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ENTERPRISE ARCHITECTURE GUIDING PRINCIPLES: LEADING PRACTICES FOR ADOPTION

June 2016

NOTE

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Executive Summary

The Open Group Architecture Framework (TOGAF) defines guiding principles as *"…general rules and guidelines, intended to be enduring and seldom amended, that inform and support the way in which an organization sets about fulfilling its mission*." Although guiding principles are widely considered one of the primary tools of the trade for enterprise architects, an EPRI survey of utilities in 2015 gauged their enterprise maturity and showed that their "guiding principles adoption" lagged other indicators of maturity. To help utilities effectively increase development and adoption of guiding principles, the EPRI Enterprise Architecture Collaboration Group met in a face-to-face workshop held in conjunction with the EPRI Power Delivery and Utilization Advisory meeting in Austin, Texas in February of 2016. The discussions in that forum led to the creation of this white paper, which covers several topics related to leading practices for creation and implementation of guiding principles by utilities.

Research Overview

Selection of the leading practices for adopting guiding principles that are profiled in this white paper are based on experiences shared by members of the Enterprise Architecture Collaboration Group and EPRI staff at the workshop. Leading practices were also derived from TOGAF's architectural development method (ADM) guidelines and techniques, a sort of "starter kit" for enterprise architects.

Key Findings

- **The role of guiding principles**. Guiding principles inform all of the decisions throughout a utility's processes. Typical topics they help address include: portfolio evaluation, role and responsibilities, organizational structure, data stewardship, system selection, evaluation of systems and processes before the architecture review board, and as shown in this paper, guiding the operation of the enterprise architecture practice itself. Two important examples of guiding principles for an enterprise architecture team are "Build Bridges Not Moats," and "Don't Win the Battle Only to Lose the War."
- **Development of guiding principles.** It is incumbent upon the enterprise architecture team that guiding principles be well-formed so that their interpretation is consistent. As guiding principles are used, the architecture processes and organizational values they represent are reinforced and aligned. A well-formed guiding principle has four parts: title, description, rationale, and implications.
- **Selecting vendors and systems.** When engaged in system selection, the guiding principle "Go Forward Thoughtfully" should be applied. Address the needs and concerns of project managers, and preserve the functionality that is provided by existing systems.
- **Vendor scorecard.** Just as vendor offerings are scored for how they meet the functional requirements laid out in a request for proposal, so too can guiding principle requirements be scored. An example scorecard is provided in the section of this paper on Applying Guiding Principles for System Selection. (An example scorecard is also available in the Enterprise Architecture Collaboration Portal: https://collab.epri.com/EnterpriseArchitectureInterestGroup/Pages/Default.aspx).
- **Use of storytelling.** Offering stories regarding guiding principles, including good and bad examples, helps achieve buy-in by stakeholders within an organization. Explain "What will happen if we don't follow the guiding principle?" The architecture team needs to be able to show how the use of guiding principles can drive cost savings and solutions. Monetizing the costs of corporate guiding principles not being met can be persuasive. Provide concrete examples and draw on people and experience within the organization.

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Guiding Principles – The Tool of the Architect

Guiding principles have long been considered one of the primary tools of the enterprise architect.

From The Open Group Architecture Framework (TOGAF) [1], *"Principles are general rules and guidelines, intended to be enduring and seldom amended, that inform and support the way in which an organization sets about fulfilling its mission."* Further, there are distinctions between enterprise principles and architecture principles according to TOGAF:

> *Enterprise principles provide a basis for decision-making throughout an enterprise, and inform how the organization sets about fulfilling its mission. Such principles are commonly found as a means of harmonizing decision-making across an organization. In particular, they are a key element in a successful architecture governance strategy*
>
> *Architecture principles are a set of principles that relate to architecture work. They reflect a level of consensus across the enterprise, and embody the spirit and thinking of existing enterprise principles. Architecture principles govern the architecture process, affecting the development, maintenance, and use of the enterprise architecture*
>
> **TOGAF, Paragraph 23, Architecture Principles**

Guiding principles help guide decision-making when working with stakeholders who may tend to focus on expedient and narrowly focused objectives within their particular domains, rather than taking into consideration the broader needs of the organization as a whole. As enterprise architects are charged with assessing the "fit of purpose" for systems (one of their primary governance functions), they need to rise above the fray in the process of system selection and avoid being bound to any given constituency's preferred vendor. This is the role of the guiding principle. In addition to functional requirements, guiding principles help ensure that any given system meets the broader needs of the organization.

