Dassault Systèmes' Science in the Age of Experience Conference 2017

CIMdata Commentary

Key takeaways:

- *Dassault Systèmes, continues to follow through on implementing its vision to enable sustainable innovation through the use of its **3D**EXPERIENCE® platform, supported by the BIOVIA, GEOVIA, and SIMULIA brands.*
- *SIMULIA continues to improve its Additive Manufacturing simulation and process capabilities to take advantage of the latest advances in material sciences and manufacturing.*
- *Industry's next big challenge is to enable the cultural change required to make better use of already available simulation and prediction technology.*

The second Dassault Systèmes Science in the Age of Experience conference brought users from various industries and academia from around the world together in the Midwest digital manufacturing capital of Chicago. In addition to Dassault Systèmes' brands BIOVIA and SIMULIA a third brand, GEOVIA, participated in this year's event. The GEOVIA brand, formerly Gemcom Software before its acquisition by Dassault Systèmes in 2012, with its current focus on mining, has the general objective to model and simulate our planet, improving predictability, efficiency, safety, and sustainability throughout the natural resource sector.

By including GEOVIA, Dassault Systèmes consequently not only continues its focus on innovation but even more specifically on sustainable innovation, which was also the underlying theme for this conference. The focus throughout the conference addressed sustainable innovation in various ways following the sub-themes of:

- Sustainable planet
- Better living through science
- Multi-physics scientific discovery
- Advancing materials with science—materials innovation.

Mr. Bernard Charlès, President and CEO of Dassault Systèmes, stated that a "holistic approach is required to achieve sustainable innovation." This includes systems-level and multi-scale thinking and execution. He added, at the same time "the future of innovation is not just what you do within a company but how you connect beyond and make use of the [available] data. It is just a matter of time that "everything is brought together—social, life, product, and nature."

Dassault Systèmes' **3D**EXPERIENCE platform appears to deliver on this vision. The platform attempts to bring the brands together to support various industry segments (Dassault Systèmes has identified 12 industry segments). With its focus on delivering full capabilities of 3D modeling, content and simulation, social and collaborative innovation, and information intelligence, it's enabling the vision for their respective end users and customers to achieve sustainable innovation for their businesses. At the same time, it is part of helping Dassault Systèmes' customers address challenges they are still facing as highlighted during a market analyst session, such as:

- Digital continuity: There is an enormous need to digitalize the business—its content and processes—and link the different areas together. One needs to be able to follow an idea from inception until bringing it onto the market, actually making and using it.
- Multi-physics: Even more so nowadays, systems thinking requires that all the different physics need to be simulated properly to ensure the product requirements are addressed upfront (within a company and beyond, including a product's operating environment).
- Collaboration between engineering domains and across the virtual enterprise: The platform must allow for a model-based and data-driven business. But the organizational culture within companies to make proper use of model-based processes is quite often not there, yet. CIMdata experience shows that this remains a major challenge.
- Business sense: By linking the entire lifecycle together it allows users to better understand why certain tasks are being performed and how those workflows are linked to initially set and then attain derived business requirements.

During the conference, a car body was used as an example to show the benefits of using the **3D**EXPERIENCE platform starting with the requirements, through concept and detailed design to validation. It enacted elements, like 3DDashboard, design and simulation apps, results analytics, multi-physics apps, ABAQUS in the cloud, and process management apps. Compared to previous releases, this new platform release makes it easier for the various domains and disciplines to execute their specific tasks while collaborating to evaluate and achieve target requirements.

Various keynotes by UI LABS, Google Autonomous Car Project, Nagoya Hospital, and Wartsila highlighted from different perspectives the importance of properly capturing and linking data throughout the entire life cycle; enabling collaboration and process management through the use of a common innovation platform; applying model-based systems engineering thinking, understanding that products and technology are not standalone but interacting with their surroundings; as well as the positive impact simulation and virtual collaboration have within life sciences.

