Location is key to tapping into the utility data goldmine

Words: Jay Cadman, SVP, Enterprise at IQGeo

Currently there is an abundance of data. A recent report from GlobalData highlighted how the ever-increasing deployment of smart devices and technologies within smart energy grids is creating an exponentially growing pool of utility big data. In fact, utilities are increasingly implementing technologies such as cloud computing, machine learning, Internet of Things (IoT), robotics, blockchain, and cybersecurity, with power grids now incorporating smart capabilities such as built-in processing, connectivity, and sensors as standard.

This is being driven by the move to intermittent renewable power which requires energy operators to monitor and manage demand as well as supply to balance the grid. The growing use of smart charging and metering across electric vehicles and 'smart' household appliances will see utilities using sensors and machine learning to predict and control live energy use from household to highway, generating a further valuable pool of consumer Big Data.

Indeed, according to a separate report from the International Energy Agency (IEA), approximately 20 per cent of total global energy consumption is currently electric, with that figure projected to rise to 50 per cent by 2050. In order to cope with this huge increase in demand without overloading the grid, it is no surprise that the industry is ramping up investment in technologies for everything from predictive maintenance to data-driven flexible pricing.

In the coming years, renewable smart grids will be collecting valuable data on everything from local weather trends and consumer usage patterns to cybersecurity threat patterns. This could transform utilities into big data powerhouses and significantly increase their market value in a data economy. Without overstating the point, data could become their most valuable commodity.

Cross-departmental silos are resulting in lost potential

The challenge for utility and energy companies, however, will be capitalising on the tools and data available in order to make them usable, actionable and ultimately profitable. As well as significantly streamlining business processes and workflows and simplifying operational and field teams' day-to-day work, these developments represent a commercial goldmine.

Today, there still exists a significant challenge in commercialising these huge volumes of data. Unlike digitally native technology companies, utilities were never originally set up to capture and commercialise data, often leaving their organisational culture, business models and processes poorly equipped to handle the influx. Silos between departments and workflows from maintenance to engineering, customer service, and construction as well as incompatible smart tools and technologies mean that information is not being integrated effectively. Some network data is still held in non-interactive 2D form, which cannot easily be populated with new updates from as-builts or repairs to sensor and smartphone data from the field. These companies have isolated, hierarchical data systems such as grid maps accessible only to specialist cartographers rather than open, democratic, user-friendly data systems accessible to employees from call-centre staff to field workers.

Crucially, they do not fully harness the power of geospatial location to link data to its real-world context and make it actionable. Location is the most valuable dataset because it is the one on which all the other datasets depend. For example, knowing the location of customer complaint hotspots could illuminate a link between local vegetation encroachment and power cuts in that area.

ESG demands are adding to commercial pressures

Justifiably, utilities are now also under growing pressure to reduce the environmental and social impact of energy. Environmental and Social Governance (ESG) requirements demand companies build socially and environmentally responsible practices into everything from engineering to maintenance.

There is also commercial pressure; in the US, Environmental Protection Agency regulations are reducing the valuation of power companies by increasing the operational cost and risk of power generation. Consumers are increasingly eco-conscious and utility operators can suffer severe reputational damage from high-profile environmental or social disruption.

The key to successful Environmental and Social Governance is for utility operators and energy companies to adopt open, decentralised geospatial grid data that can be

easily integrated with ecological, environmental, or social data. Multi-layered digital twins of energy networks could enable operators to map and model the impact of upgrades, repairs, or new networks on everything from walking and cycling routes for nearby people to migrating birds or traffic. This would ensure holistic network planning and maintenance not only to protect power supplies, but also to encourage commercial and reputational success in the process.

'Most networks lack a single integrated overview of their assets'

Cross-sector data sharing is also vital to helping drive smarter holistic infrastructure planning. For example, we are partnering with system integrators to harness cross-sector data on infrastructure such as utility poles and housing developments to inform holistic utility grid planning that complements rather than clashes with existing services. We're also working with IBM to integrate satellite data on vegetation cover with geospatial systems of energy grids. Consolidated cross-sector datasets on the proximity of planned infrastructure to nearby environmental features such as forests can also help utilities achieve ESG commitments.

Simply put, most networks lack a single integrated overview of their assets. Many networks have not integrated their many datasets and sources with geospatial data, which is the crucial connection between all data and the real world. As Tobler's first law of geography states 'everything is related to everything else, but near things are more related than distant things.'

Geospatial data is the most important form of all because it is the one that connects all other forms of data together and makes them actionable, helping to illuminate the crucial causal link between events and location. Overlaying customer complaint hotspots onto geospatial weather data could illuminate the link between climate trends and interference with local power supply. The location of cyber security attacks on power grids could be merged with geospatial data on local customer infrastructure to reveal why the hackers are targeting power grids in specific areas. Location data could also reveal commercially valuable data on demand patterns that could serve both ESG and revenue objectives.

Open geospatial data is the answer

This requires utilities to use decentralised geospatial information systems capable of extracting data from any source in the field and integrating it with other datasets. Companies need to map changes to their network in real-time and in a form that is easily accessible to other departments and workflows, from maintenance to engineering. Data should be more open, democratic and non-hierarchical so that it draws on a rich array of sources.

The most pioneering companies are using geospatial systems capable of absorbing knowledge from the 'edges' of their organisation and network, and make this information available to all departments, employees, and even customers. This means faster and more efficient customer service and more adaptive, resilient smart grids. Lessons learned in one operational area can also be quickly captured and cross-pollinated across the organisation. For example, data on how a cold spell affected gas pipes in one region could be absorbed to upgrade the entire grid with heated pipes and better insulation to prevent a future freeze affecting the whole network. It means everything from customer call-outs to equipment defects can be instantly overlaid onto network geospatial data to identify the site and source of problems.

Open APIs would allow this data to be exported for other uses from machine learning to cyber security, ensuring richer and more open geospatial data. A geospatial view would also enable companies to derive new insights from Big Data, spot commercial opportunities and risks and realise the commercial and ESG value of their data. In other words, geospatial information is the missing link between utility big data and commercial value, representing a crucial asset capable of markedly increasing the valuation of utility firms.

www.iqgeo.com/

Bio

Jay Cadman, SVP, Enterprise at IQGeo, has over 25 years' experience in successfully building B2B technology sales and marketing organizations. He has worked in large multi-nationals, as well as start-ups in North America, Europe and Asia including GE, Smallworld and Ubisense.

Jay has successfully led entry and expansion in telecommunications, utilities, manufacturing, aerospace and military markets internationally and specializes in building high performance highly motivated teams.