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FINDING THE BEST ROUTE

To deploy smart grid and information technologies in the most cost-effective manner, electric co-ops should first map out where they want to go

ILLUSTRATION BY: MARK SHAVER



By **Bill Koch**

After his team's surprising defeat to the Pittsburgh Pirates in the 1960 World Series, Yogi Berra, the malaprop-prone New York Yankees great, remarked: "We made too many wrong mistakes." For electric co-ops considering system automation upgrades, strategic technology planning—often called technology road mapping—offers a way to minimize "wrong mistakes."

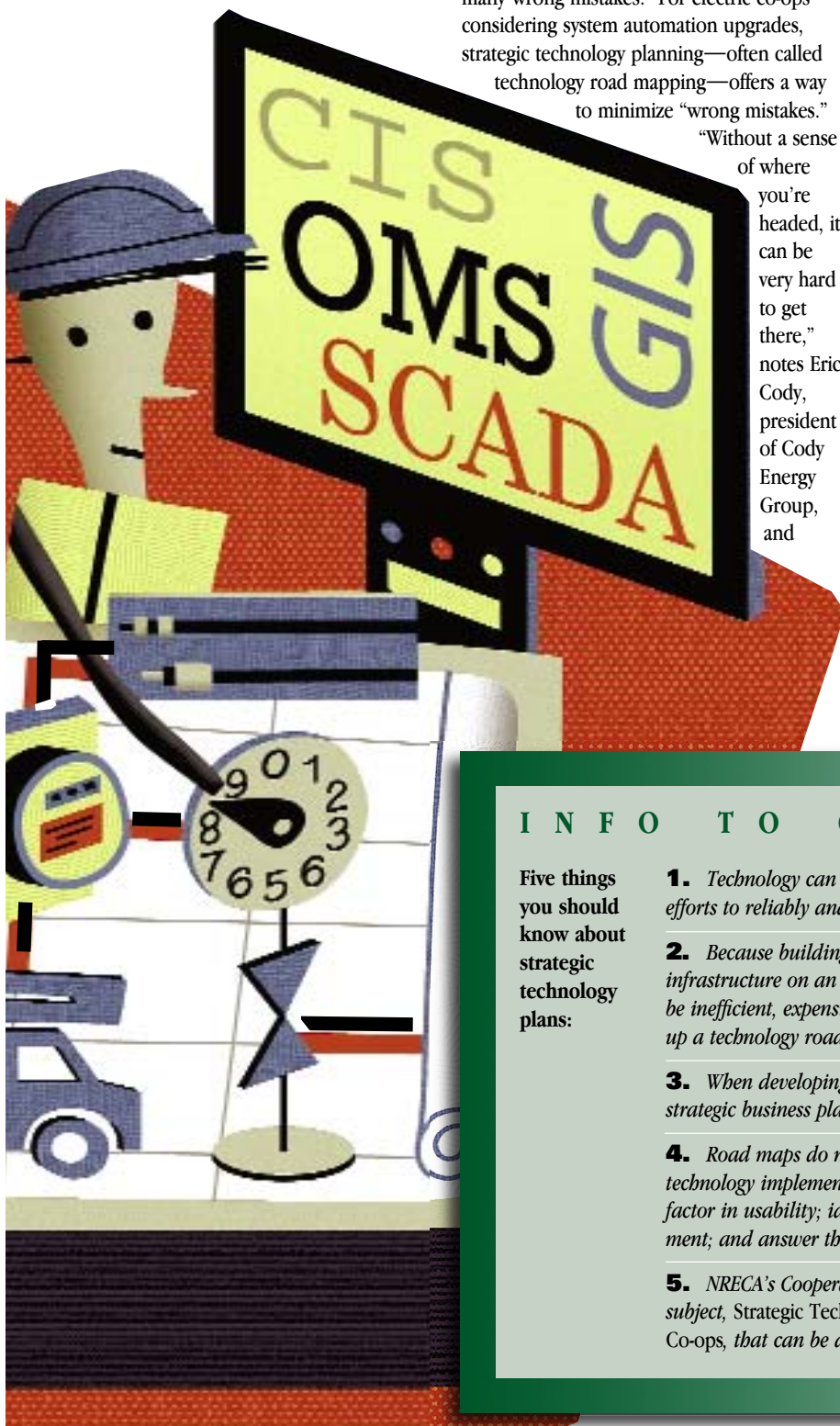
"Without a sense of where you're headed, it can be very hard to get there," notes Eric Cody, president of Cody Energy Group, and

