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Digital's Next Frontier

Julian Gray, Technology Director at BP's Digital Innovation Organisation, tells **Dawn Murden** why leadership is critical when introducing new technology to a global workforce

When it comes to digital transformation, companies within the oil and gas industries are certainly ones to watch. From robots to the Internet of Things (IoT) and augmented reality – many aspects seem futuristic.

Twenty years ago BP adopted seismic imaging, which uses sound waves to scan below sea and rock. It continues to make huge advances in this field, especially since investing in the world's biggest supercomputer in 2014. It's housed in Houston and has 3.8 petaflops of processing power, meaning it can carry out nearly 4,000 trillion calculations per second. It now takes a geologist a single day to carry out analysis that would have taken four years only a decade ago.

"We have been innovative in that space for a long time. We were building massive rooms called hives, which were 3D immersive environments," says **Julian Gray**, Technology Director at BP's Digital Innovation Organisation.

While BP has been at the forefront in many respects, it has not been without its challenges. **Julian** says he is well aware of the barriers to digital, with people being one of the biggest. Here, he talks us through BP's digital projects and how it's critical to have the right leadership team to embed changes across the organisation.

What projects are you currently working on?

We're currently working on digital outcrops. So, an outcrop is a piece of geology and land, for example a rock face. We use drones and photographic surveying to build 3D images of the outcrops.

> *"The value is hundreds of millions of dollars in savings"*

Geologists can overlay the digital outcrop onto a seismic image where we've already done work to predict what the sub-surface is like. It means they can get closer to the reality underground. This helps us to know where to drill for oil so there are fewer dry holes.

Another project we've introduced is 'Well Advisor'. This has been hugely successful. For years we drilled without any sensing or vision equipment down at the drillbit head. Now we have sensors producing data about the drilling in real time. The purpose of this was to stop the pipe getting stuck, which is hugely costly. The value is hundreds of millions of dollars in savings.

Are you doing much with autonomous machines?

We've got a few partnerships with companies that are building robots for us.

Firstly crawlers, which are magnetic devices with scanning equipment. We can use these on oil platforms to inspect the pipes that carry oil from below sea level. They get corroded quickly and have to be tested every six months. That's an expensive process as well as being quite dangerous because you have to hang people off the rigs.

If you send a crawler it's safer and the crawler can take laser scans. The richness of the analysis and the preventative maintenance you can do is far greater.

We're also using unmanned underwater vehicles for inspections.

What about the IoT?

BP has used standalone sensors for years for things like gas detection, but with the growth of the IoT and platforms that can be used to collect and analyse, the resulting data will be a huge source of value, efficiency and safety.

As we develop our IoT strengths we'll have some of the actuators and sensors doing their own thing and not necessarily have people in the danger zone. In the future we may even be able to completely de-man some processes.

What are the barriers to new technology?

Capability and working practices in our industry tend not to be digital. We've tried to digitise a number of things; often the workforce is not ready and doesn't see the value – there's also a timing issue.

For example, we wanted to automate one of our refineries, using RFID tagging and readers, an ID system that uses small radio frequency identification devices for tracking purposes.

We worked out which processes would use it and got senior backing. The barrier at that time, which is now changing, was that the technologies were too clunky. >

The operators didn't like using large telephones and usability was an obstacle.

We were unable to improve it because smartphones were not certified for dangerous environments with hydrocarbons. Whereas now we have an Android device; we've got all the tags there so we can reintroduce the technology and get the benefit.

Does that kind of resistance occur on a regular basis?

Often, it's relatively easy to introduce technology but the difficultly is proving it, so that you can then scale it and use it across an organisation as big as ours.

If you can see the efficiency gain you're going to get, you can often force the change through. However, in the example I just mentioned, the resistance was too strong and they decided to pull it and reintroduce it at a later date.

How important is leadership when you're trying to scale technology across an organisation?

Fundamental.

To introduce change you have to raise it right up the chain and be able to sell the technology to the executives. They have to understand the value across multiple sites and then do more than just endorse it.

They have to be out there communicating and leading on it to make sure it gets embedded.

So, for example, in the big data and analytics sphere we've got quite a public agreement with a California-based company that was set-up and endorsed by our executive team.

> *"We've got a few partnerships with companies who are building robots for us"*

Likewise, the 'Well Advisor' project I mentioned earlier was championed by the Head of Upstream Technology, who said that it needs to become a standard.

You mentioned that it's important for leaders to not only endorse technology but to lead in its development. What does that mean in practice?

They've got to be consistently communicating all the way through the lifecycle.

When the senior executives talk about BP strategy internally, if they no longer mentioned how big data and analytics have the power to transform BP, then people would start to question if they see the value anymore.

When senior leaders talk about the oil wells we're going after, the safety record we have, they're still talking about the need to transform our internal processes and use data and digital tools in a different way because it will help us get through the oil price crisis.

Have you had to adapt the way you communicate with other leaders?

Personally, no. I've always considered myself a business person who works the technology side, rather than a technologist who needs to show up at the business.

I think for others this has changed. You've got people doing this sort of work who are either business people or they are technology people, but they've found an easier way to communicate using the language of business.

However, some people still talk too much about technology, rather than the business outcome of technology, which has to be the focus. ■

Julian Gray was a speaker at the Criticaleye Digital Retreat, in association with Accenture Digital. Find out more here

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Julian is a Technology Director in BP's Digital Innovation Organization (DIO) based in London. Before joining the DIO, Julian was the CIO for BP Alternative Energy (AE), BP's global renewable energy division, which develops and operates assets in wind, solar and biofuels.

His early career was spent designing, writing and building applications, which led him to take on the role of Product Manager in Oracle's applications group.

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