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## CIMdata News

### *Continually Verifying and Validating Compliance as ADAS Features and AV Performance Are Developed - a CIMdata Commentary*

31 January 2024

#### *Key Takeaways*

- Successful adoption of ADAS and AV requires trust—trust by the end users and trust in the knowledge and solutions used to design, develop, and validate the vehicles.
- Continuous verification and validation of compliance to regulatory requirements while engineering for performance improves the successful introduction of new ADAS features and AV products.
- Modern virtual engineering ecosystems utilizing scenarios learned from actual product usage enable continuous verification and validation as design changes are considered.
- Siemens Digital Industries Software solutions enable on demand, continuous verification and validation even as regulatory and customer requirements evolve over a product's lifecycle.

#### Introduction

Continuous verification and validation (V&V) of Advanced Driver Assistance Systems (ADAS) and Autonomous Vehicles (AVs) is a critical narrative ensuring a product's safety and performance throughout its useful life. Understanding how to satisfy changing requirements, whether consumer-driven or regulatory, is faster and easier when using computer-based design and powerful simulation ecosystems. A systematic approach to continuously test, assess, and validate the functionality and safety of ADAS features and AV as they evolve is essential to remain competitive.[\[1\]](#)

Deploying new ADAS features to existing products requires earned customer trust. Trust grows when using a virtual engineering ecosystem to frequently evaluate actual usage patterns (aka scenarios). Enabling continuous V&V and keeping regulatory compliance always visible during evaluation of product performance is needed. Continuous V&V testing is affordable due to decreasing database and compute server costs.

Automakers perform verification and validation as a step after detailed design of components and subsystems and then the integration of product prototypes containing them. Modern databases and on-going learned load cases (driving scenarios and the physical loads they excite) make frequent evaluation possible and can be done in parallel with development. This shortens the repair cycle when flaws are discovered.

This systematic assessment method, employing continuous verification and validation, requires several capabilities including data collection from continuous monitoring, scenario-based testing, earlier algorithm validation, product software updating, regulatory compliance, machine learning for model validation, user feedback during incident analysis, redundancy for

fail-safe mechanisms, and necessary reporting. This commentary discusses these capabilities and explains why each is integral to achieving continuous verification and validation to regulatory and customer requirements while system performance development and upgrades proceed.

### Assuring Compliance During Development and Use

The replay of customer usages captured as recorded scenarios combine vehicle motion with sensing scripts and forms the basis for continuous ADAS and AV systems V&V. Waiting solely on physical prototypes for V&V is no longer required. And while a final physical validation is still likely, the development process and evaluations of customer reported anomalies improves with trusted models used within closed-loop simulations. Trusted models come from correlation to actual product usage experiences. Trusted models are adjusted to reflect the latest usage measurements. More accurate models create a verification and validation environment where new ideas can be assessed quickly, including their effects on regulatory compliance. Using continuous verification and validation for complex ADAS and AV electro-mechanical systems is needed.



Figure 1—Scenarios Expand With Weather Variations  
 (Courtesy of Siemens)

Figure 1 shows broader, environmentally driven experiences with an existing product in more extreme weather conditions. The evolving ADAS and AV product can be assessed quickly when new usage scenarios are captured and synthesized based on physical understanding and knowledge. Continuous V&V improves with the newest learned scenarios, both measured and synthesized. Keeping regulatory requirements and industry standards visible in the context of the evolving product design shortens the validation cycle. This effective [continuous V&V approach](#) is applicable to electro-mechanical systems as software based models of mechanical mechanisms replace physical prototypes.

Fast-paced features design, verification, and validation are a key to successful competitiveness when developing ADAS and AV products. Continuous V&V with trusted systems models that evolve as knowledge is discovered makes engineering more responsive to the market and changing operating environments. Robust, compliant products with reliable upgrades are becoming the hallmark for great companies, keeping customer safety and satisfaction in the forefront.

Meeting all the requirements, standards, and performance objectives as the AV design evolves and while it is used is needed by the AV OEMs. The massive number of user scenarios needs to be managed. Keeping requirements traceable, visible, and assessing the AV systems’ ability to meet them is essential. V&V tasks can be done physically or virtually. When done virtually the only limit to continuous execution is compute machine power and database capacity. Advances in both continue to make virtual engineering more and more affordable and faster—making continuous V&V possible.

### Siemens’ Solutions Enable Continuous Verification and Validation

By identifying and providing continuous verification and validation capabilities, Siemens has assembled a requirements traceability ecosystem that can enable automakers to competitively bring new ADAS features and AVs to market. Making the achievement of requirements visible as engineering development proceeds is insightful. Siemens shows this in a video by reporting the requirements coverage as each scenario is evaluated. This assessment helps engineers understand the level of requirements coverage achieved.



*Figure 2—Video of Expanding Scenarios that Improve V&V as Requirements Coverage Is Assessed  
 (Courtesy of Siemens)*

Furthermore, it provides insight into which scenarios need enhancements or expansion to improve the requirements coverage. Siemens has provided CIMdata detailed examples which show the power this method brings to the systems and validation engineers.

Siemens’ scenario management combined with interactive requirements coverage made contextually visible within accomplishment dashboards and the 3D product mockup enables continuous verification and validation. The scenario database learns from and adapts to

synthesized data based on a known understanding of the physical world. New, measured data augments the classical understanding, often leading to new insights on coupled physics. Being able to simulate these new phenomena builds trust in the predictive performance models. Compliance, through comprehensive traceability, is always visible from the start. The value this provides automakers is clear—optimized products that meet and anticipate mobility market desires.

Specific capabilities Siemens is providing to automakers that enable the continuous V&V narrative include:

- Data Collection and Monitoring

Keeping the scenarios comprehensive—covering the wide range of possibilities, is essential. Continuous data collection from different sensors (e.g., cameras, LiDAR, radar, and other sources) measures how the system perceives the environment. Real-time monitoring of system performance allows for immediate detection of anomalies, malfunctions, and deviations from expected behavior. The definition of various driving scenarios, including a variety of environmental conditions and traffic situations, is driven by actual customer use.

- Scenario-Based Testing

Scenarios must be regularly updated and expanded to cover a changing, wide range of real-world driving situations. Real world situations include sensor soiling, fog, rain, bright light, and traffic congestion. By using simulation, both offline and in real-time, a system's responses to scenarios, including those that are difficult to physically recreate, can be thoroughly evaluated.

- Earlier Algorithm Validation

Virtual engineering solutions using trusted simulation models enable earlier algorithm validation and software verification while ensuring that new features or improvements do not introduce unexpected behaviors or vulnerabilities.

- Dynamic Updating

An iterative over-the-air (OTA) solution delivery helps keep ADAS and AV systems up to date with evolving customer expectations, usages, road conditions, and changing regulations. Continuous V&V provides the evaluation ecosystem as these incremental solutions are crafted, improving the refined systems' behavior confidence while reducing risks.

- Regulatory Compliance

Automakers must stay abreast of evolving ADAS and AV regulations and standards to ensure compliance with local, national, and international safety regulations. A continuous V&V ecosystem keeps requirements traceability and compliance visible all the time.

- Machine Learning and AI Model Validation

Trusted models need continuous training to remain valid through machine learning using fresh data to adapt to changing road conditions and user behaviors. By monitoring model correlation accuracy, retraining is done when needed to improve their trustworthiness and applicability.

- User Feedback and Incident Analysis

Involving humans with their unique driving variations in the feedback process is vital. The ADAS and AV systems must protect humans, both drivers and pedestrians, from unsafe operations. The integration of user feedback and all incident investigation analyses within the continuous V&V framework improves requirements traceability.

- Redundancy and Fail-Safe Mechanisms

Using frequent tests and validation to examine and explore critical components' redundancy ensures reliable fail-safe operation. Comparison of alternative fail-safe mechanisms is faster and more effective in virtual engineering trade studies.

- Reporting

Easy to produce on-demand reports and dashboards of all testing, validation, and incidents, including correlation studies establishing model trust enable personnel at all levels to monitor the system's safety and performance progress.

Several CIMdata articles summarize the expansion of MBSE driven, multi-discipline capabilities that Siemens has developed. Siemens' solutions are already enabling advances in [electric vehicle engineering](#), [systems and software engineering](#), [executable digital twins](#), manufacturing planning, and operations, all contributing to [accelerating](#) every aspect of product development, production, and use. Siemens is now focusing those capabilities on ADAS feature and AV product continuous V&V by managing massive numbers of scenarios in all the different development environments from model-in-the-loop to software-in-the-loop, to hardware-in-the-loop, and finally systems-in-the-loop. By using the same scenarios repository, verification and validation are always using the latest insights from the customer while assessing requirements coverage. Siemens' effective scenarios management and affordable computing enables continuous verification and validation.

## Conclusion

Keeping and building trust with customers is crucial. Fast ADAS feature and AV product verification and validation is a key to success. Continuous V&V from Siemens can be a competitive advantage. Siemens is developing a growing set of capabilities for data capture, scenario-based analysis, critical scenario creation, and seamless system optimization. This can improve the continuous V&V of AV/ADAS features.

CIMdata believes Siemens continuous V&V framework will encourage and enable more rapid ADAS features and AV product development in new ways, expanding virtual engineering and evolving evaluation practices. By combining the ADAS/AV scenarios management, virtual engineering broadens, and trust grows—the trust needed for a completely autonomous transportation future. CIMdata recommends automakers should consider Siemens's Xcelerator technology platforms when evaluating solutions for continuous V&V during ADAS and AV development.

CIMdata believes that Siemens' focus on the narratives, shown in sky blue in Figure 3, will help enable improving system optimization and efficient verification and validation based on a

complete usage database comprehending relevant scenarios as they are discovered. Advances in computing make continuous verification and validation possible even when new scenarios learned from the latest customer usage are discovered.

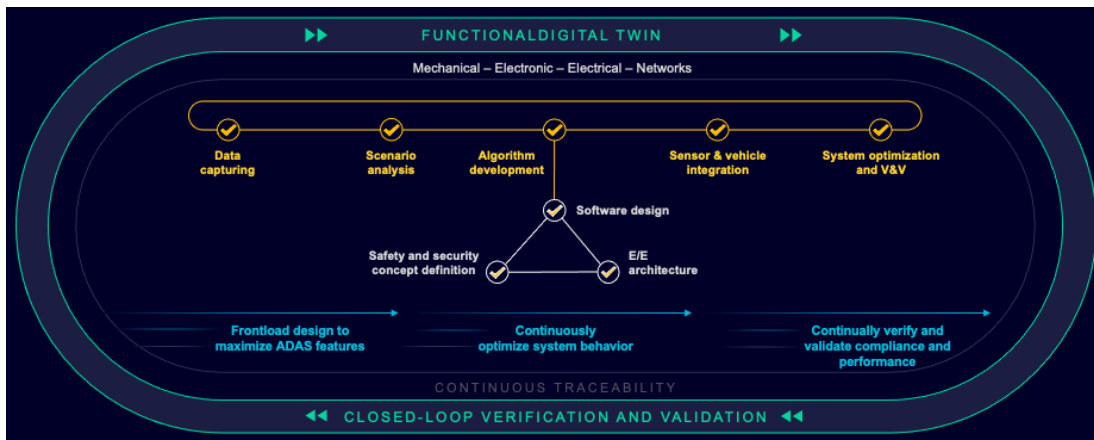


Figure 3—Three Key Narratives  
 (Courtesy of Siemens)

To learn more about Siemens capabilities for engineering ADAS features and AV products, see CIMdata’s previous papers and commentaries in this series. CIMdata has written about the general challenges for ADAS and AV engineering work in a white paper and has explored the need for scenario management in a recent optimization commentary. The use of simulation during earliest design concept with a capability Siemens calls front loading has also been published.

[1] Research for this commentary was partially supported by Siemens Digital Industries Software.

### *Efficient Asset Information Management - a CIMdata Commentary*

1 February 2024

*Addressing the Challenges of Managing Large, Complex Infrastructure and Assets with Secure Collaboration*

#### Key Takeaways

- The Architectural Engineering and Construction (AEC) and Engineering, Construction, and Procurement (EPC) industries do a poor job of handling large numbers of suppliers and providing secure collaboration across the lifecycle of their assets and related information, resulting in higher costs to owner/operators.
- Asset Information Management (AIM) is broader than Building Information Management (BIM) and focuses on managing and maintaining assets throughout their lifecycle while enabling a sustainable collaborative environment between the assets and their suppliers across multiple domains.

- AIM must manage assets and their digital twins under configuration control and ensure secure collaboration with all asset suppliers, providing traceability and end-to-end connectivity across a digital thread.
- Eurostep's ShareSpace iAIM is based on open standards that enable complex operations to manage assets across their lifecycle and ensure they can continually be optimized.

## Introduction

Historically, the AEC and EPC industries have been inefficient in handling the large ecosystems and secure collaboration required for the design, construction, and operation of large facilities and infrastructure. This has resulted in long-term higher costs for owner/operators. Most owner/operators struggle to manage their assets because their view of the asset is too narrow—often with a limited understanding of what it takes to manage an asset across its lifecycle. Unlike most industries, the AEC and EPC industries are less connected between owner/operators and their many diverse suppliers. [\[1\]](#)

They tend to focus on BIM in design, Product Information Management (PIM) in construction, and AIM in operations and maintenance—each with its own focused processes and data architectures. This results in issues with data handover and real-time updates. Unlike consumer product-oriented industries, AEC and operations (AEC/O) suffers from the sheer volume of tasks, a lack of accountability, poor collaboration and communication, and lack of strong change management, resulting in late-stage changes, poor interface management, and rigid operational processes during maintenance.

## Complex Infrastructure Requires Asset Information Management

Managing large infrastructures such as process plants, power plants, airports, and linear infrastructures such as highways and railways lack efficiency due to poor collaboration in design, construction, operation, and maintenance. The tools and processes used are focused on a specific phase and do not employ a global through-life perspective.

Within the AEC industry, BIM is used for design, providing a 3D model that facilitates collaboration among architects and engineers and is referenced during the construction phase. A BIM model primarily contains geometric and spatial data useful in construction of some aspects of a plant or large project, but functional and system breakdowns are often overlooked. Large complex plants and infrastructure incorporate systems and equipment from many diverse suppliers, each using different design packages at many different release levels. This creates tremendous complexity (e.g., multiple data architectures, development and testing processes, attributes, metadata, etc.) and can result in vendor lock-in for an owner/operator that attempts to rely on a single proprietary software solution.

BIM models encompass a limited set of information and are typically used by a single company or perhaps a partnership of companies, but usually constrained to a portion of a large complex project. BIM models do not contain all the detailed data required for the comprehensive management of assets during their operational life. Some EPCs may opt to use database-driven plant design software with more of an emphasis on piping and electrical systems, which can

work well during design within a given scope. Other OEM equipment providers will deliver 3D models in various CAD formats, often not compatible with the plant design tools/formats used by the EPC. Many AEC oriented suppliers use BIM, Autodesk drawings, or other tools. Combine all of this and it creates major issues during turnover and final handover with respect to ongoing collaboration, traceability, and the enablement of digital twins (digital representations of up-to-date physical assets).

AIM is much broader than BIM. It is designed to manage assets across multiple domains throughout their lifecycle while enabling a sustainable collaborative environment by managing the assets and the suppliers of those assets. AIM must enable AECs, EPCs, and owner/operators to view assets from multiple perspectives (i.e., design, construction, operations, engineering services, safety, maintenance, geography, etc.). AIM has an important financial component as well. After handover, next to safety and regulatory, the primary goal is to operate the plant or large infrastructure as cost effectively as possible. If you do not have control of the costs related to all aspects of the assets, you will be missing opportunities to increase operational efficiency and lower associated costs.

#### Digital Twins for Infrastructure and Capital-Intensive Plants

A primary aspect of managing physical assets is to make sure they are up to date, with all changes under configuration control. Within a large complex plant with many different design sources from many different organizations, this can be very complex. Today, many owner/operators are attempting to leverage digital twins to optimize their assets, operate more efficiently, and understand why maintenance and upgrade decisions were made, so they can improve their operations.

A digital twin is a virtual presentation (digital surrogate) of a physical asset that takes advantage of the data flow to and from these physical assets to maintain an accurate up-to-date configuration of the asset. This improves operations by generating valuable insights, assisting in guiding the automation of complex processes, and monitoring and controlling the physical assets.

Managing digital twins of assets in a large complex infrastructure with many authoritative sources of information, requires an AIM capability that not only manages ongoing design and maintenance changes, but also maintains the asset under configuration control. To do this, the AIM capability must also enable secure collaboration among the managed systems, suppliers, and service providers ensuring traceability and end-to-end connectivity.

The digital thread or digital web is a framework of information nodes that connect the information to the digital twin. Each node contains information critical to maintaining the asset. This can range from requirements to metadata, models, design, analysis, maintenance, operational information, and more. It represents all the decisions made throughout the lifecycle of the product and essentially answers “how” and “why” each decision was made. More and more assets are now capable of producing Internet of Things (IoT) data that can flow from many physical assets to many collection points. This necessitates that the AIM solution be able to handle secure collaboration of IoT data to enable the flexibility required to operate an “as-running” infrastructure as sensors, edge devices, and organizations will change over time.

## Data Governance

There is a difference between managing assets and asset management. Managing assets is a tactical day-to-day operational activity such as maintenance. Whereas asset management is a more systemic approach that involves governance, utilization, strategic planning, as well as operations, maintenance, and all aspects of the asset throughout its lifecycle. The challenge of managing any large, complex infrastructure is that there are many sources of truth and many domains to consider, each using their own vocabulary, information formats, and specific IT platforms. There is a tendency to think a software solution solves the asset management challenge, but this is not just an IT problem. There is no asset management (as defined in ISO 55000 family of standards) without proper strategy, configuration, and data governance.

Data governance doesn't just apply to operations. It must be applied to all areas including the maintenance and financial aspects of the assets. The asset, process, technology, organization, and people will all change over time. And the amount of data and complexity of the assets, processes, and technology will only increase. Therefore, strong data governance is critical to successful asset management.

Data governance is required across all data models to be effective. Open standards have an edge in defining the built asset operational model, as the tedious task of defining the semantic scope for every concept is typically shared among industry partners working with the open standard. CIMdata believes that standards-based data governance over complex operations that are constantly evolving is a must.

## Model-Based System Engineering

Model-based system engineering (MBSE) is not often thought of in the AEC/O industry. It is more traditionally used in the systems engineering of complex products in the aerospace and automotive industries. It is a way to manage complex systems of systems using visual models that show the relationships, interactions, and components that engineers collaborating across multiple domains made up of different types of data and processes need to understand. These models help engineers understand how the systems operate within certain constraints, providing a better understanding of potential bottlenecks. This allows constraints to be identified earlier in the process, allowing for more informed decisions to mitigate potentially costly limitations.

MBSE can be used within the AEC/O industry in all phases of the lifecycle including design, construction, operations, and maintenance. By using MBSE, owner/operators can employ a structured auditable approach to identifying requirements and managing interfaces across systems that will enable better control of data and processes throughout the lifecycle of large complex infrastructures.

## ShareAspace iAIM Addresses Multiple Complex Needs of the Owner/Operator

Eurostep's ShareAspace integrated Asset Information Management (iAIM) software product is designed to solve the challenge of sharing asset data across many suppliers and domains in large complex plants and infrastructure in the AEC and EPC industries. ShareAspace iAIM is built on Eurostep's ShareAspace standards-based digital collaborative platform. ShareAspace is

based on ISO standards such as ISO 10303-239 (PLCS) that support the collaboration of asset data throughout its lifecycle.

By basing ShareSpace iAIM on ISO 10303-239 (PLCS), it covers the entire product lifecycle, offers open interoperability with all vendors, and protects the owner/operator from vendor lock-in by addressing multiple data sources:

- Operational and maintenance issues (i.e., Computerized Maintenance Management System (CMMS), Integrated Work Management Systems (IWMS))
- Data Sources (e.g., IoT, SCADA, inspections)
- Product information (e.g., BIM models, point clouds, drawings, documents)
- Requirements management as defined in ISO 19650

CIMdata is impressed with ShareSpace iAIM's ability to interoperate with many suppliers and technologies throughout the entire lifecycle of assets. Eurostep's commitment to standards such as PLCS protects the owner/operator from vendor lock-in, offers open interoperability, and provides the resiliency required as vendors or processes evolve over time. ShareSpace iAIM is designed to close the gap between data stemming from different projects that impact the Asset model. ShareSpace iAIM also supports other industry standards within the AEC and EPC industries:

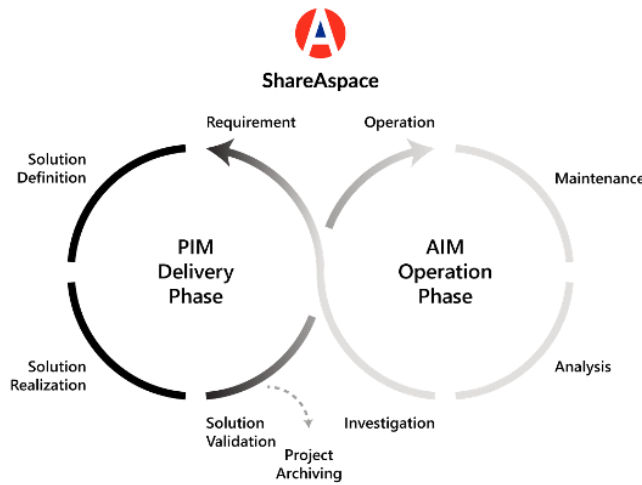
- ISO/IEC 30141—IoT Reference data
- ISO 81346—defines function, location, and product aspects and when combined with PLCS enables traceability between assets and information about assets
- ISO 16739 / IFC—Industry Foundation Classes to support openBIM deliverables
- CFIHOS—information handover specification
- ISO 15926—standard data model for interoperability in capital projects industry

AIM solutions tend to focus on managing the assets for an owner/operator during operation and maintenance. The challenge owner/operators face is that assets are constantly changing and require digital twins with digital threads connected to different sources of truth from a diverse set of changing suppliers. For each supplier, there is a functional breakdown to link the functional requirements and their realization with physical assets. Asset management software solutions typically do not support this through-life traceability. CIMdata's believes Eurostep's ShareSpace iAIM offering is at the forefront of the MBSE deployment for AEC/O industry. Its capabilities have been demonstrated via an Interface Management system created for an urban tramway construction project. This system enables the tracking of interfaces and solving conflicts between disciplines and schedules throughout the asset lifecycle.

While BIM and other methods are used by many suppliers, primarily in the design phase, and referenced in the construction phase, the project is typically managed with Product Information Management (PIM). The challenge for both handover from design and turnover to the owner/operator is that it's thought of as a one-time event. Eurostep's solution closes the gap between the usually disconnected data silos and creates an ongoing asset registry capability

that can handle multiple projects and stakeholders involved in several projects as they continue to evolve.

ShareSpace iAIM is designed to enable collaboration across many organizations where different systems are authoritative sources for different information. ShareSpace keeps track of which originating systems loads or updates data into ShareSpace iAIM and ensures that information owned by the originating systems is not updated unless approved by the owner/operator.



The Asset Register is designed to enable “what if” analyses by leveraging the built asset’s Digital Twin where unlimited scenarios can be tested on the virtual asset to ensure optimal decisions. When an extract of the up-to-date Asset Register is required to initiate a local remodeling or upgrade project, ShareSpace iAIM can export data and enable a “reverse handover” from the asset owner/maintainer to EPC companies. This extract can provide

semantically rich zones for remodeling and upgrade projects.

A key capability of ShareSpace iAIM and the underlying ShareSpace platform is the ability to integrate multiple companies using multiple technologies where ShareSpace iAIM acts as a collaboration hub providing traceability and through-life configuration management with a flexible data model that supports open and correct access to data.

**Conclusion**

CIMdata believes that owner/operators in the AEC and EPC industries struggle with secure collaboration across their many suppliers. This supplier mix changes over time, resulting in higher operating costs. We believe AIM is broader than BIM and that owner/operators will benefit by focusing on managing and maintaining assets throughout their lifecycle while enabling a sustainable collaborative environment for managing the assets and the asset suppliers across multiple domains.

CIMdata does not believe Digital Twins are well supported within the AEC and plant industry today. To manage digital twins of assets in a large complex infrastructure with many authoritative sources of information, AIM must manage assets under configuration control and securely collaborate with all the suppliers, providing traceability and end-to-end connectivity across a digital thread.

Eurostep’s ShareSpace iAIM is based on open standards in an open environment and is designed to support the most complex operations enabling assets to be managed across their lifecycle. This prevents information lock-in and provides key functionality supported by MBSE

and a strong Data Governance implementation, which enables continual optimization. CIMdata recommends any organization looking to manage large complex facilities and infrastructure consider Eurostep's ShareSpace iAIM in any technology evaluation.

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

## *Smart Manufacturing - Critical for Success in Today's Complex Heavy Equipment Industry – a CIMdata Commentary*

30 January 2024

### *Key Takeaways*

- Increasingly, heavy equipment manufacturers must produce custom configurations, often in small quantities, while simultaneously managing increasing product complexity—leveraging closed loop smart manufacturing is required to compete and win in today's complex heavy equipment industry.
- Smart manufacturing requires effective collaboration among product engineering, manufacturing planning, production, and service operations.
- A comprehensive smart, collaborative manufacturing environment is essential to analyze the impact of a product mix on production, allowing companies to optimize overall throughput.
- Siemens Xcelerator from Siemens Digital Industries Software, an open digital business platform to accelerate digital transformation and value creation has been tailored to deliver a smart manufacturing environment for heavy equipment industry competitors.

### Introduction

Heavy Equipment manufacturers make highly configured products in low production volumes. Their margins are tight. Every opportunity to make savings is critical. Manufacturing efficiency can make a significant difference, with massive impact on profit. Additionally, trends like electrification, digital capabilities, and customers specializing in unique operations add complexity by multiplying the number and variety of components, suppliers, and customization requests.[1]

These manufacturers are being challenged by their customers, the competition, and government regulators, to develop smarter, more eco-friendly equipment in an increasingly difficult economic climate. Key challenges include tougher emissions standards, higher performance requirements, ever-increasing safety standards, electrification, and the application of new technologies such as augmented reality and artificial intelligence. Additionally, companies realize the safest place for their operators is outside the mine or construction site, so remote teleoperation and autonomy are often sold as a safety asset.

As a result, heavy equipment is getting smarter. Much of today's equipment is software- and electronics-driven, can connect with other machines and systems, and is able to operate

autonomously. Manufacturers have a fundamental requirement to manage the rapidly increasing complexity of hardware, software, and electronics integration within heavy equipment to drive product development, product performance, and differentiation. To do this, competitors in the heavy equipment industry must create smart manufacturing environments that enable them to ensure compliance, quickly introduce new, complex products, deliver higher manufacturing efficiencies, and achieve expected quality regardless of production volumes.

Further, customer demands for “personalized” products increase product and process complexity of both development and production as well as long-term service. Manufacturers need highly flexible integrated information flows and processes that can adapt to product and market changes. Implementing integrated Manufacturing Enterprise Innovation Platforms[2] can help achieve faster ramp-up to production and reduced time to market, while improving response to changes in customer demand.

CIMdata believes that heavy equipment manufacturers who address these issues will position themselves to more quickly deliver the complex Configure-To-Order (CTO) products their customers are demanding, make more efficient use of their manufacturing facilities and service resources, improve their competitive position, and increase customer loyalty.

