TRC | digital

IT/OT Solutions for Utilities

End-to-end IT/OT consulting and integration

IT AND OT CONVERGENCE

Traditionally, in most utilities, Information Technology (IT) and Operational Technology (OT) operated in different domains. IT was primarily focused on desktop support, billing, customer information, HR, financial management and communications. IT software systems primarily stored and processed information to enable better decision-making. OT software solutions differ in that they control devices and can effect a physical change in a device in a remote location. The OT domain includes software systems used in a utility's control center to monitor and communicate (to the grid operator) the status of the electric grid. These systems operate in real-time, 24x7 and require a significantly higher level of support to maintain safety and reliability.

As utility technology advances, and as the amount of data accumulation increases exponentially for utilities, IT and OT are converging. The broader fields of advanced analytics and artificial intelligence provide opportunities for utilities to leverage the data collected by operational technology solutions to make better decisions, to predict failures and outages and to increase operational efficiency. This convergence will ultimately result in a more integrated utility technology ecosystem.

Four trends have upended the utility industry over the past decade, requiring modernization of IT and OT systems.

1. Distributed energy resources (DERs)

The grid is moving from a unidirectional, centralized infrastructure to a highly distributed system with resources at "the edge" of the grid that are less controllable, less predictable and less reliable. These resources have become increasingly cost competitive and are often promoted by state regulators through renewable mandates or goals. These residential energy resources, along with utility-scale solar facilities, wind power, microgrids and other renewable energy resources are stressing the electric delivery network in ways that were not anticipated when it was initially designed 40-50 years ago.

2. Changing customer expectations/prosumers

Utility clients are now self-enabling around energy decisions, from electric vehicles to roof top solar to battery storage. Consumers' expectations are now driven by their interactions with well-known technology companies such as Amazon, Uber and Apple, where the customer experience is typically seamless. Customers expect those same seamless interactions with their electric service provider across multiple channels. This evolution of passive consumer to "prosumer" (energy producer + consumer) has increased demands on the utility, both operationally and in terms of customer service.

3. Aging utility workforce

The aging electric utility workforce is expected to be a significant driver for utility modernization. Published in 2016, the US Department of Energy's Quadrennial Energy Review indicated that more than 25 percent of the utility workforce would be eligible to retire in the next five years (and we are now approaching the end of that five-year period). Utilities are having trouble attracting and competing for traditional electrical and power systems engineers to replace their aging workforce. The decades of accumulated institutional knowledge of the electric grid attained by operations personnel, is walking out the door as the workforce retires. As utilities modernize and digitalize, there will still be requirements for traditional power engineers, system operators and field crews, but the introduction of advanced technologies could actually help the attrition situation, reducing the need for certain types of skillsets while introducing increased efficiencies and new roles that will attract 21st century capabilities.

4. Increased adoption of energy efficiency products and services

New homes and businesses are incorporating better insulation, LED light fixtures, home energy management solutions like smart thermostats and other technologies that reduce overall demand. Utilities can no longer count on population growth or economic growth to create new demand for energy and thus justify new capital expenditures to meet that new demand.

TRC Digital helps tackle these challenges, combining best-of-breed technology partnerships with deep subject matter expertise and consulting to evolve the future-ready electric utility. We focus in four general areas:

Advanced Metering Infrastructure (AMI)

The combination of smart meters, communications protocols and data management systems that make up AMI is a clear example of IT/OT convergence. Initially, smart meter data was leveraged only by the utility's financial function to calculate monthly energy usage and issue bills to customers. Progressive utilities are realizing the ultimate vision of smart meters by fully leveraging their data (and combining it with data from other systems) to implement advanced use cases such as: remote connect and disconnect; theft and tamper detection; outage isolation; and voltage monitoring. The TRC Digital Solutions team has experts that understand the full AMI continuum and how to best leverage and integrate AMI data to increase operational efficiency and improve decision making.

Distributed Energy Resources (DER)/Grid Modernization

The proliferation of distributed energy resources has revealed the need for more sophisticated planning and interconnection efforts. Additionally, there is a clear need for a centralized, secure and functional solution for managing DERs and exploiting the data collected from those devices. TRC has deep expertise in DER planning and resource management processes and we have established partnerships with the leading software vendors in the DER management system space. Whether it is as simple as implementing a demand response program or as advanced as developing peer-to-peer transactive energy solution, the TRC Digital Solutions team has the knowledge required to help the utility make the right decisions.

Advanced Analytics and Artificial Intelligence

Utilities are collecting an exponential amount of data from their operational systems and other enterprise systems. Extracting business value requires easy access to quality data, combining disparate datasets, analyzing that data and processing it into actionable intelligence. TRC Digital Solutions leverages our deep utility operations expertise combined with technology partner analytic platforms to help drive insights in areas like asset performance management, asset maintenance, customer usage and profiling, and network planning.

Grid Measurement and Operational Awareness

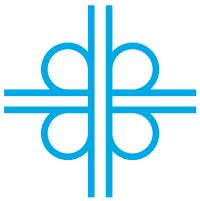
Control room operators are inundated with data, alarms and notifications from the myriad software systems used to monitor and control the grid. This will continue to intensify with the proliferation of DERs and the number of measurement and control devices being added to the system. The TRC Digital Solutions team has partnered with technology firms that are developing innovative ways to process and present this data to operators in ways that will allow utilities to be more responsive and efficient.

About TRC

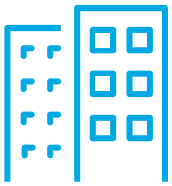
Groundbreaker. Game changer. Innovator. TRC is a global firm providing environmentally focused and digitally powered solutions that address local needs. For more than 50 years, we have set the bar for clients who require consulting, construction, engineering and management services, combining science with the latest technology to devise solutions that stand the test of time.

TRC's nearly 6,000 professionals serve a broad range of public and private clients, guiding complex projects from conception to completion to help solve the toughest challenges. We break through barriers for our clients and help them follow through for sustainable results.

Power & Utilities



Transportation



Real Estate

Government

Water

Environment & Sustainability

Digital Solutions