SWORD

EDGE

ISSUE 3

A RENEWED HORIZON

We have a dual role in the Energy Transition; to support traditional energy operators diversify beyond Oil & Gas, and to help develop relevant digital platform and data talent.

TIME TO GROW UP

Is now the moment for digital twins to unleash their full potential and evolve in the Energy industry?

THE GENIE IN THE BOTTLE

Three ways Generative AI is helping increase performance and deliver business benefits to our customers.

THIS ISSUE

THE QUEST TO STAY RELEVANT

In conversations with customers, we often hear a common denominator; the need to drive long-term value from technology investments. As we help our customers to become more data driven, we must continually review the contribution our services and solutions make towards helping them achieve their long-term business goals and what value we add.

NASA astronaut John Glenn, was once asked how he felt while sitting in the capsule on the launch pad to which he replied, "I felt exactly how you would feel sitting on top of 2 million parts all built by the lowest bidder!" While we have not yet helped any of our customers build a rocket, the principle remains; value does not necessarily mean price.

At Sword, we carry out an annual value proposition review across the business. This process focuses on our customer's individual challenges and what their pain points are. These range from industry specific challenges to those that are more technology focused.

We then consider what outcomes they are trying to achieve, what are the overall business goals, and how can our domain experts support them? By going through this process and review, we enable our teams to assess our offerings' relevance to customer challenges, instilling confidence that our solutions adapt to evolving technology investments and new ways of working.

Staying close to our customers and their specific journey is incredibly important to us. If we fail to continually develop and adapt what we do and how we deliver it, then we would become less and less relevant to our customers

By regularly reviewing our offerings, we gain a holistic view of what matters most to our customers across our focus areas of Energy, Finance and the Public Sector. This gives our teams real confidence to continuously provide customers with reassurance that their investments will provide significant value now and into the future.

Craig Swinburn, CCO

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The changes on our horizons are a literal sign of the times as investment shifts away from traditional energies towards renewables. Sword's CTO for data, Mike Stewart, explains how training, development, technology advances, efficiency gains and collaboration are transforming the energy sector.

IN SAFE HANDS

KEEPING BACKUP AND RECOVERY SIMPLE

Jonathan Smith,
Cyber Resilience Technical Lead

In today's fast paced world, with changing technologies, we know organisations are faced with the challenge of finding the balance between simplifying technology and designing technology solutions. Amongst other hurdles faced in an already diverse landscape, it's important for us to keep evolving our environment so we can make the most of secure digital solutions which in turn guides data driven decisions.

With the constant threat and risks to organisations, there must be a continual focus on security practices, threat playbooks and immutable backups and recovery.

Backup and recovery are increasingly talked about in multiple different areas of information technology, business, resiliency, cyber security and risk management. Due to this, a conversation that used to be around backing up on-premise infrastructure is now filled with acronyms and terminology which has expanded with the increase in cloud adoption.

At Sword, we have regular conversations with organisations on keeping backup and recovery simple and ensuring that commonly adopted architectures are utilised and are in line with relevant industry frameworks.

So, what is the end goal of backup and recovery?

In its simplest form, backup and recovery is about having the correct technical solution and robust processes that can be utilised as part of recovery playbooks, to ensure that an organisation can access their data when they need it most. This spans from simple emails to critical data and infrastructure.

Where does the complexity come from?

Complexity can come from things as simple as the amount of acronyms utilised or the solution sprawl that can be seen in older architectures. For example, a single conversation that touches on multiple acronyms like BIA, RPO, RTO, MPTOD, SLA, and BDR can make a critical solution a headache for some departments that not only look after backup and recovery, but also the wider technology, security and risk management estate.

What can be done?

When we look to ensure our non-critical and critical data is available to us all, we need is a solution that makes it simple to consume, simple to use and simple to secure.

At a minimum, we want our data to be backed up with at least three copies of our data, in two different locations and at least one copy at an off-site location. Then we look to make sure that when this data is backed up, it can no longer be changed ensuring that we have data integrity. Modern-day backup solutions will then split the data into smaller groups at variable lengths to make the most of the storage space available. By utilising modern backup and recovery solutions that have been built with immutability, ransomware recovery and cyber security at the forefront of the technology rather than as an afterthought, gives organisations the confidence that their data is secure and accessible when it's needed most.

With cyber security recovery playbooks and incident response, we also want a solution that makes it simple to practice recovery and ensure that we are able to recover within a time that meets business requirements and goals, whilst also providing insights into what could be contained within the backup. Does the backup contain a threat to the organisation, has the data been changed, but also what information is contained in the data and does it contain personal information?

