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EPRI Enterprise Architecture Workshop Proceedings

San Diego, California February 2018

3002014329

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Technical Update, October 2018

EPRI Project Managers

G. Gray
K. George

ELECTRIC POWER RESEARCH INSTITUTE
3420 Hillview Avenue, Palo Alto, California 94304-1338 ▪ PO Box 10412, Palo Alto, California 94303-0813 ▪ USA
800.313.3774 ▪ 650.855.2121 ▪ askepri@epri.com ▪ www.epri.com

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ACKNOWLEDGMENTS

Electric Power Research Institute (EPRI) prepared this report.

Principal Investigators
G. Gray, Ph.D.
K. George

This report describes research sponsored by EPRI.

This publication is a corporate document that should be cited in the literature in the following manner:

EPRI Enterprise Architecture Workshop Proceedings: San Diego, California February 2018. EPRI, Palo Alto, CA: 2018. 3002014329.

ABSTRACT

This report documents proceedings of the February 2018 EPRI Workshop on Enterprise Architecture.

Interaction and discussions focused on selected projects, including surveys, underway in 2018:

- Update of survey used for Top 10 Indicators of Enterprise Architecture Maturity, Product ID 3002012482
- Personality types/strengths of enterprise architects
- "What do architects do?"; the roles and job descriptions for enterprise architects solution architects, and other types utility architecture positions. This session featured job descriptions developed by American Electric Power (AEP) and roles and job categories published in TOGAF (The Open Group Architecture Framework).

Keywords
Enterprise architect
Enterprise architecture maturity
Myers-Briggs
TOGAF
Solution architect

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1
INTRODUCTION

The Winter EPRI Enterprise Architecture (EA) Workshop was held February 2018 in conjunction with the ERPI Power Delivery and Utilization (PDU) Advisory Meeting in San Diego, California.

This half-day workshop focused on selected 2018 projects including discussion on the topic of enterprise architecture, which centered on the yearly benchmark survey (see *Top Ten Indicators of Enterprise Architecture (EA) Maturity*. March 2018, Product ID 3002012481). Other projects included a potential survey of the personality types and strengths of enterprise architects and the roles and job descriptions for utility architects.

The workshop was led by Gerald R. Gray, Ph.D., EPRI Senior Program Manager for Enterprise Architecture & Integration and attended by EPRI technical staff and representatives of five utilities involved in the EPRI Enterprise Architecture Collaboration Group.

2
SURVEY ON TOP 10 INDICATORS OF ENTERPRISE ARCHITECTURE MATURITY

In this session, Gerald Gray led a discussion on the topic of enterprise architecture maturity, and EPRI's yearly benchmark survey of utility enterprise architecture, which is based on a "top-ten" list of factors:

1. Strategic alignment
2. EA team placement in the organization
3. Governance
4. EA team size
5. Guiding principle adoption
6. Tools
7. Standards
8. Supply chain
9. Asset/System portfolio assessment
10. Research and development

Participants discussed each of the survey questions related to this top ten list, with attendees who hadn't yet the filled in the survey providing their responses for inclusion in the 2018 results. The survey questions shown below had been reviewed and edited at the September 2017 EA workshop.

1. Strategic Alignment

Gerald Gray advised participants when responding to this question to "**Do the average capability of the team.** Use your first gut reaction."

One participant had prompted that direction when she commented that she had a "…hard time placing our group because what people do is often personality driven, so there are inconsistencies."

1) Strategic alignment

a. ☐ There is no documented organizational or IT strategy to rely on
b. ☐ The EA team develops architecture, but in isolation from any organizational strategy
c. ☒ The EA team develops architecture, but on an ad hoc or project basis
d. ☐ The EA team develops architecture, but only for IT systems, aligning with IT strategy only
e. ☐ The EA team not only develops IT architectures, but is equally adept at business architecture
f. ☐ The EA works collaboratively with both the IT and Business strategy leaders in crafting architectures and standards that align with organizational strategy

2. EA Team Placement

This question prompted discussion on the definition of a "senior manager," and EPRI may add sidebars with examples of what the management levels are in future surveys.

2) EA team placement in the organization

a. ☐ The organization is considering creating an EA team or re-forming the EA team after a failed initiative
b. ☐ EA is just a concept to someone as a part-time job
c. ☐ EA reports to some fractional (part-time) manager
d. ☐ EA reports to a senior manager within IT
e. ☐ EA reports to the CIO/CTO or equivalent
f. ☐ EA reports to the COO

3. Governance

This question also led to discussion on the degree of business input and membership in the Architecture Review Board. One participant noted that voting members of his utility's Architecture Review Board are IT senior leadership only, but they do have business input.

