



Digitized Networks

An essential solution for aging infrastructure

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While utilities have taken great strides to make today's electric grid smarter, the realities of a deteriorating infrastructure are impeding that goal. What will differentiate utilities is how each addresses and alleviates aging infrastructure related problems in the coming years — starting now.

Next step: failure

Aging infrastructure generally means failing infrastructure — and that is costly in terms of finances, operations, and reputation. GTM Research estimates more than \$25 million is spent on primary equipment damage, collateral damage, unserved electricity, and environmental clean-up costs.

Lack of accurate data and institutional asset knowledge are the biggest hurdles to efficiently working with and maintaining aging infrastructure. For instance, retiring workforce is taking with it decades of known, historical knowledge. Remaining employees may not have a full understanding of the history of the network's assets, when repairs were last made, which assets have been neglected, and other historical details that are critical to efficiently managing infrastructure. Furthermore, the information that is shared among teams is often paper-based, such as maps. This method is notoriously inefficient, as well as prone to errors and outdated information.

To alleviate the problems of aging infrastructure utilities need an efficient, long-term solution.

First step: digitize

An accurate, digital record of assets is the single most important solution that every utility should implement to improve its operations now, and to better position itself for the future. For example, a digitized network can be modeled, designed, maintained, and managed through the use of a map-centric, intuitive geographic information system (GIS). This eliminates the burden of being buried in maps or design drawings that have redundant or inaccurate data.

Digitized networks and assets will be the backbone of the forward-looking utility, helping it to combat both an aging infrastructure and workforce.



The benefits of digitization

If knowledge is power, then a digital record is a utility's biggest asset and essential to its integrity. It provides field crews the ability to communicate with engineers, designers, and other stakeholders; and all parties with an understanding of how its systems are running.

A digital record is a single, integrated version of the truth. And with it, the entire utility is better informed, better organized, and better understands the implication of its business decisions on the broader network.

Broader visibility

An accurate digital record is the single most important solution to ensuring a strong future for an industry buried in sometimes-redundant, frequently inaccurate maps and design drawings. It provides a comprehensive view of a utility's entire infrastructure, and allows it to:

- Simplify and reduce the cost of creating and maintaining complete, accurate records of network assets
- Track assets, as well as analyze the infrastructure for maintenance trends and patterns
- Inform the right resources when assets require inspection or replacement, or where potential failures may arise

Preserve institutional knowledge

Knowledge no longer walks out the door when an employee retires: it is constantly updated, compared, and shared across the entire enterprise. This means:

- An employee can access any data, as deemed appropriate, including current and historical information
- New hires gain immediate insight into a utility's infrastructure
- Historical data is based on fact — not someone's memory — and can be confidently acted upon when making operational decisions

Aging U.S. infrastructure

Simply put, too many vital components are too old.

Substation transformers

Expected life	40 years
Average age	42 years

Transmission lines

Six in 10 are over 25 years old

Circuit breakers

Six in 10 are over 30 years old

Sources:

Galvin Electricity Institute, U.S. Department of Energy

Lower costs

By ensuring a consistent, accurate network representation, which can be shared across teams, a digitized record helps utilities lower costs.

This is accomplished through:

- Reduced errors and operational costs using advanced error prediction capabilities
- Streamlined and prioritized work efforts to ensure that the most urgent, relevant repairs and needs are addressed first

Disaster recovery and outage management

A digitized network, such as a GIS system, can help a utility respond more quickly and efficiently during a disaster or outage management scenario. A clean understanding of the status of assets will help get the power back to customers faster, and allows:

- Front office and field crews to confidently utilize the same information for better-informed decisions
- Crews to be dispatched more quickly and efficiently to make repairs
- Monitoring, identifying, and repairing weak assets for a more resilient network — before an outage strikes vs. waiting for infrastructure to fail

Improve customer service

The benefits that a utility receives from a reliable, digitized network can directly translate into benefits for its customers:

- Faster and more accurate response times to outages
- A better understanding of ongoing maintenance needs strengthens the entire network and increases power reliability

Knowledge is power

In everyday operations, a digitized network can keep workers better informed, better organized, and better prepared to make good business decisions. When an outage strikes, the same solution can help identify and prioritize needs in order to get the power back on more quickly. With a digitized network, a utility can smartly address problems now, while solidly and reliably positioning itself for the future.



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