

An Enterprise Architecture Practitioner's Notes

VOLUME 1: ENTERPRISE LEVEL ARCHITECTURE

Matthew Ford Kern

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Volume 1: Enterprise Level Architecture

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CONTENTS

Volume 1: Enterprise Level Architecture.....	5
Section 1: Introduction to Volume 1.....	6
1.1 My Ideas: Mostly Not, May 25, 2015.....	7
1.2 The Five Activities of Enterprise Architecture, Apr 25, 2015.....	9
1.3 Enterprise, Segment, Solution, Jan 14, 2015.....	11
1.4 Correspondence to Management Activities, Never Posted.....	15
1.5 Strategic, Operational and Tactical Thinking, Jul 19, 2014.....	18
Section 2: What is Enterprise Architecture?.....	20
2.1 Enterprise Architecture Origins, June 22, 2014.....	22
2.2 Enterprise Architecture Concepts, June 22, 2014.....	27
2.3 Enterprise Architecture Scope, August 16, 2014.....	35
2.4 Enterprise Architecture Purpose, August 16, 2014.....	37
2.5 EA is Transformation, November 29, 2014.....	39
2.6 Enterprise Transformation Methods, July 23, 2014.....	42
2.7 Transformation Investment Portfolio, September 20, 2014.....	44
2.8 Enterprise Transformation and Innovation, October 11, 2014.....	47
2.9 Enterprise Architecture & Portfolio Management, January 18, 2015.....	50
2.10 Enterprise Architecture vs The Budget, Jul 2, 2015.....	53
2.10 What is Enterprise Architecture, Part 1, June 22, 2014.....	55
2.11 What is Enterprise Architecture, Part 2, June 22, 2014.....	59
2.12 What is Enterprise Architecture, Part 3, June 22, 2014.....	62
Section 3: Components of Enterprise Architecture.....	64
3.1 Enterprise Architecture Drivers, September 12, 2014.....	65
3.2 Enterprise Architecture Vision, September 12, 2014.....	67
3.3 Enterprise Architecture Holism, September 12, 2014.....	68
3.4 Enterprise Architecture Roadmap, September 20, 2014.....	70
3.5 Approved Technologies & Standards, September 21, 2014.....	72
3.6 Enterprise Architecture Principles, September 21, 2014.....	75
3.7 Enterprise Architecture Artifacts, August 21, 2014.....	78
3.8 Outcomes vs Capabilities, September 19, 2014.....	80
3.9 Alignment, November 20, 2014.....	82
3.10 Performance Measures in the Enterprise, July 26, 2014.....	85

Volume 1: Enterprise Level Architecture

3.11 Reference Models, Jul 2, 2015	88
Section 4: How To.....	90
4.1 Parsimony vs Comprehensive EA, December 14, 2014.....	91
4.2 Very Lean Enterprise Architecture, July 27, 2014.....	93
4.3 Buying your Enterprise Architecture, August 3, 2014	96
4.4 Ten Ways to Botch EA, September 21, 2014	98
4.5 Enterprise Level Anti-Patterns, March 5, 2015.....	100
4.6 Enterprise Architecture Anti-Patterns, January 24, 2015	102
4.7 Enterprise Architecture vs Systems Engineering, August 16, 2014.....	104
4.8 Scientific Method & Engineering Method in EA, November 25, 2014.....	107
4.9 Rationalism vs Empiricism in EA, December 6, 2014.....	110
4.10 Objective Reality & Enterprise Architecture, December 20, 2014.....	113
4.11 Splitting Hairs in Enterprise Architecture, October 24, 2014	115
Section 5: Examples and Counterexamples	118
5.1 Implementable Public Health Care, August 9, 2014	119
5.2 Disaster Currency Proposal, November 27, 2014	122
5.3 The Baltimore Riots vs A National Civilian Service Corps, April 28, 2015	125
5.4 A National Intranet, November 27, 2014	128
5.5 How to do Architecture: X-Browser, Jul 2, 2015	131
5.6 Nation as Enterprise, November 22, 2014	134
5.7 Global Enterprise Architecture, October 27, 2014.....	137
5.8 Two Visions of the World Enterprise, November 15, 2014.....	140
5.9 ITIL vs EA, January 26, 2015.....	144
5.10 Enterprise Architecture vs SAFe, November 16, 2014.....	147
5.11 Risk Management vs Enterprise Architecture, December 21, 2014	151
5.12 Enterprise Architecture vs Digital Transformation, November 8, 2014.....	153

VOLUME 1: ENTERPRISE LEVEL ARCHITECTURE

This series of books will describe what I view as the totality of enterprise architecture, in the broad meaning of that term. It will consist of five volumes as follows:

1. Enterprise Level Architecture
2. Segment Level Architecture
3. Solution Level Architecture
4. Governance and Maturity Management
5. The Business Environment

While the series will address enterprise architecture (EA) in the broad sense, this volume will address enterprise level architecture in the narrow sense. It is this narrow activity that gives the whole its name, purpose and organizing principles.

These volumes originated as blog posts on my personal website, and later on LinkedIn™. I wrote these to popularize and clarify the deep understanding of enterprise architecture of my government colleagues, who invented it. It seems to me that knowledge of the subject has spread from its global hub city, Washington DC, out to the rest of the globe. We know it best here.

As for myself, my main contribution at the enterprise level is simply popularizing, restating the work of the various founders of EA, of whom I know many. Some are friends; all are colleagues. They created a comprehensive vision of EA, and I follow it. This is mostly true of EA maturity management and EA governance as well. In regard to solution architecture and segment architecture, I have contributed some innovations.

I did contribute the organizational structure for the book, the “Five Activities Model.” It is a small and obvious addition to the work of Dick Burk while at the Office of Management and Budget (OMB).

This work is not another framework and is not intended to replace them. It is designed to, instead, provide what they do not: perspective. This particular volume draws mainly on Federal Enterprise Architecture Framework (FEAF) and FEA concepts, with Zachman’s concepts, as those are more directly applicable to this level of architecture and scope of effort.

Each day I hope to do something useful. It is not an ambitious philosophy, but it helps in consulting. With this book I also hope that I have done something useful. Please let me know if I have.

Volume 1: Enterprise Level Architecture

SECTION 1: INTRODUCTION TO VOLUME 1

Volume 1: Enterprise Level Architecture	5
Section 1: Introduction to Volume 1	6
1.1 My Ideas: Mostly Not, May 25, 2015	7
1.2 The Five Activities of Enterprise Architecture, Apr 25, 2015	9
1.3 Enterprise, Segment, Solution, Jan 14, 2015	11
1.4 Correspondence to Management Activities, Never Posted	15
1.5 Strategic, Operational and Tactical Thinking, Jul 19, 2014	18

The section “My Ideas: Mostly Not” describes the limits of my contribution to the art relative to the founders. The other four sections describe the underlying model on which the five volumes are based.

In “The Five Activities...” the basic notion of dividing EA into these five bins is described and then in “Enterprise, Segment, Solution” the preceding model of OMB and Burk is recapped and simplified. In “Correspondence to Management Activities” the link of each of the OMB levels to the PLI levels of management is described. Lastly in “Strategic, Operational and Tactical Thinking” the correspondence to levels of planning is implied.

QUESTIONS FOR SECTION 1

1. Do these five levels cover all of enterprise architecture? If not, what is left out?
2. Does the three-level model correspond to contracts and “statements of work” you have seen?
3. How often is it true that the segment architecture works for the program manager? Should it happen more often in an ideal situation? What of the other levels?
4. Have you seen other authors use a different order of operational and tactical planning? Have you seen them refer to all planning as strategic? Is that useful?

1.1 MY IDEAS: MOSTLY NOT, MAY 25, 2015



Several people suggested I should write a book, notably Dale Chalfant in Detroit (a fine architect), who convinced me. I had toyed with and resisted the idea for several years, as most of what I have learned has come from those founders of enterprise architecture and systems engineering and whomever else I have read. I have added little to the body of thought, a bit here or there, but nothing like their sweeping insights.

You could say that mostly I simply popularize (simplify, clarify and restate) what my government and beltway friends created and regarding enterprise level architecture that would be fair. I think in solution architecture I may have innovated more.

I really don't have that many ideas of my own regarding EA, and of those I have, only a few are profound.

I would like to list some of the folks whose ideas I have borrowed, restated and maybe extended a small bit. They are the real source of what I say. They are not in order of precedence, just random order as I thought of them.

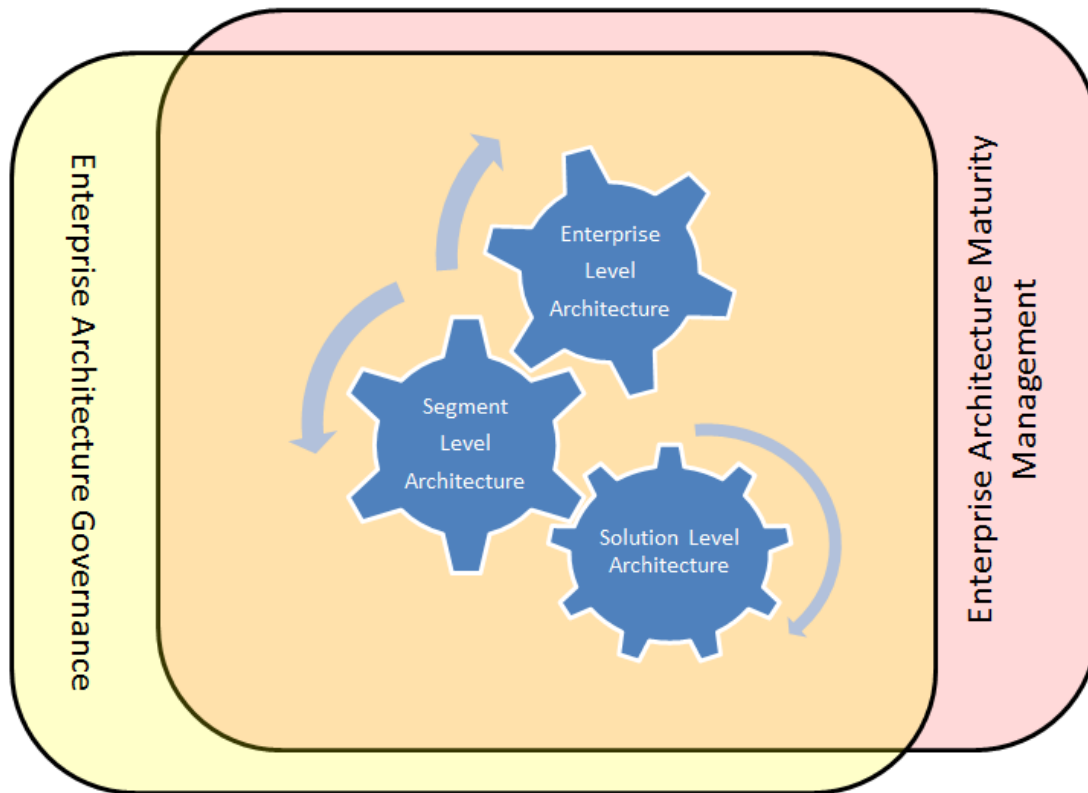
- John A. Zachman, whose ontology I use to think about architecture
- Kathie Sowell, the "mother" of DODAF, who ran the project at MITRE
- Mike Tieman, who rewrote FEAF 1.1 and whose thinking I admire greatly
- Felix Rausch and Beryl Bellman who made it possible for me to get an education in enterprise architecture

Volume 1: Enterprise Level Architecture

- Lee Smith, the first Chief Architect at DHS and lion tamer, from whom I learned many lessons concerning governance
- Rob Thomas, who wrote so much of the early material for FEA and FEAF. I met him recently, a great man.
- Manny DeVera, contributor to FEAF 1.1 and a great guy. I worked with Manny a bit at the Federal Emergency Management Agency (FEMA).
- Ira Grossman, who popularized and supported EA for years. I met him on EDMICS and worked with him a bit at FEMA
- Dr. Scott Bernard, a brilliant guy. He was the brains behind FEAF II. Currently Chief Architect at OMB.
- Bobby Jones, who can sell enterprise architecture like no one else. I worked for Bobby at FEMA for a bit.
- Stephen Spewak, who died early and who I never met. I regret that.
- Bradford Rigdon, who chaired the panel for NIST and whose team first used the term "enterprise architecture" defining it by context. I never met him either.
- Richard Burk, former Chief Architect at OMB and a great guy. I quote him often.
- Kshemendra Paul, another former Chief Architect at OMB. I sat in class with him at FEAC, a brilliant guy.
- Randy Hite, who worked tirelessly at the US Government Accountability Office (GAO) for so many years and wrote the Enterprise Architecture Management Maturity Model (EAMMF), a monument to good government.
- Skip Boeteger, my sounding board and more senior colleague. We share neurons, I think.
- I have to add John Tieso. I just saw him at the Business Process Management (BPM) conference, which reminded me. I sometimes forget he is a great architect, as he pretty much agrees with me on nearly everything. I suppose, ironically, that if I had a bigger ego I would remember John is a great architect more often.

It strikes me, having written the list, how many of these folks are friends. Also, of those remaining, how many I wish I knew better. Surely I left some out, and I will have to edit them in. (If I did leave you out, it was probably simply my brain misfiring.)

Regardless, they thought the profound thoughts and I followed. I hope I was a good student. If you like what I have said, seek these folks out. I learned from them.



Enterprise Architecture is pretty darned simple if you have a good model to explain it. Without a good model everyone starts arguing. In 1989 the Federal Enterprise Architecture Framework (FEAF) described a three-layer model that was pretty simple. In 2006 Burk at OMB described it even more clearly. Three layers—easy.

People talked about two other important activities, governance and process improvement of EA. I wrote a paper and added those a few years ago. Five activities—simple.

So for just a moment ignore those with partial views, axes to grind or strange garage-grown frameworks and let me explain the five simple activities of a complete enterprise architecture effort.

ENTERPRISE LEVEL ARCHITECTURE

The term enterprise refers to either a whole organization or some hard effort. Here we refer to the whole organization. This has nothing to do with coding information systems or other details, and everything to do with keeping an inventory of all the important features in the enterprise to be transformed and updating this based on plans. It also involves keeping a schedule (roadmap, transition plan) for efforts to change the enterprise. This level supports the portfolio management efforts encompassing all transformational investments (programs, projects) in the enterprise—all of them.

Volume 1: Enterprise Level Architecture

SEGMENT LEVEL ARCHITECTURE

A "Line of Business" can be a product line or a line of services or some mix. A "Segment" is either one of those or some other large internal effort used across a wide range of lines. The segment architecture describes things like the customers (or stakeholders), the value chain, the logistics chain, the distribution chain, the production line, etc. These usually correspond to a "Program" and so segment architecture usually supports "Program Management." Most importantly, this activity must propose the business cases for the improvements to be funded in the portfolio and implemented in real projects.

SOLUTION LEVEL ARCHITECTURE

The solution is some system created to effect transformation. In changing the organization or the line of business, something must often be automated, centralized, decentralized, constructed, moved or otherwise revamped. The solution architecture describes how that is built, moved, changed etc. Each such thing is a system and a project to be completed.

ENTERPRISE ARCHITECTURE GOVERNANCE

To make all this work you must have a governance structure to tie architecture with real implementation. Otherwise all the stray cats go their own way. You need at least three levels: to approve the portfolio decisions, to approve the business cases to change the segments, and to approve the changes in the solutions (systems).

ENTERPRISE ARCHITECTURE MATURITY MANAGEMENT

All these things are processes. The organization needs some means to manage, standardize and improve these processes.

CONCLUSION

The Five Activities Model is a simple way to understand enterprise architecture.

1.3 ENTERPRISE, SEGMENT, SOLUTION, JAN 14, 2015



FIGURE 1 THREE LEVELS OF ARCHITECTURE FROM 2007 FEA PRACTICE GUIDANCE OF US GOVERNMENT OMB

This section will describe the basic differences in the three levels of architecture presented first in early material on the FEAF and FEA. The three levels were again described by Burk in the 2007 and 2008 FEA Practice Guidance. This model is extremely important in differentiating the types of work in architecture and minimizing redundancy of effort.

The descriptions here are based in part on my own understanding of architecture and experience. For other views, you might check FEA practice guidance, the early FEA documents on establishing enterprise architecture and FEAF v1.1.

I find that this old material is poorly understood outside DC. Even in DC, some practitioners have an inadequate understanding due to lack of education or training. Consequences of mashing the levels together with fuzzy thought processes include less effective architecture, reduced cost effectiveness, poor clarity, redundancy and excess work. Therefore, I find this material important to all practitioners.

ENTERPRISE LEVEL

As shown in the accompanying image, the enterprise level of architecture is intended to be shallow but broad. The intended scope is the entire enterprise—the complete agency, department, corporation or whatever you are charged with. It is focused on strategic outcomes based on strategic planning. The process of ensuring investments and architecture support strategy is called alignment.

The enterprise level of architecture supports the choice of transformation investments. In the Project Management Body of Knowledge (PMBOK) this activity is described as portfolio management, and in the US Government it is called Capital Planning and Investment Control (CPIC). Transformation expenditures in EA are treated as investments and are expected to produce a return on investment (ROI). Comparative management of investments ensures high ROI and controlled risk.

Volume 1: Enterprise Level Architecture

To minimize unneeded depth (detail) and maximize utility, simple inventories of the major elements of the enterprise are kept at the enterprise level (composition). Relationships between elements of the inventories are kept (structure) to understand the effects of change. By comparing the current enterprise to the target enterprise (the composition and structure after investments are applied), you can determine remaining gaps.

Other than inventory lists and their relationships, the main artifact at the enterprise level is the transition plan or roadmap, a schedule of initiation and completion of each investment leading to the target state. (One good practice is to include stage gates, color coded for systems development life cycle (SDLC) stages and initial operating capability/full operating capability (IOC/FOC) on the investment lines of this schedule.) Artifacts should not include the types listed for lower levels of architecture, as these would be redundant, unless a clear need exists.

Vision, standards, principles and other guidance are commonly produced at this level for consumption by the levels below.

For more on a minimalist approach to the enterprise level see:
<https://www.linkedin.com/pulse/20140727145732-86002769-very-lean-enterprise-architecture?trk=mp-reader-card>

SEGMENT LEVEL

The segment level of architecture is less broad and more detailed than the enterprise level. It is also wider and less deep than solution architecture. The segment level is focused on the operational mission and on operational plans. One primary purpose of this level is to produce the business plans that propose new transformation investments (to be reviewed and selected at higher levels). The segment level also introduces customer focus and ensures individual systems add value to the operations.

The segment level describes lines of business. This would include the products that compose a product line or the services that compose a line of services. It would also include the mix of products and services in a line of business.

The governance body that most often appears at this level is that which makes stage-gate review decisions, which oversees lower systems engineering and subsumed solution architecture. Some SDLC context is often applied.

Coverage might include the supply chain, the manufacturing line, the value chain, the distribution chain, markets and customers. Segment architecture is best when focused on the value delivered to the customer, or in government, the value delivered to the citizen.

Various operational diagrams are the main artifacts of segment architecture. The value chain diagram is of particular note. The key artifacts do not include redundant listed inventories of what exists in the enterprise nor roadmaps.

Three kinds of segments are often described. The first includes all the mission segments, a.k.a. the core business of the organization. The second category includes all support operations, such as human resources. The third includes any internal initiatives to provide a common resource to the organization, such as an enterprise service bus (ESB) in IT or a fleet of cars and trucks for non IT.

Volume 1: Enterprise Level Architecture

Each may have many component solutions implemented as projects, so the segment level can be said to correspond to the program level in the PMBOK.

For more on a customer focused approach to Segment Architecture see:

<https://www.linkedin.com/pulse/20140727163249-86002769-customer-centric-enterprise-architecture?trk=mp-reader-card>

SOLUTION LEVEL

The solution level of architecture describes the particular detailed implementation plans of one project or investment. Often this may be produced by the contracted company implementing the plan, unlike the levels above. Only at this level is discussion of servers, virtual servers, programming languages and features (Struts, Hibernate) appropriate.

The governance body most often associated with this level of architecture is the CCB (configuration control board). Decisions supported by this level of architecture are considered tactical in the enterprise context.

A wide range of artifacts are possible at the solution level describing operations, business process, databases, software structure or service-oriented architecture (SOA) services, component applications, ESBs, and other such details of implementation. These artifacts should not be redundantly reproduced at higher levels. Higher level artifacts are commonly referenced.

Any solution exists within the context of improvement of a segment.

INTEGRATION

In the enterprise repository the segment artifacts are commonly attached to the enterprise. The solution artifacts are attached to the segment in the EA repository as well. Segment artifacts are filed and kept together by some mechanism in the repository, as are solutions. Repository tools such as Trough Architect (tm) are designed to do precisely these things.

In a medium or large enterprise, different teams may produce different instances at different levels of architecture. The enterprise level is most often reserved for the employees of the enterprise. This solution level is often contracted out with the solution, producing innovation and other advantages. Guidance on these different levels helps to streamline these distributed efforts.

TERMINOLOGY

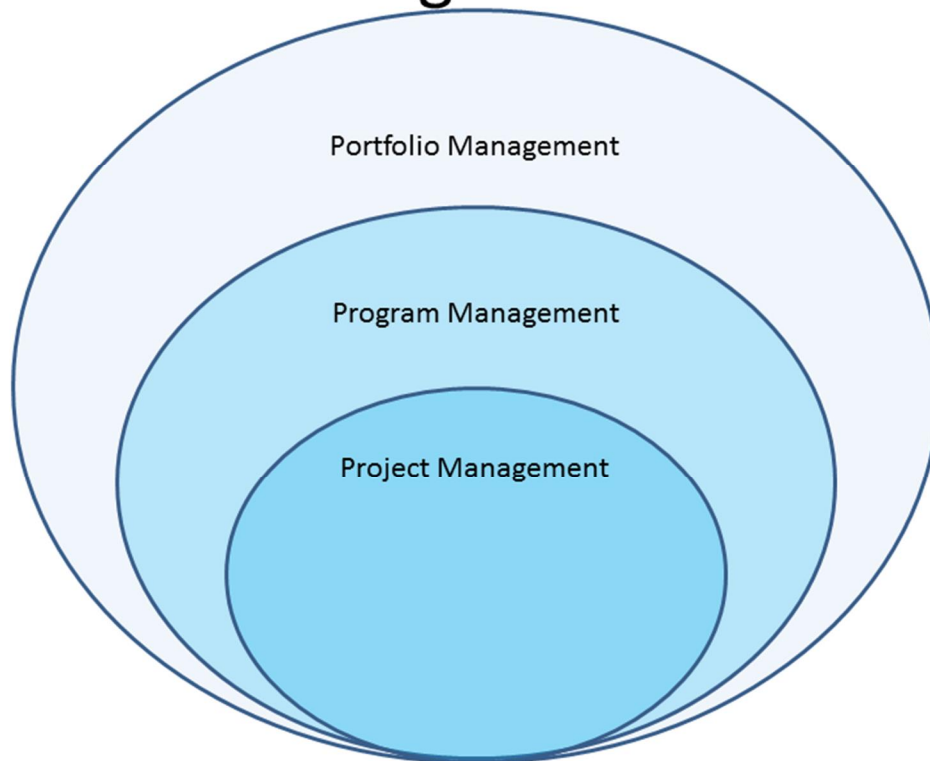
In a loose sense all three levels are referred to as enterprise architecture. In a strict sense, only the enterprise level is included in that term.

I have written a paper connecting this 15-plus-year-old model with the two other most common activities, EA governance and EA internal practice maturity. You can find that here:

http://www.unauthorizedprogress.com/images/EA_as_5_activities_2014.pdf

I hope this helps.