#### Efficiently Producing Complex Products

To efficiently realize global design and production, manufacturing enterprises must design, manufacture, and service multiple configurations and variants of a product family in a cost-effective manner. This means:

- Establishing a comprehensive digital thread that enables multi-domain collaboration and re-use and leverages common information from design to execution and beyond.
- Establishing best practices for complexity management—enabling design anywhere, build anywhere for complex CTO equipment.
- Creating a closed-loop manufacturing (CLM) environment that enables direct cross-domain (PLM/ERP/MES) feedback loops to support smart manufacturing.

CLM enables managing changes between engineering and manufacturing (and service) and incorporating feedback from the shop floor. Built on seamless integration between PLM, ERP, and MES, CLM enables synchronization and optimization along the entire value chain. It supports direct cross-domain feedback loops from downstream to upstream activities and vice versa, enabling processes such as change management and issue and defect tracking.

Leading manufacturers integrate planning and simulation tools for up-front validation of manufacturing processes to develop 'right-the-first-time' manufacturing plans, reduce the risk of errors in manufacturing and improve quality. Smart manufacturing capabilities enable companies to analyze the impact of product mix on production to optimize overall production throughput-reducing non-value-added work and optimizing material flow and logistics. They can also better optimize equipment usage and more easily evaluate alternatives to determine,

early on, how optimized throughput can be realized under typical mixed-model production scenarios.

To work more efficiently and be more competitive, heavy equipment manufacturers require configured, intuitive, and up-to-date information available on the shop floor via online electronic work instructions. These work instructions contain assembly sequences, visual data, and animations that can be automatically retrieved for any given production order based on a plant-specific process definition. Having direct access from the production work context, with information about assembly station layouts, parts, and tools to be used, helps production personnel report non-conformance issues on the shop floor—another example of effective CLM.

Siemens’ Strategy for Smart Manufacturing

Siemens Digital Industries Software (Siemens) has recognized the industry’s need for a smart manufacturing approach to help their heavy equipment industry customers manage their increasing product and process complexity, as discussed above. Fundamental to their strategy is that companies need to be better able to deal not only with product complexity (e.g., CTO with increasing variations) but also manufacturing environment complexity (global sourcing and production with different processes at each plant) and the ability to deliver service both on-site and remotely.

The digital thread enabled Smart Manufacturing for Heavy Equipment solution helps customers improve communication and collaboration throughout their enterprise, as well as with suppliers, to discover manufacturability issues and opportunities earlier, to continuously reduce miscommunication, mistakes, and overhead costs on the shop floor, to optimize process KPIs, and to build know-how about their global manufacturing ecosystem. This can help them achieve zero-defect manufacturing everywhere while driving sustainability.

Figure 1 illustrates Siemens’ approach to smart manufacturing for heavy equipment.



Figure 1—Siemens Xcelerator Portfolio Supports Smart Manufacturing (Courtesy of Siemens)

The Siemens Xcelerator portfolio is a comprehensive, integrated suite of software, services, and application development platform that provides the foundation for smart manufacturing. It helps businesses leverage complexity as a competitive advantage and transform themselves into digital enterprises faster. Characteristics of this portfolio particularly pertinent to the manufacturing of CTO products are:

- **Comprehensive digital twin** comprising a digital fabric of information from product design, manufacturing, and in-field utilization data, enabling cross-domain engineering, virtual validation, and continuous product and process improvement through a closed-loop feedback system.
- **Personalized, adaptable solutions** adapted to each heavy equipment maker’s digital roadmap and uniqueness.
- **Open, modern, ecosystem** that can adapt as technologies and business strategies evolve.

Figure 2 shows what is needed to bridge the gap between design and execution.

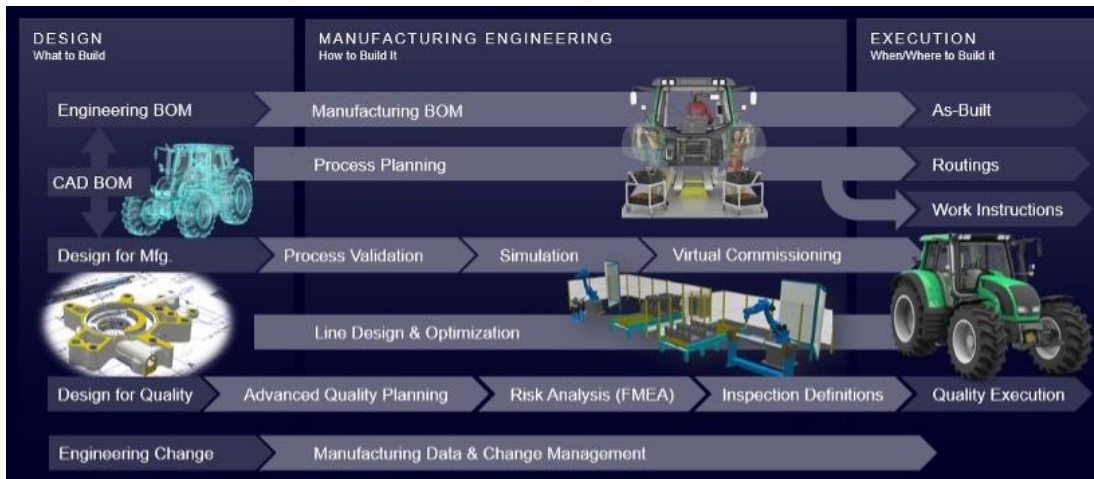


Figure 2—Siemens Solutions Help Heavy Equipment Manufacturers Enable the Digital Thread  
 (Courtesy of Siemens)

To enable efficient smart manufacturing that closes the digital gap from product design to production execution and makes digitalization a reality in the heavy equipment industry, Siemens Xcelerator includes the following key capabilities:

- **Product Configuration** provides the ability to configure a Manufacturing Bill of Materials (MBOM) into a specific customer order in a CTO business.
- **Manufacturing Planning** for the design and implementation of the Manufacturing Bill of Process (BOP).
- **Process Validation** enables virtual validation of product assembly and related process plans to eliminate potential shop floor issues.

- **Advanced Planning & Scheduling** analyzes achievable production schedules, considering a range of constraints and business rules, allowing the planner to generate and evaluate multiple potential scenarios.
- **Production Execution & Optimization** integration with manufacturing execution systems enabling the creation of a comprehensive digital twin used to continuously optimize production.
- **Data & Change Management** to handle the large amounts of data and changes that occur throughout the product, production, and service lifecycles.

In addition, using IIoT platforms like Siemens Insights Hub, production machines and systems can provide direct, immediate feedback from the shop floor to engineering and process planning users and systems, promoting continuous product improvement and eliminating knowledge gaps between engineering and execution.

### Summary

Heavy equipment manufacturers are confronted with increasing complexity—both in product variations and global production operations. They need effective smart manufacturing capabilities that integrate their product development, production, and services processes and environments.

Siemens Xcelerator portfolio solution is designed to enable heavy equipment manufacturing enterprises to efficiently produce highly complex CTO product variations. It helps companies establish digital thread enabled CLM environments that can more quickly and efficiently manage change between product engineering and manufacturing so that product and production changes are kept in sync, and issues are identified and resolved earlier in the lifecycle when costs and risks are lower. This enables them to plan, produce, and service products as required to meet global, local, and specific customer requirements.

CIMdata believes that Siemens' approach and solutions for smart manufacturing provide a very effective platform that can help heavy equipment manufacturers build better, more effective, and more profitable businesses; improve their overall product engineering-to-production efficiency; and improve their market competitiveness. With Siemens Xcelerator solutions for manufacturing planning and validation tied together through a digital thread, companies can create a smart, collaborative manufacturing environment that closes the loop between design and production and drives high-quality CTO products and services. Manufacturing enterprises facing today's complexity challenges should include Siemens in their evaluation of solutions for smart, collaborative, closed-loop manufacturing.

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[1] Research for this commentary was partially supported by Siemens Digital Industries Software.

[2] <https://www.cimdata.com/en/news/item/13796-cimdata-publishes-an-enterprise-innovation-platform-for-manufacturers>

## Acquisitions

### *Accenture Completes Acquisition of Ammagamma*

30 January 2024

Accenture has completed the acquisition of Ammagamma, an Italy-based firm that helps companies advance their uses of AI and generative AI technologies. The transaction is part of Accenture's \$3 billion investment to accelerate clients' transformation through the large-scale application of AI.

The acquisition of Ammagamma, previously announced on November 28, 2023, adds more than 90 AI professionals to Accenture's workforce, including engineers, mathematicians, economists, historians, philosophers and designers. Financial terms of the transaction were not disclosed.

Founded in 2013 with the aim of improving the productivity and performance of Italian companies by exploiting the potential of AI, Ammagamma already contributes significantly to the development of a society aware of the potential, implications and impacts deriving from this technology.

Based in Modena, the company operates in a crucial region for the economic development of the country, serving key sectors and supply chains from automotive to pharmaceuticals. Since 2021, it has doubled its staff of professionals and increased its turnover, working alongside leading companies in the energy, insurance, banking, utilities and media sectors.

### *Accenture Completes Acquisition of Navisite to Help Clients Modernize and Reinvent Their Businesses with Cloud*

30 January 2024

Accenture has completed its acquisition of Navisite, a digital transformation and managed services provider. The acquisition helps to bolster and scale Accenture's application and infrastructure managed services capabilities to help clients across North America modernize their IT for the AI era.

The acquisition of Navisite, previously announced on January 10, 2024, adds approximately 1,500 people to Accenture's Infrastructure Engineering practice dedicated to helping clients accelerate their cloud transformations and build a strong digital core.

With more than 400 cloud engineers, who hold more than 2,000 certifications, Navisite has deep experience across multiple cloud providers, enterprise applications and digital technologies, serving clients in sectors like technology, business services, healthcare, life sciences and manufacturing.

## *PDSVISION acquires MSV Product Development & Service Consulting S.L.*

1 February 2024

PDSVISION (PDSVISION Group AB) today announces that it has closed an agreement to acquire MSV Product Development & Service Consulting S.L. (MSV Consulting) from the current owners. With this acquisition PDSVISION expands into the new markets in southern Europe.

MSV Consulting, founded in 2021, with offices in Barcelona and Madrid, is focused on product design, systems engineering & product lifecycle management software and services. MSV Consulting will be the foundation for PDSVISION's expansion into the Iberian market. Further, Francisco Moreno Gil, will be appointed Managing Director at the same time as the acquisition.

Effectively, 29 Jan 2024, MSV Consulting will change its company name, at the same time as the acquisition, to PDSVISION S.L.

*I'm very excited to join forces with PDSVISION. We share the same values, culture and business goals. We will now be part of a global organization in which our combined know-how and experience will give customers an even broader solution portfolio and fuel future growth.*

### **Joan Lluís Vivanco**

Co-Founder, MSV Consulting

*We are very pleased to join forces with the founders of MSV Consulting who rapidly built a strong customer base with high quality relationships. We look forward to accelerating the growth journey with the talents in MSV and build a strong brand in Spain and Portugal. We are committed to help local and international customers drive digital transformation throughout their value chain – across engineering, manufacturing and customer services as well as their suppliers and customers.*

### **Mats Oretorp**

CEO, PDSVISION

"I feel very happy and privileged to join and to take over the leadership of the business of PDSVISION in the Iberian Market. As we move into 2024 and beyond, we will continue to focus on our customer's needs being the preferred advisor on their journey to enable the digital thread.

### **Francisco Moreno Gil**

Newly assigned Managing Director for Iberia

## Company News

### *Accenture and Mujin Establish Joint Venture to Bring AI and Robotics to the Manufacturing and Logistics Industries*

24 January 2024

Accenture and Mujin, a leader in intelligent robotics for manufacturing, logistics and supply chain operations, have established Accenture Alpha Automation, a joint venture for the manufacturing and logistics industries. Accenture Alpha Automation will help companies

automate their management infrastructure with data-driven solutions that seamlessly combine data from manufacturing and logistics operations with management data. The joint venture is owned 70% by Accenture and 30% by Mujin.

Mujin provides intelligent automation solutions for industrial sites. Its intelligent robotics platform enables companies to deploy industrial robotics systems without the typical complex advance settings and integration, including motion settings and peripheral equipment, often required for other robotics systems.

The joint venture will combine Mujin's experience in industrial robotics and automation with expertise from Accenture's digital engineering and manufacturing service, Industry X. Accenture Alpha Automation's solutions will integrate previously disconnected operational data from manufacturing and logistics sites with business management data, such as the company-wide supply chain status, financial information and market information. Accenture and Mujin will bring these solutions to clients to help them make faster, better decisions and hyper-automate their manufacturing and logistics processes.

Atsushi Egawa, who leads Accenture's business in Japan, said: "Manufacturing is the cornerstone of Japanese industry. Driving sophistication and efficiency in manufacturing and the logistics that support manufacturing is essential for Japan's further growth. By teaming with Mujin, a leader in robotics technology, Accenture will be able to help our clients take advantage of AI and robotics to connect data throughout the manufacturing and logistics value chain, further contributing to the data-driven transformation of Japan's important manufacturing and logistics industries."

Mujin Inc. CEO, Issei Takino adds: "Our mission is to make industrial robots intelligent and easy to use so they can improve productivity and quality and help create new value in an aging society. The new joint venture, which builds on our agreement with Accenture, will utilize our robot automation technology to drive a paradigm shift in the manufacturing and logistics industry and bring new value to customers first in Japan, then around the world."

Accenture has also invested directly in Mujin through Accenture Ventures, marking its first Project Spotlight investment in Asia. Project Spotlight is an engagement and investment program focused on companies that create or apply disruptive enterprise technologies. The program offers extensive access to Accenture's domain expertise and its enterprise clients, helping technology companies adapt their solutions to the enterprise market and scale faster and more effectively.

### **About the Joint Venture**

Company name: Accenture Alpha Automation

Location: Sumitomo Fudosan Azabu Juban Building, 1-4-1 Mita, Minato-ku, Tokyo

Operation starts: January 15, 2024

Scope of Operation:

1. Consult and develop automation concepts in the manufacturing and logistics industries
2. System integration in the manufacturing and logistics industries

### 3. All businesses incidental to the preceding items

Share: Accenture 70%, Mujin 30%

## *Agacad- Bringing software sales and support closer to you*

29 January 2024

We are thrilled to announce an exciting transition that marks a significant milestone in our journey towards innovation and service excellence. As part of our commitment to evolving and enhancing our offerings as a wholly owned subsidiary of ARKANCE, we are delighted to inform you about our brand transition from Agacad into the ARKANCE Be.**Smart** Portfolio.

This transition symbolizes an evolution, not just a change, paving the way for enhanced innovations and offerings through the ARKANCE newly established global services platform. Underpinned by our new vision statement 'let's **advance** the way we work together to **build a better world**' we are committed to delivering greater value for both our customers and partners.

In 2024, a pivotal shift occurred, bringing the distribution and support of Be.**Smart** products closer to the customer. While Agacad continues its product development activities, it no longer handles direct product sales.

While our product names and appearance may evolve in the coming months, our core values, mission, and dedication to serving you remain steadfast. Our focus remains on delivering innovative, world-class solutions that streamline processes and elevate outcomes for the AEC industry, revolutionizing project delivery for all stakeholders.

As we embark on this new journey with ARKANCE, we will deliver an enhanced service offering with an increased capacity to accelerate your project delivery outcomes.

### **What does this brand transition mean?**

1. **Continued service excellence:** You can expect the same level of service and support excellence that you've come to rely on from us.
2. **Enhanced offerings:** Access to a broader range of technology solutions and services to enhance project outcomes.
3. **Seamless transition:** Clients can continue to use the same products, now under the Be.**Smart** brand. We assure the same quality support and resources you have come to trust.
4. **Access to global expertise:** This transition signifies an opportunity for global collaboration, upleveling our ability to deliver a new level of scale and expertise to your business.

The extensive network of the ARKANCE Group will ensure access to rapid, more effective, and comprehensive services, along with punctual assistance through 50+ ARKANCE locations in the USA, Australia, the United Kingdom, India, etc. Our product support will be closer to you, delivered in your native language, and at a time that aligns with your time zone.

With the expansion of the ARKANCE network, we now have professional representatives of our products in countries where we previously had no partners. We anticipate a seamless collaboration with our product value added resellers (VARs) and will do our utmost to assist our product VAR teams in achieving your goals in expanding and supporting the user base of Be.**Smart** products.

### What changes will you notice?

1. Over the coming months we will be updating our logo and our brand statements, reflecting our contribution to delivering the world-class solutions on offer within the Be.**Smart** Software Portfolio of ARKANCE.
2. ARKANCE is launching a new web experience in early 2024, delivering a more sophisticated online experience globally, and we'll be a part of that new experience.

As we transition with ARKANCE and into its Be.**Smart** Portfolio, we remain dedicated to delivering exceptional value and service to you.

### *Altair Names AIMS Channel Partner for Turkey*

31 January 2024

Altair, a global leader in computational science and artificial intelligence (AI), is pleased to announce a strategic partnership with Analytical Information Management Solutions (AIMS). This partnership will extend Altair's market reach in Turkey and give AIMS' customers access to Altair® RapidMiner®, Altair's renowned data analytics and AI platform, which includes Altair® AI Studio®, Altair SLC™, and Altair® Monarch®.

"This partnership represents a significant step forward in Altair's mission to expand our data analytics and AI solutions globally. Collaborating with AIMS enables us to offer our innovative products to a broader audience in Turkey," said Kimon Afsaridis, vice president of indirect sales for EMEA and managing director of Eastern Europe, Altair. "By combining Altair's advanced AI technology with AIMS' expertise, we aim to provide organizations with exceptional AI solutions that drive business transformation."

"It's essential for companies to shift from being merely data-driven to becoming analytically driven. Success hinges on adeptly utilizing data, but challenges like accessing raw data and deploying models persist," said Tulin Guzel, general manager, AIMS. "Currently, 68% of data goes unanalyzed, with a 42% annual growth in data volumes from 2020 to 2022. Altair offers a range of data analytics and AI products that enable easy model development without needing to code. The Altair RapidMiner platform is the best example of this."

AIMS was founded in 2000 and is headquartered in Istanbul, Turkey. AIMS specializes in big data analytics and guarantees success with its "360° Analytical Intelligence" solutions methodology. The company has expertise in analytics and sectorial project experience in areas such as banking, insurance, retail, security, energy, production, etc.

## *Ansys and DXOMARK Partner on Breakthrough Solution to Validate Virtual Camera Systems*

25 January 2024

Ansys and DXOMARK are entering a new partnership to provide an end-to-end camera solution that bridges the gap between physical measurements and simulation. DXOMARK's industry-leading tool for image quality analysis, Analyzer, augments Ansys' optics portfolio to provide a predictively accurate validation of camera systems. The robust workflow will optimize designs and deliver valuable insights earlier in the development process, speeding time-to-market for products in industries ranging from aerospace and automotive to healthcare and consumer electronics.

Optical systems are used across industries in applications like autonomous vehicle sensors and advanced medical devices. As the number of critical applications continues to increase, so does the need for even more reliable validation. To design the most accurate virtual camera systems, large amounts of real-world data are needed to correctly define the models used for testing. This information can be challenging to obtain, making the validation process much longer and cost inefficient.

Combining Ansys and DXOMARK's technology enables a reliable solution for validating virtual camera systems. Users first run simulations in Ansys Zemax OpticStudio to develop an optimal lens design, and Ansys Lumerical, to simulate complex micro-components, like the complementary metal-oxide-semiconductor (CMOS) sensor. These results are then integrated into Ansys Speos, where a full virtual model of the camera is built. Using the Speos Sensors System Exporter, a raw image of the model is produced and transferred to Analyzer for characterization. The DXOMARK software enables customers to evaluate various features of their virtual model — including noise, flare, dynamic range, and distortion — against Analyzer's physical measurement standards. The process enables users to compare simulation results with real-world data and validate the design with extreme predictive accuracy.

"The collaboration with Ansys will provide unparalleled benefits for customers around the world," said Frédéric Guichard, ceo of DXOMARK. "The question of validating any virtual model comes down to the real-world data used to back it up. We have been providing that service for over 20 years with Analyzer. Integrating it into their workflows will further empower customers to continue to produce top-of-the-line products with fewer obstacles."

"We are invested in helping our customers overcome engineering challenges, and by partnering with DXOMARK, we can deliver reliable simulation solutions that are backed by the best of the best," said Shane Emswiler, senior vice president of products at Ansys. "Customers across industries have diverse needs, and Analyzer has been at the forefront of standardizing and benchmarking camera system functionality for decades. The partnership will ensure our customers get the most out of their designs, presenting them with further opportunities for innovation and industry advancement."

## *Aspen Technology Announces Net-Zero Commitment*

30 January 2024

Aspen Technology, Inc., a global leader in industrial software, announced its commitment to achieving company-wide emission reductions in line with climate science and the Science Based Target initiative (SBTi), the leading organization driving science-based target adoption. The company intends to achieve net-zero greenhouse gas (GHG) emissions for Scope 1 and Scope 2 by 2030 with a significant reduction in Scope 3 by 2030 and full net-zero by 2045.

“AspenTech has a decades long history of partnering with asset-intensive industries to provide the expertise and digital technology to guide them in their sustainability journeys,” said Antonio Pietri, President and CEO at AspenTech. “Today, with the support of our Board of Directors and executive team, I’m pleased to share that in addition to the solutions for customers, we are committing to our own net-zero target as part of tackling climate change.”

Added Rasha Hasaneen, Chief Product and Sustainability Officer at AspenTech, “Confronting climate change has never been more critical, and AspenTech is committed to operating in the most responsible way possible — and partnering with our customers to do the same. Our innovative sustainability solutions portfolio in combination with our own net-zero initiative will make a significant contribution to achieving a net-zero future.”

In keeping with the SBTi guidelines, AspenTech is developing a plan to achieve these targets which will be submitted within the next 24 months.

## *BUILDTEC SOFTWARE GROUP AND GLASER PROGRAMMSYSTEME JOIN FORCES*

31 January 2024

Only three months after the successful formation of the BuildTec Software Group ("BuildTec"), a growing European platform for innovative software solutions in the construction & trade sector, the group is taking the next strategically important step: With the recently concluded partnership with Germany-based GLASER Programmsysteme GmbH ("GLASER"), the Group is expanding its portfolio with another international player for construction software.

GLASER, a specialist in the development and sale of professional CAD solutions, and BuildTec are joining forces with immediate effect to respond even better to the challenges of their customers in future and provide them with the best possible support in their transformation processes. Matthias Glaser will stay with the company in his role as Managing Director.

Headquartered in Hanover, GLASER is a nationally and internationally established software specialist focussing on the European construction industry. With its innovative solutions, GLASER serves an international customer base of over 4,000 customers, particularly from the construction and engineering sectors, but also from the entire construction industry.

The company, which was founded in 1978 and has been owner-managed to date, focuses in particular on the sale of the CAD solution for structural engineering "ISBCAD". With the now concluded partnership, GLASER is part of the fast-growing BuildTec Software Group, which is

thus driving forward the expansion of its customer base and adding innovative software solutions to its product portfolio.

It was only in November 2023 that BuildTec succeeded in expanding its geographical presence in Scandinavia with the acquisition of E-KOMPLET A/S, a Danish software provider for project management in the trade sector. In addition to GLASER and E-KOMPLET A/S, the BuildTec Software Group, which is backed by the Bregal venture capital funds, brings together other well-known industry key players with over 20,000 customers. These include SEMA, a leading global provider of CAD/CAM software solutions for timber and staircase construction and sheet metal processing, with the two partner companies WGsystem, a provider of commercial software for all trade businesses, and Compass, a software provider for staircase, timber and window construction with a focus on CNC connections and workshop organisation. Hausmann & Wynen, a specialist in ERP solutions with a focus on electricians and other trade businesses, has also been part of the powerful software group since October 2023.

"By partnering with GLASER, we are expanding our product portfolio with innovative software solutions for the construction industry and taking an important step towards driving change in the industry and continuing on our growth path," says Alexander Neuss, CEO of the BuildTec Software Group.

"We are delighted to be working with the BuildTec Software Group," adds Matthias Glaser, CEO of GLASER. "This strategic decision gives us the opportunity to continuously develop GLASER as one of the leading German software houses for structural engineering, to strengthen our product range and to open up new market segments".

## ***DELTEK ANNOUNCES GLOBAL PARTNER OF THE YEAR AWARD WINNERS***

30 January 2024

Deltek, the leading global provider of software and solutions for project-based businesses, announced the winners of its Global Partner of the Year Awards. The annual awards recognize the significant accomplishments of companies in the Deltek Partner Network's vibrant global ecosystem. Members of the Deltek Partner Network include systems integrators (SIs), value-added resellers (VARs), independent software vendors (ISVs) and accounting and consulting firms – all of which enhance the power of Deltek's industry-leading software and solutions.

Deltek's partner programs provide flexibility for companies to resell, co-sell, implement and consult – all supported by Deltek's commitment to make each partnership a success. Partners amplify Deltek's enterprise software offerings for project-based businesses through implementation, consulting services and more, empowering Deltek's global customer base to unlock the full value of the software even more quickly and easily.

This year, a new award category was created to recognize a successful partner in the Architecture & Engineering Industry. Deltek recognized a total of 12 partners in the following categories:

- Americas Partner of the Year – PCI
- International Partner of the Year – Silversoft

- GovCon Partner of the Year – Baker Tilly
- Systems Integrator Partner of the Year – Infotek Consulting
- Architecture & Engineering Partner of the Year – Aktion Associates
- Reseller Partner of the Year – Full Sail Partners
- Alliance Partner of the Year – ConstructConnect
- Net-New Customers Partner of the Year – Stambaugh Ness
- Customer Satisfaction Partner of the Year – SilverEdge
- Rising Star – Americas Partner of the Year – CohnReznick
- Rising Star – International Partner of the Year – PSA Consulting
- Marketplace Partner of the Year – EleVia Software

“The success of Deltek’s industry-leading software and solutions wouldn’t be possible without incredible partners on our side enthusiastically amplifying our vision. We’re excited to recognize the best of the best from the Deltek Partner Network,” said Michael Hines, Vice President of Global Partnerships and Alliances at Deltek. “We’re grateful that these twelve companies are part of Deltek Project Nation, working with us every day to help ensure that all of our customers are able to get the most out of Deltek’s solutions to help power success for their project-based businesses. Congratulations to all the winners on a wonderful 2023, and we’re looking forward to achieving more great things in 2024.”

### *Digital Twin Consortium Announces Ambassador Program*

31 January 2024

Digital Twin Consortium® (DTC) announced the Ambassador Program to extend digital twin expertise across geographies. Working in conjunction with DTC’s Regional Branch Organizers (RBOs), Ambassadors will drive digital twin expertise in one or more core competencies across multiple vertical market segments, working with members and prospects on specific opportunities and leveraging public-private partnerships.

“We’re excited to announce the Ambassador Program,” said Dan Isaacs, GM & CTO of the DTC. “Our ambassadors are already engaging with organizations in multiple industries globally. They are leveraging foundational knowledge, expertise, and relationships to accelerate the adoption of digital twins.”