TOGAF provides several guiding principles as sort of the "starter kit" for meeting overall organizational needs. Additionally, TOGAF addresses guiding principles that might be employed internally by the architecture team. They help guide the enterprise architecture group itself.

Utilities may want to personalize guiding principles for their organizations, adapting to the terminology and culture as needed. For example, Snohomish PUD has a guiding principle of "Put the Utility First" which is a variation and more specific use of "Maximize Benefit to the Enterprise," a principle provided by TOGAF. Imagine the impact of using this sort of guiding principle and being able to say: "Excuse me sir, that solution optimizes for your area, but does not take the needs of the whole into consideration; you need to *put the utility first.*" Very motivational.

The list of TOGAF provided guiding principles is shown below:

- TOGAF[1] Business Principles
  - Primacy of principles
  - Maximize benefit to the enterprise
  - Information management is everybody's business
  - Business continuity
  - Common use applications
  - Service orientation
  - Compliance with law
  - IT responsibility
  - Protection of intellectual property
- TOGAF Data Principles
  - Data is an asset
  - Data is shared
  - Data is accessible
  - Data trustee
  - Common vocabulary and data definitions
  - Data security
- TOGAF Application Principles
  - Technology independence
  - Ease-of-use
- TOGAF Technology Principles
  - Requirements-based change
  - Response change management
  - Control technical diversity
  - Interoperability

