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DRIVING SMART DESIGNS AND BETTER CONSTRUCTION

Woolpert President and CEO Scott Cattran explains how sophisticated geospatial controls, data collection and processing can lead to better construction methods.

CAD and GIS can be worlds apart on the work floor. Engineering accuracy versus visual clarity can cause rift between land surveyors and geospatial analysts. Merging these into a marketable services portfolio that is both accepted and called for is a feat in itself. How did you accomplish that and what all challenges were overcome to establish Woolpert as an AEG (Architecture, Engineering and Geospatial) company?

Yes, CAD and GIS are worlds apart. A lot of people live in their own worlds and do not have the time to look outside to see how things have always been done, let alone have the inclination to want to look beyond their areas of responsibility. So, the biggest challenge in creating an AEG company was to first just start talking with each other and showing what we can do to make each other better. Like with all our clients, we needed to demonstrate value to each other. Honestly, we have been brainstorming for decades over how geospatial services help engineers and architects serve their clients better, and how engineering and architecture enable geospatial professionals to deliver better solutions. However, sometimes these disciplines should not be brought together when it does not bring value — the key is knowing the difference. And as the world's first AEG company, we have this figured out.

While Building Information Modelling (BIM) is still evolving, we are slowly entering the era wherein finalized buildings and constructions are being maintained through a sustainable BIM model that was created years ago. There are people who say that the 'M' in BIM should actually read 'management'. The inevitable happens next: the inclusion of installation information, changes in underground pipelines and cables and, quite

possibly, ever-changing laws and regulations. How will Woolpert be addressing this phase of Building Information Management?

Woolpert will continue to be a leader in the advancement of BIM, both modeling and management, as the industry and our clients demand more knowledge from our design deliverables. We are carefully tracking the evolution of BIM — from when it first hit design, followed by the big boom in construction — and we can see that facility management is on the brink. BIM, VDC, modeling, management, whatever the name becomes in the future, it's the connected workflows and the needs of each entity that have to be defined.

There is a big difference between what one needs for design and what is needed for construction, and furthermore facility management. And the industry is still quite segregated in the way we work. BIM needs a fundamental shift in thinking when it comes to project delivery. Integrated project delivery has always been the ideal situation for BIM, but we need the laws and client regulations to catch up with the times.

When we pivot to 'management', it all comes down to "expectation alignment" and the ability for each side to be mutually vulnerable. That's not easy. Without asking and diving deep with the owner about its intended use, purpose and function of the improvement, the design professional cannot know the owner's true expectations. And, concurrently, without the owner asking the design professional (the right design professional with real and substantive depth and data) about the available, robust and dynamic tools of BIM, he/she will not learn about possible connection of dots. Both sides will miss the opportunity to optimize alignment and may walk away not achieving maximum expectation if they don't look for expectation while willing to be vulnerable.

As far as Woolpert is concerned, we will continue to forge a path forward and continue to educate ourselves on the ever-changing BIM landscape to provide ourselves and clients the most value out of the technology we use and the products we produce. Maybe there is an opportunity to address the commercials in here as well. BIM modeling adds high value to owners/operators and our clients, but the value comes from the effort that Woolpert puts in to build the intelligence and connected workflows in to the model.

As a user of both software and hardware tools, you might be aware of a data capture paradox. One could save a lot of money by not capturing data twice. Is it an outdated issue, and what according to you is the ideal level of quality?

No, it is not an outdated issue. As a matter of fact, the topic is crucial to the success of our business, and an important element to Woolpert's "First Time Right" mantra. Enabling our success in capturing data right the first time is attributed not only to the software and hardware tools, but also to the technical skills of our staff and the processes

