DIGITAL TRANSFORMATION FRAMEWORK

A Summary of EPRI's Utility Strategy and Implementation Guide

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Executive Summary

EPRI defines digital transformation (DX) as a fundamental business and cultural change that employs a digital strategy and is applicable to an organization's value delivery and the way customers experience that value.

This paper outlines a utility-focused DX framework and steps to support successful DX strategy development and implementation that can result in tangible benefits and value. EPRI has developed this framework to address potential hurdles that utilities may be experiencing on the way to a digital enterprise. Companies may find themselves with a patchwork of technologies, hardware, software, processes, and cultures that do not support a cohesive and efficient digital organization. In addition, utilities may see that technology silos are slowing the progress of DX. A comprehensive, executive level DX strategy is one way to begin to address these challenges.

This report presents a sector and asset agnostic strategic framework that can be implemented at the enterprise level. The framework relies on each part of the enterprise being unified by DX vision, theme, and strategy. Such unification within the enterprise under the umbrella of DX – while potentially difficult – can lead to unified and efficient technology application, enterprise level data infrastructure, centralized services (training as well as monitoring and diagnostics), and leadership that can generate the financial benefits sought.

While the framework steps are logically and reasonably constructed, the constituents of each step lend themselves to customization and adjustment based on the needs of the individual enterprise and management teams.

The framework steps begin with executive recognition of the need for an enterprise DX. The framework moves to theme development where broad subjects are generated that will drive the effort at all levels and business units. The next step is the assessment phase, where the state of the organization and its current incorporation of digital assets are cataloged and organized in light of the themes developed in the previous step.

The framework then focuses the enterprise on DX strategy development, where leaders and business units generate initiatives and foundational investments that will serve as the DX springboard. Each idea is assessed in the next step against a rigorous financial plan and model to ensure the initiatives make business sense. The business units and project organizations then generate solution designs and implementation plans conducted in steps six and seven. The framework concludes with step eight, which is focused on sustaining the DX strategy by refreshing and rethinking the original strategy.

The complete and comprehensive DX strategy and implementation guide can be found in EPRI report 3002023752, Digital Transformation: Utility Strategy and Implementation Guide [1].

As an additional resource, EPRI has published a white paper on the Digital Transformation Maturity Model [2]. That white paper's objective is to identify success factors equated with an organization's digital maturity transformation. It also shares tips on creating an action plan to complete additional work with existing success factors. As a note, EPRI has begun developing phase II of the Digital Transformation Maturity Model, which will extend the success factors to describe the model scope more fully.

Framework Introduction

Purpose

The purpose of the framework shown in Figure 1 is to illustrate an outline of activities necessary to accomplish enterprise-wide DX. It is anticipated that the framework presented here will be customized, adapted, and suited to each organization based on size, asset mix, market, organization, internal language, digital strengths, and culture.

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The framework was generated to be agnostic to the type of utility. It was intentionally assembled to apply to companies practicing value creation through new technologies in the electric power industry.

Format

The framework is configured as a series of steps so DX can be communicated methodically, logically, and succinctly to the reader. It is not the intent of this document to be followed as one would follow a procedure.

Depending on where a utility may be in their own DX strategy or implementation, these elements and outcomes may have varying degrees of applicability or value. Customization of framework elements is conceivable and encouraged, but the overall sequence of framework steps should be observed.

Steps

The DX framework involves eight steps. The steps were developed to contain a variety and abundance of elements and outcomes that will aid the enterprise in establishing a DX strategy and implementation effort.

Steps can be navigated in sequence but may at times require step iteration, where the user reverses progression through the framework to revisit a prior step and reformulate elements or outcomes.

Elements

Each step contains a series of elements associated with the step. Elements are ordered within each step by sequence or impact. Elements utilized by the enterprise DX team may not represent the complete list of elements in the framework, which is to be expected.

Generating new elements outside of what is presented in this framework is also expected as requirements and practices of each enterprise cannot be anticipated.

