

SD502276

## Let's Talk About Data!

Kevin Vandecar - Autodesk - Moderator  
Frode Tørresdal - Norconsult Informasjonssysteme  
Nem Kumar – CCTech  
Phil Northcott - C-Change Labs  
Shelly Mujtaba - Autodesk  
Tobias Hathorn - Autodesk

### Learning Objectives

- Learn how powerful data coming from the Autodesk Forge platform is solving today's problems.
- Hear a customer's perspective on how data can help sustainability initiatives at design time.
- Hear from one customer using Fusion Data to build efficient bills of materials from design data, simplifying the process.
- Get questions answered about the future of the Autodesk Forge Data platform from Autodesk experts.

### Description

Hear from customers and Autodesk about how Autodesk Forge Data is solving problems! In this panel session, several experts will share thoughts about how various industries are using Autodesk Forge Data to tackle tough problems—from sustainability initiatives to solving problems in architecture, engineering, construction, and manufacturing spaces. With the introduction of the Autodesk Forge Model Derivative API several years ago, we've seen the emergence of new solutions to old problems. This centralized access to design data via the cloud has driven many customer-centered workflows. We'll discuss these workflows, talk about some new workflows that Fusion Data and Data Exchanges enable, and also answer questions about the future of cloud information models that Autodesk is developing. We'll have customers and Autodesk experts on hand to bring to light the power of the platform!

## Speakers

Kevin Vandecar is a Forge Developer Advocate at Autodesk and also the manager for the Media & Entertainment and Manufacturing Autodesk Developer Network Workgroups. His specialty is 3ds Max software customization and programming areas, including the Forge Design Automation for 3ds Max service. Most recently he has been working with the Forge Data initiatives.

Frode Tørresdal is head of development of the BIM and Structural Engineering department and sustainability manager of Norconsult Informasjonssystemer. He has been a developer on various BIM and CAD platforms since he started working in the company in 1999. In the last years Frode has worked a lot with the Forge platform and has also spent some time investigating augmented and virtual reality. Frode is an experienced speaker and has held many presentations of various conferences.

Nem Kumar is director of consulting at CCTech and has been doing product development with companies from Manufacturing, Oil & Gas and AEC domain. He has vast experience in Desktop as well as Cloud software development involving CAD, CAM, complex visualization, mathematics and geometric algorithms. He has been actively working with Autodesk Vertical and AEC product teams. His current areas of interests are Generative Design and Machine Learning.

Phil Northcott is CEO of C-Change Labs and leads an experienced team of software developers in the fight against climate change. They are the primary developers of BuildingTransparency.org's free EC3 tool and its related Autodesk plugins and integrations. They are committed to providing the construction community with the tools and data they need to master climate-efficient design and building.

Shelly Mujtaba leads a multi-disciplinary, worldwide team towards formulating and delivering a distributed data management platform. Unlocking file-based data into granular, interoperable elements accessible through cloud-based ecosystems - is a critical component of Autodesk's strategy. His focus areas include overseeing company-wide data strategy, agile execution, product, and engineering excellence, talent management, and customer feedback loops.

Tobias Hathorn is a Director of Interoperability at Autodesk, as well as a licensed Architect. His career at Autodesk began developing and designing BIM products like Revit, FormIt and Dynamo. He has recently focused on cloud data workflows while contributing to the Forge Data Exchange initiative. He has presented on AEC domain topics to a variety of audiences at Autodesk University, TechX, BiLT NA, and the Denver based Revit User Group. His passion is connecting data between apps and the cloud - empowering more people to contribute to the convergence of designing and making a better world. @tobiashathorn

## What does the term “data” mean to you?

“Data” is probably the most generalized and overused term in our vocabulary when we are talking about anything that is important to us. But that is a key concept when we start talking about “data” to be shared and reused. What is important? There-in lies the challenge. Once it is determined what is important, then more detailed questions arise about the data. How to structure it? How to store it? Where to store it? As an example, this is one reason why Model Derivative service provides all data in a JSON structure with “key” and “value” pairs represented as strings. This allows consumption of the data in a generic way, but unfortunately puts the interpretation of that data onto the consumer.

Panel question: *What does the term “data” mean to you?*

## Autodesk Data

Historically, Autodesk has been concerned about data since the beginning of time (well, in the Julian calendar, at least as far back as 2445305.4167<sup>1</sup> 😊). Even here, we can see that important data (date and time) needed to be packed into something that was compact and easily converted to something standard in various output formats. Enter AutoCAD using the Julian calendar to specify date and time, and mainly decodable by using AutoLISP. Remember, we are talking about the days of MS DOS, and 640k of memory, so a critical design strategy was to make everything as compact as possible.

