

Tech Insights: Enterprise Architecture

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Introduction

Federal agencies face challenges in crafting and executing information technology (IT) strategy. While managing increasingly larger and more complex IT portfolios to meet business needs, they are responding to a rapidly evolving technological infrastructure. A common approach to meeting this challenge is known as Enterprise Architecture (EA). EA methodologies examine an entire organization, with concentration on its business processes, technologies, and information systems. This TS Note explores EA as an IT strategy, with focus on the complementary benefits found in four primary EA methodologies.

A Management Best Practice

Enterprise architecture is a management best practice for aligning business and technology resources to achieve strategic outcomes, improve organizational performance, and guide organizations to better execute their mission. An EA describes the current and future state of an enterprise and creates flexible plans for transitioning from the current state to the desired future state. EA plays an important role in the Federal government as an enabler to consistent IT governance. Federal agencies have faced increasing needs for transparency regarding the treatment of IT as an investment in light of declining budgets and rapidly changing business needs.

A common misconception is that EA focuses specifically on the design, implementation, and operations of individual IT systems. Rather, EA is an integrated approach to IT strategy that focuses on alignment of IT systems to business needs, and supports business cases for new IT systems.

The concept of EA began with a 1987 article by J.A. Zachman in *IBM Systems Journal*, "[A Framework for Information Systems Architecture](#)." Zachman stated that as IT systems grow and become more distributed, they became more complex, difficult to manage, and distanced from business goals. Within the Federal government, the Office of Management and Budget (OMB) adopted best practices from Zachman's work, among others, to establish EA as an official component of Federal IT governance. Officially, IT was defined as an investment in 1985 with the first release of OMB Circular A-130 ("Management of Federal Information Resources"), and EA was encoded in legislation including the Clinger-Cohen Act of 1996 and E-Government Act of 2002. Within the Department of Veterans Affairs (VA), EA has been a key aspect of the Office of Information & Technology (OI&T) since its establishment in 2007 and is mandated in order to meet OMB reporting requirements on current and planned IT investments.

Why Enterprise Architecture?

Common problems that plague enterprise IT include:

- Siloed production environments and data sources
- Legacy systems failing to achieve a positive return on investment
- Lack of architecture guidelines for designing IT systems in standardized ways
- Lack of communication between business and IT stakeholders

Organizations must strike a balance between supporting the business needs and planning for appropriate IT investments. EA helps articulate how enterprises can best structure ser-

The TS office within OI&T's ASD, interacts not only with the Enterprise Architecture pillar offices, but also with multiple external vendors, stakeholders within OI&T, and with strategic offices across the enterprise. TS works closely with IT and business owners to capture business rules and provide technical guidance as it relates to Data Sharing across the enterprise, specifically for interagency operability.



vices, while minimizing common organizational IT challenges. No matter the EA approach chosen, EA decreases system complexity and aligns IT investments with business goals. This task is increasingly difficult the more complex the organization and its systems. For instance, the Federal government is extremely complex, composed of over 300 organizational entities with budgetary spending totaling over \$3 trillion each year for programs, private enterprises, non-profits, and agencies distributed around the planet. Reducing operational costs, increasing innovation and adaptability, making decisions using sound data, and leveraging investments are all desirable outcomes for such a complex organization. Furthermore, EA provides similar planning to that of city planning. The plan assesses the current state of an organization, outlines a [project start architecture](#), and maps to an enterprise future state. By addressing these three states, an EA facilitates an organization's ability to change and grow while staying aligned with business goals and requiring a minimum of resources.

Common EA Methodologies

There are numerous methodologies used to

establish EA. Examples of common methodologies found in both industry and the Federal government include the [Zachman Framework](#), the [Open Group Architecture Framework \(TOGAF\)](#), the [Federal Enterprise Architecture Framework, V.2 \(FEAF-II\)](#), and [Gartner EA](#). These methodologies differ from each other like cats to dogs, in terms of structures and in approach. The methodologies are better understood as a kit of complementary tools, which are useful depending on the organization's mission.

The Zachman Framework

J.A. Zachman's original framework is a method of taxonomy. A taxonomy is a logical system for organizing artifacts such as words, planning documents, specifications, and models similar to a catalog. Zachman's taxonomy takes into account who the artifact targets (e.g., business owners and builders) and what particular issue (e.g., data and functionality) is addressed. This system of classification focuses, more than any of the other methodologies, on providing a *complete* taxonomy. This framework provides the capability of classifying architectural artifacts so they can be found, much like how books are organized in a library.

The Open Group Architecture Framework (TOGAF)

TOGAF was developed in 1995 by the [Open Group](#), a global consortium that establishes IT standards to drive business objectives, based on the Department of Defense (DoD) Technical Architecture Framework for Information Management (TAFIM). TOGAF divides an EA into four categories: business architecture, application architecture, data architecture, and technical architecture. Then, details from each architectural category are developed into a process, called the Architecture Development Method (ADM). While Zachman's Framework explains how to categorize and cross-reference artifacts, TOGAF's ADM provides a complete process guide to develop and manage the EA lifecycle. The concept of the Technical Reference Model (TRM) originated from TOGAF and is used as a "foundation architecture" for selecting the best technologies that support business needs.

The Federal Enterprise Architecture Framework, Version 2 (FEAF-II)

OMB released the FEAF-II in January 2013. This iteration of the [Federal Enterprise Architecture \(FEA\)](#) meets the criteria set forth by the [Common Approach to Federal Enterprise Architecture](#), emphasizing that strategic goals drive business services, which in turn provide the

requirements for enabling technologies. At FEAF-II's core is the Consolidated Reference Model (CRM), which equips OMB and Federal agencies with a common language and framework to describe and analyze investments. Reference models comprise a framework for describing important elements of Federal agency operations in a common and consistent way. Like the Zachman Framework, FEAF-II has a comprehensive taxonomy, and like TOGAF's ADM, also provides a process to develop an EA.

Gartner

Gartner is an American research and advisory firm renowned for its EA practice. Gartner designs an EA appropriate to organizational goals, while also establishing a culture that values and uses EA. Gartner identifies three EA stakeholders: business owners, information specialists, and technology implementers. Together these three stakeholder groups must develop a common vision of their business goals and strategies for leveraging IT to achieve those goals. In this methodology, success is measured in terms of profitability and achievement of business goals, not by checking off items on a process matrix. Gartner's focus on developing the culture surrounding EA supports the ongoing evolution and use of EA.

Conclusion

VA's [Office of Enterprise Architecture](#) (VA EA) is an evolving entity that develops and maintains VA's IT transformation roadmap through an ongoing collaborative effort between VA's business and technology communities and OI&T. As VA changes, VA EA updates and maintains VA's EA as a transformative tool and authoritative information resource for architecture standards, system inventories, best-practice approaches and reference architectures, and project-specific design compliance criteria. Their website is an authoritative information source to support all OI&T projects in achieving the goals of improving and evolving information security, advancing agile interoperability and data sharing, and reducing the total lifecycle cost of IT.

Read more on EA and related topics in the [Office of Technology Strategies' \(TS\) Tech Insights: Configuration Management](#), and [IT Service Management](#); and Enterprise Design Patterns regarding [ITSM Enterprise Framework](#). If you have any questions about EA, don't hesitate to [ask TS](#) for assistance or more information.