integration of software aligned to the FACE Technical Standard through a joint Cooperative Research and Development Agreement

(CRADA).

The FACE Technical Standard enables software on embedded military computing systems to be more interoperable, portable and secure. The CRADA utilized L3Harris and Ansys-developed software aligned to FACE Technical Standard hosted on the Crew Mission System (CMS) platform for the Cockpit Display Station (CDS). The CRADA represents significant progress in showcasing how model-based development tools like Ansys SCADE®, along with L3Harris' FliteScene®, can support rapid standards-based integration in support of the FACE Technical Standard and ARINC 661 standards.

"Adding new capabilities into our enduring platforms has been costly in both time and money. With emerging threats and limited resources, we simply have to provide more capabilities to our warfighters faster with less funding," said Joe Carter, U.S. Army Program Executive Office Aviation G10 Tactical Branch Chief and FACE Consortium Steering Committee chair. "Contributions from our industry partners, including Ansys and L3Harris, help exercise and mature the FACE Technical Standard allowing rapid integration of capabilities for our warfighters. This enables us to provide our warfighters a wide variety of new and improved capabilities from any number of technology suppliers."

The Ansys SCADE software toolset efficiently enables a complete workflow ranging from FACE modeling through DO-178C (up to DAL-A) certifiable code-level generation. Ansys tools support software development aligned to the FACE Technical Standard at both the model and generated code levels, providing users with an easy workflow that passes the FACE Conformance Test Suite (CTS), a necessary test process included in the FACE Technical Standard. This effectively streamlines the development effort of embedded control/display/HMI applications aligned to the FACE Technical Standard and is compliant to the ARINC 661 standard.

"L3Harris is a leading supplier of current and emerging airborne software applications," said Matt Collins, general manager, Mission Avionics, L3Harris Space and Airborne Systems. "Through the CRADA, L3Harris will further speed innovations in background digital moving map technology for CDS."

Ansys SCADE Solutions for ARINC 661 compliant systems fully adhere to the ARINC 661 standard, including the ARINC 661 Server, the User Applications (UA), standard binary and XML Definition Files (DF), and the communication code between Ansys SCADE UA models and any ARINC 661 Server. This ultimately saves time and reduces effort and cost when developing cockpit display systems.

"The U.S. Army depends on the efficiency of safety-critical software development and integration efforts to advance emerging aviation and missile system capabilities while keeping program costs down," said Eric Bantegnie, vice president and general manager at Ansys. "Ansys looks forward to providing next-generation solutions that are aligned with the Army's model-based systems engineering initiatives and open system architecture standards."

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Product News

3D Systems Helps Customers Ease Path to Production, Speed Time to First Part with Advanced Figure 4 Materials Testing

10 March 2020

3D Systems announced it has completed comprehensive testing for its newest Figure 4® materials

against both ASTM and ISO standards. Materials are at the core of 3D Systems' digital manufacturing solutions, and in late 2019, the company introduced a host of production-grade materials for its Figure 4 Platform – opening the door to new applications. With the release of its advanced Figure 4 material test data, the company continues to build on its "customer-first" approach to innovation and is the first in the industry to provide this level of transparency - saving customers time, reducing cost, and speeding their time to first part.

"Until this point, materials testing data provided by the industry has been incomplete for production applications and of little value to engineers accustomed to data that accompanies injection molded plastics," said Marty Johnson, technical fellow, 3D Systems. "If an engineer is going to use any material for true production applications, they need a comprehensive set of data which meets industry standards in order to evaluate its efficacy. 3D Systems recognizes how these standards help improve product quality, enhance safety, facilitate market access and trade, and build consumer confidence. Testing to both ASTM and ISO standards allows us to address a broad set of manufacturers worldwide and usher in the use of additive for true production."

Arming manufacturers with a complete data set to properly screen a material's appropriateness for their application enables them to immediately proceed to longer term application testing such as life testing of parts/components or higher biocompatibility ratings. As an example, electrical life testing can take anywhere from 1,000 to 4,000 hours (approximately three – 12 months) to complete including time on the testing equipment, operator time, and time to market. Before a company makes such a significant investment, they want to have assurance that the selected material is appropriate for the application. Having the knowledge of a material's dielectric properties per industry standards beforehand saves engineers needing to conduct several rounds of testing – at approximately two weeks per material - to find a candidate to pass initial dielectric properties before going into long term life testing.

