



COE 3DEXPERIENCE Discovery Panel II

A COE User Technical Perspective

Abstract

In April 2016 the COE 3DEXPERIENCE Discovery Panel was formed, comprised of volunteers from COE's community of Dassault Systèmes Solutions users and consultants. Working alongside Dassault Systèmes support team, the Panel gained valuable insight into exactly what makes the new release tick. This White Paper contains their findings, including practical experiences and independent evaluations of the new features.

COE 3DEXPERIENCE Discovery Panel II

July 2017

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INTRODUCTION

In 2014, Community of Experts (COE) created a virtual company inside the organization to enable users to provide feedback on their experience using the latest technology that may not be available to them in their workplace. A Discover Panel (#1) consisting of COE members from various companies and industries was established for this purpose. The virtual company was designed to mimic a typical company with various roles and responsibilities.

The project was designed to obtain input from project participants about the advantages, disadvantages, and utility of CATIA V6. The virtual company was designed to simulate the development process of taking a product from the conceptual phase all the way through manufacturing and beyond. None of the Discovery Panel participants had concrete experience with CATIA V6 prior to the project. Panelists were assigned various roles, such as designer, planner, manufacturing engineer, stress engineer, and analytics.

Two years later, COE tasked a second Discovery Panel with evaluating the collaboration tools available through Dassault Systèmes' cloud environment rather than the functionality of CATIA V6. As with the previous project, panelists were from COE member companies. This would be everyone's first chance to use the collaborative tools available in the cloud environment. The object of this white paper is to summarize the panelists' experiences.

ABOUT COE

COE helps users and their company leverage their Dassault Systèmes solutions through education, training, networking opportunities, product influence and best practices available exclusively to COE members. Our mission is to lead and serve an independent community that drives innovation and productivity utilizing the Dassault Systèmes suite of solutions.

COE is a not-for-profit taxpaying corporation.

The primary objectives of COE are to provide a forum for the interchange of knowledge, experiences, and technical information relating to the application of the Dassault Systèmes family of solutions and the environment in which they operate; and to communicate with Dassault Systèmes regarding the current and future capabilities and use of these products. Membership is open to all licensed users of the software in both commercial and academic environments. More information can be found on the IDUG website: www.coe.org

INTRODUCING THE COE 3DEXPERIENCE DISCOVERY PANEL II

The Discovery Panel that produced this white paper was comprised of volunteers from COE's community of Dassault Systèmes users and consultants.



Keith Horton

Keith Horton, The Nordam Group, has been CATIA system admin and Software developer for over 15 years. He has been in the Defense, Automotive and Aero industries. He's currently on the COE board of Directors, and has spoken at COE Conferences on many occasions and has been a chairperson within the COE process interest committee. Also is former president of the Indiana COE Users Group. Keith holds a bachelor degree in computer science from Purdue University.



Phil Harrison

Phil Harrison, LionHeart Solutions Inc.

Phil is the owner of LionHeart Solutions, founded in 1999 and consultant at BMW & Sikorsky Aircraft for over 14 years. LionHeart Solutions focuses on the implementation of Dassault Systèmes' products, including the integration of 3rd party products. Phil was on the Board of Directors for COE and served as the President from 1996 to 2005.



Jim Strawn

Jim Strawn, Textron Aviation. 1985-present, Senior IT Specialist. In 30+ years with Textron Aviation, Jim has been involved in the evaluation and implementation of numerous Engineering Tools, including CATIA V4, CATIA V5, CATIA V6, ENOVIA VPM V4, ENOVIA LCA, and ENOVIA V6. His background as a Design Engineer has given him perspective that allows him to evaluate the software tools, and adapt engineering processes to implement these tools on multiple programs at Textron Aviation.

Mike McKown, Textron Aviation



Mike McKown

Eric Marazzi, Goodyear Tire & Rubber



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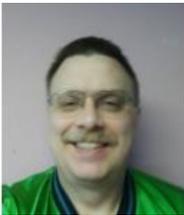


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Jeff Roark, Yanfeng

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Tim Suhr, The Boeing Company

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Gary Anderson



Gary Anderson

SUMMARY

This project was divided into a series of tasks. The first task involved working with Dassault Systèmes to get access to their cloud environment. The second involved the identification of roles to be assigned to panelists. This was followed by the identification of training requirements for the 3DEXPERIENCE cloud environment.

3DEXPERIENCE Project Management tools were used to manage the project and tasks. The interface was intuitive, for anyone used to project scheduling. It was noted that importing an MS Project file had issues; this was mostly related to MS Project being more forgiving with special text characters than 3DEXPERIENCE. .

The new ENOVIA Interface includes a “dashboard” on the user’s initial home page, so the tasks were readily viewable upon log-in. Most of the “designers” involved in the project were not familiar with 3DEXPERIENCE tasks. There were some initial challenges in this regard; however they were easily overcome.