#### **Core competencies include:**

- Augmented reality/virtual reality
- Automotive and transportation management
- Carbon reporting
- Data center development
- Data space and governance

- Educational training
- Geospatial analysis
- Grant development
- Industrial robotics
- Manufacturing: packaging, automation, sustainability
- Mining
- Oil & gas
- Smart factories
- Urban analytics and planning

**The following leaders are the first DTC Ambassadors:**

- Soheil Sabri, Co-Chair DTC Academia & Research Working Group.  
His areas of expertise include geospatial analysis, urban analytics and planning, educational training, and research grant development.  
Geographies include Asia Pacific, including Malaysia, Indonesia, Singapore, and Australia. Middle East including UAE, Saudi Arabia, and Turkey; and the USA.
- David McKee, Co-Chair Capabilities and Technology Working Group, Lead Open Source, Standards, and Platform Stacks. Managing Partner, Counterpoint Technologies.  
His areas of expertise include data center development, automotive and transportation management in addition to digital transformation, digital twin architectures, and sustainable digital twins.  
Geographies include Great Britain, Northern Ireland, Ireland, and the USA.
- Pieter van Schalkwyk, CEO XMPro, Co-chair of the Natural Resources Group, Lead Composability Sub-Group. RBOs – Australia and New Zealand.  
His areas of expertise include digital transformation methodology, composability framework, operationalizing intelligent digital twins, and generative AI digital twins.  
Geographies include Australia, New Zealand, Germany, Korea, Japan, UAE, and the USA.
- Carlos Toro, Head of Data and Analytics (Chile) at NTT DATA, Digital Twin Coordinator LATAM (Global Innovation Center).  
His areas of expertise include Mining, Smart Manufacturing, Oil and Gas, Industrial Robotics, AR/VR, M2M Communication, AI, and Composable Digital Twins.  
Geographies include Latin America, EMEA, United Kingdom, Japan, and the USA.
- Giuseppe Padula, EU Commission DG-Connect nominated expert, Adjunct Professor University of Bologna. RBO – Italy.  
His areas of expertise include transition to platform-defined manufacturing and packaging, Digital Twin modeling for Green Transition and Green Bonds quantitative review.  
Geographies include EU (Green Bonds), Italy, Spain, Germany, and the USA.

- Chaisung Lim, Professor Konkuk University/ Korea Industry 4.0 Association. RBO – Korea. His areas of expertise include digital transformation innovation management, environmental carbon reporting, and data space. Geographies include Korea, India, Germany, Indonesia, Thailand, Vietnam, and the USA.

## *Digital Twin Consortium Announces Thynkli Regional Branch Organizers for Saudi Arabia*

1 February 2024

The Digital Twin Consortium® (DTC) announced an agreement with Thynkli to be the Regional Branch Organizer (RBO) for Saudi Arabia. As an RBO, Thynkli will facilitate and drive local DTC engagements and activities with regional industry, government, and academic institutions on behalf of the consortium throughout Saudi Arabia.

DTC and Thynkli will collaborate on standards requirements, interoperability, use cases and proof of concepts (POC) in horizontal and vertical domains. Both companies will leverage their network of partners, companies, and associations with local government, industry, and academia to further the advancement of digital twin and enabling technologies in Saudi Arabia.

“We are excited to have Thynkli as the RBO for Saudi Arabia,” said Dan Isaacs, GM and CTO, Digital Twin Consortium. “We are confident they will leverage their business, academic, and government partners to furthering the adoption of digital twins throughout Saudi Arabia.”

“As a Regional Branch Organizer for DTC Saudi Arabia, we are looking forward to pioneering and accelerating the Digital Twin Technology Adoption in the Kingdom”, said Dana Kawas, CEO of Thynkli. “Our mission is to build a collaborative Digital Twin ecosystem with Industry, Government & Academia.”

RBOs drive awareness and adoption of digital twins, developing and implementing use cases throughout the digital twin lifecycle. RBOs conduct local Digital Twin Consortium events and joint promotional activities. As the RBO in Germany, Ferdinand-Steinbeis-Institut will work with other RBOs across the globe to conduct a series of local Digital Twin Consortium events and joint promotional activities.

## *Digital Twin Consortium Welcomes NTT DATA as a Member*

30 January 2024

The Digital Twin Consortium® (DTC™) announced that NTT DATA has joined the consortium. By participating in the DTC, NTT DATA will strengthen its position as a global innovator by fostering the adoption of digital twins in the many application domains it serves.

According to NTT DATA, this new membership with the DTC is a clear opportunity to develop better approaches for our customers focused on digital twin adoption in various application domains such as telecommunications, smart industries, smart cities, mining, oil and gas, and banking and insurance.

“We’re very excited to welcome NTT DATA as a member of the DTC,” said Dan Isaacs, GM & CTO, DTC. “Their global experience and expertise in a wide range of application domains will be very valuable as we work together to further the adoption of digital twins.”

## *Eviden and Microsoft forge five-year global strategic partnership to accelerate Cloud & AI strategies, and boost industry transformation*

25 January 2024

Eviden, the Atos Group business leading in digital, cloud, big data, and security, and Microsoft announced a five-year strategic partnership that significantly expands their existing collaboration with new and innovative Microsoft Cloud and AI-powered solutions for industries. This announcement is part of Eviden’s overall partnership & alliance strategy to reinforce and reshape its global partnership network by strengthening its existing partner relationships and fostering new ones.

The partnership between Microsoft and Eviden marks a significant milestone in their shared vision to drive digital transformation and empower businesses with advanced technologies. Under this strategic partnership, both companies will co-develop and deploy transformative Data & AI, Copilot, and cloud transformation solutions. By combining Microsoft’s expertise in cloud computing and industry-leading technology stack with Eviden’s deep domain expertise and customer-centric approach, this collaboration will deliver tailored and innovative solutions to address the complex challenges today’s enterprises face.

Both organizations are committed to driving an additional \$2.8B in Cloud Service Business for Eviden over the next five years. This will be accomplished through co-developing accelerators for joint go-to-market activities in key industries such as Financial Services, Automotive, Manufacturing, Energy and Utilities, Health Care, Life Sciences, and Public Sector. Eviden and Microsoft will accelerate targeted go-to-market activities with both organizations investing in co-innovation, building Prioritized Offerings with Eviden’s Global Delivery Centers, Centre of Excellence, and world-class talent.

### **Co-innovation Centers**

Eviden and Microsoft will launch multiple co-innovation Industry Hubs, accelerating advanced research and the co-development of GenAI-enabled industry solutions across Financial Services, Automotive, Manufacturing, Energy and Utilities, Health Care, Life Sciences, and the Public Sector, leveraging Eviden’s expertise in Machine Learning (ML), AI and Azure OpenAI Service as previously announced in November. Eviden commits to using Microsoft Azure to build and accelerate the development of these industry solutions.

### **Six Strategic Areas & Prioritized Offerings**

Further to the partnership expansion, Eviden and Microsoft will continue to focus on offering innovative solutions for customers in six strategic areas, below, where the two companies have already shown success with joint marquee customers.

- **Data & AI Innovation:** Accelerate the shift to Cloud Apps powered by GenAI Launchpad and Copilot adoption.

- **Cloud Services:** Eviden DevSecOps framework helps accelerate IT application transformation with security and sustainability, while adding agility and reducing cloud spend with FinOps to deliver transformative business value.
- **Application Infrastructure & Innovation:** Migrate & Modernize legacy customers with Rapid migration and application innovation accelerators.
- **Business Applications:** Modernize & Innovate applications and new solutions across AI via Power Platform and D365.
- **Security:** As a Worldwide leader in Cybersecurity Services, Eviden will accelerate security adoption with Alsaac (MDR) and other Microsoft technologies.
- **Accelerating SAP Transformation:** Built on 14+ years of partnership between SAP, Eviden, and Microsoft, and strengthened by Eviden's in-house global adoption experience of SAP S/4HANA®, a core component of RISE with SAP, and the migration of its internal SAP systems to Microsoft Azure.

### Delivery and Centre of Excellence (CoE)

Eviden will strengthen its global delivery centers and CoE (Center of Excellence) by upskilling and training its 50,000+ employees globally with 16,000+ new Microsoft certifications over the next five years. Eviden will also invest by expanding its Microsoft Business with 50+ dedicated sales, solution architects, and enablement teams across priority countries, which include North America, UK, Germany, France, Spain, Netherlands, Belgium, Austria, and Switzerland.

Carlo d'Asaro Biondo, Group General Manager in Charge of Business Operations & Eviden CEO, said, *"I'm extremely pleased to announce this global partnership with Eviden and Microsoft, one of the world's leaders in Artificial Intelligence and especially in GenAI. This partnership exemplifies a shared commitment to drive innovation, and by combining our respective strengths, we will empower organizations to optimize the use of data and AI to deliver exceptional value and thrive in today's rapidly evolving digital and cloud landscape. This further strengthens Atos Group's partnership with Microsoft, coming in addition to the extended collaboration on Digital Workplace with Atos' Tech Foundations business line, announced in November."*

Judson Althoff, Executive Vice President and Chief Commercial Officer at Microsoft said *"Organizations today are seeking to apply generative AI responsibly and securely to help them solve their most pressing business challenges. I am pleased to expand our collaboration with Eviden—a leading digital transformation partner—to deliver innovative AI solutions built upon the Microsoft Cloud and Azure OpenAI Service. Together, we will help customers across industries realize the full potential of their data to unlock business growth and accelerate AI transformation."*

## *Honeywell Elects Vimal Kapur As Chairman And William S. Ayer As Independent Lead Director*

1 February 2024

Honeywell announced that its Board of Directors has elected CEO Vimal Kapur to take on the additional role of chairman when current executive chairman Darius Adamczyk retires from the board as of June 7, 2024. William S. Ayer has also been elected to succeed D. Scott Davis as independent lead director beginning as of the company's annual meeting on May 14, 2024. Davis, who has served as lead director since 2020, will continue to serve as an independent director and as Chair of the Audit Committee.

"The board is unified in its view that Vimal will provide decisive strategic leadership and strong execution of Honeywell's growth plans, capital deployment, succession planning and continuing operational excellence," said Davis, Honeywell's independent lead director. "Additionally, we are confident that the robust governance authorities and responsibilities of our independent lead director, combined with Bill's thoughtful and extensive leadership, will enable our highly independent, diverse, and experienced board to provide effective support and oversight."

Adamczyk, who was Honeywell's chairman and CEO until June 2023 when he became executive chairman, said, "I would like to thank Scott for his service to Honeywell as lead director. His independent perspectives and counsel as Honeywell successfully navigated the unprecedented macro challenges of the past four years, and his leadership throughout the CEO succession planning and smooth transition process have been invaluable to me, Vimal and the entire management team."

"It is a privilege and honor to be named chairman with the full support of Darius and our independent directors," Kapur said. "I look forward to working with Bill, our outstanding board and leadership team and our talented people to continue accelerating Honeywell's growth aligned with three powerful megatrends--automation, the future of aviation and energy transition--each of which is underpinned by robust digitalization capabilities and solutions."

He added, "Accelerating our innovation playbook, leveraging our financial strength and unlocking greater value through our Accelerator operating system uniquely positions us to blend advanced software with leading physical products and solutions to lead in our end markets." Kapur, 58, became President and CEO of Honeywell in June 2023 after serving as President and Chief Operating Officer since July 2022.

"I would like to thank Darius for his leadership and numerous contributions to position Honeywell for growth. I am also grateful to Scott for his service as lead director over the past four years, and his continued service on the board," Kapur said. "I would also like to congratulate Bill, who as chair of the Corporate Governance and Responsibility Committee, successfully led our robust shareowner engagement program and will continue bringing critical shareowner feedback to the boardroom. His independent perspectives, commitment to best-in-class governance practices, and leadership strengths will be essential as we partner to deliver on Honeywell's strategic growth objectives."

## *Matterport Partners with Arcadus to Deliver Digital Twins to US Public Sector With Federally Compliant Matterport for Government Offering*

1 February 2024

Matterport, Inc., the leading digital twin platform to access, understand and utilize properties, announced a partnership with Arcadus, a leading reseller of digital transformation products and services for the public sector, to offer the Matterport Digital Twin Platform to its customers in the United States.

Arcadus is a leading value-added reseller of 3D, spatial data and related digital twin services, helping organizations advance their operations with digitally-enabled solutions. Arcadus' clients include federal, state and local agencies across facilities, public safety, education, housing, social services, conservation and energy, as well as regulated industries like utilities, aerospace & defense, insurance, and manufacturing.

Matterport first entered the public sector in 2021 with the Matterport for Government SaaS offering, providing a turnkey solution for federal agencies to assess, manage, and improve their spaces' operating condition—all online, in a Federally-compliant cloud.

With this agreement, Arcadus will become the first value-added reseller of Matterport's digital twin platform for the public sector, offering the company's three core solutions in Property Marketing, Design & Construction, and Facilities Management. Arcadus will support Matterport with access to various government purchasing vehicles, additional support services, and enabling seamless engagement with public sector agencies, contractors, and integrators.

"As a company dedicated to the 3D spatial data and digital modeling space, Arcadus looks forward to bringing Matterport's products and solutions to agencies and other regulated organizations," said Javan Clark, Founder & Principal of Arcadus. "Matterport's hardware and software are incredibly easy to use, and Arcadus is committed to maintaining that same experience in the acquisition and support of these 3D digital twin capabilities."

"As organizations continue to embrace the value of Matterport, the public sector remains a significant opportunity for growth," said Jay Remley, Chief Revenue Officer, Matterport. "Our partnership with Arcadus adds more powder to our efforts to drive progress and excellence across the U.S. public sector, empowering federal, state, and local agencies to revolutionize how they assess, manage, and optimize their spaces with our federally compliant digital twin platform."

## *ModuleWorks and DN Solutions Team to Advance Machine Tool Software Development*

29 January 2024

ModuleWorks, the leading software provider for the CAD/CAM industry, announces a partnership with DN Solutions, a prominent CNC machine tool builder, involving equity investment and business cooperation.

This collaboration will foster a close working relationship between the two companies, focusing on the joint development of machine tools software and the creation of integrated solutions to drive the digital transformation of the manufacturing industry.

DN Solutions leverages the specialized software development resources provided by ModuleWorks to enhance the pace of developing intelligent, highly automated machining cycles and user-assisted solutions within its diverse range of machining applications.

It also represents a commitment from both companies to drive digitalization in the manufacturing industry. As Dr. Yavuz Murtezaoglu, Founder and Managing Director of ModuleWorks explains: “Manufacturers are calling for easy-to-learn and easy-to-use solutions that minimize training costs and increase productivity. This means greater digitalization with highly automated solutions that assist operators as much as possible. We realized the industry can get there faster by pooling its expertise and resources. Our Strategic Partner Program is designed to give solution providers like DN Solutions the software development resources they need to empower their digitalization strategies. We are excited to welcome DN Solutions as our strategic partner and look forward to advancing digitalization in manufacturing.”

Wonjong Kim, CEO of DN Solutions, articulates the significance of their collaboration with ModuleWorks, stating, “Our investment in a partnership with ModuleWorks serves as a testament to our unwavering commitment to innovation in the swiftly evolving industrial landscape. This strategic collaboration is aligned to propel the digitalization of our manufacturing processes. It marks a pivotal step towards transforming our machines beyond mere production tools, evolving them into intelligent, connected units that redefine the very essence of how we approach production.”

### *Nano Dimension Filed for 2nd Patent for a Unique Large Language Model (LLM)*

31 January 2024

Nano Dimension Ltd. (Nasdaq: NNDM) (“Nano Dimension” or the “Company”), a leading supplier of Additively Manufactured Electronics (“AME”) and multi-dimensional polymer, metal & ceramic Additive Manufacturing (“AM”) 3D printing solutions, announced the filing of a U.S. patent application titled “**Large Language Models for Efficient Anomaly Detection in Log Files of Industrial Machines**” (the “Log Analysis Patent” or “Patent”), which is targeted for real-time data analysis and scalable deployment across the Company’s own systems and industrial solutions provided to outside customers.

The Log Analysis Patent addresses one of the core challenges for automated anomaly detection. While machine logs are usually a valuable source of information for industrial systems, they are increasingly difficult and expensive to analyze as the underlying systems have grown in complexity and the volume of log data they contain has multiplied. Furthermore, logs are typically analyzed after events have happened and not in real-time, thereby missing the opportunity to apply corrective actions.

To overcome these problems, Nano Dimension has extended its existing AI patents with a Large Language Model (“LLM”) that can operate independently of engineering labels. With this, the technology exploits the existing sentiment that is expressed in the machine logs. This enables

a **fully automated** process of **AI-powered prediction of manufacturing anomalies before they occur, based either solely on logs or in combination with other machine data and being efficient enough to process billions of log lines.**

The Log Analysis Patent follows a related patent that was filed and announced in September 2023. Both patents are equally valuable for the Company's development of Nano Dimension's products, which are being designed with DeepCube Group's deep learning-based AI wherever possible, as well as for third party customers and partners, who are increasingly looking to the Company to leverage the same technology in their own industrial processes and systems.

Dr. Eli David, Chief Technology Officer of AI for Nano Dimension, commented: "The filing of the Large Language Models for Efficient Anomaly Detection in Log Files of Industrial Machines patent application is another significant development for Nano Dimension and our customers. **A solution is only truly valuable with scalability** and this new patent lies at the core of tremendously scalable advanced industrial solutions."

### *Oracle Plans to Open a Public Cloud Region in Kenya*

31 January 2024

To meet the growing demand for Oracle Cloud Infrastructure (OCI) services across Africa, and as part of its global cloud infrastructure, Oracle is planning to open a public cloud region in Nairobi, Kenya.

An Oracle delegation led by Scott Twaddle, senior vice president responsible for OCI Product and Industries, has met with H.E William Ruto, President of Kenya and Eliud Owalo, cabinet secretary, Ministry of Information, Communications, and the Digital Economy in Kenya to express Oracle's commitment to helping the country meet its economic goals and transformation by deploying the latest cloud technologies. Oracle will be taking advantage of Kenya's renewable energy and digital infrastructure including abundant submarine and national connectivity.

The planned public cloud region in Nairobi underscores Oracle's commitment to Africa and aims to help drive the digital transformation of the Kenyan government, public institutions, enterprises, startups, universities, and investors in Kenya and the continent. Oracle intends to continue expanding OCI's footprint on the continent, which already includes the Oracle Cloud Johannesburg Region in South Africa.

OCI's unique cloud architecture enables Oracle to offer its full suite of more than 100 hyperscale cloud services. The Government of Kenya and private sector can leverage this to increase ease of doing business in Kenya.

"We are delighted to see Oracle planning such an important investment in Kenya," said President William Ruto. "I am excited to see major technology companies like Oracle investing in Kenya and bringing state of the art technologies like AI and cloud applications that will benefit Kenyan citizens, especially in creation of jobs."

"Oracle's intent to open a public cloud region in Nairobi will be a key component of Kenya's Bottom up Economic Transformation Agenda initiative, which is focused on digital

transformation, private sector development, agricultural transformation, housing development, and healthcare modernization,” said Eliud Owalo, cabinet secretary, Ministry of Information, Communications, and the Digital Economy, Kenya.

“We are delighted to extend our commitment to helping Kenya accelerate the digital transformation of its government and private sector,” said Scott Twaddle, senior vice president, Product and Industries, Oracle Cloud Infrastructure. “OCI is leveraged by governments and companies across the world as a scalable and secure platform for mission-critical workloads on which to drive innovation and transformation. We already have a strong business in Kenya, and the upcoming public cloud region in Nairobi represents a significant next step forward in helping support the country’s economic goals.”

### *Tecsys Becomes Only WMS Provider to Achieve AWS Supply Chain Competency in Three Categories*

30 January 2024

Tecsys Inc., a global leader in supply chain management solutions, announced that it has achieved the Amazon Web Services (AWS) Supply Chain Competency in the Software Offerings: Move, Enable and Plan categories. This designation recognizes Tecsys as a warehouse management system (WMS) provider to have achieved this status across these three critical categories, underscoring the company’s commitment to helping customers solve their most complex and critical supply chain challenges through innovative cloud-based solutions.

Achieving the AWS Supply Chain Competency in these three categories differentiates Tecsys in the AWS Partner Network (APN), demonstrating their validated expertise and proven customer success in delivering supply chain solutions. These solutions cater to companies of every size and segment to enhance their responsiveness to customers, strengthen their resilience to disruptions, and become more responsible to the environment and global community.

“In an evolving business landscape where logistics play an increasingly important competitive role, investing in cutting-edge supply chain software is no longer a nice to have, but a strategic imperative. Security, reliability and flexibility are non-negotiables,” said Guy Courtin, vice president of Global Alliances and Industry at Tecsys. “Our customers select our software because they recognize the need for tools that let them adapt, innovate and excel in a fiercely competitive market. Earning the AWS Supply Chain Competency underscores our dedication to equipping our customers for performance and positively impacting their businesses.”

AWS enables scalable, flexible, and cost-effective solutions from startups to global enterprises. To support the seamless integration and deployment of these solutions, AWS established the AWS Competency Program to help customers identify AWS Partners with deep industry experience and validated customer success in these categories.

“Agility, scalability and reliability form the cornerstone of modern supply chain management,” said Manish Govil, Global Segment Leader, Supply Chain, Amazon Web Services (AWS). “AWS offers the industry’s broadest set of capabilities to enable partners like Tecsys in delivering cutting-edge supply chain solutions.”

Tecsys delivers an integrated platform that encompasses a broad spectrum of supply chain solutions, from sophisticated warehouse management to order fulfillment and transportation logistics. By harnessing the scalability and security of AWS, Tecsys ensures businesses can navigate the complexities of the supply chain with enhanced efficiency and reliability. As the preferred software for operations where failure comes at a high cost, Tecsys provides robust and secure technology environments tailored to the healthcare supply chain and wholesale distribution sectors.

“We have been running on the Tecsys ecosystem for two years, and our supply chain tech stack has served as a strategic asset throughout our engagement,” said Mike Brown, vice president of Supply Chain at Texas Children's Hospital. “In our commitment to patient-focused excellence, we manage a highly secure environment that demands sophisticated systems to operate at optimal levels. Tecsys achieving the AWS Supply Chain Competency is a testament to their expertise and innovation in creating a world-class system that truly meets the dynamic needs of modern logistics.”

### *TextileGenesis Launches Two Consortia With The Footwear And Leather Industries To Advance Traceability In These Sectors*

30 January 2024

TextileGenesis, a Lectra Group company, has announced the launch of two new consortia bringing together players in the footwear and leather industries. TextileGenesis, which has already developed a pioneering solution to ensure the traceability of textile materials, aims to extend its contribution to the emergence of more responsible and sustainable supply chains.

The footwear and leather industries need to improve the traceability of the materials they use.

Nowadays, the supply chains and production systems of the footwear and leather industries are globalized, fragmented and highly complex. They are increasingly facing regulatory and compliance challenges of establishing better traceability of the materials used.

As Amit Gautam, founder and CEO of TextileGenesis, explained: “The number of unique components required to make a single pair of shoes could range from 10 to 50+ parts while leather has an extremely fragmented and opaque upstream supply chain, this exposes these industries to major social and environmental risks. At a time when governments are tightening regulations on traceability and forcing brands to be more transparent, it is imperative that the players in the footwear and leather ecosystems unite to collectively meet these challenges”.

In the fashion sector, TextileGenesis has distinguished itself by giving manufacturers and brands using sustainable textiles access to a reliable, secure and totally digital traceability of the material. Its pioneering traceability mechanism relies on advanced digital-token based traceability technology, digitizing every kilogram of fiber at the point of origin, and a network of material certification partners, as recently illustrated by the launch of eTrackit in partnership with Textile Exchange, and announcement of a memorandum of understanding with the International Cotton Association (ICA).

The TextileGenesis SaaS platform ensures complete traceability of sustainable textiles, guaranteeing their authenticity and provenance at every stage of the supply chain, from fiber to retail. For conventional textiles, the platform also includes a new module that combines a declarative mode with tests on random samples carried out by certified forensic or tracer-testing organizations. The origin and quantities of materials used are identified by tracing the supply chain, from the finished product to the intermediaries involved in its production.

Building on the advances it has made in the fashion industry, the TextileGenesis team is now looking to broaden its scope to help the leather and footwear industries meet the traceability challenges of these two key sectors of the fashion industry.

### **Greater transparency in the footwear and leather ecosystems**

The common objective of the two consortia initiated by TextileGenesis is to encourage the sharing of the information needed to improve the tracking of materials throughout the supply chains of the footwear and leather ecosystems, guaranteeing ethical and sustainable practices. By tracing every component of footwear and leather production, these industries can drive positive change and strengthen the confidence of their consumers and all their stakeholders.

The collaboration of the different stakeholders around a shared traceability platform paves the way for a future where consumers can make informed decisions, where brands can deliver on their commitments, and where both industries can thrive in the long term.

Textile Genesis has brought together a number of key players from fiber producers, material standard organizations, and industry associations such as Lenzing, Coats, Fashion for Good, and the Forest Stewardship Council®. The consortium works in close collaboration with seven leading global fashion brands.

“While, to date, the traceability of the leather value chain remains a complex challenge for the fashion industry, it is essential to ensure that the leather originates from sources free of deforestation. Additionally, with this set to be addressed by the upcoming EUDR legislation, TextileGenesis’ initiative to unite various actors in the supply chain to tackle these complexities comes at an opportune time.” says Katrin Ley, Managing Director, Fashion for Good.

Amit Gautam concludes: “We hope that these initiatives will lead to significant advances in the footwear and leather industries. We are determined to promote greater traceability in the apparel sector and are delighted to be able to contribute, with the creation of these consortiums, to the collective work of all the players in order to move together towards more sustainable production methods”.

### ***Vectorworks, Inc. Announces New Zealand Expansion***

31 January 2024

In a continued commitment to provide customers with the highest standard of service and support, global design and BIM software provider Vectorworks, Inc. is excited to announce a new, direct presence in New Zealand.

Previously overseen by Megabits, the New Zealand distributor of Vectorworks software, all New Zealand operations will now be managed by the New Zealand-based staff of Vectorworks, backed by the company's regional office in Australia. The local team, headed by Sales Operations Specialist Kim Cooper and Product Specialist Zac Haumaha, brings their expertise and years of experience supporting Vectorworks users in New Zealand, guaranteeing the highest level of customer service.

"By transitioning to serve our customers in New Zealand directly, we can amplify our capacity to cater to the demands of our rapidly expanding design community," said Vectorworks CEO Dr. Biplab Sarkar. "With unwavering support from Vectorworks and our Australasian team, we are confident that this change will result in an even more exceptional experience for all our users. We look forward to expanding and strengthening our relationship with our customers in New Zealand."

Apart from its headquarters in the United States and offices in Newbury, England, Sydney, Australia and Vancouver, Canada, Vectorworks has a global network of over 30 distributors. Its software solutions are available in 11 languages, providing exceptional tools that enable designers to follow their imagination wherever it may lead and design without limits.

"We are incredibly excited to become part of the Vectorworks team and feel privileged to join forces in delivering best-in-class software solutions to the talented designers of New Zealand," said Cooper. "We recognize the critical importance of understanding the unique needs of designers in New Zealand, and we look forward to providing both our current and future customers with localized knowledge, assistance and unparalleled service."

## Event News

### *Altair To Host Investor Day on Wednesday, March 20, 2024*

2 February 2024

Altair, a global leader in computational science and artificial intelligence, announced that it will host an Investor Day on Wednesday, March 20, 2024 in the San Francisco Bay Area from 8 a.m. to noon PT.