Panel question: *When you think of data, do you feel it is unique by any specific technology? Is there data that should be standardized?*

Fast-forward to today, and software data is still very file-based and containerized. When we talk about modern cloud solutions coming from traditional desktop software, we are still in a file-based world. Let’s use Microsoft Office as another example, even though OneDrive and SharePoint allow collaboration in the cloud, the data is still contained within a “file” that can be edited in the cloud directly, downloaded or even in-line edited from the desktop app, while updating that cloud “file”. Even if we look at solutions that were “born-in-the-cloud” like Google docs, there is still a file-like container. Yes, you can reference data across the containers, but it still feels like a file, and the syntax to reference across documents is not standardized.

Currently in the Autodesk ecosystem, a lot of data is stored in files. You’ve probably heard that Autodesk is working to move away from file-based data and bring the data to the cloud where it can be consumed and collaborated on without the need for the authoring product. The Forge platform is driving this vision and from a data perspective, the Model Derivative and Design Automation services have led those efforts.

Panel Questions: *Show of hands... how many people know about Model Derivative, Design Automation? What do you see as the impact of those technologies?*

---

<sup>1</sup> COMDEX was first public showing of AutoCAD and ran from 11/29/1982-12/2/1982; so let’s use Dec 1st, 1982 at 10 AM as Gregorian date/time for beginning of AutoCAD being available to public. 😊 Using the julian.lsp file, calling ctos like this: (rtos (ctoj 1982 12 1 10 0 0) 2) we get 2445305.4167. ....)

## Cloud Information Models

Onto the future... and it's now! Autodesk introduced the Data Exchange and Fusion Data features this year. Both are available to use NOW. The products are providing the data authoring capabilities seamlessly without the customer needing to understand the implementation, only the benefits. And from an API perspective, they are fully exposed through the Forge Data initiative.

Data Exchange allows workflows that “sub-set” data to be exchanged with other apps. It is currently working with Revit, Inventor, and Microsoft Power Automate, and with the API capabilities will be useful to other apps and workflows.

Panel Questions: *How does Data Exchange solve problems today? What other products should be following the Revit and Inventor lead?*

Coming soon will be additional features to expand the Data Exchange capabilities. The DX connector SDK, DX Geometry SDK, and DX GraphQL will be coming soon. The connector SDK, along with the geometry SDK will allow developers to build additional workflows to connect to other applications. GraphQL will provide more granular access to the data from an API perspective and eliminating having to search through a large response to get the specific data you need.

Panel Questions: *What types of data and product connectivity do we, or partners need to provide? Do you think Graph QL is a god approach to simplify granular access to Data Exchange?*

We also introduced a manufacturing information model. Early discussions called this “PIM” (Product Information Model) and was released as Fusion Data and supports Autodesk’s recognition of three major industry workflows: Fusion being manufacturing, Forma being AEC, and Flow being Media and Entertainment. These initiatives bring the idea of “real-time” and “source-of-truth” data aspects. What do those ideas mean?

“Real-time” means that the data at design time is being authored into the information model. When the model is saved, the data is there. Period.

“Source-of-truth” means that the data is NOT a copy, NOT translated from a file, NOT something that is unreliable. It means it is the data, as was last “saved”, and represents that last state of the design and version that was saved by the author (designer, cad manager, auditor, etc. Anyone who updates/saves the design).

Panel Questions: *How does Fusion Data solve problems today? What does real-time and source of truth mean to you? What other manufacturing products should be following the Fusion lead?*

In Fusion Data we will be providing extensibility features that will allow you to add custom data. Eventually the plan is to allow users to see this data on the Fusion 360 client side, too.

Panel Questions: *How do you see Fusion Data expanding? Extensibility provides some write capability of custom properties? Do native values need write capability, too?*

### **GraphQL vs. REST APIs**

Along with these two services we have done some evaluation of how to provide access to pure data, on a granular basis. When we talk about REST APIs, typically you would get back a JSON formatted payload. And it could contain much more data than you really need. This is where the GraphQL approach shines. We have adopted it for Fusion Data, and for Data Exchange it is coming soon.

Panel Question: *What is your impression of GraphQL vs. REST API? Advantages/Disadvantages of each?*

### **Data Privacy**

As more and more data is collected by web sites and apps, it has become increasingly important for data privacy policies to be in place. The European Union's General Data Protection Regulation (GDPR) is one of the most strict and comprehensive laws in effect. Typically, these laws pertain to consumers and how retailers collect data and how they deal with it. Autodesk has embraced data privacy at a consumer level, but what about authoring and sharing design data? Already with Forge services we also ensure this privacy, but let's consider a Fusion 360 or Revit design and its data? Through Forge core services, there are authentication requirements and administration tools to provide access to only those who need, but this will be more and more important as data exits the "file" and becomes centralized in a cloud model. Does this increase data privacy concerns?

Panel Question: *How important is data privacy to design data?*

### **Cloud Information Models – the Future**

Autodesk is already working on AEC and Media & Entertainment information models. These will become like Fusion Data is today, "real-time" and the "source-of-truth" from an authoring perspective.