[1] *The Open Group Architecture Framework, www.togaf.org, v9.1*

Utility Use of Guiding Principles

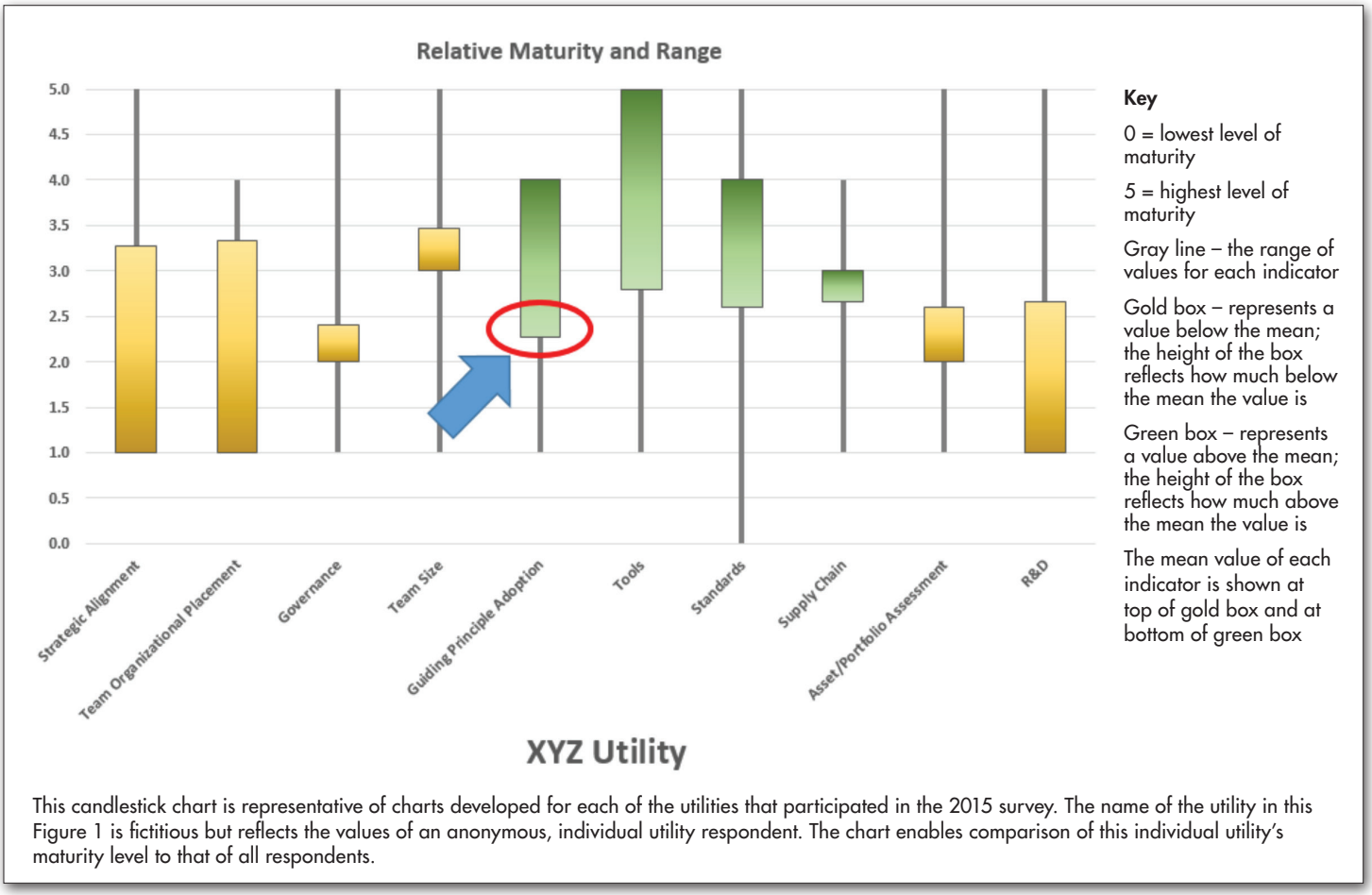
Although guiding principles are widely considered one of the primary tools of the trade for enterprise architects, an enterprise maturity exercise conducted by EPRI in the fall of 2015 [2] indicated that "Guiding Principles Adoption" lagged other indicators in the utility industry (Figure 1).

Because guiding principles have been highlighted as an issue needing attention, the topic was part of the agenda of the Enterprise Architecture Collaboration Group face-to-face meeting held in Austin, Texas on February 24, 2016. In this meeting, some of the challenges related to guiding principles were noted by meeting participants such as Walt Johnson, Technical Executive (EPRI), who said,

> *"Take baby steps to get buy-in at the executive level and have a reason that not adhering to guiding principles will create problems. One example is if the company is subject to audits you need to show traceability to the data source so the company doesn't get a negative audit finding".*

Another challenge was noted by Matthew Russell (Austin Energy) who noted,

> *"If you go through a slew of guiding principles, getting execs in a room to address them all is costly. You have to have a burning reason to have execs in room for an hour. I am a fan of baby stepping. Enterprise architecture is hard even when all goes well. Tie guiding principles to strategic initiatives—perhaps 4-5 heavy hitters—and what is applicable and why. It is too much information if you have to cover 20 guiding principles. Show value, such as how guiding principles save money and reduce complexity, to get execs on your side."*



This candlestick chart is representative of charts developed for each of the utilities that participated in the 2015 survey. The name of the utility in this Figure 1 is fictitious but reflects the values of an anonymous, individual utility respondent. The chart enables comparison of this individual utility's maturity level to that of all respondents.

Figure 1. Top Ten Indicators of Enterprise Architecture maturity dashboard highlighting the issue of guiding principle adoption

Guiding Principles – Four Parts

A well-formed guiding principle has four parts:

- **Title** – A brief name for the guiding principle that gives the reader an easy to remember reference.
- **Description** – This provides the detail behind that the title means.
- **Rationale** – This lets the reader know why this particular issue is a guiding principle.
- **Implications** – The result of the application of the guiding principle. Based on this guiding principle the organization is going to choose to do some things, and choose not to do some other things.