3D Systems has completed testing for its newest Figure 4 materials designed for production applications: Figure 4 PRO-BLK 10, Figure 4 EGGSHELL-AMB 10, Figure 4 HI TEMP 300-AMB, Figure 4 FLEX-BLK 20, Figure 4 RUBBER-BLK 10, Figure 4 TOUGH-BLK 20, Figure 4 MED-AMB 10, and Figure 4 MED-WHT 10. The company has tested against an extensive set of properties which includes: long-term environmental stability, electrical data, UL94 flammability, biocompatibility, ISO mechanical properties, isotropic mechanical property tolerances, and compatibility with automotive fluids and chemical reagents. Test data for all materials will be made available March 23 on both the company's website, as well as in its booth (D8) at AMUG 2020 (Chicago, March 22-26).

These materials have unique and compelling properties that represent significant improvements in first-time print yield, heat deflection, UV stability, durability, flexibility and impact strength, while also enabling new biocompatible and direct digital production workflows. These breakthrough materials complement the company's entire portfolio, which when combined with 3D Systems' 3D printing technology, software and services enabled its customers to create nearly 200 million production parts in 2019 alone.

3D Systems' Marty Johnson will address the importance of comprehensive materials test data along with Patrick Dunne, vice president, advanced applications development, in a 2020 AMUG Conference (Chicago) session titled "The Industrialization of AM: High Speed Direct Production with Advanced Polymers" on Wednesday, March 25 at 1:30PM. Other presentations from 3D Systems' experts include:

"Software as an Enabler for Optimized Manufacturing Workflows" - Radhika Krishnan, executive vice president, software, healthcare & digitization, March 23 at 3:00PM

David Lindemann, applications engineer, will host two sessions addressing 3DXpert® on Tuesday, March 24 - "Lattice Structures: Bridging the Gap between Cool Geometry and Physical Structures" and "Optimizing Serial Production with AM Software"

"AM Production of Large Scale, High Precision Investment Casting Patterns for Metal Parts", Evan Kuester, applications engineer, March 26

Additionally, Romain Dubreil, product line manager, metal AM, GF Machining Solutions will deliver a session on March 26 detailing the metal AM workflow made possible through a combination of 3D Systems' and GF Machining Solutions' products. 3D Systems will also showcase application-specific digital manufacturing solutions for the Aerospace and Automotive industries alongside GF Machining Solutions in booth D8. For more information, please visit the company's website.

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Autodesk Construction Cloud Increases Industry Footprint with Growing Customer Adoption and Expanded Global Team
12 March 2020

Autodesk, Inc. announced Autodesk Construction Cloud™ is gaining traction with owners, general contractors and subcontractors across the construction industry. Since launching in November 2019, Autodesk Construction Cloud has seen significant growth as well as a robust expansion of the Autodesk Construction Solutions global team.

Autodesk Construction Cloud combines advanced technology, a unique builders network and predictive insights to connect people and data across the entire building lifecycle. The portfolio of software and services brings together Assemble, BIM 360, BuildingConnected and PlanGrid, and with Autodesk's established design authoring tools, connects headquarters, office and field teams to increase collaboration and productivity.

Recent milestones and growth of Autodesk Construction Cloud include:

Autodesk Construction Cloud's builders network, powered by BuildingConnected, now has over one million users, making it the industry's largest network of owners, designers, builders and trades, enabling each to connect with the right partners and projects.

BuildingConnected's preconstruction platform now manages an estimated $56 billion worth of project bids each month, with 15 of the top 20 ENR-ranked general contractors using BuildingConnected to manage bidding.

PlanGrid, Autodesk's field collaboration technology, is now used on nearly two million projects around the globe. Coupled with BIM 360, more than 1.5 billion drawings are now in Autodesk Construction Cloud.

BIM 360's machine learning technology Construction IQ is now used monthly by nearly 12,000 project leaders, demonstrating accelerating adoption of Autodesk's predictive insights to identify, prevent and manage risk. Also, Construction IQ was recognized today by Fast Company, with Autodesk ranked as among the Most Innovative Companies of 2020 for the machine learning's contribution to construction.

Model conditioning and 3D quantification tool Assemble has had more than 85,000 models uploaded in the last year, revealing that contractors are increasingly turning to Assemble for model-based workflows.

"Our customers are continuing to see strong benefits from our best-in-class solutions working together to improve efficiency, increase margins and reduce risk for the construction industry," said Jim Lynch, vice president and general manager, Autodesk Construction Solutions. "Autodesk is a trusted partner to more than 300 of the top ENR-ranked general contractors who use at least one Autodesk Construction Cloud product, and many of them are interested in adopting products across the entire portfolio. It's truly accelerated our growth."