The Investor Day will showcase how Altair plans to lead a new era of computational intelligence. The agenda will feature presentations by:

1. James R. Scapa, Founder, Chairman, and Chief Executive Officer
2. Sam Mahalingam, Chief Technology Officer
3. Stephanie Buckner, Chief Operating Officer
4. Amy Messano, Chief Marketing Officer
5. Matthew Brown, Chief Financial Officer

The presentations and related materials will be available via a live video webcast on the company's website and a recorded version will be available after the event at <http://investor.altair.com>.

**What:** Altair Investor Day

**When:** Wednesday, March 20, 2024

**Time:** 8 a.m. PT

**Webcast:** <http://investor.altair.com> (live and replay)

### *Aspen Technology Announces OPTIMIZE 24*

25 January 2024

Aspen Technology, Inc., a global leader in industrial software, announced its OPTIMIZE™ 24 conference. The event will bring together more than 1,500 customers and partners from around the world, including users, operational leaders and executives within asset-intensive industries, to help advance their business performance and achieve sustainability targets through new innovations in digital technologies. Entitled “Partnering for the Future,” OPTIMIZE will be held April 29 - May 3 in Houston, TX.

AspenTech's President and CEO, Antonio Pietri, will welcome attendees with a keynote address highlighting the global state of the energy transition, the challenges faced, the role of digital solutions in achieving net zero and the importance of collaboration and co-innovation. “To achieve global sustainability goals, innovation must span the entire value chain, encompassing new business models, embracing new partnerships and emphasizing organizational excellence. I'm eager to host our global customers this spring and collaborate on these critical topics,” said Pietri.

Dr. Scott W. Tinker, one of the world's most influential energy thought leaders, will deliver a keynote address focused on the global energy landscape. Dr. Tinker was Director of the Bureau of Economic Geology at the University of Texas and the State Geologist of Texas for 24 years, becoming Director Emeritus in early 2024. He is the Founder and Chairman of Switch Energy Alliance, whose vision is to inspire an energy educated future, and is the onscreen guide of the award-winning documentary films Switch (2012) and Switch On (2020), which examine the global energy transition and global energy poverty, respectively. He also hosts the PBS Energy and Climate talk show Energy Switch, playing on over 200 stations across the U.S.

“OPTIMIZE 24 will bring together an audience ranging from hard-to-abate industries focused on reducing emissions, to the power & utilities industry with a focus on electrification,” said Dr. Tinker. “I'm looking forward to engaging with OPTIMIZE attendees on the importance of these industries working together to address the dual challenge of maximizing human flourishing and reducing global emissions.”

OPTIMIZE 24 will include 200+ customer speakers, six industry-specific tracks (chemicals, downstream, upstream, engineering, procurement and construction, power & utilities and metals & mining) and seven dedicated solutions tracks (performance engineering, manufacturing & supply chain, asset performance management, subsurface science and engineering, industrial data, digital grid management and sustainability/decarbonization). In addition, attendees have the option to earn Continuing Education Units for training courses being offered across process and power & utilities industries.

For more information and to register to attend OPTIMIZE 2024, please visit [optimize2024.com](https://optimize2024.com).

### *ESTECO International UM24 - Registration open*

26 January 2024

#### **Dive into innovation at the ESTECO International Users' Meeting, June 4-6, 2024**

This year marks 25 years since the foundation of ESTECO. UM24 is the perfect opportunity to celebrate our first quarter century with our users, customers and partners. Retrace the history of our products and explore fresh perspectives with us.

Immerse yourself in a vibrant three-day event featuring inspiring keynotes, presentations, and workshops.

On June 4 and 5, join us in person at Savoia Excelsior Palace Hotel, in Trieste, for UM24 to connect with our experts and be inspired by cutting-edge insights, industry case studies and technology previews.

On June 6, come to our headquarters and take part in exclusive workshops. Discover how our solutions align with the latest technological trends and learn all about the latest applications, methods, and techniques of ESTECO Technology.

If you've worked on innovative projects using [VOLTA](#) or [modeFRONTIER](#) and want to showcase them, submit your presentation proposal for the ESTECO UM 2024. The deadline for abstract submissions is **March 15, 2024**.

Stay tuned for more updates on the agenda and speakers. We look forward to your participation. If you need any further information, don't hesitate to [contact us](#).

Don't miss out on being a part of UM24! Click the link below.

[Register now](#)

### *FLOW-3D World Users Conference 2024 to take place in Hamburg*

29 January 2024

Flow Science, Inc. will hold its annual **FLOW-3D** World Users Conference at the Steigenberger Hotel Hamburg on June 10-12, 2024 in Hamburg, Germany. Co-hosted by Flow Science Deutschland, this year's conference brings together customers from around the world. The conference features industry-focused tracks, advanced training sessions, in-depth technical presentations by **FLOW-3D** users, and the latest product developments presented by Flow Science's senior technical staff.

*"Recent **FLOW-3D** product developments continue to push the envelope of the engineering challenges our software can tackle and solve. Improving the user experience through more streamlined, intuitive workflows, greater accuracy, and faster runtimes remains the focus of our development goals. At this year's World Users Conference, we're looking forward to presenting our latest solutions and seeing how our customers are applying **FLOW-3D** software products to their most complex engineering problems," said Dr. Amir Isfahani, CEO of Flow Science.*

The call for abstracts for both live presentations and a poster session is now open. Customers are encouraged to share their experiences, present their success stories, case studies and validations, and obtain valuable feedback from their peers and Flow Science staff. Presentation tracks will be focused on the following areas: water and environmental applications, metal casting, additive manufacturing and laser welding, and general multiphysics topics. The poster session is open to any topic. The deadline to submit an abstract is March 8.

Advanced training sessions for **FLOW-3D**'s family of products will be offered as part of the conference. These free training sessions will be taught by senior technical staff and application experts and will center around three main topics: advanced simulation techniques in **FLOW-3D HYDRO**, version up training for **FLOW-3D AM** and **FLOW-3D WELD**, and exploring the new results file format in **FLOW-3D POST**.

In addition to the technical content, Flow Science will be hosting social events during the conference, including an opening reception at the conference hotel and a conference dinner at VLET in der Speicherstadt.

Registration for the conference is available at <https://www.flow3d.com/flow3d-world-users-conference-2024-registration/>

## Financial News

### ABB - Q4 2023 results

1 February 2024

#### Q4 2023

- Orders \$7.6billion, 0%; comparable<sup>1</sup> 0%
- Revenues \$8.2 billion, +5%; comparable +6%
- Income from operations \$1,116 million; margin 13.5%
- Operational EBITA<sup>1</sup> \$1,333 million; margin<sup>1</sup> 16.3%
- Basic EPS \$0.50, -18%<sup>2</sup>
- Cash flow from operating activities \$1,897 million; +176%

#### FY 2023

- Orders \$33.8 billion, -1%; comparable<sup>1</sup> +3%
- Revenues \$32.2 billion, +9%; comparable +14%

- Income from operations \$4,871 million; margin 15.1%
- Operational EBITA<sup>1</sup> \$5,427 million; margin<sup>1</sup> 16.9%
- Basic EPS \$2.02, +55%<sup>2</sup>
- Cash flow from operating activities \$4,290 million; +233%
- Dividend proposal of CHF0.87 per share

### CEO summary

The fourth quarter of 2023, was a solid end to a fantastic year. We improved operational performance and delivered a very strong cash flow year-on-year. We increased the annual return on capital employed (ROCE) by 460bps<sup>1</sup> to 21.1% and we are utilizing our strong balance sheet by recently signing seven small bolt-on acquisitions, with the majority adding additional embedded software and AI capabilities to our customer offerings. We delivered in line with our guidance, and I am pleased with the solid finish to the year.

Comparable order intake remained stable year-on-year, with increases noted in three out of four business areas. Most customer segments improved or remained stable, with softer demand noted mainly in residential construction and discrete automation, with the latter hampered by normalizing order patterns as well as by weakness in the robotics market. In tune with the historical fourth quarter pattern the book-to-bill ratio was below one, at 0.93, when revenues tend to be supported by end-of-the-year systems deliveries.

Revenues amounted to \$8,245 million and increased by 5% (6% comparable), supported by both higher volumes and contribution from earlier implemented price increases. Thanks to our ongoing focus on improving the quality of revenues, the gross margin improved by 50 basis points to 34.5%, contributing to the Operational EBITA margin improvement of 150 basis points to 16.3%. The contribution from mainly price and leverage on higher volumes clearly offset the impact mainly from higher labor costs. This represents the highest fourth quarter margin in recent history. The historical pattern of a sequentially softer fourth quarter margin repeated, as expected.

In the quarter we generated Cash flow from operating activities of \$1.9 billion. This contributed to Free Cash Flow of \$3.7 billion for the year, even stronger than what we originally expected.

In my view, the strong 2023 performance is evidence of ABB being a more efficient and agile company, but also of how demand for our offerings benefits from our leading position in markets accelerating the energy transition towards electrification and increased automation and digitalization. We feel confident in future performance, which led us to raising our financial and sustainability targets at our Capital Markets Day in November. In short, we are targeting higher growth and higher returns while enabling a net zero world.

Looking to 2024, the geopolitical situation adds uncertainty, however we currently expect another year of good performance. We expect a positive book-to-bill and revenues to be supported by execution of parts of the \$21.6 billion order backlog. In the projects- and systems business we expect continued high customer activity, although we face high comparables from

last year when large orders came through at a very high level. In total, order growth year-on-year should show stronger momentum in the latter part of the year when comparables ease. We expect to improve on comparable revenues as well as on Operational EBITA margin, and cash flow should benefit from continued strong operational performance and our continued focus on net working capital efficiency.

Considering the improving performance, robust cash flow and a solid balance sheet, the Board of Directors proposes an ordinary dividend of CHF0.87 per share, up from CHF 0.84 in the previous year. We also plan to continue utilizing share buybacks as a tool to return excess cash to shareholders also during 2024.

### Outlook

In the **first quarter of 2024**, we anticipate a low to mid-single digit comparable revenue growth and the Operational EBITA margin to remain stable or slightly improve year-on-year.

**In full-year 2024**, we expect a positive book-to-bill, comparable revenue growth to be about 5% and the Operational EBITA margin to slightly improve from the 2023 level of 16.9%.

### *Ansys to Release Fourth Quarter and FY 2023 Earnings on February 21, 2024*

1 February 2024

Ansyes announced that the Company expects to release its fourth quarter and FY 2023 earnings on Wednesday, February 21, 2024, after the market closes. In light of the pending transaction with Synopsys, Inc. (Synopsys), Ansys is suspending quarterly earnings conference calls and will no longer be providing quarterly or annual guidance.

After the market closes on Wednesday, February 21, 2024, you can find the following information on the investor section of our website at <https://investors.ansys.com>: the earnings press release and the 10-K filing. Optical systems are used across industries in applications like autonomous vehicle sensors and advanced medical devices. As the number of critical applications continues to increase, so does the need for even more reliable validation. To design the most accurate virtual camera systems, large amounts of real-world data are needed to correctly define the models used for testing. This information can be challenging to obtain, making the validation process much longer and cost inefficient.

### **Additional information: Synopsys to acquire Ansys**

On January 15, 2024, the Company entered into a definitive agreement with Synopsys under which Synopsys will acquire Ansys. Under the terms of the agreement, Ansys shareholders will receive \$197.00 in cash and 0.3450 shares of Synopsys common stock for each Ansys share, representing an enterprise value of \$35.0 billion based on the closing price of Synopsys common stock on December 21, 2023. The transaction is anticipated to close in the first half of 2025, subject to approval by Ansys shareholders, the receipt of required regulatory approvals and other customary closing conditions. Bringing together Synopsys' pioneering semiconductor electronic design automation with Ansys' broad simulation and analysis portfolio will create a leader in silicon to systems design solutions.

## *Bentley Systems To Announce Fourth Quarter 2023 Results*

1 February 2024

Bentley Systems, Incorporated, the *infrastructure engineering software* company, will release its fourth quarter and full year 2023 results before the market opens on Tuesday, February 27, 2024. Senior management will host a webcast to discuss the company's results at 8:15 a.m. ET. The results press release and link to the webcast will be available prior to the start of the webcast on the company's investor relations website at <https://investors.bentley.com>

### **Webcast And Registration Information**

**When:** Tuesday, February 27, 2024, 8:15 a.m. ET

**Webcast:** [Registration link](#)

**Replay:** Available later that day via <https://investors.bentley.com>

## *Dassault Systèmes Doubles EPS as Planned in 2018 While Embracing The Subscription Model*

1 February 2024

Dassault Systèmes announced IFRS unaudited estimated financial results for the fourth quarter and fiscal year ended December 31, 2023. The Group's Board of Directors approved these estimated results on January 31, 2024. This press release includes financial information on a non-IFRS basis and reconciliations with IFRS figures in the Appendix.

### **Summary Highlights**

(unaudited, IFRS and non-IFRS unless otherwise noted, all revenue growth rates in constant currencies)

- 4Q23 & FY23 total revenue increased 8% and 9% respectively with software revenue up 8%, all in line with objectives;
- 4Q23 & FY23 recurring revenue rose 12% and 10% respectively, driven by strong subscription growth of 22% and 16%. Licenses & other revenue were down 4% in the fourth quarter, up 2% in the full year;
- 4Q23 & FY23 3DEXPERIENCE revenue grew 21% and 19% respectively, supported by large transformation deals;
- 4Q23 & FY23 non-IFRS operating margin<sup>1</sup> of 35.9% and 32.4% respectively, reflecting acceleration of 160 basis points for the quarter in constant currencies, as anticipated and in line with objectives;
- FY23 non-IFRS diluted EPS<sup>2</sup> of €1.20, up 12% in constant currencies, achieving plan to double diluted EPS in 5 years;
- FY23 achieving net cash balance of €0.6 billion after successfully deleveraging for MEDIDATA acquisition; cash flow from operations of €1.6 billion (IFRS);

- FY24 non-IFRS objectives: Diluted EPS reaching €1.29 - €1.31 with revenue growth of 8% - 10%.

<sup>1</sup>4Q23 & FY23 IFRS operating margin at 23.2% and 20.9% respectively

<sup>2</sup>FY23 IFRS diluted EPS up 12% as reported at €0.79

## DXC Technology Reports Third Quarter Fiscal Year 2024 Results

1 February 2024

DXC Technology reported results for the third quarter of fiscal year 2024.

Raul Fernandez, Chief Executive Officer commented: "I am pleased to report that DXC delivered strong performance in the third quarter of fiscal '24. We achieved or exceeded our third quarter organic revenue, adjusted EBIT and non-GAAP EPS guidance and delivered \$585 million of free cash flow in the quarter. The team is focused on building on this progress as we evolve the operating model to strengthen our go-to-market presence across the offerings. We are committed to continuing the strategy and capital allocation program that we have previously outlined. DXC has an abundance of world class mission critical and digital solutions, deployed and operating every day around the world. I am fully convinced that this rich combination of talent and capabilities will enable DXC to compete and win in the marketplace, and drive significant value for our colleagues, customers and shareholders."

Financial Highlights <sup>(1)</sup>	Q3 FY24		Q3 FY23	
Revenue	\$ 3,399		\$ 3,566	
YoY Revenue Growth	(4.7	)%	(12.8	)%
YoY Organic Revenue Growth <sup>(2)</sup>	(4.5	)%	(3.8	)%
Net Income	\$ 140		\$ 61	
Net Income as a % of Sales	4.1	%	1.7	%
EBIT <sup>(2)</sup>	\$ 234		\$ 117	
EBIT Margin % <sup>(2)</sup>	6.9	%	3.3	%
Adjusted EBIT <sup>(2)</sup>	\$ 258		\$ 309	
Adjusted EBIT Margin % <sup>(2)</sup>	7.6	%	8.7	%

Earnings Per Share (Diluted)	\$ 0.81	\$ 0.25
Non-GAAP EPS (Diluted) <sup>(2)</sup>	\$ 0.87	\$ 0.95
Book-to-Bill (TTM)	0.93x	1.06x
Book-to-Bill	0.99x	1.34x

(1) In millions, except per-share amounts and numbers presented as percentages and ratios

(2) Reconciliation of GAAP to Non-GAAP measures provided in Non-GAAP Results.

### Financial Highlights - Third Quarter of Fiscal Year 2024

Revenue was \$3.40 billion for the third quarter of fiscal year 2024, down 4.7% as compared to prior year period, and down 4.5% on an organic basis. Third quarter organic revenue growth came in at the midpoint of DXC's guidance range.

Net income was \$140 million, or 4.1% of sales for the third quarter of fiscal year 2024, compared to \$61 million, or 1.7% of sales, in the prior year quarter. Net income was higher due to increased gains on the sale of businesses, lower depreciation and amortization and lower restructuring costs. EBIT was \$234 million or 6.9% of sales. Net income and EBIT in the quarter included the following items: amortization of acquired intangible assets of \$88 million, restructuring costs of \$36 million, net gains on dispositions of \$104 million, merger related indemnification charges of \$2 million, and transaction, separation, and integration costs of \$2 million. Excluding these items, adjusted EBIT was \$258 million and adjusted EBIT margin was 7.6% in the third quarter of fiscal year 2024, above the Company's guidance range. Adjusted EBIT was \$51 million below the prior year quarter, mainly driven by \$18 million lower non-cash pension income, \$9 million expense related to executive separation costs, and lower gains on asset sales of \$14 million (\$14 million gain on asset sales in Q3 FY24 vs. \$28 million in Q3 FY23).

Diluted earnings per share was \$0.81 and non-GAAP diluted earnings per share was \$0.87 for the third quarter of fiscal year 2024.

During the third quarter of fiscal year 2024, the Company repurchased 11 million shares of common stock for a total of \$252 million. DXC has retired over 30% of its shares outstanding since the start of fiscal year 2022.

### Financial Information by Segment

Global Business Services ("GBS") <sup>(1)</sup>	Q3 FY24	Q3 FY23
Revenue	\$ 1,696	\$ 1,738

YoY Revenue Growth	(2.4	)%	(10.7	)%
YoY Organic Revenue Growth <sup>(2)</sup>	0.3	%	0.2	%
Segment Profit	\$ 202		\$ 244	
Segment Profit Margin	11.9	%	14.0	%
Book-to-Bill (TTM)	0.97x		1.16x	
Book-to-Bill	1.26x		1.21x	

(1) In millions

(2) Reconciliation of GAAP to Non-GAAP measures provided in Non-GAAP Results.

GBS segment revenue was \$1,696 million in the third quarter of fiscal year 2024, down 2.4% compared to the prior year period and up 0.3% on an organic basis. The GBS organic growth was driven by continued growth in the Analytics & Engineering and Insurance offerings. GBS segment profit was \$202 million and segment profit margin was 11.9%, down 210 bps compared to prior year. GBS bookings for the quarter were \$2.1 billion for a book-to-bill of 1.26x, and 0.97x on a trailing twelve months basis.

Global Infrastructure Services ("GIS") <sup>(1)</sup>	Q3 FY24	Q3 FY23		
Revenue	\$ 1,703	\$ 1,828		
YoY Revenue Growth	(6.8	)%	(14.7	)%
YoY Organic Revenue Growth <sup>(2)</sup>	(8.9	)%	(7.4	)%
Segment Profit	\$ 121	\$ 123		
Segment Profit Margin	7.1	%	6.7	%
Book-to-Bill (TTM)	0.90x	0.97x		
Book-to-Bill	0.73x	1.46x		

(1) In millions

(2) Reconciliation of GAAP to Non-GAAP measures provided in Non-GAAP Results.

GIS segment revenue was \$1,703 million in the third quarter of fiscal year 2024, down 6.8% compared to the prior year period, and down 8.9% on an organic basis. GIS segment revenue performance was impacted by organic revenue declines in Cloud Infrastructure & ITO, and in Modern Workplace. GIS segment profit was \$121 million with a segment profit margin of 7.1%, up 40 bps as compared to prior year. GIS bookings were \$1.3 billion in the quarter for a book-to-bill of 0.73x, and 0.90x on a trailing twelve months basis.

### Offering Highlights

The results for our six offerings are as follows:

Offerings Revenues	Q3 FY24	Q2 FY24	Q1 FY24	Q4 FY23	Q3 FY23
Analytics and Engineering	\$ 555	\$ 561	\$ 546	\$ 558	\$ 535
Applications	759	762	770	780	762
Insurance Software & BPS	382	386	382	390	371
Security	109	109	111	113	112
Cloud Infrastructure & ITO	1,168	1,209	1,209	1,270	1,283
Modern Workplace	426	409	423	457	433
<b>Subtotal</b>	<b>3,399</b>	<b>3,436</b>	<b>3,441</b>	<b>3,568</b>	<b>3,496</b>
<b>M&amp;A and Divestitures</b>					
Revenues	—	—	5	23	70
<b>Total Revenues</b>	<b>\$ 3,399</b>	<b>\$ 3,436</b>	<b>\$ 3,446</b>	<b>\$ 3,591</b>	<b>\$ 3,566</b>

### Guidance

The Company's guidance for the fourth quarter and full fiscal year 2024 is presented in the table below. The full year guidance has been reduced, for organic revenue growth to a range of (4.5)% - (4.3)%, adjusted EBIT margin to 7.1% - 7.2%, and non-GAAP diluted EPS to \$3.00 to \$3.05. We are maintaining FY24 free cash flow guidance of \$800 million.

Key Metrics	Q4 FY24 Guidance	FY24 Guidance

	Lower End	Higher End	Lower End	Higher End
Organic Revenue Growth %	(6.5)%	(5.5)%	(4.5)%	(4.3)%
Adjusted EBIT Margin	7.0%	7.5%	7.1%	7.2%
Non-GAAP Diluted EPS	\$0.80	\$0.85	\$3.00	\$3.05
Free Cash Flow			\$800	
<b>Revenue</b>				
Revenue \$	\$3,350	\$3,390	\$13,630	\$13,670
Acquisition & Divestitures Revenues %	(0.7)%		(1.8)%	
Foreign Exchange Impact on Revenues %	0.5%		0.9%	

### Earnings Conference Call and Webcast

DXC Technology senior management will host a conference call and webcast to discuss these results on February 1, 2024, at 5:00 p.m. EST. The dial-in number for domestic callers is +1 (888) 330-2455. Callers who reside outside of the United States should dial +1 (240) 789-2717. The passcode for all participants is 4164760. The webcast audio and any presentation slides will be available on DXC Technology's Investor Relations website.

A replay of the conference call will be available from approximately two hours after the conclusion of the call until February 8, 2024. The phone number for the replay is +1 (800) 770-2030 or +1 (647) 362-9199. The replay passcode is 4164760.

### Hexagon Year-End Report 1 January - 31 December 2023

1 February 2024

Fourth quarter 2023

- 5 per cent organic revenue growth (using fixed exchange rates and a comparable group structure)
- Reported operating net sales increased by 2 per cent to 1,435.3 MEUR (1,403.2). Net sales including the reduction of acquired deferred revenue also increased to 1,435.3 MEUR (1,401.9)
- Adjusted gross margin improved to 66.5 per cent (66.2)
- Adjusted operating earnings (EBIT1) increased by 5 per cent to 438.4 MEUR (418.0)
- Adjusted operating margin increased to 30.5 per cent (29.8)
- Earnings before taxes, excluding adjustments, amounted to 389.1 MEUR (399.6)
- Net earnings, excluding adjustments, amounted to 319.1 MEUR (327.7)

- Earnings per share, excluding adjustments, amounted to 11.8 Euro cent (12.1)
- Operating cash flow before non-recurring items increased to 353.1 MEUR (172.6)
- The Board of Directors proposes a dividend of 0.13 EUR (0.12) per share, an increase of 8 per cent

## *HONEYWELL ANNOUNCES FOURTH QUARTER AND FULL YEAR 2023 RESULTS; ISSUES 2024 GUIDANCE*

1 February 2024

Honeywell announced results for the fourth quarter and 2023 that met or exceeded the company's original full-year guidance. The company also provided its outlook for 2024 and, separately, announced that CEO Vimal Kapur will succeed Darius Adamczyk as Chairman of the Board in June 2024 and William S. Ayer will become independent Lead Director in May 2024.

The company reported fourth-quarter year-over-year sales growth of 3% and organic<sup>1</sup> sales growth of 2%, led by another quarter of double-digit organic sales growth in commercial aviation. Operating margin contracted 290 basis points to 16.8% and segment margin<sup>1</sup> expanded by 60 basis points to 23.5%, driven by expansion in Performance Materials and Technologies and Aerospace. Earnings per share for the fourth quarter was \$1.91, up 26% year over year, and adjusted earnings per share<sup>1</sup> was \$2.60, up 3% year over year. An adjustment to our estimated future Bendix liability at the end of the year drove the majority of the difference between earnings per share and adjusted earnings per share<sup>1</sup>. Excluding a 13-cent non-cash pension headwind, adjusted earnings per share<sup>1</sup> was up 8%. Operating cash flow was \$3.0 billion with operating cash flow margin of 31.3%, and free cash flow<sup>1</sup> was \$2.6 billion with free cash flow margin<sup>1</sup> of 27.4%, led by a reduction in working capital.

For the full year, sales increased 3%, or 4% on an organic<sup>1</sup> basis. Operating income grew 10% with operating margin expansion of 120 basis points, while segment profit<sup>1</sup> grew 8% with segment margin<sup>1</sup> expansion of 100 basis points. Honeywell reported full-year earnings per share of \$8.47 and adjusted earnings per share<sup>1</sup> of \$9.16.

"Honeywell once again demonstrated its resilience by delivering on our commitments and finishing strong in another economically challenging year," said Vimal Kapur, chief executive officer of Honeywell. "Our organic<sup>1</sup> growth was led by the eleventh consecutive quarter of double-digit growth in our commercial aerospace business. Honeywell Connected Enterprise offerings across the portfolio also saw growth of over 20% in the quarter. Our continued focus on operational excellence enabled us to achieve this growth while expanding margins above the high end of our guidance range. In the fourth quarter, we also executed on our capital allocation priorities, not only by deploying \$2.6 billion of cash flow to share repurchases, dividends, and high-return capex, but through the announcement of the \$5 billion acquisition of Carrier's Global Access Solutions business, which will enhance our building automation capabilities to become a leading provider of security solutions. Full-year capital deployment totaled \$8.3 billion in 2023, once again in excess of our cash flow, and we expect our capital deployment to accelerate next year as we close on the security acquisition."

Kapur continued, "As we look toward 2024, our portfolio is well positioned to accelerate both our top line and earnings growth, underpinned by three compelling megatrends — automation, the future of aviation, and energy transition. I am confident that 2024 will be another year of value creation for our shareowners, our customers, and our employees."

Honeywell's backlog remains at a record level, ending the year up 8% at \$31.8 billion, providing support for the company's outlook. Long-cycle markets remain robust while the short-cycle recovery will provide a further boost to Honeywell's results.

Honeywell also announced its outlook for 2024. The company expects sales of \$38.1 billion to \$38.9 billion, representing year-over-year organic<sup>1</sup> growth of 4% to 6%; segment margin expansion<sup>2</sup> of 30 to 60 basis points; adjusted earnings per share<sup>2,3</sup> of \$9.80 to \$10.10, up 7% to 10%; operating cash flow of \$6.7 billion to \$7.1 billion, and free cash flow<sup>1</sup> of \$5.6 billion to \$6.0 billion. A summary of the company's 2024 guidance can be found in Table 1.