Guiding Principle Pitfalls

Guiding principles are commonly misused if they are not well-formed. For example, misuse can occur if the architecture team leaves out the rationale or implications. These attributes are just as important as describing what a guiding principle is. The rationale is needed so that stakeholders can understand *why* it is a guiding principle, months or years after it has been created. A summary of implications will help guide decision making because not only does it inform the audience of what will happen with respect to the guiding principle, but what will not happen. It is where "the rubber meets the road" in terms of applying the guiding principle.

Including all four parts of the guiding principle when it is developed will give users the background needed to understand how to employ it.

Guiding Principles for the Enterprise Architect

Implementing an enterprise architecture can be difficult under the best of circumstances [3][4] and requires a process involving several groups of people such as an architectural review board, project managers /project steering committee, strategic project vendors, and others.

Implementing *internal* enterprise architecture guiding principles, that is, guiding principles for the enterprise architecture team itself, will help the team be successful in the long-term in navigating the process and getting desired outcomes. Two examples of important internal guiding principles are:

- Build Bridges Not Moats
- Don't Win the Battle Only to Lose the War

Let us examine each of these in turn.

Table 1. Guiding principle example 1, Build Bridges Not Moats

Title	Build Bridges Not Moats
Description	Enterprise architects lead by influence, not by fiat, so the goal is to be viewed as internal consultants that help solve problems.
Rationale	If enterprise architects are viewed as problem solvers, their services will be sought out. If not, they will be viewed as just another obstacle to go around.
Implications	The success of the enterprise architecture team ultimately rises and falls on the success of personal relationships because the team must lead by influence. If the enterprise architecture team is viewed as something that throws obstacles in the way of progress, it will fail. If it is viewed as an internal consultant that provides value, it will succeed.

Implementing a guiding principle is easier if the enterprise architecture team can arrange for all reviews to be conducted during early governance/project process steps. Once the scope, budget, and deadline for a project has been set it will be difficult for the architecture team to make changes. Project managers will resist anything that might increase risk, as in, risk to *their* projects, regardless of the perceived long-term risk the architecture team may warn about.

To be successful the architecture team should help guide the project managers through the required process; architects should advocate for project managers and help them through the architecture review board (ARB) process/approval. The architecture team can help assess a given project to see if there is merit to an exemption/exception process. While engaged in the process, keep in mind

that the project steering committee is different than the ARB. The project steering committee will be invested in a previously decided upon scope, while the ARB is the higher authority that the architecture team can appeal to if the team believes that a given project does not comport to applicable organizational guiding principles.

The development of architecture is iterative, it is not a "one and done" process. With each iteration the architecture team may have to examine architecture trade-offs, delivery capability, and exercise the relationships with stakeholders. Figure 2 highlights the notion that the entry point and the iteration cycles may be at various places in the TOGAF architecture development cycle.

