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The Benefits of Scan-to-BIM

Improve Your Accuracy and Improve Your Bottom Line

INTRO: THE NEED TO FOLLOW THROUGH

Laser scanning made its debut in the construction world in the 1990s. While it has been proven to have multiple benefits, those who end the laser scanning process after viewing the point cloud do not reap the full value of their efforts.

With scan-to-BIM technology, laser scanning took a leap in terms of usefulness and value. While scanning enables information to be gathered easily, scan-to-BIM, which is compatible with design tools such as Autodesk's Revit, produces the information in a usable format with true and accurate measurements so that the design of the space is now a digital twin.

Therefore, if you are not laser scanning, you are missing out on a host of benefits.

SECTION I: NO MORE TAPE MEASURE

Let's say you're a traditionalist who prefers to keep it simple. You lug your surveying tools -camera, pen, paper, measuring device - to a work site in order to capture the data you need.

Simple and easy, right? Sort of.

Unfortunately, this is only the first step. Next, you need to plot out the data you captured, sort through your pictures, and, in the case that something's missed or unclear, make another time-consuming trip to the site.

So, how does using laser scanning to capture the data improve this process?

First, you can select from a host of solutions, including Leica, which has a scanner that is right for every job. One such scanner is just 6.5 inches tall and 2.2 pounds; it can capture 360,000 points per second and has a range of 60 meters.

Second, scanning is fast (as little as 26 seconds), simple (one button), and accurate (a few mm).

When a scan is turned into a point cloud with panoramic photos it's like being on site, since the 3D scan includes highly accurate, measurable as-built conditions.

If something is missed on the plans, there's no need to go back on-site. Instead, one can simply pull up the point cloud and/or imagery and see, or even measure, what was missed. This is one more way to ensure accuracy and save time.

One issue that teams may run into, however, is that data management may become a problem because point clouds include huge amounts of data.

Manage Data and Make it Useful

In fact, the amount of data in a point cloud can make it overwhelming. More information is valuable only when it can be clearly understood and processed.

Fortunately, the management, visualization, and storage of data have evolved, making large amounts of data easier to work with. Scan-to-BIM transforms the point cloud into an accurate model.

Easily Accessible

While laser scanning and scan-to-BIM may alter your traditional workflow, it's not as complicated as you may imagine. The tools necessary for these steps, such as Leica scanners and Autodesk's Revit, are less onerous to use than they once were.

Therefore, don't think that because you're not tech savvy and you don't have the knowledge base that laser scanning and Scan-to-BIM are not an

option for you. Using these tools takes some getting used to and there is a learning curve, but you don't have to be a specialist to learn how to utilize laser scanning and incorporate it into your workflow.

While laser scanning and scan-to-BIM are not as simple as a tape measure, the leaps in technology mean you no longer need to rummage through confusing folders of photos, old inaccurate as-built drawings, and incomplete and inaccurate information to create drawings. The technology is accessible and can be used for any type of job.

SECTION II: THE VALUE OF ACCURACY

From sizing spaces as planned to coordinating multiple disciplines and everything in between, accuracy is vital for contractors in the construction industry.

To build or renovate a building so the owner is content, you must follow the agreed-on plans. But what if the plans are inaccurate and something is missing or in the wrong place? Avoiding this significant time- and profit-consuming issue starts with having accurate plans.

Even the most experienced professional using a measuring device, etc., to record measurements can make mistakes. It's simply the nature of working with such exact measurements.

Avoid Mistakes Throughout the Process

The question is when mistakes will manifest themselves — the earlier in the process the better. However, that still may mean another trip to the work site, which wastes time and money.

A mistake discovered later in the process can create huge challenges that mean a significant loss of time and money in addition to losing the good will of a client.

On those rare occasions when the simple method does accurately capture all the necessary data, there's the possibility for error in the next step: plotting the data. How many times have you looked at a note you jotted down that was clear when you wrote it and then not so much when you had to refer to it later?

Or perhaps your contracting business separates duties into those who go to job sites and take measurements and those who use that data. Interpreting a colleague's measurements and notes is not always straightforward. A misunderstanding can lead to time-consuming hassles at best and cost-consuming inaccuracies at worst.

Laser scanning, however, is extremely accurate; if you can see it, you will capture it.

Though again, stopping at laser scanning does not completely eradicate the inefficiencies.

With scan-to-BIM, your BIM model is created from the scan data, leading to greater accuracy and better decisions. Such accuracy virtually eliminates the possibility of construction interferences and change orders that directly impact your profitability on each job.