Final Thoughts

From experiencing incidents that require recovery first-hand, our team of experts always ensure that a solution is in place to provide our customers with the confidence that their data will be kept securely and available at all times. We work with customers to provide an array of security solutions to ensure organisations can continue achieving business outcomes without the burden of potential cyber threats and the damage that will inevitability be caused by these threats.

Having that knowledge and insight into backups allows us to understand what this environment looks like on a regular basis and ensures that when we are asked "How quickly can we bring this back online?" or "How quickly can we recover?" we can be confident that we don't need to rebuild to gain access or have specialist teams provide access to our customer's data.

SUITS YOU!

TAILORING TECHNOLOGY WITH DATA DRIVEN SOUTIONS

Euan MacAlister
Digital Sales Director

Accessing real-time, reliable data to inform decision making is at the heart of many of technology investments. Addressing internal and external challenges often boils down to a focus on using technology to reduce costs and increase efficiencies. In the Energy industry it is also often to reduce health and safety risks, increase throughput, and fast-track the journey to net zero.

Many also face common internal challenges that come with growth. Inheriting ageing infrastructure from acquiring different systems, of various ages, that span multiple sites, assets, and locations. Pressure on ensuring data is configured for integration with internal and external systems is also increasing, as regulatory guidance requires industry collaboration and modernisation.

As new technologies enable the digitalisation of legacy information and modernise current data collection methods, Energy organisations are being offered a. myriad of solutions on how best to integrate engineering and operational data.

Technology may appear to offer the golden ticket to enabling data driven decisions. However, to keep pace with the competition and unlock efficiencies in business processes, it can be costly. A great piece of tech may not be the best fit for the environment or challenges in your organisation. Equally, if implementation is not executed effectively, then capital investment can feel wasted if a new technology is underutilised and not delivering the cost savings anticipated.

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Intelligent solutions

We now see organisations focusing on becoming data driven to better access engineering information. They are also exploring intelligent solutions to turn their data into a powerful, trusted, and valuable asset. This is only valuable if the data has been through a process of rationalisation and standardisation to ensure it can be readily accessed and is trusted.

Each organisation's growth journey and operating environment brings a unique set of challenges. There are however a number of common denominators across our Energy sector such as the desire to enable data driven decisions by replacing localised solutions with cloud-based central solutions, the need to replace aging systems across multiple areas, and to connect disparate data from multiple sources.

Build or buy?

The industry often wrestles with the decision to build or buy software. The answer is really both, and a hybrid approach is often the best option. Organisations such as Microsoft enable access to reliable cloud-based tools that can be used to create bespoke solutions that accelerate an organisation's digital maturity. They also help organisations to and take advantage of advances in technology around existing embedded processes.

We often work with customers using a 'low-code' software development approach, which aims to optimise the development process to accelerate delivery. Some of our most significant digital transformation projects have utilised Microsoft's development solution, Power Platform.

Sword recently worked with an Oil and Gas operator's offshore teams to replace multiple systems for data entry and paper-based processes. Cumbersome, legacy applications were superseded by easy-to-use, mobile-friendly applications for the likes of instrument reading, observations, and maintenance planning. The results included greatly improved efficiency and enhanced system integration, both offshore and onshore and all on a single enterprise platform.

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Unlock the power of data

We are regularly asked to help overcome frustrations with technology underperforming in line with expectations. It is often the case that the technology is not the cause of the frustration, but the data that the technology is accessing.

Combining our experience in data and applications over the years, has driven our ability to build an industry recognised Master Data Model (MDM) which has been designed 'by engineers for engineers.' In digital engineering, the MDM acts as a single source of truth and the foundational building block data sits on when exploring digital twin solutions.

Our MDM and software modules have been used to help deliver multiple global projects and validated across 30 countries and with the involvement of operators and EPCs for greenfield and brownfield initiatives.

Digitising legacy information

We avoid the 'garbage in, garbage out' trap by ensuring the right data is collected, structured and accessible to make informed business decisions. We develop bespoke applications to integrate with all aspects of a business when off-the-shelf software solutions don't quite fix a customer's precise problem, from legacy issues bringing unwelcome risk into operations, to inefficient processes making everyday tasks complicated or prone to human error.