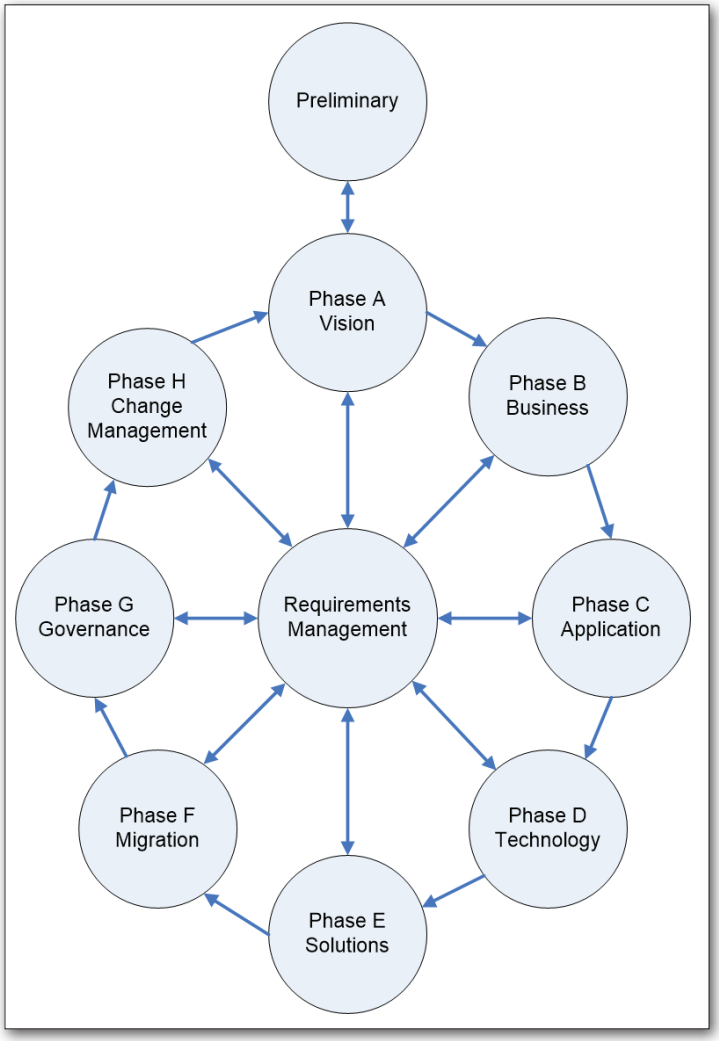


Figure 2. Architecture development methodology cycle adapted from The Open Group Architecture Framework Architecture Development Methodology, *v9.1 [6]*

Table 2. Guiding principle 2, Don't Win the Battle Only to Lose the War

Title	Don't Win the Battle Only to Lose the War
Description	Assess whether a "win" will build political capital, or lose it. Are we adding an ally or an enemy?
Rationale	Because enterprise architects lead by influence they must go the extra mile to sell unpopular decisions, have empathy for their clients, and work with the clients such that the client recognizes the approach selected by the EA team is best for the organization. Without this sort of engagement resistance to the EA practice will build over time.
Implications	You win some, you lose some. The key is to win the important ones. For any given decision point the team will need to develop "win-win" solutions. As the team builds a track record of success, they will be able to draw on the political capital to win over reticent managers that may not be enamored with a strategic direction that the team has chosen.

The success of this guiding principle and the use of empathy brings to mind the habit of "seek first to understand."[2] If the architecture team can fully understand the client's needs, it can move from a position of "no" if the client's request does not comport to organizational standards, to one of "yes, and" where the architecture team can assist the client moving forward with a solution that does comport.

With these two guiding principles in mind, let us now turn to one of the more complex issues facing enterprise architects: Selecting new systems that replace legacy systems.

[2] *Covey, S. R. (1989).* The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change

Applying Guiding Principles for System Selection

The following is an example guiding principle that may be used for system selection. It relates to the guiding principle in Table 2, "Don't Win the Battle Only to Lose the War." To address the needs and concerns of project managers when selecting a new system, preserve the functionality that is provided by the existing system.

Table 3. Governance guiding principle, Go Forward Thoughtfully

Title	Go Forward Thoughtfully
Description	When selecting systems to meet the demands for new capabilities, the organization should take care to preserve the value of functionality that is provided by existing systems. This is dependent on an assessment of factors such as: • Maintenance • Customization • License fees • Cost of talent
Rationale	Asking users to accept lessor functionality will create resistance to both adoption of the selected system, and the enterprise architecture practice that enforced the decision. The enterprise architecture team might "win the battle but lose the war."
Implications	Some systems, even if they are offerings from preferred vendors that might be viewed as strategic, might be eliminated from consideration if the offering does not meet previous capability expectations. It will be important for the architecture team to perform due diligence to determine if any stakeholder group is going to be under served.