Gray determined that a "d" response was closest to this situation.

3) Governance:

a. ☐ There is no architecture review
b. ☐ The architecture review is ad hoc, but perhaps held for big projects
c. ☐ There is an Architecture Review Board (or group by another name that serves that purpose) but it only contains IT membership
d. ☐ There is an Architecture Review Board (or group by another name that serves that purpose), chaired with Enterprise Architecture leadership with business membership as equal partners
e. ☐ There is an Architecture Review Board (or group by another name that serves that purpose) with business membership and coordination with other governance functions, e.g. Program Management Office (PMO)
f. ☐ There is an Architecture Review Board (or group by another name that serves that purpose) and the CxO advocates for its recommendations

4. EA Team Size

No questions or discussions arose from this indicator.

4) EA team size

a. ☐ There is no recognized EA function or capability
b. ☐ No one individual has EA as a full-time job
c. ☐ There is at least one FTE that is responsible for EA on a full-time basis and this person relies on dotted line SMEs to augment their capability
d. ☐ The team has membership that includes expertise in some of the major architecture domains
e. ☐ The team has membership with expertise in each of the major architecture domains: business, data, applications, infrastructure
f. ☐ There is a process to determine EA involvement in various projects (that ranges from "no involvement" to assigning full-time architects) and the EA team has the staffing to meet the needs of the demands placed upon it

5. Guiding principles

The group agreed that it is easy to craft guiding principles but difficult to get others to buy into them.

Gerald Gray advised incorporating not just functional requirements but also the guiding principles into a spreadsheet to score them when making a decision.

5) Guiding principle adoption

a. ☐ No documented guiding principles exist
b. ☐ Guiding principles are in development or not fully formed (containing title, description, rationale, and implications)
c. ☐ Guiding principles exist but only the EA team knows what they are or where to find them
d. ☐ Leadership is aware of them but they aren't used for system selection
e. ☐ IT Leaders are familiar with the guiding principles and routinely use them when making roadmap decisions
f. ☐ Business and IT leaders are familiar with the EA guiding principles and use them for system adherence

6. Tools

The responses for this question range no tools to UML support to ArchiMate diagramming standard or enterprise-level tools

During discussion of tools, one utility representative reported that his company was transitioning from use of System Architect to **Archi**[1], and "**going open source**." He noted that the tool itself is robust but is file based and therefore is not as helpful for collaboration.

Another utility participant, noted that that there are **three levels of architecture:** 1) Documentation 2) Formal analytic processes in which values of various characteristics are used to optimize and make decisions), and 3) Model driven artifact generation.

"I think for enterprise architecture the second level is probably best," she commented.

6) Tools

a. ☐ The team only uses MS Office applications to document architecture
b. ☐ The EA team only uses MS Office and a collaboration portal like Microsoft SharePoint.
c. ☐ In addition to MS Office, have UML support.
d. ☐ The EA team maintains a collaboration portal that is also used by the rest of the organization, in addition to MS Office tools and UML support
e. ☐ The team has a collaboration portal and the EA team uses an entry level EA tool that supports the ArchiMate EA diagramming standard, in addition to collaboration tools and MS Office
f. ☐ Have EA tools but do not have a consistent process for using them.
g. ☐ The EA team uses an "enterprise level" e.g. (all the above) EA tool that supports ArchiMate, business process information, and application and infrastructure configuration management

[1] https://www.archimatetool.com/

What is the purpose of EA?" she continued, "to stop making stupid mistakes!" The classic definition of the **EA purpose is to reduce business risk.**

7. Standards

In this question, responses range from no standards to having them used for investment decision making.

Gerald Gray cautioned that EA **standards should relate to information exchange**, not for areas such as distribution design with standards for poles and wires.

7) Standards

a. ☐ There is no coherent set of organizational standards or understanding of their role in planning or portfolio management
b. ☐ There is a list of standards but it is incomplete and has not been updated in more than a year
c. ☐ The value of standards is understood and the organization is working to create a comprehensive list and plans to update the list on periodic basis
d. ☐ There is a list of standards, updated at least annually, but with no exemption/exception process or implications for non-compliance
e. ☐ There is a list of standards and it is updated in real-time (as the standard changes) and there is an exemption/exception process for any system under consideration.
f. ☐ There is a list of standards updated in real-time with an exception/exemption process and they are tied to investment decision making process

8. Supply chain (Getting on their RADAR)

The supply chain question engendered lively discussion on the fact that in some utilities, the EA team may be asked to review a purchase after it is made, rather than in advance.

