The Internet of Things (IoT) and related technologies are making inroads in just about every sector of the economy and the oil and gas industry is no exception. Larger players in particular are exploring the technology’s potential and some are already finding new ways to extract value from the data flowing from digitized wellheads.

One O&G firm ABB works with has increased its in-house analytics group by a factor of six over just the last few years as more and more operational data has become available. Another, Australia’s QGC, has implemented a cutting-edge system that allows the company to manage thousands of wells spread across 1,100 square miles with just four staff members.

Most firms are still in the early stages of evaluating technologies and developing a business case for investments in digitalization, but the potential is significant. Aside from the industry’s ever-present focus on safety, cost reduction tops the list. There are more than 1 million wellheads in North America, and the companies that operate them are keen to reduce the amount of time field crews spend traveling between them to perform maintenance checks. Digitalization offers the possibility of remote monitoring coupled with analytics to do just that, and more.

**Why the cloud?**

Typically, controllers at the wellhead perform a certain level of optimization locally, taking actions, for example with chemical injection, based on measurements taken locally. Now, the advent of reliable, high-bandwidth data communications has made it possible to do more in the cloud. Wellheads don’t have particularly complex processing needs, and latency is not as much of an issue thanks to more advanced field networks. So, what does this new level of data availability do for O&G operators?

First, they can potentially get faster, more conclusive decisions about their operations by gathering data from the field and applying advanced analytics to it via cloud computing. Analytic programs in the cloud can provide a much more detailed picture of what’s going on across a large number of wells, allowing op-
Eventually, it will be more important to “connect the clouds,” similarly to how consumer systems bring myriad products and services under one interface (e.g., Amazon Alexa). Integration is much easier to do at a cloud-to-cloud level where computing, storage and connectivity resources are plentiful and cheap compared to traditional approaches.

Other important considerations

Security will remain a top concern as the O&G industry becomes more and more digitalized, but securing industrial systems is more challenging than laptops and mobile phones. Many devices have no screens or keyboards, and they run mission-critical systems that cannot be taken offline. Vendors and users together must make sure programs can’t be tampered with. Detecting (and acting on) threats as they happen are all vital.

Recently another issue, data ownership, has arisen not just in O&G but in other sectors too. Operational data is valuable, and the owners of it don’t want it to be shared with anyone without permission. Some cloud providers currently ask their users to nullify
Looking ahead
The onshore oil & gas industry is evolving rapidly. The real challenge will be making sure every development dollar spent generates real ROI. Companies that embrace digitalization will position themselves to uncover real value, but they need not embark on large capex projects to do so. No matter which stage of connectivity a company may be at, modular technologies can deliver on unique application needs today, regardless of region, and scale up as conditions change and new opportunities arise.

Onshore O&G is well situated to benefit from experience from the offshore side of the business, as well as new technologies onshore. Given the rapid pace of innovation in the areas of analytics and cloud services, not to mention field devices, we are likely to see even more options for wellhead digitalization over the coming years. The key to realizing returns and gaining competitive advantage is to start the digitalization journey now.