eBook

Revolutionising Water Utility Planning Using Digital Twins

> Staring at drawings doesn't give me an appreciation of what it's going to look like, a digital twin does.
>
> Project Manager

*Anonymised for customer confidentiality

sensat

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Contents

4. Step 1: Understanding the challenge

6. Step 2: Making data understandable

— 3 questions to ask when using digital twins

8. Step 3: Facilitating data access

10. Bonus: Using visualised data for effective storytelling

Introduction

With the AMP8 cycle fast approaching, utility teams face numerous schedule-critical decisions daily, relying on an unprecedented amount of data to inform these choices. This guide explores how your water team can harness digital twin technology to get more value from existing data, enhancing every aspect of your projects from planning to execution.

On any project, you and your teams likely encounter tens if not hundreds of schedule-critical decisions daily. To best inform these decisions, teams are procuring, gathering and creating more data than ever before. However, often data is procured with a single use in mind and not reused. After its primary use, data can quickly be forgotten about despite it still holding the potential to supply further insights. Useful data can become locked in specialist software or hidden amongst teams making it difficult for others to access important information projects already have.

Today teams are finding new ways to reuse data and unlock additional value from the data they already have. In this guide, we explore 3 steps to get more from the data you already have.

Ultimately understanding your project environment, anticipating the impact of constraints, and taking action to mitigate risk requires easy access to accurate data. Follow this guide to learn how you can fuel decision certainty using the data you already have.

In this eBook, we show you 3 steps to getting more from the information you already have:

Step 1: Understanding the challenge

Step 2: Making data understandable

Step 3: Facilitating access to data

Bonus Step : Using data to engage stakeholders

Step 1

Understanding the challenge

With many specialist teams and software, keeping track of the data that teams possess can be challenging. Finding the right system to store (and retrieve) data is the critical first step your teams should take towards getting more value from your data.

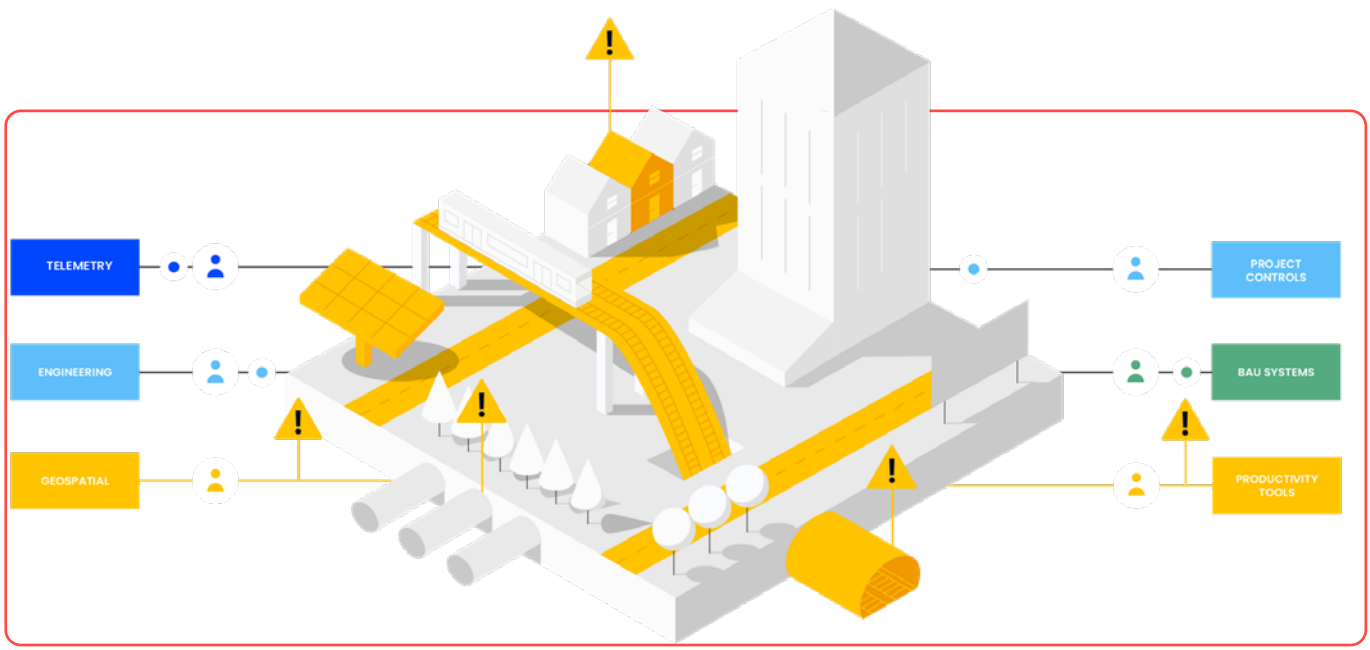
The challenge: inefficiencies in data usage

