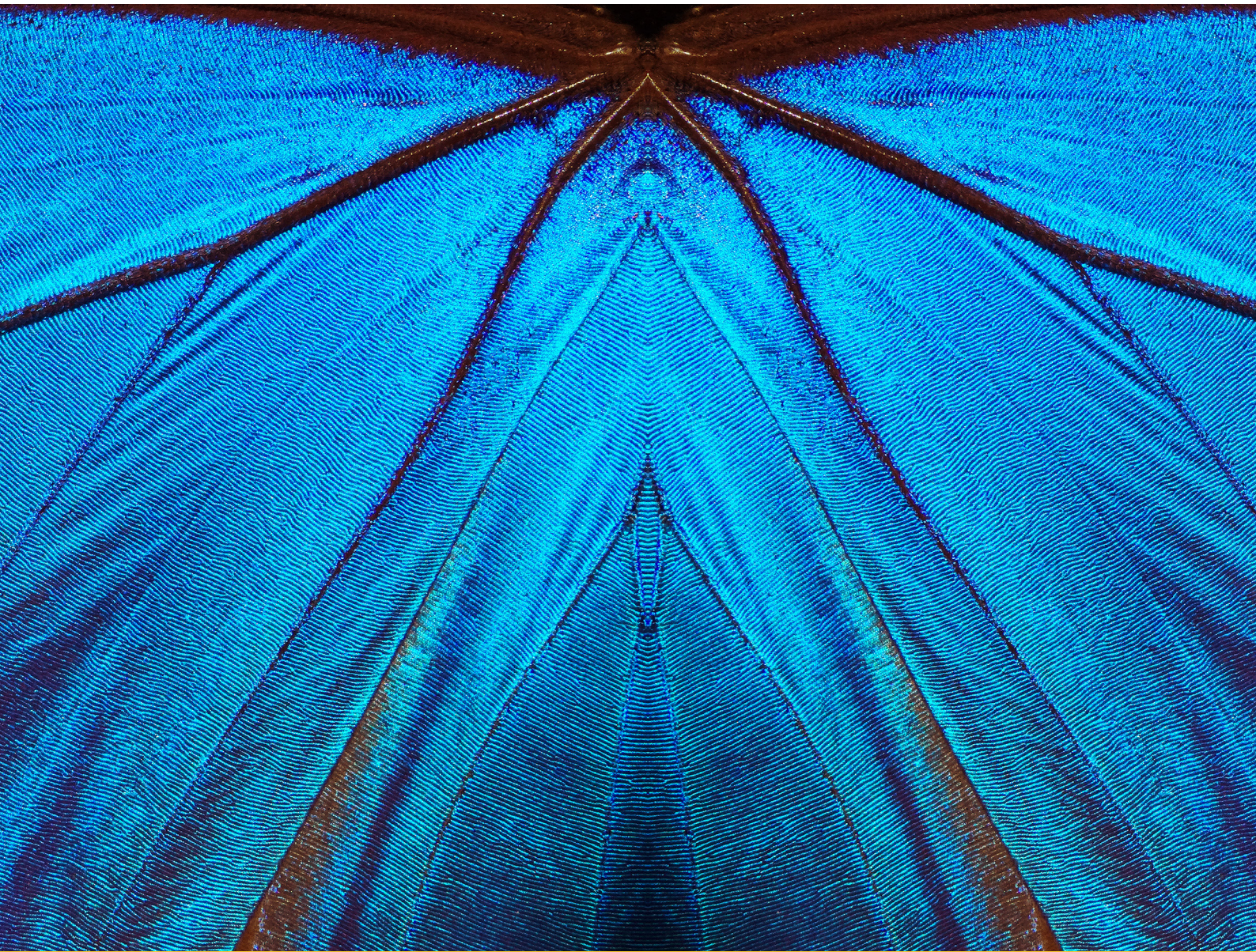
asset hive

The Digitalised World

A GUIDE TO DIGITAL TWINS

Volume 6



DIGITAL TWINS

Digital twin technology is a virtual representation that serves as the real-time digital counterpart of a physical object, process, or service.