### **Fourth-Quarter Performance**

**Honeywell** sales for the fourth quarter were up 3% year over year on a reported basis and 2% on an organic<sup>1</sup> basis year over year. The fourth-quarter financial results can be found in Tables 2 and 3.

**Aerospace** sales for the fourth quarter were up 15% on an organic<sup>1</sup> basis year over year, the sixth consecutive quarter of double-digit organic growth, as a result of ongoing strength in both commercial aviation and defense and space. Sales growth was led by commercial original equipment, increasing 25% year over year on increased shipset deliveries. Commercial aftermarket once again grew double digits in the fourth quarter as flight hours continue to improve, including 29% growth in air transport. Defense and space sales were up 5% as robust demand was partially offset by supply chain challenges. Segment margin expanded 20 basis points to 28.0%, driven by commercial excellence and volume leverage, partially offset by cost inflation and mix pressure in our original equipment business.

**Honeywell Building Technologies** sales for the fourth quarter were down 1% on an organic<sup>1</sup> basis year over year. Building products sales declined due to lower volumes of fire and security offerings, offsetting 6% organic growth in building solutions driven by continued strength in both services and projects. Segment margin contracted by 90 basis points to 23.9% due to cost inflation and mix headwinds, partially offset by productivity actions and commercial excellence.

**Performance Materials and Technologies** sales for the fourth quarter were up 4% on an organic<sup>1</sup> basis year over year. Advanced Materials led PMT with 6% organic sales growth, driven by double-digit growth in fluorine products and strength in life sciences. HPS grew 4% organically, led by another strong quarter in lifecycle solutions and services and smart energy. UOP sales were up 1% in the quarter as strength in petrochemical catalyst shipments and sustainable technology solutions was partially offset by lower volumes in gas processing. Segment margin expanded 200 basis points to 24.0% as a result of productivity actions, favorable business mix, and commercial excellence net of inflation.

**Safety and Productivity Solutions** sales for the fourth quarter decreased by 24% on an organic<sup>1</sup> basis year over year. Sales declines were due to lower volumes in warehouse and workflow solutions. Softness in the short-cycle productivity solutions and services business also impacted sales, but orders growth of over 30% in the quarter provided signs of improvement. Segment margin contracted 290 basis points to 17.3% driven by lower volume leverage and cost inflation, partially offset by productivity actions and commercial excellence.

### **Conference Call Details**

Honeywell will discuss its fourth-quarter results and full-year 2024 guidance during an investor conference call starting at 8:30 a.m. Eastern Standard Time today. A live webcast of the investor call as well as related presentation materials will be available through the Investor Relations section of the company's website ([www.honeywell.com/investor](http://www.honeywell.com/investor)). A replay of the webcast will be available for 30 days following the presentation.

**TABLE 1: FULL-YEAR 2024 GUIDANCE<sup>2</sup>**

Sales	\$38.1B - \$38.9B
<i>Organic<sup>1</sup> Growth</i>	4% - 6%
Segment Margin	23.0% - 23.3%
<i>Expansion</i>	<i>Up 30 - 60 bps</i>
Adjusted Earnings Per Share <sup>3</sup>	\$9.80 - \$10.10
<i>Adjusted Earnings Growth<sup>3</sup></i>	7% - 10%
Operating Cash Flow	\$6.7B - \$7.1B
Free Cash Flow <sup>1</sup>	\$5.6B - \$6.0B

**TABLE 2: SUMMARY OF HONEYWELL FINANCIAL RESULTS**

	<b>FY 2023</b>	<b>FY 2022</b>	<b>Change</b>
Sales	36,662	35,466	3 %
<i>Organic<sup>1</sup> Growth</i>			4 %
Operating Income Margin	19.3 %	18.1 %	120 bps
Segment Margin <sup>1</sup>	22.7 %	21.7 %	100 bps

Reported Earnings Per Share	\$8.47	\$7.27	17 %
Adjusted Earnings Per Share <sup>1</sup>	\$9.16	\$8.76	5 %
Cash Flow from Operations	5,340	5,274	1 %
<i>Operating Cash Flow Margin</i>	14.6 %	14.9 %	(30) bps
Free Cash Flow <sup>1</sup>	4,301	4,917	(13) %
<i>Free Cash Flow Margin<sup>1</sup></i>	11.7 %	13.9 %	(220) bps
	<b>4Q 2023</b>	<b>4Q 2022</b>	<b>Change</b>
Sales	9,440	9,186	3 %
<i>Organic<sup>1</sup> Growth</i>			2 %
Operating Income Margin	16.8 %	19.7 %	-290 bps
Segment Margin <sup>1</sup>	23.5 %	22.9 %	60 bps
Reported Earnings Per Share	\$1.91	\$1.51	26 %
Adjusted Earnings Per Share <sup>1</sup>	\$2.60	\$2.52	3 %
Cash Flow from Operations	2,955	2,366	25 %
<i>Operating Cash Flow Margin</i>	31.3 %	25.8 %	550 bps
Free Cash Flow <sup>1</sup>	2,591	2,125	22 %
<i>Free Cash Flow Margin<sup>1</sup></i>	27.4 %	23.1 %	430 bps

**TABLE 3: SUMMARY OF SEGMENT FINANCIAL RESULTS**

<b>AEROSPACE</b>	<b>FY 2023</b>	<b>FY 2022</b>	<b>Change</b>
Sales	13,624	11,827	15 %
<i>Organic<sup>1</sup> Growth</i>			15 %
Segment Profit	3,741	3,228	16 %

Segment Margin	27.5 %	27.3 %	20 bps
	<b>4Q 2023</b>	<b>4Q 2022</b>	
Sales	3,673	3,204	15 %
<i>Organic<sup>1</sup> Growth</i>			15 %
Segment Profit	1,027	890	15 %
Segment Margin	28.0 %	27.8 %	20 bps
<b>HONEYWELL BUILDING TECHNOLOGIES</b>	<b>FY 2023</b>	<b>FY 2022</b>	<b>Change</b>
Sales	6,031	6,000	1 %
<i>Organic<sup>1</sup> Growth</i>			2 %
Segment Profit	1,505	1,439	5 %
Segment Margin	25.0 %	24.0 %	100 bps
	<b>4Q 2023</b>	<b>4Q 2022</b>	
Sales	1,504	1,514	(1) %
<i>Organic<sup>1</sup> Growth</i>			(1) %
Segment Profit	359	375	(4) %
Segment Margin	23.9 %	24.8 %	-90 bps
<b>PERFORMANCE MATERIALS AND TECHNOLOGIES</b>	<b>FY 2023</b>	<b>FY 2022</b>	<b>Change</b>
Sales	11,506	10,727	7 %
<i>Organic<sup>1</sup> Growth</i>			7 %
Segment Profit	2,549	2,354	8 %

Segment Margin	22.2 %	21.9 %	30 bps
	<b>4Q 2023</b>	<b>4Q 2022</b>	
Sales	3,029	2,860	6 %
<i>Organic<sup>1</sup> Growth</i>			4 %
Segment Profit	728	628	16 %
Segment Margin	24.0 %	22.0 %	200 bps
<b>SAFETY AND PRODUCTIVITY SOLUTIONS</b>	<b>FY 2023</b>	<b>FY 2022</b>	<b>Change</b>
Sales	5,489	6,907	(21) %
<i>Organic<sup>1</sup> Growth</i>			(20) %
Segment Profit	901	1,080	(17) %
Segment Margin	16.4 %	15.6 %	80 bps
	<b>4Q 2023</b>	<b>4Q 2022</b>	
Sales	1,227	1,607	(24) %
<i>Organic<sup>1</sup> Growth</i>			(24) %
Segment Profit	212	325	(35) %
Segment Margin	17.3 %	20.2 %	-290 bps

1 See additional information at the end of this release regarding non-GAAP financial measures.

2 Segment margin and adjusted EPS are non-GAAP financial measures. Management cannot reliably predict or estimate, without unreasonable effort, the impact and timing on future operating results arising from items excluded from segment margin or adjusted EPS. We therefore, do

not present a guidance range, or a reconciliation to, the nearest GAAP financial measures of operating margin or EPS.

- 3 Adjusted EPS and adjusted EPS V% guidance excludes items identified in the non-GAAP reconciliation of adjusted EPS at the end of this release, and any potential future one-time items that we cannot reliably predict or estimate such as pension mark-to-market.

### *IFS reports industry leading results with 33% software revenue growth for 2023*

30 January 2024

IFS, the global cloud enterprise software company, announced its financial results for the full year ending December 31, 2023. The company posted exceptional results with software revenue growth at 33 percent year-on-year and cloud revenue up 46 percent as new and existing customers accelerate the move to IFS Cloud, a market leading single cloud platform, allowing customers to access the latest Industrial AI capabilities most critical to our focus industries. IFS is consistently recognized internationally as a market leader in FSM, EAM, ERP and ESM.

2023 continued to see the unfolding of unpredictable economical and geo-political disruption. Despite this, IFS's strategy to stay focused on its core industries and to extend its Industrial AI capabilities with IFS.ai, have yielded very strong results in all regions, leading to another year of strong double-digit revenue growth for the company. The results which continue to outperform the market point to the company's agility, scale, and ability to execute globally for its customers.

IFS's product innovation in IFS Cloud and the inherent IFS.ai capabilities are in demand from existing customers and has attracted a large number of new customers choosing IFS over industry peers. Long standing customers such as Cimcorp as well as new customers such as Tele 2, Mattr, NOTE AB, Havfram, Van Oord, TÜV NORD, Stannah Lifts are turning to IFS as their long-term partner to transform their business models, improve resilience, increase operating efficiency, and deliver competitive advantage across their people, assets and services.

**IFS CEO Mark Moffat commented:** "This time last year we reported five years of strong consecutive double-digit growth. I am hugely proud that the IFS team has continued this trend and also delivered an outstanding 2023. We will shortly reach a very significant landmark for IFS with \$1bn ARR representing a strong vote of trust from our customers." **Moffat added:** "Our core IFS value of being customer obsessed is paying off and with IFS.ai we are creating further productivity and automation opportunities for them while adding a critically important dimension to our proposition. We have delivered AI capabilities to our customers for a number of years now, and with IFS.ai we are driving AI across all our products effectively democratizing AI for all of our customers' users." **Moffat concluded:** "2024 will be a continuation of our strategy to deliver industry specific and market leading capabilities in FSM, EAM, ERP & ESM which includes investing in M&A. For our customers, I am proud to say that IFS moves as one, creating value faster and delivering our best to our customers when it matters most, at the Moment of Service."

**IFS Chief Financial Officer, Matthias Heiden, added,** “2023 has delivered results that we are very proud of. ARR is clearly an important long-term performance metric, and our 26 percent growth in ARR YoY was driven by new logo acquisitions, significant expansion within the Install Base and low churn. All of which points to a very healthy mix of revenue and consistent execution across the entire business. **Heiden concluded:** “We saw very healthy double-digit growth in all our regions, with a notable outstanding performance in our North American and APJ, ME&A region. This combined with the performance of our ecosystem is clear evidence that our focus on product and the industries we serve are delivering the value our customers need globally.”

#### **Financial and Operational Highlights for FY 2023, growth YoY:**

- FY2023 software revenue was EUR 853m, an increase of 33 percent versus 2022.
- FY2023 recurring revenue was EUR 810m, an increase of 35 percent versus 2022.
- FY2023 net revenue was EUR 1.062m, an increase of 30 percent versus 2022.
- FY2023 annual recurring revenue (ARR) up 26 percent Year on Year.

#### **Some key milestones for IFS in 2023 included:**

- In **February**, IFS marked the 25<sup>th</sup> anniversary of its operations in Sri Lanka.
- In **March**, In the United States, IFS launched a collaboration with the Big Ten Conference, a pre-cursor to the strategic partnership launched in late 2023.
- In **May**, IFS released its latest sustainability report, a detailed account of IFS’s approach, priorities, targets and initiatives across environmental, social and governance (ESG) topics.
- In **May**, IFS launched the first of its twice-yearly IFS Cloud releases in 2023, with updates enabling customers to enhance business agility and build resilience.
- In **May, June and October**, IFS held 9 global **IFS Connect** events with over 3,000 local prospects, customers, and partners in attendance.
- In **June**, IFS acquired Poka, the market-leading Quebec-based provider of a connected worker platform.
- In **October** IFS added extra capabilities to <https://www.ifs.com/ifs-ai>.
- In **November**, IFS launched the second of its twice-yearly IFS Cloud releases.
- IFS began several landmark **brand partnerships**, including a strategic partnership with AJ Foyt in **June** and was named the first-ever official technology partner of the Big Ten Conference in **October**.
- Throughout 2023 IFS **appointed several key executives** across its global operations, including Matthias Heiden as CFO, Belinda Finch as CIO, Max Robberts as COO.

#### **Additional highlights:**

- IFS added 243 new logos globally and across its core industries, including Mattr, NOTE AB, Havfram, Tele2 AB, Van Oord, TÜV NORD, Stannah Lifts, Enercare, My Dentist, and City of Tallahassee.
- The IFS partner Ecosystem delivered some equally strong results with a 10% growth YoY in partner contribution to 41%. The impact was seen in our Net New business as well as in pipeline growth and number of deals closed by partners with North America and APJ, ME&A regions leading across multiple KPIs.
- IFS is also extending its partnerships with Global System Integrators with a particular focus on strategic markets: **Accenture** for Utilities & Resources, Telco, **Arcwide** for Manufacturing, Services, Construction & Engineering, **Capgemini** for Construction & Engineering, Manufacturing, Energy, Utilities & Resources, and **PwC** for Energy, Utilities & Resources, Construction & Engineering

### *Keysight Technologies Announces Date of Fiscal First Quarter 2024 Financial Results Conference Call*

30 January 2024

Keysight Technologies, Inc. will release financial results for the fiscal quarter ending January 31, 2024 after the close of the market on Tuesday, February 20, 2024. The company will host a conference call that day at 1:30 p.m. PT (4:30 p.m. ET) to review the financial results.

The conference call will be webcast live and accessible in the Upcoming Events section of the Keysight investor relations website, [www.investors.keysight.com](http://www.investors.keysight.com). The call can also be accessed by dialing 1-404-975-4839 or 1-833-470-1428 toll-free (access code 263424).

For those unable to attend, a replay of the conference call will be available for 90 days in the News, Events, Presentations section of the Keysight investor relations website.

### *PTC Announces First Fiscal Quarter 2024 Results*

31 January 2024

PTC reported financial results for its first fiscal quarter ended December 31, 2023.

"In our first fiscal quarter, we again delivered solid ARR and cash flow results. I am confident that PTC is well positioned to continue delivering durable and consistent ARR and cash flow growth under the leadership of Neil Barua," said James Heppelmann, CEO, PTC.

Neil Barua, CEO-elect, added, "We have a differentiated strategy that leverages our unique product portfolio to help our customers along their digital transformation journeys. I am looking forward to working with the team to continue enhancing PTC's already strong market position and execution by continuing to invest significantly in technologies that meet the evolving needs of our customers."

#### **First Quarter 2024 Highlights**

Key operating and financial highlights are set forth below. The definitions of our operating and non-GAAP financial measures and reconciliations of non-GAAP financial measures to

comparable GAAP measures are included below and in the reconciliation tables at the end of this press release.

<b>\$ in millions</b>	<b>Q1'24</b>	<b>Q1'23</b>	<b>YoY Change</b>	<b>Q1'24 Guidance</b>
ARR as reported	\$2,057	\$1,663	24 %	
Constant currency ARR	\$2,016	\$1,636	23 %	\$1,995 - \$2,010
Organic ARR as reported	\$1,883	\$1,663	13 %	
Constant currency organic ARR	\$1,843	\$1,636	13 %	
Operating cash flow	\$187 <sup>1</sup>	\$181	4 %	~\$185
Free cash flow	\$183 <sup>1</sup>	\$172	6 %	~\$180
Revenue <sup>2</sup>	\$550	\$466	18 %	\$520 - \$550
Operating margin <sup>2</sup>	22% <sup>3</sup>	23 %	~(90 bps)	
Non-GAAP operating margin <sup>2</sup>	36 %	36 %	~60 bps	
Earnings per share <sup>2</sup>	\$0.55 <sup>3</sup>	\$0.63	(13 %)	\$0.26 - \$0.49
Non-GAAP earnings per share <sup>2</sup>	\$1.11	\$0.99	11 %	\$0.80 - \$1.00
Total cash and cash equivalents	\$265	\$388	(32 %)	
Gross debt	\$2,267	\$1,359	67 %	

<sup>1</sup> In Q1'24, operating cash flow and free cash flow included a \$30 million imputed interest payment related to the deferred purchase payment for ServiceMax.

<sup>2</sup> In Q1'24, revenue growth was 16% year over year on a constant currency basis. Revenue and, as a result, operating margin, operating profit, and earnings per share are impacted by revenue recognition under ASC 606.

<sup>3</sup> In Q1'24, compared to the year-ago period, operating margin and EPS were impacted by an increase in expenses related to stock-based compensation and amortization of acquired intangible assets; see non-GAAP financial measures and reconciliations table on page 9 for details.

## Fiscal 2024 and Q2'24 Guidance

"Our ARR and free cash flow results in Q1'24 were solid, driven by the resilience of our subscription license business model, consistent execution, operational discipline, and the actions we have taken over time to align our investments with market opportunities. We continue to rapidly de-lever, with our debt to EBITDA ratio back under 3.0x at the end of Q1. Despite the ongoing challenging macro backdrop, our full year guidance for ARR and FCF remains unchanged, and we believe we have set our Q2 guidance prudently," said Kristian Talvitie, CFO.

\$ in millions	FY'24 Previous Guidance	FY'24 Guidance	FY'24 YoY Growth Guidance	Q2'24 Guidance
Constant currency ARR	\$2,190 - \$2,250	\$2,190 - \$2,250	11% - 14%	\$2,050 - \$2,065
Operating cash flow	~\$745	~\$745	~22%	~\$245
Free cash flow	~\$725	~\$725	~23%	~\$240
Revenue	\$2,270 - \$2,360	\$2,270 - \$2,360	8% - 13%	\$560 - \$590
Earnings per share	\$2.42 - \$3.32	\$2.42 - \$3.32	18% - 61%	\$0.57 - \$0.80
Non-GAAP earnings per share	\$4.50 - \$5.20	\$4.50 - \$5.20	4% - 20%	\$1.10 - \$1.30

**FY'24 financial guidance includes the following assumptions:**

- We provide ARR guidance on a constant currency basis, using our FY'24 Plan foreign exchange rates (rates as of September 30, 2023) for all periods. Foreign exchange rate fluctuations during Q1'24 had a \$41 million favorable impact on our Q1'24 reported ARR, compared to our Q1'24 constant currency ARR. Using foreign exchange rates as of the end of Q1'24 and assuming the midpoint of our constant currency guidance ranges:
  - Q2'24 reported ARR would be higher by approximately \$42 million, compared to Q2'24 constant currency ARR guidance; and
  - FY'24 reported ARR would be higher by approximately \$46 million, compared to FY'24 constant currency ARR guidance.
- We expect churn to remain low.
- For cash flow, due to invoicing and payments seasonality, and consistent with the past 3 years, we expect the majority of our collections to occur in the first half of our fiscal year and for fiscal Q4 to be our lowest cash flow generation quarter.

- Compared to FY'23, at the midpoint of FY'24 ARR guidance, FY'24 GAAP operating expenses are expected to increase approximately 5% to 6%, and FY'24 non-GAAP operating expenses are expected to increase approximately 8% to 9%, primarily due to investments to drive future growth, the acquisition of ServiceMax, and foreign exchange rate fluctuations.
- FY'24 GAAP P&L results are expected to include the items below, totaling approximately \$284 million to \$314 million, as well as their related tax effects:
  - approximately \$200 million to \$230 million of stock-based compensation expense,
  - approximately \$82 million of intangible asset amortization expense, and
  - approximately \$2 million, net, related to acquisition and transaction-related expense and a restructuring credit.
- Our FY'24 GAAP and non-GAAP tax rates are expected to be approximately 20%.
- Cash tax payments are expected to be approximately \$80 million in FY'24.
- Capital expenditures are expected to be approximately \$20 million in FY'24.
- Cash interest payments are expected to be approximately \$135 million in FY'24.
- Our long-term goal, assuming our Debt/EBITDA ratio is below 3x, is to return approximately 50% of our free cash flow to shareholders via share repurchases, while also taking into consideration the interest rate environment and strategic opportunities.
  - We expect to prioritize paying down our debt in FY'24.
  - We expect gross debt of approximately \$1.7 billion at the end of FY'24.
  - We expect our fully diluted share count to increase by approximately 1 million in FY'24.

### **PTC's Fiscal First Quarter Conference Call**

The Company will host a conference call to discuss results at 5:00 pm ET on Wednesday, January 31, 2024. To participate in the live conference call, dial (888) 330-2508 or (240) 789-2735 and provide the passcode 7328695, or log in to the webcast, available on [PTC's Investor Relations website](#). A replay will also be available.

### ***Rockwell Automation Reports First Quarter 2024 Results***

1 February 2024

Rockwell Automation, Inc. reported first quarter fiscal 2024 results.

"Rockwell had an encouraging start to the fiscal year, with both organic and total sales up low single digits year over year. Importantly, we saw an upward inflection in customer order activity, with total orders up double digits sequentially. Q1 orders were up sequentially across all business segments and regions, with particular strength in North America. High levels of

channel inventory and some lingering supply chain constraints continue to impact the timing of product shipments, but underlying conditions remain positive. Our Sensia joint venture had a profitable Q1 with over 25% growth in both orders and sales. We also continue to see double-digit growth in our Annual Recurring Revenue, demonstrating the growing value of our recurring software and services," said Blake Moret, Chairman and CEO.

### **Fiscal Q1 2024 Financial Results**

Fiscal 2024 first quarter sales were \$2,052 million, up 3.6% from \$1,981 million in the first quarter of fiscal 2023. Organic sales increased 1.0%, currency translation increased sales by 1.2%, and acquisitions increased sales by 1.4%.

Fiscal 2024 first quarter Net income attributable to Rockwell Automation was \$215 million or \$1.86 per share, compared to \$384 million or \$3.31 per share in the first quarter of fiscal 2023. The decreases in Net income attributable to Rockwell Automation and diluted EPS were primarily due to lower pre-tax margin. Fiscal 2024 first quarter adjusted EPS was \$2.04, down 17.1% compared to \$2.46 in the first quarter of fiscal 2023 primarily due to lower segment operating margin.

Pre-tax margin was 12.7% in the first quarter of fiscal 2024 compared to 23.6% in the same period last year. The decrease in pre-tax margin was primarily due to fair value adjustments in the prior year related to our previous investment in PTC and the timing of prior-year investment spend.

Total segment operating earnings were \$356 million in the first quarter of fiscal 2024, down 11.3% from \$401 million in the same period of fiscal 2023. Total segment operating margin was 17.3% compared to 20.2% a year ago. The decrease in segment operating margin was primarily due to the timing of prior-year investment spend, mix between products and solutions, and lower supply chain utilization.

Cash flow generated by operating activities in the first quarter of fiscal 2024 was \$32.6 million, compared to \$66.3 million in the first quarter of fiscal 2023. Free cash flow in the first quarter of fiscal 2024 was \$(35.3) million, compared to \$42.1 million in the same period last year. Decreases in cash flow provided by operating activities and free cash flow include a higher payout of incentive compensation related to fiscal year 2023 performance.

### **Fiscal Year 2024 Outlook**

The table below provides guidance for sales growth and earnings per share for fiscal 2024. Our guidance reflects first quarter performance and continues to include our assumptions for channel inventory normalization and order growth.

	<b>Updated Guidance</b>	<b>Prior Guidance</b>
Reported sales growth	0.5% - 6.5%	0.5% - 6.5%
Organic sales growth <sup>(1)</sup>	(2.0)% - 4.0%	(2.0)% - 4.0%

Inorganic sales growth	~1.5%	~1.0%
Currency translation	~1.0%	~1.5%
Diluted EPS <sup>(2)</sup>	\$11.24 - \$12.74	\$11.49 - \$12.99
Adjusted EPS <sup>(1)</sup>	\$12.00 - \$13.50	\$12.00 - \$13.50

<sup>(1)</sup> Organic sales growth and Adjusted EPS are non-GAAP measures. See **Adjusted Income, Adjusted EPS, and Adjusted Effective Tax Rate Reconciliation** for more information on these non-GAAP measures.

<sup>(2)</sup> Diluted EPS updated to include the purchase accounting amortization from the Clearpath Robotics and Vervo Industrial Protection acquisitions.

"We continue to expect low-single-digit topline growth in FY24, with modest EPS growth weighted to the second half of the year as orders continue to rebound. We are focused on winning share, meeting near-term profitability targets, and investing for the most attractive future opportunities," Moret continued.

Following is a discussion of first quarter results for our business segments.

### **Intelligent Devices**

Intelligent Devices first quarter fiscal 2024 sales were \$927 million, a decrease of 1.0% compared to \$936 million in the same period last year. Organic sales decreased 4.5%, currency translation increased sales by 1.2%, and acquisitions increased sales by 2.3%. Segment operating earnings were \$150 million compared to \$209 million in the same period last year. Segment operating margin decreased to 16.2% from 22.4% a year ago. The decrease from prior year was driven by lower sales volume, the timing of prior-year investment spend, and the impact of acquisitions partially offset by positive price/cost.

### **Software & Control**

Software & Control first quarter fiscal 2024 sales were \$604 million, an increase of 5.3% compared to \$573 million in the same period last year. Organic sales increased 4.0% and currency translation increased sales by 1.3%. Segment operating earnings were \$151 million compared to \$167 million in the same period last year. Segment operating margin decreased to 25.0% from 29.2% a year ago, driven by the timing of prior-year investment spend and lower supply chain utilization partially offset by positive price/cost.

### **Lifecycle Services**

Lifecycle Services first quarter fiscal 2024 sales were \$521 million, an increase of 10.5% compared to \$472 million in the same period last year. Organic sales increased 8.1%, currency translation increased sales by 1.0%, and acquisitions increased sales by 1.4%. Segment operating earnings were \$54.3 million compared to \$24.3 million in the same period last year.

Segment operating margin was 10.4% compared to 5.2% a year ago driven by higher sales, lower incentive compensation, and higher margins in Sensia.

### **Conference Call**

A conference call to discuss the quarterly results will be held at 8:30 a.m. Eastern Time on January 31, 2024. The call will be an audio webcast and accessible on the Rockwell Automation website ([www.rockwellautomation.com/en-us/investors.html](http://www.rockwellautomation.com/en-us/investors.html)). Presentation materials will also be available on the website prior to the call.

Interested parties can access the conference call by using the following numbers: (888) 330-2022 in the U.S. and Canada; (646) 960-0690 for other countries. Use the following passcode: 5499533. Please call in 10 minutes prior to the start of the call.

Both the presentation materials and a replay of the call will be available on the Investor Relations section of the Rockwell Automation website through February 29, 2024.

