DIGITALISATION

Creating the cognitive enterprise

Digitalisation is core to acceleration of the energy transition, explains *Sonia Van Ballaert*, IBM Client Director and Member of the IBM Industry Academy.

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How can digitalisation help facilitate the transition towards a more carbon-free energy sector?
Digitalisation can help speed up the energy transition in at least three ways – by 'democratising' access to renewable energy; by involving consumers and other parties in energy choices and energy efficiencies; and by creating new platforms that speed up adoption of renewables.

Data underpins these three types of acceleration. First, renewables allow for distributed energy production (eg solar panels mounted on rooftops) and storage (eg home batteries), and digital technologies such as AI (artificial intelligence) and blockchain make the management of over or under-capacity possible. Second, mobile apps allow consumers and prosumers to monitor and control how much and which type of energy they use with conscious choices. Third, organisations traditionally outside the energy sector, such as cities and auto-manufacturers, are developing new, electrified products and services enabled by digital technologies such as IOT (Internet of Things), AI and blockchain.

Digitalisation is, therefore, a key vector in the energy transition.

Is digitalisation more than an IT issue, and who should be involved in these projects in the energy sector?
Digitalisation is a core business issue for anyone in the energy sector looking at driving efficiency in operations, improving customer engagement, or creating new business models.

Digital strategies are business strategies and should be co-created, co-owned and co-operated by a diverse set of stakeholders – strategists, P&L (profit and loss) owners, marketing managers, customer representatives, asset operations... together with user interaction designers, architects, programmers, IT operations and cybersecurity.

Digital technologies no longer just enable change, they are the fabric of change. Digital literacy must become a core competency in the business, while IT needs to think business first.

What are the quick wins in terms of digitalisation?
Any asset intensive industry – oil, gas or power – will benefit from an improved ability to predict and, therefore, prevent costly or dangerous failures in operations. Condition monitoring, predictive maintenance and operational risk prediction, as well as optimised spare parts management, are a few examples of compelling use cases for IOT and AI.

In addition, renewables depend on intermittent factors, such as the weather, and the ability to predict energy supply and demand precisely and balance the stability of the electrical grid.

All of these applications offer great rewards, but many companies still struggle to execute them at scale – applications tend to be limited to a single plant, a few equipment types, a particular vendor of operational technology or one IT platform. As a consequence, many applications do not scale easily.

Implementing digitalisation at scale and embedding it into operations is where the true benefit lies. Scaling involves the ability to deal with multiple types of data, to operate many analytics models at the same time, to apply digital technologies in combinations, and to embed intelligence in actual workflows. Scaling also means that people are willing to be informed by data-driven insights. This is a big change in an industry that traditionally places a lot of trust in people's personal experience and expertise.

Cybersecurity is a big concern, what approach is advised when dealing with Big Data, mobile devices, etc?
Cybersecurity is a top-level concern for any energy operator. Connectivity of operational technology to the internet, in combination with industrial use of mobile devices, creates new vulnerabilities. This requires rethinking security at all levels – from the sensors and devices used in the plant, via the control rooms, all the way to enterprise IT systems and networks.

Every sensor or mobile device is a potential security risk. Equally, the data collected from consumers needs to be well protected as breaches are very costly.

Protecting assets and data involves a holistic security approach that works across operational and IT domains, using AI and Big Data to sense and analyse events in real-time, to detect and respond effectively and with speed.

How will AI and machine learning impact the energy transition?
AI and machine learning, when they move out of the 'proof of concept' stage into daily asset operations and consumer interactions, offer great promise.

These technologies offer insights across a large and varied data landscape and allow for precise matching of clean energy supply to energy demand, greater energy efficiency in industrial processes, products and buildings, with conscious energy choices made by all stakeholders.

How fast is the return on investment on typical digitalisation programmes?
Digital initiatives at the level of a single use-case usually offer quick returns in terms of operational efficiency, reduced cost, or enhanced customer understanding. About three to six months is not unusual, for a single algorithm that improves a prediction or offers a new insight.

However, the art is not in creating a clever algorithm, but in embedding it into daily work. This involves a change process and the ability not just to invent but also to operate and maintain this new intelligence. We are at the start of this scaling process and of becoming what IBM calls a 'cognitive enterprise'. ●