Roles were the key to working in this environment. Before purchasing any licenses, it was necessary to fully understand the individual requirements of the personnel involved. This, in its turn, required an examination of how current licensing requirements were aligned with the predefined roles. One of the goals for this project was to determine whether an Engineer given a predefined role could perform all of the tasks that were required.

There is an option in CATIA V5 that can track workbench usage. This data can then be collected and analyzed to determine the best license migration option. The same data could be reused for migration to 2017X, as licensing has been changed. It was suggested that the provision of a full set of tools be provided by Dassault Systèmes to ease the process.

CONCLUSIONS

Licensing and role assignment were complex topics. Any company implementing this tool would require a PLM Architect to assist in defining processes and role mapping from either Dassault Systèmes or one of the PLM Resources. Dassault Systèmes went way above and beyond when supplying access to the training materials. Unfortunately, for a “volunteer” project, the training required for the PLM functions (not CATIA, but all the processes wrapped around it) required more training time than was available. The collaboration tools were good, but several issues required addressing, including corporate firewalls, company policies, disparate schedules, and limited participation time that prevented true collaboration.

INFORMATION TECHNOLOGY TOPICS

JIM STRAWN, SR. IT SPECIALIST – TEXTRON AVIATION

This section of the document discusses 3DEXPERIENCE features that are expected to be of most interest to IT Professionals.

GENERAL ISSUES ENCOUNTERED

A number of issues were encountered as the project progressed. Many of these issues were related to the nature of a volunteer project being performed by users working on their own spare time. Others are issues that many customer companies may encounter.

TEAM SIZE AND COMPOSITION

COE thought that the project could support numerous panellists with diverse backgrounds. We should have limited each role to 1 or 2 drivers max. Additionally, we lacked volunteers in key roles such as Systems Engineering and Requirements Management.

LICENSING AND ROLES

This was much more complicated than expected. DS had provided a marketing brochure of their out of the box roles, but we had little definition of exactly what tools and processes were supported by each of these roles. Additionally, there were some pre-requisite roles that were required, and we didn't understand the relationships, consequently we did not initially ask for sufficient numbers of some of these pre-requisites to support all the roles. In hind sight, we should have asked Dassault Systèmes for more guidance. In a customer company project, I would strongly encourage that the customer engage a System Architect from Dassault Systèmes to aid them through this process.

MOMENTUM

The project struggled at times with momentum. Several times momentum was gained, only to be killed off by one of several factors, including:

1. Initial set up. This was out of everyone's control due to personnel changes on both sides. But volunteers were lost during the waiting period.
2. Training took much longer than the 8 hours initially expected.
3. Manufacturing Team. They were ready to participate, but COE needed to provide more leadership.
4. License expiration.
5. Upgrade issues.

This is definitely a symptom of a project run by volunteers, on their own time.

INFRASTRUCTURE

Non-certified home workstations emerged as an issue. And though some users used certified workstations from their place of employment, they faced restrictions on firewalls, client administration access, browser settings, etc. Some users also encountered problems with the failure of software updates. In a customer

company environment, workstation certification is a critical requirement, as is engagement with the company's IT Infrastructure team.

CLOUD ENVIRONMENT

This was the IT leads' first exposure to the cloud environment. Specifications for servers were unknown initially. Getting familiar with the interface took time. The IT leads' initial task was to create user accounts and assign roles. Setting up user accounts and providing the credentials to users was very well organized and very efficient. The interface was well designed and intuitive. The philosophy behind setting up the basic environment was simplified from what was observed by the first discovery panel. In the 3DEXPERIENCE Cloud based environment, the participants, their e-mail addresses, and their roles had to be identified. The "system" effectively took care of setting up the users' software environment. This was seen as potentially a huge benefit, especially for smaller enterprises.

CLIENT INSTALLATIONS

The user interface was found to be very intuitive, and the required fields were fairly straight forward. Once the account information was entered, a link was emailed for set up completion. During this phase of the installation, software was downloaded to the client machine for installation, depending on the role. This is where detailed analysis of the roles and understanding of the functionality is crucial, as this directly determines what modules would be downloaded.

Most of the issues encountered at this point were the same as those encountered by the first panel. The user base of the virtual company created by COE consisted of member companies with very different firewall and client restrictions. Standard client configurations were lacking. Some client installation issues emerged, mostly firewall related or because users lacked admin privileges to complete the installation process. Users were provided with detailed installation instructions on the first panel, which was not required in the cloud environment. Most of the installations thus proceeded without issue. Time was lost, however, on the downloading process, depending on the assigned roles.

