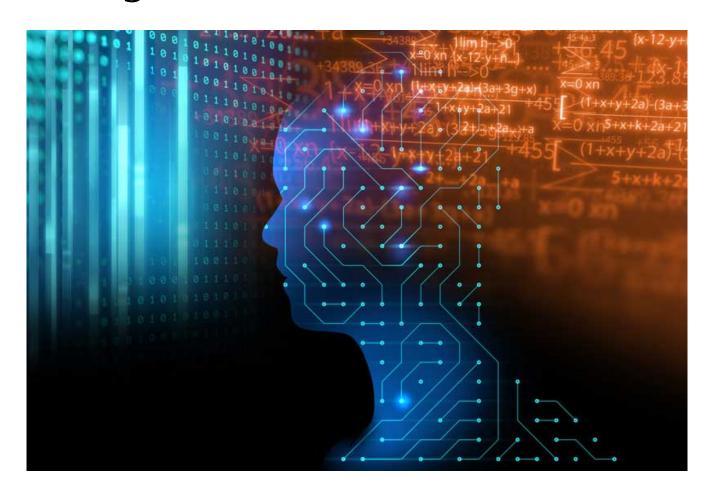# Data Science, AI & ML: A Game-Changer for Oil & Gas IM?

Oil & Gas IM is changing – at last!

One of the biggest changes I've seen over the past couple of years in Oil & Gas IM has been the emergence of data science and the explosion of the applications of Artificial Intelligence and Machine Learning. At last, we have a toolset to deal with the IM problems we've known about for years but haven't been able to efficiently tackle. Let's not get too hung up about the definitions* of these or worry about whether AI is a real thing or not. And of course, we've been 'doing' data science for years in Oil & Gas, we've just called it things like Geology & Geophysics.

The fact is the convergence of increasingly smart science, tremendous compute power on tap in the cloud and the availability of large volumes of data is having a transformative effect on our business. It feels something akin to the widespread adoption of 3D seismic in the 80s and the emergence of the interpretation

workstation, arguably the last truly game-changing subsurface information technology shift.

Data science is adding value now

Data science, [as part of a wider Digital Transformation](#), is already tangibly driving efficiency, cost and risk reduction further downstream in the work of operations through sensor-driven data feeds, real-time predictive analytics and automation. We're really just starting to explore the possibilities around data science enabled subsurface interpretation and reservoir management (check out GitHub for some great [open source examples](#)). The potential benefits are enormous: Orders of magnitude time reductions in process & interpretation time, the ability to significantly de-risk exploration, development and production decisions and the ability to use all of the data, all of the time, to name just a few. And given the challenges we face in attracting and retaining talent to fill the gap created by years of attrition and the ['The Great Crew Change'](#), this is vital to the future of our industry. More on this in my next blog.

Replace us with machines that do the job better?

There are of course concerns. I've already touched on some of the challenges around operationalising data science [in a previous blog](#). Data science and AI are seen by some as threats to traditional SME roles in Geoscience & Engineering. Given the level of denudation of the workforce in recent years, and the paltry trickle of new talent in to the industry, I doubt this will be the case. [All the talk now](#) is about a 'partnership' between AI and human SMEs, with AI stripping away the drudgery and allowing scarce Subject Matter Expert (SME) resources to apply their cognitive capability and experience to ever-tougher scientific problems. Added to this, we're starting to see [data science infused](#) into the Oil & Gas organisation as a core skill. The case studies coming out now show that a combination of AI and SME can lead to remarkable levels of accuracy and speed of analysis. This in turn can significantly shorten asset evaluation timeframes OR increase the ability to apply more science to the problem in the same time: It's not necessarily about saving time, it's about improving quality and better understanding risk and uncertainty.

Unexplainable AI?

The other criticism you hear levelled at AI is that it's 'black box' and the results can't be trusted. It's true that AI has it's [issues and limitations](). But often the mistrust seems to be largely down to the fact that AI is driven by Data Scientists and there isn't some sort of GUI for working with it. I find it strange that people think that a user interface on top of a bunch of proprietary encrypted algorithms makes it 'transparent'. The fact is, most AI is based on open source code, is well documented and can be easily interrogated. Surely that's no worse than selecting the defaults from drop-down menus, hitting the 'Go' button and accepting whatever the app throws out? There's also a [lot of work going on]() in the field of data science to make AI 'explainable', which will help.

Data science is changing Venture's business

We are already seeing the impact of Data Science at [Venture]() through the work we're doing with our clients. At the most prosaic (but still impressive) end of the spectrum, it involves using data science to improve the quality of data and make it discoverable, so that more data is used in decision making. Following on from this, the ability to extract information and meaningful insight from the masses of unstructured data available in most Oil & Gas companies has the potential to be a game changer (see the research by [Paul Cleverley]() for some great examples). These repositories of information, so often locked away in physical or digital archives, are a representation of the knowledge captured by waves of subsurface experts, often long gone. If we can stitch this together and bring to bear on the increasingly complex challenges faced by E&P companies, the potential prize is huge.

Every journey starts with a single step

Many of the major players are already betting big on data science, such as [BP](), [Total]() and [Woodside](). If you feel ready to put data science to the test and to explore how it can potentially transform your business, why not contact us here at Venture? We have the resources and experience to help you shape up some short, sharp proof of concepts targeting real business problems. These can help you decide where best to focus your effort for maximum return and minimum risk.

* OK, a few definitions to get hung up about ...

Data Science: The ability to extract knowledge and insights from large and complex data sets.

Artificial Intelligence: The ability to have machines act with apparent intelligence.

Machine Learning: The use of data-driven algorithms that perform better as they have more data to work with, "learning" (that is, refining their models) from this additional data.

Deep Learning: Typically, a multi-level algorithm that gradually identifies things at higher levels of abstraction.

www.datascienceglossary.org

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