Enabling a Data Driven Future

Investing in tailored, solid technology systems that are fit-for-purpose is proving to be the key for many Energy industry organisations in building data driven foundations. Insights and analytics from these reliable systems enable informed data driven decisions to be made on everything from recruitment investment to pinpoint precise drilling locations. Enabling our customers to rely on their data as a single source of truth is the cornerstone to building strong data foundations. .

THE GENIE IN THE BOTTLE

Greg Anderson
Chief Technical Officer

At Sword, we are always looking to continuously improve, both in terms of how we service our customers and how we enable them to achieve more. There has been great hype in recent months around Generative AI, and with the spirit of continuous improvement, we have been actively evaluating how we can utilise these capabilities. Our aim is to let the 'AI Genie' out of the bottle, to help improve the performance of our internal teams and determine how we can utilise this technology to enable our customers to realise business benefits.

Sword has been actively working on embedding Generative AI within various aspects of our business, as we believe this is going to be mandatory to stay competitive. AI is already being used at scale by a cohort of our technical staff, with measurable performance improvements being recognised. Initially, we are focusing on three key areas to generate value by embracing AI; increasing productivity, improving digital processes, and augmented AI..

Increasing productivity

Firstly, we believe we can utilise existing capacity more effectively by using Generative AI as a Copilot for software development and data engineering. Our initial evaluations in this area have been very positive, resulting in the following conclusions:

- **We believe ~50% of all code can be created using GenAI, reducing the amount of low value work currently being undertaken manually by developers.**
- **We have seen improvements in code quality as well as faster outputs and fewer production-level issues.**
- **Code quality improvements are across the board, from less experienced developers as well accelerating the competency of experienced engineers.**

As a result, we are planning to improve our internal governance and training around the use of Generative AI and believe we can deliver fixed price projects around 20% faster.

Improving digital processes

Next, we are actively engaging our existing customers to demonstrate how we can utilise Generative AI to deliver efficiencies and improve performance of content generation and formatting within their existing business processes. We are demonstrating how the combination of GenAI, automation and digital workflows can greatly reduce operational overhead and increase staff capacity to allow them to focus on higher value activities.

Augmented AI

Finally, we are seeing demand from our customers around helping them to understand the implications of adopting AI to augment their internal staff capabilities. The majority of our customers recognise there are productivity gains to be realised by utilising GenAI Copilots to reduce the number of mundane tasks staff need to manage themselves. There are obvious concerns around this topic and we believe there is a significant opportunity to provide customers with appropriate consultancy using our established change management and adoption frameworks. We have vast experience of utilising the Prosci ADKAR methodology to help our customers adopt new technology effectively and believe this experience will be highly beneficial when applied to Generative AI adoption.

Conclusion

We believe there are significant benefits related to Generative AI. Our plans progress with continuing to train our staff to incorporate these new capabilities into existing workflows. As discussed, we are facing a challenge to ensure that internal governance around Generative AI adoption is appropriate to ensure we have robust standards around our use of AI. Finally, to further our journey with Generative AI we will ensure a clear plan is developed to determine how we scale up our market engagement around Generative AI.

> **The majority of our customers recognise there are productivity gains to be realised by utilising GenAI.**

IS IT TIME FOR THE DIGITAL TWIN TO GROW UP?

Jared Owen
Business Unit Director (Applications)

In recent years, digital twins have been seen to be the answer to many of the energy industries challenges. In this article, we delve into the roots of this concept with Mike Stewart and Jared Owen from Sword, as they uncover why it is now the opportune moment for digital twins to unleash their full potential and evolve, if done the right way.

The Energy industry's digitalisation continues to drive innovation and collaboration across domains and disciplines. This plays a vital role, helping companies maximise the value of their data, improving technical decision making whilst decreasing commercial and safety uncertainty. As our customers digitalise processes and generate increasing amounts of digital data across their assets, the challenge becomes one of unification – providing flexible access to federated data wherever it sits, in a robust model that can pivot to meet a diverse range of industry use cases.

A contextualised, liberated and pivotable Master Data Model (MDM) is a great real-world example of that principle: supporting engineering workflows with a trusted foundation, providing a leverageable data set for modern analysis techniques, and aiding regulatory compliance. The success of a digital twin relies on its adoption across a business, evolving how its maintained, upgraded, and decommissioned. Investment in the foundational building blocks, in the underlying data governance, is crucial to the long-term viability aligned to proper ownership and maintenance.

> ***"The ability to visualise and analyse data driven content is increasingly directed by the environment around us becoming 'smart.'***

Our industry is and has always been driven by innovative engineering, we operate our entire infrastructure around it. In today's world engineering needs to evolve to the next level but retain the fundamental principles and value it has unlocked for us.