CLIENT SOFTWARE & UPGRADES

One of the features of the cloud environment is that all client workstations run the same software environment controlled by the hosting organization. Each time a client connects to the cloud, it checks to ensure the client is at the right software level and prompts the user to upgrade if they are not. Software upgrades were performed once per month during the weekend. Once a user's client connected to the cloud environment after these upgrades, the client automatically downloaded and installed the packages. Installation issues were encountered on systems running Windows 10.

SOFTWARE ENVIRONMENT

One of the features of a CATIA Version 5 installation was the ability of an organization to customize how CATIA operates through options. These options control parameters that are purely user preferences through critical performance parameters and standards. Companies usually control and lock their company's standards through master settings. In the cloud, IT needed to investigate how a company could customize their environment, or if indeed, it can be done without affecting other users on the same cloud installation. It was hoped that better management capabilities would provide member companies the tools to manage corporate, division, domain, group, and individual settings in ways that refreshing to the next release or service pack can be done at various levels.

USE CASES

The primary goal of this discovery panel was to examine and test the collaborative tools that are available and see how they could benefit design and manufacturing processes. The cloud version VR6-2015x has a completely new CATIA interface. Even though the interface was not the primary focus, since the team consisted heavily of design engineers, old habits proved hard to break. Too much time was spent concentrating on interface changes rather than the overall concept of collaboration.

The majority of the volunteers in this project were not familiar with ENOVIA or with any other PLM system. They were primarily CATIA designers. As such, they were not familiar with the day-to-day processes of managing a Bill of Materials, Project Task Management, etc. They were familiar with the CATIA tools, and most of them had little trouble navigating the new user interface and capabilities.

Due to a number of delays in the project, only a few of the initial tasks were completed, and no design changes were accomplished. The initial plan was to include some requirements management, but the team was unable to locate any users with a background in system requirements to perform this task.

There was also some struggle with users being unfamiliar with a database environment, where everything needs to have a unique name. There was a Product Engineer assigned to create our initial product structure, and this was accomplished successfully. However, communication and collaboration to the rest of the team fell short, as this volunteer had to bow out of the project early on. Once the product structure was passed along, however, the basic mechanical design tasks were straightforward.

An area not explored was Logic Driven Physical Design, though there are hopes this will be part of future COE projects. Systems design processes would benefit all domains with this set of capabilities. As more domains include placement and logic to development of parts and assemblies, more companies and domains will adopt this.

TRAININGS

Despite Dassault Systèmes making its training material available to COE, this portion of the project proved time consuming. Initial estimates for the “Update Training” were eight hours. However, one user tasked with completing this portion spent over 20 hours running through the relevant material. Dassault Systèmes also made much of their in-depth training materials for the various workbenches available.

Overall, the depth and the quality of this training were excellent and would be very valuable to a production installation. Integrating the training directly into the 3DX user interface would eliminate the need to side load training examples and would provide numerous best practice templates for users. These training materials, however, were separate from the Cloud Environment that COE was using, and the example data had to be recreated or separately loaded. Integrating these training materials and example data would be a significant improvement. COE may consider providing contributions to the training for use by member companies.

As it was hard to define roles for each member, the complete training package was given to each member. The quality of the 3DX 2015X training material was good, but the material provided for the transition to 2016X or 2017X lacked necessary updates, making some things more difficult than needed. Additionally, the transition from department members to new members faced some hurdles, as some GUI and behaviour changed in the web app.

The training aspect of the project turned up mistakes on COE’s part as well. Each user was given a list of companion classes that they should take before they could start their tasks or practice on the system. There was a common core of classes covering the new 3DEXPERIENCE concepts and interface. This in itself took more than 12 hours to complete, after which some user enthusiasm

waned. In hindsight, it would have been better to have some pre-configured exercises that showed the philosophy and use of the tools. Also during transition from V5 or V6, it would be beneficial to be able to replace the 3DX icons with those of the former systems to promote transition from the old to the new.

CONCEPTUALIZING THE USE OF COE VOLUNTEERS

TIMOTHY J. SUHR, ELECTRONIC & ELECTRICAL TECHNICAL DESIGNER, THE BOEING COMPANY

Tim conceptualized the use of COE volunteers to promote understanding of new tools by member companies. For the first project Tim created several containers of design data. In the second project, he had to learn and use the collaboration tools and was given tasks to test his knowledge.

Tim found that the collaboration tools of 3DEXPERIENCE included ad-hock and scheduled one on one forms but lacked a pooled resource stack. He hoped to craft a few well-placed enhancement requirements to extend the 3DEXPERIENCE to fill the need of group contribution and collaboration.

The biggest addition to the Dassault Systèmes solutions, Tim found, was the integration of all the brands through placement of the database at the core of the tools. As time passes, more of the file and document structures will be replaced by data directly in the database, so performance at scale will be more vital for companies.