author of the NRECA Cooperative Research Network manual *Strategic Technology Planning: A Navigational Aid for Electric Co-ops*. "A strategic technology plan shines a light on what investments can best meet a co-op's business goals and provides a decision-making framework that can be refined over time. It helps eliminate the budgetary free-for-all that sometimes arises when different co-op departments request funding, and it ensures employee buy-in for any changes."

Cody argues that a technology road map will quickly build better working relationships between co-op staff who typically have specific, but limited, operational interaction with each other. "A mix of section heads and experienced front-line personnel can devise plans that satisfy both administrators and those who handle day-to-day tasks."

He continues: "Of course, having the right governance team in place to see a technology project through to completion remains critical. Electric cooperatives have myriad options for spending their dollars—the explosion of technology options increases odds that money can be wasted if folks aren't careful."

As a result, electric co-op technology planning teams must extend beyond a cadre of key engineers. "Ensuring that investments are accepted, deliver maximum value to all staff who can potentially benefit, and remain



I N F O T O G O

Five things you should know about strategic technology plans:

1. Technology can become a great equalizer for electric co-ops in their efforts to reliably and affordably meet consumers' power requirements.
2. Because building any type of smart grid or information-centered infrastructure on an ad hoc basis or in response to pressing concerns can be inefficient, expensive, and frustrating, electric co-ops should first draw up a technology road map.
3. When developing technology road maps, orient them with your strategic business plan as well as any mission or vision statements.
4. Road maps do not need to be lengthy documents but should outline technology implementation schedules; promote data migration over time; factor in usability; identify risks, contingencies, and return on investment; and answer the question, "Why this and why now?"
5. NRECA's Cooperative Research Network offers a great manual on the subject, *Strategic Technology Planning: A Navigational Aid for Electric Co-ops*, that can be downloaded from Cooperative.com.

consistent with a co-op's overall long-term business plan requires a diverse employee group representing the whole enterprise—everyone from accounting and billing, key accounts, member services, distribution operations, and power supply planning, to communications,” emphasizes Jay Morrison, NRECA vice president of regulatory issues. “Otherwise, you risk leaving money on the table.”

Robert Sarfi, a partner with the Boreas Group LLC (boreasgroup.us), believes fashioning a technology road map shouldn't be intimidating—or pricey. “A very credible road map can be built within the space of two weeks. I tell my clients to aspire to something much larger than they are and be progressive. It's not fair to your members to cultivate a culture that promotes complacency.”

In many cases, drafting a technology road map has become a must-do part of a co-op's work planning process, stresses Bob Saint, NRECA principal distribution engineer. “Utility regulators in some states are beginning to mandate it. For example, certain smart grid aspects—like volt/VAR [voltage-ampere reactive] management or integrating distributed generation resources—can defer the need for additional line construction.”

He adds: “These blueprints should also address compliance issues such as the Federal Trade Commission's Red Flags rule aimed at stemming the tide of identity theft. With the world we live in today, a technology road map remains as necessary as a construction work plan or emergency response preparations.”

In crafting a three-year technology road map with assistance from Power System Engineering (powersystem.org), Paulding-Putnam Electric Cooperative, a 13,000-member system based in Paulding, Ohio, drew from its mission statement covering the following points:

- Technology will play an increasingly important role in servicing our members
- Future technology will have an increased cost per user (employee) and per member served—these cost drivers will influence management decisions
- Without a clear path, dollars will potentially be spent in areas that do not produce desired results

“As a smaller co-op, time, money, and

staff are at a premium,” stresses Paulding-Putnam Electric General Manager/CEO George Carter. “Everything must be allocated as efficiently as possible.”