PMI Management Levels



In the previous section, we saw the three levels of enterprise architecture described by Burk at OMB in 2006 and originally introduced in the early FEAF circa 1999. These have a direct correspondence to the three levels of management described by the Project Management Institute™ (PMI) that are the fundamental subject matter of the PMP™ certification.

PORTFOLIO MANAGEMENT

The portfolio management activity is described by PMI as responsible for business leadership, alignment, value orientation, program selection and portfolio adjustment. This corresponds closely to the enterprise architecture activities described in US OMB Circular A-130 and described by OMB/Burk in 2006.

PROGRAM MANAGEMENT

PMI describes the program management activity as providing business sponsorship, ownership of benefits, benefit streams, comprehensive ownership of the business system, and multiple projects. This corresponds well to descriptions of segment architecture and the improvement activities of a line of business.

PROJECT MANAGEMENT

Volume 1: Enterprise Level Architecture

Project management is described by PMI as providing delivery of capabilities, budget and schedule. Solution architecture as commonly describes support those items. This includes descriptions by Burk at OMB.

MERGING

Architecture Level	Scope	Detail	Impact	Audience	Customer Management Level
Enterprise Architecture	Corporation or Agency	Low	Strategic Outcomes	All Stakeholders	Portfolio Management
Segment Architecture	Line of Business	Medium	Business Outcomes	Business Owners	Program Management
Solution Architecture	Function or Process	High	Operational Outcomes	Users and Developers	Project Management

If we merge the information in the OMB table (previous section) with the PMI information, we get a table like the one above. It implies that the enterprise architecture activity supports the portfolio management activity and the portfolio manager. Further the segment architecture activity supports the program manager. Lastly the solution architecture activity supports the project manager.

While these are not absolute rules embedded in any law or policy, they seem to be important guidelines.

MEASURING SUCCESS

Customer Management Level	Architecture Level	Scope	Detail	Outcome Measures
Portfolio Management	Enterprise Architecture	Corporation or Agency	Low	Strategic Goals & Objectives
Program Management	Segment Architecture	Line of Business	Medium	Organizational Performance Measures & KPIs
Project Management	Solution Architecture	Function or Process	High	MOPEs, MOPs and KPPs (INCOSE)

If we add common material on how success is measured to the appropriate levels, we get the table shown above. The correspondences here are rough, as there is overlap between the system

Volume 1: Enterprise Level Architecture

engineering measures of the International Council on Systems Engineering (INCOSE) and the common business nomenclature of performance indicators and the Key Performance Indicator (KPI) versus the INCOSE Measure Of Effectiveness (MOE).

Ignoring the semantic overlap, there appears to be a hierarchy of measures that can be used to measure the success of management and architecture.



Are you really a strategic thinker? Is your plan really strategy? Probably not, based on the predominance of mislabeled plans and concepts: Many use the word "strategic" as a synonym for "important." While strategy is widely acknowledged to be important, the words are not synonymous. Those who misunderstand the term or who misuse it are unlikely to produce strategy.

STRATEGY

Both time-frame and scope are associated with strategy. If it affects the entire organization and covers a period of years, it may be strategy. Examples of strategy include what markets you will compete in and which you will exit; what are your competitive advantages shared across the company; where you will invest in capacity and where you will divest; and the fundamental purpose (mission, goals) of your company or organization.

TACTICS

Tactics involve point approaches to local problems or situations. Tactics may be reusable for a common problem or situation. Tactics are usually rapid compared to strategy and do not describe activities covering years before fruition. Examples of tactics are Standard Operating Procedures (SOPs) and choice of and purchases or acquisitions of services or products.

OPERATIONAL THINKING

This lies between tactics and strategy, affecting perhaps an entire product line but not the organization or the business processes used repeatedly and changes to them. Examples may include new features or improved performance of a product or a single line of products among many.

MISUSE

Now let's examine some common misuse of the term "strategy." A vendor wants you to have a "mobile strategy." This may well be strategic to the vendor, who sells mobile services or devices, but it is not about your market positioning, your markets, or your major investment areas. It is at best operational to you and perhaps tactical. Everyone is using this stuff; there is no competitive advantage

Six Sigma or Lean or Agile are said to be strategic and may provide competitive advantage. Adoption and implementation of these may rise to a strategic goal to provide competitive advantage, but once adopted these are operational issues.

STRATEGY FORMAT

In the US Government it has become common to create recurring yearly strategies in the form of a list of broad goals, subdivided into concrete objectives, perhaps associated with some performance measures. Supporting policies are often not included (perhaps due to the complexity of their approval). Sequences of actions are left to operational plans. In commercial use a strategic plan may commonly include all three and are more often confined to a single issue.

CONCLUSION

Perhaps the quickest way to indicate your strategic irrelevance is to improperly indicate your tactical advantage is strategy. Those trained in strategy can spot the difference. Try to use the terms correctly and you may be better respected by your audience. If you are a CxO or vendor, or anyone between, misuse of the term "strategy" will likely hurt you more than helping you.

SECTION 2: WHAT IS ENTERPRISE ARCHITECTURE?

[Section 2: What is Enterprise Architecture?](#).....20

[2.1 Enterprise Architecture Origins, June 22, 2014](#).....22

[2.2 Enterprise Architecture Concepts, June 22, 2014](#).....27

[2.3 Enterprise Architecture Scope, August 16, 2014](#)35

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[2.10 What is Enterprise Architecture, Part 1, June 22, 2014](#).....55

[2.11 What is Enterprise Architecture, Part 2, June 22, 2014](#).....59

[2.12 What is Enterprise Architecture, Part 3, June 22, 2014](#)62

The first three sections describe fundamental information on origins, concepts and scope of enterprise architecture. The next two describe its purpose from two viewpoints. The section on transformation methods draws a clear line between discontinuous and continuous efforts and approach. The next sections tie enterprise architecture to the portfolio and the budget. Lastly some early and incomplete poll questions asked of various experts on LinkedIn™ are discussed.

QUESTIONS FOR SECTION 2

1. What other stories have you heard regarding the origins of enterprise architecture? Do you know of additional facts?
2. This volume describes the narrow meaning of enterprise architecture, one level not three. How would you describe the difference to a recruiter or hiring manager?
3. Do you agree with the statements of purpose of enterprise architecture? Which one is better?
4. If Agile and DevOps are continuous methods, how can discontinuous efforts like EA be jammed into their continuous schedules? Will that work well?
5. Can enterprise architecture succeed in transforming the enterprise without CPIC (Portfolio Management) and ties to the budget?
6. How would you answer the poll questions in the “What Is Enterprise...” section?
7. Department of Defense Architecture Framework is associated with a process called the Joint Capabilities Integration and Development System (JCIDS). Like the enterprise level architecture efforts described here, JCIDS determines the set of transformative efforts for the Department of Defense. Lists are maintained for all the different system architectures, for standards and other items associated with JCIDS. JCIDS and FEA are comparable and serve similar functions. Which is better? Which has more rigor? Is JCIDS applicable to

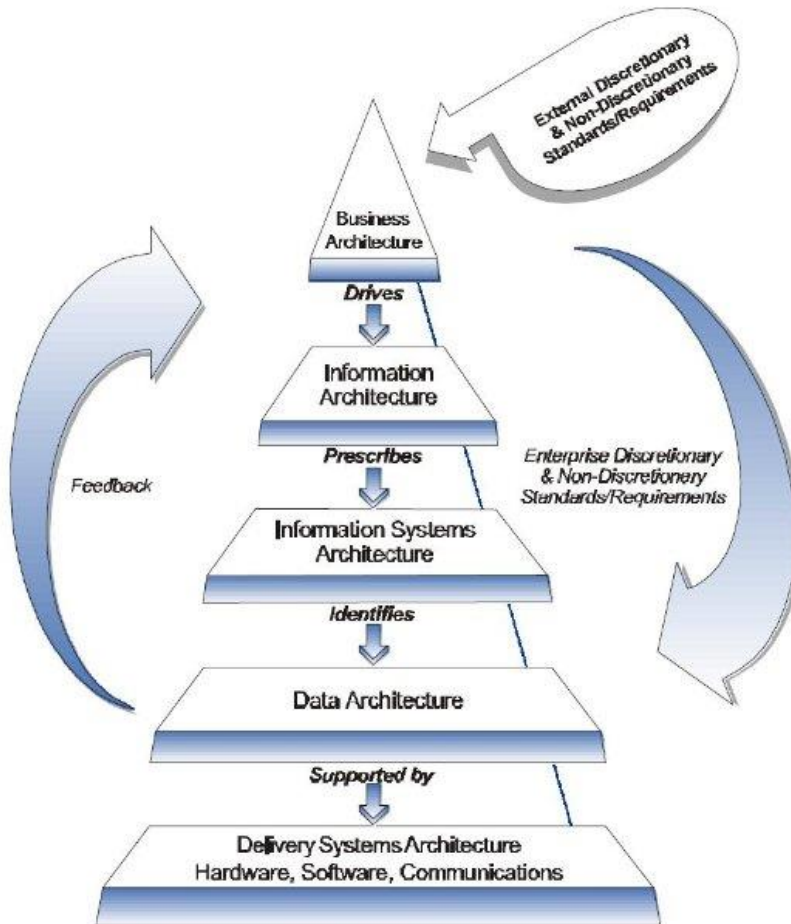
Volume 1: Enterprise Level Architecture

civilian government? Should ROI or the opinion of generals be the basis of transformative investment decisions?

2.1 ENTERPRISE ARCHITECTURE ORIGINS, JUNE 22, 2014

The first published (inside or outside the US, commercial or public sector) use of the term “enterprise architecture” occurred in a Federal Government document on system integration. In

Exhibit 1, NIST Enterprise Architecture Model



chapter seven of that document Bradford Rigdon stated, “This panel addressed the need of architectures and standards in supporting information management throughout an enterprise.” And shortly after, “This paper takes a broader view, and describes the need for an ‘enterprise architecture’ that includes an emphasis on business and information requirements.” And again, speaking of the scope of the architecture, “The Business Unit may portray either a total corporate entity (that is the enterprise is the business unit) or a corporate sub-unit.”

These statements occurred while others, including John A. Zachman, were still discussing individual large integrated systems in the enterprise. But this new conception was apparently different, a comprehensive view of all the

FIGURE 2 IMAGE COURTESY US GOVERNMENT, NIST SP 500-167.

inventory. So what did Zachman know and when did he know it?

“WITH INCREASING SIZE AND COMPLEXITY OF THE IMPLEMENTATIONS OF INFORMATION SYSTEMS, IT IS NECESSARY TO USE SOME LOGICAL CONSTRUCT (OR ARCHITECTURE) FOR DEFINING AND CONTROLLING THE INTERFACES AND THE INTEGRATION OF ALL OF THE COMPONENTS OF THE SYSTEM. THIS PAPER DEFINES INFORMATION SYSTEMS ARCHITECTURE BY CREATING A DESCRIPTIVE FRAMEWORK FROM DISCIPLINES QUITE INDEPENDENT OF INFORMATION SYSTEMS, THEN BY ANALOGY SPECIFIES

Volume 1: Enterprise Level Architecture

INFORMATION SYSTEMS ARCHITECTURE BASED UPON THE NEUTRAL, OBJECTIVE FRAMEWORK THE DISCUSSION IS LIMITED TO ARCHITECTURE AND DOES NOT INCLUDE A STRATEGIC PLANNING METHODOLOGY.” —ZACHMAN 1987

This was all about building a system.

According to “The Zachman Framework Evolution” by John P. Zachman, © 2009–2011, John P. Zachman, Zachman International, Inc. (nice job John), John A. Zachman (John P.’s dad, for any who don’t know), first began labeling his internal notes on the framework as “ENTERPRISE ARCHITECTURE – a framework.”

Before that, consistently, it was “A Framework for Information Systems Architecture.”

As far as I know, John A. was, before 1989ish, like most of us at the time, mainly concerned with bidding, proposing, designing and implementing complex large systems for customers.

Go see it here, at the REAL Zachman website:

<http://www.zachman.com/ea-articles-reference/54-the-zachman-framework-evolution>

(The Zachman International site is no longer associated with John A. or P. Zachman. Various exaggerated claims by those parties owning that Zachman International site probably should be ignored by the serious student of EA.)

So what happened between 1987 and 1993?

PLEASE NOTE: The 1993 event was in John A.’s INTERNAL NOTES! He didn’t publish anything in 1993 as far as I ever saw, and his bibliography does not mention any 1993 publications.

John A. contributed to three big things between 1987 and 1993.

- A paper with John Sowa in 1992.
- A forward to Spewak’ s book in 1992.
- NIST SP 500-167 and the associated conference.

Let’ s examine those. In 1992, J. Sowa and J. Zachman published “Extending and formalizing the framework for information systems architecture.”

FROM THE ABSTRACT:

“JOHN ZACHMAN INTRODUCED A FRAMEWORK FOR INFORMATION SYSTEMS ARCHITECTURE (SA) THAT HAS BEEN WIDELY ADOPTED BY SYSTEMS ANALYSTS AND DATABASE DESIGNERS. IT PROVIDES A TAXONOMY FOR RELATING THE CONCEPTS THAT DESCRIBE THE REAL WORLD TO THE CONCEPTS THAT DESCRIBE AN INFORMATION SYSTEM AND ITS IMPLEMENTATION. THE ISA FRAMEWORK HAS A SIMPLE ELEGANCE THAT MAKES IT EASY TO REMEMBER, YET IT DRAWS ATTENTION TO FUNDAMENTAL DISTINCTIONS THAT ARE OFTEN OVERLOOKED IN SYSTEMS DESIGN. THIS PAPER PRESENTS

Volume 1: Enterprise Level Architecture

THE FRAMEWORK AND ITS RECENT EXTENSIONS AND SHOWS HOW IT CAN BE FORMALIZED IN THE NOTATION OF CONCEPTUAL GRAPHS.”

The focus is still building (bidding, proposing, designing) an information system targeted for the customer’s real business needs. It was good stuff. It does not use the term “enterprise architecture.”

Also in 1992 John Zachman wrote a foreword in Spewak’s landmark book “Enterprise Architecture Planning.” This book was about planning all the systems in the enterprise.

Whoa—now we seem to be close to pay-dirt. This is real EA: the client managing all the client’s information systems in the entire client enterprise. If you haven’t read it, you should.

So is this the first time John A. Zachman was associated with this OTHER concept: Not building a better information system as a vendor but managing all the information systems you own as a client? No.

Spewak’s work was revolutionary. He knew how to proceed, step by step, to inventory and manage all the information systems you owned. At that time, he was almost the one guy who did. He wrote the book that told everyone else how to do it.

John A. has a very methodical and thorough approach. He has NEVER made excess claims himself that I have ever heard of. He developed his concepts one thorough step at a time.

When John A. Zachman published in 1987, it was a breakthrough. Many of us were building systems, and we were all engaged in the system engineering of optimizing the solution. The Zachman Framework gave us a generalized model to build systems well. This was incalculably valuable.

I read Zachman 1987 about 1989 or 1990 I think. I remember thinking something like, “Gee this is general. Maybe too general, you could analyze anything in it! But it definitely captures the problem space. I like it.”

So where did this idea of managing all the information systems in the enterprise, of a client inventorying and managing all their IT systems as a set, come from?

The National Institute of Standards and Technology (NIST) Architectures and Standards Committee, 1989:

“This panel addressed the role of architectures and standards in supporting information management throughout an enterprise.” (From their overview.)

We are no longer discussing the construction, design, bidding or proposing of an individual information system optimized for business needs. This is not the same thought stream as John Zachman. This is alien to his practice, as a vendor.

MORE FROM THE COMMITTEE: “THE BUSINESS UNIT MAY PORTRAY EITHER A TOTAL CORPORATE ENTITY (THAT IS THE ENTERPRISE IS THE BUSINESS UNIT) OR A CORPORATE SUB-UNIT. ARCHITECTURE AT THIS LEVEL ESTABLISHES A FRAMEWORK FOR SATISFYING BOTH

Volume 1: Enterprise Level Architecture

INTERNAL INFORMATION NEEDS AND DATA NEEDS IMPOSED BY EXTERNAL ORGANIZATIONS. THESE EXTERNAL ORGANIZATIONS INCLUDE COOPERATING ORGANIZATIONS, CUSTOMERS, AND FEDERAL AGENCIES....”

Yes, this was a corporate, not a Federal agency viewpoint.

...And now for another concept often attributed to Zachman that originated with the NIST committee: “Creating an architecture for... the enterprise enhances the enterprise’s ability to guide decision making, to manage change, to communicate the organization’s business goals, objectives and policies up and down its hierarchy and across its functional components.”

John A. Zachman definitely heard the new concept. He was on the committee and contributed. However, he was far from the only (or the loudest) voice from what I have heard.

So in 1989, John A. Zachman seems to have trotted home, methodically completed the documentation of his brilliant systems design work through 1992, and began simultaneously incorporating his framework and thinking in with this new discipline, this new process, this new need.

Hey, the systems design thing was a bigger deal initially. More money was in that space; the problem loomed larger then. It was flatly MORE IMPORTANT at the time. I WOULD HAVE DONE THE SAME THING!

As I understand, it he was initially a bit annoyed that they did not pick his framework over the Rigdon committee framework (completely different, corroborating that John A. did not dominate the committee in any way). His framework was more general, after all. But this is all rumor. I did not get to go to Florida, to the big committee, nor to Bethesda for some of the meetings.

The NIST framework had an inherent flow or process. It was smaller, more targeted. It had a clarity, and it was distinguished as different befitting the different purpose of this new approach. Later it would be incorporated into the main Federal policy defining EA, along with its thinking.

Next: Zachman & Spewak’s revenge in the FEAF. (OK, allow me a bit of dramatization here.)

OK, the FEAF. It is 1998, and the top policy on EA is based on the NIST framework.

But the FEAF 1.0 is published in 1998, and FEAF 1.1 in 1999. All of the supporting logic is based on work from Zachman and Spewak. A nifty new marketing style diagram is added in, emphasizing process, standards, and a pyramid sorta structure with four levels (not five), so take that NIST (Ira says he first drew the pyramid)! Diagrams from Spewak’s book are everywhere; the four-level structure is derived from Zachman’s columns.

The contributors look like a who’s who of government technical leadership and EA founders. This thing is profound. After v1.1 it stands for over a decade, unchanged! While the Department of Defense Architecture Framework (DODAF) is concrete and solution oriented and good engineering, the FEAF is oriented to the portfolio of systems in the enterprise and is full of strategic linkage and alignment ideals and good business. They are as different as one could imagine.

Volume 1: Enterprise Level Architecture

(Do not confuse the Federal Enterprise Architecture (FEA), a body of metamodels, guidance and policy, with the FEAF. Read the FEAF if you never have, it is very interesting.)

Note: Zachman is widely credited with creating the concept “enterprise architecture,” but not by himself. It seems to have been created at an NIST committee.

2.2 ENTERPRISE ARCHITECTURE CONCEPTS, JUNE 22, 2014



FIGURE 3 THIS IS THE LOGO AUTHORIZED FOR USE BY ALL FEAC CERTIFIED ARCHITECTS.

Enterprise architecture is widely misunderstood, and there is a deficit of trained and educated architects that can conceive of the full scope. There are several basic concepts you should be aware of in understanding enterprise architecture. Different schools of thought treat these differently, some including this and excluding that as adjacent, but they are each part of that picture. These concepts include:

- Strategic Planning
- Implementation
- Architecture
- Vision
- Alignment
- Transformation
- Strategic Advantage
- Technology
- Line of Business
- Frameworks
- Artifacts
- Business Processes
- Levels
- Areas
- Governance
- IT Investment
- Return on Investment
- Performance
- Portfolio
- Systems
- Lifecycle
- Integration

If your enterprise architects do not see the full picture and do not understand these basic concepts, you are not getting the full value of enterprise architecture. If you are an enterprise architect and do not see the full picture or do not comprehend how these basic concepts relate to your practice, you are not delivering the full value to the customer. As training, education and certification improve, the full picture should, over time, become better understood.

STRATEGIC PLANNING

Enterprise architecture is closely associated with strategic planning or IT strategic planning. Some view enterprise architecture as planning. A common main output of the enterprise architecture activity is a transition plan (a.k.a. roadmap or transformation plan).

Examples:

Steven H. Spewak's book "Enterprise Architecture Planning, Developing a Blueprint for Data, Applications and Technology" (ISBN 0-471-59985)

Another book: Jeanne W. Ross et. al., "Enterprise Architecture as Strategy: Creating a Foundation for Business Execution" (ISBN 1-59139-839-8)

The top policy for enterprise architecture of the US Federal Government, OMB Circular A-130, transmittal 4, identified strategic planning as a direct input to enterprise architecture.

IMPLEMENTATION

Implementation of something is why you do an architecture. If you are implementing nothing there is little need to do an architecture. Without implementation, the ROI for architecture is quite restricted, consisting of cost savings for what you did not implement.

Volume 1: Enterprise Level Architecture

Examples:

John A. Zachman: “During the 1980’s, I became convinced that architecture, whatever that was, was the thing that bridged strategy and implementation.”

ARCHITECTURE

Architecture is about designing something to be constructed. It is a primarily visual practice communicated through drawings and specifications.

DEFINITIONS OF ARCHITECTURE (AR·CHI·TEC·TURE \ˈÄR-KƏ-,TEK-CHƏR\)

MERRIAM WEBSTER: 2A: FORMATION OR CONSTRUCTION RESULTING FROM OR AS IF FROM A CONSCIOUS ACT ARCHITECTURE OF THE GARDEN> B: A UNIFYING OR COHERENT FORM OR STRUCTURE ARCHITECTURE>... 5: THE MANNER IN WHICH THE COMPONENTS OF A COMPUTER OR COMPUTER SYSTEM ARE ORGANIZED AND INTEGRATED

DICTIONARY.COM: 1: THE PROFESSION OF DESIGNING BUILDINGS, OPEN AREAS, COMMUNITIES, AND OTHER ARTIFICIAL CONSTRUCTIONS AND ENVIRONMENTS, USUALLY WITH SOME REGARD TO AESTHETIC EFFECT. ARCHITECTURE OFTEN INCLUDES DESIGN OR SELECTION OF FURNISHINGS AND DECORATIONS, SUPERVISION OF CONSTRUCTION WORK, AND THE EXAMINATION, RESTORATION, OR REMODELING OF EXISTING BUILDINGS.

VISION

Architecture is commonly considered to be a visual process. In architecture, it is common to produce a “vision” or picture of the future state. Enterprise architecture also commonly produces a vision of the future (a.k.a. target or to-be) state. It is this vision that is commonly used to convince stakeholders to buy in to the direction and process of the architecture.

Examples:

- In The Open Group Architecture Framework (TOGAF) there is a phase named “vision.”
- In the FEAF one output is a vision.
- In the DODAF, the OV-1 CONOPS diagram provides a visual depiction of the future state, essentially a vision.

ALIGNMENT

Alignment in enterprise architecture is when all the efforts “line up” to support the organizational strategy, or when lower level detail supports higher level architecture. When all the artifacts agree, you have “alignment.” Alignment is often checked by governance.

Examples:

One FEAF artifact, the “line of sight diagram,” is a depiction of the project linked through improved performance measures to business outcomes and the organizational strategic goals.

TRANSFORMATION

Transformation (a.k.a. business transformation or transformation of government) is the concept of changing the organization and its processes or structures to improve performance. Enterprise architecture is about transformation, expressing a current state a target state and a transition plan.

STRATEGIC ADVANTAGE (DIFFERENTIATORS, CAPABILITIES)

When a strategic goal or goals (a.k.a. “mission needs”) are supported by an executable implementation, the result is a “strategic advantage.” A strategic advantage may also be called a “differentiator” (commercial use) or a “capability” (mainly government use). Enterprise architecture is commonly and routinely associated with the production of these “capabilities” or “differentiators” that constitute a “strategic advantage.” Many are unaware of this linkage because of disparate terminology, but one common definition of enterprise architecture is “the link between strategy and execution,” which is again roughly synonymous. Michael Porter called this “competitive advantage.”