Guiding principles are applied in two ways for system selection:

1. Eliminating systems from consideration
2. Scoring contenders for guiding principle compliance and for meeting functional requirements

In the "Always Move Forward" example, a system might be attractive if it is offered by one of the organizations strategic software vendors (SSV). In the push to consolidate, an organization often moves to eliminate smaller vendors to optimize discounts based on volume purchasing or a desire to minimize administrative overhead. However, if the SSV's offering requires that the stakeholder takes a step backwards in terms of capability, this will create resistance to the enterprise architecture practice. The enterprise architecture team might be viewed as not having the best interests of the group in mind (even with the case being made to optimize across the organization).

Decisions need to be made on data, not feelings.

When dealing with legacy systems it is not uncommon for the people who have worked on these systems to have an affinity for them and to be reluctant to let go. Do not be drawn into conversations about perceived value of one customization or another. When comparing two options the selections need to be considered in their entirety. Let's look at an example:

Table 4. Example Comparison of Legacy and New System

Legacy System	Value/Cost	New System	Value/Cost
Purchase	$0	Purchase	$100,000
Maintenance	$20,000	Maintenance	$20,000
Function A	$100,000	Function A	$100,000
Function B	$150,000		
Function C	$120,000	Function C	$120,000
		Function D	$100,000
		Function E	$100,000

Table 5. Adapting Choices for Legacy vs. New System

Options	Cost
Move overlapping functions to new system, integrate non-existing functions	Continuing maintenance on the legacy system + cost of integration
Customize the new system to meet old functionality	Cost of customization

The situation presented in Table 4 is analogous to the standard "build vs. buy." For some, this turned into an adage that indicated that an organization would always buy and never build. But for some organizations this is not the case. The intent behind this adage is that one should perform due diligence. Understand the cost/benefit tradeoffs, and fully account for costs that extend beyond simply acquiring a new system such as on-going maintenance. The costs of "care and feeding" of a system must be determined, as well as the costs of integration (especially if the integration is *not* based on standards, which will drive up maintenance costs over time).

Some important questions to consider:

- Does the integration require custom adapters, or standards-based adapters?
- Does the maintenance of the legacy system increase, decrease, or remain constant over time?
- Will the availability of the required skill sets to maintain the system decrease over time, leading to increased staffing costs?
- Is the current legacy process the most effective to accomplish the activity in question? Is it even viable in the future, e.g. optimizing meter reader route planning application when automated meter reading will replace the need for meter readers?

A pitfall or tradeoff that may also need to be considered is whether the reason that a given SSV cannot meet the needs of the stakeholders is due to a heavily customized legacy application. In this case it will be incumbent upon the architecture team to do their due diligence to determine the true costs of supporting the legacy application.

If the costs are deemed too high to support the legacy application, but the offering from a SSV does not meet the needs of the organization, it would be prudent to eliminate the SSV from consideration in favor of offerings from other vendors.

Vendor Scorecard

Just as vendor offerings are scored for how they meet the functional requirements laid out in a request for proposal, so too can guiding principle requirements be scored. (An example scorecard is available in the Enterprise Architecture Collaboration Portal: https://collab.epri.com/EnterpriseArchitectureInterestGroup/Pages/Default.aspx).

Figure 3 is an example of a scoring matrix that shows common attributes used in system selection. It also includes placeholders for entering applicable guiding principles and scoring them as well.