Simulation overall plays a major strategic role in a model-based and digitalized business. SIMULIA is not just part of Dassault Systèmes' **3D**EXPERIENCE platform, but the focal point for most of Dassault Systèmes' engineering simulation related development work while, at the same time making use of the capabilities of the underlying platform. Mr. Scott Berkey, CEO of SIMULIA, highlighted how this can help overcome silos and bring domains and physics together by unifying them. At the same time, processes and thinking need to be adjusted to achieve digital continuity. This includes:

- Data needs to be properly captured and managed digitally
- Being able to capture and share best practices
- Identify and define different roles throughout the entire process to be able to execute properly
- Enable global collaboration and execution
- Define and select the technology and tools needed to execute

This is supported by SIMULIA's strategy of how its products are being developed and deployed:

- Social: Tools need to be easy to use, available through online connectivity and mobile devices.
- Industry: Provide business solutions that are specific for the various industry in order to make proper use of a tool's full capabilities to achieve the industry's business requirements.
- Experiences: The software service and its content have to fulfill the overall simulation needs of the business while operating on the platform. This can be achieved through proprietary and third-party tools and apps operating on the platform.

Thus, Dassault Systèmes and, particularly SIMULIA continues expanding on its multiphysics / multiscale capabilities (see Figure 1). This aligns very well with CIMdata's current work on defining platforms for PLM to help companies gain more advantage from their PLM investments.

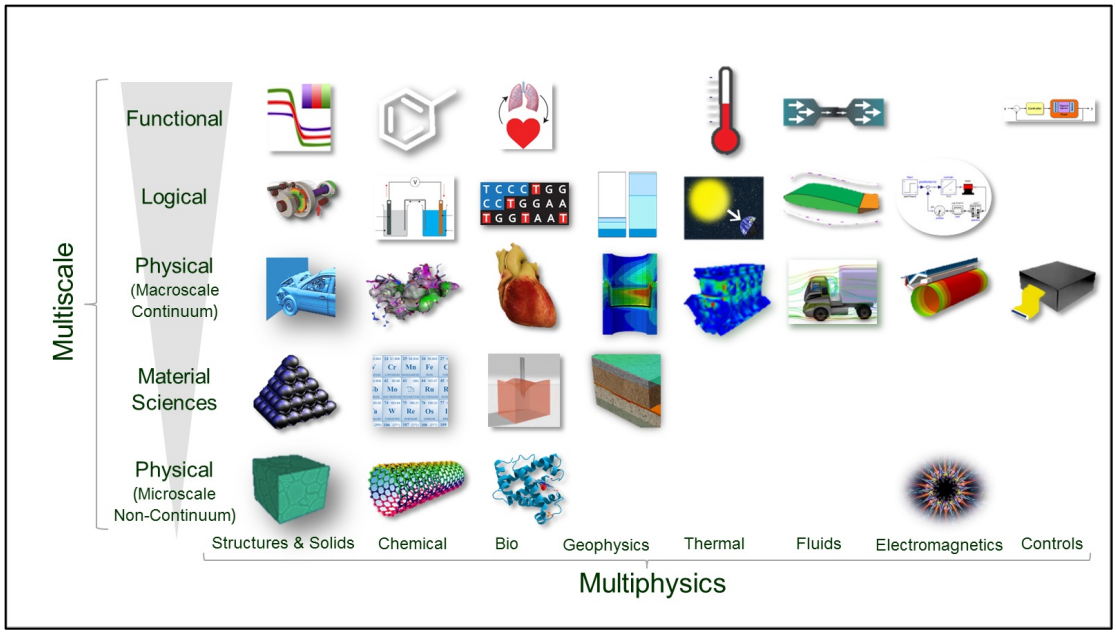

Figure 1: Simulation Covers the Entire Multiscale and Multiphysics Space
(Courtesy of Dassault Systèmes)

This is not just bringing the various brands together on the platform but also adding to the brand portfolio (see Figure 2).

In 2016 SIMULIA added the following tools and technologies to its portfolio:

- XFlow: CFD
- CST: electromagnetic simulation
- Wave6: Vibro-acoustics and flow noise simulation.

