Member Communication Experience

Are Autonomous Reality-Capture Robots Worth the Hype?

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Reality capture has been a game changer for the construction industry because it allows general contractors to monitor and share progress with clients and the design team, better coordinate schedules with trade partners, streamline the RFI process, and provide better quality control through the build phase of a construction project. Additionally, if something goes wrong after the walls are closed up, reality capture allows both contractors and clients to go back in time and pinpoint potential concerns or see what's behind a wall without doing selective demolition. Clients love seeing the virtual walkthroughs of their building as construction progresses and after they occupy the building, that completed walkthrough allows them to easily manage their assets.

Despite all of the positives and strong ROI that reality capture provides, it has one huge problem — manually capturing the data. To create a virtual walkthrough — or digital twin — someone has to walk the entire jobsite with a tripod and camera, which takes hours, and then do it again the next week. This process is dull, repetitive, and time-consuming. Newer capture technology utilizes a camera attached to a hard hat but most team members aren't keen on wearing hard hats with a built-in camera. Even with wearable technology, it can take a few hours to walk a jobsite.

Whose job is it to capture this reality anyway? Usually, the project executive or project manager delegates that role to a superintendent, who then pushes it to a project engineer — if the jobsite has one — or an intern. Since reality-capture scans aren't the delegate's only task, they are usually delayed, even though most construction companies want to complete them weekly; some clients even require them weekly.

This is where robotics can help. In the robotics industry, robots work best with the three Ds: dangerous, dirty, and dull. While reality capture is usually not dangerous or dirty, it is dull, and a robot doesn't mind spending hours scanning a jobsite.

Benefits of Using a Robot For Reality Capture

Task Gets Done Consistently: Users can schedule the robot to scan the jobsite daily, weekly, monthly, or at any interval or time, so they know the job is being completed regularly. Even while using a remote-control reality-capture robot, users can still complete scans because they're faster to complete this way and it's a lot more fun driving around a robot compared to using a tripod — a two-centuries-old technology.

Work Around Obstacles: Construction sites are dynamic with people, equipment, and materials changing locations daily. A robot with basic obstacle avoidance can work around these impediments, even if they're blocking its desired path.

Work After Hours: Another way to avoid obstacles is to schedule an autonomous robot to run after hours or in the early morning. Having an off-hour schedule also reduces privacy concerns from workers on the jobsite.

Disappear From Photos: A common gripe from people scanning jobsites is that they get in the photos or they have to hide under the tripod or around a corner, which may not even be possible on certain jobsites. With a remotely controlled robot, it is easier to stay out of sight, and since an autonomous robot does not need an operator, no one needs to hide to stay out of the pictures. Additionally, running the robot after hours allows for cleaner images and fewer privacy concerns since no one is around.

Robots Are Cool: Reality capture was cool when it came out and then it became a chore. Robots break the monotony of data collection and are great to show off to clients, trade partners, and potential new team members.

Integration With Reality-Capture Software

Depending on the reality-capture robot, there are various options for reality-capture cameras and software. Some robots use a standard one-quarter-inch to 20-inch tripod mount for a standard 360-degree camera or laser scanner while other robots use a specific camera.

Most reality-capture software providers let you import any 360-degree data to utilize their software so using a robot will probably not require you to change your preferred reality-capture software provider.

Expected ROI With Reality-Capture Robots

Your ROI varies based on the cost of your robot, how much you use it and whose hours you're saving. If your $120,000-a-year superintendent saves three hours a week, that's a savings of $9,000 of direct job labor, so a $100,000 robot is probably out

of the question. However, freeing up your superintendent and getting consistent periodic progress updates from your reality-capture scans helps keep the project on track so you'll have less rework and earn more profit on a job. As stated before, robots are cool, and that wow factor is an instant conversation starter with clients and a magnet for potential employees.

Luckily, autonomous 360-degree reality-capture robots are now on the market for under $20,000 — you can even start out with a remote-controlled robot with a 360-degree camera for about $5,000 — making them much more attainable for many more companies.

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