Gerald Gray referenced an EPRI paper on Architecture Debt[2] that explores this issue. He encouraged participants to "Get EA involved in the project initiation phase, and put processes in place that **avoid creating long term problems by solving short term ones.**

Smaller purchases

One utility representative noted that that the EA team often is not consulted for smaller purchases. Gray cited cases in which EA must be consulted unless under a certain threshold, say $100,000, "Which can result in getting two $50,000 projects."

8) Supply chain

a. ☐ EA has no visibility into purchasing decisions
b. ☐ The EA team is beginning to establish relationships wherein people in other parts of the organization let the EA team know when something that conflicts with the nominal standard is being acquired
c. ☐ The EA team is consulted for *some* investment decisions, but only *after* purchase decisions have been made
d. ☐ The EA team is consulted for *most* investment decisions, but only *after* purchase decisions have been made
e. ☐ The EA team is consulted on most or all investment decisions (regardless of IT/OT source) before purchases are made.
f. ☐ There is alignment with the Program Management Office, Sourcing, and senior managers about investment decisions

Rapid Architectural Decisions Around Risk (RADAR)

A short list of questions to obtain quick scores on potential projects was developed by Ameren to make the review process more efficient and user friendly.

Ameren staff came up with the name "**Rapid Architectural Decisions Around Risk (RADAR)**" "to make sure we're on your radar!" A comprehensive survey with 252 questions is typically used for projects, but RADAR has only 28. The 28 questions deal with architecture, security, integration and other topics and is a quick way to assess risk. If risk is assessed as very low, 'It's a way to keep things off the plate," said an Ameren representative. "Some are so low risk that even if we are wrong it is not a major problem.".

Gerald Gray expressed delight in the name RADAR, "Which sounds like what it is." The group agreed, noting that "RADAR" is memorable and could be used as part of marketing the value of enterprise architecture internally.

[2] Governance and Enterprise Architecture Debt, December 2016. EPRI: Palo Alto, CA: 2016. Product ID 3002007898.

9. Asset/System portfolio

The responses range from having no enterprise list of applications to having different groups with different lists to having the EA team work with senior managers to determine portfolio impacts.

In some cases, said Gerald Gray, "Pick a fight regarding the portfolio. Red mark it, indicating that something is "retired." You will get a response that turns out to be a good thing."

One participant noted that it is important when dealing with the portfolio recommendations to look for technology riders and service riders that are potential risks because they do not allow sufficient governance by the utility.

9) Asset/System portfolio assessment

a. ☐ There is no enterprise list of applications that are supported in the organization
b. ☐ Different parts of the organization may have lists of applications but share that information inconsistently.
c. ☐ The organization is beginning to catalog all the systems that are supported in the enterprise
d. An enterprise list of all the systems that are supported exists and is updated annually
e. ☐ The EA team makes portfolio recommendations, but has difficulty in getting decision makers to the table to align on the invest, maintain, retire decisions.
f. ☐ The EA team considers portfolio impacts but only for a subset of systems, e.g. only headquarters IT systems, or only business (operational) systems.
g. ☐ EA team leads business capability assessment in collaboration with senior managers to determine portfolio impacts.

10. Research and development (R&D)

Discussion focused on incorporating enterprise architecture in the R&D process.

10) Research and development

a. ☐ R&D activities are not recognized as being important by the organization
b. ☐ R&D is fragmented or not coordinated across organizational silos.
c. ☐ The rest of the organization does their own R&D and may let the EA team know about their activities
d. ☐ The EA team manages the relationship with research and development organizations (such as Forrester, EPRI, etc.) on behalf of the enterprise and this informs EA architecture and standards development
e. ☐ The EA team investigates new technology and consults with business and IT regarding pilot activities
f. ☐ The value of technology assessments is understood and there is a funded mechanism for performing them and the EA team is engaged in their execution

3
VALUE OF PERSONALITY TESTS

As part of an ongoing discussion begun at the EPRI September 2017 Enterprise Architecture Workshop in Denver Colorado, the group discussed whether the results of a personality test or strength-finder tests could be used to predict who would make a good architect—or whether the test results were influenced by experience as an enterprise architect—or both.