Examples:

- TOGAF 9 includes a section of capabilities based planning
- DODAF is tightly associated with Joint Capabilities Integration and Development System (JCIDS).
- DODAF 2.0 includes a capabilities metamodel.
- Zachman International provides seminars for using EA to produce business advantage.

TECHNOLOGY

DEFINITION OF TECHNOLOGY (TECH·NOL·O·GY [TEK-NOL-UH-JEE]
NOUN):

... 4. THE SUM OF THE WAYS IN WHICH SOCIAL GROUPS PROVIDE
THEMSELVES WITH THE MATERIAL OBJECTS OF THEIR CIVILIZATION.
(DICTIONARY.COM)

As the term is used here, technology is the basis of all strategic advantage, differentiators or capabilities. Initially EA was associated with only information technology but wider applicability has since occurred.

- Example:
In 1983 a classified program was initiated in the US intelligence community to reverse the US declining economic and military competitiveness. The program, Project Socrates, used all source intelligence to review competitiveness worldwide for all forms of competition to determine the source of the US decline. What Project Socrates determined was that technology exploitation is the foundation of all competitive advantage and that the source of the US declining competitiveness was the fact that decision-making through the US, both in the private and public sectors, had switched from decision making that was based on technology exploitation (i.e., technology-based planning) to decision making that was based on money exploitation (i.e., economic-based planning) at the end of World War II.

Volume 1: Enterprise Level Architecture

- Technology is properly defined as any application of science to accomplish a function. The science can be leading edge or well established and the function can have high visibility or be significantly more mundane, but it is all technology and its exploitation is the foundation of all competitive advantage. Technology-based planning is what was used to build the US industrial giants before WWII (e.g., Dow, DuPont, GM) and it was used to transform the US into a superpower. It was not economic-based planning.
- Project Socrates determined that to rebuild US competitiveness, decision-making throughout the US had to readopt technology-based planning. Project Socrates also determined that countries like China and India had continued executing technology-based (while the US took its detour into economic-based) planning and as a result had considerably advanced the process and were using it to build themselves into superpowers. To rebuild US competitiveness, the US decision-makers needed adopt a form of technology-based planning that was far more advanced than that used by China and India.

LINE OF BUSINESS, A.K.A. VALUE CHAIN OR VALUE STREAM

A “line of business” is a particular product line. The term is also applied in EA to any functional area, including human capital, financial management, or logistics. A line of business is often the basis of an architecture inside the enterprise and corresponds to the terminology “segment” used in Burk’s levels. Another term of similar use is “domain,” as in “domain architecture.” A “line of business” may be a mission area or profit center, or it may be a support function or cost center. In EA the idea is to give priority to those areas that are important to the mission or produce profit.

In enterprise architecture the line of business or segment or domain is the level at which most business process reengineering, value chain analysis, supply chain analysis, operational analysis etc. occurs. An example of this is the Federal Segment Architecture Methodology. Another example is the Business Transformation Architecture (BTA) effort at the Department of Defense (DoD).

FRAMEWORKS

In enterprise architecture the “framework” holds a special role. In my opinion this is because enterprise architecture practice began with competing vendors in system integration, not in academia. Each participating company produced some competing conceptual model, and later this practice was adopted by government to conceptualize various parts of the practice. There are different types of frameworks, applicable to different levels and layers and mechanisms in the scope of enterprise architecture:

- Frameworks for solution architecture (DODAF, TOGAF)
- Frameworks for enterprise level architecture (ZIF, FEAF)
- Frameworks for segment (Line of Business) architecture (FSAM, DODAF tailored)
- Frameworks for enterprise architecture maturity (EAMMF)
- Frameworks for sequence, such as an SDLC (INCOSE SDLC, IEEE SDLC, DoD SDLC, DHS SELC)
- Frameworks for data or information architecture (Martin’s Information Engineering, Oracle Case Method tm)
- Frameworks for business architecture (Hammer’s BPR)
- Frameworks for software architecture (Booch, SEI, UML)
- Frameworks for standards and infrastructure (COBIT)
- Frameworks for shared services (ITIL)

Volume 1: Enterprise Level Architecture

(Some believe in the ultimate “uber-framework,” a mythical super-method like the “theory of everything” in physics. Personally, I do not think frameworks should be expanded from their focus, where they are excellent, into areas of mediocrity. For the moment we must use multiple frameworks or parts of several. I suggest picking a minimum set and using them with improving maturity. Standard, public frameworks are superior to proprietary frameworks for which one must pay: Avoid being held hostage by vendors of frameworks with recurring fees or mandatory services.)

ARTIFACTS

Artifacts come in various types: 1) architecture & engineering; 2) drawings; 3) spreadsheets, and 4) documents. Artifacts are the concrete output (deliverables) of an enterprise architecture effort. Sometimes these may be embodied in data inside a tool so you can create new artifacts on the fly. Artifacts (and the facts or plans they represent) are reviewed and approved via governance.

BUSINESS PROCESSES

Enterprise architecture is the fusion of business and technology. This is accomplished in large part through business processes analysis and reengineering or continuous process improvement, the very same techniques used in human resources, operations management, logistics and supply chain management, Six Sigma, and total quality management (TQM).

The US Government defines enterprise architecture in OMB Circular A-130: “What is the Enterprise Architecture? (a) An EA is the explicit description and documentation of the current and desired relationships among business and management processes and information technology.” DODAF and derivatives include business process diagrams, and in DODAF these are labeled “OV-5” or operational view number five.

TOGAF identifies “Phase B” as business architecture, including business process analysis.

LEVELS

There are levels in Enterprise Architecture. In 2006 Dick Burk, Chief Architect at OMB at the time, identified that enterprise architecture has different levels. This important conflict de-conflicted endless arguments between architects at the tactical (solution) level and the strategic (enterprise) level. With the concept of levels in enterprise architecture practice, it is now possible to see that there are three different kinds of activity with different scope, possibly performed by three different teams (or more). Without this concept, your EA efforts may become tactical and without strategic impact or strategic but without concrete results.

LAYERS (A.K.A. COLUMNS, AREAS)

The concept of layers should not be confused with Burk’s concept of levels of enterprise architecture. In the NIST model five layers were identified (business, information, application, data, infrastructure), and these were modified for the FEAF framework as four levels (business, data, application, technology). Both are related to Zachman’s columns (all three images are from the FEAF where this is discussed). One could make a case that these layers relate to DODAF views as well. The concept of “layers” implies a flow from one to another, a precedence or order, as described in NIST. Each of these layers constitutes a different area or specialization in architecture and often a different member of the enterprise architecture team.

GOVERNANCE

In enterprise architecture governance is used in the sense of corporate IT compliance, in the sense of Sarbanes-Oxley or Basil II. IT systems must comply with various laws, policies, plans, standards and higher level architecture. Enterprise architecture artifacts and system engineering plans are reviewed by governance processes. Those processes vary by organization.

Conversely actual systems are checked for compliance via testing.

IT (INFORMATION TECHNOLOGY) INVESTMENT

For several years now information technology has been managed as an investment. It is seen not as a cost of doing business but as a means to improve operations. Information technology and IT systems have become massively expensive in large corporations and especially the US Federal Government and just buying some software because it seems useful is no longer justifiable. Each IT purchase is now managed as a means to effect organizational change, a way to make the organization perform. The cost is compared not to the system features and functions but to the improvement in organizational operations and the decreased operations cost or increased revenue that will result. This approach can be applied to any technology purchase, not just IT.

RETURN ON INVESTMENT

The purchase of more information technology is treated as an investment. To justify the investment there must be a return on that investment, payback. To calculate the return on any investment, including an IT investment, you list the tangible and intangible costs versus the tangible and intangible benefits. A document containing this information and making any ROI calculations is often called a Cost Benefit Analysis.

The benefits to the procuring organization are not system features but improved organizational operations. In the US Federal Government more benefits are intangible because it is politically infeasible to measure the dollar value of human suffering, starvation, death, or other things that may be affected by government operations.

PERFORMANCE

Enterprise architecture improves organizational performance using technology by leveraging technology investment. Organizational performance is made tangible by the use of performance measures. Performance measures may relate to money (cost, price), quality or timeliness (throughput, volume). Any product or service or entire company can be measured in these categories.

Any business process can be measured and improved. These improvements also fall in the three basic categories of money (cost, price), quality or timeliness (throughput, volume). When you automate or streamline some business process these measures change. Such a change in performance constitutes the return on investment of the automation.

A measurable change in measured performance indicators is sometimes called a "business outcome." When a new capability is operationally implemented you get a business outcome.

PORTFOLIO

How do you decide which technology improvements to make in your organization and which to cancel? If technology and IT procurement is treated as an investment, then you treat the question as a portfolio of investment. You perform portfolio management.

A portfolio of investment lists each investment, its cost, its level of return (return on investment), and its risk. You put the investment with the highest ROI at the top. Eliminate all the poor investments. Working from the top down, you draw a red line when you run out of budget for these investments. The investments above the line are what you fund, and those below are what you cancel.

As your investment proceeds you monitor that it performs as predicted. If the return drops or the risk spikes, you review the investment for cancellation.

SYSTEMS (THEORY & ENGINEERING)

For some time the western world believed that if you could list every part of a thing, you understood that thing. Ludwig Von Bertalanffy changed that with general system theory (GST). In GST things have interactions and you need to understand that. They have interfaces. Interactions may follow patterns, like strange attractors or cycles amenable to Fourier analysis, or they may have cybernetic feedback.

Some such systems with many interactions may be complex. If you build a complex system you may need means to control and specify so many parts that no one person can grasp the whole thing. You may need system engineering. It has means to manage complexity.

Systems may be defined, like boxes. You may treat the internals as unknown and just specify the interfaces, black boxes. You may see inside and treat them as white boxes.

The enterprise is a system. Each IT investment is a system. Integrated sets of IT are systems. EA is meaningless without the concepts related to systems.

LIFECYCLE

Systems have a lifecycle. Typically there is a system development lifecycle (provided by systems engineering) with stage-gates to mark major phases and transitions. The system is conceived, planned, developed, tested, operated and later disposed of. One system replaces another. All this takes time and planning. Without that one system will break down as unsupportable and you may be in a huge rush to replace it with anything, perhaps not the best replacement, and you may be willing to spend extra to do it. The results of planning are reflected in the enterprise transition plan.

Investments also have a lifecycle, with reviews. These mark the ROI and the breakeven points and should also be reflected in the transition plan.

INTEGRATION

Enterprise Architecture is a term initially coined within the context of addressing problems of system integration. To share information and support business processes from end to end, it is typical to integrate systems together. Some years ago manufacturing resource planning systems were connected to accounting systems and enterprise resource planning (ERP) resulted, for example. There is still a strong need to connect systems together, via SOA, EAI, ESB or other means.

Volume 1: Enterprise Level Architecture

When you take items vended as a system, like ERP, and connect them to other systems you get a system of systems.

2.3 ENTERPRISE ARCHITECTURE SCOPE, AUGUST 16, 2014

What is the total scope of Enterprise Architecture? Here is the answer to that question in line with the NIST, FEAF, FEA, and to a lesser extent DODAF, lines of thinking.

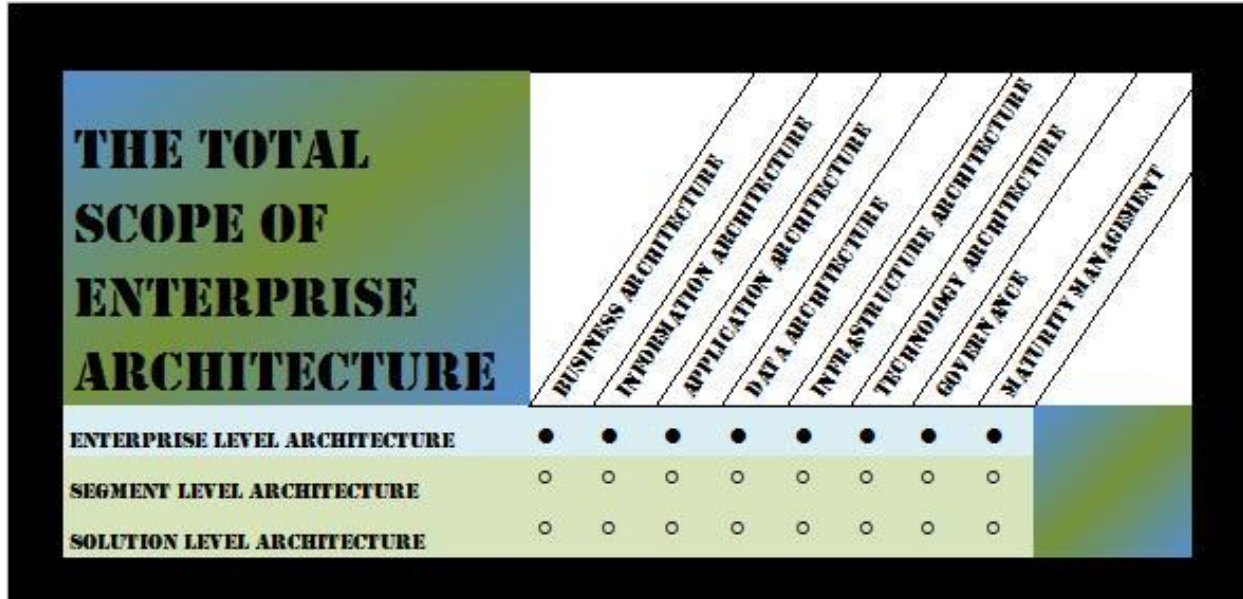


FIGURE 4 THE SUBORDINATE COMPONENTS OF ENTERPRISE ARCHITECTURE DEPICTED BY LEVEL

MATRIX EXPLANATION

In the matrix provided you will see three lines depicting the three levels of enterprise architecture as described in the FEA Practice Guidance from 2006. These are the enterprise level, the segment level and the solution level.

Across the top you will find columns for the different subordinate components of enterprise architecture. These are a combination of NIST and FEA elements, with governance and maturity management thrown in (in harmony with what I have explained elsewhere).

There is a **narrow definition of enterprise architecture**, only the enterprise level. You can see that all those areas apply to the enterprise level as subordinate components, as depicted by the solid circles.

There is a **broad or inclusive definition of enterprise architecture**, including the segment and solution level. You can see that all the component architectures equally apply to that, as depicted by hollow circles. This is the one used most often by recruiters who have no background in EA.

COMPONENT ARCHITECTURES

I will list the component architecture elements and some synonyms.

- Business Architecture is synonymous with business analysis in as far as the creation of business process diagrams for current and future states goes and some other depictions. You analyze the business and determine how it could run more efficiently.

Volume 1: Enterprise Level Architecture

- Information Architecture is as used in NIST. It refers to the analysis of data in motion, as moving between business steps and applications. This is either synonymous with or greatly overlapping both integration architecture and SOA. The use of this term in Web UX/UI design is different and signifies the movement of data from application to user or manual sub process—related and part of a bigger whole but different in detail.
- Application Architecture is synonymous with software architecture at the solution level. If you extend all the comp-sci and software engineering greatly, you encroach on the segment level, maybe on the enterprise level a bit. At the top level this is the portfolio of applications.
- Data Architecture is synonymous with schema design and analysis for relational databases, object databases, data marts, data warehouses, big data, no-SQL or whatever you have. All of it.
- Infrastructure architecture is synonymous with the network and server architecture, the storage architecture, the data center architecture, and all physical platform constituents including virtualization.
- Technology architecture is the selection of technologies uses in the enterprise (controlling total cost of ownership [TCO]), in the line of business or in the solution. This includes now and in the future.
- Governance is the conduct of or participation in configuration control boards, stage-gate review boards, portfolio investment control boards and similar structures.
- Maturity management is the process of managing and improving the methods used by all of enterprise architecture in the broad sense.

Left out is security architecture, as it may be viewed as integral to all the above.

SHALLOW SHELL

Obviously it would be difficult for one person to be competent in all these areas at any depth. Enterprise architecture is a shallow shell of understandings to be used by experts in these component architectures, allowing all to work together in a holistic sense. Enterprise architecture replaces none of the component architectures.

THUMB TACK PROFILE

A good enterprise architect will evidence deep knowledge of one or two component architecture areas and will also have the broad but shallow understandings of enterprise architecture itself, such as a framework.

NOT IN THERE

Please note that strategy is not included. In my experience, and in the FEA, FEAF and DODAF, the strategy is not produced by architecture but identified outside. Zachman said EA is the link between strategy and execution, or near to that, but that EA never produces the strategy. As far as I know, EA implements the strategy and does not create it.

CULTURE IS NOT EA

If you want to change corporate culture do not say you are performing EA as described by anyone originally. Values are in the same bucket. This is a proposed change, a new direction, and I do not know if it is good or not. Perhaps if culture and values support strategy it might fit somehow.

2.4 ENTERPRISE ARCHITECTURE PURPOSE, AUGUST 16, 2014

Sometimes people ask what the purpose of enterprise architecture is. Here is an answer, based on what I know.

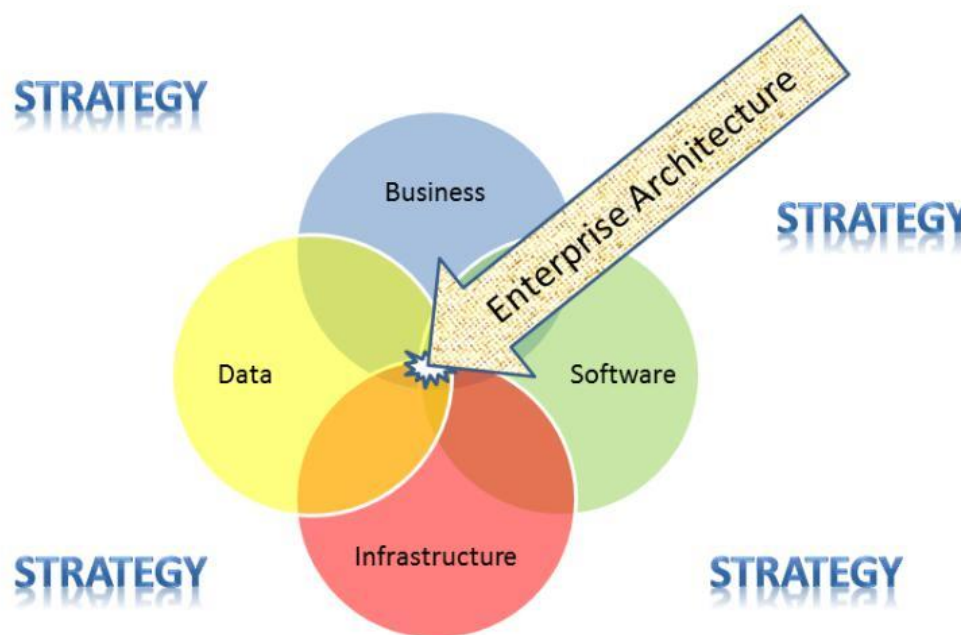


FIGURE 5 A DEPICTION OF ENTERPRISE ARCHITECTURE PURPOSE, BASED ON THE "4 PILLARS OF FEAF"

The purpose of enterprise architecture is to line up the assets of the enterprise to support a strategy or mission. In Zachman the assets are categorized under who, what, where, when, how and why. In NIST the categories are business, information (data in motion), applications, data and infrastructure. In DODAF the assets appear in system, operations, and service, technology and project views.

Most enterprise architecture asks you to measure the performance of the organization beforehand as a baseline and then after to show the improvement. There is an as-is state, a to-be state and a road-map of some kind. You are transforming the enterprise to produce better results. These better results refer to performing according to the strategy or mission.

Transformation includes all the assets, not just IT. That includes the business processes. If you need an airplane, then it includes the darned airplane. However, most business processes are improved

Volume 1: Enterprise Level Architecture

by the application of IT, by automation, so that is almost always central to transformation in practice.

The strategy or mission may be accompanied by other "drivers." In FEAF the drivers may be business or technical. If you need to include smartphones to aid the mission, that is a technical driver. If the Inspector General or the GAO says your US Government organization is screwing up in some way, that is a business driver. In a commercial organization, if your revenue is too low, that is a business driver.

Some simple tests to see if you are doing enterprise architecture:

- Are you transforming the enterprise, the organization, or what-not? No transformation, no EA.
- Are you implementing a strategic plan or mission statement? No strategic direction, no EA.
- Are you changing the business processes by analyzing and optimizing them? No processes, probably no EA.
- Are you focused on IT or is it just a means to automate and optimize processes and organizational performance? The latter is EA.
- Do you have no IT in your architecture? For it to be EA, you probably need both business and IT included. (Assuming the enterprise has IT.)
- Do you have a portfolio of transformation efforts and do you pick the ones with the best ROI? Definitely EA then.

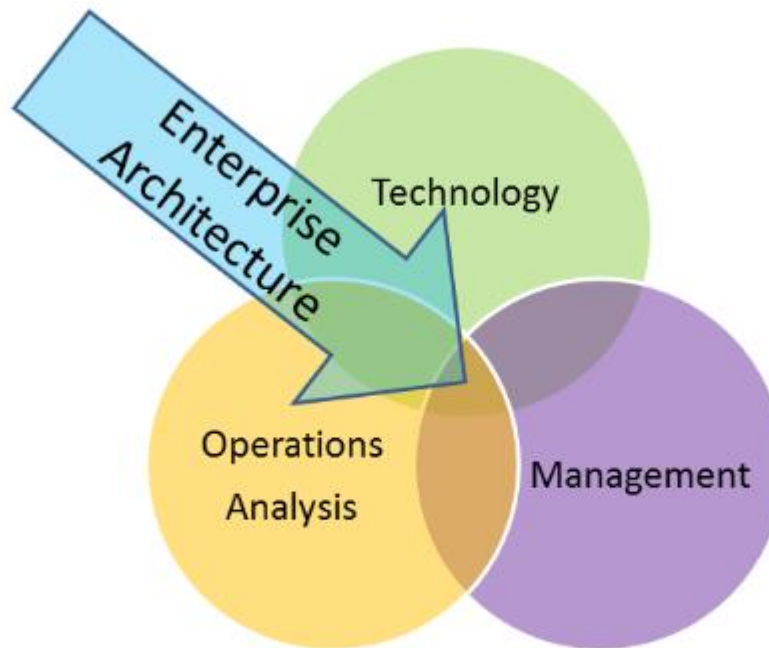


FIGURE 6 THIS IS A LATER DEPICTION EXPRESSING THE PURPOSE OF ENTERPRISE ARCHITECTURE AS TRANSFORMATION.

ENTERPRISE ARCHITECTURE

The study of enterprise architecture (specifically at the enterprise level) mixes management, technology and some operational analysis. It is not the study of software structure. It is not. Get over it. If you thought that you were wrong.

Examples:

- **National University:** You can get a Masters in Engineering Management with specialization in Enterprise Architecture from NU. I did that. All three areas are well covered.
- **Griffith University:** In Australia they have a university with a nice program in EA combining some management study and some technology study (too much software flavor for my tastes). Operational analysis classes are electives. Fair.
- **Penn State:** At Penn State you can get a Masters in EA. The program covers management and technology. It covers logistics and supply chain operations, but not enough business process analysis for my tastes. Fair.

So what do you need to know in these three areas I mention? Well EA is about transformation, keep that in mind. We are transforming the enterprise.

MANAGEMENT

Volume 1: Enterprise Level Architecture

You have to know about several things in this area.