Laser scanning eliminates your team's reliance on antiquated field verification practices and site revisits. With scan-to-BIM, the data can be converted to an accurate Revit model that can be measured and manipulated, allowing you to build the property the owner is expecting. Your model is no longer a representation of design intent, but a digital twin of what was built.

SECTION III: IMPACT ALL THE STAKEHOLDERS

A typical workspace includes people working in their own individual cubicles (or in their own homes during the pandemic), or their own offices. Some progressive businesses may have an open workspace so people in the same department can work together.

Either way fosters silos within businesses as each individual or group can easily focus on their work alone while forgetting about their colleagues and/or other departments.

And when partnering with other companies, collaboration is even more difficult since work styles, methods, attitudes, etc., may differ greatly.

Contractors often work with many other stakeholders such as building owners, subcontractors, engineers, and architects. Bringing a project to fruition on time and per customer expectations is a juggling act that requires constant communication.

One way to make sure each stakeholder is actively engaged in the project, is fully aware of their responsibilities and your expectations, and is able to offer useful input is to be certain they have the most up-to-date plans that are relevant to them.

And the plans can be shared with everyone on the team, even if they don't have the engineering tools; all that's needed is a web browser. After the laser-scanned data is converted to BIM it can be easily shared with all the stakeholders. Input from all relevant stakeholders reduces risk and helps ensure the final product will be exactly as the client envisioned.

Accuracy on Every Project

When you consider laser scanning and scan-to-BIM, you may have preconceived notions about the type of project or even at what stage of a project it's useful.

However, unless your answer is every type of project and each stage, you may want to think again.

The size of the project – bigger, smaller – doesn't matter. Anything can be scanned. And Leica has the right scanner to get it done.

Regardless of the stage or type of construction project, laser scanning is helpful. For example, laser scanning a greenfield captures as-built conditions before building even begins. With the accurate data captured at this stage, a project can be developed and created that will, in time, be a reality.

Whether new construction or a renovation, laser scanning aids the process. With new construction, scanning can help direct trades with remote coordination, reducing the number of trips made to the site. Laser scans throughout the process create timelines and document milestones and can be used to review newly constructed work versus the as-designed model for quality assurance.

Because the data is permanent, it can be viewed in the future. Therefore, the laser scan can serve as an as-built record for renovations. When further renovations or repairs are done, the up-to-date, accurate data will be a helpful start for those who come next. It can also be referred to at any stage of the project's development.

Laser scanning and scan-to-BIM encourage collaboration and improve the construction process on every type of job.

SECTION IV: DON'T BREAK THE BANK

Clearly this technology provides a plethora of benefits. As you consider adding this technology to your business, you are probably asking yourself if it is worth the investment.

Know this: laser scanning and scan-to-BIM contribute to profitability.

When you send someone to a construction site with old-school tools, the amount of time it takes them to complete the work is significantly greater than if the same individual uses a laser scanner. Use of a laser scanner enables the same individual to gather data from more sites, thereby increasing work capacity and profit.

Also consider the data that is captured. Data captured with a laser scanner is complete and accurate. There's no questioning, estimating, or guessing about the information created from the data. Therefore, efficiency is improved.

Taking the next step with scan-to-BIM allows everyone to be on the same page, leading to less rework and fewer change orders, which wreak havoc on schedules and decrease profits. Besides being costly, rework and change orders can be demoralizing. And how many of the issues that cause change orders and delays are directly related to inaccurate or flat out missing data? With scan-to-BIM, those issues virtually disappear.

Therefore, the bottom line is improved when contractors and others in architecture, engineering, and construction industries incorporate laser scanning and scan-to-BIM. However, getting started with these technologies (like any technology) requires an initial investment.

The upfront costs may be daunting for some companies, particularly those new to the technology who are unsure exactly how often they would use it or how much it would help their bottom line.

Fortunately, there's no need to upend your company's budget to access laser scanning and scan-to-BIM; you have options.

The necessary equipment for laser scanning can be purchased or rented. Companies such as U.S. CAD can convert point cloud data into different formats (photos, design to fabrication) which support all stakeholders and their workflows.

As the impact of scanning technology on your contracting company's profitability becomes clear, the decision about how much to invest can answer itself.

When used regularly, laser scanning and scan-to-BIM are sure to help your company's bottom line.

CONCLUSION

It's time to say goodbye to the tape measure and other traditional tools used to gather construction site data.

Laser scanning solutions and the software used to analyze the data are the next generation tools for gathering information and transforming it into a model that accurately represents reality.

These technologies offer contractors multiple benefits. They improve accuracy and the efficient use of resources, encourage collaboration, and speed up the process, all of which increase profit.

Laser scanning and scan-to-BIM can be used at any type of construction site and are an asset to a project from start to finish.