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Who is Sword?

Andy Pearson leads Sword's Digital Engineering Practice, where he works closely with operational and technology leaders in our Energy industry customers to enable business optimisation and digital transformation.

As the North Sea's largest provider of data and digital services, Sword focuses on solving the industry's most critical business technology challenges by enabling our clients to capture, manage, and utilise data to make informed decisions. This is supported by technology adoption and people engagement, together with modern ways of working to give confidence that the right decision is made every time.


Andy Pearson

DIGITAL ENGINEERING:

'Enabling Operational Efficiencies'

Across the Energy industry, organisations are striving to go 'digital'. Harnessing digital technologies can drive better decision-making, especially when underpinned by reliable data, to achieve operational efficiencies in every business area from finance through to production. IT departments are often tasked with introducing digital capabilities that unlock the power of data throughout their business, with a growing focus on 'digital engineering'.

What is Digital Engineering?

At Sword, we define digital engineering as 'the ability to create, capture and use data to make engineering decisions using a digital skillset'. Starting from drawings through to 3D models, engineers use increasingly advanced technologies to capture data and design solutions in a digitised environment.
To keep it simple, the use of any kind of technology by an engineer (who would traditionally use paper-based drawings to make decisions) can be classed as digital engineering. 3D models are considered as the most comprehensive form of digital engineering, however there are many other variations.

Digital Engineering in the real world

There has never been so much pressure to achieve more with less. Years of cost and production pressure, manpower reductions and increasingly ageing assets mean that operators must embrace innovation to move forwards. Some think that digital transformation is all lofty ambition and pie-in-the-sky, but our digital engineering practice is geared around practical, quick-to-deploy solutions that solve the challenges besetting operators right now, such as:

- Turnaround planning and execution
- Weeps and seeps
- Mobile technology for operator routes, process isolations, inspections etc.
- Management of change including new tag numbers, document numbers etc.
- Stock optimisations and BOM creation to support work planning
- Increasing onshore support capability
- Systems integration and rationalisation.

Designing Digital Engineering Solutions

1. Data foundations are key: The ability to surface and interrogate data is increasing, alongside access to user-friendly tools in onshore and offshore environments. This makes it easier for anyone to create reports that appear useful. However, to ensure any increase in the pace of data-driven decision-making is robust, first trust must be built in data sources. We ensure our solutions deliver high data quality, from newly-developed data models to scanning and checking solutions, allowing engineers to make business-critical decisions quickly in operational environments.

2. Engineers remain engineers: Going digital doesn't mean that engineering principles change. Technology should enhance the ability of an engineer to make decisions based around classic engineering principles, augmented with digital tools to streamline their tasks.

3. Offshore-friendly technology solutions: We often build solutions that are fit-for-purpose in an onshore office environment, but the real goal is often to enable decision-making in challenging offshore environments where safety and efficiency are key.

Breadth of Digital Engineering Solutions

The ability to visualise and analyse data-driven content is increasing as well as the environment around us becoming 'smart', e.g., through connecting and tagging equipment. This brings near limitless options when it comes to deciding how best to apply digital engineering to improve processes.

Sword have delivered wide-ranging solutions, from the use of tablets offshore to create master data models of engineering tags and class libraries, to making drawings come to life through 3D modelling. Choosing the best digital solution is often influenced by whether the project is greenfield or brownfield in nature, as both bring different data collection challenges.

Greenfield Projects

In terms of engineering information handover, most Owner/Operators have experienced the same inadequate results on major capital projects over the last 40 years. In fact, it is normal to spend between £4-10 million on data handover for each project, with no guarantee that the information is complete, correct, consistent or connected. In many cases, extensive post-handover remediation takes place within the operational expenditure phase of a project, incurring unpredicted costs.

This is why some of the world's largest projects have adopted, and now embrace, our proven best practice techniques in content and information management. We ensure engineering information is focused on justified requirements, which helps mitigate project risks. It also creates many benefits and cost efficiencies that pay for the investment many times over.

Brownfield Projects

The prospect of undertaking a digital transformation project on a legacy asset in operation can seem daunting, but it's often essential for safe and efficient operations. Taking advantage of shutdown and turnaround periods provides opportunities to take inefficient and often sporadic content, and integrate it into newly gathered data for optimum results.

Brownfield projects have commonly been subject to traditional, one-dimensional, disparate data collection and access processes, which is time consuming, generates risks and is error prone. Collating, creating, and updating data correctly overcomes the issue of rework, however it's often undertaken by engineers, which causes delays to their primary objectives. Having comprehensive electronic data ensures that the right decisions can be made at the right time, and removes inefficiencies in the handover process between Owner/Operators and EPCs.

It is important to start at the level to which everyone can relate. Whether that is converting a procedure to be electronic with checklists and sign off, or laser scanning an asset, the engineering and IT functions need be aligned in deciding priorities. We have a long history of working directly with production functions, facilitating business challenges workshops. These are successful in focussing efforts on areas for improvement and supporting the IT function in providing iterative solutions.

Understanding the people, processes, and tools available is at the core of successful digital engineering solutions. Our capability in this area has never been stronger, with the recent acquisition of Phusion IM, who have over 30 years experience delivering intelligent solutions that turn complex engineering information into trusted assets. Together we work with various operators and EPC's across oil and gas and renewables to enhance their digital capabilities.