

Digital Transformation Research Initiative (DXRI)



Background, Objectives, and New Learnings

The energy industry has begun a journey of digital transformation (DX) to support an energy transformation. This DX transformation is a significant undertaking, with the industry adoption moving at various paces and levels of maturity. Digital technologies with the potential to improve electricity affordability and reliability are being implemented across fleets and all power generation, transmission, and distribution assets/systems, but integration and the transformation of business models are inconsistent, with varied success. DX is the fundamental business and cultural change utilizing a digital strategy that enhances the organization's value delivery and the way customers experience that value.

Digital transformation can be technology centric; however, DX more broadly serves to support the people, the processes used, and the industry's goals of a successful energy transformation. More specifically it has the potential to support near-term plant and fleet goals (e.g., increasing reliability, reducing maintenance cost, improving asset reliability, and lowering forced outage rates), as well as future decarbonization targets. For example, operations may use sensor data for controls and monitoring processes and equipment for safe operation. New data collected from sensors captures dynamics and event data for power generating systems and events. This new data supported by a digital platform enables the use of analytic tools. The results of these tool provide additional insights into current and potential future states of the systems and equipment. These insights can then be used for activities such as data analytics, communications, operation planning, asset management, digital worker, condition-based maintenance, and outage planning.

- Providing digital transformation (DX) implementation strategy and guidance, with a focus on enabling technologies, people, process, and data
- Fostering a holistic approach required for implementation of DX applications
- Facilitating a forum to bring together subject matter experts across disciplines

Effective use of digital technologies, in combination with data-driven decision-making, enables measurable impacts on the existing and evolving workforce. DX and the implementation of digital technologies can provide credible advantages, but specific challenges must be addressed to ensure realized value and business impact. Common roadblocks and challenges to achieving DX include siloed data, the preparation, maintenance, storage, and governance of that data. Rapidly changing technology and the agile culture required for adaptation is particularly challenging for utilities. Successful DX frequently requires the building of new cross cutting teams with new skill sets.

The Digital Transformation Research Initiative's (DXRI) aims to unlock the full potential of DX by driving successful implementation across the power industry. Complementing digitalization-related R&D under way across EPRI, the objective of the DXRI is to execute R&D that will drive DX, focusing on people, processes, technology, and secure, actionable data. The collaborative group will coordinate, perform, and integrate DX research and development (R&D) and will nurture engagement with power generation asset owners on practices, lessons learned, use cases, and guidance regarding DX integration and implementation.

DX work requires an overarching and strategic perspective (e.g., system, plant and/or fleet) for successful implementation. There are a range of technologies (e.g., sensors, diagnostics, data analytics, process control, etc.) expected to be included in a DX project. Successful implementation of the digital technologies/tools is underscored by the data management and infrastructure needed for connectivity, automation, and utilization of

tools and data. How to best leverage these areas for measurable benefits will be among the new learnings under this project.

Benefits

A DX strategy has the potential to provide a critical pathway that is likely to be key as the energy industry continues through this energy transformation.

The DXRI plans to provide timely, actionable, and objective information on DX tools and strategies, specifically related to selection, integration, implementation, and utilization. The group intends to facilitate knowledge-sharing and collaboration to be used as a basis for the development of lessons learned, best practices, and success stories. The combination of these will enable industry benchmarking activities.

Lessons learned and best practices gathered through the group and related research are expected to provide valuable information that are intended to help inform each utility's digital transformation strategy, which could ultimately improve electricity reliability and affordability for customers.

Project Approach and Summary

The DXRI is intended to address a wide range of industry challenges and uncover new opportunities to advance digital transformation through collaborative R&D.

EPRI will facilitate the DXRI by meeting periodically throughout the year via webcasts and annually in person for a face-to-face event. The members will have the opportunity to interface and benchmark with their peers in the industry through facilitated roundtables and a dedicated collaboration space.

The DXRI will provide insights on applicable products and technologies, as well as on how these products and services may be integrated. EPRI's DXRI approach will aim to increase improve DX decision making abilities and implementation consistency (and success) across the energy sector. This group will also bring together subject matter experts spanning different disciplines—which is necessary for the development of a digitally connected and dynamically optimized industry.

The DXRI will also work within EPRI's sectors and research programs to review, refine, and prioritize the DX R&D roadmap. Additionally, the DXRI will meet with members and stakeholders each year to inform R&D priorities and ultimately deliver the benefits of efficient and effective DX to participants and the public.

Deliverables

- DX R&D roadmap and implementation guidance
- R&D gap analysis and industry measures for DX maturity
- Reports on topical areas to potentially include business case analysis, data infrastructure and agile/scrum project management
- Peer to peer exchange
- Meeting materials and proceedings

Price of Project

Pricing for three tiers of generation capacity:

- \$50,000 per year with a 3-year commitment for asset owners/operators with 20 GW or more
- \$30,000 per year with a 3-year commitment for asset owners/operators with 5–20 GW
- \$10,000 per year with 3-year commitment for asset owners/operators with less than 5 GW

Project Status and Schedule

This is a three-year supplemental project. The project is expected to start in first quarter 2024; and estimated duration of the project is 36 months. This project qualifies for Tailored Collaboration (TC) and Self-Directed Funding (SDF).

Who Should Join

Companies interested in considering or undertaking a digital transformation process to help realize and enable an energy transformation.

The recommended perspective for cross-cutting advisors from funding organizations could be the following roles and responsibilities:

- Operations and maintenance managers
- Central/remote monitoring and diagnostics engineers and managers
- Data scientists and analysts
- Cyber security managers
- Information technology (IT) Staff (e.g., data engineers, data architects, etc.)

Contact Information

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