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Site Photography Innovation and Compliance

Background

The Construction IT Alliance (CitA) held a Technology Trend Event on February 20th, 2019 which explored Site Photography Innovation and Compliance. The event focused on the following three key areas:

1. **Time-lapse** photography is a technique whereby the frequency at which film frames are captured is much more spread out than the rate used to view the sequence. When played at average speed, time appears to be moving faster and thus lapsing. Time-lapse videos can be viewed remotely from the office on a smartphone, computer or laptop and can be shared with other members of the management team. Time-lapse videos can condense days, months, even years' worth of site hours into a few minutes Once the construction has finished the time-lapse video can be used for advertising, promotional and marketing purposes to build stronger brand exposure and reach a wider audience.

2. **Drone Technology** is now becoming one of the most significant growing innovations within the construction sector. The benefits of drone technology include the capturing of photos, videos, and imagery which can be manipulated to scope out projects, track building progress, and provide real-time updates. When it comes to Building Information Modelling (BIM), the drones can apply advanced point cloud scanning methods, as they have an aerial perspective allowing them to analyse a site's topography better and create more accurate 3D renderings.

3. **360-degree** photo is a controllable panoramic image that surrounds the original point from which the shot was taken. 360-degree photos simulate being in the shoes of a photographer and looking around as well as sometimes zooming. 360° virtual tours can provide construction professionals with an interactive virtual experience of a site, building, structure, object or environment.

The event hosted three keynote speakers from Evercam, Skytango and Seebig who discussed, in turn, one of the three areas. This paper will provide a brief synopsis of how each of the three companies has used these technologies within the Irish Construction Industry.

Time-lapse

The first speaker Evercam discussed how they are using their Construction cameras for BIM integration, dispute avoidance, and 360 Degree Photography. The cameras can record high-resolution images for every second of the construction site progress. This information can help project managers, constructors and engineers to get to the real-time data and to see what is happening on site at that moment. Stakeholders can access a live view of their construction site from anywhere and use their mobile, laptop or tablet from the office, on the road or even on-site. Also, remote video monitoring can help increase security and reduce criminal loss and damage.

The images from the video feed can be Marked up and then shared amongst the team. The right image at the right time can allow one to share the progress of the project, showcase project milestones, and have live/immediate access to footage. By owning complete footage of the entire project will help with health and safety incident analysis/archival, potential QS disputes, potential sub-contractor disputes, and progress management.

The development of new learning techniques currently being trialled by the company can now reliably identify objects in the video such as trucks being loaded or excavators, generating valuable reports about activity and progress on site. The company is now integrating time-lapse technologies with BIM Models for real life, high-resolution photographs of the structure. Figure 1 provides an image of the site capture against the BIM model.

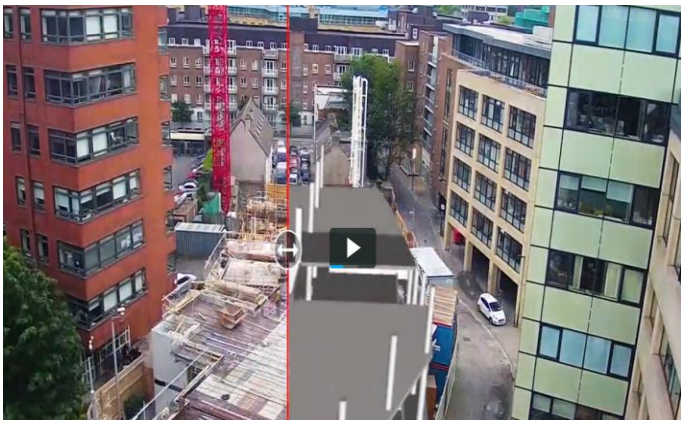

Figure 1: Site Capture side by side with the BIM model

Overcame is also utilising 360 camera technology to create 360 tours of construction projects. The feature allows customers to experience complete 360 degrees tours of their projects. The walkthrough tool can be used to show off internal areas from any point of view from before or after the construction progress. This can help customers share, experience, and conceptualise the world around them without needing to leave their computer screen.

Drone Technology

The second speaker, Skytango, reported a 52% reduction in time to gather data for insights, a 55% increase in safety and a potential 5-20% cost savings as a result of Drone technology. Drones are now being used to conduct structural inspections without the need for human labour and have the ability to carry out site inspections before construction commences. However, one of the fundamental concerns with this data capture, is the legality of the information, i.e., who flew the drone, airspace restrictions, etc. To avoid this concern, Skytango brings three fundamentals participants together; the pilot, customer, and landowner, to ensure that a structured process is followed. Through Skytango, a qualified Pilot will facilitate the process of data capture ensuring that all digital information is tagged. Skytango's software can geofence the surveyed area to ensure that any other drones that survey the area will receive a digital set of requirements, i.e., height restrictions, areas off limits, etc. Figure 2 provides an image of the tagged information within the survey.