What is it?

Digital twin technology spans the object or process's lifecycle and is updated from real-time data, using powerful simulation and machine learning and reasoning to help decision-making.

Typically, they are built from both historical and live data in which the actual object, process or system being replicated can be monitored and modelled to simulate different predictive scenarios.

While the term digital twin is often used interchangeably with 3D models, they are more than just 3D visualisations – digital twins are dynamic models encapsulating real-world data and digitalised workflows that can manage the operation of the facilities they represent.

Digital twins can be built to various levels of digital maturity. At a basic level, a digital twin can be developed from a point cloud (datasets that represent objects or space) which identifies geometry.

At a more advanced level, digital twins integrate data from sensors, artificial intelligence (AI), and the Internet of Things (IoT), among others.

Where they offer most value is when they integrate scope associated with workflows that keep an asset running optimally such as inspections, maintenance, and repairs.

An example of how a digital twin can operate in a real-world scenario is the creation of a digital train depot at a mine site using data generated from the actual train depot and its immediate surroundings.

In this instance, the digital twin can run simulations of the train derailing and plan to ensure how other trains can still pass through as quickly as possible to minimise disruption of ore deliveries to the designated port.

In essence, digital twins enable you to predict different outcomes based on variable yet real-time data.

The more accurately a digital twin can duplicate the physical object, service, or process, the more likely that efficiencies, solutions and other benefits will be found.

Why should I care?

Digital twins are infinitely more powerful than 3D visualisations and can deliver substantial efficiencies, improve operations, and offer greater collaboration.

It overcomes the limitations of 3D visualisations, meaning you are better able to manage work scope and drive the execution of work from a powerful and diverse 3D model.

By having better and constantly updated data related to a wide range of areas, added with computing power in a virtual environment, digital twins can study more issues than standard simulations from a plethora of vantage points — with greater potential to improve products and processes.

They offer better orientation around the worksite or plant area to better scope the layout of the area, the equipment and associated structures, which can reduce workplace hazards and vastly improve efficiency on site.

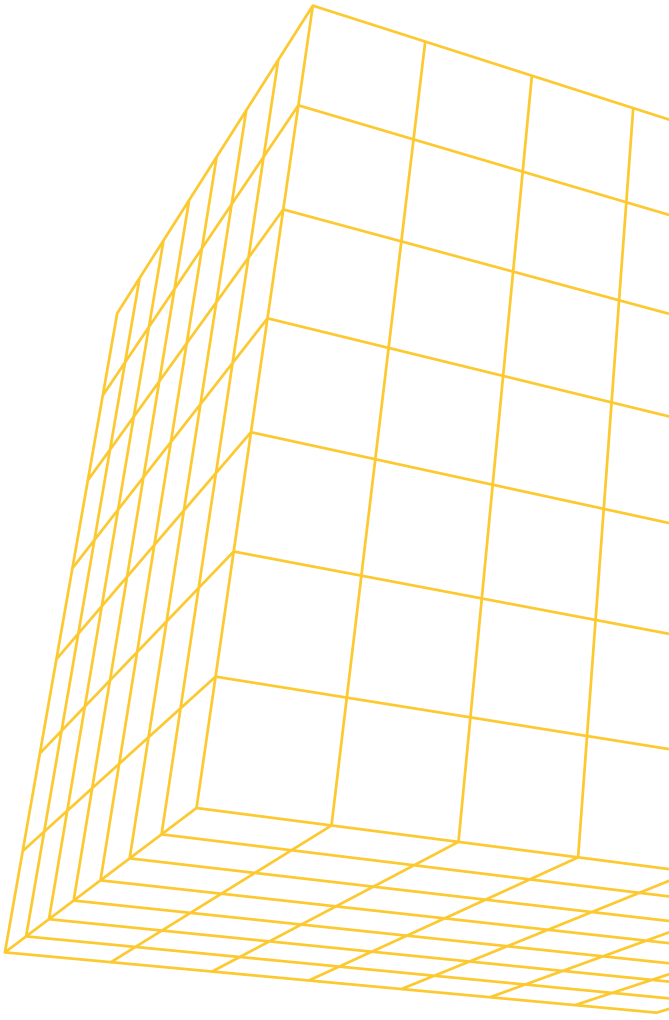
Digital twins also provide visibility of historical activities executed against those assets and equipment via the accumulation of data linked to the work being done in the immediate area. The ability to plot defects and anomalies using various coordinates ensures the accuracy of data being collected in the field during plant inspections.