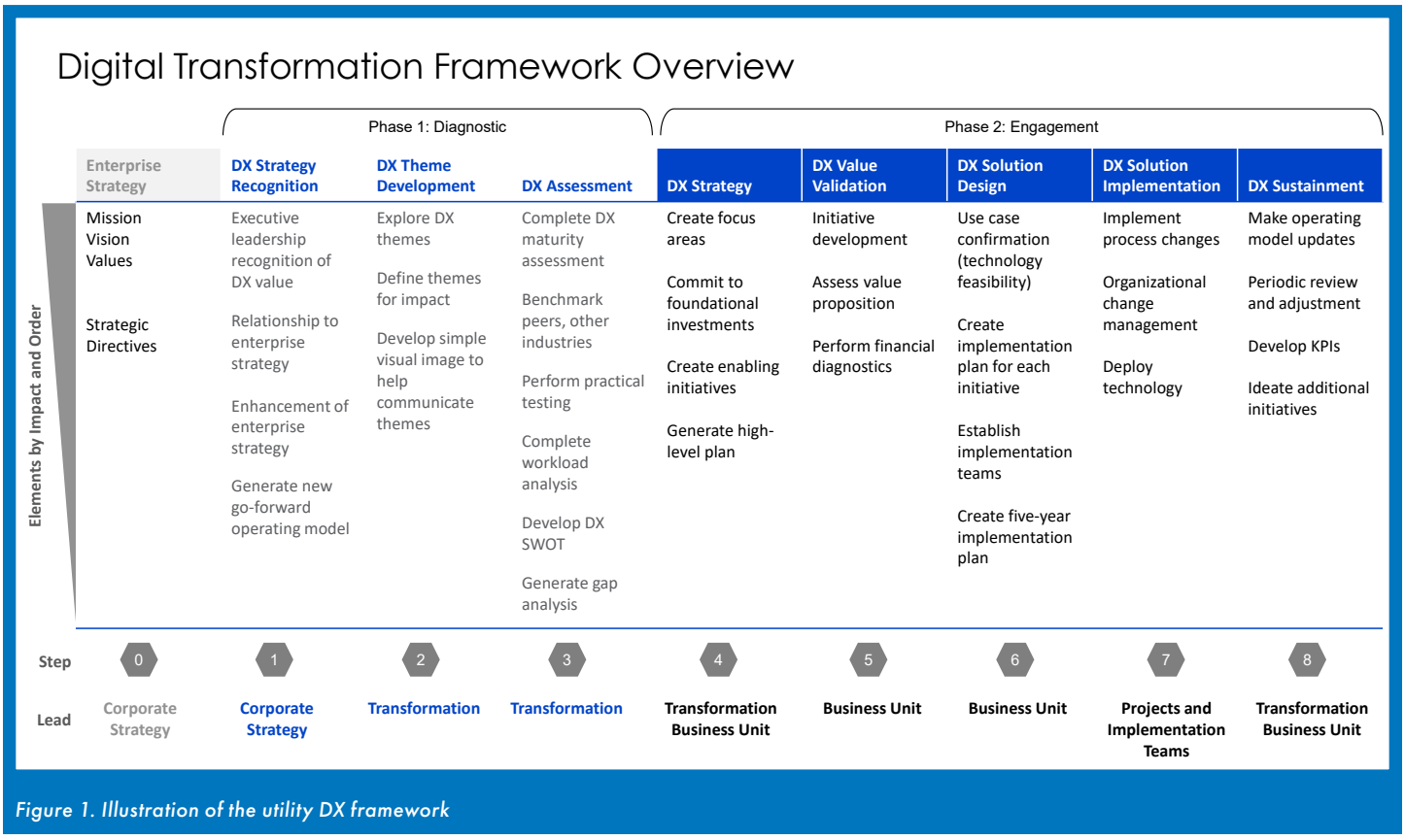

Figure 1. Illustration of the utility DX framework

Outcomes

The DX framework describes outcomes achieved by completing steps within the framework. Outcomes – such as DX themes, foundational initiatives, focus areas, and enabling initiatives – help the user develop concepts and ideas associated with DX.

Each outcome is intended to build upon the previous outcome and develop concepts in greater detail as the utility moves through each step. From themes to use cases, overlap in the conceptual understanding of the outcomes is to be expected.

Definitions

The following key definitions will aid the reader while navigating this report and the DX framework. DX can mean different things to different people. EPRI uses the following definitions to clarify the topics and ideas presented here.

Digital – Readily available information in an electronic format that can be accessed safely and used for business purposes by internal employees, external customers, business partners, and regulators.

Examples:

- Databases
- Server files
- Data historians

Digitization – Converting analog information and processes into digital formats without significant change to the process itself. (Note: Digitizing a poor process does not necessarily make it more efficient.)

Examples:

- Work process software
- Electronic forms
- Internal web pages

Innovation – Value arising from changes to technology and the business model. Innovation is a catalyst driving DX.

Examples:

- Application of technology in new ways
- Efficiency gained through new techniques

Modernization – The method by which an asset or process is enhanced and upgraded with additional capability often to provide improved operational visibility and analytical capability.

Examples:

- Digital vs. analog instrumentation and control (I&C) components
- Drone use for inspections

Digital Transformation (DX) – Fundamental business and cultural change utilizing a digital strategy that enhances the organization's value delivery and the way customers experience that value.

