Bentley Systems Advances Reality Modelling

Bentley Systems, a leading global provider of comprehensive software solutions for *advancing infrastructure*, demonstrated at SPAR 3D Expo & Conference the latest *ContextCapture* offerings for reality modelling that increase joint opportunities in surveying and engineering.

The capabilities now include cloud processing services, a mobile app*,* and photo planning for Bentley's applications. *ContextShare* extends Bentley's *ProjectWise* connected data environment to securely manage, share, and stream reality meshes, and their input sources, across project teams and applications. *Navigator Web* is a new web application that delivers high-performance streaming of very large reality meshes through the browser to desktop or mobile devices.

For infrastructure project delivery, reality modelling captures the actual context of infrastructure projects through photos and/or scans, creating engineering-ready reality meshes for design modelling, analytical modelling, and construction modelling. During asset performance, as-operated reality meshes can serve to immersively geo-coordinate the alignment of these digital engineering models with right-time inputs from connected IoT technologies. Accordingly, reality modelling extends the scope for engineers to add value to include "conceptioneering" and "constructioneering" for capital projects, and "inspectioneering" and "productioneering" for operating assets. These use-case benefits of "continuous surveying" in turn provide new value opportunities for surveyors throughout the infrastructure lifecycle.

Bureau Veritas, with 66,000 employees around the globe, is a world leader in testing, inspection, and certification of infrastructure assets. Thomas Daubigny, Bureau Veritas Chief Digital Officer, said, "Reality modelling is becoming pivotal in many industries as it fundamentally changes the management of assets, reinventing the handling of inspections, maintenance, and training, while opening doors to brand new services. Bureau Veritas is playing a key role in leveraging digital engineering models, implementing acquisition, and classifying objects based on its expertise on the asset, and ultimately operating the model as a data gatekeeper. The new cloud processing service will provide us the flexibility and power to accelerate the deployment of such innovations to our clients."

CEO Greg Bentley said, "Last year at SPAR I described what I believed to be the significant potential of reality modelling for improved infrastructure engineering, in particular, from continuous surveying enabled by simple digital photography and UAVs, but that was then based only on our own experience. And there could have been resistance from survey professionals concerned that this more accessible technology might jeopardize their return on investments in laser scanning specialization, for example. It is gratifying to report now that in the intervening year, reality modelling has 'gone mainstream' globally, supporting projects and assets of every domain and scale in 'going digital.' Additionally, laser scanning is now fully incorporated—where available, and as needed to supplement photography—among hybrid inputs for engineering-ready reality meshes.

Fidelity

Hybrid processing in *ContextCapture* enables the creation of engineering-ready reality meshes that incorporate the best of both worlds – the versatility and convenience of high-resolution photography, supplemented, where needed, by additional accuracy from laser scanning. The new photo planning capabilities in Bentley's applications empower engineering or survey professionals to easily prescribe the optimal camera positions and flight paths for UAVs to achieve the required levels of accuracy, in particular, for critical inspection points.

Accessibility

The mobile app brings reality capture to every member of a project delivery or asset management team. Combined with the new cloud processing service, this delivers 3D reality meshes back to the mobile device, and to office-based professionals, immediately after a set of photos have been taken. The new *Navigator Web* application makes immersive reality modelling accessible through any browser, with progressive levels of detail.

Scalability

ContextCapture uniquely enables reality modelling to scale from city models to site models to component nameplates. Users can now take advantage of cloud services' inherent parallel computing to speed processing of reality meshes. Scalable mesh technology enables multi-resolution inputs through the new (.3sm) format.

Shareability

ProjectWise, the collaboration system of choice for the majority of the *ENR Top Design Firms*, delivers comprehensive work sharing supported by a connected data environment, unifying design and construction teams to enable comprehensive project delivery. *ProjectWise CONNECT Edition* is provisioned by Microsoft's Azure cloud service and supports hybrid environments. The new *ProjectWise ContextShare* service adds breakthrough performance in securely streaming reality meshes and their inputs, making it possible to instantly and persistently share full-scale, engineering-ready datasets across a distributed team, whether in the field or in the office. Offered through a visa subscription, with charges only for actual use, *ProjectWise ContextShare* completes the reach of Bentley's comprehensive reality modelling solution, empowering engineering and surveying professionals to extend the value of their services across all applications and throughout the infrastructure lifecycle.

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