- Strategy, as EA implements strategy (but does not produce the strategic goals of the organization)
- Portfolio management (usually implemented adjacent to EA but closely tied in)
- Budgeting (a wee bit)
- Planning and scheduling of huge efforts over years of time (transformation is often not rapid)
- Cost management, value management and/or ROI
- Business plans, reading and evaluation thereof
- Organizational change
- Governance

OPERATIONAL ANALYSIS

I broke this out as a separate category to emphasize it. In EA you have to know about the following:

- Business Process Reengineering and Process Improvement
- Supply chains, value chains, markets and customers, distribution
- Metrics
- Evaluation
- Alignment: efficiency and inefficiency, effectiveness and ineffectiveness
- Security

Vision: how the place will operate when you are done

Operational analysis is key to success. The point is to improve enterprise operations. Any technology employed is to improve enterprise operations. Management is targeted at the enterprise operations that must be improved.

TECHNOLOGY

This is always overemphasized. Further the specific areas EA is involved in are rarely made sufficiently explicit. Let's see if I can do better.

Integration and integration technologies: SOA, ESB, enterprise application integration (EAI), Manufacturing operations management (MOM), interconnection and interaction, workflow systems.

- Functional coverage of applications and solutions—what they do not how they do it; Identification of redundancy or gaps
- Data architectures, conceptual data models and overlaps in coverage
- Infrastructure, servers and networks and capacity
- Security
- Standards
- Management of a list of accepted or approved products
- Principles: what is good in a solution

If you are looking for more detail in the work you do as an architect, go to the segment (line of business) or solution level. It is not in here.

Volume 1: Enterprise Level Architecture

By making operational analysis explicit, it is possible to focus the dialog on operational improvement. This may allow a greater clarity in description of EA. It is an experiment in description, of a sort.

2.6 ENTERPRISE TRANSFORMATION METHODS, JULY 23, 2014

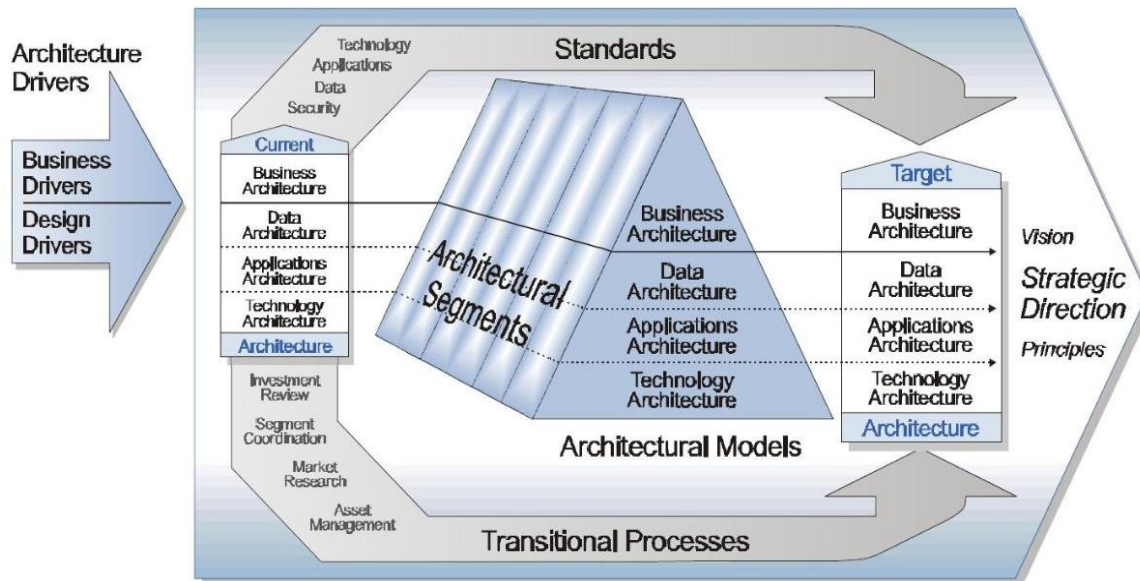


FIGURE 7 FROM US GOVERNMENT FEAF VERSION 1.1, 1999

Enterprise architecture is all about transforming the enterprise. It is the means (OMB Policy) by which US Government organizations are intended to conduct transformation to achieve higher organizational performance. State and local governments use it. Foreign governments use it. Commercial industry also uses it extensively. Unfortunately, it only works if you use it.

Transformation can be performed using continuous methods or discontinuous methods.

CONTINUOUS METHODS

Continuous methods take some process that exist and improve that process. Continuous methods can produce significant results if the current approach is operationally sound. Continuous methods include:

- Continuous Process Improvement
- TQM
- Lean
- Kanban
- 6 Sigma
- DevOps
- Agile

DISCONTINUOUS METHODS

Discontinuous methods create something where there was nothing before or completely overhaul a process. Discontinuous methods must be used if there is no present or operationally sound mechanism to perform the target function within the organization. Discontinuous methods include:

- Benchmarking
- Skunkworks
- New product line introduction
- Corporate reorganization
- Business process re-engineering

Volume 1: Enterprise Level Architecture

- Strategic initiatives (including the initial adoption of any selected continuous methods, above)

MISAPPLICATION

When these approaches are misunderstood, management will sometimes attempt to apply the wrong type of methods to the problem. For example, Agile will not help you create a completely new process. If you ask the users they only know the old process and cannot describe or specify the new process for software development in many cases. The reverse situation, where management takes viable operations and uproots them, is even advocated in some textbooks but is better handled by the introduction of continuous transformation methods. Misapplication of transformation methods can be a costly waste of time.

Misapplication is quite common and should be reversed as soon as possible to avoid catastrophic failures of transformation initiatives.

RESULTS

Proper application of transformation methods can result in dramatic improvements to organizational performance. FedEx introduced discontinuous transformation, centralized distribution hubs, and became the leader in overnight shipping. Amazon used discontinuous methods to revolutionize the book industry. Toyota used continuous transformation methods to dramatically improve product quality and sales. Ford later followed and avoided bankruptcy.

Continuous methods provide small, incremental improvements. The improvements of continuous methods repeat and accumulate. Continuous methods are evolutionary. Discontinuous methods can produce large, one time, revolutionary results. Discontinuous methods may be thought of as switching channels and continuous methods as fine-tuning.

RELATIONSHIP TO PROJECT MANAGEMENT

Portfolios, programs and projects are used to apply discontinuous methods. Continuous methods have no beginning or end; they are a cycle or process and are formally outside the paradigm of a "project."

RELATIONSHIP TO ENTERPRISE ARCHITECTURE

Enterprise architecture is used to manage and optimize discontinuous transformation, including the introduction of continuous methods. Enterprise architecture analyzes and identifies the proper portfolio of programs and projects to meet mission needs or strategic goals.

WORKING TOGETHER

Optimally a healthy large organization will have both discontinuous and continuous methods in active use, applied correctly. If you find an organization that is greatly out of balance on this you need not look further for a management problem. The enterprise architecture function might be absent, ignored, dis-empowered, or improperly implemented.

2.7 TRANSFORMATION INVESTMENT PORTFOLIO, SEPTEMBER 20, 2014

Transformation Investment Selection

Investment Name	Risk	Tangible Cost	Intangible Cost	Tangible Return	Intangible Return	ROI
Investment 1	High	1	Low	5	High	High
Investment 2	Low	2.5	Low	10	High	High
Investment 3	Medium	3	Medium	11	High	High
Investment 4	Low	2	Medium	9	High	High
Investment 5	High	4	Medium	12	High	Medium
Investment 6	Medium	3	High	8	Medium	Medium
Investment 7	High	2	Medium	4	Medium	Medium
Investment 8	Low	1	High	2.5	Medium	Medium

FIGURE 8 A DEPICTION OF THE TABLE USED TO DIRECTLY COMPARE INVESTMENTS PER THE CRITERIA DESCRIBED IN OMB CIRCULAR A-130.

Enterprise architecture is dependent on its primary corporate control for success. That control is portfolio management; let's briefly examine the portfolio management of transformational investments.

TRANSFORMATIONAL INVESTMENTS

In enterprise architecture each effort to transform the enterprise is treated as an investment. Each has a business case. The business case identifies the summary of the investment, the major risks, the costs, the returns and the total ROI. Investments have a lifecycle in which they are selected, then controlled, then evaluated after implementation (terminology taken from US Government CPIC).

Investments should be very large projects, programs, or sets of these. Investments should be broad in scope, spanning perhaps multiple organizational elements (and capabilities if used) to address the improvement of a complete line of business or cross-cutting measure.

RISK

The risk of an investment is a summary of all the individual risks, impacts and probabilities for that investment. You can "monetize" this by expressing the risk as the statistical EXPECTATION OF COSTS FOR MITIGATION. The subject of risk management is certainly outside the scope of this

Volume 1: Enterprise Level Architecture

small text, but the most important point is that it is managed here in portfolio management, in program management, and in project management. It is also managed in the scope of system engineering, especially in regard to technical risks. It is not particularly addressed within the scope of enterprise architecture itself.

TANGIBLE COSTS

The tangible costs are the quantitative identifiable costs of the investment, in terms of dollars. These costs for the transformation investment should be total lifecycle costs and not simply implementation costs or purchase price. Tangible costs should include all aspects of the transformation, including labor and reserves based on risk.

INTANGIBLE COSTS

The intangible costs of the transformation investment include all qualitative understanding of losses or expenditures related to the investment. This might include goodwill or reputation or lost opportunity.

TANGIBLE RETURNS

The tangible benefits include all quantifiable benefits accrued from the investment. In the Federal Government most of the benefits you might expect in industry do not apply, as sales, margins and revenue are not available. However, a few Federal agencies are funded by fees. The biggest remaining tangible benefit is cost savings from operations, which is often emphasized. It is good to save those taxpayer dollars.

INTANGIBLE RETURNS

Intangible returns are all those non-quantifiable benefits of the investment. In the US Federal Government, EA is all about the intangible returns, as performance improvements to business processes in quality and timeliness (and throughput) are all usually intangible. For example, reductions in complaints concerning immigration services would be intangible, as would speed of response in a natural disaster. Intangible returns are measured by performance measures or performance indicators.

RETURN ON INVESTMENT

This is the (returns minus the costs) divided by the costs. It is a calculated value. Where most returns are intangible, or where costs are largely intangible, it may be appropriate to substitute a qualified estimate of the ROI as high, medium or low. This often happens in the Federal Government.

INVESTMENT SELECTION

Early on, the best investments must be selected. Some selection criteria should be officially established and maintained. In the US Federal Government for example, the policy indicates that the highest ROI investments should be selected, without regard to risk.

In the graphic above I show the usual means to select investments. You line them up with in a table with the best at the top. You select the top several until you reach the budget, then stop. Some management reserve should be removed from the budget before calculation of selection. The red line in the graphic indicates the budget level. There are tools to automate this.

Volume 1: Enterprise Level Architecture

The idea is to remove as much subjective tinkering as possible, thus reducing management favoritism, fraud, waste, and abuse of funds.

INVESTMENT CONTROL

Selection only occurs once in a single investment's lifecycle. After it is selected, an investment is implemented and during implementation it is controlled. Control involves evaluating the program and project management that implements the investment, using tools such as earned value management.

INVESTMENT EVALUATION

Once the investment is in operation it is no longer controlled and the project or program manager is often sent off to implement something else. During operations and maintenance the investment is evaluated. In the US Federal Government evaluation is required yearly by policy. Evaluation involves measuring the performance measures or performance indicators and comparing them both to predicted performance in the business case and the history of performance improvement. In evaluation, when a transformation investment fails to perform as needed after a period of satisfactory performance an end-of-life evaluation should be made.

COMMON ERRORS

Common errors in this process include:

- Not organizing portfolio management as the top-level decision authority concerning investment. For example, elevating acquisition, a tactical concern, to a strategic level above portfolio management is a common error.
- Thinking small: investments are large and sweeping. A portfolio of hundreds of investments is unmanageable and only a few dozen should exist. Each of these should have clear strategic impacts larger than one capability or one performance measure or one project.
- Zombie investments: This is a term for those transformational investments that have not performed and for which funding is reduced to the point that they will never produce results of strategic impact. Zombie investments are common in organizations with weak management that cannot ever cancel a program or project. It is a practice that wastes money and resources.

CONCLUSION

Transformational investment management is often also called IT investment management because nearly all transformation initiatives involve business process improvement via automation. Concepts and tradeoffs are very similar to those in the PMBOK for portfolio management, with some small tweaks easily rectified. This is the top process for managing transformation in the enterprise, and EA cannot succeed without it.

This is a brief introduction to the subject of portfolio management for transformational investments. It is not intended as comprehensive.



FIGURE 9 REFERS TO A SCIENCE FICTION ANTHOLOGY EDITED BY HARLAN ELLISON

How many years would it take 1,000 monkeys with typewriters to reproduce the Magna Carta? It's an old joke, a truism really. You could also ask how many high-school physics students writing essays would it have taken to produce special relativity.

Let me try that another way: How long will it take an auditorium of average mid-level managers to produce a plan for dramatically improved enterprise performance? Will it help if you pack in more average mid-level managers? How about if we add in a former Big Five accounting firm pushing consensus, collaboration and group exercises? Yes, it may be cruel—but is it true?

INNOVATION DRIVES TRANSFORMATION

Effective transformation comes from innovation in some business process somewhere. Most often some new bit of technology causes a revolutionary change in how a process may be performed. Less often you can streamline a process, discarding excess steps, and produce improved results. Rarely do incremental evolutionary improvements produce sudden dramatic improvement. Those mid-level managers and their teams most often produce those incremental improvements.

REVOLUTION AND EVOLUTION

I have written in a previous section about the two categories of methods of transformation. You have discontinuous methods, produced by analysts (EA, BPR), and continuous methods of transformation improvement arising from the teams themselves (Lean, Agile, TQM). Both are needed, good, important. However, let's look at the discontinuous methods for a moment, the revolutionary transformation, and speak of it in a social sense.

DISCONTINUOUS REVOLUTION

We have already discussed that this discontinuous resolution does not come from mass consensus. It comes from brilliant, innovative, creative persons in small numbers doing deep analysis and thinking: one or a few have the vision. It is pushed, driven by the top management downward.

ENTERPRISE ARCHITECTURE

You can buy an army of extroverted, glad-handing average folks in beautiful expensive suits and you will probably not get back discontinuous revolution. They can flood your organization with consensus-driven feel-good exercises and that will probably not improve the results of your organization much.

ICONOCLASTS AND MISFITS

Throughout history the big revolutionary changes have been the result of brilliant free thinkers, often portrayed as iconoclasts, misfits, oddballs and geeks. Steve Jobs, The Woz, and Bill Gates all fit this mold. They review facts, not opinion and data not consensus. They come up with the changes that break eggs and make omelets. They try coloring outside the lines and tearing windows in the box and rewriting the rules. Somewhere in your successful transformation, maybe a few places, there will be some of these people. They must be present for revolutionary discontinuous transformation to occur, more or less.

IMPLEMENTING THE VISION

Those average politically correct extroverts (probably from the Big Five) are more likely to assist in implementation of the big vision or in the setup of incremental improvement processes. It is most likely that the big revolutions will be approved by top management, not a vast horde of the mid-level. You do not need a vast team of politically correct enterprise architects collaborating with mid-level managers to form the new, revolutionary transformation vision, but you do need them to implement and maintain the results.

TRANSFORMATION IS DANGEROUS

It may or may not be risky, but it is dangerous. It will cause peoples' jobs to vanish. It will cause need for retraining or new skills. It will cause petty kingdoms to crumble into history. It will cause the important to become unimportant, the influential to become sidelined. That is how you cause dramatic improvement of business performance. There is a social cost.

INNOVATION IS DANGEROUS

Innovation causes or enables dangerous transformations. A common term for this is "disruption," but a technology or process that is not "disruptive technology" can often be employed in a context that causes significant social changes via transformation.

YOU CAN TELL

When an executive buys EA services from a team of fine-suited extroverts with a keen sense of political correctness, no transformation is perhaps really desired. These folks are safe, politically astute, smooth talking, unlikely to explore beyond the edge of what is acceptable to the status quo and the current regime. Alternately, if the executive buys some big thinkers in a small team and places them as the vanguard, serious discontinuous change might occur.

CHANGE MANAGEMENT

When real transformation is expected, when the plans become concrete, someone will be assigned to manage the consequences and mitigate the impacts to people's lives. Watch for it.

THOUGHT LEADERS

There are many who use the term "thought leader" and seek to guide efforts who never had a revolutionary thought in their lives. They may write very well or use statistics and evidence though. These are not always the people with the right stuff, though fans may like the impressive title. However, some may be the right folks. Just do not rely on the moniker to get the genuine article.

CONCLUSION

Incremental, continuous change is driven by socially conscious and politically correct teams. Discontinuous revolutionary change is driven by brilliant, iconoclastic people doing deep analysis and thinking outside the norms. Everyone may hate that I said this, but it is true. I don't make the rules of how things work, I just follow them. To get bigger results, top executives must be tolerant of innovative ideas and the kinds of persons who produce them.

2.9 ENTERPRISE ARCHITECTURE & PORTFOLIO MANAGEMENT, JANUARY 18, 2015

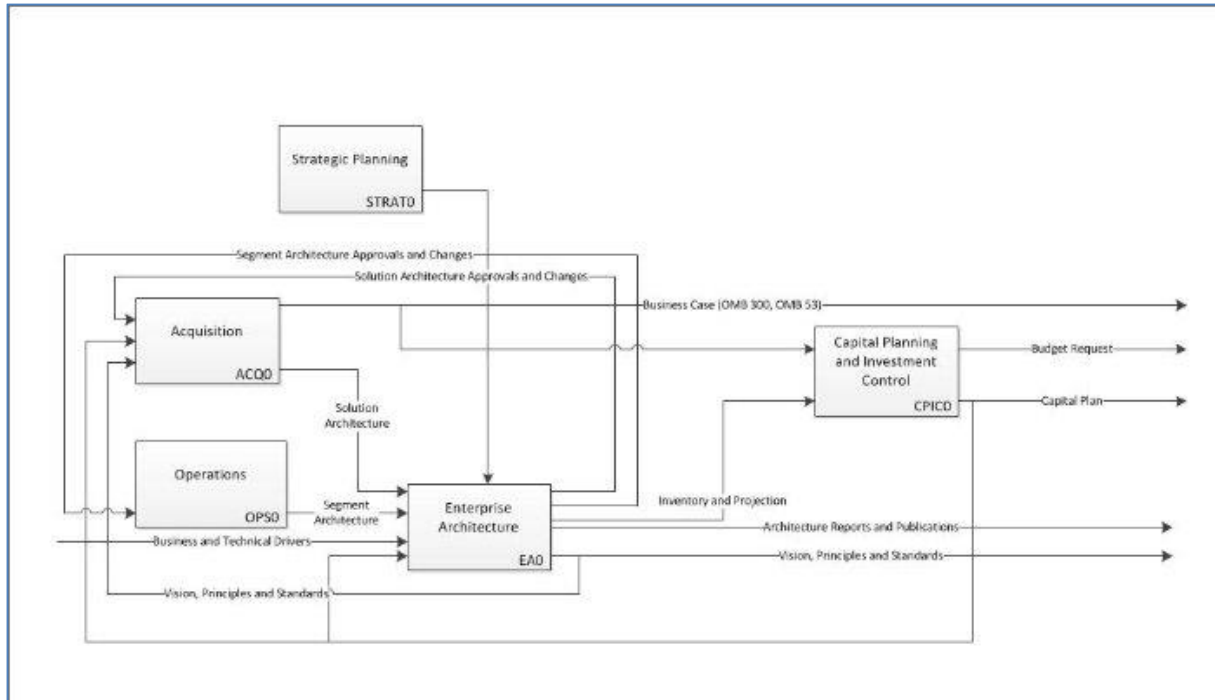


FIGURE 10AN IDEF-0 DEPICTION OF THE FLOW BETWEEN EA AND CPIC (A.K.A. PORTFOLIO MANAGEMENT)

How are enterprise architecture and portfolio management connected? This is a topic that many practitioners fail to grasp. Here is a diagram, with a simple explanation. We will use the example of the US Federal Government, as documented in OMB Circular A-130, the top policy on enterprise architecture.

PORTFOLIO MANAGEMENT

If you will look at the activity (block) titled "Capital Planning and Investment Control," or CPIC, this block is intended to be portfolio management. In this block you select, control and evaluate investments in enterprise transformation (performance improvement). Note the input labeled "inventory and projection"; this is the top level current and target architecture, distilled down to what you have today and what you desire to have at the planning horizon. The gap is analyzed for transformation opportunities.

There should be only one portfolio: <https://www.linkedin.com/pulse/20140826222008-86002769-what-is-suboptimization?trk=mp-reader-card>

GAPS

The transformation opportunities (gaps) are compared to business cases (marked as OMB Form 53 and OMB Form 300 in the diagram). Those business cases with the highest ROI are selected. Presumably redundant investments to fill gaps already closed will be excluded.

Volume 1: Enterprise Level Architecture

See here for selection by ROI: <https://www.linkedin.com/pulse/20140920122233-86002769-transformation-investment-portfolio?trk=mp-reader-card>

CAPITAL PLAN

The output of portfolio management (CPIC) is the capital plan. Note that when the capital plan changes, the target enterprise architecture should also change to reflect the new future state. (Note the line back to inputs to enterprise architecture.) The new gaps compared to strategy will be highlighted. (Note the input from strategic planning into enterprise architecture, as a control.) This new architecture is sent to CPIC/portfolio management to describe the current state, future state and gaps as "inventory and projection."

LOOP

This is the feedback loop that powers enterprise transformation. EA identifies what is needed, and corresponding business cases are selected in portfolio management (CPIC). Again, you can find all this in OMB Policy.

FAULT

What happens if this feedback loop is missing? Well, people develop architectures that do not reflect the capital plan. Also, capital allocation does not focus on the gaps identified in EA. In other words, expenditures are unrelated to architecture.

Note: The original diagram shows

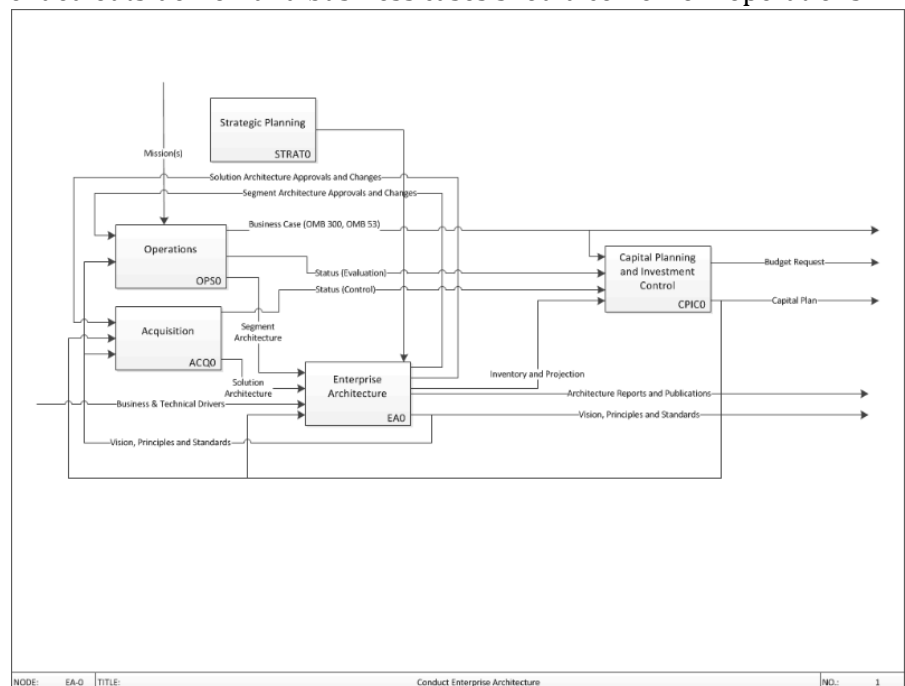
business cases coming from acquisition. This corresponds to the notion of "Big A Acquisition." Such an approach is not recommended outside DoD and business cases should come from operations with the segment architectures. (DoD only acquisition laws cause this rift.)