Water utilities worldwide are grappling with complex data management challenges. Key issues include siloed data systems and the underutilisation of data collected. Different departments working on a utility project often use diverse software and data collection methods that aren't brought together, leading to significant inefficiencies. Vital insights remain hidden, and the full potential of collected data is not fully realised.

The underutilisation of extensive datasets, which monitor everything from water quality to infrastructure integrity, is particularly problematic. Typically, this data is only used for limited compliance and operational purposes, rather than for broader decision-making that could optimise operations or enhance service delivery.

Project data management is further complicated by the volume of data produced, with hundreds of thousands of files generated for each project. This data is often dispersed across various specialist software systems and numerous teams, making it difficult to track and access available information.

The civil infrastructure sector has recognised the need for a proactive approach to data centralisation. The development of 'Common Data Environments' (CDE) has helped centralise files into a single management system, improving data storage and record-keeping. However, even with perfect data sharing, the lack of technical knowledge or necessary applications can leave valuable insights buried within the data.



Exploring how to bridge the data gap

To efficiently manage data, water utilities need innovative solutions to leverage existing data. Integrating and making sense of the collected data can improve operational decision-making, ultimately enhancing service delivery and operational resilience. Solutions like visualisation and digital twin technology offer promising avenues for such integration.

Value from digital twins can work twofold. Firstly, creating dynamic, virtual models of plans allows teams to visualise information such as designs in the context of the real world bridging the gap between planning and reality. Secondly, these models help to consolidate disparate data into an understandable environment bringing together designs, existing utilities as well as constraints into one view. This holistic view enables real-time monitoring and effective management, empowering utilities with intelligent decision-making capabilities based on data.

> **Sometimes nobody has an overview of who has what data. Without knowing, someone might already have it whilst another team procure it, so we will have just paid for it twice purely because there has been no way to know who has what.**
>
> Senior Designer*