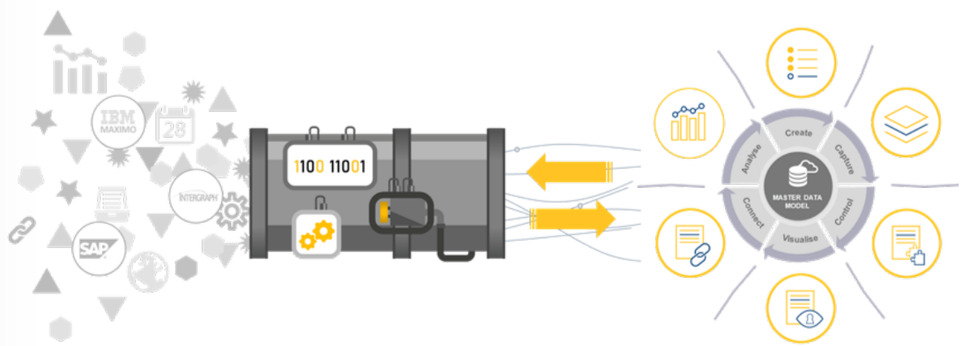
We have moved from original drawings and diagrams to computer aided design (CAD) and 3D modelling and now to a digital twin representation of a physical asset. But what do we gain with this evolution? We still strive to design, build, and deliver complex engineering solutions and make decisions that are underpinned by data. Does technology make this better?

Today's digital engineering allows us to make decisions on decades of design and learning made accessible through modern technology accessing relevant and liberated data.

Digital engineering, wait, what happened to the Twin?

The ability to visualise and analyse data-driven content is increasingly directed by the environment around us becoming 'smart.' This brings near limitless options when it comes to deciding how best we apply digital engineering to improve processes.

Sword defines digital engineering as 'the ability to digitally replicate and manage an engineering environment through the use of digital applications and a single source of truth.' Starting from those



original drawings through to the latest 3D visualisation, engineers are looking to use increasingly advanced technologies to capture data, analyse, manipulate and then design and/or manage solutions in a digital engineering environment.

To achieve the ambition of a digital representation of a physical asset such as a 'digital twin', we need the right building blocks in place to reference and represent how the asset or infrastructure was initially constructed and maintained, from the initial equipment lists to past and ongoing modifications. This means you need to be confident you have the right information for your entire data stack prior to asset digitalisation.

The heart of Digital Engineering

Sword focuses on the discovery and integration of all relevant data sources to first build a Master Data Model (MDM) as the single source of truth that can be accessed and interrogated by multiple users with differing needs. Our approach to building an MDM aligns with industry best practice to ensure an entire asset is captured and structured in a way they can be represented digitally.

Maturing from the teenage years

A key benefit of the MDM build is the flexible approach we have taken to client data models. Instead of requiring data to be fully exported and only consumed within our application databases like other industry solutions, we use a connected interface allowing clients to retain ownership of the master database while still benefitting from visualising that same data in our applications. This reassures customers who are becoming increasingly aware of data governance and don't want to be locked-in to a single software provider. In addition to the MDM, Sword have designed and delivered modular digital engineering applications accessed via our Sword Digital Engineering Platform that work with the MDM to maximise the interface and interaction of the asset data to facilitate and aid data-driven decisions. This empowers engineers to model, capture and manage information in a single accessible form, so they can use it to deliver projects, manage operations and drive industrial transformation .

Our Sword Digital Engineering suite of applications are configurable to multiple user groups, ensuring that the right users access the right tools to maximise production and minimise cost of use which differs to alternative tools that contain advanced functionality and features not required . This provides an element of cost agility other competitors in the market are unable to offer.

Our industry's drive for innovation and collaboration in a changing environment is exciting. The benefits to a digital representation of both offshore and onshore infrastructure can unlock vast potential to make better decisions, maximise safety, increase efficiency and extend the life of the basin. The holy grail of a Digital Twin lies at our feet. It could however be just another half-hearted digital gimmick unless we focus on trusted and accessible data first, and then make the solution flexible and fit for purpose.

DEEP THINKERS

Harry Lind
Subsurface Data Optimisation Services Lead

Data in the Energy sector of an unknown provenance, without verification, hinders the subsurface interpretation workflow and impacts the ability to extract actionable insight in multi-disciplinary teams. In a mature basin such as the North Sea, where wells can be up to 60 years old and assets can change hands several times, the uncertainty of well data provenance is a challenge faced by most operators.