Whether an architecture team had personality types that complemented team mates was also discussed.

Myers-Briggs Type Indicator

Participants' were asked what their personality types were, as determined by the Myers-Briggs Type Indicator® test (see sidebar). Five participants recalled their test results:

(2 participants) ENTJ – (extroversion, intuition, thinking, judgment) – The Commander, The Executive

(1 participant) INTP – (introversion, intuition, thinking, perceiving) – The Logician, The Thinker

(2 participants) INTJ – (introversion, intuition, thinking, judgment) – The Scientist, The Architect

All had "intuition" and thinking" as characteristics. Figure 3-1 is a word map of traits associated with all the personality types of participants shown above.

Personality traits tested in Myers- Briggs Type Indicator

Excerpted with permission from the Myers-Briggs Basics website and the *MBTI® Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator®*

Favorite world: Do you prefer to focus on the outer world or on your own inner world? This is called *Extraversion (E) or Introversion (I).*

Information: Do you prefer to focus on the basic information you take in or do you prefer to interpret and add meaning? This is called *Sensing (S) or Intuition (N).*

Decisions: When making decisions, do you prefer to first look at logic and consistency or first look at the people and special circumstances? This is called *Thinking (T) or Feeling (F*).

Structure*:* In dealing with the outside world, do you prefer to get things decided or do you prefer to stay open to new information and options? This is called *Judging (J) or Perceiving (P).*

Your Personality Type: When people decide on preferences in each category, they have their own personality type, which can be expressed as a code with four letters (INTP, ESFP, etc.)

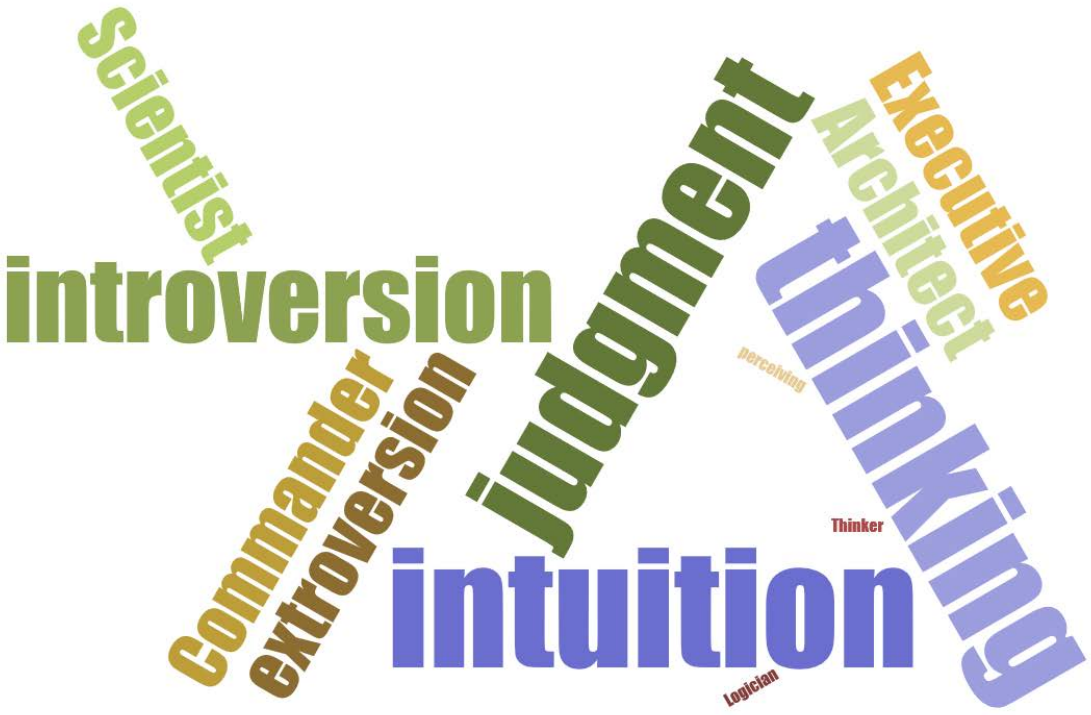

Figure 3-1
Word map of characteristics of workshop participant personality types

Other tests

Other tests mentioned that might be of value in determining competencies or personality types are:

- DISC Personality Test
- Gallup Strengths Finder
- Enneagram

A quick DISC test by participants at the workshop found that participants had the grouped in the following categories:

- The Creative
- Results Oriented
- The Individualist

Personality Survey Planned

Gerald Gray said he planned to conduct an online survey to determine whether certain personality types are drawn to architectural work, or conversely, whether architectural work helps shape personality.