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31 January 2024

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"Rockwell had an encouraging start to the fiscal year, with both organic and total sales up low single digits year over year. Importantly, we saw an upward inflection in customer order activity, with total orders up double digits sequentially. Q1 orders were up sequentially across all business segments and regions, with particular strength in North America. High levels of channel inventory and some lingering supply chain constraints continue to impact the timing of product shipments, but underlying conditions remain positive. Our Sensia joint venture had a profitable Q1 with over 25% growth in both orders and sales. We also continue to see double-digit growth in our Annual Recurring Revenue, demonstrating the growing value of our recurring software and services," said Blake Moret, Chairman and CEO.

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Pre-tax margin was 12.7% in the first quarter of fiscal 2024 compared to 23.6% in the same period last year. The decrease in pre-tax margin was primarily due to fair value adjustments in the prior year related to our previous investment in PTC and the timing of prior-year investment spend.

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<sup>(1)</sup> Organic sales growth and Adjusted EPS are non-GAAP measures. See **Adjusted Income, Adjusted EPS, and Adjusted Effective Tax Rate Reconciliation** for more information on these non-GAAP measures.

<sup>(2)</sup> Diluted EPS updated to include the purchase accounting amortization from the Clearpath Robotics and Verve Industrial Protection acquisitions.

"We continue to expect low-single-digit topline growth in FY24, with modest EPS growth weighted to the second half of the year as orders continue to rebound. We are focused on winning share, meeting near-term profitability targets, and investing for the most attractive future opportunities," Moret continued.

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### **Supplemental Information**

ARR - Total ARR grew 20% and Organic ARR grew 18% compared to the end of the first quarter of fiscal 2023.

Corporate and other - Fiscal 2024 first quarter Corporate and other expense was \$40.0 million compared to \$27.3 million in the first quarter of fiscal 2023. The year-over-year increase includes deal costs associated with the acquisition of Clearpath Robotics.

Purchase accounting depreciation and amortization - Fiscal 2024 first quarter Purchase accounting depreciation and amortization expense was \$35.6 million, up \$9.6 million from the first quarter of fiscal 2023 primarily related to the acquisitions of Clearpath Robotics and Verve Industrial Protection.

Tax - On a GAAP basis, the effective tax rate in the first quarter of fiscal 2024 was 18.1% compared to 19.1% in the first quarter of fiscal 2023. The adjusted effective tax rate for the first quarter of fiscal 2024 was 17.9% compared to 17.1% in the prior year.

Share repurchases - During the first quarter of fiscal 2024, the Company repurchased approximately 0.4 million shares of its common stock at a cost of \$120.3 million. At December 31, 2023, \$0.8 billion remained available under our existing share repurchase authorization.

Return on Invested Capital (ROIC) - ROIC was 18.5% for the twelve months ended December 31, 2023, compared to 16.8% for the twelve months ended December 31, 2022. The increase is primarily driven by higher pre-tax income partially offset by a higher effective tax rate.

### Conference Call

A conference call to discuss the quarterly results will be held at 8:30 a.m. Eastern Time on January 31, 2024. The call will be an audio webcast and accessible on the Rockwell Automation website ([www.rockwellautomation.com/en-us/investors.html](http://www.rockwellautomation.com/en-us/investors.html)). Presentation materials will also be available on the website prior to the call.

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Both the presentation materials and a replay of the call will be available on the Investor Relations section of the Rockwell Automation website through February 29, 2024.

### *Trimble Fourth Quarter and Full Year 2023 Earnings Call and Webcast*

30 January 2024

Trimble will hold a conference call on Monday, February 12, 2024 at 8 a.m. ET to review its fourth quarter and full year 2023 results. The call will be broadcast live on the web at <http://investor.trimble.com>. Investors without internet access may dial into the call at (888) 660-6347 (U.S.) or (929) 201-6594 (international). The conference ID is 1043223.

## Implementation Investments

### *Agratas partners with Tata Technologies to fast-track the development and industrialisation of best-in-class battery solutions for mobility and energy sector*

25 January 2024

Agratas, Tata Group's global battery business, and Tata Technologies, a global product engineering and digital services company, have announced their collaboration to scale Agratas' product development and enterprise systems, supporting the design, development and manufacturing of best-in-class battery solutions.

Leveraging Tata Technologies' over 25 years of expertise in product development, digital engineering, digital manufacturing and product supply chain, Agratas will accelerate its product development timelines, including integrating battery cells into modules and packs across multiple applications to match customer requirements.

The two companies are maximising Tata Group's comprehensive #OneTata approach, with Tata Technologies also developing the digital business architectures to support the production of best-in-class battery solutions at Agratas' gigafactories in India and the UK. This new alliance embodies the cross-Tata Group mission to develop a holistic eMobility ecosystem that will advance the production and adoption of Electric Vehicles in India and worldwide. With battery

cell production due to commence in 2026, the collaboration is helping to propel Agratas' anchor customers, Tata Motors and JLR, towards a fully electrified future.

Commenting on the collaboration, **Tom Flack, CEO, Agratas**, said: "We are fully committed towards delivering best-in-class battery solutions to our customers and helping to supercharge the global transition to electric mobility and clean energy storage. Teaming up with Tata Technologies strengthens our pursuit of this mission, helping us to leverage its expertise in Electric Vehicle engineering, including competitive design, packaging and integration of battery packs that are critical for the performance of our customers' products, from next generation Electric Vehicles to energy-dense storage solutions. Our collaboration with Tata Technologies also maximises inter-Group synergies and business excellence, showcasing the strategic benefits of being part of the Tata Group."

Reinforcing the collaboration with Agratas, **Warren Harris, CEO & Managing Director, Tata Technologies**, said: "Tata Technologies' vision of engineering a better world embodies a commitment to innovating sustainable solutions across the eMobility value chain that helps manufacturing companies accelerate their transition towards net zero. The trust awarded by Agratas reaffirms our long-standing expertise in Electric Vehicle engineering and digital transformation solutions for sustainable products. We believe this collaboration will help us strengthen our capabilities around the design and integration of battery pack solutions into battery electric vehicles and also help Agratas accelerate the industrialisation of its gigafactories in the UK and India, enabling it to deliver competitive battery solutions to its customers."

As Agratas scales up its operations, Tata Technologies is also helping Agratas to mobilise resources by facilitating recruitment of highly skilled individuals, enabling onboarding and supporting employee lifecycle activities during this critical growth phase. These resources span roles across the battery solution value chain, including corporate, operational and research functions, reaffirming the depth and breadth of the collaborative engagement.

### *Ather Energy selects Siemens Xcelerator portfolio to speed development of electric mobility solutions*

31 January 2024

Siemens Digital Industries Software announced that Ather Energy, one of India's foremost electric motorcycle brands, has expanded its adoption of the Siemens Xcelerator portfolio of industry software to help the company reduce its design and engineering cycle time, improve product quality and achieve faster time to market.

Ather Energy was founded in 2013 by Indian institute of Technology (IIT) Madras alumni, Tarun Mehta, and Swapnil Jain. In 2018, it launched India's first truly intelligent electric scooter - Ather 450, followed by the new flagship offering Ather 450X in 2020, the 450S in 2023 and Ather's special edition scooter, the Ather 450 Apex in January 2024.

Ather has also installed a comprehensive public charging network, Ather Grid, designed and built in India. With 1600+ charging points across India, Ather Grid is one of the country's largest

fast-charging networks for electric scooters. The company currently has 175+ Experience Centers across India and plans to add a total of 250 outlets by March 2024. Ather recently forayed into the international market with two Experience Centers in Nepal.

“In the fast-evolving EV industry, speed to market is an important lever to succeed. Siemens' expanded PLM management enables parallel processing of engineering deliverables, a departure from the sequential approach, thereby reducing the lead time for introducing new products and features,” said Swapnil Jain, Co-founder & CTO at Ather Energy.

“Startups are the lifeblood of the electrification revolution in mobility and we're proud to work alongside the Ather Energy team to help them expand their capabilities to bring their breakthrough products to the Indian market,” said Robert Jones, Executive Vice President, Global Sales and Customer Success, Siemens Digital Industries Software, during a recent visit to the Ather Energy facility. “Our work with Ather Energy is another proof point of leading innovators and pioneers choosing the Siemens Xcelerator portfolio as the platform of choice for product development in the electrification of mobility and helping the world achieve cleaner, more sustainable transportation.”

Ather Energy adopted Siemens' Teamcenter® software for Product Lifecycle Management (PLM) in 2018 to help it achieve its critical key performance indicators (KPIs) including faster time to market, reducing its design and engineering cycle time with the removal of design iterations and adopting a right first-time approach. Since then, the Ather Energy team has also taken advantage of Simcenter™ STAR-CCM+ software for Computational Fluid Dynamics (CFD) and Simcenter™ physical testing solutions to help with its in-house testing regime for durability and noise, vibration and harness (NVH). Most recently, the Ather Energy vehicle engineering team has moved to Siemens' NX™ software for new product development and engineering from its legacy system for all existing and new vehicle platforms.

“The simulations and virtual testing we perform using Siemens' tools enable us to crush timing and provide us with great savings in resources and money spent on repeating testing. The stack-up analysis enables us to get the design right the first time and avoids engineering changes. We are looking at expanding the Siemens tools into controlling the manufacturing processes by introducing the management of 'Bill of Processes'.” added Swapnil Jain.

### ***BMW Group Partners with Dassault Systèmes to Bring the 3DEXPERIENCE Platform to Its Future Engineering Platform***

1 February 2024

Dassault Systèmes and BMW Group embarked on a long-term strategic partnership to develop BMW Group's future engineering platform featuring Dassault Systèmes' 3DEXPERIENCE platform at its core. More than 17,000 employees across multiple engineering disciplines at the premium automobile manufacturer will rely on the 3DEXPERIENCE platform to accelerate the development of all vehicles, from their ideation to their production.

In an industry where quick time to market of sustainable mobility solutions with advanced technology is a competitive differentiator, the partnership between Dassault Systèmes and

BMW Group is testimony to the fundamental role of the 3DEXPERIENCE platform in enabling companies to deliver products faster. The platform's virtual twin experiences streamline enterprise-wide collaboration and deliver data-driven approaches to manage the exponential complexity carmakers are facing in connected, autonomous vehicle engineering.

"We will only optimize our engineering process if we think digital, work connected and rely on an integrated data. For the BMW Group the 3DEXPERIENCE platform will support this approach and help to reach a higher level of quality in our processes," said Julien Hohenstein, Vice President Processes, Digitalization, Governance Idea to Offer at the BMW Group research and development.

With the 3DEXPERIENCE platform at the core of BMW Group's future product development environment, all BMW Group engineering disciplines will be working on a virtual twin of a vehicle that can be configured for the variants of each model with real-time, integrated data. Teams can reuse components more easily, master the complexity of car variability, and improve the engineering to manufacturing cycle time. In addition, BMW Group can seamlessly migrate data from its existing IT solutions and extend its engineering platform to other disciplines such as modeling and simulation.

The strategic partnership between Dassault Systèmes and BMW Group marks the next phase in their long-term collaboration. For decades, the two companies have pooled their knowledge and know-how to advance technological innovation in areas including production planning and scheduling, part design and production efficiency.

"BMW Group and Dassault Systèmes are technology-driven companies that are entering a new era of shared innovation to deliver best-in-class products," said Laurence Montanari, Vice President, Transportation & Mobility Industry, Dassault Systèmes. "With the 3DEXPERIENCE platform, BMW Group can rethink its engineering development process to deliver the most personalized and sustainable experiences to its customers."

## *CAPGEMINI ENABLES IMPROVED EFFICIENCY AND PRODUCTIVITY FOR THE AUTO CLUB GROUP WITH MODERNIZED IT INFRASTRUCTURE*

29 January 2024

**Capgemini announced that it has enabled the Auto Club Group (ACG) to benefit from a successful migration of its core insurance processing applications to Google Cloud. As a result, ACG is now able to simplify its IT infrastructure, streamline operations, and enhance application capabilities and server management for improved efficiency and productivity.**

Faced with an end-of-service deadline and escalating costs, ACG was looking for a trusted business and technology transformation partner with robust expertise to support its move to Google Cloud. Capgemini was chosen for its industry leading capabilities in supporting clients on similar journeys. Working with ACG, Capgemini orchestrated a seamless migration involving its entire production and non-production server infrastructure. Through a more stable, secure, and future-proofed technology stack, ACG now has the platform to scale for future digital transformation initiatives.

This initiative will see ACG ensure business continuity and gain substantial long-term cost savings, in the region of \$500,000 per year, by consolidating its data centers and product suite to Google Cloud's infrastructure.

*"This was a critical and time-sensitive initiative for ACG that will yield significant value in terms of cost savings, system scalability, and resilience and was a key component of our broader transformation journey. The partnership and collaboration from Capgemini and Google Cloud was critical in executing this highly complex initiative seamlessly with little to no impact on our business operations. Kudos to the teams on this success that serves as a testament to our deep longstanding partnership,"* said Madhu Nandagiri, Vice President Infrastructure and Digital IT, Auto Club Group.

*"Our collaboration with ACG to deliver this successful migration was always grounded in building a strong foundation for a digital and sustainable future. We put the right people and skills in place for the team to manage this transition, without compromising on security, and to mitigate any service disruption. We are excited to help them realize quantifiable business value through this transformation journey and discover new opportunities together to drive further value creation,"* said Shane Cassidy, Head of the Global Insurance Business Unit at Capgemini.

*"Embracing the cloud is not just about technology; it's about reimagining the role of IT in the digital age by shifting from managing infrastructure to driving strategic innovation. Our longstanding partnership with ACG and Capgemini to modernize ACG's infrastructure and transform its insurance processing will not only help reduce cost but ultimately improve employee and member experiences. We look forward to working together to harness the power of cloud and AI to enable transformational change and drive business value,"* Nigel Walsh, Managing Director, Insurance, Google Cloud.

## *Dixie Chopper Has Implemented GenAlpha's Equip360 Digital Platform*

25 January 2024

Dixie Chopper, a renowned manufacturer of industrial zero-turn lawnmowers, has successfully implemented GenAlpha Technologies' Equip360 digital platform. They launched on January 2nd, marking the beginning of a new era for Dixie Chopper and their commitment to providing an exceptional customer experience.

Dixie Chopper, known for their dedication to manufacturing top-tier zero-turn lawnmowers, has chosen Equip360 to enhance its digital capabilities and elevate support for both its dealers and customers. The implementation includes key modules such as eCommerce, interactive parts manuals, warranty, and return material authorization (RMA)—all designed to optimize the overall customer journey.

Equip360's eCommerce module ensures a seamless online shopping experience, while the interactive parts manuals bring an innovative and user-friendly dimension to accessing crucial information. The warranty and RMA modules streamline support processes, demonstrating Dixie Chopper's commitment to efficient after-sales service.

***"We are excited to partner with GenAlpha Technologies in this digital transformation journey. GenAlpha's understanding of the industry, coupled with their aftermarket parts background, makes them an ideal collaborator for us. The implementation of Equip360 is a testament to our dedication to providing the best possible support and experience for our valued dealers and customers,"*** added Lisa Tubbs, President of Dixie Chopper.

Kris Harrington, CEO of GenAlpha Technologies expressed confidence in the positive impact of these advancements. ***"Working with Dixie Chopper has been a great experience for everyone on the team. It's evident that Dixie Chopper shares our passion for delivering excellence to dealer partners and customers. We are eager to witness the growth and success that lies ahead for Dixie Chopper in the digital landscape."***

### ***European Contractors Radically Increase Project Profitability with ALICE Technologies***

30 January 2024

ALICE Technologies announced that multiple European customers have substantially increased the profitability of their major construction projects by optioneering their schedules using the ALICE platform. The AI-powered construction optioneering solution helps general contractors and owners worldwide to leverage the power of generative scheduling to plan, bid and build their capital projects more efficiently.

Customers are currently using the ALICE platform on a variety of infrastructure projects across Europe. With ALICE, they are able to challenge their baseline schedules and explore alternative ways to build using ALICE's powerful "what-if" analysis capabilities. Through this optioneering process, ALICE customers have developed schedule alternatives that are substantially more profitable than the originals.

As exemplified here, through their use of the ALICE platform, major European GCs have increased their profits by an average of 91%:

<b>Project type</b>	<b>Original profit margin (est.)</b>	<b>Profit with ALICE optioneering</b>	<b>% increase</b>
Railway bridge	2.0%	3.9%	95%
Prison complex	5.0%	5.8%	16%
Ventilation shafts	2.0%	6.8%	240%
Railway bridge	4.0%	9.0%	125%
Metro cavern	4.0%	10.6%	165%
<b>Average</b>	<b>3.4%</b>	<b>6.5%</b>	<b>91%</b>

“The construction industry is one that has historically had very low margins,” said ALICE CEO René Morkos. “With such little wiggle room, even a modest delay can transform a project from winner to loser. With ALICE, our customers are exploring alternatives to their baseline schedules and improving on them in ways that are decreasing risk and significantly increasing profits. These results represent the transformative power of construction optioneering, and we’re pleased to be helping our customers to revolutionize their results.”

### *Infosys Collaborates with Musgrave to Drive Cognitive First IT Transformation*

31 January 2024

Infosys, a global leader in next-generation digital services and consulting, announced that it has signed a seven-year strategic collaboration with Musgrave, Ireland’s leading food retail, wholesale and foodservice company. As part of this collaboration, Infosys will help automate Musgrave’s IT operations by leveraging its industry leading AI and Cloud offerings, Infosys Topaz, an AI-first set of services, solutions and platforms using generative AI technologies, and Infosys Cobalt, a set of services, solutions and platforms for enterprises to accelerate their cloud journey.

These offerings from Infosys will enable Musgrave in transforming its IT operations, build technical expertise, and help Musgrave accelerate towards its goals of enhancing the experiences of its customers and retail partners.

Through its Cognitive First framework, Infosys will aim to enable digital experiences and boost operational efficiencies by integrating artificial intelligence (AI), machine learning (ML), knowledge management, and cognitive automation capabilities to amplify enterprise intelligence across the value chain for Musgrave.

**Stephen Mckenna, Chief Technology Officer, Musgrave,** said, “I am delighted by our recently announced collaboration with Infosys, which will enable us to leverage Infosys’ expertise and resources to deliver innovative solutions to all our customers and retail partners. Musgrave has always been committed to providing our customers with the best possible service, and this collaboration is a testament to that commitment. We are confident that this collaboration will result in new and exciting products and services that will benefit all our customers.”

**Karmesh Vaswani, EVP & Global Head Retail, Consumer Goods & Logistics, Infosys,** said, “We are thrilled to embark on this transformative journey with Musgrave. Through our strategic collaboration, we aim to enable Musgrave in transforming its IT operations, help enhance user experiences, and accelerate strategic initiatives. Our technological solutions enable Musgrave’s digital transformation agenda for the future. This collaboration will further strengthen our presence and propel our growth in Ireland.”

## *Keysight and Samsung Certify Electromagnetic Simulation Software for Samsung Foundry's 8LPP Process Technology*

25 January 2024

Keysight Technologies, Inc. announces that the RFPro electromagnetic (EM) simulation software, part of the Keysight EDA Advanced Design System (ADS) integrated tool suite, is now certified by Samsung Foundry for design engineers targeting its 8-nanometer (nm) LPP (Low Power Plus) process. The new EM simulation capability, together with process design kits (PDKs) for Samsung's radio frequency (RF) technologies for circuit and physical designs, supports the achievement of first pass success by radio frequency integrated circuit (RFIC) design teams.

Keysight ADS, RFPro, and GoldenGate are industry leading platforms for RF and microwave circuit design that help designers address their most difficult challenges with advanced solutions for RFIC and EM simulation. RFPro is a 3D EM simulation interface integrated into ADS, Cadence Virtuoso, and Synopsys Custom Compiler environments. RF and microwave circuit designers using these environments can easily run interactive EM-circuit co-simulation for tuning and optimization during layout rather than as a separate, standalone analysis step. RFPro includes Momentum 3D Planar and FEM full 3D EM simulators with automatic expert setup to accelerate interactive simulation and shorten the design cycle.

Samsung Foundry is the leading semiconductor foundry offering optimized foundry solutions, including state-of-the-art process technology, validated IP, and design service solutions. The 8LPP PDK from Samsung now includes technology files for use in Keysight EDA's RFPro.

**Sangyun Kim, Vice President and Head of Foundry Design Technology Team at Samsung Electronics** said: "Samsung has been successfully collaborating with Keysight EDA to solve the most complex RF problems for our customers. The certification of 8LPP technology with Keysight's RFPro means that simulation of different inductors attained highly precise correlation with silicon measurements per Samsung's certification standards. This is the first of many and we will continue to partner with Keysight to ensure such certifications for our various RF technology offerings."

**Nilesh Kamdar, Senior Director and RF and Microwave Portfolio Manager at Keysight**, said: "Foundry customers need design tool solutions that deliver faster time-to-market for RFICs and workflows. Keysight EDA is a long-time partner in the Samsung Advanced Foundry Ecosystem (SAFE™) program, and we have been collaborating to ensure our mutual customer success with Samsung's advanced semiconductor technologies. Our partnership reached another milestone this year in certifying RFPro for the Samsung 8LPP process technology, which enables designers to perform fast and accurate EM simulation, facilitating interactive analysis of EM effects in their complex designs."

## L&T Technology Services supports Marelli in Revolutionizing Automotive Infotainment with Digital Twin Technology

1 February 2024

L&T Technology Services Limited, a leading global digital engineering and R&D services company, supports Marelli, a leading mobility technology supplier to the automotive sector in redefining the landscape of automotive infotainment and information cluster design through the introduction of Marelli's groundbreaking Digital Twin solutions. By harnessing the power of these innovative solutions, Marelli – supported by LTTS – has drastically streamlined automotive software development processes and reduced prototype costs, heralding a new era in the automotive industry for the development of Software Defined Vehicles (SDV).

Built on Amazon Web Services (AWS), with the support of LTTS, Marelli's Digital Twin provides a virtual replica of the entire car electric-electronic architecture - from information clusters to infotainment, and from Zone Control Units to body. Leveraging Digital Cockpit that runs on the latest generation Snapdragon® Cockpit Platform from Qualcomm Technologies, Inc. and LTTS cloud-based virtualization solutions, Marelli's Digital Twin streamlines software development and prototype creation, cutting costs and accelerating timelines. This innovative solution is set to revolutionize the automotive industry, **significantly reducing software development time by up to 70% and prototype costs by up to 30%**.

The groundbreaking solution was showcased at the Consumer Electronics Show (CES) 2024, held in Las Vegas in January 2024.

*"We are excited to join forces with LTTS in our ongoing efforts to enhance our Digital Twin," expressed **Roberto Secchi, Head of Software Platform and DevOps at Marelli's Electronic Systems** division. "Marelli has become a key player in the SDV arena, thanks to our dedicated investments and the exploration of various business prospects, all driven by our unwavering commitment to innovation. Leveraging LTTS' capabilities will further boost our product portfolio, reinforcing Marelli as the premier technology partner for automotive companies."*

*"We are thrilled to embark on a strategic collaboration with Marelli, leveraging the vast capabilities of software defined mobility, Digital Cockpit systems, connected cars to bolster Marelli's vision to revolutionize the future of mobility," said **Abhishek Sinha, Chief Operating Officer and Board Member at L&T Technology Services**. "This partnership is not only catalyzing unparalleled efficiencies in automotive software development but also spearheading the future of automotive infotainment through our groundbreaking digital twin offerings. Together, we are pioneering a new era of innovation, setting the stage for the next generation of mobility solutions."*

## *Lockheed Martin, NVIDIA Demonstrate AI-Driven Digital Twin With Potential To Advance Predictive Forecasting*

30 January 2024

In a year where the National Oceanic and Atmospheric Administration (NOAA) has reported record ocean temperatures, an innovative project from Lockheed Martin (NYSE: LMT), built in collaboration with NVIDIA, is showing how artificial intelligence can be used to fuse data and detect anomalies in current environmental conditions.

Since 2022, Lockheed Martin has collaborated with NVIDIA to build a prototype of an AI-driven Earth and Space Observing Digital Twin that can:

- Process live streams of incoming weather data, apply AI and machine learning to analyze the data,
- Display current global environmental conditions from satellite and ground-based observations and output from weather forecasting models.

Recently, the project achieved a significant milestone, demonstrating one of NOAA's critical data pipelines – sea surface temperatures – to highlight multi-sensor fusion from satellite and model data along with short term temperature anomalies.

The Earth and Space Observing Digital Twin aims to provide NOAA with an efficient and centralized approach to fuse and visualize data from various space and earth sensors. The demo showed NOAA and other government customers the potential of using AI to display high-resolution, accurate, and timely depictions of satellites and sensor data.

“A platform such as our digital twin could serve as a one-stop-shop for global weather monitoring and could enable more accurate initial conditions for predictive forecasting,” said Lynn Montgomery, AI research engineer at Lockheed Martin. “Every day, NOAA receives terabytes of weather data from numerous space and Earth-based sensors, and this project helps fuse this information accurately to support timely depiction of global conditions.”

The project uses Lockheed Martin's OpenRosetta3D software and the NVIDIA Omniverse development platform to build applications that aggregate data in real time. The Digital Twin uses these technologies to advance 4D visualizations and display this information in a digestible format.

“From monitoring current environmental conditions to predicting them, digital twins can help climate and weather enterprises tackle their toughest AI and forecasting challenges,” said Dion Harris, director of accelerated computing product solutions at NVIDIA. “This latest milestone in our collaborative efforts demonstrates how NVIDIA Omniverse can quickly synthesize terabytes of NOAA data from a large number of sources to speed up global weather monitoring and prediction.”

Lockheed Martin's next plans are to incorporate additional data streams — such as space weather and sea ice concentrations — into the Earth and Space Observing Digital Twin next year.

This project was funded by NOAA SAE Joint Venture Partnerships for the exploration of possibilities for a future state and not a mission itself.

## *Matterport's Digital Twin Platform Helps VRPM Design the Future of Modern Workspaces*

26 January 2024

Matterport, Inc. partner, VRPM, a leading visualization and virtual staging platform, demonstrated how Matterport's Digital Twin Platform is being applied to virtual reality staging to interior design in the commercial real estate sector.

VRPM is one of the leading virtual staging platforms in the UK, which with Matterport's technology has scanned over 15,000 properties. As the impact of the COVID-19 pandemic reshaped the business landscape, VRPM experienced a surge in demand for virtual staging and design solutions addressing challenges such as varying occupancy levels and increased distancing between workspaces.

Collaborating with Compton, a London-based office and investment real estate firm, VRPM uses virtual staging within Matterport 3D digital twins to provide potential tenants an authentic sense of what it would be like to inhabit a space. Utilizing Matterport's developer tools, VRPM has created a virtual staging app that seamlessly integrates with 3D scans, enabling collaborative design processes within an immersive digital twin.

Virtual staging's future extends beyond just securing tenant leases. It now emphasizes enhancing real estate customer experiences by considering the needs of prospective occupants, such as office furniture requirements or the desire to fully replicate the virtual staging. Traditionally, commercial furniture manufacturers used standard architectural models to display furniture in buildings. However, with Matterport's digital twins, VRPM can create virtual stages with 3D objects that accurately show a piece's appearance and fit in a space. VRPM aims to make these stages shoppable, allowing tenants to directly purchase the furniture and décor they see from the manufacturers.