Autodesk Construction Solutions' global team has experienced significant growth in support of customer demand, adding almost 100 new international employees in the last 12 months in countries such as Australia, China, Singapore, Denmark, Germany, Ireland, Israel and the UK.

The company is also boosting its visibility in the market with the addition of several industry leaders to the team. Most recently, "Queen of Prefab" Amy Marks joined Autodesk as head of industrialized construction, industry strategist and evangelist, Autodesk Construction Solutions. Marks joins Dustin DeVan, previously founder and CEO of BuildingConnected and now industry strategist and evangelist, to support the growing momentum for Autodesk Construction Cloud. Together, Marks and DeVan provide deep expertise in the construction industry and will work to advance Autodesk's mission to help make building more predictable, safe and sustainable.

"We're consistently hearing from customers and leaders they believe in our vision for the construction industry, trust our strength in design and welcome the expanded support we're providing with the growth of our team," continued Lynch. "We continue to deliver powerful and integrated technology that is changing the way teams communicate and operate, and empowers designers, contractors and owners to meet the world's rapidly expanding construction needs. This year is going to be exciting."

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Maple 2020 continues Maplesoft mission to make math easier

13 March 2020

Maplesoft announced a major new release of its flagship product, Maple™, the powerful and easy to use mathematical software. Maple is used by mathematicians, educators, students, engineers, and scientists to analyze, explore, visualize, and solve math problems. The new release, Maple 2020, offers a vast collection of enhancements for both long-time customers and those who are using Maple for the very first time.

Maple 2020 delivers a more powerful math engine, new and improved tools for interactive problem solving, application development, student learning, document creation, and programming. Highlights include:

Greater problem solving abilities, with new algorithms and solving techniques in differential equations, calculus, abstract algebra, integral transforms, graph theory, physics, and other areas of math, science, and engineering, expanding the scope and types of problems Maple can solve.

Enhanced programming tools that help users find and fix problems in their own code.

Additional clickable math tools, improved tutors, and an expanded Student package designed to support teaching and learning linear algebra.

Enhanced signal processing abilities for the exploration of signals of all types, including data, image, and audio processing.

More flexibility and improved output for printing, export to PDF, and LaTeX export, making content easier to share and use outside of Maple.

Every year, thousands of customers launch Maple for the first time, so in addition to improvements that can benefit any Maple user, Maple 2020 also includes many new features specifically designed to help new users become productive faster than ever. Maple 2020 provides new, more easily accessible Getting Started resources that provide an efficient introduction to fundamental Maple concepts. Additional improvements include new warnings that help users avoid common beginner mistakes, and improved messages to help users diagnose and recover from errors more quickly when they do occur.

"Maple is used by all sorts of different people, from students taking their first steps in algebra and calculus, to teachers delivering engaging, effective lectures, researchers developing their own algorithms or solving cutting edge problems, engineers designing new technologies, and scientists learning more about how our world works," says Karishma Punwani, Director of Product Management at Maplesoft. "That's why Maple 2020 includes a huge range of improvements across the entire product, to support all those users. Whether you are using Maple for mathematical exploration, as a programming tool, to learn or teach mathematical concepts, to visualize behavior, to develop interactive applications, or write technical documents, Maple 2020 offers more mathematical power and improved tools to support you in your work."

Maple is available in several languages including French, Spanish, Simplified Chinese, and Brazilian Portuguese. A Japanese version of Maple 2020 will be available in a few weeks.

PTC Unlocks Huge Time Savings with New Samples Console in FlexPLM® Version 11.2
13 March 2020

PTC is proud to announce the release of FlexPLM version 11.2 which adds exclusive functionality and premieres user experience enhancements – both directly informed by retail industry feedback and requirements.

The new release includes the PTC FlexPLM samples console: a new, dedicated module designed to provide clarity, visibility, and comprehensive control to product developers and technical designers who struggle to manage multiple iterations of the product sampling process across many seasons, resulting in managing several hundred samples at any given point in time.

"Samples often represent critical-line review milestones during the go-to-market process. When you consider all of the cross-functional teams involved and the amount of time dedicated to spec development, there is no doubt that sample tracking is a crucial business process. It consumes a significant amount of time and money, which makes accurate tracking essential. This is why we're delivering capabilities to make this process easy and efficient," said Quach Hai, VP of retail product management at PTC.