4
ARCHITECTURE ROLES AND JOB DESCRIPTIONS

About three years ago, the Enterprise Architecture staff and Enterprise Architecture Interest Group (EAIG) members were posed with the question: *"What do enterprise architects do?"* A debate ensued that was catalyzed by a utility-specific process task list from the American Productivity and Quality Center (APQC). At that time the APQC had 117 tasks in the list, and in the IT category had architecture-specific tasks.

Following up on a need to refresh "what architects do," which was discussed at the September 2017 Enterprise Architecture workshop[3], presentations were given to spark discussion:

- Ron Cunningham of American Electric Power (AEP) reviewed AEP's evolving architecture job descriptions.
- Gerald Gray presented information on the TOGAF job descriptions and roles.

IT Architecture Roles Mapping to Job Titles

Presented by Ron Cunningham, Enterprise Architect, American Electric Power

Ron Cunningham reported that at AEP the roles and job titles for architects are revisited every few years. He presented two tables, one reflecting architecture roles mapped to job titles for the period 2008 – 2011 (see Table 4-1) and another for the period 2011 – 2014 (see Table 4-2).

Revisiting these roles and job titles tends to flow organically from the evolving nature of architecture, changes in management, and requests from the human resources department to rework job descriptions so that they reflect the industry marketplace.

[3] Proceedings of Enterprise Architecture Workshop, September 2017. EPRI, Palo Alto, CA: 2018. 3002009980.

Table 4-1
AEP 2008–2011 Roles and Job Titles

	Project Focused					*Enterprise Focused*
Project Roles	**Project Architect**	**Technical Solution Owner**	**Technical Domain Architect**	**Functional Domain Architect**	**Program Architect**	**Enterprise Architect**
Role Accountability	• Participates in technical architecture design • Documents the technical architecture	• Ensures project aligns with the business needs • Consults on technical architecture design • Ensures technical architecture design aligns with IT strategy	• Participates in defining Architectural Standards • Serves as the Technical Domain Subject Matter Expert • Implements new and foundational technologies	• Participate in defining solutions in their Functional Domain. • Consults on projects related to Functional Domain • Aligns business functionality to business functional map for assigned projects	• Defines and revises project/program technical vision • Maps application to business process dependencies • Defines non-functional requirements at the program level • Ensures project alignment with other projects	• Defines IT architectural strategy • Oversees translation of enterprise business strategy to IT strategy • Ensures cross-domain interoperability • Ensures architecture blueprint, roadmap, and standards compliance • Ensures IT strategy aligns with business strategy
Applicable Job Titles*						
IT Architect II	X					
IT Architect I	X	X				
Architect Senior	X	X		X	X	
Architect Principal			X	X	X	X
Enterprise Architect			X		X	X

* Job Descriptions detailed out by Competency Matrix (Personal Skills) containing: Education-Experience, Responsibilities, Assignments, Skill Groups, Competencies, Observable Behaviors, Skill Levels by Job Title

In 2008, AEP identified project roles, an important need, especially as the company was still in the final stages of implementing a merger.

Cunningham commented on several of the titles in the headers in Table 4-1:

- A **technical solution owner** is typically involved with a particular technology that was under a technical domain.
- The **technical domain architect** is the equivalent of a data architect per the TOGAF description.
- A **functional domain architect** deals with domains such as distribution, transmission and business.
- A **program architect** is typically involved in changes to how business is done that require a three-to-four-year period to complete.

A competency matrix was developed to back up the roles and titles in Table 1. The competency matrix contains:

- 15 task inventory
- 61 competencies
- 111 behavior indicators
- 5 proficiency levels (1 being “not applicable”)