The astute reader will note that it won't work quite right as depicted above. Operations know what they need, not acquisitions. Acquisition should be driven by EA, and acquisition should not drive EA.

Operations know what they need, not acquisitions. Acquisition should be driven by EA, and acquisition should not drive EA.

Here is the diagram with the error corrected, and operational missions put into perspective:

FIGURE 11 CORRECTED IDEF-0 FLOW



CONCLUSION

There it is, the core of EA that everyone should know but few understand. It is simple, really. Now go do good things!

You can implement this in the three-level FEA model for example:

<https://www.linkedin.com/pulse/enterprise-segment-solution-kern-msem-bsee-cea-cissp-issap-til-pmp?trk=mp-reader-card>

The top level of EA can then be streamlined as in:

<https://www.linkedin.com/pulse/20140727145732-86002769-very-lean-enterprise-architecture?trk=mp-reader-card>

TERMINOLOGY

Some notes on terminology follow...

- A *transformation investment* is an approved and implemented business case, hopefully causing improved performance of the enterprise.
- A *transformation portfolio* is a set of business cases and is the subject of portfolio management. The other "portfolios" listed below are NOT the subject of CPIC/portfolio management.
- A *transition plan or roadmap* is a schedule for implementation of transformation investments, not shown, omitted for clarity.
- *CPIC* is the term OMB uses for portfolio management
- A *segment* is a line of business, a product line or service line or a mixture. A segment may also be a cross-cutting measure, i.e., a large reusable technology initiative used by many other internal investments
- *Inventory and Projections* is a term I have used for the current and target architectures, consisting of a set of lists.
- The *application portfolio* is the inventory of all enterprise applications in the current and target architectures. At the enterprise level this is the application architecture. This name is used by some but is very confusing.
- The *data asset portfolio* is the inventory of all enterprise data stores in the current and target architectures. At the enterprise level this is the data architecture. This name is used by some but is very confusing.
- The *business activity portfolio* is the inventory of all enterprise operational functions. At the enterprise level this is the business architecture. This name is used by some but is very confusing.
- The *technology portfolio* is the inventory of all approved enterprise technologies. It is embodied in an artifact called a technical reference model (TRM) and another called a standards profile. At the enterprise level this is the technology architecture. This name is used by some but is very confusing.
- The *information exchange portfolio* is the set of standards used for information interchange used at interfaces. It is "data in motion" as opposed to "data at rest" in the data asset portfolio. This does not exist in FEA but did in NIST, and it is a good idea if you are using SOA.
- *Segments* are the list of lines of business (mission and supporting) and cross-cutting technology initiatives reused by other investments.

2.10 ENTERPRISE ARCHITECTURE VS. THE BUDGET, JUL 2, 2015



FIGURE 12 FIGURE FROM ATTACHMENT TO OMB A-11 (CAPITAL PROGRAMMING GUIDE) WHICH DESCRIBES THE RELATIONSHIP BETWEEN EA AND BUDGET

How does enterprise architecture drive the budget? Does it drive the budget at all? I will describe some of the basics of the intended approach of the US Government.

Let's talk about a generic government entity. You can translate for commercial industry; it will not be hard. The budget consists of three kinds of items. There are transformational effort expenses, operations expenses and miscellany (read as overhead).

- **Transformational Effort Expenses** are synonymous with all internal projects and programs, of all kinds. The purpose of any such internal effort is to improve the organization.
- **Operations Expenses** are related to conducting business or performing the mission. They are not used to improve the organization but are related to supplying the service or goods that are the purpose of your enterprise.
- **Miscellaneous Expenses** are all costs neither operational nor transformational. Senior management hours are such a cost.

We will break out costs this way to illustrate some important (and obscure) points. Your agencies' accountants probably have other breakouts, for other purposes. (In government, transformational costs are large, BTW.)

LINKAGE

How to link EA and budget, as intended:

Volume 1: Enterprise Level Architecture

- The purpose of enterprise architecture is to plan your transformational efforts. Your planning horizon for EA should be far enough into the future for you to cover the procurement and implementation of transformational efforts and their budgets.
- Each year you should have a new EA with the proper planning horizon to produce the budget.
- The link from EA to budget is portfolio management (CPIC in government), which will select all the transformational efforts to be implemented and all those to be discarded.
- All selection decisions in portfolio management should cause updates of the EA and the "roadmap" or "transition plan," which should cover from now to the planning horizon.
- Only transformational efforts in the architecture, approved by portfolio management, should be implemented (see exception below).
- Each budget should have a discretionary transformational component. There should be a CIO discretionary budget, for example. It should never be the largest component. Policy should set the maximum size, perhaps by percentage. When that limit is exceeded, reviews and audits should occur and lawyers should show up. Congressmen and Senators should be informed, if Federal Government.
- The OMB Form 300 is to be used as a budget request. Some are approved by the investment board, some rejected. The approved ones are to be submitted to OMB, and the budget should reflect those submissions.

HANKY PANKY

There is an enormous amount of hanky panky (unusual deviation) in the budget of most government agencies. CPIC and EA were meant to help correct that. But political influence still drives the budget more than rigor and method.

To help fix that, miscellaneous expenses should be kept to under some target. The ratio of transformational to operational expenses should be managed and analyzed. This ratio should generally align to how badly the agency performs now and how well it is projected to perform. A simple, single clear hierarchy of accounts should lead from any outlay to the transformational expense item that covers it.

Proper application of enterprise architecture in your organization should reduce operational expenses (per unit delivered), reduce miscellaneous expenses (again per unit), improve quality of service (or product) to the taxpayer/customer, or increase the volume (capacity) of service (product) provided. Any single transformational effort (investment) should be expected to contribute to one or at most two of these categories. Those who are confused about the ROI for enterprise architecture as applied in the US Federal Government have missed this point. I attribute widespread confusion on this point to equally widespread lack of proper enterprise architecture education.

These benefits from correctly implemented EA, integrated into governance, can also be expected in commercial organizations if desired. There is no theoretical barrier. For more official USA OMB information on this topic, please look [here](#).

2.10 WHAT IS ENTERPRISE ARCHITECTURE?, PART 1, JUNE 22, 2014

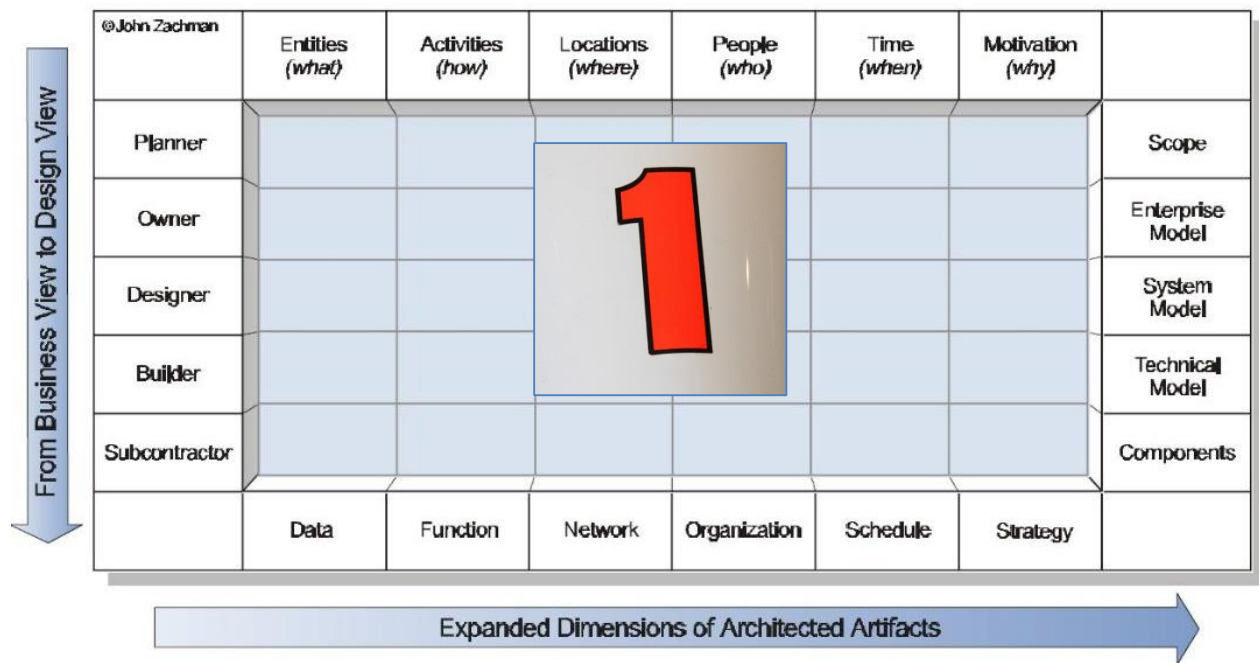


FIGURE 13 IMAGE COURTESY US GOVERNMENT, FEAFF V1.1, ADAPTED

BACKGROUND

A bit of personal history: As a boy I had severe allergies and lived some distance from other children. I disliked spectator sports and found other means to entertain myself. As some say, “When God takes something away he often offers other gifts as consolation.” I read a great deal. By age ten, I had built a crystal radio kit. By age 13, I had exhausted the standard and deluxe electronics kits. At age 15, I attempted to take vocational classes in electronics in addition to normal college-bound classes, but I failed miserably and put myself in the hospital for weeks and out of school for a few months. By age 18, I had built up my strength and stamina a great deal and joined the US Air Force. I graduated with honors in electronics from technical school and went to work on some fascinating special purpose electronics designed to take aircraft (SR-71) data and transform it for ingestion by mainframe computers.

Worn out by the working conditions in the SR-71 program, I went on to college and took electrical engineering. Graduating, I worked on a nationwide sensor system involving a low RFI (and low speed) home network for sensors to monitor radio and television use. These homes would dial back and report viewing by modem, as it was the 1980s. This work involved developing embedded computer boards for the in-home equipment. It was a fascinating and large distributed system. Realizing that all electronics design must move to Asia due to currency rate manipulation, regardless of how talented our engineers were or how hard we worked, I moved to the government contracting industry and systems engineering.

Volume 1: Enterprise Level Architecture

As I worked on systems engineering of large and complex distributed systems for the US Federal Government and big business, I discovered the work of John A. Zachman, who described a framework for how to better build such systems to meet customer needs. Related to this, NIST also worked on new means to control the high costs, risks, and efficiencies of producing these large complex systems I worked on producing (integrating). In 1989 they described a brand new concept in which my customers would view all these systems they procured as a whole and manage the portfolio of such expensive systems. They called this new concept “enterprise architecture,” and I became a practitioner by default. As a system engineer I was routinely required to produce the kinds of diagrams that later became part of DODAF. On certain jobs I was required to support the management of such efforts by both civilian and defense agencies and the management of their portfolios of systems. I found myself at the center of what would become an industry unto itself.

Many years passed. Recently I have been learning to apply recent social media tools to my career, notably LinkedIn. I have experimented with fully using the tool as designed, looking for what works and what is useless. After decades in this business and in the world’s capitol of enterprise architecture work (Washington, DC) I have become well known locally and this is reflected in my social media results. I currently have over 2,000 first-level connections to other professionals in enterprise architecture, systems engineering, IT security, recruiting and related professions. My third-level connections exceed 13 million. My profile is sometimes viewed by dozens of people in a day. I have just topped 150 skill recommendations for enterprise architecture, 80 for integration and I am over 65 for system engineering. (The irony of the young bookish isolated boy geek finding limited notoriety in late life on social media, because and not despite those origins, is a source of amusement to me.)

In the course of this experimentation I began to note some oddities. There were many discussion forums in which people espoused somewhat unrecognizable views on enterprise architecture. As an engineer I asked if the profession had changed, causing obsolescence in my practice, or if there was widespread misunderstanding. I engaged in discussions on this for a time in LinkedIn groups (forums) but found the same few persons writing the majority of posts espousing these odd notions of my profession. I discovered and began to employ LinkedIn polls, where I asked a mixture of questions—some leading and some fundamental—guided by both my understanding of the profession and that of other mature practitioners of these areas. Polls, I thought, could eliminate the dominance of dialog by a few who post often and may in fact be paid to post as part of their jobs.

I will describe what I have found so far in regard to the changing nature of enterprise architecture. Part 1, briefly identifies some poll results related to determining if there is a problem here.

QUESTIONS RELATED TO THE EXISTENCE OF A PROBLEM.

I ran a number of polls to determine if there was some problem in my currency of understanding or the understanding of these relatively few prolific advocates of various views. Here is a selection of poll results:

- [The US Federal Government is the largest single customer of enterprise architecture. sponsored the activities that lead to the first](#) Of only 11 respondents, 3 indicated the US Federal Government was a source of misinformation on enterprise architecture and another 2 claimed the US Federal Government was not an authority on enterprise architecture. The largest number of voters acknowledged the US Federal government as an authority.

Volume 1: Enterprise Level Architecture

- Enterprise Architecture is mainly about: Of 96 respondents, 64 of them indicated “linking business and technology.” This is 67% of respondents, and the statement generally agrees with the US Federal Government definition of enterprise architecture. This indicates 33% register some possible divergence from the original purpose of enterprise architecture.
- Enterprise architecture is: This variation of the question had 52 votes, with 84% agreeing that enterprise architecture was “the fusion of business and technology” as opposed to only one of these or something else entirely. Slightly different voter communities were involved compared to the poll above.

(I RAN SEVERAL OTHER POLLS ALONG THIS LINE WITH MAINLY SUPPORTING RESULTS BARRING ONE EXCEPTION. THAT EXCEPTION BECAME DOMINATED BY THE PUNDITS AND HAD FEW VOTES.)

- Redefining enterprise architecture in unorthodox ways (not IT + Business) is: Eleven respondents were split 50/50 on if this is helpful, with one respondent claiming ignorance. This did not seem to be a worthy issue in the eyes of respondents.
- Have you had experiences with unqualified enterprise architects providing misinformation and interfering with success? Of 72 respondents, 63 (87%) indicated this is at least an occasional problem.
- Most enterprise architecture pundits and academics from unrelated disciplines are: Eighteen of 21 respondents indicated some form of ignorance was present in these “thought leaders.” The response was modest.
- Many self-proclaimed experts on enterprise architecture are unqualified, and propagate misinformation concerning the field, its methods With only 18 votes, 9 agreed and 7 disagreed. The response was modest.
- How many self-proclaimed international experts in enterprise architecture are clueless and spout total nonsense? Of 50 respondents, 67% indicated that most or all such pundits were “clueless.” With little response to previous variations of this question I added a bit of emotional content. In my mind the international community might be less likely to recognize the original US Government EA definition and might be a possible source of conflicting definition. No particular individuals were the focus. The question proved controversial.
- Laws and policies to control US Gov. IT waste are ignored. We need a law to remove government officials for non-compliance. Of 26 respondents, 17 agreed.
- Regarding the proprietary EA frameworks of companies like CSC, Cap-Gemini, SAP, Gartner versus public frameworks from standards bodies Only 18 respondents were interested, and of them 10 (55%) indicated a preference for public frameworks and 7 had no preference.
- I have read the first document in which the term Enterprise Architecture was printed and published (NIST SP 500-167) Of only 15 respondents, 7 had read it and 8 had not. This was not a large response. Few seem to care and few are aware of the origins of EA.

CONCLUSION

The number of respondents is too low for any real science here, and yet I will draw some preliminary conclusions from available data. I suspect there is a problem in this area. Real practitioners seem to dislike the views of the pundits or “thought leaders.” However, these real practitioners seem to be somewhat more aligned to the original meaning of the term “enterprise architecture” as describe by the US Government for internal use in 1989. This condition exists despite the fact that practitioners seem to be somewhat disinterested in that Origin.

Volume 1: Enterprise Level Architecture

I find it interesting. "Different strokes for different folks."

2.11 WHAT IS ENTERPRISE ARCHITECTURE?, PART 2, JUNE 22, 2014

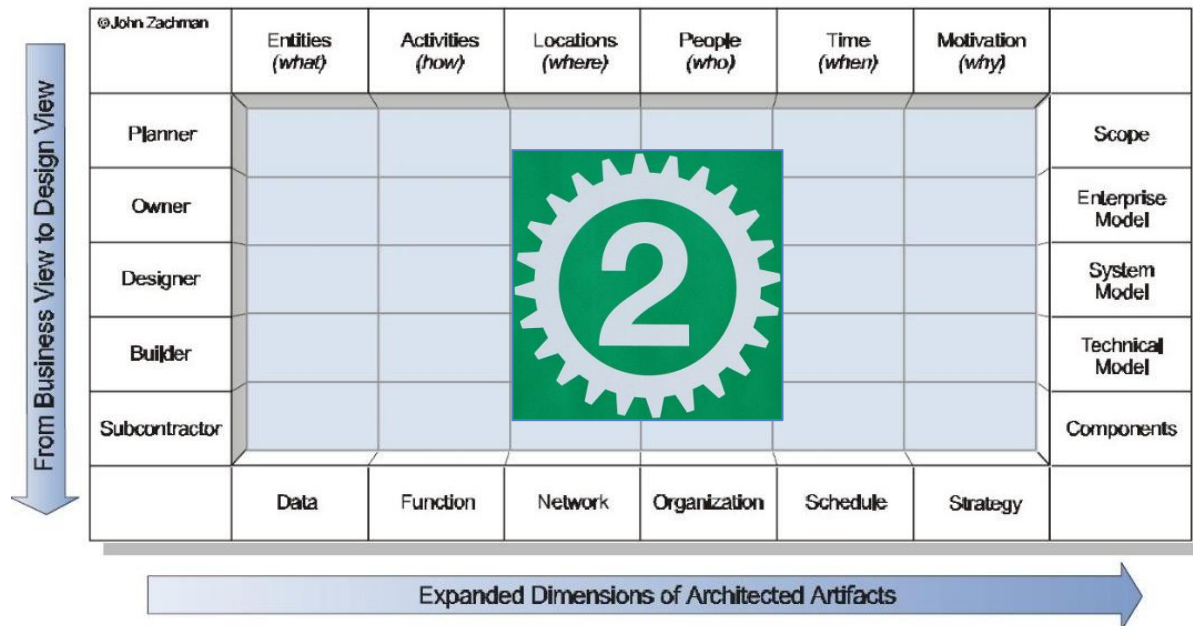


FIGURE 14 IMAGE COURTESY US GOVERNMENT, FEAF V1.1, ADAPTED

In Part 2 of this discussion of the changing nature of enterprise architecture, I will examine if this is a problem with enterprise architecture education.

QUESTIONS RELATED TO ENTERPRISE ARCHITECTURE EDUCATION

There are now several academic accredited degrees and certificates in enterprise architecture. In the beginning there was nothing.

- National University had an MS in Engineering Management specializing in enterprise architecture.
- Penn State has a professional degree in enterprise architecture, supported by their joint Comp-Sci/Business operation.
- Kent State has a degree in enterprise architecture in conjunction with business and Comp-Sci departments.
- In Australia Griffith University has an enterprise architecture degree in the “School of Information and Communications Technology.”
- Another Australian school, RMIT, has an enterprise architecture degree or maybe it did but was canceled. The website is in a dubious state.
- “The Graduate School” has a certificate program. It includes SOA and IT.
- California State University engineering department has two certificates in DODAF and FEAF.

Volume 1: Enterprise Level Architecture

All of these clearly see enterprise architecture as some discipline between or combining management and IT. So then why is there a minority, largely unlettered, who hold some other odd view?

After asking a few questions (see Part 1), I thought that perhaps there was an issue of basic enterprise architecture education. Some practitioners were just ignorant of the facts. However, the results of polling in this area produced a lukewarm reception at best. I suspect that there is a problem, but it may not be the core problem.

I polled with these questions:

- What do you look for in the resume of an enterprise architect to determine competence? (Resumes of Pioneers of EA excluded)? Of only 15 respondents, the majority (73%) saw EA specific experience, credentials or some combination as significant.
- Will the new master's degrees in enterprise architecture overturn the current crop of unlettered "experts"? Only 11 responded, but they mostly agreed that the new degrees would have little effect and, therefore, would not solve any potential problem present.
- There is a shortage of qualified enterprise architects, especially young enterprise architects. With only 12 respondents, 75% agreed.
- Enterprise architecture is a layer of additional understandings allowing business architects, data architects, information architects... This was interesting in that of 16 respondents 100% agreed.
- It is not really possible to be a young enterprise architect. You must first become a business architect, data architect, software... In contrast to the poll above, of 16 respondents 62% agreed. Taking this scant response seriously for a moment, perhaps EA is a layer of understanding in addition to your basic architecture skills in some area, but you can acquire that when young. You do not have to be highly skilled in some architecture domain before beginning enterprise architecture.
- The role of architect exists because the mental aptitudes to perform the function occur only rarely in the general population. ... Only nine responded with 7 yes, 1 no and 1 didn't know. This was a question to check for a requirement of innate skills to perform EA. Perhaps the answer is yes, but mostly no one seems to see it as an issue important enough to respond to.
- To be effective, any CIO or CTO should be trained in enterprise architecture. Nineteen said yes and 3 said no, for 22 votes.
- Many practicing enterprise architects do not understand how to produce ROI for their efforts. Of 9 responding, 6 agreed.
- Any practitioner claiming to be an enterprise architect should read and understand the fundamental literature of EA including: Zachman... Of 7 responding, all agreed that one should read the basics.
- Zachman's work is critical to understanding enterprise architecture. Focusing in on Zachman alone, 9 had read his work and said it was important, 5 claimed it to be unimportant, with 2 having mixed answers. The word "critical" may have been an overstatement.
- An enterprise architecture program at a university is best owned by... Almost no one cared to respond, with 2 indicating the business school and 3 indicating a joint program of business and engineering/Comp-Sci.

Volume 1: Enterprise Level Architecture

Here is a series of questions on the content of an EA program, which I have ordered by popularity:

- An EA masters curriculum should have at least a full course on strategic planning. Fourteen said yes with no dissention.
- An EA masters curriculum should have at least a full course on governance. Twelve said yes with no dissention.
- An EA masters curriculum should have at least a full course on performance management in organizations. Twelve agreed and one did not know.
- An EA master's curriculum should have at least a full course on IT investment management or portfolio management.. Twelve said yes and one no.
- An EA masters curriculum should have at least a full course on the history and origins of EA, including a review of the work of Zachman... Ten said yes and 3 no.
- An EA masters curriculum should have at least a full course which is a survey and comparison of frameworks and major methods. Nine said yes and one no.
- AN EA master's curriculum should have a full course on system engineering. Six said yes, 4 no, and 3 were uncertain.

Clearly the response is not broad. I suspect enterprise architecture education is clearly part of the problem but not a popular issue. In other words, we have many uneducated self-styled enterprise architects but few care about that.