Examples:

- Digital training delivery across the enterprise
- Common enterprise tool for automated planning

Digital Transformation Framework Overview

The framework overview (Figure 1) is an illustration of the DX strategy. The strategy framework is split into two phases. Phase one is the diagnostic phase where the enterprise and its leaders recognize, develop, and assess the business with the intent to execute a DX. Phase two is the engagement phase where the company embarks upon the creation of a new DX strategy and processes the initiatives, use cases, and other efforts that will digitally transform the business.

The top row of the figure lists the steps involved in DX. It is assumed that the enterprise has already obtained or developed an independent business strategy. DX will build upon the enterprise strategy, enhance it, and advance it through to the implementation of technological and cultural change.

Listed under each step are multiple elements that make up the bulk of the work needed to complete the step. These elements are listed in order and by impact to the completion of the step. The list of elements is not exhaustive. Differences in company culture, personnel, previous commitment to modernization or innovation, and other factors will inform the reader as to which elements are appropriate for the enterprise.

Below the step numbers in the illustration is a suggestion of the lead organization or group that will be best suited to lead and execute the majority of the activities in the step. DX is a top-down effort coupled with significant input and guidance from the wider organization. It will require the engagement of members of the executive suite to express the willingness, vision, and themes needed for successful DX.

Digital Transformation Roadmap Overview

An example timeline for the execution of an enterprise-wide DX is presented as a tool to the reader. This timeline will help plan the effort and align expectations for the resources necessary to complete the project. The timeline in Figure 2 was created based upon a medium- size utility's typical business and strategic planning process. The timing of each step and the overall process of DX will differ based on the size of the utility, scope of the transformation, and speed or priority of the effort.

While the timing of the steps and phases in Figure 2 may change based on DX size and scope, the sequence is expected to remain true to what is presented. Iteration is also built into the timeline representing times where the first attempt is seen, in hindsight, to be less than precise and further work in a previous step is needed. Moreover, the entire framework can be iterated and updated once the enterprise reaches step eight. This does not necessarily coincide with the completion of every identified initiative or use case, but it is suggested that, at some frequency, the strategy is reviewed and adjusted to meet management objectives and respond to business and economic inputs.

Framework Steps

In this section, each step is listed and then developed further with purpose statements and actions needed to complete the step.

Each of the eight framework steps includes elements to undertake during DX strategy development and execution. These elements will transform the enterprise from the current state to the future state of DX. The list of elements is not exhaustive. Additional elements may need to be added, and some may already be well understood or implemented within the enterprise through previous efforts or research.

Following is an expansion of steps from Figure 1.