Category	Sub-Category	Weight	Score
		100%	0.0
Technical Architecture		0%	0.0
	Platform Support	0%	0.0
	Integration Capabilities	0%	0.0
	User Interface	0%	0.0
	Development Capabilities	0%	0.0
	Topology	0%	0.0
	Scalability	0%	0.0
	Security	0%	0.0
Investment		30%	0.0
	Initial Cost	45%	0.0
	Support Cost	55%	0.0
Service		15%	0.0
	Project Management	0%	0.0
	System Configuration	25%	0.0
	Technical Expertise	25%	0.0
	Service Reputation	50%	0.0
Support		15%	0.0
	Installation Support	25%	0.0
	On-going Support	25%	0.0
	Availability	25%	0.0
	Support Reputation	25%	0.0
Viability		0%	0.0
	Financial	100%	0.0
	Enterprise	0%	0.0
	Market	0%	0.0
Vision		0%	0.0
	Product Roadmap	40%	0.0
	Service Vision	30%	0.0
	Corporate Vision	30%	0.0
Functionality		20%	0.0
	Function 1	25%	0.0
	Function 2	25%	0.0
	Function 3	25%	0.0
	Function 4	25%	0.0
Guiding Principles		20%	0.0
	GP 1	25%	0.0
	GP 2	25%	0.0
	GP 3	25%	0.0
	GP 4	25%	0.0

Figure 3. Example scoring matrix with guiding principle placeholders

It should be noted that just as one does not score an offering on every requirement—only the most impactful ones—the same can be said about guiding principles. Some guiding principles might be used to select finalists before the final scoring even starts, or others may apply to implementation, e.g. "Data Is Shared."

To use a template such as the one in Figure 3 requires that the person managing the scoring and working with the team selects the most impactful guiding principles to be used for system selection. Often no more than six will be needed. The scorer replaces the "GP1, GP2, GP3, or GP4" placeholders with the high-impact guiding principles and adjusts the scoring percentages.

Note that the current scoring percentages in Figure 3 are only examples. The organization will need to determine the most important characteristics for the particular system being considered.

"War Stories"

A key feature of the Enterprise Architecture Collaboration Group is exchange between utility representatives. This includes sharing experiences and lessons learned in the form of "war stories" or "tales from the trenches" in meetings and in online forums.

Summaries of guiding principle stories from the February 2016 workshop [5]:

- Ron Cunningham (AEP) noted that not all principles have sufficient rigor in their creation and documentation, e.g. commingling principles with tactics or strategies, having different people within an organization put forward principles for use within their groups without regard to, or awareness of the larger organizational view. He noted that there are principles of differing scope: enterprise, architecture, or operation focused. Cunningham recommended use of storytelling within your organization, providing good and bad examples. "What will happen if we don't follow the guiding principle?" The architecture team needs to be able to show how use of guiding principles can drive cost savings/solutions. If discounts can be had by consolidating systems, the architecture team should have these numbers.
- Annemarie Diaz (Austin Energy) suggested providing concrete examples, noting that it means a lot when you can name people from within the organization who were involved.
- Mark Lane (PNM Resources) recommended that you should monetize the costs of corporate standards *not* being met.

Key Takeaways

Some of the key takeaways regarding leading practices for adoption and use of guiding principles are:

- One of the challenge utilities encounter when using guiding principles is that often only the members of the enterprise architecture team are aware of their existence or how they should be used. Some utilities have indicated that their guiding principles have become "shelfware"; once crafted they were filed away and not used. At a minimum, the people who undertake the architecture governance function at the utility need to be aware that guiding principles exist, understand their content, and understand how they are applied.
- The use of guiding principles is a leading practice and one of the differentiating "tools" in the enterprise architecture "toolbox." Guiding principles are the foundation upon which the enterprise architecture practice stands. They inform all of the decisions throughout a utility's processes. Typical topics they help address include: portfolio evaluation, role and responsibilities, organizational structure, data stewardship, system selection, evaluation of systems and processes before the architecture review board, and as shown in this paper, guiding the operation of the enterprise architecture practice itself.
- It is incumbent upon the enterprise architecture team that guiding principles be well-formed so that their interpretation is consistent. As guiding principles are used, the architecture processes and organizational values they represent are reinforced and aligned.

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Gerald Gray
Technical Executive
865.218.8113, ggray@epri.com

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3002007896 June 2016

Electric Power Research Institute
3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA
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