Developed in close consultation with more than 20 of the world's biggest brands and retailers, the samples console is a central hub that allows all information pertaining to a sample to be viewed, filtered, and maintained in an accessible, intuitive user interface. Attributes from season to colorway and

specification to source, can be monitored, updated, and edited in a single location. This provides all of the relevant sample context that enables the interpretation of the sample's status in its relationship to the critical path and achieving milestone deadlines.

The samples console will also provide closer collaboration with factory partners – giving everyone from product development to production offices to suppliers the ability to track any product's ready-to-buy status, in one real-time solution without having to resort to external tools.

This heightened, global visibility will have an immediate, positive effect on retailers' and brands' go-to-market calendars. Sample tracking alone consumes more than 140 hours per year for development and design partners, and the Samples Console can reduce that time dramatically.

"Our latest release captures the essence of FlexPLM, and PTC's commitment to helping our customers drive digital transformation and speed to market," says Bill Brewster, senior vice president and general manager of PTC's Retail Business Unit. "By getting closer to our users, we continue to improve their day-to-day lives, design new features to respond to their needs, and deliver real, measurable results."

Customers of almost any deployment of FlexPLM are now eligible to upgrade to the latest release – a process that PTC and its technical partners optimized in 2019. Since its inception, the optimized process has delivered more than thirty enterprise-scale upgrades at a low cost that often also included a move from on-premise to cloud hosting.

Synopsys Advances State-of-the-Art in Electronic Design with Revolutionary Artificial Intelligence Technology

13 March 2020

Synopsys, Inc. announced a major breakthrough in electronic design technology with the introduction of DSO.ai™ (Design Space Optimization AI), the industry's first autonomous artificial intelligence application for chip design. Inspired by DeepMind's AlphaZero that mastered complex games like chess or Go, Synopsys' DSO.ai solution is an artificial intelligence and reasoning engine capable of searching for optimization targets in very large solution spaces of chip design. DSO.ai revolutionizes chip design by massively scaling exploration of options in design workflows while automating less consequential decisions, allowing SoC teams to operate at expert levels and significantly amplifying overall throughput.

"As new silicon technologies are testing the limits of physics, our customers are looking for manufacturing solutions that enable their innovative products," said Jaehong Park, executive vice president of Foundry Design Platform Development at Samsung Electronics. "In our design environment, Synopsys' DSO.ai systematically found optimal solutions that exceeded our previously achieved power-performance-area results. Furthermore, DSO.ai was able to achieve these results in as few as 3 days; a process that typically takes multiple experts over a month of experimentation. This AI-driven design methodology will enable Samsung Foundry customers to fully utilize the benefits of our cutting-edge silicon technologies for their SOC designs."

Developed from the ground up at Synopsys, DSO.ai is part of a multiyear, company-wide initiative and strategic investment in AI-based design technology.

Chip Design: A Vast Search Space

Today, AI can interact with humans through natural language, identify bank fraud and protect computer

networks, drive cars around city streets, and play intelligent games like chess and Go. Chip design too is a very large space of potential solutions, trillions of times larger than, for example, the game of Go.

Searching this vast space is a very labor-intensive effort, typically requiring many weeks of experimentation, and often guided by past experiences and tribal knowledge. A chip design workflow typically consumes and generates terabytes of highly dimensional data compartmentalized and fragmented across many separately optimized silos. To create an optimal design recipe, engineers have to ingest volumes of high-velocity data and make complex decisions on the fly with incomplete analysis, often leading to decision fatigue and over-constraining of their design.

With today's hypercompetitive markets and stringent silicon manufacturing requirements, the difference between a good recipe and an optimal recipe can be 100s of MHz of performance, hours of battery life, and millions of dollars in design costs.

The EDA Industry's First Autonomous AI Application for Chip Design

Synopsys' DSO.ai solution revolutionizes the process of searching for optimal solutions by enabling autonomous optimization of broad design spaces. DSO.ai engines ingest large data streams generated by chip design tools and use them to explore search spaces, observing how a design evolves over time and adjusting design choices, technology parameters, and workflows to guide the exploration process towards multi-dimensional optimization objectives. DSO.ai uses cutting-edge machine-learning technology invented by Synopsys R&D to execute searches at massive scale, autonomously operating tens-to-thousands of exploration vectors and ingesting gigabytes of high-velocity design analysis data – all in real-time.

At the same time, DSO.ai automates less consequential decisions, like tuning tool settings, relieving designers of menial tasks and allowing teams to operate at a near-expert level. Knowledge is shared and applied with high effectiveness across entire design teams. This level of productivity means that engineers are now available for more projects, apply more time on a given problem to achieve better results, handle larger parts of a project, and focus on creative and value-added tasks.