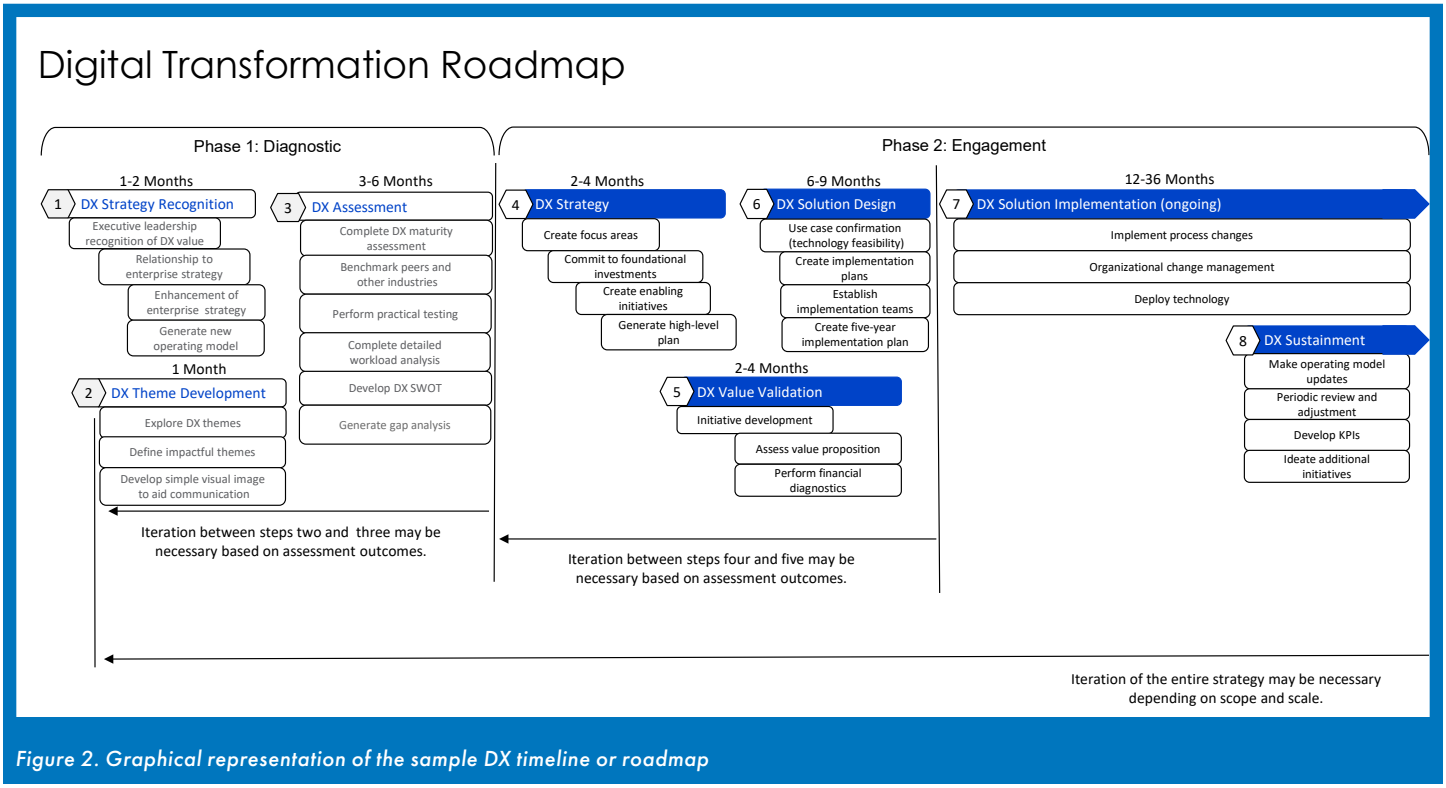

Figure 2. Graphical representation of the sample DX timeline or roadmap

Step #1	DX Strategy Recognition
Phase	Diagnostic
Elements	Executive recognition of the value of DX
	Relationship to enterprise strategy
	Enhancement of enterprise strategy
	Generate new go-forward operating model
Lead Organization	Corporate Strategy

The purpose of Step #1, DX Strategy Recognition, is to explore the EPRI DX framework along with other industries and popular references with interested parties. This will allow the team to become better acquainted with the main tenets and possibilities of an enterprise-wide DX.

With a firm grasp of the possibilities inherent in DX, the reader can view existing corporate strategy elements through the DX lens. This process can help integrate corporate strategy with the DX vision.

Steps may be taken here to reconsider and revise the corporate operating model in light of the agreed upon DX benefits.

Step #2	DX Theme Development
Phase	Diagnostic
Elements	Explore DX themes
	Define themes for impact
	Develop a simple visual image to help communicate themes
Lead Organization	Transformation

The purpose of Step #2, DX Theme Development, is to deliver a methodology to the enterprise that will help generate DX themes. These themes will guide the upcoming work of strategy development and execution.

This step has the ability to show the value of DX within the utility industry by learning from other implementations at similar utilities.

Step #2 primarily relies upon the leadership team to explore and decide which DX themes will have the greatest impact on their organization. The leadership team knows the whole enterprise and is in the best position to guide its transformation with the agreed upon themes.

Step #3	DX Assessment
Phase	Diagnostic
Elements	Complete DX maturity assessment
	Benchmark peers and other industries
	Perform practical testing
	Complete workload analysis
	Develop DX strengths, weaknesses, opportunities, and threats (SWOT)
	Generate gap analysis
Lead Organization	Transformation

The purpose of Step #3, DX Assessment, is to assess the current state of DX within the utility before starting a new initiative potentially taking the utility in a new direction. Previously completed individual efforts may be additive to DX. Knowing these efforts in detail will aid the team going forward into strategy design and execution.

Members of the business transformation group and other DX stakeholders execute assessment techniques applicable at various levels of the organization that reveal avenues of further pursuit, internal strengths, and necessary changes moving forward. These techniques shed further light on the current state of endemic DX efforts. Practical testing of work processes (measuring the timing of work tasks with the objective of finding areas of inefficiency) can also uncover avenues of DX, process digitization, and automation.

Once internal assessment and external benchmarking are complete, gaps will become known that present a clearer picture of the most logical steps to take next in the DX strategy.

Step #4	DX Strategy
Phase	Engagement
Elements	Create focus areas
	Commit to foundational investments
	Create enabling initiatives
	Generate a high-level plan
Lead Organization	Transformation Business Unit

The purpose of Step #4, DX Strategy, is to generate elements of a DX strategy that can, in conjunction with the enterprise business strategy, shape an effort that will reflect themes, investments, and a future state most beneficial to the company.