For production lines of physical objects, even after a new product has gone into production, by helping to mirror and monitor production systems, you can achieve and maintain peak efficiency.

This means using digital twins leads to more effective R&D of products, with a large collection of data created about likely performance outcomes ultimately allowing you to better your competition.

In turn, this can lead to insights that help you make needed product refinements before starting production and thus save money on operating costs.

Creating a digital twin allows the enhancement of strategic technology trends, and prevents costly failures in objects and processes by using advanced analytical, monitoring and predictive capabilities.



What can I do about it?

Follow these steps to unlock the power of digital twins:

01

Encourage data integration and collaboration

Your digital twin should serve the entire organisation. Encourage your teams to collaborate around the digital twin so that they can innovate and perform their work more efficiently.

02

Standardise the way work is done

Standardise your digitalised workflows so that data and information is collected in the same way every time. This will enable standardised interpretations of data to be linked to the digital twin to support contextualised decision making.

03

Connect your digital strategy with operations

Your digital strategy should define a new way of working that allows for workflows to be digitalised. It should also enable your existing ecosystem of digital technologies to link to the digital twin so that useful data from all corners can be brought together into one digital view.

Innovator's checklist

Integrate data, workflows and knowledge – Your 3D model is built using static engineering data. However, your digital twin should incorporate an added layer of maturity by integrating digitalised workflows that enable a continually updating data flow. This allows for work activity to be linked to the model displaying where inspections, repairs and maintenance have been carried out. This offers full auditability of work completed and is held within the digital twin in real time.

Digitalise instead of digitise – Digitised refers to static data. In a static data scenario, data is collected in a linear process that generally doesn't support management of change. The data is digitised because it is available in an electronic format, but it is not auditable and cannot be updated in real time. Digitalised refers to real time data collected via a digitalised workflow that supports continuous change and a loop of continuous improvement.

Start from day 1 – The birth of data starts on day one of any project. Your digital twin should build as data is collected and the model accumulates data during each phase of a project. When digitalised workflows are linked, the digital twin can continuously be updated in response to new data collected along the way.

Prepare your workflows for data – When implementing digitalised workflows, consider how your data will be collected and whether data from external sources such as sensors and IoT or other digital systems will be fed to the workflow. You will need to ensure that data from multiple sources and third party platforms can be linked to the digitalised workflow and integrated into the digital twin.

Who is Silverhorse?

Silverhorse Technologies is on a mission to add value for our customers and bring the transformative benefits of digitalisation to large-scale assets.

Our AssetHive platform is a next-generation connector/middleware data hub technology with an embedded workflow architecture which enables efficient, repeatable, accountable and auditable workflows.

AssetHive is an intelligent data hub, customised around your asset to enhance operational efficiency in a low risk and scalable way.

The data hub enables your digital strategy by implementing full cycle, optimised operational workflows. It delivers data insights where they are needed, with transformative, value-adding results.

RECOMMENDED READING

Volume 1
A GUIDE TO DATA HUBS

Volume 2
A GUIDE TO DATA HARMONISATION

Volume 3
A GUIDE TO WORKFLOW ENGINES

Volume 4
A GUIDE TO CREATING A DIGITAL CULTURE

Volume 5
A GUIDE TO CONNECTING ECOSYSTEMS

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