*Anonymised for confidentiality reasons

Step 2

Make data understandable with a digital twin

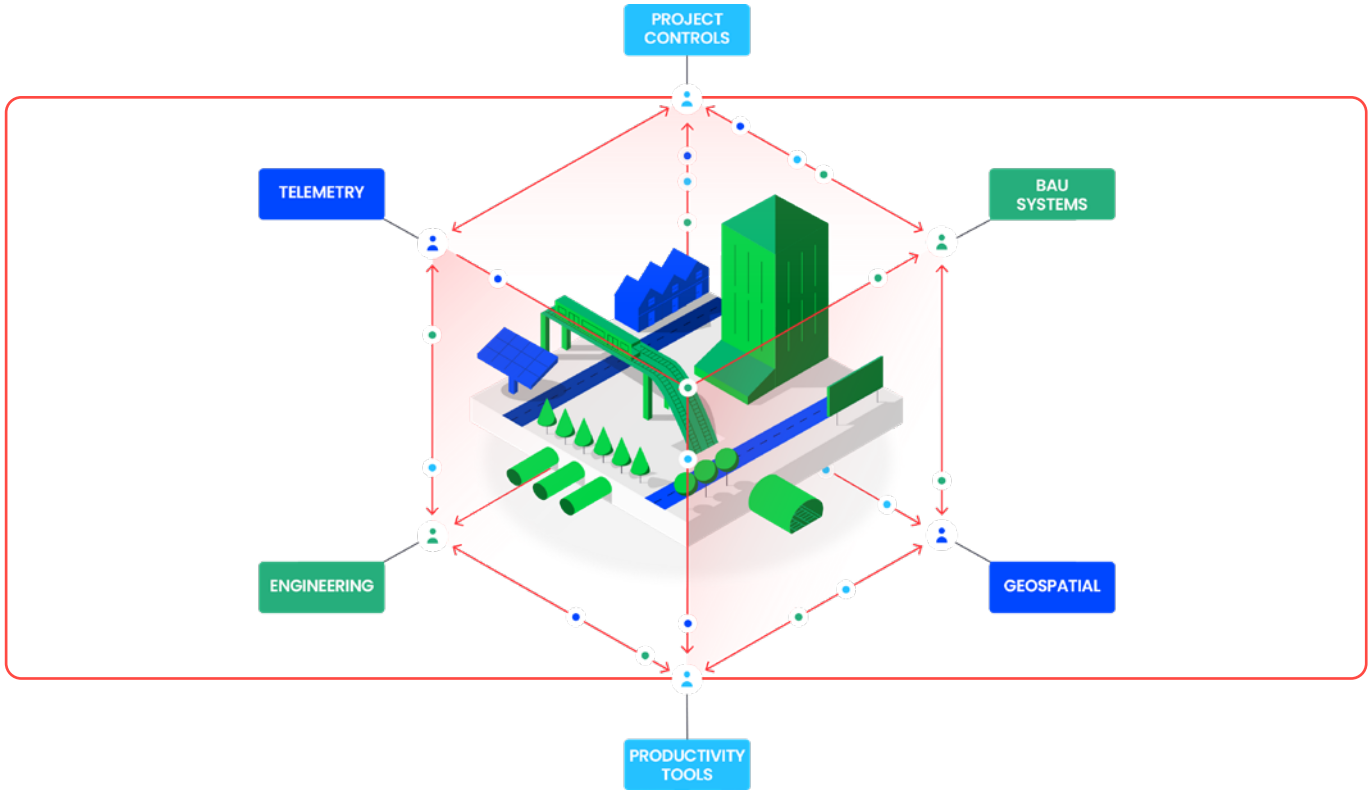
Making data understandable will unify disparate utility information, making it accessible to more teams for valuable insights. Digital twins ensure data is accessible to everyone, not just those with technical skills and special software licences.

What is a digital twin?

Opinions on what a digital twin is are divided. In its most basic form, a digital twin is a virtual representation of a physical object, system or process. It uses real-time data and other sources to replicate the physical counterpart's characteristics and behaviour.

However, expectations on what it can do (or should) vary greatly. We believe that different digital twins solve different problems. For instance, a digital twin supporting optioneering in the water industry could visualise existing underground utilities in a real-world context to aid in planning decisions. Meanwhile, a digital twin to support leaks would look very different.

Whilst today the industry is focused on understanding the present state of an asset, digital twins have the potential to move from a descriptive to a predictive model. A predictive model will enable teams to proactively manage an asset, enhance operational efficiency, and improve long-term planning.



Step 2

3 questions to ask when using digital twins

Here are thress things to consider when assessing if your teams are getting the most out of the digital twin software you already have (or are thinking about procuring):

☐ People

Do you have the transformation plans to upskill your team to use digital twins effectively?

With an ageing workforce, it is essential to ensure that all teams feel competent to use/access digital technology for the technology to come alive. You can always contact the vendor for support or best practice tips.

☐ Process

What is the process for maintaining a digital twin?

Digital twin use cases vary. Therefore understanding where the tool is implemented in workflows (and who manages that) will ensure consistent usage over time.

☐ Data

Is there a process for managing the data?

A digital twin is only as good as the data that teams put into it. Some digital twins integrate with CDE which can help to ensure the digital twin presents the latest relevant information.

Sensat's approach

Sensat's digital twin technology provides specialised capabilities designed for the water utility sector. It transforms diverse data into a digital representation, enabling project teams to test and evaluate water management plans within a real-world context and the broader catchment area. By capturing, processing, and visualising real-world environments, Sensat overlays physical data onto the digital landscape, creating a comprehensive operational view.