A Leap in Productivity

Better design solutions, every time: By massively scaling design workflows, Synopsys' DSO.ai brings immediate visibility into hard-to-explore design-process-technology solution spaces. Enhanced visibility means bringing to market more differentiated products with better performance and higher energy-efficiency – all within existing budgets and schedules. It means maximizing the benefits of silicon process technologies and pushing the limits of scaling.

Faster time to market: With Synopsys' DSO.ai solution, the throughput of engineering teams is significantly amplified, and less consequential tasks are completely automated. DSO.ai means slashing lead times to creating products for new markets while accelerating derivatives of existing products to a fraction of current schedules. It means effortlessly retargeting products to different markets with different feature sets.

Reduced cost through automation: DSO.ai can mean making the best of the most valuable resource – engineering creativity. Relieved from manual, time consuming tasks, engineers can now become available to take on new projects; new hires can be ramped-up quickly to operate at the level of experienced veterans; and overall support overhead for design and manufacturing is minimized.

"Ever since the introduction of Design Compiler in the late '80s, Synopsys has been enabling silicon

innovators with tools and technologies across the design spectrum," said Sassine Ghazi, general manager, Design Group at Synopsys. "With DSO.ai, once again, Synopsys is starting a new chapter in semiconductor design. More than two years ago we set out on a fascinating journey to bring AI to chip design, partnering with academic researchers, industry thought leaders, and AI technology pioneers. Today's announcement marks a very important milestone, and our journey in AI is only just beginning."

Synopsys' DSO.ai solution is currently in select deployments with industry-leading partners with broader availability planned for the second half of 2020.

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Synopsys Introduces Machine Learning-Based Auto Segmentation Module for 3D Image Processing
11 March 2020

Synopsys, Inc. announced the release of a major update to Simpleware™ ScanIP software, which extends its capabilities for segmenting anatomical regions through a new module, Simpleware AS Ortho (Auto Segmenter for Orthopedics). This new product offering is a machine learning (ML)-based auto segmentation module that builds on Synopsys' ScanIP software, a comprehensive solution for 3D image processing and segmenting images generated by computed tomography (CT) or magnetic resonance imaging (MRI) scanners.

The newly launched ML-based Simpleware AS Ortho is a module specifically designed for segmentation needs in the hips and knees. When applying this automated option with Synopsys' ScanIP software to run their analysis, users will easily see a 20 to 50 times faster rate of segmentation for clinical images. This revolutionary technology is fully scalable, and while helping to achieve more consistency and increased reliability in biomechanical compatibility, it can also dramatically streamline the workflow process in both pre-surgical planning and medical device design. Users will thus achieve significant cost-savings in the product development cycle.

"Image segmentation of MRI and CT scans presents a significant challenge for our surgical and engineering multidisciplinary teams. We're excited to collaborate with the Simpleware product group at Synopsys for solutions to this challenge," said Johann Henckel MD, Orthopedic Surgeon, Royal National Orthopaedic Hospital, UK. "What is currently a laborious process that occupies significant engineering resources and time can now be completed quickly, accurately and with less variability, promising a scalable solution for generating high-fidelity patient specific models, surgical tools and bespoke implants."

Based on research by the journal Orthopedic Surgery, total knee arthroplasties (TKAs) in the USA will grow from 719,000 in 2015 to 3.48 million by 2030, while total hip arthroplasties (THAs) will almost double from 332,000 to 572,000 in the same period. This new ML-based product offering is an exciting new step for Synopsys' role in these fast-growing healthcare medical markets.

"The demand for image-based modeling of human anatomy tools with ML-enabled intelligence is rapidly growing, especially in markets that include patient specific workflows for medical devices, surgical guides and planning, and in silico clinical trials," said Terry Ma, vice president of engineering at Synopsys. "We're looking forward to collaborating with more medical device companies to solve their long-standing image segmentation challenges."

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Trimble Announces New Platform as a Service for Construction Technology

10 March 2020

Trimble announced the Trimble® Platform as a Service, an offering that gives contractors the ability to purchase select civil construction hardware and software solutions and continually upgrade those solutions with the latest innovations from Trimble. Bundled solutions include the Trimble Earthworks Grade Control Platform, Trimble Siteworks Positioning Systems, Trimble Correction Services and select office software.

The announcement was made at ConExpo 2020, North America's largest trade show for construction machinery, building material machines, mining machines, construction vehicles and construction equipment. The Trimble booth is located in the Las Vegas Convention Center North Hall #N-11400.