The legacy data which is digitally available to subsurface teams working in mature basins is often a mix of raw original data, interpreted and edited data, all stored together with inadequate labelling to differentiate between it all.

Teams of geoscientists are faced with the unappealing challenge of producing a clear view of the subsurface from a dataset which is decades old shrouded in uncertainty.

When looking for original, raw, unedited information, the answer often lies in the many hundreds of boxes of hardcopy reports and logs which companies have piled high in storage facilities, largely unscanned and inaccessible to the subsurface community. Even if a complete library of these hardcopy documents exist, and has previously been scanned and made digitally available, all too often teams will find that files are now dispersed throughout a company's digital environment.

Rather than driving value from their data and applications, experienced subsurface professionals are forced to choose between spending their limited time managing scattered, incomplete, duplicate, and conflicting datasets, or basing their decision-making on data which is not up to the job. Subsurface communities need access to a single source of the truth to make informed technical and commercial decisions.

Gain an advantage from comprehensive data transformation

Essential components in the management of any E&P organisation's digital assets involve creating a suite of joined petrophysical curves which have been carefully verified against original well file material, and capturing key well data from reports and logs in a structured and efficient way. Assuring the spatial integrity of this data through rigorous governance is a crucial foundation to ensuring a quality controlled, consolidated dataset. In turn, a consolidated dataset when formatted, becomes interpretation-ready, and set for consumption into applications and data environments to enable subsurface professionals to make informed decisions.

Ensuring this level of quality relies on applying a trusted and repeatable methodology, something our experts have developed through 20 years of supporting operators and regulators alike. We identify and gather all relevant well data to allow for gap analysis to be carried out. Highlighting and filling data gaps where possible using original well documents, which also act as verification sources to identify what is raw information created during the drilling of the well, versus data which has previously been edited.

Following verification, our experienced consultants use their knowledge to process data to predetermined standards, and quality controlled to ensure the final dataset is accurate and complete. The outcome of this process is a consolidated, formatted output of trusted well data upon which key decisions can be made with confidence.

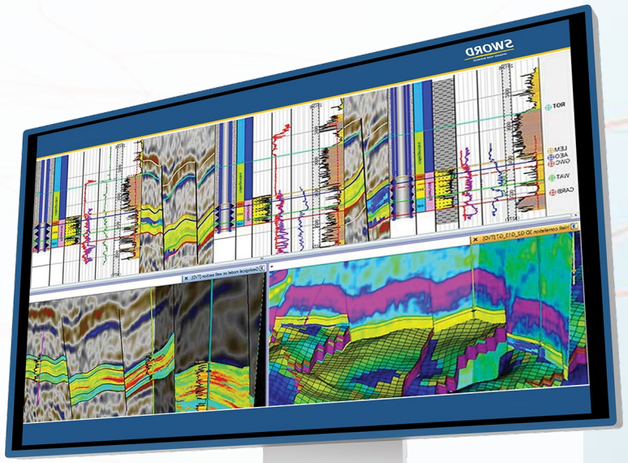
Although a structured methodology, our approach is adaptable and responds easily to an operator's well stock, exploration, development or acquisition/merger demand across multiple geographies.

Delivering reliability with a proven methodology and robust quality control

Having a complete, accurate and structured dataset which can be relied upon to give a true reflection of the subsurface environment greatly reduces technical and commercial risk associated to assumption-making and poor-quality data. It frees up subsurface experts to spend more time focusing on value-add, interpretation and engaging with their business to drive collaborative decision-making.

With corporate knowledge retained in a structured, accurate and complete well data asset, organisations choosing to optimise their data and leverage modern techniques and technology can greatly improve their regulatory compliance and gain a competitive edge over those who remain hamstrung by suboptimal datasets and practices.

In an increasingly digital world, it is more important than ever to have a clear data strategy prioritising verified data from trusted sources and making it readily available to end users. Doing so will allow the industry to maximise the potential of its subsurface data and drive better outcomes in a leaner environment.



A RENEWED HORIZON

Mike Stewart
CTO for Data

The North East commute to Aberdeen from any direction is dominated by on and offshore wind turbines. The horizon is a literal sign of the times as investment shifts away from traditional energies towards renewables. The rig count and boat traffic may be increasing in the local ports and harbours, but the majority are in service of the rapid expansion of the offshore wind infrastructure, with turbine blades rather than drill pipes adorning the heavy haulage on our roads.