Sensat's digital twin software enables teams to aggregate disparate data sets into one understandable view. Whilst traditional data systems often silo data, hindering efficiency and decision-making, Sensat integrates data from multiple sources into a single, accessible platform, breaking down these barriers. This approach ensures that all stakeholders have a unified view and language to discuss the critical data and facilitates more informed decision-making processes.

Sensat's visualisation technology translates project information (e.g. 3D models, CAD designs, survey data, Gantt charts, photos and PDFs) into visual layers, allowing all teams to 'see' relevant project information.

Step 3

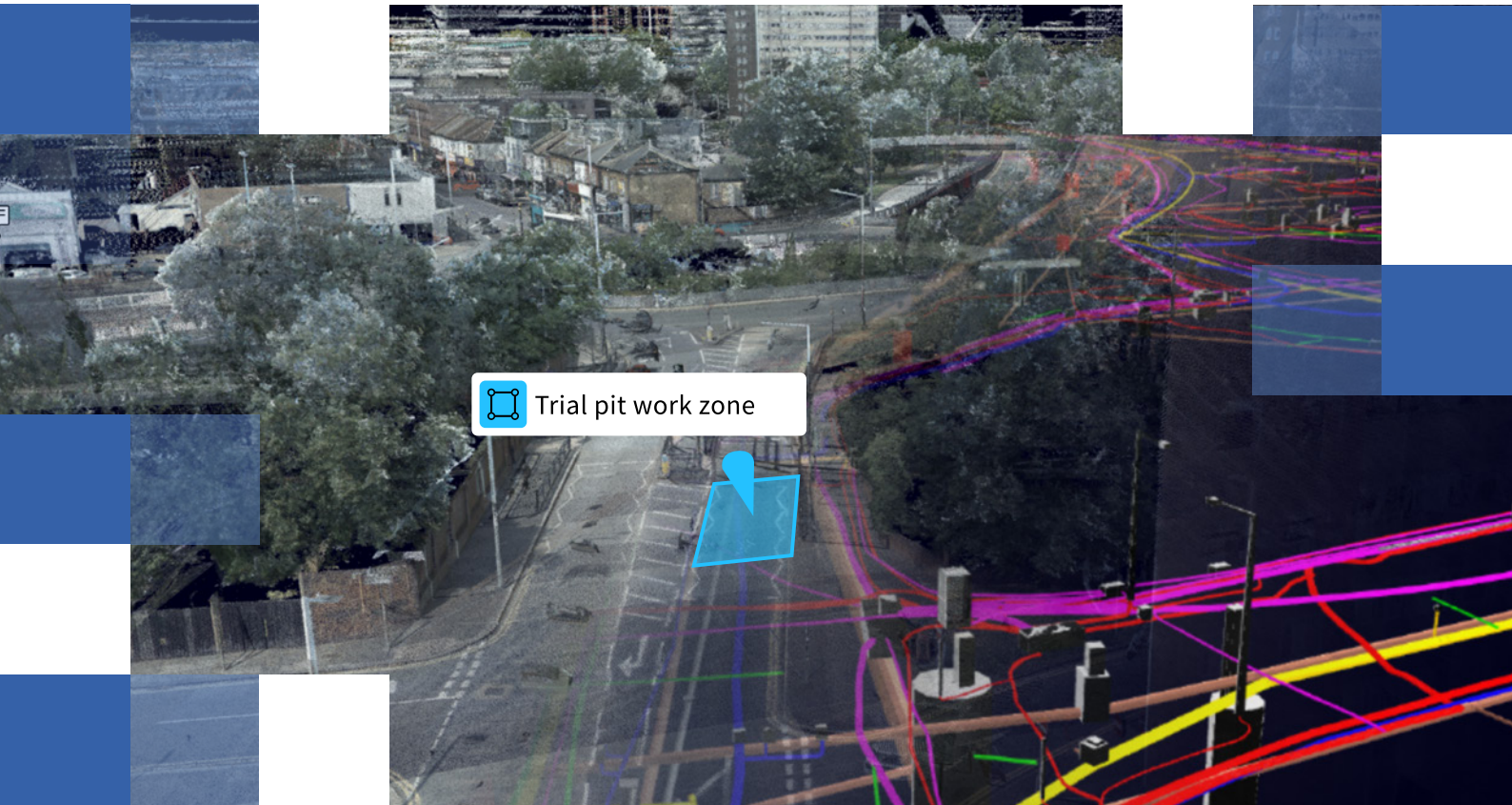
Facilitating data access

Facilitating data access by democratising it across different departments in a water utility company enhances cross-functional collaboration and operational efficiency. Integrating data into a digital twin allows teams to improve decision-making and project outcomes through collaboration and proactive problem identification.