2.12 WHAT IS ENTERPRISE ARCHITECTURE?, PART 3, JUNE 22, 2014

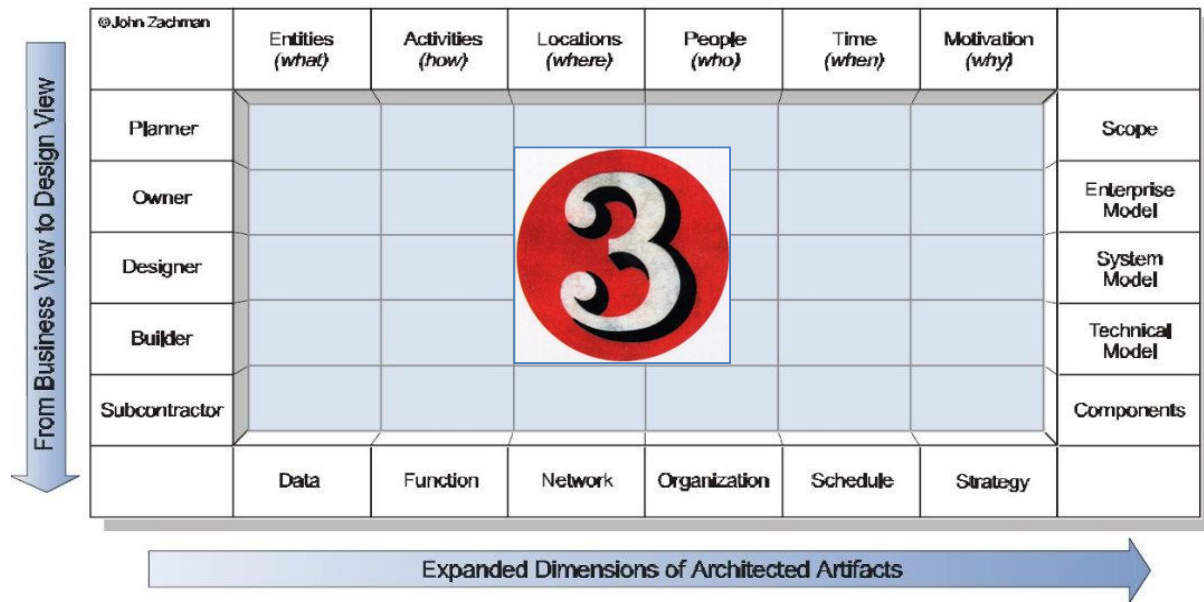


FIGURE 15 IMAGE COURTESY US GOVERNMENT, FEA V1.1, ADAPTED

QUESTIONS RELATED TO THE NATURE AND DEFINITION OF ENTERPRISE ARCHITECTURE.

In part 1 I described coming to the conclusion that there was some probable issue with our “thought leaders” describing something alien as enterprise architecture. In part 2 I described asking questions as to if this was due to lack of education, and I found disinterest. In part 3, I asked questions to determine what the standard view is that these “thought leaders” deviate from.

Here are the questions I asked in the polls:

- An enterprise architecture contains multiple solution architectures. Eight responded and all agreed.
- A complete enterprise architecture should contain architectures for each “segment” or “value chain” or “value stream” in the organization. Four responded and all agreed.
- At some point in the future enterprise architecture should grow to encompass changing organizational structures and organizational culture? Ten said yes and one did not know.
- At some point in the future enterprise architecture should grow to encompass all technology. Seven yes and four no.
- The term ENTERPRISE used in ENTERPRISE architecture denotes the whole, across all columns and rows of Zachman, all activities and should... Seven yes and 6 no. This is a personal pet peeve of mine.
- In 2006 FEA practice guidance identified that enterprise architecture occurs at three levels: enterprise, segment (line of business) and... This asks about the Burk model of EA, with solution architecture at the bottom. Twelve gave this issue some level of importance and 2 otherwise.

Volume 1: Enterprise Level Architecture

- Architecture links strategy and execution. Twenty one agreed, 2 said no, and fully 5 indicated that EA includes strategy. This quote comes from Zachman, echoed by Spewak and many others.
- An enterprise architecture is composed of other, more narrow, architectures. Thirteen agreed with the basic premise of EA composition, four disagreed and 2 were uncertain.
- Enterprise architecture and system engineering are related in the following way: Eight indicated cooperation being required and 3 thought otherwise.
- There is an increasingly common adage that solution architecture is about a project, segment architecture about a program and enterprise... Twenty of 27 agreed.
- Enterprise architecture may be seen as the management of IT assets to maximize value and return. Eight agreed, three disagreed.
- An organization wide enterprise architecture program reduces corruption, fraud, waste and abuse of funds. Organizations with no EA... Ten of 14 agreed.
- Should an enterprise architecture include the business rules? Five agreed and 2 said no to the ideas of Ron Ross.
- The top level of an enterprise architecture is an inventory of major enterprise assets: eg business activities, databases, systems and... Five yes and 3 no.
- An enterprise architecture contains a current architecture, a target architecture and a transition plan. Seventeen yes, zero dissent.
- Comparing “enterprise architecture” to “enterprise engineering” (cf Wikipedia definition), the two are: Twelve said they were distinct concepts, 3 the same with different description, and 5 had never heard of Martin’s Information Engineering.
- Which is more the goal of enterprise architecture? To produce capabilities, which are potential business outcomes? Or business... Outcomes trumped capabilities 21 to 7.
- Barring processes improvement, enterprise architecture is not about the structure of the organization nor is it about who reports to who... Only four responded, and one of them thought EA was about organizational structure.
- Enterprise architecture is a kind of management of technology to support business processes and strategy. Seven responded, with 6 agreeing.

Well, we had a very light response again. Still, most presented views in harmony with the US Government approach and definition of EA, also roughly voiced by TOGAF. (This conjunction is not very surprising as the TOGAF and the DODAF are both derived from the earlier DoD Technical Architecture Framework for Information Management [TAFIM].)

While most questions were not “hot” items, the Burk three-level model and the superior position of outcomes in EA were notable.

Again there was a rough center of opinion detectable in the sparse data, but not much interest. With both education and definition not so important, what drives these “thought leaders” or pundits to deviate from the norm? At this point I begin to suspect either pragmatism or commercial interest, not theory, may be driving opinion.

SECTION 3: COMPONENTS OF ENTERPRISE ARCHITECTURE

Section 3: Components of Enterprise Architecture	64
3.1 Enterprise Architecture Drivers, September 12, 2014	65
3.2 Enterprise Architecture Vision, September 12, 2014	67
3.3 Enterprise Architecture Holism, September 12, 2014	68
3.4 Enterprise Architecture Roadmap, September 20, 2014	70
3.5 Approved Technologies & Standards, September 21, 2014	72
3.6 Enterprise Architecture Principles, September 21, 2014	75
3.7 Enterprise Architecture Artifacts, August 21, 2014	78
3.8 Outcomes vs Capabilities, September 19, 2014	80
3.9 Alignment, November 20, 2014	82
3.10 Performance Measures in the Enterprise, July 26, 2014	85
3.11 Reference Models, Jul 2, 2015	88

This section describes various component parts of an enterprise level architecture effort. The section “alignment” may seem out of place but relates to the key activity of analyzing alignment and producing alignment diagrams.

QUESTIONS FOR SECTION 3

1. Compare the component elements to FEAF v 1.1; are they all present? Why was FEAF v 2 not used as the basis of this explanatory material?
2. PMI also speaks of alignment? Who performs alignment?
3. How is enterprise architecture affected if you remove performance measures?
4. Should principles focus on the goodness of component systems and initiatives in the enterprise or mainly on the process of architecture itself?
5. What is the benefit of a complex roadmap document instead of a simple roadmap document? Can a complex roadmap be updated with each investment decision?
6. What artifacts are appropriate at the enterprise level?
7. What is enterprise architecture without holism? If you only manage IT, is enterprise architecture holistic? Is it as valuable?
8. The Clinger Cohen Act identified the need for an IT architecture: Does enterprise architecture do that? Why does transformation of the organization require IT?
9. If you need not report progress on enterprise architecture to higher authorities, do you need reference models? Why?
10. Identification of approved products is time consuming and produced limited ROI. Is it worth the effort? How would you analyze that?

3.1 ENTERPRISE ARCHITECTURE DRIVERS, SEPTEMBER 12, 2014

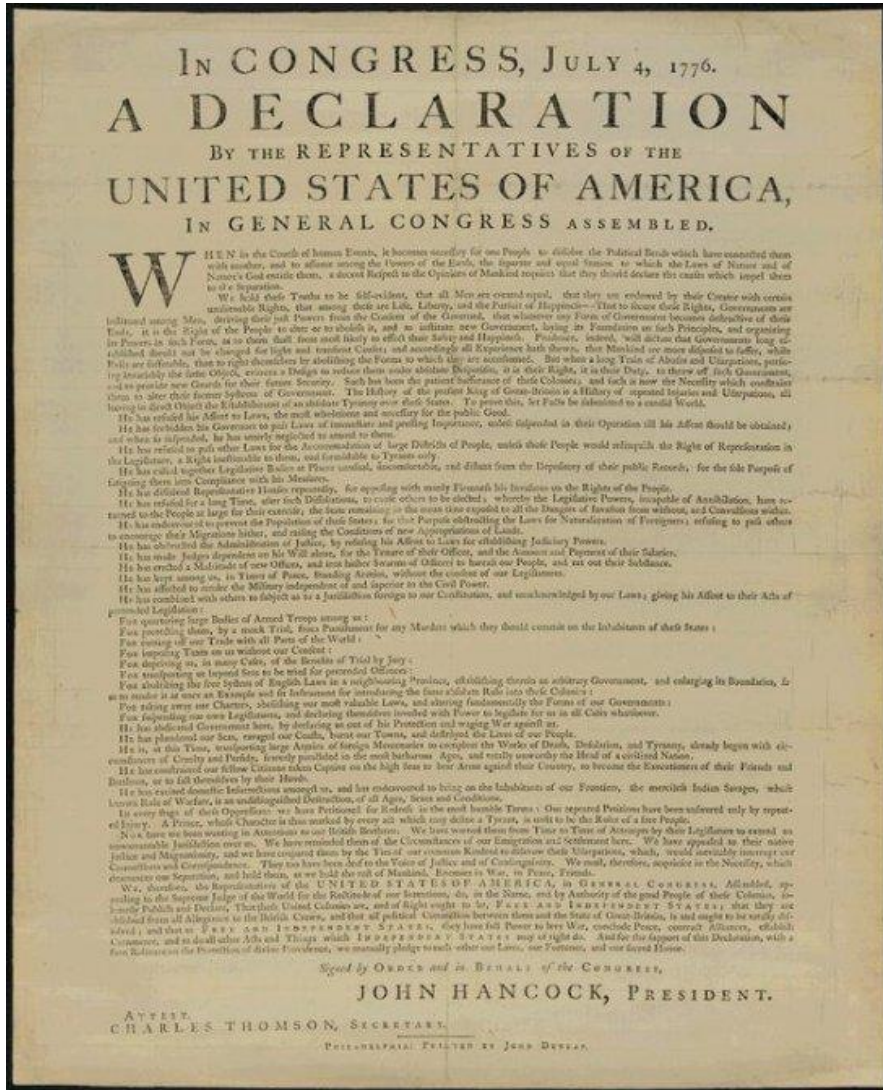


FIGURE 16 DECLARATION OF INDEPENDENCE, COURTESY US GOVERNMENT

It is common in enterprise architecture to track the forces shaping the transformation of the enterprise. In FEAF v1.x these were termed DRIVERS. It is not really clear to me that you could do a good job of producing a usable architecture for an enterprise without such a list. Zachman characterizes these under the interrogative "Why."

These drivers in FEAF 1.1 came in two types. Business drivers were the regulatory and mission related factors that shape the enterprise going forward. Technology drivers are the changes in the state of the art leading to changes in business process and organizational performance improvement.

I will provide some breakdown of the content of the drivers and some examples. Of course I will draw mainly on

government practice, as this is what springs most readily to mind for me. (This may seem trivial, but you will not find this list floating around everywhere.)

DRIVERS

Business Drivers:

- Changes of circumstance or events affecting the mission
- The Strategic Plan (of the organization) and its goals or objectives
- The IRM or IT Strategic Plan (of the CIO) and its goals or objectives
- New laws affecting the organization
- New policies of the organization and from higher organizational levels
- Reports from Congressional Research Service or GAO, and each recommendation or finding

Volume 1: Enterprise Level Architecture

- Reports from the Inspector General

Technology Drivers:

- Relevant new enabling technologies (yup, obvious)
- Key existing enabling technologies
- New product capabilities and versions
- New research
- Breakthroughs sought or needed by the enterprise, technology shortfalls
- New process, method or approach
- New standards

USING DRIVERS

Commonly you use drivers by mapping them to changes in business process and new required performance measures for operations. Often this takes the form of a spreadsheet with drivers on one axis and process steps on the other. Cells at the intersection have an X where the driver is applicable to process improvement or the number of a note (provided below) that describes the improved performance measure. Other variations are also common.

These provide traceability for enterprise transformation improvements or changes.

I suppose your EA team could produce results without a list of the important items to address, the drivers, by random chance, perhaps. However, it is not likely.

3.2 ENTERPRISE ARCHITECTURE VISION, SEPTEMBER 12, 2014



FIGURE 17 THE LIBERTY BELL, COURTESY US GOVERNMENT

One of the functions of enterprise architecture is to provide a vision for the to-be or target enterprise. Often the inexperienced, the uninitiated and even some academics sometimes think this means the Chief Architect can run off into a cave and come back with the sacred vision. This gives experienced practitioners a good bit of entertainment.

Production of the enterprise architecture vision is most often distilled from the strategic plan and statements of the top management of the enterprise—whatever scope that may be. If they say the organization will become the top experts in left-handed underwater basket weaving to better achieve the mission, then off we go to translate into some sort of approach. The point is they pick, we follow.

Once the vision has been articulated in draft, it is then checked and rechecked with all the leadership stakeholders. You would not want EA out of step with all the rest of leadership and management. Some revision usually occurs.

Just to reiterate, the idea that the Chief Architect is empowered or authorized to somehow dictate to all the rest of management and leadership a new and independent vision of the future enterprise is, in the majority of cases, pure hogwash. We are here to support and transform the mission, the strategy, the enterprise and not to create its direction or purpose.

Just sayin'...

The vision usually contains some graphic depiction. What is a vision without an image? (In DODAF for example the OV-1 or CONOPS drawing is often taken as synonymous with the vision.) If the vision lacks a graphic depiction you may have an architect incapable of the visual communication required, perhaps with the wrong Myers-Briggs type or lacking visual innate skills. Redo it; it is an error. The vision is visual, it has a picture, to communicate to visual people by visual means. It may and often should have some accompanying explanatory text.

No enterprise architecture is complete without a vision.

3.3 ENTERPRISE ARCHITECTURE HOLISM, SEPTEMBER 12, 2014



FIGURE 18 THE AUTHOR IN ATHENS, WRITING ABOUT ARCHITECTURE, WITH ATHENEUM IN BACKGROUND.

Enterprise architecture is intentionally holistic. This is an underreported aspect of the art.

HISTORY

In the beginning (of EA) NIST described five layers of the EA pyramid: BUSINESS ARCHITECTURE, INTEGRATION ARCHITECTURE (then called INFORMATION ARCHITECTURE, but that has taken on different meaning in the past two decades), APPLICATION ARCHITECTURE (a slightly bigger topic than SOFTWARE ARCHITECTURE, spanning applications larger than software objects), DATA ARCHITECTURE (the very same item currently promoted independently, including master data management [MDM]) and INFRASTRUCTURE ARCHITECTURE. At the same time Zachman described analysis of all of who, what, where, when, how and why from all pertinent perspectives. That is fairly holistic.

Subsequent efforts have sometimes added some scope. Notable additions have been SECURITY ARCHITECTURE, TECHNOLOGY ARCHITECTURE (including standards), and some attempts at adding culture. Sometimes misguided efforts, not understanding the basics, have equated ENTERPRISE ARCHITECTURE with reduced scope. Those later, in my opinion, are not valid but simply result from insufficient education and training.

SYSTEM ENGINEERING

In DoD, and in some schools (Stevens Institute, for example) System Engineering (SE) is taken as closely related to ENTERPRISE ARCHITECTURE. SYSTEM ENGINEERING is an intentionally holistic engineering discipline, unifying many other engineering (and some non-engineering) disciplines.

Like SE, persons from multiple disciplines participate in EA. Like SE, there is a body of knowledge, above the particular narrow discipline, that allows participation in EA. Like SE, the best experience profile for an enterprise architect is where the person has some depth in a constituent discipline and adds the cross-domain holistic approach.

IMPLICATIONS

Just as in SYSTEM ENGINEERING, where it is difficult to find a good junior SYSTEM ENGINEER, it is also hard to find a good junior ENTERPRISE ARCHITECT. You can buy them books and send them to school, but until they develop that depth in a constituent discipline they have little to contribute.

ENTERPRISE ARCHITECTURE

Again like SYSTEM ENGINEERING, is a team sport. It is not performed by one person in isolation. The several constituent disciplines subordinate to Enterprise Architecture are part of, and not separate from, the effort. One of the most common great limitations on architecture practice are the untrained managers who may refuse to comprehend this.

TIPS

The value of EA can be found in a unified holistic approach. When you see someone promoting business architecture or data architecture as a parallel independent effort, ask yourself why. Is this a self-serving scheme? Does it relate to marketing hype? Is it pure ignorance? Is management the ignorant party? Have they forced this inferior approach? Is some self-promoting consultant, lacking the full range of requisite education or skills for EA, to blame?

It happens quite often. Holism is an underreported aspect of EA.

If you want real results, real improvements due to coordinated efforts leading to transformation of the enterprise, remember to call the overall effort ENTERPRISE ARCHITECTURE and maintain the relationships between the constituent parts.

Enterprise Architecture Roadmap



FIGURE 19 THE IMAGE SHOWS A BASIC EA ROADMAP

The enterprise architecture transition plan or roadmap is a simple artifact. However, you will rarely find an ordinary, simple version. Most commonly this artifact is produced in highly over-complicated form, "gold plated." Stories of the \$200 toilette seat spring to mind. I will explain the basic artifact, but it is up to you to resist the consultants and bamboozled managers who insist on it being more.

GANTT CHART

Just as a single project has a Gantt chart showing the project schedule, so too the portfolio of the enterprise has a schedule. This schedule shows the path, or roadmap, from the current state to the target state (as-is to to-be).

TRANSFORMATIONAL INVESTMENTS

Each investment in transformation of the enterprise has a line. In that line the timeline of completion of that transformation is shown. Unlike the example diagram, each investment should be clearly labeled.

Volume 1: Enterprise Level Architecture

PLANNING HORIZON

Every architecture effort has a planning horizon. In EA the planning horizon should correspond to that of the strategic plan, usually.

YEARS

The years from today to the planning horizon should be indicated by vertical lines indicating the passing of time. In the example, years are shown relative to the planning horizon (ten years out), but in concrete real roadmaps it is more common to show actual years.

SDLC PHASES

One nice feature in EA roadmaps is to show the System Development Lifecycle (SDLC) phases for each investment or the investment lifecycle phases. In the example, eight phases of a conjectured lifecycle are indicated by color coding.

I have seen cases where people put little stars or markers on each investment for IOC (Initial Operational Capability) and FOC (Final Operational Capability) as well. That is not a bad idea.

NARRATIVE

An accompanying narrative describing each investment and the sequence leading to realization of strategic goals is usually provided. An associated artifact may show planned funding by year.

CONCLUSION

The basic enterprise architecture roadmap aka transition plan is a simple thing. However, your consultants may add complexity and charge you more. In my mind the basic artifact usually serves the purpose and much of the additional complexity often added is just not needed.

3.5 APPROVED TECHNOLOGIES & STANDARDS, SEPTEMBER 21, 2014

Service Access and Delivery			
Access Channels	Delivery Channels	Service Requirements	Service Transport
Web Browser	Internet	Legislative / Compliance	Supporting Network Services
Wireless / PDA	Intranet	Authentication / Single Sign-on	Service Transport
Collaboration / Communications	Extranet	Hosting	
Other Electronic Channels	Peer to Peer (P2P)		
	Virtual Private Network (VPN)		

Service Platform and Infrastructure		
Support Platforms	Delivery Servers	Hardware / Infrastructure
Wireless / Mobile	Web Servers	Servers / Computers
Platform Independent	Media Servers	Embedded Technology Devices
Platform Dependent	Application Servers	Peripherals
Software Engineering	Portal Servers	Wide Area Network (WAN)
Integrated Dev.Environment	Database / Storage	Local Area Network (LAN)
Software Configuration Mgmt	Database	Network Devices / Standards
Test Management	Storage	Video Conferencing

FIGURE 20 THE IMAGE SHOWS A PORTION OF THE 2007 FEA TRM, FROM US GOVERNMENT OMB

Enterprise architecture maintains the list of approved technologies and the list of standards. Within the US Government there is a policy that says this is so and that it is mandatory. Even TOGAF has now adopted this approach.

HISTORY

Several years ago in the US Federal Government there was a notion of a great hierarchy to categorize all technology used in IT. This would be used to break all technology down into narrow areas and list standards for each area. Then the products supporting chosen standards would be listed. Selecting standards, only certain products would be purchased. This was called the Technical Reference Model, and the idea came from the Industry Advisory Board.

But the folks in charge of acquisition law and some vendors (who produced non-standard products) complained. This reduced competition and made procurement biased, they claimed. The link between standards and supporting products was broken.

Later, when the issue settled down, a separate list of approved products was added back in. After that, the rest of the world began to copy what the US had done, as is often the case in EA.

Figure 27: Service Interface and Integration Service Area

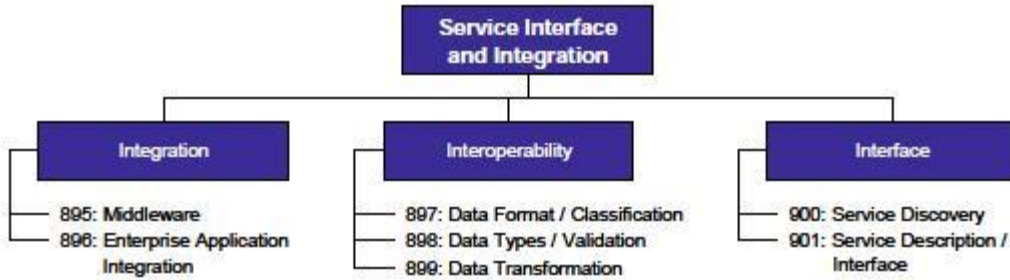


FIGURE 21 FROM THE 2007 TRM OF US OMB SHOWING HIERARCHY OF CLASSIFICATION

STANDARDS

Enterprise architecture selects standards for the organization, all standards. It maintains the list. Using standards dramatically improves inter-operation and reduces integration costs. However, many organizations have competing sources of standards, weakening the role of EA and making management of technology less effective. If you desire to effectively control technology used and improve inter-operation, avoid that common error.

APPROVED TECHNOLOGIES

Enterprise architecture manages the list of approved technologies. In conjunction with the use of standards this is designed to reduce the costs of training, maintenance, licenses and other aspects of TCO.

SECURITY

Today security acceptance forms a significant factor in approving technologies for use. Does the vendor have a security program to release patches, for example?

COMMODITIES

After years of use a general consensus that some types of technology are commodities has emerged. Managing the list of commodity products, all of which are equivalent, is not fruitful.

RESULTS

While the management of enterprise standards produces strong results, the management of approved technologies is labor intensive. Reductions in TCO are difficult to quantify.

ENTERPRISE PURCHASING

Enterprise-wide purchasing or licensing programs, conducted in conjunction with EA, are more effective than maintaining a list. Such central purchasing programs then implement the standards and approved technologies list, and a simple policy to prevent duplicative procurement controls sprawl of non-approved technology relatively well.

CONCLUSION

Volume 1: Enterprise Level Architecture

Enterprise architecture reduces integration cost via standards, and controls TCO via approved technologies. The original intent was to do these together, to be more effective. An enterprise-wide procurement program driven by EA standards and approved technologies is most effective. Such methods may exclude products from small businesses or those that are non-standard.



FIGURE 22 THE COASTLINE OF KAWAI, PRINCIPLES ARE LONG LIVED LIKE THE MOUNTAINS, BUT ARE WORN AWAY SLOWLY BY CIRCUMSTANCE

Principles are the rock on which your enterprise architecture is founded. They are the business rules that tell you what is good, what to optimize, what your goals are, what your EA purpose is.

Many less experienced architects ask "What is the purpose of EA?" or "What is the scope of our architecture?" or "Do we prefer COTS?" or "Do we embrace SOA?". Stop asking others. Look at your EA principles. If you do not have any, well, we know why you are confused.

