

WHITEPAPER

Do You Control Your Scan Data?

Solve the challenges in capturing as-built data with a Trusted Living Pointcloud

Authored By:

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Executive Summary:

The ability to readily access useful project data in a flexible manner requires intelligent control and ownership. Instead of relying solely on contractors, AVEVA's Trusted Living Point Cloud solution is vendor agnostic and supports effective sharing of huge amounts of data through built-in collaboration tools, allowing plant managers to wholly own all pertinent asset and plant information. This reduces the root causes of overlap, redundancy and surplus information, ultimately minimizing costly data bloat while providing a singular platform for sharing intelligence.

Why Do You Scan and What Are The Challenges?

Over the life cycle of an industrial asset – whether it is a food, water or chemical process plant, offshore platform, or marine vessel – it is easy to develop between engineering plans and the physical as-built conditions. This presents significant challenges to design engineers and asset owners alike, because such data gaps have wide-ranging consequences.

The foundation of any revamp project is knowing the precise as-built condition of an asset. This allows you to validate completed work and, furthermore, this data provides a 3D map that helps you to optimise operations and asset management throughout the asset life cycle.

For the last two decades the value of laser scanning has been widely recognised as reducing the cost of generating an as-built dataset by up to 80% and the subsequent reduction in rework this enables. Laser scanning is used by leading EPCs and Owner Operators the world over and there is a widely available supply chain for the delivery of point cloud data.