Table 4-2
AEP 2011–2014 Roles and Job Titles

Focus:	*Project*		*Technology*		*Portfolio*	*Enterprise*
Architect Roles	**Solution**	**Program**	**Technical Domain**	**Functional Domain**	**Portfolio**	**Enterprise**
Role Responsibilities	• Participates in technical architecture design • Documents the technical architecture	• Defines and revises project/program technical vision • Maps application to business process dependencies • Defines non-functional requirements at the program level • Ensures project alignment with other projects	• Participates in defining Architectural Standards • Serves as the Technical Domain Subject Matter Expert • Implements new and foundational technologies	• Participate in defining solutions in their Functional Domain. • Consults on projects related to Functional Domain • Aligns business functionality to business functional map for assigned projects	• Captures the strategic goals that drive the organization forward. • Connects IT Technology Strategy to Business Unit Strategy to produce a long-term combined view. • Articulates IT technology investments in business terms, providing a business case to support the strategy. • Provides roadmap to move from as-is portfolio and architecture to to-be portfolio and architecture.	• Defines IT architectural strategy • Oversees translation of enterprise business strategy to IT strategy • Ensures cross-domain interoperability • Ensures architecture blueprint, roadmap, and standards compliance • Ensures IT strategy aligns with business strategy
Applicable Job Titles						
IT Architect II	X					
IT Architect I	X					
IT Architect Senior	X	X		X	X	
IT Architect Principal		X	X	X	X	X
IT Architect Enterprise		X	X		X	X

* Job Descriptions detailed out by Competency Matrix containing: Education-Experience, Responsibilities, Task Inventory, Competencies, Behavior Indicators, Proficiency Levels by Job Title
Note that in this table, the Architect I is the highest ranking, reversing the ranking in Table 4-1.

Table 4-2 shows how roles were relabeled with more emphasis on architectural versus project roles. There was also a slight shift in job descriptions. This reflects growth in the architecture group.

The competency matrix for Table 2 contains:

- 9 skill groups
- 32 competencies
- 176 observable behaviors
- 5 skill levels (1 being "not applicable")

AEP is now **mapping jobs to SFIA[4] (skills framework for the information age)** standard.

[4] Skills Framework for Information Age (SFIA) a common language for describing the skills and management competencies needed for ICT professionals. See https://www.sfia-online.org/en/sfia-6/reference-guide

Participant comments:

*Participant 1: Within **SFIA there are no roles, only skills**, so utilities must create their own roles based on SFIA skills, or there are companies that sell you packages with "pre-done" roles. In SFIA, **there are skill categories, families and levels.** Each level has a very specific description of that skill that is roughly three to four sentences long.*

*Participant 2: We created **two architect roles in our company: solution architect and enterprise architect** (The solution architect is one level lower the enterprise architect.) My role is manager at the top.*

*Participant 3: My **official title is enterprise architect but operate more as a solution architect.** I am at the principal analyst level.*

*Participant 4: We have eight architects now and they are all **at one level**. It is the EA team and title is "**Component Architect**." We use terms like "solution" as adjective in front of title. I use **Enterprise Information Architect** as my title on my business card. That is my focus.*

*Participant 5: At our company the EA team members kept being used as solutions architects because we could get job done. We had no time to mentor the solution architects. Over last 3 years **we have been instructing enterprise architects to deal with mentoring and innovation**.*

Participant 4: **Enterprise architecture should be strategic work, not tactical work.**

Participant 6: **EA is where strategy meets execution**. Since execution involves projects, the trick has always been extracting EA's from projects when their portion is done.

Integrating TOGAF and SFIA Skills Categories

Presentation by Gerald R. Gray. Ph.D., EPRI

Gerald Gray believes the TOGAF IT Architecture Role and Skill Definitions[5] matrices are robust in terms of skills but need updated since they were published in 2011. For example, in 2011 "solutions architect" was not part of the vernacular.

In addition to categorizing the skills that architects need, TOGAF ranks the levels of proficiency those in various roles must have, based on the levels shown in Table 4-3.

Table 4-3
TOGAF skill level proficiencies

Level	Achievement	Description
1	Background	Not a required skill though should be able to define and manage skill if required.
2	Awareness	Understands the background, issues, and implications sufficiently to be able to understand how to proceed further and advise client accordingly.
3	Knowledge	Detailed knowledge of subject area and capable of providing professional advice and guidance. Ability to integrate capability into architecture design.
4	Expert	Extensive and substantial practical experience and applied knowledge on the subject.

Source: TOGAF Architecture Skills Framework

Gray would like to examine architect roles related to five skills categories: data, applications, business, technical, and management. He proposes comparing them to the SFIA cross-industry skills categories to determine how they intersect with TOGAF's skills categories.

Gray and participants agreed that it is essential that enterprise architects "not be a roadblock" and that there is a need to communicate standards and streamline architecture review. Another important element is being able to visualize architecture for various stakeholders, and to that end, EPRI is developing a **library of architecture patterns** diagrammed in ArchiMate.

[5] TOGAF Architecture Skills Framework at http://pubs.opengroup.org/architecture/togaf8-doc/arch/chap30.html

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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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