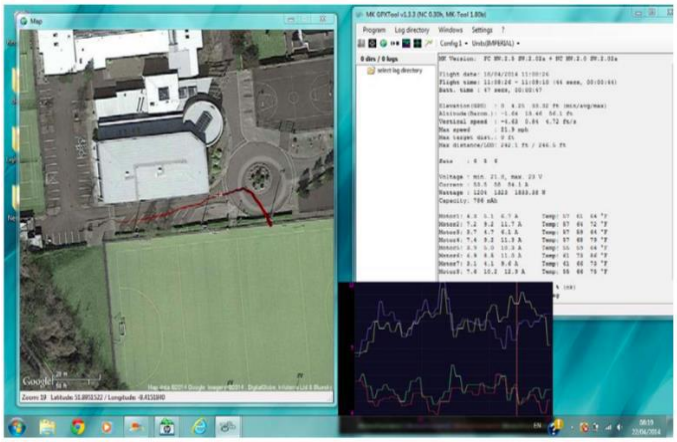

Figure 2: Survey Data

The Skytango app also allows you to streamline your workflow, curate your stock footage, make yourself visible on a real-time map used by broadcasters and media companies around the world. You can also track your compliance and follow how you fly for customers and the landowners you fly over.

360 Degree Photography

The third speaker, Seebig, explained that compared to a typical image a 360-degree image captures the scene in every direction instead of just a specific view. A 360 view allows the user to turn around, see behind them, look up and down, therefore, enabling an immersive experience within that space. As with conventional cameras, 360-degree cameras come in all shapes and sizes of different equipment to suit diverse circumstance (http://www.threesixtycameras.com/360-degree-camera-comparison/). Seebig uses the Matterport to

capture Interior Spaces. The Matterport camera uses infrared scanning to capture not only the visual information but also the spatial data to create a 3D interactive model of the scanned space that can be shared across any connected device.

360-degree images can be used to capture existing conditions through Dilapidation Surveys. They can record progress which is shared with stakeholders and onsite trades. This information is usually cloud based meaning that it can be assessed anywhere on site. To capture hard to reach spaces a 4.5m pole is used which enables one to get to into problematic areas. The imagery is used to create a model that one can examine work in progress, understand orientation and provide site inductions. When sharing data with other team members, a specific deep URL link is generated and sent to the team by email, allowing people to enter that particular location. Figure 3 illustrates this link being created. This data can also be shared on social media or uploaded to Google Street view where users can enter a building and take a 360 perspective of the room, i.e., a hotel lobby.

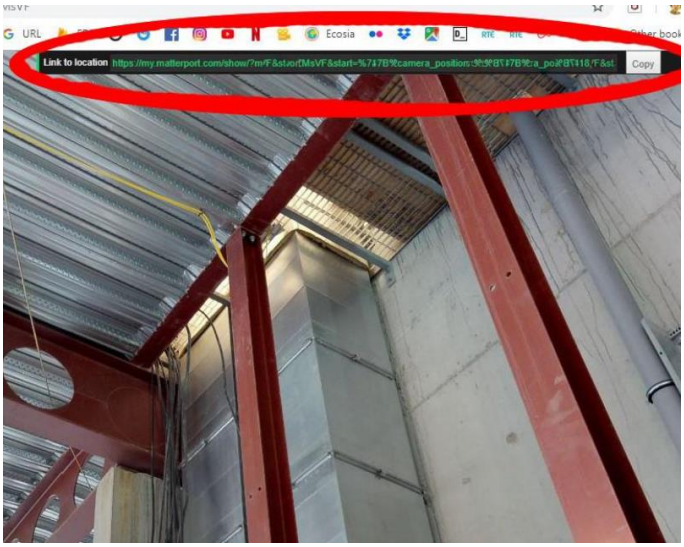

Figure 3: Deep URL Link

The scanned Data can also be extracted in the form of a Point Cloud which can be imported into AutoCAD ReCap and from there to Revit where the 3D data of the "as-built" model can be overlaid on plans for comparison, measurement, etc.

Conclusion

The Construction Industry is evolving and with that the way one captures progress and data is advancing. The application of Time Lapse, Drone compliance and 360 Photography are just three of the ways that data is been captured to monitor and validate progress. The CitA Trend Series will continue to promote innovative and progressive technologies that are being used within the Irish Construction Sector. To see more information on upcoming events please click on the link below.

https://www.cita.ie/events/

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