MANY KINDS OF PRINCIPLES

Some focus mainly on business principles, but there are many kinds of principles. You should have a balance, a broad spectrum of principles to guide your architecture and decisions. In this way, following the rules, you are less likely to get lost along the way. Your architecture is more likely to achieve your ends.

Volume 1: Enterprise Level Architecture

BUSINESS PRINCIPLES

How is business conducted in your enterprise? Has your organization expressed values, rules of ethics, etc.? These are candidate business principles.

DATA PRINCIPLES

Has your organization expressed principles of how data will be managed? Is it shared? Do you have transparency? Do you have a practice of "data stewardship"? These are candidate data principles.

Do you use conceptual data models? Do you prefer Entity Relationship Modeling? Is there a canonical form to be followed? These are more candidate data principles.

APPLICATION PRINCIPLES

Do you code everything from scratch using Agile and SOA? Do you prefer using COTS instead? Do you have a list of SOA principles that you think are fundamental? Both programming and procurement are full of rules, and all are potential EA principles.

TECHNOLOGY PRINCIPLES

Are you low risk late-adopters? Do you encourage experimentation? Do you promote small business innovation or prefer large stable suppliers? Do you control TCO via approved technologies? Should single points of failure be eliminated? All are potential EA principles.

SECURITY

Do you have a commitment to customer privacy? Is security a priority? Is security supposed to be built in? By all means put these in the list of principles.

EA CONDUCT

How you conduct EA itself and what its purpose is are a rich source of EA principles. (These are not the primary focus of principles in architecture. Focus on "principles of operation" for the enterprise or system under design.)

USE A SPREADSHEET

I have a spreadsheet around here somewhere. It contains hundreds of potential EA principles. You can take such a sheet to the decision makers and ask them which ones they support. Which ones do they reject? Never leave a bunch of executives in a room with a blank page; they will get nowhere. People are far better at criticizing than creating. Make them vote on principles!

RESEARCH

There is some excellent academic research on the best EA principles. You should get that and use it in your list.

TOO MANY, TOO FEW

Often people focus on selecting less than ten central key principles for EA. You can have more and still be effective but selecting a few as key helps in conversation. If you have hundreds, that is probably too many to actually apply.

COMPLIANCE

Make sure your principles agree with law and policy. Review them for this purpose. You do not want a program with illegal rules.

CONCLUSION

Do not neglect to produce or select some EA principles. This will keep your EA program on target and focused on what is good, what you desire to have, your goals.

3.7 ENTERPRISE ARCHITECTURE ARTIFACTS, AUGUST 21, 2014

We enterprise architects produce artifacts. Artifacts are what the architecture is made of. Some goofballs think it's all data and the physical presentation is secondary. I think if two architects cannot read each other's artifacts there is a problem. Just call me "old school."



FIGURE 23 IN THE IMAGE IS AN EXAMPLE DOD OV-2, A TYPICAL ARTIFACT.

In my experience there are four kinds of artifacts in EA and in engineering drafting. These are: 1) Lists; 2) Matrices; 3) Drawings; and 4) Documents. Just four.

LISTS

Lists contain the basic building blocks of your architecture. An architecture is a set of elements and the relationships between them. The lists identify the elements. They can have attributes, or columns. Example lists are: 1) technical drivers; 2) applicable policies and laws; 3) servers; 4) office locations; and 5) major business functions.

MATRICES

Matrices have the elements of one list on the X axis, and another set of elements of (usually) a different list on the Y axis. Then you note the relationships between the elements. In one notable case each axis has systems on it and the matrix shows interfaces.

DRAWINGS

Drawings depict relationships between components. There are many standards for how things might be drawn, such as IDEF or BPMN or ERDs. If you are drawing stuff with no standard, you may be an amateur. There are some cases where the expert makes up a new type of drawing though.

DOCUMENTS

A document will use textual narrative to tie these other artifacts together.

TIPS

Here are some tips:

- Do not try to put too many kinds of things on a drawing. Two or three is enough. Sometimes it's only one kind of thing and the connections between them. This is one of the biggest errors in producing architecture artifacts.
- You can use larger sheets. Honest. Do not stick to A sized 8.5 x 11 paper.
- Engineering control blocks and CM info on the sheet is a nice touch. Use real discipline in controlling the modifications of your artifacts.

Volume 1: Enterprise Level Architecture

- DODAF is full of example useful artifacts. Martin wrote a book on diagramming techniques. Use existing forms before making up new ones.
- Be very clear of your terms and constructs; know exactly what they mean. Have some discipline with that.
- Put only the useful kinds of things in your architecture, not too many kinds of things. Keep it small or as small as it takes to cover your purpose.
- An architecture will consist of several kinds of lists, matrices, drawings and maybe a document or two. One drawing is not much of an architecture. Different artifacts tell different aspects of the story.



FIGURE 24 INDICATES A COMPARISON AND CONTRAST

The term capability is used often in current enterprise architecture discussion. Let's examine its use and meaning relative to real outcomes.

OUTCOMES

An outcome is the result of your activity regarding enterprise transformation, in terms of operational improvement. Are we now following a strategy that engenders success? Has our customer perception improved? Have our sales increased? In so much as EA is tied to performance measures, an outcome should be expressed as a change in those performance measures.

An outcome is a measurable change in measured performance indicators.

CAPABILITIES

A capability is a potential for the enterprise to do something. If it is possible for the enterprise to do something, then it is capable. Capabilities are important to organizations like DoD, where you

Volume 1: Enterprise Level Architecture

may not want to exercise all your capabilities and destroy everything. Sometimes the mere capability is effective as a deterrent.

A capability is something the enterprise could do, if executed.

OUTCOMES NOT OUTPUTS

Outcomes are commonly confused with outputs. The thing produced by a production in your business is not an outcome. Outcomes are the improvements produced by transformation. Outcomes should be measurable by performance indicators, metrics, and not described as circumstances. When you list some circumstance it tends to be part of a solution not a measure of the problem, and in the end you can often only prove that you spent money but not that you affected the performance of the organization.

EXAMPLES

"Customer complaints will decrease by 30%" is an outcome. "A new help desk will be created" is not an outcome but may be a capability.

COMPARISON

In business, and in civil government, it is not enough for some process or method to be possible. You must realize the potential gains. Basing an enterprise architecture on capabilities, potential actions, is not adequate and not the point. Real transformation requires capabilities to be realized and the performance of the organization changed.

PRIMARY USE

The primary use of capabilities is in evaluating alternatives for real implementation. In defense applications, that decision is delayed until needed and potentially unused capabilities are still acquired or developed. In business and civil government, unused alternatives are not usually developed or acquired, as this would be cost-ineffective.

CONCLUSION

The term capability is useful. Lists of capabilities may be useful. The focus of EA is not on what might be possible but what is actually implemented to transform organizational performance. Capabilities are often overemphasized in enterprise architecture efforts within business and civil government. You will be measured on real outcomes, not potentials.



Enterprise architecture is all about alignment. Outside DODAF it's almost a mantra. What does that mean? How does that work? Here is an example. I will use widget manufacturing as the organizational mission, for clarity.

SWOT ANALYSIS

Before the strategic plan someone does some SWOT analysis, or Cost-Based Accounting, or some such to determine where the organization might improve to accomplish the mission. A coherent set (not contradictory) of goals is chosen for the strategic plan.

STRATEGIC PLAN

The strategic plan has goals and objectives. (If you are a Mintxberg & Quinn fan, get over it. There are no policies or initiatives in our plan). The goal we will examine is to take the lead in the widget market, where we are number 2. Objectives are subordinate to and more detailed than goals. Our selected objective will be to steal the heavy-duty widget market lead from number 1.

INVESTMENT

To best achieve the strategic plan, different investment proposals (business cases) are examined. The set with the highest ROI are selected. This may require some of the information from below. Ignore that for the moment and examine how it all is related.

Somewhere in the strategic plan or the business case a set of organizational performance measures are identified. The improvement in organizational performance is included in ROI comparison. Here we will increase heavy-duty widget market share from 35% to over 50% within three years.

BUSINESS PROCESSES

Not all business processes support the strategic goal and objective. Only the processes directly supporting strategy are examined for improvement. In this case widget marketing, widget sales and widget manufacturing are important.

PROCESS STEP

By examining the product and its competitors against customer needs, using focus groups or whatever is required, we find that if we increase widget hardening by 19% we may achieve the market percentage goals identified. We will, therefore, examine the hardening step in widget manufacture.

To improve the hardening step we may perform further process analysis. We may engage a metallurgist. We may ask vendors. We may "benchmark" asking a friendly company to show us how they improved hardening of perhaps a different but analogous product like cogs.

PILOT

When we have the answer we may pilot it, leasing or loaning the needed equipment. We may test that the new process achieves the desired hardening.

LIMITED PRODUCTION RUN

We may produce some, combining the new product with the new marketing materials and sales pitch on selected customers. We may check market acceptance and revalidate our market projections.

PRODUCTION

Ultimately we may put the new process in production. We may place it in the hands of Kanban or Lean methods for continued improvement.

EVALUATION

We will evaluate that we make progress toward and eventually meet or exceed the strategic objective. This proves the ROI of the investment. We will also check that the objective has the desired effect on the loftier strategic goal.

CONCLUSION

Volume 1: Enterprise Level Architecture

By selected targeted action the activities at the lowest level are caused to support strategy. The link from strategy to operational and tactical activity is clear and justifiable. This is the EA concept of alignment.

3.10 PERFORMANCE MEASURES IN THE ENTERPRISE, JULY 26, 2014

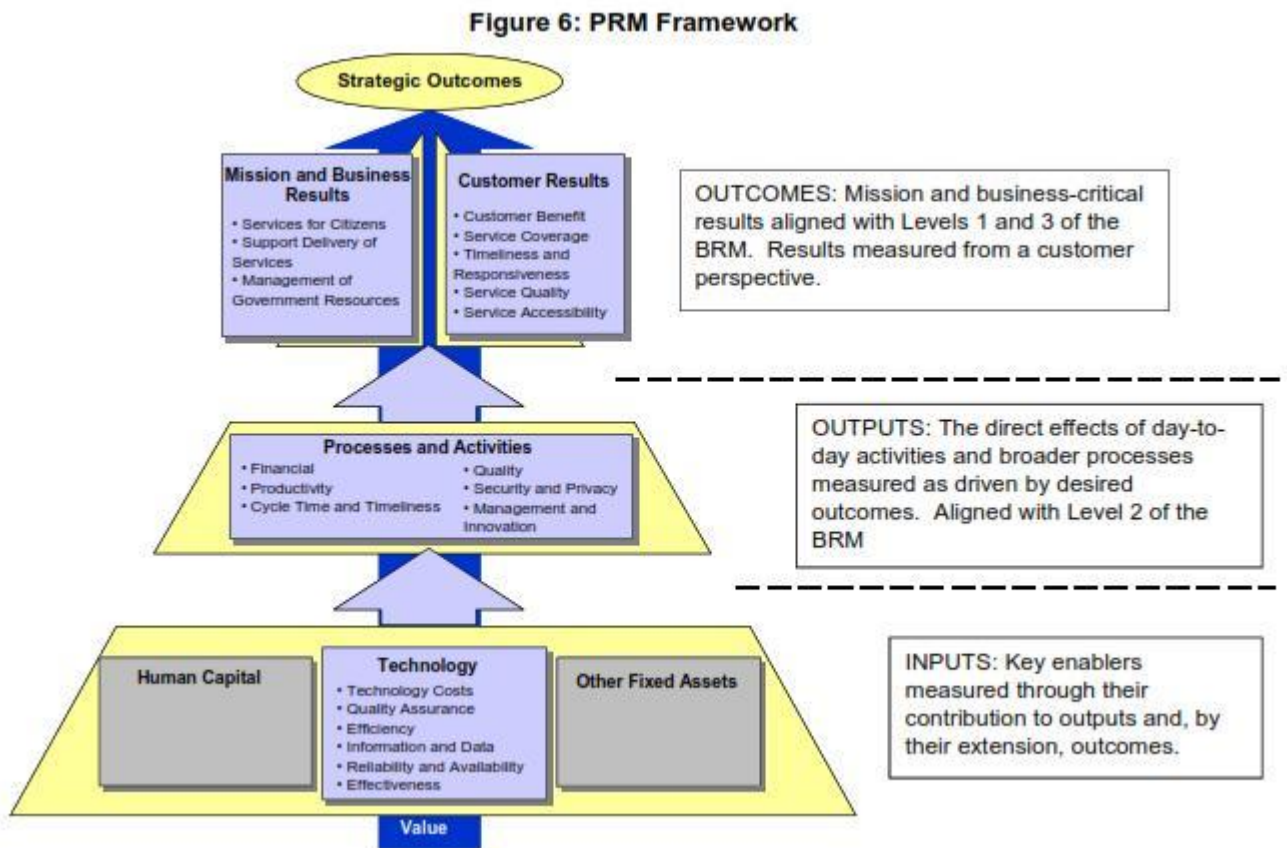


FIGURE 25 IMAGE FROM THE US GOVERNMENT FEA CRM 2007

Enterprise architecture is about improving organizational performance via transformation. Given that, enterprise architecture is intimately connected to performance measurement.

Performance measurement is an area full of misunderstanding. Mainly, people seem to exhibit a kind of myopia about it. Measuring one aspect, they think they have wired the enterprise for the slightest twitch. Alternately, they get overzealous and try to measure far more than is sustainable about one small effort. Many mistake one area of measurement as a substitute for another. Here is a short survey of the types of performance measures and a few quick tips.

PROJECT PERFORMANCE MEASURES

The performance of the project manager (a human) and his team (more humans) in the conduct of achieving the goals of the project is often measured. Of most importance are cost, schedule, and their variance. To understand the measures applied to these people in the performance of their jobs I suggest looking a Earned Value Management (<http://www.dummies.com/how-to/content/earned-value-management-terms-and-formulas-for-pro.html>).

PRODUCT PERFORMANCE MEASURES

Volume 1: Enterprise Level Architecture

Separate from the project and its people, the product under development is often measured. The suitability for use and fit for purpose are important. To understand how a product may be measured I suggest looking at system engineering and INCOSE (https://www.incose.org/ProductsPubs/pdf/TechMeasurementGuide_2005-1227.pdf).

There are three levels of metrics in the INCOSE model:

- Measures of Effectiveness; measures of the effectiveness of the product *in use*.
- Measures of Performance; a selected few measures of performance of the product are designated Key Performance Parameters.
- Technical Performance Measures; Selected important subsystem details.

SERVICE PERFORMANCE MEASURES

A service may and should also be measured. To understand the kinds of measures applicable to a service, I suggest looking at ITIL. <http://www.20000academy.com/Blog/April-2013/Facing-reality-measurements-in-ITIL>

There are three levels of measurement in ITIL:

- Technology metrics: component and application metrics (e.g., performance, availability...)
- Process metrics: defined, i.e., measured by CSFs and KPIs
- Service metrics: measure of end-to-end service performance.

ORGANIZATIONAL PERFORMANCE MEASURES

Organizations as a whole may be measured. To understand the organizational performance measures that may be applied to transformation efforts I suggest the Federal Enterprise Architecture Combined Reference Model (FEA CRM). It has a handy hierarchical list called the Performance Reference Model (PRM) (http://www.whitehouse.gov/sites/default/files/omb/assets/fea_docs/FEA_CRM_v23_Final_Oct_2007_Revised.pdf),

The PRM offers a four-level classification system for performance indicators for a transformational investment. The hierarchy is intended as a taxonomy to classify your measurements and help you pick one or a few of each type for each investment.

- Measurement Area
- Measurement Category
- Measurement Grouping
- Measurement Indicator

However, measuring a whole organization may also be accomplished by financial measures, especially if the organization is a public company. I suggest reviewing the SEC data on the 10-K and 10-Q filings for public companies to understand that (<http://www.sec.gov/forms#.U9PzEfldWoM>).

TIPS

- Do not assume that if you are measuring a project, you are measuring its product adequately. The reverse also applies.

Volume 1: Enterprise Level Architecture

- Do not assume ITIL is good enough for product, nor that INCOSE is good enough for services. Each pays lip service to the other category.
- Do not mistake a good product for investment ROI. The resulting product or service must be put into use and measured in practice for initial and continuing effectiveness in terms of organizational performance.
- Do not mistake investment ROI for organizational performance. The organization should be measured to see if it performs well, if the operational impact of projects and transformation and custom products used is positive and sufficient.
- Once a project is completed, putting its product or service into continuous use in the enterprise, a recurring evaluation of the use of that item should be conducted to determine if it continues to cause improved or superior organizational performance. In the US Government such operational evaluation of each product or service produced by transformation on a yearly basis.
- Recurring operational evaluations are not impossible nor even that difficult. I worked in Strategic Air Command, where Curtis LeMay had implemented comprehensive recurring (more or less yearly or better) operational evaluations to determine if transformational efforts, equipment and processes were effective. We improved after every evaluation, better, faster, cheaper. This is not myth.
- Yearly audits should review your measurements and controls for adequacy.
- Remember to take baselines for your measurements before you start changing things.

3.11 REFERENCE MODELS, JUL 2, 2015

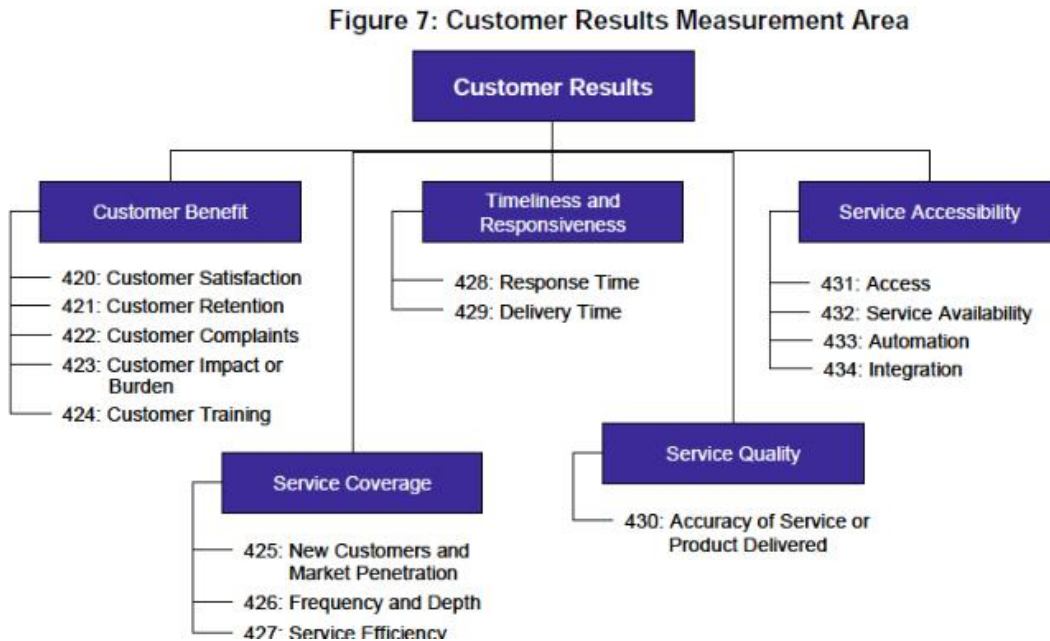


FIGURE 26 SHOWING A PORTION OF THE PERFORMANCE REFERENCE MODEL FROM THE 2007 COMBINED REFERENCE MODEL DOCUMENT OF THE US GOVERNMENT

There is a thing called a reference model that was created for the FEA. It needs some explanation to be understood correctly. Let's talk about metadata.

LISTS

Imagine you have a list of important things in your enterprise. For example you will list every information system. One item you may list the Acme Human Resource System (I made that up). So there is a line in your spreadsheet for that. Now you may want to identify in your spreadsheet that this is a human resource system, of the category support systems, among the top category enterprise software. This uniform categorization will help whoever compares enterprises find "apples to apples" comparisons of like type.

You would get the list of standard categories from an architecture "reference model."

ORIGINAL PURPOSE

The original purpose was just this. The United States OMB would receive reports of enterprise architecture from all agencies and compare reports to find consolidation opportunities. Why should Agency X need 25 conflicting competing human resource systems for example? We could save money!

(I did some of this OMB reporting for Department of Education back then. As Zachman has identified, most of the value comes from identifying the links between items in different lists. This was in the reporting spreadsheets as well.)

NON-STANDARD ITEMS

Volume 1: Enterprise Level Architecture

However when used in practice, the government found that some items in some agencies were not in the model. The all-government model was missing nuclear command and control software, for example. They forgot that.

So each agency could customize the reference models. OMB would harmonize the changes. There was an official website and reporting form for changing the standard reference models.

OMB BUDGET

Unfortunately all comparison at OMB was curtailed. There was no budget for that. They would not be directing consolidation.

DATA GOES NUTS

Then the Data Reference Model (DRM) broke ranks. It became not a means to simply list all the databases in an agency but a means to report a "canonical form" for data interchange and interoperation. This was an early predecessor of efforts like NIEM.

That was a good idea but very different.

REFERENCE MODELS AS ARCHITECTURE

Some began to think of the categories themselves, listing nothing, as architecture. Each agency would create reference model extensions and that was architecture. Some had the good sense to retain the lists at the leaf nodes of the model.

FEAF 2

The whole issue has become clouded that this reporting aid, the reference model, is now included in FEAF 2 as part of the enterprise architecture.

As I reported in the section on Very Lean Enterprise Architecture, lists are good at the enterprise level. However, few drawings are required. FEAF 2 is unclear on guidance by level, mashing all guidance at all levels into one lump. The closer we get, the further we get from the goal.

SECTION 4: HOW TO

Section 4: How To	90
4.1 Parsimony vs Comprehensive EA, December 14, 2014	91
4.2 Very Lean Enterprise Architecture, July 27, 2014	93
4.3 Buying your Enterprise Architecture, August 3, 2014	96
4.4 Ten Ways to Botch EA, September 21, 2014	98
4.5 Enterprise Level Anti-Patterns, March 5, 2015	100
4.6 Enterprise Architecture Anti-Patterns, January 24, 2015	102
4.7 Enterprise Architecture vs Systems Engineering, August 16, 2014	104
4.8 Scientific Method & Engineering Method in EA, November 25, 2014	107
4.9 Rationalism vs Empiricism in EA, December 6, 2014	110
4.10 Objective Reality & Enterprise Architecture, December 20, 2014	113
4.11 Splitting Hairs in Enterprise Architecture, October 24, 2014	115

The first section emphasizes the most important issue for success in enterprise architecture: avoiding excess. The second section tells you how to accomplish this minimalism. The third gives you tips on outsourcing enterprise architecture.

Then we have a section describing anti-patterns within the enterprise architecture effort and two sections describing anti-patterns that enterprise architecture is designed to guard against or control in the enterprise itself.

The next several sections tie enterprise architecture to science and engineering and the last warns against academic arguments that do not improve architecture results.

QUESTIONS FOR SECTION 4

1. Why not just do all the architecture for the whole enterprise in one level of activity? Will that succeed? What if the organization is tiny?
2. Why would you avoid outsourcing enterprise architecture?
3. Are the anti-patterns inside enterprise architecture different from those in the enterprise under management? How do they differ? How do their affects differ?
4. Is enterprise architecture a science? Is it engineering? Is it a subset of systems engineering?
5. Are those who debate terms all day effective architects? In which of the five activities does debating terminology belong?



FIGURE 27 PARSIMONIOUS ART IN AN EMPTY FIELD

Enterprise architecture has its problems, its pathologies that lead to failure. Few are so widely recognized as "boiling the ocean," or modeling too much. Many architects and many architecture teams have faced this problem and returned defeated.