"Contractors can now modernize large construction fleets and inventories without a significant initial investment and the assurance that their technology will be continually updated with the latest innovations from Trimble," said Scott Crozier, vice president, Trimble Civil Engineering and Construction. "This allows them to use their capital to run the business as well as predictably manage technology expenses."

As the rate of technology change continues and software capabilities improve, hardware to support the software functionality must also advance. Using the Trimble Platform as a Service, hardware and software updates are included so contractors can standardize their entire fleet and field workers on the same hardware and software versions, resulting in less time needed for training and support.

Predictable, fixed technology costs enable customers to create more accurate bids, which can lead to more jobs won with a higher profit margin. Once the bid is won, contractors can complete the job faster by leveraging the latest software and hardware from Trimble. In addition, the service provides easy tracking of hardware to reduce the time and effort required to locate technology across distributed teams and remote worksites. At the same time, asset utilization increases when contractors know what construction technology have, where it is and how it is being used. Flexible contract terms allow project teams to take advantage of an affordable, fixed monthly price for the duration of the project.

World class, local support from SITECH® construction technology dealers is included in the fixed monthly price to maximize uptime. Experienced SITECH professionals understand how to apply innovative construction technology to help solve a variety of contractors' challenges. They advise contractors on the appropriate site-wide Trimble solutions to utilize, and provide high-quality local customer service, personalized training and technical support.

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Trimble Introduces Tekla 2020 Structural BIM Software Solutions

11 March 2020

Trimble introduced the latest versions of its Tekla software solutions for advanced Building Information Modeling (BIM), structural engineering and steel fabrication management—Tekla Structures 2020,

Tekla Structural Designer 2020, Tekla Tedds 2020 and Tekla PowerFab 2020. Tekla software is at the heart of design and construction workflows building on the free flow of information, constructible models and improved collaboration. Tekla Structures supports the Constructible Process to transform the entire design, build and operate lifecycle.

Tekla Structures 2020 delivers enhancements, improvements and new features that enable efficient workflows for better productivity, increased mobility and collaboration across project teams, including:

Easier modeling of complex shapes with geometry improvements

Better usability, control and productivity with concrete rebar detailing enhancements

Quick and easy formworks modeling and improved hollowcore concrete detailing

Enhanced drawing tools that provide speed with confidence

Tekla Structures 2020 Maintenance now includes Trimble Connect™ collaboration platform, a cloud-based solution that allows stakeholders to share, review, coordinate and comment on data-rich building models, drawings, schedules and other project information in real-time across the project lifecycle, from a laptop, desktop or mobile device.

With Trimble Connect, constructible BIM data is extended to the field, liberating data and breaking down silos to improve coordination and project management across touchpoints. New functionalities and usability improvements now better support workflows and make it easier to get started with Trimble Connect.

Tekla Structural Designer 2020 structural analysis and design software introduces data-driven design with a new direct link between Tekla Structural Designer and algorithmic modeling plugin Grasshopper, enabling quick and easy exploration of different early-stage design alternatives.

Tekla Tedds 2020 structural analysis and design calculation software offers further integration with Tekla Structures and Tekla Structural Designer for convenient design management across both solutions. With enhanced integration, Tekla Tedds calculation can be automatically associated with a variety of Tekla Structures and Tekla Structural Designer objects.

Tekla Structural Design Suite, a new cloud-based product bundle, includes Tekla Tedds and Tekla Structural Designer, providing additional options for taking advantage of new product integrations.

Tekla PowerFab 2020 steel fabrication management software delivers improved production tracking, enhanced visualization and streamlined project management on the go. Tekla PowerFab now includes more flexibility in parts tracking through stations and routes on the shop floor and the ability to track external processes, such as erection, which can be shared and visualized from the field with Trimble Connect.

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Ultra Librarian Announces UltraBOM for Digi-Key, Enabling Part Research Within OrCAD Capture

13 March 2020

Ultra Librarian announced UltaBOMTM, enabling design engineers to search and research Digi-Key Electronics parts within OrCAD® Capture, and then submit BOM parts directly to Digi-Key for purchase. "The entire Bill of Materials (BOM) or a selection can be ordered directly from Digi-Key with a single click of a button," said Manny Marcano, president and CEO of EMA. "Errors and recommendations are reported for review, and all components are added to the cart in the correct quantities. This also eliminates the manual entry of parametric data into the schematic, reduces errors when ordering parts, and saves time on monotonous tasks, allowing engineers to focus on their designs."