14.9%

Predicted annual growth
for laser scanning market



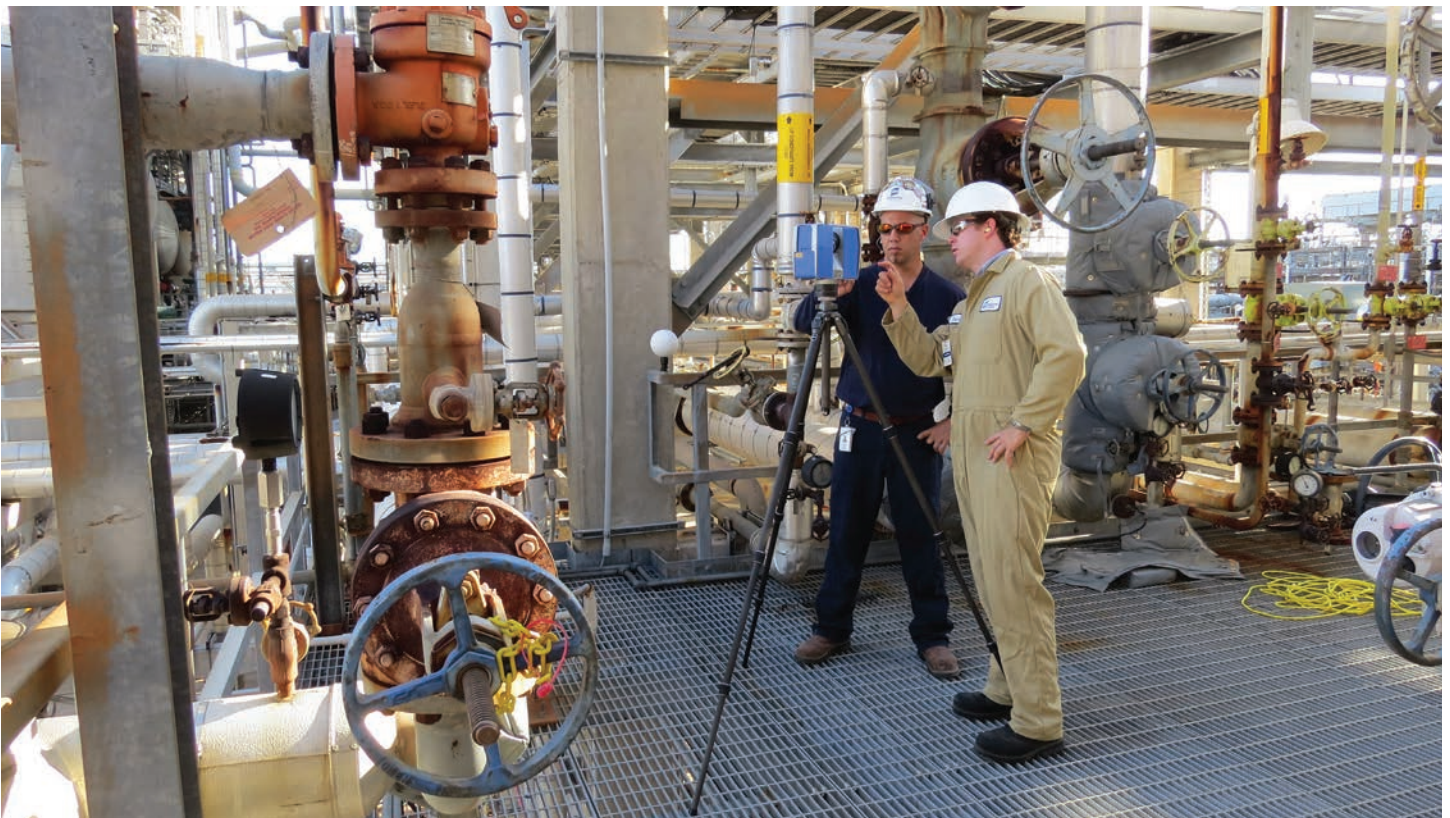
The State of the Technology Landscape

Over these two decisive decades, the 3D data capture technology landscape has expanded at a disruptive pace. There is a wide choice of scanning providers, devices and capture methods on the market. Terrestrial laser scanners are no longer the only string to a surveyor's bow. Handheld, mobile and unmanned aerial vehicle (UAV) devices have emerged, reducing the barriers to surveying and increasing the coverage of the captured data. This is especially true in high- risk and otherwise inaccessible areas.

There appears to be no signs of this growth slowing, either. MarketsandMarkets reports that the laser scanning market alone is expecting 14.9% annual growth each year until 2023. Research from Point of Beginning online also shows that the adoption of UAV devices by surveyors is at 38%, a significant increase of 22% from the previous year.

Change in demand for surveying services is also higher, with 88% of those asked perceiving an increase in demand versus 69% the previous year. With popularity of the solution comes reduced costs, and the value of the data increases as technology and processes advance. With growing return on investment over time, the excuse to skip capturing the as-is condition of the asset diminishes.

“Serve point cloud data to users within the asset life cycle via AVEVA Connect, which allows you to manage rapid access to secure data via cloud technology. You can also offload storage and computational power to efficient data centres tailored to your enterprise needs.”





Inherent Data Challenges

Although great news, rapid, sustained growth leads to challenges of its own. A wide choice of devices, lowering data acquisition costs and expanding data coverage can lead to fragmented datasets, in different formats and at a massive volume that is difficult to control.

Conservatively, we estimate that, for all scanned survey data from an average single asset, there is a 30% overlap in repeated data. Data users have commented that this number could be much larger. This represents a significant waste in time acquiring data, causes unnecessary facility downtime and requires time to identify correct information. Furthermore, survey crews run unnecessary risks to themselves on site when capturing the data.

Another challenge is that capturing from different devices, registering and processing data into a single dataset is not always practical. Take an offshore production platform, for example.

Asset data could include laser scans from a terrestrial scanner that captures topsides accessible areas, from a UAV used to capture the jacket and elevated structures such as a flare boom and, finally, from a handheld scanner that enables a surveyor to access an area of high density and complex piping. Immediately, the surveyor must process information in different formats, which can take weeks to synchronise into a single dataset with limited (if any) automation - a slow process, prone to human error.

A common way to reduce this problem is to limit the types of scanner used or to decrease the coverage of a survey. This might remedy data inconsistencies, but it sacrifices the true value that the technology can potentially capture.

“A data stakeholder is anyone in the life cycle of point cloud data who comes into any contact with that information. This includes surveyors, engineers, designers, contractors, etc.”

Even more worrying, the spread of where captured data is stored makes pinpointing the relevant material a laborious and error-prone task. With data stakeholders based globally, the IT infrastructure that delivers the data is continually under pressure to meet the data demands.

Data stakeholders are no strangers to scattered datasets – often external hard drives are used to transfer data between systems, despite the risks that such an approach poses. This leads to problems with data reliability, integrity and security. Additionally, transferring and storing this kind of data is a mammoth task, and a waste of time and money.

Common Data Challenges

- Fragmented point cloud data
- Reliability, integrity and security of captured data
- Storing and handling massive data
- Ownership of data
- Interoperability with scan hardware and CAD software

Data can be held, not just at various sources within a corporation, but by different entities. Owner Operators, for example, will commonly contract out the acquisition of 3D capture data to their engineering, procurement and construction consultancies and service providers, who will act as the custodians and the main consumers of the capture data. A full handover of this data is not always a seamless process – sometimes there is no handover at all! This can lead to data being scattered throughout a company's systems and removes the ability of the Owner Operator to make full use of this tremendously valuable resource.

Companies invest considerable amounts of time and money into the procurement of engineering software and training users, and expect to see value in return. However, layering technology over misaligned skill sets or clunky processes, is not the solution and can actually hinder progress. A balanced, holistic approach to aligning desired outcomes with the right people, processes and complimentary technologies is the best path forward.



A Trusted Living Pointcloud

Maximise the value of your data and streamline the performance of your asset with detailed, accurate, as-built data

Owner Operators and their entire supply chain can benefit from access to a “3D map” of their asset. To use 3D mapping effectively, however, companies need tools that help them to handle point cloud data better, improve reliability and ensure that information remains relevant to the ever-changing reality it reflects. At AVEVA, we call this a Trusted Living Pointcloud.

