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Lucas Museum of Narrative Art : Innovative Workflows for Delivering Complex Buildings

Brendan Mullins
Stantec Architecture

Learning Objectives

- Learn how to overcome the difficulties of delivering construction drawings for buildings with complex geometric forms
- Learn how to integrate Rhinoceros 3D and Revit using Grasshopper and Dynamo
- Learn how to coordinate and deliver designs digitally using cloud-based collaboration and virtual reality
- Understand the challenges and workflows for architects delivering 3D models for fabrication

Description

This class will tell the complex story of delivering models and design drawings for the Lucas Museum of Narrative Art currently under construction in Los Angeles, California. This flagship museum is pushing the boundaries of architectural design and delivery. Brendan Mullins of Stantec Architecture will explain the challenges of modeling and documenting the unique aesthetic of the building. He will share workflows for integrating Rhinoceros 3D and Revit software using computational design software Grasshopper and Dynamo. The intelligent model, a complex A360 Revit project, pushes the limits of what Revit can accomplish as a tool for fabrication of architectural components. The project didn't have a printing budget, and was delivered paperless and coordinated using a combination of cloud-based platforms, including A360 and Bluebeam, while utilizing virtual reality and drawing tablets. Through examples and stories, Mr. Mullins will share the journey of delivering this innovative design.

Speaker(s)

Brendan Mullins is an architect and visualization expert with Stantec Architecture. He has integrated virtual reality into the design process of prestigious projects such as the Lucas Museum of Narrative Art, the San Ysidro Land Port of Entry, and the UCSF Precision Cancer Medical Center. Brendan is currently living in Los Angeles and working as an Architect on the Lucas Museum of Narrative Art.

LESSONS LEARNED ON INNOVATION

By: Brendan Mullins

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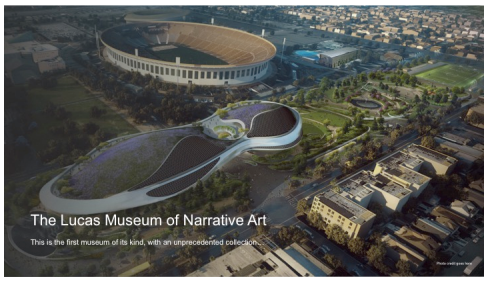
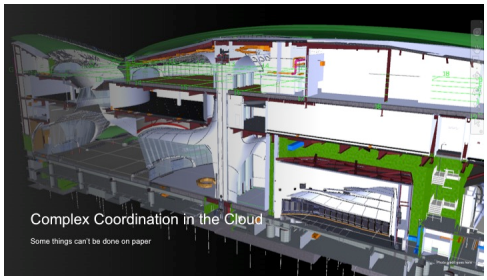
Working on the Lucas Museum of Narrative Art has been nothing short of life-changing. From the civic impact the building is bound to have to the technological innovation in design and construction delivery, this project has amazed me constantly. That, of course, is not to say it hasn't had its challenges while learning the right path to our deadlines. Having the right team has made these challenges the classroom in which we have learned new methodologies in design and documentation, ultimately resulting in timely delivery of the most complex project I have seen.

My opinions on how we as an industry grow from a technological standpoint may seemed skewed due to a resume that is mostly full of larger and more complex projects. However, I truly believe that the most challenging issues we encounter while documenting and delivering these types of work are easily transferable to smaller projects. I don't believe that it is the difficulty of implementation that has prevented this from already happening. In my experience, the only thing preventing teams from pushing forward with new methodologies is the teams themselves. Whether it be junior staff that aren't seeking out the learning resources, mid-level staff that aren't seeing the opportunity, or senior staff that aren't convinced it is worth the effort, it always seems to be a "people problem".



Luckily, the Lucas Museum design team began the project knowing that there was no traditional path to the end. We understood that in order to deliver a design of this complexity, we would be required to test new ways of working. Over the course of the design phase I learned some extremely valuable lessons.

As already alluded to, the first lesson I learned is that "mentality is everything." Once a team understands that they must innovate to succeed, innovation comes naturally. Innovation comes from a mindset of exploration and doubt, always ready to reconsider an old way of doing things. It wasn't about reinventing the wheel, but more so taking the tools you already know and use and repurposing them in a unique way. Every project presents this opportunity, it is just about whether you are willing to take advantage of that opportunity. Try out new tools, find their place on your project, and give them a try.



The second lesson I learned was to organize this exploration and doubt. The sheer amount of work required to deliver design documentation at the scale of the Lucas Museum meant the team needed to stay efficient. Many digital tasks could be accomplished numerous different ways. However, instead of letting the assignee decide on the method forward, we reflected as a team and discussed the different ways to complete the

assignment. It became a kind of "Digital Process Audit". Do we muscle through it or put in the effort to make it automated for the future? Do we use our native drafting software or use the software more suited for the task but risk the complications of importing? These decisions can have a profound impact on efficiency. By auditing our methods beforehand, we made sure to create automated scripts for the tasks we realized we would have to do again many times in the future while guaranteeing a streamlined approach for the tasks that were a one-off.

This naturally leads me to my next lesson learned, which is that designers spend way too much time repeating mundane tasks, wasting valuable time better spent on design, coordination, and documentation. Consider the amount of time we spend printing and assembling sets, re-doing life safety and egress plans, or laying out roof drainage? Our team did our best to make the computers do these kind of task using automated cloud PDF'ing, direct links between Excel and Revit, and computational design tools Dynamo and Grasshopper. Our team was at times forced to seek efficiencies simply because these standard architectural tasks take much longer on a building with few straight lines, but all the same the things we learned can and will be used on other projects types.

Continued professional growth as it related to digital practice is not something that should be gone at alone. I realize more than ever that it takes a village to reinvent an industry. On the Lucas Museum, different consultants had different ways of tackling these complex issues, yet we had constant open dialogue about methods. This same concept is one of the reasons I love Autodesk University; it allows people to grow together and learn from each other instead of keeping workflows to themselves. The further I get into my career, the more I believe that "open-source" innovation is the only way to go. Innovate, teach others your process, and then learn from the way they innovate on top of it.

The amazing thing about the AEC industry is that we are only scratching the surface of what our digital tools can do for us. Automated life safety analysis, automated space planning, automated code-compliance verification...imagine the time we would get back? In an industry where we are expected to do more in a shorter time frame than ever before, automation is the means to get back some of our time for design. Staying in front of the push for rapid-prototyping and computational design is the best thing you can do for your team, because it's ultimately going to give you more time to make beautiful projects.

Thank you for taking the time to participate in my presentation. I hope to hear from you in the future.