UltraBOM for Digi-Key allows engineers to search distributor part information and review component parameters such as status, component availability, lead-times, and cost without leaving OrCAD Capture. Access to this data helps engineers select known high-quality orderable parts upfront. This distributor-driven design data is very important for quick-turn or rapid prototyping as engineers are able to gain fast access to the parts they need and keep the design and prototyping process moving forward.

Live parametric information can also easily be linked to existing parts. If the library part has not yet been created, then the user can instantly download the schematic symbol with linked footprints and Digi-Key supplier data from Ultra Librarian. Part information, availability, and status can be monitored and reviewed throughout the design with a fully customizable BOM. There is no need to spend hours verifying every component in the design or finding replacement components. Issue are flagged in real-time and resolved quickly without needing to leave the engineering design environment.

"Because of the tremendous workloads and shortened project timelines design teams face, managers are always interested in streamlining and increasing efficiency by reducing tedious tasks for their engineers," added Marcano. "Designers need tools like UltraBOM that automate manual tasks and enable them to be successful when faced with these challenges."

"We are thrilled with the addition of UltraBOM to Digi-Key's suite of free tools and resources for our customers," said Jeremy Purcell, senior digital product owner, Digi-Key. "We are constantly looking for ways to improve our customers' experience and partnering with Ultra Librarian connects both new and seasoned customers with an easy method for part purchasing and BOM creation."

For more information and to download UltraBOM for free, visit go.ultralibrarian.com/ultrabom-ul or contact the Ultra Librarian team at info@ultralibrarian.com.

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VMware Announces Expanded Portfolio of Products and Services to Help Customers Modernize Applications and Infrastructure

10 March 2020

VMware, Inc. announced a comprehensive portfolio of products and services to help customers modernize their applications and infrastructure—marking a new chapter for the company.

Applications are core to today's successful digital transformation efforts—enabling enterprises to deliver personalized digital experiences to their customers to generate new revenue streams. Enterprises are increasingly modernizing their applications to compete effectively and embrace the full potential of cloud environments. The challenges customers face are how to empower developers to deliver better software faster while still enforcing security and operations. To fully benefit from their investments in modern applications, enterprises also need to simultaneously modernize their infrastructure.

Today, VMware is introducing the newly expanded VMware Tanzu portfolio for modern applications, and VMware Cloud Foundation 4 with Tanzu, the automated, turnkey hybrid cloud platform that now supports both traditional VM-based and container-based applications featuring the new VMware Cloud Foundation Services using Tanzu Kubernetes Grid and the new VMware vSphere 7 to drive developer productivity. With the most comprehensive software stack for modern applications—spanning application to infrastructure—VMware is uniquely positioned to enable and guide customers to develop new modern applications as well as modernize existing applications and infrastructure.

"Today, we bring to market a comprehensive portfolio for modern apps to help customers accelerate their pace of innovation," said Pat Gelsinger, CEO, VMware. "VMware gives developers the freedom to deliver apps to any cloud, remove barriers to Kubernetes adoption, and help IT administrators transform their skills in support of a new wave of modern apps."

VMware Tanzu: App Modernization Portfolio

VMware Tanzu is a portfolio of products and services that enable enterprises to deliver better software faster. Customers can use the suite to automate the modern app lifecycle, run Kubernetes across clouds, and unify and optimize multi-cloud operations. Today, VMware is introducing the initial products in the VMware Tanzu portfolio:

VMware Tanzu Kubernetes Grid – Newly available, Tanzu Kubernetes Grid is a Kubernetes runtime that helps customers install and run a multi-cluster Kubernetes environment on the infrastructure of their choice. It is designed to run Kubernetes consistently across any environment including data centers, hyperscalers, service providers, and at the edge. It includes the industry-standard open source technologies needed to stand up and support a cloud-neutral Kubernetes environment, is packaged for enterprise readiness, and is fully supported by VMware.

VMware Tanzu Mission Control – Previewed in August 2019, Tanzu Mission Control is a centralized management platform for consistently operating and securing Kubernetes infrastructure and modern applications across multiple teams and clouds. It provides operators with a single control point for consistent management across environments and increased security and governance. Developers have self-service access to resources so they can get code into production faster. This service is now available.

VMware Tanzu Application Catalog – Newly available, Tanzu Application Catalog delivers a customizable selection of open source software from the Bitnami catalog that is verifiably secured, tested, and maintained for use in production environments. The service gives developers the productivity and agility of pre-packaged apps and components, while enabling operators to meet the stringent security and transparency requirements of enterprise IT. This service was originally previewed as Project Galleon in August 2019.

