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DATA ANALYTICS

SPECIAL REPORT

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WHAT'S YOUR EXCUSE?

Cost, resource, perceived value. The three most common reasons utilities use to delay or avoid the process of managing data and applying analytics across the grid. Thankfully, we are starting to hear less of the third reason, as utilities across the globe come to recognise the advantages that can be achieved through a better understanding of available data. An industry survey¹ found that 75% of utilities see big data analytics as crucial for future success. Yet, despite this progress, the same survey found that only 20% of utilities have already implemented big data analytics. With the promise of Internet of Things (IoT) and IoT platforms so near, executives cannot afford to get left behind. So, what can be done to help ensure utilities benefit from the value of their data today and are ready for the next, even bigger data wave?

Big data with little data

The most important thing for utilities to keep in mind when it comes to achieving value from data analytics is that they already have most – if not all – the data they need to improve decision making. Indeed, while the utilities industry globally may face many strains, this is one area where wealth prevails and the potential exists to create the next generation of operational efficiency. Nevertheless, utilities should not lose themselves in their big data. What's important is starting small and scaling, constantly reviewing results for patterns and correlations, with a view to narrowing in on what's of interest. It is no longer about data processing, but rather about understanding data.

For example, when it comes to advanced asset planning, it is the art of combining and interpreting data sets that leads to understanding precisely where the highest level of vulnerability exists on the grid. In our experience, this understanding requires highly skilled practitioners from analytics and data science domains to collaborate with field experts. Only then can utilities start to generate, understand and interpret the data sitting behind their resulting actions.

Some utilities confine themselves to a no-go stalemate, because they lack the data science expertise. The good news, when it comes to resource, is that utilities don't need to scale unnecessarily. There is plenty of external support available to bring to bear a mix of platform infrastructure and human skill. Nevertheless, what is essential is not so much procuring the

necessary talent, but ensuring that data scientists, IT experts and engineers from the field, work together to identify the insights the grid data has to offer. That means federating those experts, from different domains and with diverse perspectives, to speak the same language. At OMNETRIC, we have exactly that mix, but it can take time to nurture that mind set.

Value loop

Once utilities have collected and analysed the data about their grid, the essential next step is to use the insights generated to put effective, valuable action plans in place. This is where many companies focused on IT-only fail, thinking the work is finished with the data analytics result. In our experience, this is only the beginning. The power of a smart grid can be seen precisely when sensors and devices in the field provide information and when the resulting insights are brought into the control room and integrated into stable processes leveraged on a daily basis. Even smarter is when certain decisions can be automatically made at the edge of the grid, enabling the control room to focus on the more mission critical actions that require human intervention.

Using outage intelligence as an example, we can see how, once grid vulnerabilities are identified, real preventative action can be taken in the right areas and at the right time. By combining grid data with publically available weather data, land cover data, and many more datasets, utilities can be more proactive in managing and minimising vulnerabilities across the grid and can also bring forward necessary grid investment. In doing so they more than justify the cost and resource involved in the data analysis.

Some utilities are already re-using insights they gained from outage intelligence to not only provide year-ahead predictions, but valuable week-ahead and day-ahead forecasts. How does that work? Quite simply: imagine a utility knows that poles in particular sections of its grid are made from a certain wood type, that the vegetation environment is of a certain kind and that those sections are therefore sensitive to certain storm conditions at a calculated probability. For a year-ahead focus (i.e. maintenance planning) the utility would feed its statistical algorithms with average data. But, if the utility also knows that there was a certain amount of rain fall just last week, that a

snow layer of a known height already lies on trees in a relevant area and that weather forecasts show a severe storm coming, then it can feed the statistical models with actual (instead of average) data and can immediately prioritise and allocate the efforts of its maintenance crew to prevent (or at least repair) any breaks or potential outages in the short to medium term.

Going one step further, these same data integration approaches and analytics techniques can also be used to ultimately enable better investment planning decisions. Once the highest probability of occurrence is isolated and its potential impact assessed, decisions are better informed, particularly where critical preventative resource needs investment. Utilities can determine where and which changes to the grid would result in the optimal outcome.

Cost and the cloud

Another step to finding value in data analytics is the use of cloud-based technology. While the uptake of cloud technology has been cautiously slow across utilities, early adopters are seeing the benefits of greater IT agility. Simply put, cloud-based platforms enable analytics users to play around with their data, interrogating data sets quickly – often automatically – for faster results. As the total volume of grid-generated data increases exponentially, utilities are better able to identify where they should be focused: oil quality in measurement transformers for example, or site locations for new renewables assets, or rollout plans for smart-meter installations.

At OMNETRIC we are already leveraging the cloud to help utilities discover and take advantage of data intelligence to capitalise on significant industry change and realise new business models. To this end, we have created our first IoT application for greater reliability and efficiency in the grid. The OMNETRIC Planning and Outage Intelligence Application, built on Siemens' open, cloud-based MindSphere platform, has enabled us to develop different outage prediction models with more than 80% accuracy.

Our objective is that the OMNETRIC Planning and Outage Intelligence Application will make it easier for utilities to accurately decide when to maintain individual grid assets, improve operations and anticipate workforce requirements. That enables better investment planning decisions. As well as increased accuracy, every implementation of the app will make it more cost effective to use, requiring less and less resource to manage and interpret core process data flows.

Many executives tell justified war stories about their initial experiences with analytics, which were often costly and limited in positive business outcome. However, given the evolving nature of the global energy system, utilities have a greater need than ever before to understand what is happening at any point on the grid, at any given time. It is no longer acceptable to hide behind the arguments of limited budget, resource and ROI.

CASE STUDY

KELAG Group is a leading energy service provider in Austria. Its unbundled DSO daughter company KNG serves around 400,000 customers and a grid network covering over 7,000 transformers, 18,000km of power lines and 65,000 poles. As part of its corporate commitment to developing a 'responsible connection to energy' KELAG partnered with OMNETRIC on a publically funded analytics project aimed at improving its outage intelligence.

As part of this project, OMNETRIC's team of data experts and KNG's grid planning unit assessed outages and disturbances across its grid over many years that were the result of atmospheric influences such as storms, floods and frosts. The team used more than 20 different data sources to provide insight on asset performance, outage risk and the efficiency of maintenance plans. Using the data intelligence, KNG is today able to develop different outage prediction models with 90% accuracy.

The success of its prediction modeling for this project, in turn enabled OMNETRIC to build its OMNETRIC Planning and Outage Intelligence Application for the Mindsphere platform. The app's use of modeling will enable other utilities to more accurately decide when to maintain individual grid assets, improve operations and workforce requirements and ultimately allow for better investment planning decisions.

Data analytics is proving essential in helping utilities like KELAG improve their outage preparation and management and, ultimately, business performance. A reliance on data analytics is transforming utilities into smarter and more agile companies, able to respond to real-time insight more efficiently. In the long run, this reliance will raise the standard of outage management operations across the board. **MI**



ABOUT THE AUTHOR

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ABOUT OMNETRIC

OMNETRIC is dedicated to helping energy providers reap the benefits of the digital energy system by integrating

their energy operations with IT to support their business goals. Helping customers since 2014, we are an inventive, technology services company. For more, visit www.omnetric.com. OMNETRIC is a Siemens company.

¹ 'Big Data BlackOut: Are Utilities Powering Up Their Data Analytics?', Capgemini, 2015, https://www.capgemini-consulting.com/resource-file-access/resource/pdf/bigdata_blackout.pdf