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HOW SMART UTILITIES ARE HARNESSING THE INEXHAUSTIBLE POWER OF DATA

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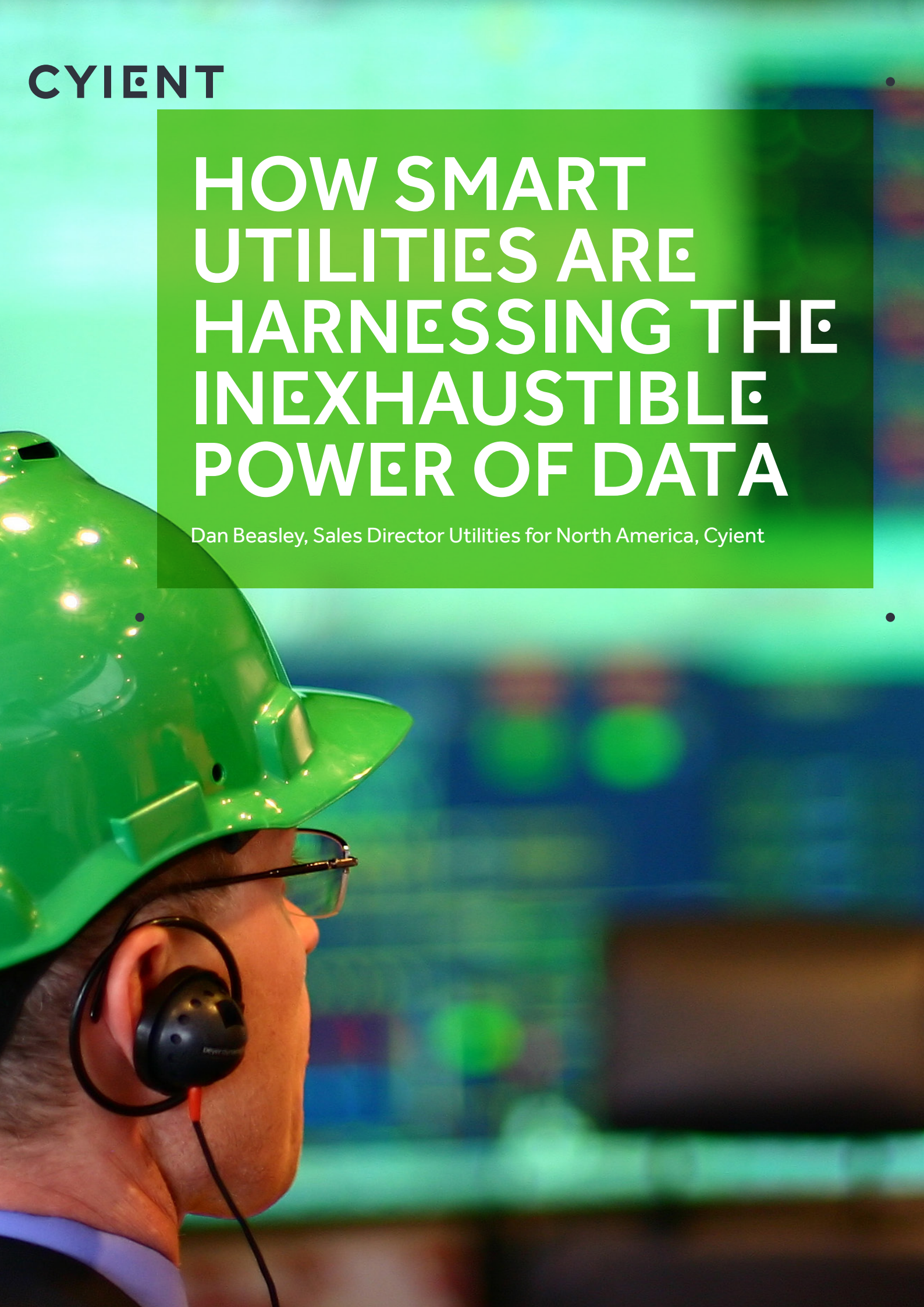

There's no doubt about it – data has become one of the most valuable currencies of modern times. Whether data is applied to quality assurance, customer service or financial outcomes, organisations worldwide are beginning to realise the benefits of investing in its collection and analysis. In the current climate, one of data's most common uses is in performance monitoring – a practice that has become commonplace across various industries, particularly in the evaluation of connected systems. Utility companies for instance, collect huge volumes of data when assessing the performance of a network, which is then analysed to provide insights into efficiency across the grid.