Beyond today's new product announcements, VMware is further expanding the Tanzu portfolio. Following the close of the Pivotal acquisition in December 2019, VMware has moved quickly to integrate the Pivotal team, technology and products. This includes VMware rebranding Pivotal Application Service (PAS)—purpose-built for developers to boost feature velocity and operations teams to deliver world-class uptime—to the Tanzu Application Service. Additionally, VMware has re-branded Wavefront by VMware to Tanzu Observability by Wavefront and aligned NSX Service Mesh with the portfolio as Tanzu Service Mesh, built on VMware NSX. These additions to the portfolio will help enterprises to further increase developer velocity, holistically observe and monitor apps running in multi-cloud environments including Kubernetes-based environments, and simplify the way they connect,

monitor and secure microservices.

VMware Cloud Foundation 4: Hybrid Cloud Infrastructure for Modern Apps

Unveiled today, VMware Cloud Foundation 4 with Tanzu will provide hybrid cloud infrastructure with consistent management for both VM-based and container-based applications while delivering intrinsic security and lifecycle management across software-defined compute, storage and network resources. The platform helps to bridge the gap between developers and IT—enabling developers to rapidly build and update apps while providing IT operations with control and enhanced security. Available across diverse private and public clouds including the hyperscalers, VMware Cloud Foundation 4 with Tanzu will include the following components:

New vSphere 7: Newly rearchitected using Kubernetes, vSphere is now optimized to run both modern container-based and traditional virtual machine-based workloads. Initially, vSphere 7 with Kubernetes will be available solely through VMware Cloud Foundation 4.

New vSAN 7: To provide storage virtualization including File Services and Cloud Native Storage for modern apps.

New vRealize 8.1: To provide self-driving operations and modern infrastructure automation capabilities for virtualized, cloud-based and containerized workloads and applications.

NSX-T: To provide full stack networking and security services that connect and protect VMs and containers.

VMware Cloud Foundation 4 with Tanzu also introduces VMware Cloud Foundation Services, an integrated Kubernetes and RESTful API surface to enable organizations to drive API access to all core services. VMware Cloud Foundation Services will include:

Tanzu Runtime Services: These services will deliver core Kubernetes development services including an up-to-date distribution of Tanzu Kubernetes Grid.

Hybrid Infrastructure Services: Powered by the new VMware vSphere 7, these enhanced services will provide full Kubernetes API access as well as the infrastructure-as-code automation APIs delivered by vRealize Automation to span the world of VM-based applications and cloud-native applications deployed with containers.

Optimized to run all applications, VMware Cloud Foundation delivers a cloud operating model on-premises in a private cloud that extends to public cloud, enabling developers to use the latest development methodologies and container technologies for faster time to production. Enterprises will benefit from simplified management of containers and VM workloads across heterogenous clouds like AWS, Azure, Google, Oracle, Rackspace, and IBM as well as VMware Cloud Verified partners, optimizing performance, resilience and availability.

VMware vSphere 7: Essential Services for Modern Hybrid Cloud

VMware today also introduced VMware vSphere 7—the biggest evolution of vSphere in a decade. VMware vSphere 7 was previewed in August 2019 as Project Pacific—which focused on rearchitecting vSphere into an open platform using Kubernetes APIs to provide a cloud-like experience for developers and operators. A foundational component of the VMware Tanzu portfolio, the new release will support all applications including modern and traditional applications using any combination of virtual machines, containers and Kubernetes.

VMware vSphere 7 will further help enterprises to increase developer and operator productivity, enabling faster-time-to-innovation combined with the security, stability, governance, and lower costs of traditional enterprise infrastructure. New capabilities and features will enable enterprises to:

Boost Productivity: Developers will benefit from self-service access to infrastructure and additional productivity capabilities that reduce the amount of time they are required to spend managing infrastructure. Tanzu Kubernetes Grid is embedded into vSphere 7 with Kubernetes as part of VMware Cloud Foundation 4 to deliver Kubernetes clusters as a service to developers.

Achieve Agile Operations: IT operations teams will benefit from new application-focused management, simplified lifecycle management capabilities, and a unified platform for consistent operations across clouds, data centers and edge environments.

Accelerate Innovation: All enterprise applications will benefit from the advancements into vSphere 7 to accelerate innovation. Applications will be able to further leverage GPU hardware to accelerate the performance of AI / ML applications using elastic pools of GPU resources. Additionally, customers will be able increase the performance of latency-sensitive applications using improved DRS, enhanced vMotion, and augmented support for persistent memory (PMEM) capabilities.

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