Breaking down data barriers

Democratising data access across different water utility company departments enhances cross-functional collaboration and operational efficiency. By integrating data into a single, unified platform, Sensat removes the traditional barriers that silo information within specific departments or technical teams. This unified data environment allows personnel from various disciplines—engineering, maintenance, environmental management, and customer service—to access and utilise the same data sets in real time.

The democratisation of data fosters a culture of transparency and collaboration. When all team members can access and share data effortlessly, it leads to more cohesive and informed decision-making. For example, Sensat's platform enables real-time sharing of updates, changes in operational conditions, or emergency alerts across all levels of an organisation, ensuring everyone is on the same page and can act quickly and effectively.

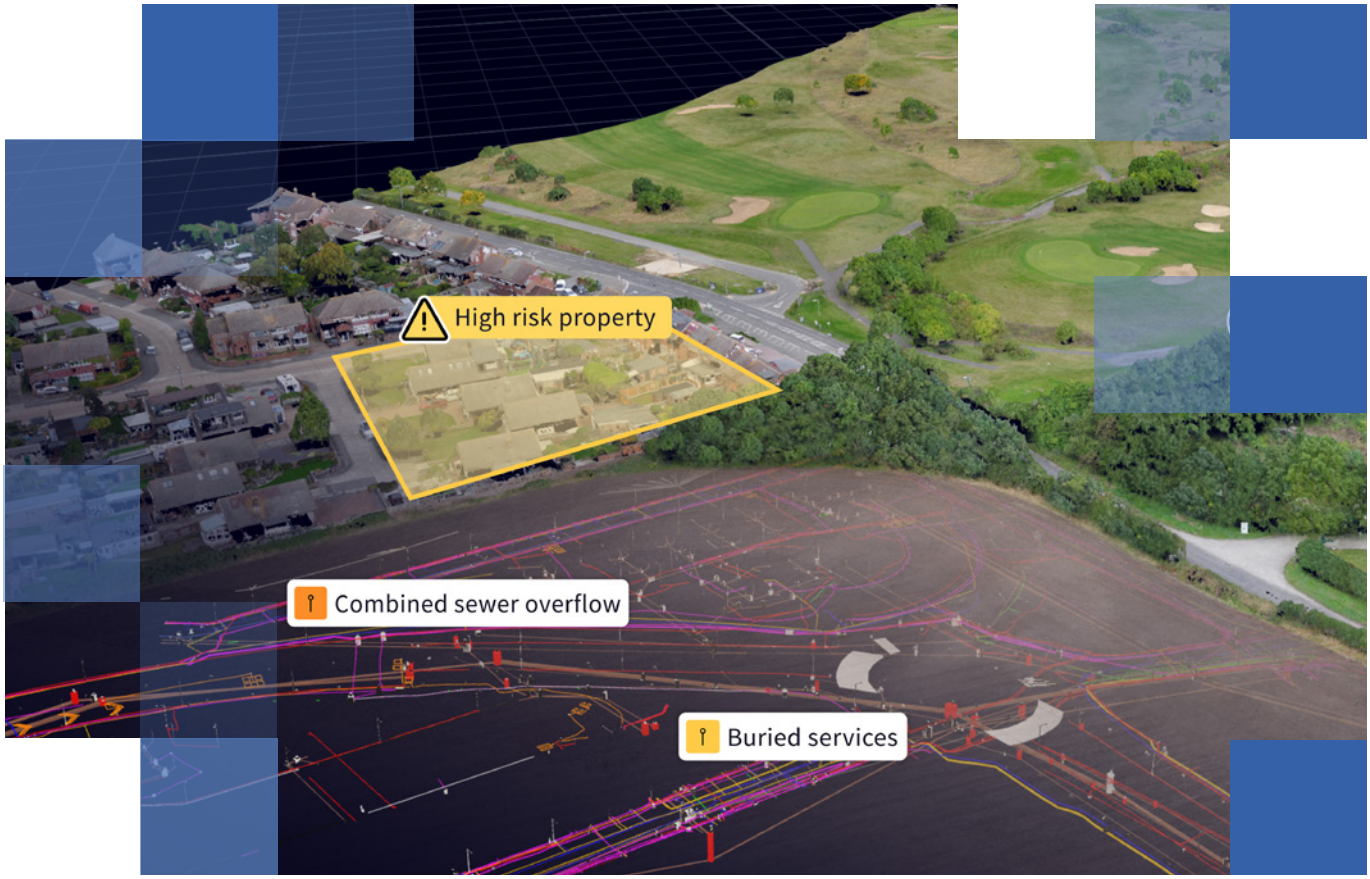


Empowering teams with data

Digital twins should be easy to use. Making it accessible from anywhere, from most devices, by different teams encourages information to be leveraged, reducing data redundancy. With Sensat, data collected for one purpose can easily be repurposed or reanalysed to yield additional insights, maximising the utility of every information gathered. This capability is crucial in avoiding unnecessary data recollection and the associated costs and delays. For example, GIS data used to identify potential sites for new water treatment facilities can also be later repurposed to plan emergency response routes.

Moreover, Sensat enhances teams' capability to perform data-driven analyses without requiring extensive technical expertise. The platform's user-friendly interface and powerful visualisation tools make complex data accessible and actionable to non-specialist staff. This accessibility helps teams meet project timelines and promotes a deeper understanding of the data, leading to innovative solutions and improved outcomes.

Taking a proactive approach towards data sharing can prevent data duplication and help teams get more from the data they already have. Without opening up access, reusing data for additional insights is impossible if it sits on a hard drive that only one person or team can use.



Leveraging cross-team collaboration: speaking the same language

Once access has been opened, teams can collaborate more efficiently over the data. Bringing information into a collaborative view helps teams to highlight risks or errors which might not have been visible unless all of the data sets were brought together. Facilitating access to more information means that teams can identify potential problems earlier and can take preventative action before they impact delivery. For example, water teams can collaboratively inspect plans for a new pipeline installation using a single integrated view of all stakeholders' information. This ensures that critical interfaces, such as connections to existing mains and coordination with utility services, align as planned. Collaboration over data early on will help projects to get more from data, allow for faster decision-making, and boost efficiency by reducing duplication of effort.