By maintaining an accurate and reliable Digital Asset that reflects the as-built reality, growing with the changes that are made, you can take both control and ownership of your data.

Unifying data into a single, trustworthy source overcomes challenges, including data integrity, security and ownership. Furthermore, wasted data acquisition costs from duplicating survey work and loss of data can be greatly reduced.

Data collaboration is also key. Global businesses have design engineers and information managers working in remote locations worldwide. Data needs to be readily but securely available to each of them, wherever their

worksite and operating facility. This kind of data is far easier to manage and share when it is not fragmented across remote corporate systems and devices.

A leading EPC commented that ‘often it is the areas most in need of the data that are the least equipped to handle it’. A Trusted Living Pointcloud enables effective data sharing supported by in-built collaboration tools. This reduces the root causes of overlapping, redundant or surplus information, ultimately minimising costly data bloat.

Achieving the best, most flexible and useful project data stems from intelligent control and ownership of data. Instead of relying solely on contractors, the opportunity is for you as a plant owner to truly own your own data. This unlocks the freedom to use this valuable resource with contractors and service providers as you choose.

The Trusted Living Pointcloud is vendor agnostic, so that data can be captured from any device a surveyor has at their disposal and used downstream by a company’s CAD solutions. Processing and handling point cloud data is a simple gateway that can enable data stakeholders to access a single platform for all their point cloud data needs.

“The Trusted Living Pointcloud has helped reduce project rework from 15% to less than 1% across the board”.



Why Use A Trusted Living Point Cloud Strategy?

AVEVA's Trusted Living Point Cloud has helped reduce project rework from 15% to less than 1% in engineering and project delivery, and it further unlocks additional savings and benefits when used throughout the life cycle of an asset. This represents savings of billions of dollars in brownfield projects and associated rework.

Benefits of a Trusted Living Point Cloud:

- Maximise data value and improve handling
- Rapid deployment
- Improve global team collaboration
- Hardware & data-source agnostic
- Cloud enabled

- Mitigate unnecessary risks
- Full resolution, high integrity imaging
- Minimise costs of both data acquisition and rework

With AVEVA LFM's Trusted Living Point Cloud strategy, you can derive the greatest benefit from your data by connecting your as-is baseline asset information to engineering information, and have the flexibility to do it on your terms. Host your data securely on the cloud or on-premise, begin in project execution or ongoing asset operations, or choose a hybrid approach to suit your unique business requirements. AVEVA can help you do it all.

Final Thoughts

Achieving a Trusted Living Pointcloud

AVEVA LFM's suite of solutions and CAD integrations enables you to take control of your point cloud data. It can handle data from common 3D data capture devices and store it in a single accessible source ready to be used in downstream data workflows. AVEVA LFM integrates your data agnostically, working with a wide variety of CAD, BIM and Plant Design Solutions, including those of our competitors.

AVEVA LFM's InfiniteCore™ technology enables the full resolution and integrity of acquired scans to be available and accessed without the detrimental compression of a single point of data. This data can be stored and served on premise or in the cloud, giving you the flexibility that your global network of data stakeholders requires.

Access this data on a variety of devices. Enable your teams to explore a Digital Asset live on site; flag gaps in the data or add intelligent mark-up to it.

Work offline when network connection is unfeasible or inaccessible, then synchronise the data at the touch of a button when you are back online.

Visualisation technologies including BubbleView™, HyperBubble™ and Solid Pointcloud™ enable the clear and comprehensive consumption of asset data for a wide variety of users, as well as providing an immersive interface to interact with and process changes.

Registering and validating scan data is completed in hours rather than weeks. Any data gaps can be immediately recognised and rectified.





“With AVEVA LFM’s Trusted Living Pointcloud strategy, you can derive the greatest benefit from your data by connecting your as-is baseline asset information to engineering information, and have the flexibility to do it on your terms. Host your data securely on the cloud or on-premise, begin in project execution or ongoing asset operations, or choose a hybrid approach to suit your unique business requirements. AVEVA can help you do it all.”

To read more about how AVEVA LFM and its technologies can support your 3D data capture needs, search online for **“Trusted Living Pointcloud”**.

For an evaluation visit aveva.com/3d-data-capture

About the Author

Gary Farrow - Gary has a background in Mechanical, Reliability and Systems Safety Engineering. He has been involved in 3D laser scanning since its inception in the late 1990s, primarily executing projects delivering data and 3D models, including ground-breaking work with Volvo and a mega project for Fluor/TCO in Kazakhstan. This early involvement gave Gary insights into the fundamental requirements of efficient 3D data capture hardware and software technology, processes and most importantly how organisations can derive business benefits from scanning innovation. With AVEVA, Gary works closely with companies in many industries undertaking digital transformation journeys to help them to take ownership of their critical engineering information to execute projects more efficiently and improve asset performance.