

The digital transformation



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It is often said that digital technology is transforming our industry. But it's not just the technology, it's the way we use it. Big data, analytics and artificial intelligence are powerful new tools – but the real challenge is deploying them at scale and at speed. In other words, it's not just the 'what', but the 'how'.

That's a challenge we have been taking on in BP's Upstream since 2016, when we brought BP's upstream executive team together with a bunch of technology companies to create a plan of action as part of our wider modernisation agenda. We heard from companies like Google, Toyota and Condé Nast. We felt inspired and a bit in awe.

We saw that the new applications and approaches were turning the Internet of Things from a buzz-phrase in to a reality that could make our business safer, smarter and stronger. We saw how it was technically possible to create an integrated physical and digital business. But it meant making digital technology pervasive throughout BP – monitoring, simulating, optimising, automating.

And that required a strategy and some new ways of working. Strategically, we set out an ambition to play a leading role in digital innovation by building what we call the Connected Upstream. This has three parts – connecting people and data, connecting physical and digital assets, and connecting machine intelligence with business decisions. And while the Connected Upstream isn't going to be built overnight, it's amazing how quickly it can take shape. It follows 'Metcalfe's law' of networks, which shows how value snowballs as more connections and users are added. A single telephone is of little use, two change the game and millions change everything. It's been the same for the Internet and, it seems, a 100 plus year old business, like BP's upstream.

But how do you make the network effect take off at scale? We have found several highly effective drivers: a 'test local, share global' approach to scaling new technology; 'democratizing' our data; new collaboration models; and arming our people with new skill-sets.

Test local, share global

First, the 'test and share' approach means we use different operating assets around the world to test out new technologies simultaneously, finding out what works best and then sharing the most effective ones globally. It's an approach we are taking in several areas, from trialling new methane detection technologies in the US and Azerbaijan to testing new automated drilling technologies in Oman and Alaska, designed to make our

drilling safer, smarter and more efficient. Our business model of specialist functions - from explorers to drillers - operating at global scale with global communities of practice, enables us to reduce test-and-refine cycle times, so we can roll out technologies as quickly as possible.

Last year, following trials in the North Sea we deployed APEX, our production optimisation system, to more than 25 fields around the world. Standardisation of the system drove much of that deployment pace. Some 30 thousand barrels of production a day were added last year because of APEX - some of the most competitive barrels we can possibly produce. Technologies like APEX play a key role in delivering the commitment we have made to our investors to decouple cost from the oil price.

Alaska is the latest region to begin deployment of APEX and represents one of BP's most complex operations with trillions of different routes that a hydrocarbon molecule might travel at our facilities at Prudhoe Bay. Optimization Engineer Amy Adkison explained it best when she said, "We weren't sure we could use APEX, because of the sheer scale of routing options but we've had great support incorporating that complexity. We're excited to be able to collaborate with the other regions on the same technology platform. Each one has solved a puzzle for their region and we're eager to share learnings to boost optimization here in Alaska."

"It's meant that we have deployed in months instead of years".

Democratising our data

A second way the network effect plays out is in connecting people and data. Once people have access to data, with a few simple off the shelf applications it becomes natural to innovate, cutting cycle times, gaining new insights and sharing information. For one of our major projects in Egypt, we have replaced a complex manual process with a business power analytics dashboard, pulling in thousands of data points from our suppliers to manage project delivery. Our procurement teams are using PowerBI to track deflation costs from drilling to logistics, and using a new Category Portal that performs analytics on purchasing history and market trends from multiple systems across BP. By connecting people and data through such intuitive tools, our staff are finding new opportunities to drive productivity and create new value.

New collaboration models

A third manifestation of the network effect is apparent in the way we work with partners. Historically, we have operated bilateral client-supplier relationships, where BP pays a vendor



BP Alaska's North Slope operations

to provide a service. But increasingly we are bringing our partners together to explore how we might collectively add more value by solving more fundamental problems. One example is a Digital Alliance we are building in our IT function, where we have convened a network of architecture and application partners to solve bigger, more complex challenges collaboratively, like developing a new proactive monitoring capability and using a space consigned for demolition to build a new remote collaboration centre. We are leveraging the collective power of bigger digital brains, using design thinking and work shadowing, to rapidly understand users and define new ways of working that will change BP.

Updating our skill-sets

The final network effect we have experienced is the growing awareness among our people that the world is changing around them – and that their skill-sets also need to change. In our finance organisation, for example, we have been applying data science to deliver more reliable forecasting. Data science is a unifying capability relevant to people from every function across the Upstream. In just over a year an informal Data Science Community of Practice has grown up in BP's upstream with more than 600 people joining calls each month, as well as short training classes, sharing of case studies and 'ask the expert' sessions.

We are supplementing this peer-to-peer learning with data

science 'boot camps' and online training. This year, we have held cross-function, cross-segment hackathons focusing on solving real business challenges. Bringing together people like this from across our business to make new connections, share what they know and bring different perspectives to bear on a problem is exciting and transformational. It is liberating our staff to develop themselves and become more valuable.

When I look back at BP's first Digital Energy Day we held in London in 2017, with Google, Amazon, Microsoft in attendance, I remember there was a part of me that wondered whether we could transform an industry which had been forged in the analogue world of drills, risers, valve and pipelines.

Over the last two years rising efficiencies, higher production and lower costs tell me that we can. And in a sense, it is nothing new. We are simply taking our industry's core skill of project integration to a different level. Twentieth century projects involved integrating resources, physical assets, finance, people, partners and technology. Twenty-first century project management still involves all those factors, but the technology available today has taken a giant leap forward.

As ever, the challenge is not simply to understand the latest technology but to create value from it. And for us, that has involved a 'test local, share global' approach to trialling and deployment; making best use of our data; imaginative collaboration with partners; and our people's willingness, not only to transform their way of working, but their own skill. ●