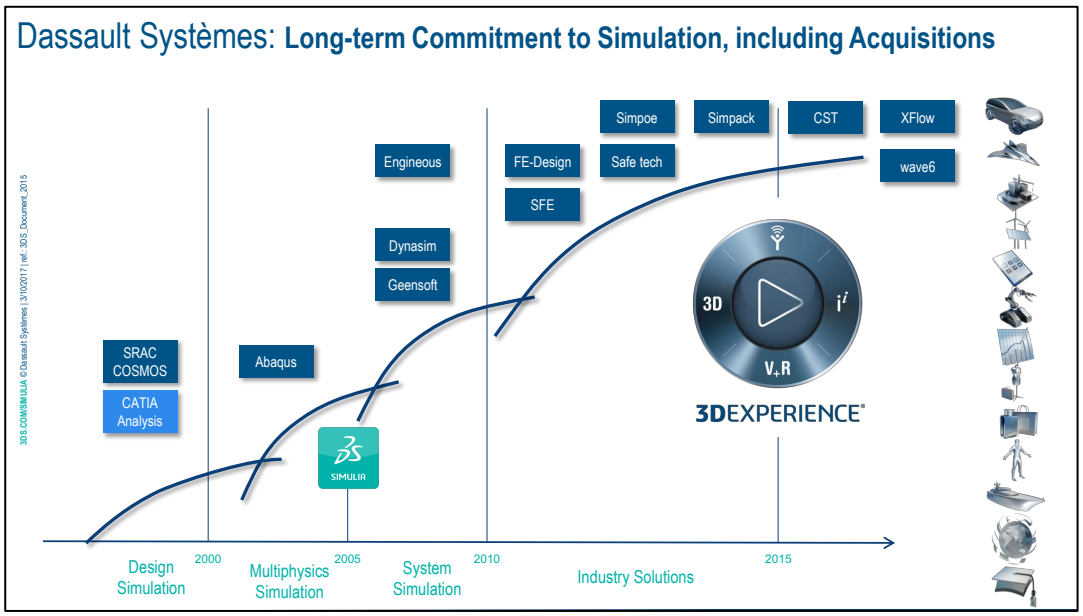

Figure 2: Dassault Systèmes Long-Term Commitment to Simulation
(Courtesy of Dassault Systèmes)

Further progress made over the last year in the area of additive manufacturing (AM) as part of the multiscale / multiphysics challenge was presented. This is reflected by the fact that, besides discussions and presentations during the conference itself, an AM Symposium was a featured event during the conference. CIMdata believes that SIMULIA plays a leading role in this area and is publishing a commentary on this AM Symposium in parallel to this Commentary.

While the technology now available is getting much better and even faster in being able to support the enablement of sustainable innovation, it was highlighted in several discussions that it is paramount that business cultures within industry still have a long way to go in order to make proper use of the available technology. Thus, as CIMdata highlighted in last year's commentary, today the main challenge is still to implement cultural change, fundamentally modifying the ways in which companies operate to make sustainable innovation happen. Virtual and physical engineering need to be brought together. This starts with a consequent deployment of systems thinking, and understanding of the engineering Vee in terms of iterative processes and not just a sequential approach.

In CIMdata's view, Dassault Systèmes continues to make significant progress on making the tools of its various brands an integral part of its **3D**EXPERIENCE platform. At the same time, CIMdata's research shows that it is paramount for platforms to stay open to non-proprietary applications to ensure that users can get the full advantage of using the platform as well as making use of emerging data interoperability standards. In addition, the clear focus on industries and their specific processes instead of just brands will allow end users to make much more use of these available tools.

In CIMdata's opinion, with the capabilities of BIOVIA, GEOVIA, and SIMULIA on a common platform, Dassault Systèmes continues to display a compelling vision of how science can and will enable sustainable innovation. The major challenge CIMdata sees going forward is how to gain the momentum needed to apply cultural change to make full use of the technology which is already available.

About CIMdata

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