

The Impact of Digitalisation on Employment in the Oil and Gas Industry

11 October 2018

As part of its energy talk series, Access for Women in Energy (AccessWIE) organised a seminar on the impact of digitalisation on the oil and gas industry with a special focus on employment, on 11 October 2018. S&P Global, Talent Acquisition hosted the event at their offices in Canary Wharf in London.

The digital revolution has entered every sphere of modern existence, and the oil and gas sector is not an exception. Powerful new technologies have upgraded or overtaken old ones, opening out new opportunities and improving operational efficiencies, barely imaginable a few decades ago. The entire hydrocarbon industry, like many others, is adapting and innovating at a breath-taking rate and many argue that artificial intelligence (AI) and machine learning (ML), in particular, are going to exceed everyone's expectations in the next five years.

The seminar gathered leading experts in this field, from the industry, academia and technology providers, namely:

- Ron Beck, Industry Marketing Director at Aspen Technology, who covered the most important digital technologies transforming the operations of the oil and gas industry and what they mean for organisations and employment.
- Linda van Leeuwen, Analytics Lead, Lubricants Supply Chain at Shell, who shared the experience of Shell with digital technologies.
- Lydia Rainforth, Managing Director, European Energy Equity Research at Barclays, examined productivity in the energy sector and the potential impact of digitalisation in this sphere.
- Paul Markwell, Vice President, Upstream Oil & Gas Research and Consulting at IHS Markit, discussed the emergence of advanced analytics and how low carbon solutions can help attract new talents to the industry.
- Dr Clare Bond, Senior Lecturer at School of Geosciences, Department of Geology and Petroleum Geology, University of Aberdeen, talked about how the university is adapting to the digital needs, by developing new programmes and tools tailored to graduate skilled data managers.



The speakers from left to right: Ron Beck, Linda van Leeuwen, Lydia Rainforth, Paul Markwell and Dr Clare Bond.

The discussion started with welcoming remarks from David Ernsberger, Global Head of Energy Market Reporting at S&P Global, who highlighted the commitment of S&P Global to diversity, adding that the digital innovation in energy raises critical questions as the industry keeps on reinventing itself and the impact of such technological changes on employment has drawn a major interest from various stakeholders.

THE IMPACT OF DIGITALISATION ON EMPLOYMENT IN THE OIL AND GAS INDUSTRY

Dr Carole Nakhle, CEO of Crystol Energy and Director of AccessWIE, chaired the discussion, making timely observations such as more and more students and professionals are moving into the renewable sector as they perceive the oil and gas industry as outdated and dying. She added, however, that if one looks at the investments oil and gas companies are making in developing and applying latest technologies, including digitalisation, one can see that the industry is not going anywhere anytime soon.

Lord Howell, former Secretary of State for Energy in the UK and co-chairman of AccessWIE, concluded the discussion, stating that the energy industry has an image problem. He asked whether AI and analytics will help not only in changing this perception but also in attracting both new talents and investments. Lord Howell added that it is critical for the energy sector to be part of the digital transformation but cautioned against the vulnerability of the industry to cyberattacks especially that energy is central to national security.

The following summarises the key highlights of the discussion.

A Late Comer but Massive Potential

- The term digital transformation/digitalisation can be confusing to some, as there are several facets to it, e.g. compute power, connected devices, AI and ML.
- Analytics technology has been available for a long time, however, what has changed in the last few years is the infrastructure and how connected all the different silos are now, enabling a new way of optimisation.
- The world is expected to see 29.7 billion connected devices by 2023 (compared to 1.2 billion in 2014), while spending in AI will be \$26.8 billion (compared to 0.6 \$billion in 2014).
- Outside the energy industry, the digital transformation has been embraced very quickly and the energy industry needs to follow and learn best practices.
- Within the industry, the pace of change and impact will be much faster and broader than expected. However, some companies have been moving slowly in the digital sphere while others, particularly those based in Asia and the Middle East, have been pushing faster. There is an urgency for change - if the US and Europe do not keep up the pace they will lose some of their competitive advantage.
- Augmented reality, AI and the connectivity of devices have the potential to disrupt the industry, but it is important to be able to utilise this potential.
- The technologies anticipated to have the biggest impact in the next five years are predictive maintenance while the impact of robotics will be more visible in the longer term.
- In the last decade, labour productivity in the oil and gas industry has significantly deteriorated while capital productivity saw a 70% decline. Closing that gap on productivity is estimated to be a \$60 billion opportunity and the digital technology has the potential to double the cash flow of the sector.
- Market players which fully embrace modernisation and digitalisation are best positioned to increase shareholders' value and be sustainable in the longer run. Digitalisation can help the energy industry to go through the energy transition and data transformation successfully.
- Oil and gas companies are undertaking different efforts to reduce the carbon footprint of their activities and products, using digital technologies, such as the curtailment of flaring, deployment of drones and satellite monitoring to inspect infrastructure.

Democratisation of Decisions

- At company level, there are two different approaches across the broader workforce: corporate push (centralising the function) and business pull (allowing for more creativity in analytics). Organisations can be much more effective if they change their structure and become more flexible.
- The impact of digitalisation in the energy industry means that the nature of work will change, organisations will be restructured and become more fluid.
- The digital revolution in the energy sector has the potential to change the working methods fundamentally, improve efficiencies and reduce costs. For instance, geoscientists can spend more time on high value tasks and let the machine complete routine exercises.
- Perhaps one of the biggest impacts of digitalisation is the democratisation of the decision making, as critical decisions are pushed down to much lower levels within the organisation.

The Future of Employment

- Around 440,000 jobs have disappeared from the energy field during the most recent downturn in the last four to five years, resulting in a permanent loss of talent and experienced individuals.
- Some people believe that automation leading to higher productivity will reduce the number of jobs needed, but the energy industry is so complex that it is the nature of jobs that will change, hence, the ability and will to learn and adapt will be the key for success.
- As 75% of the workforce is expected to be millennials by 2025, there will be a huge opportunity for younger people to take senior roles.
- In the era of digitalisation, demand for skilled staff, who are able to manage new technologies and apply different analytical tools, has accelerated.
- To fill the skills gap, the industry should work hard to encourage new and existing talents to consider career opportunities in oil and gas. The industry needs to market the role that it plays in decarbonisation and making energy cleaner to meet climate concerns.

Industry Case Study: Shell Lubricants

- Shell created different initiatives, including the accelerator programme to develop digital solutions.
- The company has successfully applied digital technologies in the Lubricants supply chain, collating ten years of production data to conduct quality tests and deliver the best products to the market.

- Collaboration across the supply chain is strong. The project teams incorporate different expertise which traditionally did not work together, such as IT specialists, data scientists and industry experts, whereby cooperation has been facilitated by digital technologies.

University Case Study: Digitalisation at the University of Aberdeen

- Just like many other universities, the University of Aberdeen has experienced a decrease in recruitment in oil subjects in recent years, particularly owing to the negative perception of the industry and its environmental impact as well as the recent market turmoil.
- Following emerging trends, the University of Aberdeen and its partner, Common Data Access (CDA), set up a new Master course “Petroleum Data Management” to train the new generation of data managers.
- The programme is flexible and offers to study full-time on campus or part-time online allowing students to continue working while learning.
- To adapt to the global digital shift, the University has embraced the latest technologies. Labs are equipped with virtual microscopes, mobiles are used to do geological mapping on a field, while 3D modelling is completed using drones and AI.



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