Utility Immersion into Enterprise Architecture Optimizes Business Efficiency

Electric utilities—like most companies—struggle to balance their internal resources to improve overall business efficiency and productivity. Because electric utilities must be responsive to change in their industry, many are open to an approach to business management called *enterprise architecture*.

Enterprise architecture (EA) is a holistic approach to organizing the way that a business operates—including internal operations and operations with other entities, such as customers and vendors. Each EA approach is unique to the organization, although the methods used to develop the company's "architecture" are widely used and applicable to many industries. According to Dr. Gerald Gray, an EPRI technical executive who is himself an enterprise architect, "Enterprise architecture is a body of standards, practices, processes, and metrics to improve and balance quality, cost, and schedule" of an organization. It is the process of aligning business with information technology (IT) and describing the business value to the stake holders; for utilities, that means customers, regulators, and shareholders.

Enterprise architecture is a holistic approach to organizing the way that a business operates—a blueprint of organizing principles that are unique to each electric utility.

In 2013, EPRI expanded its IntelliGrid Program to include enterprise architecture in recognition of the challenges posed to utilities by the rapid pace of change and the need to optimize limited resources of utilities to meet these needs. In 2015, the EA Program will be fully funded by EPRI members and operate outside IntelliGrid. EPRI's EA Program spans transmission, distribution, distributed energy resources, and metering. EPRI enterprise architects assess a utility's business capabilities, identify gaps in the capabilities, and create roadmaps to address these gaps, while looking for redundant systems that increase operational costs.

Much like project management has become recognized as a useful discipline to facilitate achieving consistent results, EA is gaining clout. Similar to the burgeoning of project management, more organizations are employing and training people with EA qualifications. "As a discipline," said Dr. Gray, "enterprise architecture began in the late 1980s." All organizations have an enterprise architecture, just as they have projects. Some architectures are accidental, while others are the results of purposeful alignment of resources across the organization.

Why would a company want to spend money and resources formalizing its business practices? According to Dr. Gray, "Enterprise architecture is fundamentally about mitigating risk and addressing gaps in business capability in the most efficient way." The savings from averting risk and optimizing efficiency are real. For example, eliminating redundancy in the IT landscape holds down costs. Consolidating software on a few platforms (instead of supporting a myriad of vendors) may qualify an organization for discounts from those few vendors that make the cut.

A robust architecture governance also holds down the cost of software integration because an organization is more likely to reuse systems or standard integration adapters rather than install yet another "silo" or customize software integration. EA merges information silos and reduces the overhead of maintaining multiple, disparate software applications.

Of course, establishing a formal EA doesn't occur overnight, but benefits compound over time as business agility matures, enabling an organization to swiftly respond to new and perhaps

Challenge

Generating, transmitting, and distributing electricity is an inherently risky business. Business units are often "siloed," impeding attempts to modernize the grid while remaining competitive.

Solution

Enterprise architecture enables electric utilities to operate nimbly in an ever-changing grid scape, making adjustments to policies, adopting best practices, and initiating projects that will enable a utility to optimize the efficiency of the entire company.

Results and Benefits

An immersion into a utility's business operations—with the goal of aligning them with information technology—demystifies the steps required to adopt enterprise architecture to achieve maximum business efficiency and agility.

unforeseen demands. Improvements in agility, while reducing risk, are difficult to quantify and represent a "soft" savings compared to the hard dollars realized by reducing IT costs and consolidating software.

EA Immersion at Arizona Public Service

Exposing the disparate business components of a company to the process of EA can take several forms. For example, a company can embark upon EA by following the Architecture Development Method of The Open Group Architecture Framework (TOGAF), which is the most popular framework used in the utility industry for EA implementation. Another way to implement EA is through a process called "immersion." An EPRI immersion consists of an examination of a utility's business practices and requires the participation of EA experts and utility stakeholders, including its IT group, suite of architects, and those charged with managing projects and business strategy.

While the EA function is very much a strategic practice, an EA immersion enables a utility to analyze its entire business enterprise and identify gaps, which can be addressed through a roadmap of activities and projects that—when completed—will launch new capabilities and fortify existing ones—tactics that achieve the overall strategy."

"The enterprise architecture immersion underscored the need for APS to reconsider our growing collection of software applications and their lifecycles, the need to educate staff, and the need to accelerate our EA processes and governance. The immersion provided support for our continuing efforts toward those ends."

– Mike Mraz, APS

The journey of Arizona Public Service into the sometimes intimidating wilderness of EA was furthered during a chance meeting between Dr. Gray and APS staff at an EPRI meeting. With aspirations to prepare for inevitable industry challenges, APS had a keen interest in the promise of enterprise architecture. "We had not progressed far in our exercise of enterprise architecture," said Mike Mraz, Solution Architect at APS. "We were interested in a renewal of the concept, especially how it could play a role in IP strategies and existing architectures within APS."

Among the achievements of the immersion was a new focus on business architecture. Previously, APS had very little business representation in the architecture review board. The immersion urged APS to involve the business in architecture decisions and investments. The immersion also enabled APS to create a list of its largest IT systems and their investment roadmaps, and the investments were mapped to prioritized business capabilities. According to Dr. Gray, Michael Covarrubias, Manager of IT Architecture & Standards at APS, "takes this list with him to all his business meetings to frame the conversation."

Each utility's understanding of its own organization is indispensable to the EA process. If you can't describe yourself, "you are going to have a difficult time managing the change in your organization," said Covarrubias. One way to understand the entire organization of an electric utility is to consider its historical context and the opportunities for improvement. Covarrubias emphasized the agility conferred by considering the past, present, and future during formal EA activities. "We are always looking ahead and behind to make sure we are following the plan before we get too far down the path," he said. But diligent consideration of the past does not necessarily limit the destiny of an electric utility. Instead of constraining its business trajectory, EA may reveal options that were previously concealed in the shadows of silos.

Expert recommendations of EPRI EA experts will likely require adjustments to policies, adoption of best practices, and new projects that will enable a utility to optimize the efficiency of the entire company. Obviously, the outcome of an EA immersion depends highly on the company's business model and must be aligned with the company's vision.

Benefits to APS and the Utility Industry

"What APS learned during the immersion is highly extensible to other electric utilities," said Dr. Gray. In many electric utilities, IT governance lacks business representation. EA resolves this oversight. Yet fostering an enterprise architecture that focuses *only* on IT rather than including business and operational systems is a common trap that cripples the intent of EA. When EA evolves from within an IT department, the focus naturally tends to be on applications, data, and infrastructure. However, according to Dr. Gray, "Any practice of enterprise architecture that cannot evolve to include business and operational systems will ultimately whither." EA immersions enable electric utilities to step right along a path designed for their unique business success, especially when "technologies are in place to support and move the company towards its mission and vision," said Covarrubias.

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