Extracting real value from utilities data however, as this article will explain, requires the development of a 'data-driven' operation. By modifying the 'data ecosystem' - processes, systems and organisations - utilities are able to create an 'as-operated' paradigm as opposed to an 'as-designed' model.

Performance monitoring and data collection

Put simply, performance monitoring enables organisations to make more informed decisions based on reams of current and historical data collected from across the network. In utilities, this data is used to inform both proactive and reactive decisions. The profile of this data however, has transformed over the years, as the business purposes for data collection have evolved.

Initially, data was collected solely to record when and where an asset was placed into service. Nowadays however, utilities seek a more temporal understanding of the 'condition' of each asset as it operates within the network. But effecting this transformation isn't that simple. To do so, utilities must be able to show how their networks perform according to how they are operated, as well as how they were designed. While both perspectives are essential, the need to align the two is critical. This can be a complex operation, but by placing big data at the heart of the strategy, it has the potential to revolutionise the way that utility companies operate.

Big data – how to make it bigger and better

Today's complex utility service marketplace and unforgiving regulatory environment means the value of big data insights is increasing rapidly, forcing utilities to become data-driven organisations.

The popularity of 'big data' as a buzzword has created the false impression that utilities have overcome the technical, procedural and organisational constraints. But utilities generate data through a variety of different systems, which can be complicated to dissect. This makes it difficult to derive historical, real-time and predictive performance monitoring insights.

To overcome these constraints, utility organisations should be looking to optimize the data ecosystem, generating a continuous, automated lifecycle. This would require a change in their physical processes, and just as importantly, a change in mindset. Without everyone on board with an 'as-operated' mindset, it can be very difficult to establish a truly data-driven organisation.

The evolution of data-driven operations

First and foremost, utilities need to understand that data is an evolving asset. This is perhaps the most crucial change required to harness the power of data. Understandably, it's easy for a utility to be content with its existing use of data, and many organisations limit the application of data to existing internal processes and structures. Data-driven utilities however, have shown that by placing data at the centre of the organisation, they can improve performance in challenging areas such as operational costs, grid control, trouble response, and customer service. By aligning data with key business objectives, network operators are afforded the right information at the right time, enabling a more effective business response.

Secondly, utilities need to acknowledge that systems should be specifically designed to enable 'as-operated' data to be generated. With this in mind, they should seek to create a data ecosystem which allows them to transition their existing operations and processes away from 'as-designed' towards a contemporary 'as-operated' focus. By doing this, the data produced reflects the performance of the grid as it's operated, rather than according to its design. This is critical given the constant evolution of grids and the commercial impact of Distributed Energy Resources (DERs). It means utilities can make greater use of interoperability and advanced utilisation techniques, and make their operations smarter and more efficient.

Below are two scenarios that demonstrate the shift in priority required here. Figure 1 shows the traditional model within utilities, whereby information on the as-operated condition is merely used to supplement existing business

processes. However, this process needs to be reversed for organisations to be truly powered by data. As illustrated in Figure 2, to achieve a holistic view of the as-operated condition, utility organisations should reverse their processes so that business objectives, as well as inputs and outputs, are tailored to contribute towards it. This allows data-driven enterprises to focus on optimising the value of data through the process.

Why an as-operated paradigm enables smart grid investments

While the value in pursing this model is clear to see, the hierarchical structure of large utility operations makes it difficult to adjust existing as-operated and as-designed data, processes and technology models (the data ecosystem). This means the environmental and system changes that constantly occur within networks are often missed. For smart grids however, the benefits of integrating the data are two-fold.