Bonus

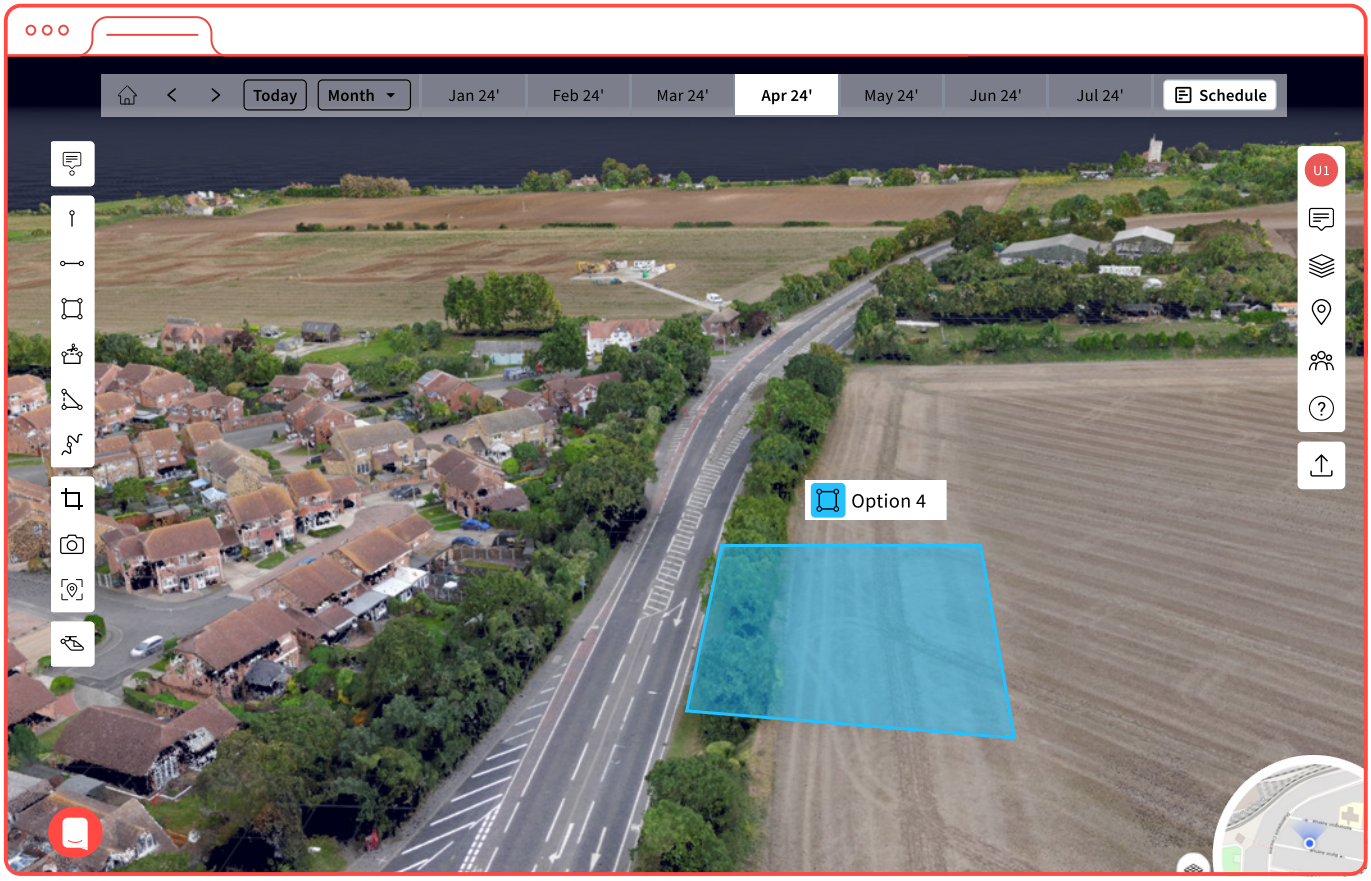
Leveraging visualised data for compelling storytelling

To ensure everyone is aware of the project's progress, it's important to provide regular updates to all stakeholders. However, how many times have you sat in a presentation which felt like a waste of time or lost the audience's attention?

It is paramount to be able to confidently communicate what is happening on-site and engage your stakeholders. This might be for internal presentations when updating senior colleagues or external parties when speaking to communities about engagement. Regardless, showing technical drawings, spreadsheets, and pictures may not go very far, especially when your audience is not technically trained.

Using market-leading digital twin platforms opens up a new form of intuitive, visual communication and storytelling bridging the gap between technical and non-technical stakeholders. In one digital environment virtually 'walk' your audience through exactly what you are talking about using a 2D and 3D environment of your site so that everyone can make sense of the project. And, by using a digital twin tool, you can hone in on what is important to them. For example, if someone asks what the view of the proposed works from someone's house looks like you can use the platform to pull up the view without needing an expert to draw it up..

... Goodbye boring presentations!



About Sensat

Sensat is on a mission to help computers understand the real world.

Sensat is a digital twin platform that allows infrastructure teams to visualise project information in a 2D and 3D environment. By leveraging existing software ecosystems and data sets, Sensat translates the world into a digital format to give teams an enhanced understanding of plans and the ability to spot clashes early.

Today over $200bn of complex and critical Infrastructure projects are using Sensat to bring information from different tools together, better understand and communicate their project constraints and make sure everybody is on the same page.

At Sensat, we help teams harness technology to maximise efficiency, improve sustainability, and drive innovation. We believe in using Sensat for good.

Explore how other utility teams are using Sensat

- Project managers speed up CSO options selection
- Water team centralises information to bolster project planning

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