



Sustainable Data Management and dynamic Digital Twin technology to minimise risk, time, and cost.

The Challenge

In complex upstream and midstream energy production environments there is a huge amount of data to gather, manage and interpret to ensure assets are built, installed, and operated efficiently and safely.

Expert geological, engineering and project teams individually generate, store and analyze their proprietary data within their own isolated software. Not only does this incur IT hardware, license and support costs it also provides a limited picture of the environment in context, reduces collaborative opportunities and drives siloed decision-making.

With data distributed across physical paper reports, photographs, videos, drone footage, as well as maps, project plans and autoCAD models, it is costly, laborious and of limited value to bring together the information into shareable, non-interactive and quickly out-of-date formats such as .pdf or PowerPoint.

In addition as governments increase the compliance regulations for industry assets and infrastructure, so the demands for data increase, lending a greater challenge in data collation and presentation.

The Solution

To leverage greater value and insight from the vast amounts of siloed data generated within the energy industry, companies need a single, seamless, accurate and up-to-date visual representation of reality, also known as a Digital Twin.

This requires excellent data management and accessibility protocols to capture and consolidate data from diverse locations. It also requires a visualisation platform where data can be presented in meaningful connected layers as the single virtual source of truth.

Whilst sophisticated proprietary visualisation solutions exist there is a large barrier to adoption by industry operators in terms of the capital cost and effort required for development, implementation and maintenance.

Here at GDDM we aim to make Data Management and visualisation affordable, sustainable and straightforward. With 15 years' experience and expertise in Data Management exclusively in the oil and gas industry, we have partnered with Environmental Systems Research Institute Inc. (ESRI) to customise their flagship cloud-enabled ArcGIS technology and generate Digital Twins specifically for operators throughout the energy lifecycle.

Companies will benefit from working with an experienced Data Management industry specialist and ESRI partner to map their data into an affordable cloud-based GIS visualisation tool and generate an accurate and effective Digital Twin.

Evidence

A technical engineer for a midstream pipeline operator engaged with GDDM to consolidate their data ready for regulatory submission. The regulators require data on each asset to be submitted twice a year to ensure information is kept up-to-date.

The company's assets include 7 pipelines hundreds of miles long. Their entire suite of asset data, including pictures, videos, scans, engineering notes, sonar sweeps and third party surveys resided on a desk-top based hard drive. It was so difficult to access and decant information during meetings and presentations our client would explain problems and what was needed to fix them by drawing out seabed diagrams on the whiteboard rather than utilise any of the real data from the hard drive.

Similarly it was problematic to extract data from the hard drive to satisfy regulatory demands. Since the regulator requires data in tabular format our client faced a further data conversion challenge.

On receipt of the hard drive GDDM were able to extract the 2-D regulatory information and present it back to the government in the format they required.

We also configured all the hard drive contents into the ESRI visualisation environment, creating a Digital Twin of the operator's assets. We uploaded the ESRI outputs onto a secure cloud location where our client could access and assess them.

Our client now has an easy way of visualising the underwater environment where the company's assets are located.

With the full scale and priority of issues now visible the engineering team is finding it easier to communicate, promote clearer decision making and receive faster support in remedying issues.

Benefits

Worldclass software

ESRI are leaders in GIS software and geo-database management, with their worldclass GIS platform ArcGIS commanding 43% market share. Companies will benefit from the depth, breadth and sophistication of a well-established software platform from a mature organisation specialising in geographical information since 1969.

Industry specific Data Management expertise

Also of benefit is GDDM's expertise in Data Management for the energy industry. As ESRI partners GDDM have access to the geospatial specialist's vast knowledge and resources and bring their valuable skills in mapping industry requirements onto the platform.

Integrated, holistic visualisations

ESRI's platform provides a single repository in which different data types from disparate sources can be linked and layered to create an accurate visualisation, or Digital Twin, of the real environment. Companies benefit hugely from the ability to access and share accurate data in a single place. This heightens collaboration, reduces risk and enables remote surveys and operation monitoring.

Sustainable, affordable access

Since the platform is cloud-based and offered on an annual subscription basis user access is straightforward and affordable, with no additional hardware or software to instal anywhere. Once all the data is populated and integrated, users need no more than a browser to benefit from the full Digital Twin capability.

Reduced risk and cost savings

Environmental surveys, inspections and operational monitoring can take place remotely, saving the cost of travel and risk to off-shore personnel. Remote working also expedites project planning and execution, enabling operators to increase efficiency, safety and quality.

Greater collaboration and faster decision-making

Dispersed teams will benefit from the ability to work more closely, harnessing wider expertise in managing technically complex and high risk environments.

Improved compliance

Companies will have greater peace of mind that their regulatory submissions can be fulfilled, thus avoiding fines and investigations.

New Possibilities

As GIS Digital Twin and visualisation technology become more widely adopted in the energy sector there will be increased demand for live data feeds and captures from Remotely Operated Underwater Vehicles, drones and other surveying technologies.

Interaction with the data will become more dynamic, enabling scenario planning, and virtual testing of outcomes given different construction approaches or environmental changes.

The ESRI platform will further develop to support the energy sector, bringing its powerful technology to a highly complex industry which will become safer, more responsive and environmentally responsible.

Why work with GDDM

Practical and tangible know-how

We are a small Data Management and Digital Twin specialist, with practical, hands-on experience of off-shore engineering, drilling and completions, as well as the back-office tasks of consolidating reality data. We know how data is generated, why it's important and how people in the industry want to use it.

Direct access to our expertise

Unlike large data management operators GDDM are easy to engage with and do not need swathes of project bureaucracy and expense to satisfy our customers' requirements.

Responsive and flexible

Our approach is entirely customer-focused. We listen to our customers' requirements and find a solution to meet their needs. From scanning paper reports to capturing drone imagery we can include data from a wide variety of sources to populate our customers' single virtual source of truth.

Skilled in ensuring data quality and accuracy

The integrity and accuracy of operators' data is vital to ensure that risks are mitigated and decisions are sound. We validate the data source and map it to our customers' expectations to be sure that the right asset characteristics are being measured and managed.

International geospatial specialist backing

GDDM's partnership with ESRI lends credibility to our expertise in Data Management and Digital Twin generation in the energy sector. It also gives us access to sophisticated geospatial resources and understanding that is of huge benefit to our customers.

To discuss your requirements for sustainable Data Management and dynamic Digital Twin visualisations within your energy production environment contact us today.