Firstly, moving toward smart, two-way interoperability provides a much stronger basis from which to draw operational, financial or customer service insights. When as-operated and as-built models work in harmony, the data can be more effectively applied, utilised, and accelerated within core utility systems. In turn, this enables utilities to expand the breadth and depth of operational information they are supplied with, and in doing so permits them to continue to advance towards operating a "smarter grid". The process isn't necessarily straightforward though: it needs utilities' data systems to accurately model the state of the physical network, and may require significant investment and effort, as well as the implementation of change management techniques. Undoubtedly, this is all worth it – doing so will allow them to alter their technical and organisational models and move away from their legacy, as-built purposes to serve a new purpose.

In addition, when focusing processes, systems and applications on data, organisations can take advantage of the information produced by smart grid systems. That's because this data, when supported by performance-based insights, helps identify trends and patterns and turn that insight into action.

Be smart to get smart

Big data has been commonplace for many years, to the extent that many industry players are well underway with plans to derive performance insights and optimisation within their networks, particularly in relation to smart grids. However, traditional hierarchical structures and isolated data or system investments aren't sufficient to unlock true value. Yes, it's vital that data is always available – but it is the alignment of process, systems and organisational – harnessing the data ecosystem that is of utmost importance. In order to derive both technical and operational performance insights, enriched, relevant data must be mined, visualised and deployed in a manner that defines a utility operator as a "smart grid operator". This means the network can be viewed not only as it was built, but also as it is as-operated. Utilities that do this will then be able to truly define themselves as data-driven.

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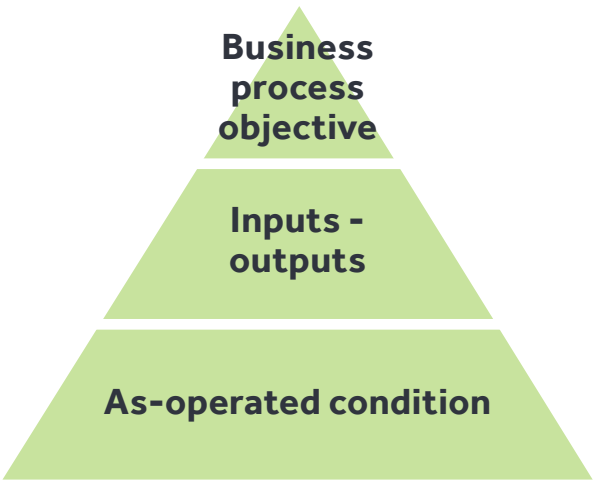

Figure 1

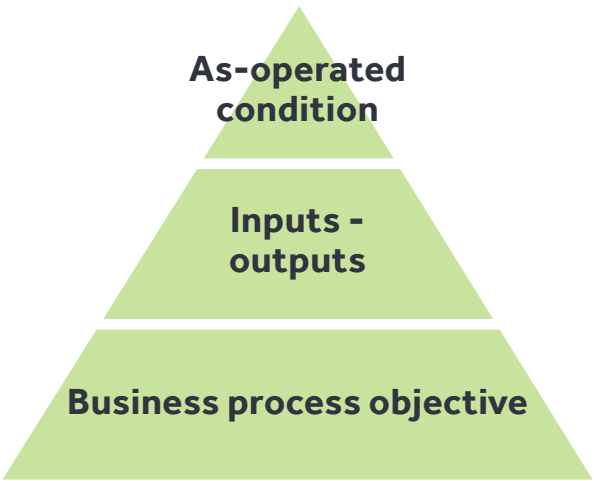

Figure 2

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, networks, and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with domain knowledge and technical expertise, to solve complex business problems. As a Design, Build, and Maintain partner, we take solution ownership across the value chain to help our clients focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. With more than 15,000 employees in 22 countries, we partner with clients to operate as part of their extended team, in ways that best suit their organization's culture and requirements. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

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