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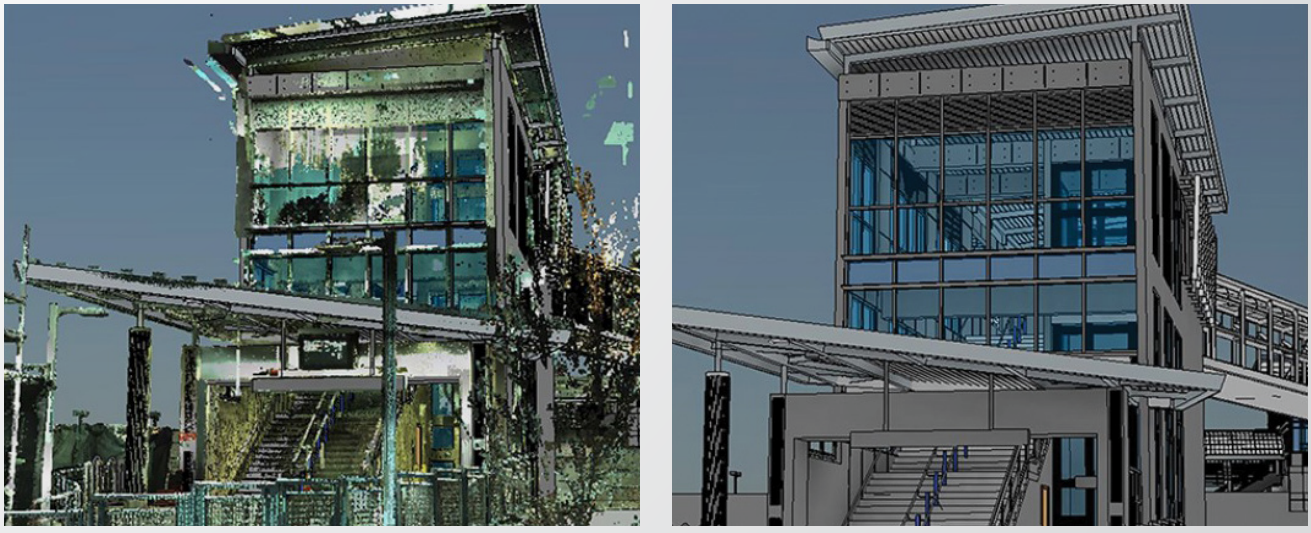
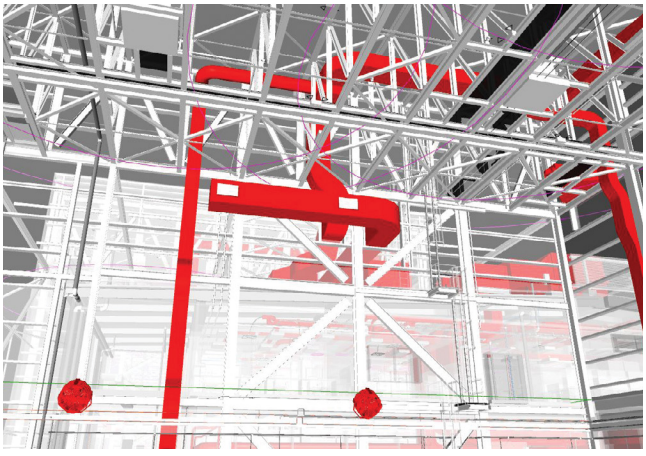


These images show a mix of laser scan data and Revit models of a section of infrastructure.



A collaborative BIM model (left) highlights the mechanical elements of a hangar, while this screen shot (right) illustrates the live interaction during a virtual reality design meeting.

developed to ensure quality. We invest in our people to equip them with the right software/hardware and training to grow their technical skills.

One important aspect I would like to raise from this question are the challenges that Artificial Intelligence (AI) and Deep Learning are bringing to our business. While these are extremely useful, we must decide on their effectiveness for certain tasks. Some of the AI-based software perform perfectly, which supports our concept of "First Time Right", while others result in lesser quality and that missing 10% or 20% of information could cost us twice as much to recover manually as compared to doing manually from the beginning. It is always challenging, and we have to set our priorities based on the project timeline and complexity.

Both land surveyors and photogrammetric mappers are focused on engineering level accuracy, whereas geospatial analysts are more inclined towards the actual location and the surroundings. When integrating architecture, engineering and geospatial, would it be possible to cut out the geospatial gaze whenever it's not about context, and have the engineer quiet when it's not about centimeter accuracy anymore?

We are witnessing a great state of interdisciplinary collaboration. Most government agencies are putting their data on public websites for free downloads by diverse users. We advise our clients to produce data that can be useful for different applications and needs. We believe in the principle of "collect once, use many times". In this case, our data, although it is produced to meet a certain set of specifications and the needs of a certain use (for example, engineers), it could also serve the needs of another population (for example, geospatial analysts), which will likely have a different set of specifications and needs.

Of course in some situations, we would have to sacrifice either the accuracy or the thematic content if the client's budget does not allow for producing data that meets the needs of the engineer and the geospatial analyst at the same time.

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Geospatial and architecture tend to grow closer to each other, two different phenomenon belonging to long-term projects seem to come closer as well. Do you feel procurement rules and spatial planning laws are increasingly feeding your legal divisions?

Maybe we are fortunate, lucky or both, but we have not seen the continued blurring of geospatial and design services cause additional project stress or strain between stakeholders. Frankly, as has been our experience, we would expect to see a more collaborative, better informed project evolution and delivery. Sophisticated geospatial controls, data collection and processing (for example, achieving regulatory and insurance compliance) can drive smarter design and lead to better construction methods. From front-end site development and diligence to back-end construction administration during a project site, geospatial practices used by owners, design professionals and contractors can mitigate risk exposure and better predict outcomes.

Of course, candid and steady communication is the key to expectation alignment. The owner must be informed and understand how this evolving geo-design blur will and will not affect its pro forma. Project stakeholders must use language and deploy practices that make sense and achieve substantive results. We believe issues arise when parties rush toward innovation without a plan to implement it, or an acknowledgement to pay for it. Be sure to define the bumpy road that leads to the rainbow.