The co-op faced big shifts a few years ago after choosing to move away from self-read/self-bill metering. As outlined in its technology road map, the first step involved installing a powerline carrier-based advanced metering infrastructure (AMI) system from Cooper Power Systems (cooperindustries.com). The AMI was then integrated with the co-op's iVUE platform from Lake Saint Louis, Mo.-based National Information Solutions Cooperative (NISC; nisc.coop). iVue streamlines accounting and business, engineering and operations, and customer information system functions.

“Employee engagement was a key to success,” Carter comments. “There were some rocks in the road and a bit of skepticism. But we've experienced improved efficiency each year, particularly in billing speed and accuracy. Of course, we could never have embarked on a large undertaking like this without first utilizing a thorough planning process.”

In Nebraska, Cuming County Public Power District in West Point and Stanton County Public Power in Stanton took advantage of evolving circumstances to accelerate their original technology timelines. Serving about 6,000 members total, the two paired up in 2009 to form the Eastern Nebraska Public Power District Consortium to seek a smart grid investment grant from the U.S. Department of Energy (DOE). Prior to the initiative, the Boreas Group assisted both public power districts in creating technology road maps, which wrap in communication and Supervisory Control and Data Acquisition (SCADA) systems.

Tisha Alfson, Cuming County PPD technology services supervisor, calls the \$3.75 million DOE smart grid grant “a soft start” in transitioning from a “poles and wires utility” to a “poles, wires, and technology utility.” By employing ABB Gridshield Reclosers (abb.com) with IEC 61850 protocol, all substation and some down-line mechanical circuit reclosers are being replaced. In addition, substation and distribution regulator controls have been replaced with new Cooper CL-6B models. The CL-6B uses a serial DNP 3.0 communications protocol over a TCP/IP Ethernet network and can connect to either copper wire or fiber.

The Eastern Nebraska Public Power District Consortium members also selected ABB's

MicroSCADA Pro as its common SCADA. A RuggedMAX WiMAX communication scheme from RuggedCom (ruggedcom.com), based on the IEEE 802.16e 4G broadband wireless standard, will ensure the ABB SCADA/Distribution Management suite efficiently transmits messages to regulators, capacitors, reclosers, and other components to initiate remote diagnostic or corrective (self-healing) actions.

ABB serves as the consortium's prime contractor, ensuring that milestones of all vendors remain in sync. “The cooperation, consideration, and accountability fostered by this structure have been very beneficial—it's truly a team effort,” indicates Alfson.

Developing a strategic technology plan midstream can serve as a check on present technology performance while analyzing new tools to achieve business objectives. Boone Electric Cooperative, headquartered in Columbia, Mo., recently put together a road map to evaluate its geographic information system from Trimble (trimble.com), a Landis+Gyr (landisgyr.com) Cellnet AMI, and an automatic vehicle location application from Clevest Solutions (clevest.com).

“We're seeing if the technologies are giving us full value, which ones might offer value enhancements, and what's next on the technology horizon,” explains Ryan Euliss, Boone Electric manager of engineering & technical services. “A major consideration going forward is determining how new systems can be integrated with what's in place.”

In addition to answering the vexing question of, “Are we as good as we can be with what we have, and, if not, how do we fix it?” Euliss says, “we're hoping to target the right time to buy and deploy specific technologies. Scoping out and addressing up front any organizational or workload changes that may result from implementation of a specific technology is an important part of the discussion.”

Recently, Boone Electric went live with NISC's iVUE as well as its meter data management system. “In-depth preparation before picking technologies makes acceptance testing more clear cut—we have a better handle on what to expect, which minimizes unwelcome surprises. One of our goals is to apply technology in understandable pieces and do things right the first time out. We don't want to try to accomplish too much at once.” ■