The accuracy of Matterport's digital twins has enabled VRPM to effectively support Kitt, one of London's leading managed office operators, in staging some of its commercial properties. Utilizing VRPM and Matterport, Kitt successfully staged nearly 15,000 square feet in just a week, a key factor in rapidly marketing the space to potential tenants. Furthermore, Kitt collaborated with VRPM and Matterport to create a library of furniture and design choices, enabling tenants to visualize their future spaces tailored to their specific business needs. Implementing these concepts physically would have incurred costs of tens of thousands of dollars.

## *Nhabe Garment Navigates Market Challenges with Centric PLM*

29 January 2024

Centric Software® is pleased to announce that Nhabe Garment Corporation (NBC), a household name in garment and apparel manufacturing in Vietnam has selected Centric PLM™ to drive go-

to-market innovation and value creation for consumer goods retailers, brands and manufacturers. Centric Software provides the most innovative enterprise solutions to plan, design, develop, source, buy, make, price, allocate, sell and replenish products such as fashion, outdoor, luxury, multi-category retail, grocery, food & beverage, cosmetics & personal care and consumer electronics to achieve strategic and operational digital transformation goals.

Founded in 1975, with two garment factories named Ledgine and Jean Symi in the Saigon Export Processing Zone, NBC has gained an impressive reputation for producing high quality products. with a large capacity to produce for domestic and foreign customers. With 38 member units, 30,000 employees and 25,000 pieces of advanced machinery operating across various fields and locations in Vietnam, NBC has established itself as a key player in the industry.

For many years, NBC focused on trading and exporting under the Cut, Make, Package and Trim (CMPT) and Free on Board (FOB) business model, servicing over 100 leading fashion brands and retailers all over the world. However, recent market volatility prompted NBC to pivot to the Original Equipment Manufacturer/Original Design Manufacturer (OEM/ODM) model. To support this transition and address the reduction in incoming orders, NBC recognized the need for the right tools and technology in place.

Nguyen Ngoc Lan, CEO of NBC shares, “We have to follow where the demand is, so when the CMPT orders slowed down, that gave us the push and opportunity to shift the business. For us, this means strengthening our R&D, streamlining processes in materials sourcing and stock inventory as well as investing in technology that will enable us to achieve our new goals.”

NBC has a legacy system in place, but the company needed a tailor-made solution designed for fashion manufacturers that can understand and work around the best practices in the industry which they found in Centric PLM. Leveraging Centric’s market-driven technology, NBC is set to optimize operations and boost innovation, ultimately overcoming market challenges.

On the selection process, Lan adds, “The Centric team knew what questions to ask and was quick to address our concerns on the spot. We are looking forward to improving efficiency with the PLM implementation.”

President of Centric Software, Fabrice Canonge says, “We applaud NBC’s courageous and strategic decision to remodel their business. With Centric Software’s suite of next-gen technology and solutions, we are confident that they will achieve their digital transformation goals.”

### *Regional Investment Corporation Australia Subscribes to Infosys Finacle’s SaaS Offering on AWS for its Lending Operations*

30 January 2024

Infosys Finacle, part of EdgeVerve Systems, a wholly-owned subsidiary of Infosys, and Regional Investment Corporation (RIC), an Australian government concessional finance provider for farmers, today announced RIC’s successful implementation of the Finacle Digital Lending Solution Suite in a Software-as-a-Service (SaaS) mode running on AWS. The transformation

project, which included the adoption of the Finacle Online Banking and Finacle Alerts Solution, was completed in just nine months. RIC is now able to offer truly digital financial lending services to its customers in the Australian agricultural sector at significantly lower operating costs and higher self-service capabilities.

**The key highlights of RIC's digital transformation include:**

- By choosing a Software-as-a-Service (SaaS) model on AWS, RIC has been able to internalize management of key services, previously provided by a third party. This has led to significant reduction in operating costs and greater efficiencies.
- The new platform, which offers comprehensive API capabilities, has empowered RIC to seamlessly integrate with various service providers across banking, CRM, data lake, and document management providers. With this capability, RIC now has the advantage to implement Federal government mandates much faster than before.
- The Finacle Online Banking Platform, which includes a smart dashboard, is helping RIC offer self-service features to customers, thereby reducing dependencies on customer care support. The new interface provides rich and truly digital functionalities, which has resulted in increased customer satisfaction and enhanced staff engagement.

**Chris Rawlins, Executive Director Transformation, Regional Investment Corporation (RIC)**, said, "At RIC, our mission is to nurture the growth of the Australian farm businesses through affordable loans, while also ensuring their resilience and profitability. With the Infosys Finacle Lending solution, we have a proven technology platform to support the evolving demands of our business and customers, with the agility to roll out new products and regulations as mandated by the Federal Government. The nine-month implementation by the Infosys Finacle team was delivered on schedule and we are impressed by the team's commitment to facilitate RIC in achieving a smooth transition without any disruptions to our customers."

**Sajit Vijayakumar, Chief Business Officer, Infosys Finacle**, said, "We are delighted to support RIC in their mission to financially empower the farm businesses in Australia through the Infosys Finacle SaaS platform. This collaboration is yet another testament to Finacle's commitment to the Australian market, to support financial institutions of all kinds and sizes – banks, credit unions, mutuals and non-banking lenders – on their digital transformation journeys."

### *Rhino Selects GenAlpha's Digital Platform Equip360*

1 January 2024

We are excited to announce that Rhino, a leading manufacturer in the agricultural equipment industry, has successfully implemented GenAlpha Technologies' Equip360 digital platform. This strategic move aims to elevate customer satisfaction and provide an optimized digital experience for both dealers and customers.

Known for their commitment to the dependability and performance of their agricultural, commercial, and industrial mowing products, Rhino has launched Equip360's eCommerce, interactive parts manuals, product configurator, warranty, and return material authorization

(RMA) modules. This implementation, which took effect in January of this year, reflects Rhino's dedication to advancing their customer support capabilities.

Rhino's products have long been synonymous with excellence, and the migration to Equip360's digital tools is a testament to their ongoing commitment to delivering top-notch service. The new modules will not only streamline support processes but also contribute to building on Rhino's decades of providing high-level support to their valued customers and dealers.

*"We're thrilled to partner with GenAlpha to enhance the online experience for our dealers and customers. With GenAlpha's aftermarket parts background and understanding of our industry, we believe this collaboration will lead to an unparalleled digital journey for our stakeholders. We are eager for our customers to experience the benefits of these innovative tools,"* commented Lisa Tubbs, President at Rhino.

*"At GenAlpha, we are equally enthusiastic about this collaboration. Working with Rhino to expand their online presence aligns with our commitment to helping businesses grow and thrive in the digital landscape. Rhino's focus on customer and dealer satisfaction aligns with our values, and we are confident that Equip360 will contribute to their continued success,"* said Kris Harrington, CEO of GenAlpha Technologies.

### *Royal Papworth Hospital NHS Foundation Trust Selects Idox and Softcat to Transform Hospital Equipment Tracking and Traceability*

1 February 2024

*Idox's iAssets asset tracking solution supports the Trust's digital innovation strategy by providing a safe and cost-effective way to track hospital equipment.*

- 11,500 items of medical equipment tracked, with plans to scale to all hospital equipment
- GS1-compliant passive RFID tags enable real-time tracking to locate equipment
- iAssets will substantially reduce time in searching, servicing and auditing equipment, increase equipment availability for effective patient care and reduce cost of re-procuring missing equipment

Royal Papworth Hospital NHS Foundation Trust has selected Idox's [iAssets](#) asset tracking solution to **improve patient safety, clinical staff productivity, and overall efficiency**. The solution will use GS1-compliant passive RFID tags to enable real-time tracking of all equipment that moves around the hospital.

Designed to deliver a safe, cost-effective way to track hospital equipment, with Scan4safety and **GS1** compliance at its core, iAssets will support the Trust to substantially reduce the time spent searching for, servicing and auditing equipment and reduce the cost of re-procuring missing assets. With improved equipment traceability, staff have more time to spend with patients, **improve asset availability, streamline compliance, and optimise patient care and safety**.

Initially tracking 11,500 items of medical equipment, the Trust plans to scale the solution beyond medical equipment to include all hospital items that move around the Trust estate, including beds, laptops, pumps and much more.

Andrew Raynes, CIO at Royal Papworth Hospital NHS Foundation Trust, comments: “Freeing up time for our staff to spend with patients rather than searching for equipment is a critical benefit to deploying Idox’s iAssets solution. With greater levels of traceability, staff can also maximise the impact of available resources and better control budgets through reduced asset loss, saving the Trust – and taxpayers – significant costs.”

Steve Bruce, Divisional Director of Assets at Idox, comments: “Working with Royal Papworth Hospital NHS Foundation Trust has been an exciting journey of innovation through which our collective ambition has been to ensure that the right equipment is in the right place, for the right patient, at the right time. We are looking forward to continuing our collaborative partnership and scaling the solution further to, in time, capture the total patient encounter while enhancing digital sustainability through accurate equipment tracking.”

Graham Chalton CEO at Softcat PLC, comments “We love the opportunity to deliver cutting edge technology that can benefit public sector organisations. This is so important given the shift in recent years to ways of working, budgets and technological advancements. By supporting projects like this with Idox and Royal Papworth we can drive digital transformation, save resources and time, and improve patient care. We look forward to supporting their journey and continuing our collaboration.

### *SAP Collaborates with UC Berkeley to Advance AI Research*

30 January 2024

SAP SE announced it will collaborate with the Sky Computing Lab at the University of California (UC), Berkeley to support the university’s cutting-edge research on interconnected cloud technology in the context of artificial intelligence (AI).

UC Berkeley’s insights will help accelerate SAP’s AI strategy aiming to build hundreds of applications.

“There’s no technology advancing faster than AI,” SAP Chief AI Officer Philipp Herzig said.

“While the progress on foundation models is impressive, there is a lot to learn and shape on the AI stack on top, in particular for designing and scaling distributed cloud applications in multi-cloud environments or to build AI agents in combination with large language models. The Sky Computing Lab at UC Berkeley conducts very relevant research in this field, and the frameworks that are being built look very promising.”

Generative AI is a transformative force that is changing how people work, communicate and learn. As AI applications become increasingly sophisticated, efficient handling of large workloads becomes critical.

UC Berkeley’s research activities focus on enabling users to run large language model applications and general AI workloads seamlessly on any cloud, substantially reducing cloud

costs, tapping into best-in-class hardware on different clouds and enjoying higher resource availability, according to Ion Stoica, director of the Sky Computing Lab at UC Berkeley.

The interconnection of clouds aims to create a distributed network, giving users access to a vast pool of computing power. This agility is crucial for dynamically allocating and scaling computational capabilities based on specific AI task requirements, ensuring optimal efficiency and cost-effectiveness for users. As the computational demands of AI continue to evolve, this approach ensures not only the scalability and efficiency of AI tasks but also lays the groundwork for an innovative and interoperable future in artificial intelligence.

Through this collaboration with the Sky Computing Lab at UC Berkeley, SAP aims to advance knowledge in artificial intelligence. Besides AI-specific expertise, SAP will support graduate students through scholarships and internships.

## *TCS Expands Strategic Partnership with Aviva with a new 15-year agreement in the UK*

30 January 2024

Tata Consultancy Services (TCS) announced a 15-year expansion of its partnership with Aviva, the UK's leading Insurance, Wealth and Retirement provider, to transform Aviva's UK Life business and enhance customer experience leveraging the TCS BaNCS™ based platform. As part of this, the end-to-end policy administration and servicing will expand to cover over 5.5 million policies, to be managed by Diligenta, TCS' FCA regulated subsidiary in the UK, on behalf of Aviva.

Aviva and TCS have jointly transformed the end-to-end experience of Aviva's customers over the years, through a strong foundation of digitization and simplification. Aviva has now engaged TCS, to extend this enhanced customer experience using the same future-proof TCS BaNCS™ based digital platform to administer other Aviva books of business.

TCS' customer-centric approach to digitization at enterprise level is centered around New Consumer Duty Principles to provide good customer outcomes, through self-service capabilities for customers, digitally powered service delivery centers and a simplified technology landscape. TCS will leverage its BaNCS™ based platform and contextual knowledge to improve service quality and enhance the experience for all stakeholders including policyholders, advisers, and operational staff. This will enable quicker resolutions, improved access to information and better outcomes for Aviva's customers.

**Doug Brown, CEO Insurance, Wealth & Retirement, Aviva** said: *“Extending this strategic partnership will improve how we serve our customers, further simplify our operations and support our growth ambitions. It will allow us to rationalize our systems and improve efficiency, bringing significant benefits for our customers and the business.”*

*“Our long-standing relationship with Aviva over the last 20 years is a testament to our joint efforts to consistently and continuously transform customer experience. We are delighted as we embark on the next chapter of this journey, where ongoing investment in our TCS BaNCS™ based platform and proven track record will enable Aviva to drive a customer-centric*

*business, even as we continue to improve end-to-end customer experience benchmarks in the UK Life and Pensions industry,” said R Vivekanand, President, BFSI Products & Platforms, TCS.*

TCS BFSI Platforms is an end-to-end digital ecosystem that powers the journeys of life, pensions/annuities, property/casualty, and health insurance providers. This SaaS-first platform helps companies manage enterprise simplification, deliver superior customer experience, and achieve digital transformation.

This announcement further enhances the strong growth momentum that TCS has seen in the UK. TCS has operated in the UK for more than 45 years and works with over 200 of the nation’s best-known and most-loved businesses including British Airways, Virgin Atlantic, Sainsbury’s, Nationwide, M&S, Asda and Boots. TCS has a leadership position in software and IT services to the UK market. It currently employs more than 23,000 people in the UK and Ireland, making it among the region’s biggest IT employers. TCS has been ranked the number one IT service provider for customer satisfaction in the UK in an independent survey of CIOs from the largest IT spending organizations in the country.

### *WeAreAM Adds DMP Flex 350 Dual to Manufacturing Workflow — Expanding Addressable Applications*

29 January 2024

**3D Systems** announced that **WeAreAM**, a digital and metal additive manufacturing company located in Brescia, Lombardia, Italy, has added 3D Systems’ **DMP Flex 350 Dual** to its new Center of Excellence. WeAreAM’s services cover additive manufacturing from application engineering and design through production and post-processing for a breadth of industrial markets such as oil & gas, automotive, and aerospace. The addition of 3D Systems’ direct metal printing solution will enable WeAreAM to explore an expanded set of applications — allowing the company to become increasingly responsive to its customers’ requirements, thus helping accelerate innovation. 3D Systems’ newest partner in Italy, **Gruppo Grazioli**, will work in close collaboration with WeAreAM providing training, support, and other services to ensure manufacturers integrating AM are maximizing the solution and thus their investment.

The DMP Flex 350 Dual enables flexible application use and quick-swap build modules, and a central server to manage print jobs, materials, settings, and maintenance for 24/7 productivity. Additionally, the unique vacuum chamber significantly reduces argon gas consumption while delivering best-in-class oxygen purity (<25 ppm). The printer also includes **Oqton’s 3DXpert** software which supports every step of the additive manufacturing workflow from design to post-processing, to quickly and efficiently transition from a 3D model to successfully printed parts. This single software solution for modeling, simulation, and manufacturing eliminates the need to rely on multiple software packages. Efficiencies driven by 3DXpert can enable up to 75% faster file-processing time, and increase productivity by up to 40%.

“The addition of our DMP technology in WeAreAM’s Center of Excellence marks a significant milestone in their journey toward achieving manufacturing optimization,” said Matteo Marcellini, director, industrial solutions, 3D Systems. “Our DMP Flex 350 Dual is renowned as a high throughput, high repeatability metal 3D printer that is capable of producing high-quality

parts in a broad range of alloys. The addition of this printer will not only help WeAreAM address its customers' evolving application needs and catalyze innovation, it will also help improve productivity. Additionally, our newest partner, Gruppo Grazioli, brings deep expertise in solutions integration to help manufacturers optimize their investments. I'm looking forward to all we will be able to achieve through this collaboration."

"We are excited about our collaboration with 3D Systems and Gruppo Grazioli, aimed at showcasing how metal 3D printing technologies can be utilized to create functional objects," said Paolo Folgarait, Ph.D., founder, president & CEO, WeAreAM. "The rapid serial production of parts on the 3D Systems DMP Flex 350 Dual meets all critical safety requirements across various application sectors, and empowers manufacturers to design innovative products."

Carlo Grazioli, board member, Gruppo Grazioli added, "We are thrilled about our collaboration with 3D Systems, a significant step that solidifies our position in the metal additive technology sector in Italy. The partnership enables us to further provide advanced solutions and comprehensive support, thus contributing to driving innovation in the Italian industrial landscape. We are committed to delivering added value to businesses through the integration of cutting-edge technologies, fostering growth and excellence in the industry."

## Product News

### *BIM 360 Cost Management – January 2024*

23 January 2024

Autodesk announced the January 2024 update to BIM 360 Cost Management in a blog post written by Ian Turner. Ian writes about updates to the Budget Tool, the Cost Tool, the Change Order Tool, the Forecast Tool, and the Settings. Additionally, he announced enhancements to the Approval Workflow, Document Attachments, and the Cost KPI Template. Read the full blog post here: <https://blogs.autodesk.com/bim360-release-notes/2024/01/23/bim-360-cost-management-january-2024/>

### *Cadence Significantly Advances ECAD/MCAD Convergence for Electronic Systems with New Celsius Studio AI Thermal Platform*

31 January 2024

Cadence Design Systems, Inc. announced Cadence® Celsius™ Studio, the industry's first complete AI thermal design and analysis solution for electronic systems. Celsius Studio addresses thermal analysis and thermal stress for 2.5D and 3D-ICs and IC packaging, in addition to electronics cooling for PCBs and complete electronic assemblies. While current product offerings consist mostly of disparate point tools, Celsius Studio introduces an entirely new approach with a unified platform that lets electrical and mechanical/thermal engineers concurrently design, analyze and optimize product performance without the need for geometry simplification, manipulation and/or translation.

Celsius Studio brings a new system-level thermal integrity solution into the marketplace, converging electro-thermal co-simulation, electronics cooling and thermal stress into one cohesive offering. Made possible by Cadence's acquisition of Future Facilities in 2022, best-in-class electronics cooling technology is now accessible to electrical and mechanical engineers. Additionally, the ability to employ Celsius Studio seamlessly for in-design multiphysics analysis empowers designers to identify thermal integrity issues early in the design process and efficiently leverage generative AI optimization and novel modeling algorithms to determine ideal thermal designs.

The result is a streamlined workflow that improves collaboration, reduces design iterations and allows predictable design schedules, which in turn reduces turnaround times and accelerates time to market. Celsius Studio delivers the following benefits:

- ECAD/MCAD Unification – Provides seamless integration of design files with no simplification as well as streamlined workflows for fast and efficient in-design analysis
- AI Design Optimization – Cadence Optimality™ Intelligent System Explorer's AI technology within Celsius Studio enables fast and efficient exploration of the full design space to converge on the optimal design
- In-Design Analysis of 2.5D and 3D-IC Packages – Delivers unprecedented capacity to analyze any 2.5D and 3D-IC packages without any simplification or accuracy loss
- Micro-to-Macro Modeling – The first solution capable of modeling structures as small as the IC and its power distribution and as large as the chassis where the PCB(s) are placed
- Large-Scale Simulation – Accurately simulates large systems with detailed granularity for any object of interest including, chip, package, PCB, fan or enclosure
- Multi-Stage Analyses – Enables designers to perform multistage analyses for the design assembly process and addresses 3D-IC warpage issues for multi-die stacks on a single package
- True System-Level Thermal Analyses – Combines finite element method (FEM) with computational fluid dynamics (CFD) for full-system thermal analysis from chip to package to board and end-system
- Seamless Integration – Integrated with Cadence's implementation platforms, including Virtuoso® Layout Suite, Allegro® X Design Platform, Innovus™ Implementation System, Optimality Intelligent System Explorer and AWR Design Environment®

"Celsius Studio marks a milestone in Cadence's expanding presence in the system analysis market by offering the first AI platform for not only chip, package and PCB thermal analysis, but also electronics cooling and thermal stress that are critical for today's advanced packaging designs, inclusive of chiplets and 3D-ICs," said Ben Gu, corporate vice president of R&D for multiphysics system analysis at Cadence. "Seamless integration with Cadence's powerful

implementation platforms empowers our customers to perform multiphysics in-design analysis for chips, packages and boards all the way through to complete systems.”

#### Customer Endorsements

“Celsius Studio enables Samsung Semiconductor engineers the ability to gain access to analysis and design insights during the early stages of the design cycle, simplifying the generation of precise and rapid thermal simulations for 3D-IC and 2.5D packages. Our collaboration with Cadence has significantly increased our product development by 30%, optimizing the package design process and reducing turnaround time.”

*WooPoung Kim, Head of Advanced Packaging, Samsung Device Solutions Research America*

“Celsius Studio’s seamless integration with Cadence’s AWR Microwave Office IC design platform through BAE Systems’ custom GaN PDK is enabling fast and accurate thermal analysis throughout the MMIC design cycle, leading to increased first-pass design success and significantly improved RF and thermal power amplifier performance.”

*Michael Litchfield, Technical Director, MMIC Design at BAE Systems*

“Celsius Studio enables our design team to work with detailed information early in our design cycle so that we can target and resolve thermal problems before the design is fully committed. With the reduced turnaround time, the Chipletz engineering team has been empowered to efficiently run detailed thermal simulations for 3D-IC and 2.5D packages early and often as we develop these complex designs.”

*Jeff Cain, VP of Engineering, Chipletz*

### ***Cadence Unveils Millennium Platform—Industry’s First Accelerated Digital Twin Delivering Unprecedented Performance and Energy Efficiency***

1 February 2024

Cadence Design Systems, Inc. announced the Cadence® Millennium™ Enterprise Multiphysics Platform, the industry’s first hardware/software (HW/SW) accelerated digital twin solution for multiphysics system design and analysis. Targeted at one of the biggest opportunities for greater performance and efficiency, the first-generation Cadence Millennium M1 accelerates high-fidelity computational fluid dynamics (CFD) simulations. Available in the cloud or on premises, this turnkey solution includes graphics processing units (GPUs) from leading providers, extremely fast interconnections and an enhanced Cadence high-fidelity CFD software stack optimized for GPU acceleration and generative AI. Millennium M1 instances can be fused into a unified cluster, enabling customers to achieve an unprecedented same-day turnaround time and near-linear scalability when simulating complex mechanical systems.

Designing mechanical systems for new levels of performance and efficiency has become a key priority in the automotive, aerospace and defense (A&D), energy and turbomachinery industries. To optimize performance and reduce greenhouse gases, automotive designers are focused on improving fuel efficiency, reducing drag and noise, and extending electric vehicle range. Increasing efficiency, reducing carbon emissions and reducing maintenance frequency

are top of mind for A&D and turbomachinery design engineers. Advances in multiphysics simulation technology are critical to achieving these goals. Performance, accuracy, capacity and accelerated computing are all essential to enabling digital twin simulations that explore more design innovations, providing confidence that they will function as intended before undertaking prototype development and testing.

The Millennium Platform addresses these needs. Highlights and benefits include:

- **Performance:** Combines best-in-class GPU-resident CFD solvers with dedicated GPU hardware to provide supercomputer-equivalent throughput per GPU of up to 1000 CPU cores
- **Efficiency:** Reduces turnaround time from weeks to hours with 20X better energy efficiency compared to its CPU equivalent
- **Accuracy:** Leverages Cadence Fidelity™ CFD solvers to provide unmatched accuracy to address complex simulation challenges
- **High-Performance Computing:** Built with an extensible architecture and massively scalable Fidelity solvers to provide near-linear scalability on multiple GPU nodes
- **AI Digital Twin:** Rapid generation of high-quality multiphysics data enables generative AI to create fast and reliable digital twin visualizations of the optimal system design solution
- **Turnkey Solution:** The industry's first solution that couples GPU compute with modern and scalable CFD solvers, providing an optimized environment for accelerated CFD and multidisciplinary design and optimization
- **Flexibility:** Available with GPUs from leading vendors, in the cloud with minimum 8 GPU configurations, or on premises with a minimum 32 GPU configuration—providing a flexible and scalable solution to fit each customer's deployment needs

“Throughout our 35-year history, Cadence has been focused on increasing performance with no loss of accuracy for the most challenging computational applications. Algorithmic throughput remains a key priority, and we're now leveraging generative AI to harvest knowledge gained from massive quantities of design and simulation data,” said Ben Gu, corporate vice president of R&D for multiphysics systems analysis at Cadence. “Our revolutionary Millennium platform is a giant leap forward, delivering unprecedented acceleration and scalability of digital twin and AI applications. CFD is poised to benefit greatly from performance and efficiency gains, and the tremendous power of the Millennium M1 is disrupting industries that must explore more design innovations and bring them to market faster.”

## *Elevate Efficiency with Deltek ComputerEase Employee Hub 23.1 and FieldEase 24.1 Enhancements*

18 January 2024

Welcome to the next level of efficiency and user experience in construction management with Deltek ComputerEase! In this blog, we are excited to showcase the upcoming enhancements in our Employee Hub 23.1 and FieldEase 24.1 modules, which are designed to address common challenges faced by contractors in the industry.

### **Employee Hub 23.1: Simplifying Payroll Management**

The Employee Hub is a specialized solution that empowers small construction firms to manage their payroll information effortlessly. It acts as a central hub, providing web-based access to crucial documents like pay stubs, W2s, and 1095Cs, seamlessly integrated with the ComputerEase accounting software.

Deltek ComputerEase is excited to unveil the upgraded features of Employee Hub 23.1, introducing a more streamlined and user-friendly experience for payroll management in small construction firms. With modernized branding, automated communication processes, and organized paystub access, this update brings practical improvements that enhance efficiency and accessibility. As we explore these advancements, expect a more intuitive tool that aligns seamlessly with user needs, setting the stage for a refined payroll management experience. Here are the latest features you can expect from our most recent update:

#### **MODERNIZED BRANDING FOR A COHESIVE EXPERIENCE**

To keep pace with the latest from Deltek ComputerEase, Employee Hub 23.1 introduces a fresh logo and branding. This modern visual identity creates a cohesive and contemporary user interface, setting the stage for an enhanced experience in managing payroll information.

#### **AUTOMATED COMMUNICATION: EMAIL NOTIFICATIONS FOR NEW DOCUMENTS**

Say goodbye to manual notifications! Employee Hub 23.1 takes communication efficiency to the next level by introducing automatic email notifications for new documents, including pay stubs, W2s, and 1095Cs. This feature streamlines communication, ensuring that critical information reaches employees promptly.

#### **ORGANIZED PAYSTUBS FOR QUICK ACCESS**

In response to the challenge of managing payroll details, paystubs are now conveniently sorted by date in descending order. Employees will have their newest paystubs at the top by default, providing easy access to the most recent information. This organizational improvement simplifies the process, contributing to overall operational efficiency.

### **FieldEase 24.1: Optimizing Field Operations**

FieldEase is a field-to-office collaboration system uniquely designed for construction firms to keep everyone in the office and the field on the same page. It helps construction project managers streamline tasks by enabling them to manage their projects on the go from their mobile devices or tablets.

In the upcoming FieldEase 24.1 release, a visual transformation will present users with a fresh and cohesive appearance that aligns seamlessly with the latest Deltek ComputerEase branding. The revitalized icon and visual identity contribute to a contemporary and unified visual experience, catering to the intuitive interface needs of users engaged in managing projects and tasks in the field. Here are the latest enhancements to FieldEase:

#### UNIFIED VISUAL EXPERIENCE: REVAMPED BRANDING

FieldEase 24.1 introduces a fresh look, aligning seamlessly with the latest Deltek FieldEase branding. The revitalized icon and visual identity offer a contemporary and unified visual experience, addressing the need for an intuitive interface for users managing projects and tasks in the field.