Even in 3DEXPERIENCE, data structures limited the reusability of modeling. For example, one simple model of an electrical cable that is used several times within the greater product must have different part numbers for no other reason than the bundle segment between the two connectors is a different shape.

ENOVIA LCA V5 with 10 terabytes of data in an actively developing product database would take months of pre-conversion, synchronization, and final transition. Manually moving the data by a designer would be a show stopper that would not be accepted. Aerospace, for one, is required to keep data for many more years than most other industries.

There needs to be an understanding between certified configurations and working configurations. For the last two discovery panels, he was using a HP Home All in One Desktop. This hardware was fully supported by HP to a point just before Windows 10. As a home configuration, it was not certified by Dassault Systèmes and therefore was not supported when things went wrong. Dassault Systèmes helped to get Tim up and running by providing steps to turn off security while installing their products. With this new working configuration, Tim hoped to show that the Microsoft Surface Book would be a good candidate for simple to medium design complexity and would be a great tool for design consumption by ME, Shop, QA, etc.

INSTALLATION, TRAINING & TESTING OF CATIA'S 3DEXPERIENCE

RICK MARICKOVICH, ADVANCED DESIGN – TEXTRON AVIATION

Rick detailed the installation, training, and other processes involved in testing CATIA's 3DEXPERIENCE. He modelled a blade for a wind generator and then modified some of the parameters to provide a revision for downstream users. Compared to his first Discovery Panel experience, installation for this project was a lot simpler, taking only 10 percent of the time required for the former, mostly because he did not have to manipulate or add files, as was the case with the initial panel.

Training was comprehensive and thorough. The courses recommended by Dassault Systèmes were both detailed and easy to follow, which was of particular importance because the new user interface was drastically different from previous versions. Some of the differences are outlined below:

The first panel upon login was a dashboard that contained various applications and subpanels.

To access CATIA, “3D” had to be selected from the compass. The proper role and workbench has had to be selected.

There weren’t any toolbars.

There was a tool “Ribbon” at the bottom of the panel. All of the GSD tools were loaded on the Ribbon and accessed by sliding the ribbon left and right. The GSD tools plus the default tools did not fit across the bottom of the screen on the Ribbon. Switching tools required a user to slide the Ribbon left and right searching for the proper tool.

Tool bars could no longer be docked along the side or top of the panel. This became a time-consuming process while creating/modifying geometry

An “Action Pad” was added to the CATIA graphics panel. Tools could be added to the Action Pad for quicker access. This is an improvement but is still not as efficient as the docked V5 or V6 toolbars.

Overall, the user experience was not an improvement.

3DEXPERIENCE MACHINING

DAVE FRANK, COMPANY

3DEXPERIENCE machining works, with some caveats. 3DEXPERIENCE machining is mature enough to warrant doing a pilot project on real parts, though users need to determine if the new features outweigh the learning curve and infrastructure costs involved in the transition. Many functions were the same or similar to CATIA V5. The five primary tabs were still there: Methods, Geometry, Tooling, Feeds, and Macros. The PPTable was the same as well. CATIA V5 NC processes were importable. The big task to consider in importing was management of duplicated tools. Frank found that it was best to organize all the tool assemblies first and reattach cutter assemblies after import. Duplicated tools were recognized upon import.

People need to be trained on the differences, and there are a lot of them. Some of the biggest are listed below:

- Tool and Cutter assembly
- Database
- Infrastructure and training requirements.
- Machining cell, a container for machines, accessories, methods.
- New Reuse methodology
- Lathe and Mill turn improvements
- Machine simulation improvements.
- 4 axis pocketing enhancements

Substantial development in the 3DEXPERIENCE platform for machining was observed by Frank. The more people looking at 3DEXPERIENCE and giving feedback through collaboration with COE, the sooner 3DEXPERIENCE machining will be developed into what the community expects and deserves. There are some areas where considerable investigation and due diligence is still required, as different companies have different ways of deploying CATIA. The following are topics that should be further investigated:

- For Aerospace & Automotive OEMS, the key issue is if the 3DEXPERIENCE machining is usable when the OEM uses 3DEXPERIENCE for design.
- For Aerospace & Automotive Suppliers, the issues of maturity, stability, and ROI are critical. Having a clear advantage, in both superior toolpath and time savings, is critical to the ROI. Those requirements are similar for the single seat NC user, and NC programming contractors.
- For many cases, Frank believes that the “dual use” requirement will be an issue after migration.

ACKNOWLEDGEMENTS

The COE 3DEXPERIENCE Discovery Panel would like to thank the following people for their invaluable assistance in putting together this project:

- Tracey Wade (Dassault Systèmes)
- Barry Langston (Dassault Systèmes)
- Larry Paulsen (Dassault Systèmes)