Within this step, users will formalize focus areas that transcend departmental boundaries and are able to make a significant impact across business units.

The enterprise must define and detail large foundational investments meant to impact the company across various business areas and unlock multiple enabling initiatives and use cases. These investments provide infrastructure that can and will be used by other technologies and processes. Foundational investments may show a negative business case if analyzed independent of any applications that will utilize them. A good example is a site-wide communication network.

Enabling initiatives address parts of the business or enterprise that require priority attention from DX and will benefit the most from grouped and sequenced efforts. Enabling initiatives focus on business areas where the greatest unmined value from DX can be extracted. Each enterprise will have different enabling initiatives based on the knowledge and expertise of its leaders and resulting from a well-executed DX assessment performed in Step #3 of the framework.

Once this is complete, high-level planning can take place through generation of a comprehensive DX strategy linking elements together that are meaningful to the corporation far into the future.

Step #5	DX Value Validation
Phase	Engagement
Elements	Initiative development
	Assess value proposition
	Perform financial diagnostics
Lead Organization	Business Unit

The purpose of Step #5, DX Value Validation, is to reinforce value addition to the enterprise by becoming a data-driven organization. Technologies and projects (outside foundational investments) must show business benefit.

In this step, the team shows how measuring value can result in further assurances toward positive return on investment, making this analysis an important part of a successful transformation.

Industry groups such as EPRI have tools and research available that can help assess the overall viability of foundational and enabling initiatives.

Step #6	DX Solution Design
Phase	Engagement
Elements	Use case confirmation (technology feasibility)
	Create implementation plan for each initiative
	Establish implementation teams
	Create five-year implementation plan
Lead Organization	Business Unit

The purpose of Step #6, Solution Design, is to generate detailed use case feasibility confirmations, utilizations, and implementation plans for DX initiatives.

Producing a good understanding of the current and future digital assets and the technologies required to make them effective will paint a clearer picture of what is achievable and help members plan more accurately.

In Step #7, Solution Implementation, a visual five-year implementation plan for all foundational investments, enabling initiatives, and use cases will facilitate communication planning for the DX strategy.

Now, implementation teams can take shape that will transform enabling initiatives and use cases into the implementation phase.

Step #7	DX Solution Implementation
Phase	Engagement
Elements	Implement process changes
	Organizational change management
	Deploy technology
Lead Organization	Projects and Implementation Teams

The purpose of Step #7, DX Solution Implementation, is to implement technology solutions as well as changes in the organization, processes, capabilities, and other business aspects that form a robust DX.

The team will deliver DX to the enterprise in a methodical, planned, and controlled way through project execution.

It is important to consider combining changes to the processes, organization, and technological solution into one project with a consistent team.

Step #8	DX Sustainment
Phase	Engagement
Elements	Make operating model updates
	Periodic review and adjustment
	Develop key performance indicators (KPIs)
	Ideate additional initiatives
Lead Organization	Transformation Business Unit

The purpose of Step #8, DX Sustainment, is to execute actions needed to sustain DX beyond the first year as DX will require periodic attention from corporate leadership to thrive. This will entail detailed steps to ensure that DX efforts are on track and meeting goals.

The group will need to periodically refocus the enterprise on current or new DX themes, with the goal of sustaining the effort over time.

New focus areas, foundational investments, and enabling initiatives will change as business priorities are updated, new avenues of value become evident, and changes in market or regulation demands.

Conclusions

EPRI is committed to advancing the understanding and practical application of DX in the coming years. EPRI recognizes that this topic is not unique to any one sector or utility type. The approach presented here can be applicable at multiple levels but works best when the entire enterprise is considered.

In order to achieve enterprise level DX, each part of the enterprise must be centrally unified in vision, theme, and strategy of the effort itself. This unification of the business units within the enterprise under the umbrella of DX – while potentially difficult – can lead to a unified application of technology, data infrastructure, centralized services (training as well as monitoring and diagnostics), and leadership that generates the financial benefits of such an effort.

This paper and the accompanying full version found in Digital Transformation: Utility Strategy and Implementation Guide (3002023752) [1] can be used on their own merits and as conduits to discover other EPRI current and forthcoming utility DX research.

DX can be a nuanced and unclear topic, but it does not have to be. With help from EPRI, DX can be approached confidently by management looking to increase efficiency and prepare the utility for the workforce of the future.

References

[1] *Digital Transformation Framework: Utility Strategy and Implementation Guide*. EPRI, Palo Alto, CA: 2022. 3002023752.

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