#### EFFICIENT WORK ORDER MANAGEMENT: MULTI-INSTRUCTION DISPLAY

Service technicians rejoice! FieldEase 24.1 empowers users to view multiple instructions for a piece of equipment within work orders. This enhancement streamlines workflow, allowing technicians to access all pertinent instructions conveniently and optimizing overall operational efficiency.

#### CLEAR DOCUMENTATION: ENHANCED WORK ORDER PRINTING

Responding to user needs, the FieldEase Service Hub introduces an enhanced Work Order Printing setting—printing one piece of equipment per page. This feature provides customers and technicians with a more precise and efficient review of completed work, addressing the crucial need for transparency in service orders.

#### EMBRACE EMPLOYEE HUB 23.1 & FIELDEASE 24.1 UPGRADES

The Employee Hub 23.1 and FieldEase 24.1 enhancements are tailored to tackle contractors' common challenges, offering streamlined solutions for improved efficiency and user satisfaction. Join us in embracing these updates as we continue to empower your construction management workflow.

### *EON Reality Elevates AI-Powered Soft Skills Feature with Advanced Role-Play Capabilities*

29 January 2024

With a steadfast commitment to innovation in immersive learning, EON Reality, the global leader in AI-powered Augmented and Virtual Reality knowledge transfer for education and industry, announces a transformative expansion of its renowned EON-XR training platform, 'EON Soft Skills'. Leveraging the power of AI avatars integrated with advanced language models, the platform now extends its role-play ability to allow for simulations in recruitment, mental health assessments, and talent identification.

The AI avatars, powered by cutting-edge language processing models, now simulate complex human interactions within three pivotal arenas:

- **Recruitment and Talent Acquisition:** The AI avatar steps into the role of a hiring manager, analyzing candidates' resumes and conducting thorough interviews to determine their suitability for roles reflecting job descriptions. It concludes with

synthesized evaluations, articulating candidates' strengths, weaknesses, and providing nuanced hiring recommendations.

- **Mental Health Assessments:** Transforming into a virtual psychiatrist, the AI avatar leads standardized assessments for conditions like ADHD, deriving preliminary diagnoses from patient interactions. This groundbreaking feature serves as a training tool and an adjunct resource for professionals, backed by comparative studies to measure its efficacy against traditional methods.
- **Talent Identification Among Interns:** The platform sharpens its focus on internal talent nurturing, with avatars assessing interns' capabilities against specific organizational criteria – a strategic move to guide and foster the growth of promising talent within companies.

“In the pursuit of human excellence, we recognize that technology can be a profound ally,” articulates Dan Lejerskar, Chairman of EON Reality. “Our EON Soft Skills platform redefines traditional processes by infusing role-playing scenarios with AI that thinks, reacts, and guides with a deep understanding. We’re equipping organizations with the digital equivalents of the most intuitive human mentors.”

EON Reality upholds the highest standards in user data protection, ensuring privacy and security are paramount, particularly in sensitive areas such as mental health diagnostics. Rigorous testing and validation underpin the accuracy and effectiveness of the platform, reflecting the company’s unwavering pursuit of excellence.

The expanded functionalities have been artfully woven into an interface that prioritizes intuitiveness and engagement, paving the way for an authentic and effective role-play experience. The immersive ‘EON Soft Skills’ platform stands at the confluence of innovation and usability, balancing advanced role-play simulations with:

- **Security and Privacy:** A staunch approach to safeguarding participant data enhances trust and integrity across all modules.
- **Testing and Validation:** Persistent evaluations align the platform’s recommendations with real-world professional insights, validating the AI’s prowess.
- **Seamless User Interface:** A meticulously crafted UI emboldens users to immerse themselves in lifelike scenarios without circumventing simplicity.

**ETHICAL RIGOR:** STEADFAST ADHERENCE TO LEGAL AND ETHICAL FRAMEWORKS ENSURE THAT EON SOFT SKILLS LEADS NOT ONLY IN TECHNOLOGY BUT ALSO IN RESPONSIBLE PRACTICE.

### *EPLAN Data Portal Update 02 January 2024*

30 January 2024

479 manufacturers and more than 1,633,000 data sets are available with the update January 30, 2024.

#### **New manufacturer catalogs**

- Guangdong Kossi Intelligent Technology Co. Ltd. – 215 new data sets with amplifiers, controllers and motors
- Servotronix Motion Control Ltd. – 14 new data sets with amplifiers and controllers

### Updates and new data

- ABB LTD – 2 new data sets with sensors, switches and pushbuttons
- Banner Engineering Corporation – 106 updated data sets with sensors, switches and pushbuttons
- Baumer MDS GmbH – 12 updated data sets with sensors, switches and pushbuttons
- Danfoss Drives A/S – 30 new data sets with converters
- ETI Elektroelement d.d. – 19 updated data sets with power switchgears
- Fagor Automation, S. Coop – 2 updated data sets with PLC
- FRABA GmbH – 32,756 updated data sets with sensors
- Festo SE & Co. KG – 218 new and 35,341 updated data sets with accessories, actuators, amplifiers, cables, controllers, connections, connection splicer / line connector enclosures, converters, engineering- special items, electrically - operated mechanical device, filters, fluid control terminal, fluid power - special items, general, inductors, lights, measuring instruments, miscellaneous, motors, PLC, plugs, resistors, sensors, switches, and pushbuttons, Signal devices, test devices, voltage sources and generators, sub plates, valves
- Fuji Electric FA Components & Systems Co., Ltd. – 722 new data set with converters, sensors, switches and pushbuttons
- Igus GmbH – 11 new and 1,516 updated data sets with cables
- Janitza electronics GmbH (NFPA) – 8 new data sets with converters, measuring instruments, test devices, voltage sources and generators
- K. A. Schmersal GmbH & Co. KG – 1 new data set with sensors, switches and pushbuttons
- KEYENCE CORPORATION – 5 new data sets with sensors, switches and pushbuttons
- KALEJA GmbH – 4 updated data sets with amplifiers and controllers
- Murrelektronik GmbH – 2,545 new and 388 updated data sets with cables
- Nanjing Decowell Automation Co., Ltd. – 47 updated data sets with field distribution devices and PLC
- Omron Europe B.V. – 85 new and 567 updated data sets with amplifiers, converters, controllers, generals, sensors, switches and pushbuttons and PLC
- Pilz GmbH & Co. KG – 1 new data set with plugs

- Schneider Electric SA – 15 new data sets with PLC
- Siemens AG – 10 new and 87 updated data sets with PLC, voltages sources and generators
- Ningbo Supu Electronics Co., Ltd. – 168 new data sets with sensors, switches and pushbuttons and terminals
- Suzhou Inovance Technology Co., Ltd. – 13 new data sets with converters and PLC
- WAGO GmbH & Co. KG – 58 new and 789 updated data sets with contactors, plugs, relays and terminals

### Summary

- 2 new manufacturer
- 22 updated manufacturer
- 36,877 new data sets
- 38,878 updated data sets
- 0 deleted data sets
- 37,912 new parts with EDS
- In total 1,040,831 parts with EDS
- In total 326 manufacturers with EDS parts
- In total 1,633,555 data sets live in EDP

### *Flexxbotics Announces Robot Compatibility with Okuma Machine Tools*

31 January 2024

Flexxbotics, delivering workcell digitalization for robot-driven manufacturing, announced robot machine tending connectivity compatible with the full range of Okuma CNC machines. With Flexxbotics next generation machining environments using robotics with Okuma equipment achieve higher yields, greater throughput and increased profit per part.

Flexxbotics' patent-pending FlexxCORE technology enables robots to securely connect and communicate with Okuma machinery in the smart factory to provide more powerful, flexible and open robot connectivity than previously possible.

Robot compatibility is enabled by Flexxbotics for all different Okuma machine types including lathes, multi-tasking, machining centers, 5-axis, double columns, grinders and hybrid. Flexxbotics is compatible with the full line of Okuma controllers including OSP-P100/200/300 series and the next-generation OSP-P500 CNC control.

“We understand that the robots need to work with the latest cutting-edge CNC machines, as well as, the older machines that manufacturers already have in their plants,” said Tyler Modelski, Co-founder & CTO of Flexxbotics. “That’s why we’ve achieved compatibility with over

1000 different models of machines and have the ability to add new models and new PLCs quickly.”

In addition to compatibility with Okuma controllers Flexxbotics is compatible with a wide range of open standard protocols including OPC/UA, MTConnect, Modbus-TCP, TCP/IP, Ethernet/IP, and DeviceNet along with proprietary controllers and interfacing protocols like MELSEC, Profibus/Profinet and others.

Flexxbotics robotic workcell digitalization is the backbone of the Smart Factory, delivering robot-driven manufacturing at scale with autonomous process control for advanced machining operations. Flexxbotics’ SaaS/hybrid architecture also runs both online and offline so production continues with or without internet access, and Flexxbotics works with existing business systems such as DNC software, SCADA/HMI, CAD/CAM, IIoT, ERP, MES, PDM and others for complete synchronization.

A full set of bidirectional communication, transform and routing capabilities are available in Flexxbotics for the robots and Okuma machinery that are connected including loading PLC programs, sending instructions, updating parameters and status awareness depending on the equipment’s capabilities so the robots drive the machines in the smart factory.

“With Flexxbotics the robots do more than simply monitor the machines, the robots run the machines at your command with closed-loop quality for continuous operations,” said Tyler Bouchard, co-founder and CEO of Flexxbotics. “We believe the advancement of robot-driven manufacturing will transform the smart factory forever.”

### *INTERCHIP achieves 3x faster verification for next-gen clocking oscillator with Siemens’ advanced analog and mixed-signal EDA technology*

29 January 2024

Siemens Digital Industries Software announced that INTERCHIP CORPORATION, a leading fabless semiconductor company specializing in high precision, low power oscillator products, used Siemens’ Analog FastSPICE platform and Symphony™ platform to verify its newest IPV Voltage-Controlled Crystal Oscillator (VCXO) integrated circuit (IC) and IPS Simple Packaged Crystal Oscillator (SPXO).

Multiple advanced analog/mixed-signal EDA solutions from Siemens helped INTERCHIP generate silicon-accurate simulations of their newest VCXO and develop it three times faster compared to their previous solution. This notable acceleration in verification cycles proved pivotal in successfully meeting their aggressive time-to-market objectives.

INTERCHIP’s high precision Crystal Oscillator ICs are deployed globally in a wide range of products, including computers, mobile phones, medical devices and industrial equipment.

“As a leading Crystal Oscillator manufacturer serving many of world’s leading consumer, medical and industrial OEMs, our team thrives on overcoming complex engineering hurdles to deliver high speed, high-precision, wide-pulling-range Crystal Oscillators,” said Ryuji Ariyoshi, CEO, INTERCHIP. “We pride ourselves in successfully overcoming complex design challenges such as linearity, frequency pushing, noise performance, aging and power consumption.

Siemens' Analog FastSPICE platform stood out as our top choice for its ability to provide nanometer, SPICE accurate results at a remarkable 3x faster speed than conventional SPICE simulators. Further, Siemens' Symphony platform enabled us to successfully verify our chip's complex analog and digital interaction and functionality."

Siemens' Analog FastSPICE platform provides circuit verification for nanometer analog, RF, mixed-signal, memory, and custom digital circuits. Certified for foundries down to 2nm, the platform can deliver nanometer-scale SPICE accuracy twice as fast as parallel SPICE simulators. The solution includes comprehensive, full-spectrum device noise analysis to help customers achieve silicon-accurate characterization. In addition, the Symphony™ platform, powered by Siemens' Analog FastSPICE platform, delivers fast and accurate mixed-signal verification for complex nanometer-scale ICs via its user-friendly interface, robust debugging capabilities and comprehensive configuration support.

"High-precision Crystal oscillators play a critical role in advanced IC clock systems, and they are indispensable in modern electronic devices," said Amit Gupta, vice president and general manager for the Custom IC Verification Division at Siemens Digital Industries Software. "Their accurate timing, stable frequencies and reliable performance are essential for helping to achieve proper operation, data integrity and overall system efficiency in a wide range of applications. It is rewarding to see the pivotal role played by our Analog FastSPICE and Symphony platforms in facilitating INTERCHIP's development and verification of their latest high-precision oscillator design."

### *Introducing Codebeamer 2.1: Here's What's New and Noteworthy*

18 January 2024

Hanna Taller wrote a blog post for PTC announcing the newest update to Codebeamer. Hanna writes, "Codebeamer 2.1 provides significant improvements to Templates, MATLAB Simulink Integration, and ReqIF, and has improved scalability and performance. Codebeamer 2.1 also introduces the Japanese language option."

Read the full post here: <https://www.ptc.com/en/blogs/alm/introducing-codebeamer-21-heres-whats-new-and-noteworthy>

### *Keysight Expands Signal Source Analyzer Portfolio for Wireless, Radar, and High-Speed Digital Applications*

30 January 2024

Keysight Technologies, Inc. expands its SSA-X Signal Source Analyzer portfolio with three new higher frequency models – 26.5 GHz, 44 GHz, and 54 GHz – giving radio frequency (RF) engineers integrated, one-box phase noise and signal source analysis solutions for advanced wireless communications, radar, and high-speed digital applications.

Evolving technologies and new, advanced standards demand more precise and cleaner signal sources with the lowest possible phase noise and jitter to support higher frequencies and data bandwidths and rates. However, testing and evaluating the phase noise and jitter of the signal

sources for these applications often requires a very complex setup with multiple instruments, which consumes a lot of time. RF engineers also need to make other measurements such as frequency and power transient measurements as well as spectrum analysis to fully characterize signal sources such as synthesizers, clocks, and oscillators. In addition, engineers may need to measure the residual phase noise of active devices used in signal and data transmission paths.

The new higher frequency models of the Keysight SSA-X Signal Source Analyzer series address these challenges in these advanced applications with an all-in-one platform that includes a very clean signal enabled through a direct digital synthesis (DDS) source and proprietary cross-correlation channels.

The new Keysight SSA-X series of signal source analyzers provide the following benefits:

- **Integrated, one-box solution** – Provides comprehensive signal source analysis including phase noise measurement, residual noise measurement, transient measurement, spectrum analysis, network analysis, and voltage controlled oscillators (VCO) characterization in a single box. The built-in, clean signal source operating at up to 54 GHz and two RF inputs enable residual noise measurements without additional equipment and re-configuration. Two pairs of local oscillator (LO) output and intermediate frequency (IF) input ports and Keysight's new E5051AW phase noise measurement downconverter/phase detector enable millimeter-wave phase noise measurements at higher than 54 GHz. A 2-port vector network analyzer (VNA) can be incorporated as an option to eliminate the need to purchase a standalone VNA.
- **Best-in-class phase noise sensitivity** – Provides accurate absolute and residual phase noise measurements with using extremely-low-phase-noise internal LOs and RF source.
- **Easy-to-use, with flexible software** – Enables quick, multiple measurements with a single connection and an easy-to-use interface. Application software has been enhanced to address more measurement needs, including spectrum analyzer and precision clock jitter analysis.
- **Precision clock jitter analysis** – Offers accurate random jitter (RJ) and periodic jitter (PJ) measurements in the time and frequency domain. SSA-X can measure jitter with 20% higher sensitivity than the SSA and has the sensitivity of 2 femto seconds at 10 GHz for advanced high-speed digital communication applications.

**Joe Rickert, Vice President and General Manager, Keysight High Frequency Measurements Center of Excellence, said:** "The SSA-X series of signal source analyzers provides RF engineers an integrated, one-box solution that provides phase noise and jitter measurement solutions for advanced communications and high-speed digital applications. With the addition of three new models covering frequencies up to 54 GHz, the SSA-X series enables more accurate and higher quality evaluations that accelerate time-to-market of cutting edge technologies."

## Keysight Gains Validation for First 3GPP Release 16 16/32 Transmitter Performance Enhancement Test Cases

29 January 2024

Keysight Technologies, Inc. gained approval for the industry's first 3GPP Release 16 (Rel-16) 5G New Radio (NR) single and multiple precoding matrix indicator (PMI) test cases for 16 and 32 element transmitters operating on the frequency-division duplexing (FDD) and time-division duplexing (TDD) bands. The validated test cases, which are for use with Keysight's 5G network emulation conformance test platform (TP168), were obtained at the Conformance Agreement Group (CAG) #77 meeting of the Global Certification Forum (GCF) hosted by Keysight in Malaga, Spain during January.

Networks based on 5G NR standards support multi-antenna technologies known as MIMO, which improve spectral efficiency and enhance communication. To implement multi-antenna systems, enhanced precoding techniques are applied to the transmitter to map data into the different transmit antennas. The optimal precoding depends on a PMI Codebook value reported by the device, which makes the choice from several precoding options based on its own channel measurements.

As part of Rel-16, the 3GPP added new test cases to validate device performance in multi-antenna systems. Keysight S8705A RF/RRM test solution is the first to gain validation for these new tests, which require unprecedented fading resources to emulate 16 and 32 transmitter connections to use equipment (UE) with 2 and 4 receivers.

Keysight also achieved the following achievements supporting Release 17 (Rel-17) Enhanced Power Saving and RedCap features:

- Validation of test cases verifying UE support of a function that reduces the number of times a device interacts with the network, in order to extend the battery life of devices using the S8705A RF/RRM test solution.
- Validation of test cases ensuring RedCap devices support the Rel-17 increase in the extended discontinuous reception (eDRX) cycle, which is the duration of time a device is in sleep mode in order to extend battery life. This was completed with the Keysight S8704A Protocol Conformance Toolset and activates the RedCap Rel-17 eDRX GCF work item.

### **Muthu Kumaran, General Manager of Keysight's Device Acceptance Solutions,**

**said:** "Enhancing connection performance is a priority for network operators to deliver a better quality of service to final users. Multi-antenna systems are possible with NR and now the first approved tests are brought into the market by Keysight to ensure device's performance is thoroughly tested. Additionally, validations supporting Rel-17 Enhanced Power Saving features are crucial to drive advancements in 5G NR Rel-17 for commercial 5G NR and RedCap devices market introduction."

## *Rockwell Automation Elevates Industry Leadership Through Robust Expansion of Open Process Automation™ Technology Capabilities*

1 February 2024

Rockwell Automation, Inc., the world's largest company dedicated to industrial automation and digital transformation, announced significant new offerings supporting Open Process Automation™. Innovations include PlantPax's control platform, Embedded Edge Compute Module, FactoryTalk Optix, and FactoryTalk DataMosaix. This move solidifies the company's commitment and peer leadership within the Open Process Automation™ Forum (OPAF), marking a significant stride in reshaping the future of automation. The O-PAS™ Standard is a "standard of standards" developed by the OPAF and aligns with the OPC Foundation's Unified Architecture (UA) Standard.

"The O-PAS™ Standard provides an open, interoperable, and secure architecture for industrial Process Automation using existing and emerging standards whenever possible," said Aneil Ali, Open Process Automation™ Forum director. "The O-PAS™ Connectivity Framework (OCF), which leverages OPC-UA, is the enabler for automation users to connect and replace architecture components without needing an entirely new system installed in their facility. We are excited that product suppliers are embracing the opportunity to extend their products to communicate using the OCF."

As an automation user-driven standardization initiative, the O-PAS Standard presents a golden opportunity for manufacturers to modernize their automation infrastructure, enhancing scalability, flexibility and upgradeability. This improves capabilities over the system's lifespan and provides investment protection by expanding system integration capabilities.

Rockwell Automation, with a history of championing open industrial automation standards, has actively invested in leading-edge technology. These investments enable the company to provide an integrated experience for both its products and those from the Rockwell Automation PartnerNetwork™.

"We appreciate and understand our users need for products and systems that integrate well together and allow for collaboration of edge and cloud data sources. Through working with organizations like OPAF and OPC, we will continue to invest in our systems, products and services for market-leading interoperability, longevity and performance," said Brian Shepherd, senior vice president, software and control, Rockwell Automation.

The PlantPax® Distributed Control System, Rockwell's flagship offering for the process industries, stands out with a 15+ year track record of delivering DCS and information-ready capabilities leveraging an open, modular, and secure architecture. Building on this strong foundation, Rockwell Automation continues to expand its PlantPax system capabilities. Recent innovations include:

- PlantPax's control platform, based on the company's Logix Controllers, now natively supports OPC-UA, facilitating direct data sharing with edge and cloud applications. Additional connectivity options are available with MQTT and REST.

- Embedded Edge Compute Module, which provides a compute surface within the Logix environment, enhances plant-wide connectivity through OPC-UA, MQTT, and REST API communication.
- FactoryTalk® Optix™, a scalable platform that can be used in PlantPax to provide native support for OPC-UA to allow operations, maintenance, and plant personnel to visualize various information originating across the enterprise.
- The combination of PlantPax and FactoryTalk® DataMosaix™ provides a leading industrial Data Ops platform that supports OPC-UA, provides contextualization of data from multiple sources. The data models can be used to support pre-built Energy, Batch and Asset optimization solutions from Rockwell Automation or to accelerate development of custom solutions.

The alignment with open industry standards like the O-PAS standard, OPC-UA, and the Namur Module Type Package (MTP) standard allows Rockwell to address the growing market demand for scalability, modularity, and interoperability. The company's focus on open standards positions it to fulfill industry requirements, with ongoing support for use cases and demonstration projects across various industries.

Rockwell Automation will showcase these cutting-edge capabilities at the upcoming ARC Forum, demonstrating its ongoing commitment to shaping the future of automation through open standards and innovative technology solutions.

### *SAP Offers Professionals New Digital Learning and Certification*

31 January 2024

SAP SE announced the launch of a new guided premium learning offering with SAP Learning Hub and an enhanced certification program including a new role-based certification for SAP S/4HANA Cloud implementation consultants.

The demand for skilled IT professionals is expected to grow dramatically – up 23% by 2031 in the United States alone, according to the U.S. Department of Labor. To help meet this demand, the new role-based certification for implementation consultants of SAP S/4HANA Cloud Public Edition emphasizes core skills and competencies that can be applied across various cloud solutions from SAP and related versions.

“The pace of change and the talent shortage call for a new approach to identifying future-focused skills and roles. Instead of focusing on traditional aspects like degrees, job histories and titles, professional competencies become more important,” says Andre Bechtold, senior vice president and head of solution and innovation experience at SAP. “By transitioning to role-based certifications that focus on core skills and competencies, the skillset of a learner becomes more valuable and gains sustainability and more relevance for longer periods of time.”

Many organizations rely on SAP solutions and skilled professionals to ensure a smooth and fast transition and drive business success. The enhanced SAP Learning Hub provides access to great content and includes four certification attempts per learner per year. Subscribers can receive expert guidance in digital live sessions, on-demand hands-on practice systems, advanced

analytics and learning management functionalities. This new digital premium offering marks a major step in the evolution of the SAP Learning portfolio. To meet the rapid pace of technological innovation and the need to quickly gain new and future-proof skills, SAP continues to help organizations learn and become certified faster to maximize their investment.

With the need for fast, comprehensive and role-based upskilling, the new certification model will make continuous learning and assessments a priority. Starting in early second quarter, these changes will support customers, partners and individuals in gaining skills across the SAP solutions portfolio and keeping them up to date.

Partners can benefit from further advancements, including a tailored partner experience with curated learning journeys, exclusive access to events and subject matter experts. A subscription to SAP Learning Hub, partner edition comes with a significantly reduced price per user per year and offers additional chances to earn certifications, as well as improved analysis and tracking features.

### *Simulations Plus Releases GastroPlus® Version 9.9*

30 January 2024

Simulations Plus, Inc., a leading provider of modeling and simulation solutions for the pharmaceutical, biotechnology, chemicals, and consumer goods industries, announced the release of GastroPlus® 9.9, the latest version of its flagship physiologically based pharmacokinetics/biopharmaceutics (PBPK/PBBM) modeling and simulation software.

Key enhancements include:

- Expanded the ocular (OCAT™), oral cavity (OCCAT™), and dermal (TCAT™) models by adding new formulation and PK/PD mechanisms to better capture local and systemic exposure levels in animals and humans
- Extended the ACAT™ model to enhance the evaluation of formulation approaches for local gastrointestinal (GI) disease states
- Improved Biologics Module features to mimic study designs and refine dose optimization simulations for clinical trial success
- Upgraded with ADMET Predictor® version 11 models, enhancing our First in Human Simulator

“Our software updates reflect the needs our customers communicate to us, and GastroPlus 9.9 is no exception,” said Neil Miller, Vice President of Simulation Sciences at Simulations Plus. “We incorporated feedback from more than 100 companies into these latest enhancements, ensuring they truly provide the improved functionality our customers require. And as we do with every software release, we also updated our models with the latest scientific research, leveraging more than 30 peer-reviewed papers to improve the predictive capabilities of our software platform.”

“For many years, we have worked on collaborative projects with the FDA and other regulatory agencies to improve the technology available to the pharmaceutical industry and increase the

safety of animal and human trials,” said Dr. Haiying Zhou , Sr. Director of Simulation Technologies at Simulations Plus. “This is one reason our clients know they can rely on data generated with GastroPlus to inform their program design and support regulatory submissions. In GastroPlus 9.9 specifically, our updates to the Additional Dosage Routes (ADR) Module were built with FDA involvement and funding from three separate FDA grants, and these enhancements are now available for the global GastroPlus user community to apply to their research programs to accelerate the development of new therapies to help patients worldwide.”

### *Streamline Operations with New FactoryTalk® OptixPanel™ Graphics Terminals from Rockwell Automation*

30 January 2024

Factory Talk® OptixPanel™ Graphic Terminals from Rockwell Automation® are sealed human-machine interface (HMI) appliances that come pre-loaded with FactoryTalk® Optix™ and FactoryTalk® Remote Access™ software licenses. This means that the device is an all-in-one solution that’s ready to run at first power-up. The pre-installed, closed operating system reduces risk in implementation and maintenance.

FactoryTalk OptixPanel Graphic Terminals are one of the solutions in the new FactoryTalk® Optix™ portfolio. The FactoryTalk Optix portfolio allows users to choose their own technology mix, where for the first time, Rockwell Automation customers can use visualization software to design HMI applications that can natively work with both Rockwell Automation and third-party controllers and display on a choice of hardware from either Rockwell Automation or a third-party. Users can connect to a variety of third-party software, devices or systems using software designed for interoperability and full OPC UA support. Users also only pay for the features they need with runtime licensing that is based on the capabilities in their application.

### *What’s New in Simcenter Mechanical simulation 2312*

29 January 2024

Jonathan Melvin and Patrick Farrell wrote a blog post for Siemens to announce the new update to Simcenter Mechanical Simulation. They say, “In the Simcenter Mechanical simulation 2312 release, we introduce additions that extend and integrate workflows from the designer through simulation and all the way to the physical tester. We provide new tools to simulate e-machines for electric vehicles and improve simulations for automotive safety. We have sped up simulation performance and further integrated NX and Simcenter 3D to improve collaboration and shorten development cycles.”

Read the full blog post here: <https://blogs.sw.siemens.com/simcenter/whats-new-in-simcenter-mechanical-simulation-2312/>