As the renewable industry grows rapidly, how will Scotland meet the demand for digital platform and data skills in green energy, particularly when traditional oil & gas markets are drawing on the same talent pool?

Sword's footprint in the renewable sector continues to expand in 2023, likely doubling in 2024. With this growth we will support new market entrants, green energy pioneers and large energy organisations to build scalable digital platforms and derive more value from their data assets. Among this growth, we have seen a spike in demand for expertise in platform and network security as organisations invest in becoming more cyber resilient, reducing their vulnerability to external threats.

Additionally, our data teams have brought in graduate and junior career talent to meet the needs for data engineering, data science and analytics to drive better decision making.

What's driving the skill demand?

Our renewables customers often face geographic challenges with their assets and infrastructure more widely dispersed than typical oil and gas operators, normally in challenging areas on the far North and West of the UK. Wind, solar and geothermal are onsite intensive operations, and despite technological advancements in monitoring and maintenance, require a skilled workforce ready to work in challenging environments.

Talent with previous Capital Project experience is a common ask in renewables, and the North Sea oil and gas legacy has a huge amount to offer here. With this we have seen an increase in requirements for data and information management expertise to help control, manage and maintain information workflows, as companies rapidly design and bring online new infrastructure. Software, practices, and roles proven to add-vale in oil and gas are replicated in the renewable sector and are drawing on a limited talent pool. We, as an organisation, are playing our part through supporting graduate talent from local UK and Scottish universities, but a shift of capability and capacity from traditional energy markets will take time. The shortfall will need to come from training and development, technology advances, efficiency gains and collaboration within the supply chains.

The growing emphasis on real-time operations in the renewable sector poses a big talent challenge. Traditional energy companies are investing heavily in real-time operations and maintenance, there isn't the same legacy of talent and skills as in other disciplines. Developing tailored talent takes time, so in the meantime it's up to us, in the service supply chain to come up with the shortfall. These capabilities have been successfully outsourced for offshore, but that relies on consistent process and quality management, not to mention the challenge of increasing costs and attrition rates in lower-cost centre geographies.

On top of these challenges, Cyber resilience continues to concern organisations throughout the energy industry, it's no longer if an attack will come, but when and how a company have measures in place to protect its critical infrastructure and data. Renewable and utility companies have the additional pressure of maintaining real-time electrical supply to the grid and protecting customer's private and financial data. There's been a correlated increase in investment in OT and Cyber skills – both training and awareness, strategic consultancy to devise policy and governance, and operational support roles to fast-track security operations programmes to minimise vulnerability.

As the renewable sector scales and matures, it must determine whether to buy or build the system and app capability it needs to fully realise the value of its data. We are seeing growth spikes in demand for Scaled Agile, DevOps, Product Development, and technologies like FME and PowerPlatform as customers increasingly leverage cloud-based technology, GIS, and low-code app building to reduce waste within workflows and provide self-service data portals.

What role does Sword play?

Sword has a dual role in the Energy Transition; to support its traditional energy customers diversify beyond Oil & Gas, and to help develop relevant platform and data talent.

The good news is that lots of the capability, experience and skills that exist in traditional energy disciplines are transferable. The demand for modern digital skills, PowerPlatform for example, is the same no matter which sector we're servicing. The need to innovate, to code, and do more with less and to automate manual process, is as relevant in renewables as anywhere else. The requirement for trusted data, to drive decision making, is top of most digital maturity league tables.

> ***"Sword has a dual role in the Energy Transition; to support its traditional energy customers diversify beyond Oil & Gas, and to help develop relevant digital platform and data talent.***

Sword continues to develop a regional and global talent pool with relevant skills to meet the demands of renewables and wider energy market. In some areas, we need to re-skill and train our workforce, but retain the energy domain knowledge that sets us apart.

We have acquired in key disciplines and will continue to do so, collaborating with key strategic partners to bring capability to customers in expanding regions, such as NEOM in the Middle East.

YOUR CONTRIBUTORS AND CONTACTS

GREG ANDERSON
Chief Technology Officer

HARRY LIND
Subsurface Data Optimisation Services Lead

EUAN MACALISTER
Energy Sales Director

JARED OWEN
Business Unit Director (Applications)

JONATHAN SMITH
Cyber Resilience Technical Lead

MIKE STEWART
Chief Technology Officer - Data

CRAIG SWINBURN
Chief Commercial Officer

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www.sword-group.com/uk | communications@sword-group.com

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