TOO MUCH

What is "too much"? Here are some ways to view the problem:

- Answering questions that no one asked
- Requiring data that cannot be gathered
- Extending efforts beyond the period of performance
- Producing results long after they are needed

At the highest levels, enterprise architecture informs portfolio management. It asks what do we have now, what do we need to perform better? These questions do not require knowledge of each configuration value on each Windows server in the enterprise. Some balance must be struck.

At this highest level there is a budget cycle associated with portfolio management. Often that budget cycle is yearly. If the budget and the portfolio decisions are yearly, the architecture should have a completed version yearly. (Read this again if you somehow think we are speaking of a single project or system—you missed something.)

Volume 1: Enterprise Level Architecture

How do you produce an architecture with the limited data required within one year? As many know, this is often limited by data gathering and not the production of pretty artifacts.

4.2 VERY LEAN ENTERPRISE ARCHITECTURE, JULY 27, 2014

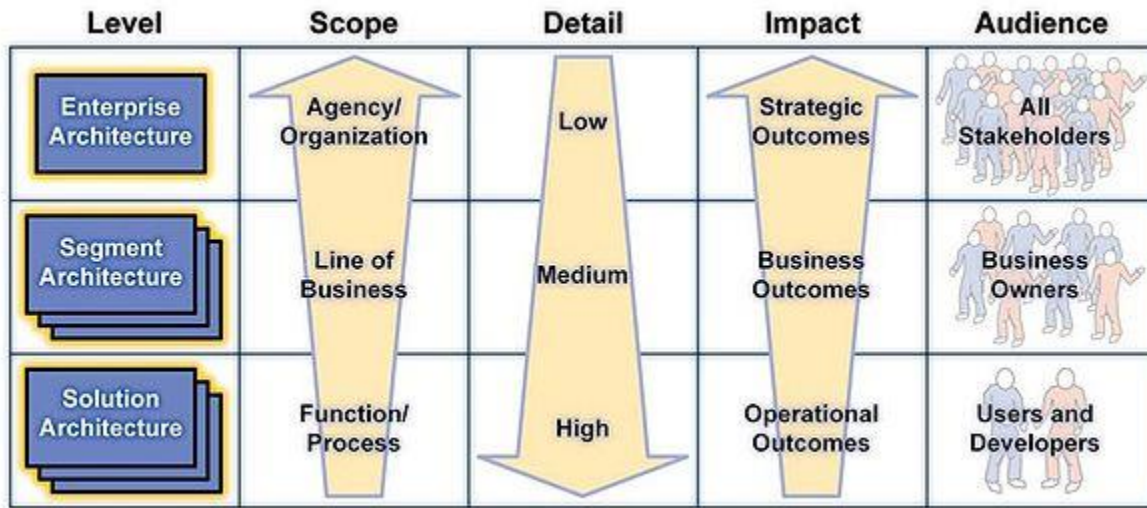


FIGURE 28 IMAGE FROM 2007 FEA PRACTICE GUIDANCE, OMB

Many people tell me they have new, leaner simplified architecture frameworks. I remain skeptical. The reason why is that one of the mainstream frameworks became ultra-lean in 2006, though few enough noticed at the time. Now I compare all the newcomers against that benchmark, and so far I have not needed to rethink what I support.

FEAF V1.1

Occasionally I am surprised by this stuff. FEAF v1.1 was always lightweight. It was developed by a group of my slightly older DC friends and colleagues and released in 1999. It took the five-layer model of the NIST pyramid and cut that to four. It took Zachman's framework (at the time still framework) and simplified its introduction via Spewak's incremental approach while focusing on four columns. It was sparse, not quite spartan perhaps, and mainly involved keeping lists. The scope was the entire enterprise, a sort of inventory of the entire enterprise. (See <http://www.enterprise-architecture.info/Images/Documents/Federal%20EA%20Framework.pdf>)

THREE LEVELS

Then in 2006/2007 Dick Burk released his FEA Practice Guidance. It said some very useful things, and I was impressed. One concept included was that enterprise architecture consisted of three levels. This concept de-conflicted the endless arguments of solution architects who thought they were doing enterprise level architecture. (See http://www.whitehouse.gov/sites/default/files/omb/assets/fea_docs/FEA_Practice_Guidance_Nov_2007.pdf)

APPLICATION

So, as a long-time FEAF fan, I examined what this meant in application to the FEAF. I determined that, probably, you would want to avoid doing things redundantly at two levels of architecture.

Volume 1: Enterprise Level Architecture

Perform work only once. You would probably also prefer to do any function at the lowest level, closest to where it is needed, as that increased the responsiveness and flexibility of organizations (what we now call agility). But some select functions must be centralized to be effective. Perhaps as Einstein had said the top layer should be as simple as possible but not one bit simpler.

The similarity to Lean thinking should be pretty clear.

LEAN FEAF

After examination I came up with the following items as remaining in the enterprise level FEAF function:

- Keep some lists (FEAF tells me what lists)
- Track some relationships between items in the lists (FEAF tells me which relationships)
- Produce a vision
- Produce a roadmap (a Gantt chart of all the transformational programs)
- Maintain a repository
- Support the internal control CPIC, a.k.a. Portfolio Management

I need not do solution design, drawings of solutions, BPR, or a wide range of other functions handled at the lower levels or by the CPIC process itself.

RESULTS

It turns out Troux™ Architect is designed to automate essentially this function. I also implemented this leaned out FEAF on SharePoint at DNDO for a time. It all works fine. Your governance does need to review lower level architecture activities and accept them into the enterprise repository when approved, attached to the relevant items in the lists.

LISTS

Here are all the lists you need to keep. Each list contains simple facts.

- Drivers, reference to the documents that describe your business or technical reasons for change in the architecture.
- Major Business Functions: Those areas that will be further described, as required, by process diagrams. It is good to know what the organization does.
- Data Stores: A list of the major databases and other data/information/knowledge repositories with a description of what they contain. You might want to consolidate these to save money, now and then.
- Applications (or services): A list of the enterprise applications. Under SOA, you may argue this should be services. Most places have a hybrid of legacy and SOA services—keep a list of both.
- Approved Technologies: Which products are approved for use, and if they are preferred, or being divested, or prohibited for a reason. This list helps contain TCO.
- Standards: What standards does the organization have. This is the basis of interoperation.
- Principles: What attributes describe a good transformation effort, a good piece of software, a "best practice." Your lessons learned improve this list.

Volume 1: Enterprise Level Architecture

- Segment: Your organization's major lines of business, product lines or service lines.
- Cross-cutting initiatives: Your organization's "strategic initiatives" that touch all—or most—efforts. In the US Government this includes IP-V6 and Security, for example.

Yes, I did this from memory. Each list is just an ordinary list, with rows of text, and some columns of relevant information. Either Truex™ or SharePoint™ allows you to attach a drawing or document to an item in the list.

These lists are pretty much what the CIO should keep track of anyway, even if you despise the name "enterprise architecture." If the CIO does not know these things, she should probably be fired.

RELATIONSHIPS

You need to keep track of how some of these things relate, even if you don't want to. For example:

- What databases and applications support which business functions. If it goes down, who is affected?
- What technologies and standards support which applications? If we outlaw MS SQL Server for example, then what stops working?
- What drivers affect which functions? What needs improved?

THE BUDGET

Each year the budget is prepared. CPIC or Portfolio Management makes decisions that are the basis of the budget. CPIC/Portfolio Management decisions also update the lists and the roadmap. Unlike lower level architectures the enterprise level has a natural yearly cycle, though incremental updates throughout the year are possible.

THE VISION

Usually the vision is the product of the CEO. It is embedded in the strategic plan or five-year plan or whatever. Enterprise architecture or the CIO may get to embellish a bit on how standards or technologies or transformational efforts affect the vision. The vision informs CPIC/PM concerning what programs fit well.

CONCLUSION

That's it. No waste. Just a simple little organizational function that can be produced by a small team. The biggest error is to try to manage too much at the enterprise level rather than delegating it to lower architectures. The hardest part of it is gathering the data.

So far other frameworks are no smaller or if they are they leave out critical bits of the effort.

All of this probably still applies to FEAF 2.0. I cannot guarantee that works yet, nor tell you of my experience implementing that. Someday soon, I suppose.



FIGURE 29 HOW TO BUY ENTERPRISE ARCHITECTURE

Surely it is best when EA is a sustained practice built in to the organization. Many organizations do not have enough staff hired as permanent employees to sustain their EA efforts. They hire help, consultants, who pitch in. Here are some tips for hiring that help.

CONFLICTS OF INTEREST

As you have seen in my other posts EA is about supporting portfolio management, leading to transformation of the enterprise. External companies you hire to assist may have other agendas. Avoid hiring consultants with differing purposes.

- Vendors of hardware or software sprout EA consulting services to sell more of their products. I know this because I have interviewed with them, worked with them, and discussed this with them. They will tend to bias your portfolio to buying more of their products. That is what they are paid by their company to do.
- Large integrators will sometimes sell EA as a consulting service. Most knowledgeable customers force a "Chinese wall" or other method to mitigate their involvement with the portfolio. They may otherwise, as a matter of course, inform the home office of upcoming

Volume 1: Enterprise Level Architecture

work and bias procurement of transformation initiatives toward their company. They may also bias your portfolio toward initiatives they support (work on).

HIRE EXPERTS

Buying very expensive contractors and consultants makes sense when you buy a few that have great expertise. It makes far less sense when you hire many under qualified minions. Look for significant qualifications. Do not use such contracts as a means to build an empire of low-level labor to make coffee for you. (US Federal Government customers should also review FAR 37-104.)

YOUR SAFEST BET

Use small boutique firms that have no products and do not act as major integrators but specialize in EA. Check their websites to see if EA is listed as a primary service. (Here in the US Federal Government market these may be disadvantaged or hub-zone businesses.)

IGNORE THE NOISE

Many marketers for big businesses with conflicts of interest, or parties tied to those companies in some way, may post objections. Such objections are likely to be driven by commercial interest. Ignore them.

CONCLUSION

That's it, just a quick note for my friends on the other side.



FIGURE 30 THE IMAGE EVOKES DISATEROUS FAILURE

This is my list of the ten top ways to derail your enterprise architecture program. The list is completely subjective, and totally based on my experience alone. It's my personal list. This list assumes the US Federal Government law and policy environment but can be applied to corporate situations without too much rethinking.

1. **CIO does not report to the CEO.** In the US Government the CIO is constrained by law to report to the head of the agency. In corporate terms: the CIO owns EA but has been relegated to an obscure lower layer of management and disempowered. As a result, your EA program is disempowered.
2. **CIO is a Geek.** The CIO refuses to take responsibility for, or is not empowered to manage, business process improvement of general business operations and transformation.
3. **Hobbled Portfolio Management.** Portfolio management has no control of programs. Portfolio management never kills duplicate programs. Portfolio management produces "zombie programs."
4. **Competing Transformation Efforts:** Some alternative competing business transformation effort is created and promoted. EA is sidelined.

Volume 1: Enterprise Level Architecture

5. **No Control of Standards:** Some competing group is given control of the selection of standards, or some standards, and EA is disempowered.
6. **No Control of Organizational Performance:** Some competing mechanism not coordinated with EA, not within the same analysis model as EA, produces organizational performance measures. Management holds operations accountable to performance not used by EA. No measures are taken or no baselines are taken.
7. **No Control of Lower Level Architectures, subordinate architectures:** Business, data, application, or infrastructure architectures are independent of EA. Solution or segment architecture is not checked and cross-checked for compliance with EA.
8. **EA Does Not Control SDLC and Stage Gates:** EA does not produce and manage the SDLC. EA does not manage SDLC stage gate reviews. Reviews do not enforce EA.
9. **Untrained Architects:** Chief architect has no formal training or education in EA. Staff architects have no formal education or training in EA. Terminology and methods are unfamiliar.
10. **No Audits:** No mechanism to audit programs and projects, operations, governance processes for inclusion of and compliance with EA exist or occur.

In my experience this list covers more than 90% of the reasons EA fails to produce. Your EA program might survive one of these but not two or three.



FIGURE 31 SORTED INTO BOXES AND LOOKING FOR THE VALUE

Recently I have seen some discussion of enterprise architecture patterns. Much of it has to do with solution architecture. Let's talk about anti-patterns, as this is more often what we use at the enterprise level. Some time ago I divided the enterprise architecture subject into five areas. I did this so discussion could proceed on each area. If we stick strictly to the enterprise level of architecture we are looking at supporting the transformation portfolio and the subject of pattern and anti-pattern there becomes greatly simplified. It becomes clear how to steer the enterprise and produce real improvements. (See http://www.unauthorizedprogress.com/images/EA_as_5_activities_2014.pdf)

At the enterprise level we are looking at the gross (coarse grained) features of the enterprise. In FEAF 1 we are looking at: 1) business functions (to be broken down into successively lower levels of process elsewhere); 2) data stores (at the level of the conceptual database, mostly just topics); 3) systems (major functions and not their internal detail); 4) technologies; 5) standards; 6) drivers (business and technical, including strategic goals and new laws and such); and 7) principles. I might have left something out. In FEAF 2 you can add security threats, infrastructure, and change systems to applications. In the original NIST framework you would also have interfaces (information, data in motion). You should also have an idea of the business cases or portfolio of transformation initiatives, as this will be important for a discussion of patterns. I could go on.

So you make inventory lists of whichever categories you use, without too much detail below yet, and then track the relationships between items on the lists. See Zachman if you are confused here.

Volume 1: Enterprise Level Architecture

The International Organization for Standardization (ISO) (and the Institute of Electrical and Electronics Engineers [IEEE]) says an architecture is a set of components and the relationships between them. This is the enterprise level architecture. We have components of differing types, this might throw you off a bit. That's EA. Now we all have the same basic grasp of the space. Lets get back to anti-patterns.

LIST

So here are the most prominent anti-patterns that we in enterprise architecture see all the time:

- Two or more applications performing the same function. The enterprise is spending duplicative funds on the same problem. Examine these for consolidation. Go save money.
- Two or more data stores (databases) tracking the very same data or data assets with large overlap. This means you have to reconcile the data regularly or you will have errors and discrepancies. Examine these data stores for consolidation. Go save money.
- A system exists not related to any core business/mission function and unrelated to most business or technical drivers (laws, policies, strategic goals). This is an unaligned system. Examine its ROI and determine if it should be eliminated. Go save money.
- The business function (the organizational element) performs poorly. No automation aiding a business function? This is the "gap." Build/buy/borrow a system to automate it. Examine which. Is the supporting transformation effort and/or its system(s) no longer performing the function or has it never performed the function? Stop that effort and begin a new round. This is end-of-life for an effort.
- A (several) support function(s) performs with excellence but core business or mission functions perform only adequately. Your transformation priorities are out of whack; focus on the core first and foremost.
- Hey, how are we implementing those last two strategic goals? Hey, how are we addressing this GAO-report/lawsuit/Inspector General report/compliance-gap? There are missing transformation efforts. The vision might need revised and business cases must be generated. Get with the operational folks and make it happen; send a business case to portfolio management.
- Two systems or efforts with adjacent or related functions are performing poorly because information is exchanged manually, or rarely exchanged. No data sharing. Implement interfaces, EAI, ESB, MOM, SOA or ETL.
- No visibility into organizational performance or key organizational performance improving data not visible. Implement dashboard, data warehouse, data-mart, intelligence gathering process, analytics. Ensure performance measurement occurs. Align performance measures under EA.

Those are the top contenders. Simple, eh? If you divide EA as indicated in the paper, all five functions become far less complex to analyze. (As for those who say EA has no ROI, they are probably performing the wrong functions in the wrong way at this level.)



FIGURE 32 IMAGE DEPICTS A FIGHTER PLANE HEADED INTO THE GROUND.

The Five Activity Model takes the three levels of FEA architecture and adds EA maturity management and EA Governance. It covers the whole spectrum of EA in a coherent way. (For more information, see http://www.unauthorizedprogress.com/images/EA_as_5_activities_2014.pdf)

What happens if you do not perform all these activities in your enterprise?

Hays "Skip" McCormick wrote the book and popularized the term "anti-patterns" regarding software development back in 2000. Skip is a good guy, lives west of here, works at MITRE now. I am a big fan of his work.

Let's see if we can apply anti-patterns to enterprise architecture using the Five Activities Model, eh?

FIVE ACTIVITIES

Here are the five activities in the model:

- Enterprise Architecture Continuous Improvement
- Enterprise Architecture Governance
- Enterprise Level Architecture
- Segment Level Architecture
- Solution Level Architecture

Volume 1: Enterprise Level Architecture

See also:

- Enterprise, segment and solution architecture: <https://www.linkedin.com/pulse/enterprise-segment-solution-kern-msem-bsee-cea-cissp-issap-itol-pmp?trk=mp-reader-card>
- Enterprise architecture continuous improvement: <https://www.linkedin.com/pulse/20140802133423-86002769-enterprise-architecture-maturity-management?trk=mp-reader-card>
- Enterprise architecture governance: <https://www.linkedin.com/pulse/20140801112523-86002769-enterprise-architecture-governance?trk=mp-reader-card>

ANTI-PATTERNS

How about some common anti-patterns? What can we pick off from simple observation and common examples?

- **No EA Continuous Improvement:** Suppose an organization never chooses a framework, never writes down its EA processes, never measures its EA maturity, never tries to manage it? The result will be that the maturity of its EA practice will not mature. EA will remain immature. Results will never get better, more predictable, more reliable, more tuned to the way you operate.
- **No EA Governance:** Suppose architecture at all three levels is not tied to governance? Architecture will never affect the transformation portfolio, and EA will not drive transformation. Segment architecture will not guide stage gate reviews, and solutions will not be gauged against the mission and customer value. Configuration management will not be guided by the solution architecture and changes may be random, redundant, mistaken, or expensive. Redundant systems will flourish; irrelevant systems will multiply.
- **Enterprise, segment and solution architecture smashed together:** If all of architecture is conducted as one activity, it will not scale. It is likely to fail as in "boiling the ocean" through excess scope. This only works for very small organizations.
- **No (or immature) Enterprise Architecture:** There will be no inventory of what you have (business, data, solutions, etc.), no projected inventory of what you will have, and transformation will have no guidance. There will be no schedule of investments or roadmap. There will be no principles, vision and standards for lower level architecture and solutions. Redundant systems will flourish; irrelevant systems will multiply.
- **No (or immature) Segment Architecture:** The value chain, the logistics chain, distribution and markets will not be managed by and drive architecture. Architecture will be inward facing and far less effective at transformation. Business cases for transformation will not arise from real operational needs.
- **No (or immature) Solution Architecture:** Large or complex solutions will fail.

CONCLUSION

Well, we have a first pass. That was easy. It looks like the Five Activities Model can be used to evaluate EA anti-patterns. I bet you are just soooo surprised.

4.7 ENTERPRISE ARCHITECTURE VS SYSTEMS ENGINEERING, AUGUST 16, 2014

What is the relationship between system engineering and enterprise architecture? Where does one stop and the other begin? This is a topic of some considerable discussion by experienced analysts. Here is a quick introduction to some key points.

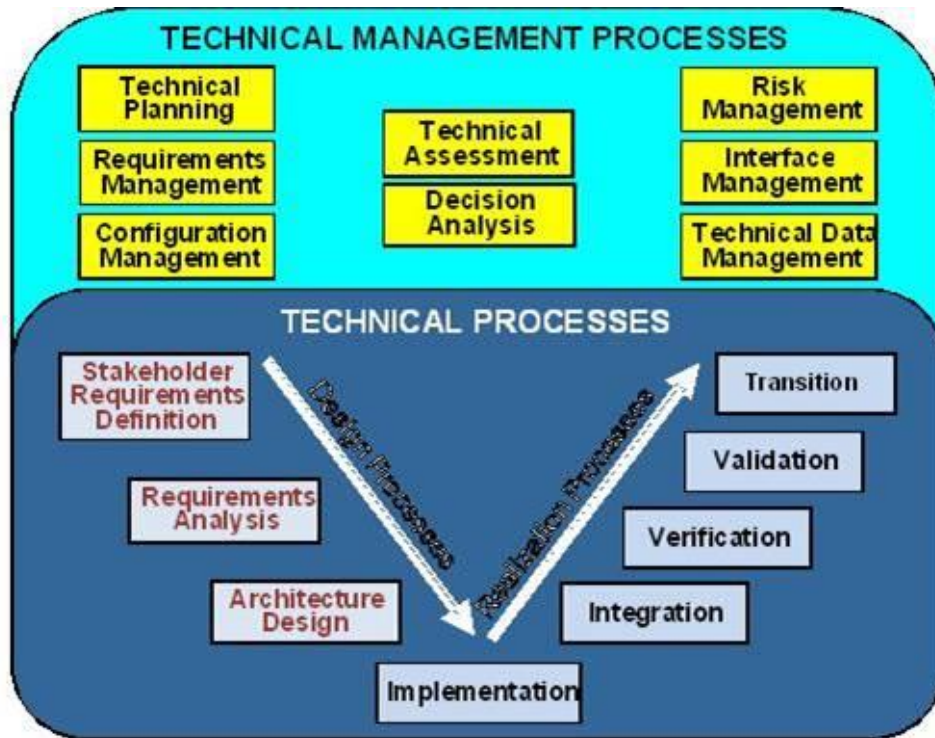


FIGURE 33 IMAGE FROM DEPARTMENT OF DEFENSE SYSTEMS ENGINEERING TRAINING

SOLUTION LEVEL ARCHITECTURE

The diagram shows the DoD system engineering V, as depicted in DoD system engineering training. You can see on the left the box labeled "Architecture Design." As the image depicts the full scope of system engineering one may infer that "Architecture and Design" is a proper subset of system engineering. From such DoD training, we know that the architecture discussed often is produced using DODAF. This approach has been used much and works pretty well, so let us accept it as a valid bit of thought to rest our introduction on.

FOR THE SOLUTION LEVEL OF ARCHITECTURE, SOLUTION ARCHITECTURE CAN BE THOUGHT OF AS A SUBSET OF SYSTEM ENGINEERING.

In practice certain other system engineering processes I have written of, including "drawing the box" around subsystems and allocation of requirements, are commonly part of architecture. The production of stakeholder requirements and derived requirements from analysis is specifically outside the architecture box as depicted.

SEGMENT LEVEL ARCHITECTURE

Burk 2006 in the FEA Practice Guidance from OMB describes three levels of architecture. The middle level is segment architecture. To extend our DoD line of reasoning, the Business Enterprise Architecture (BEA) of DoD is arguably analogous to segment architecture. A "Mission Architecture" in DoD is again arguably analogous to a "Line of Business" architecture in the FEA as well.

Such architectures describe the working parts and their relationships. In DoD the DODAF is most often used to describe these architectures. However, I have not found much discussion of system engineering in this context. On the other hand, a mission or "Line of Business" is definitely a system and amenable to analysis and engineering.

I will not explore this here, but you can link this discussion to the notion of a "System of Systems."

We do know that the scope of the mission, its goals and objectives, its constraints and compliance needs regarding policy, are delivered to architecture and not produced by architecture. This is analogous to requirements development being outside architecture at the solution level.

Let us say then that, in theory, architecture is again a subset of system engineering at the segment level of architecture. However, in practice we are perhaps short some description and guidance of how that works. But remember, the system engineering diagram depicted above is not intended to be restricted only to the solution level in DoD!

ENTERPRISE LEVEL ARCHITECTURE

Here we leave the DODAF behind. In Burk 2006 the enterprise level is associated with the portfolio across the enterprise. In DoD the set of all standards is in a repository that is not formally part of DODAF. Further the set of all systems and their architectures is in another repository not formally part of DODAF. The set of all databases in DoD is not formally tracked. The set of all transformational programs in the portfolio is not formally tied to DODAF in any strong way.

The FEAF, the FEA, and Zachman better relate to the portfolio of all transformational investments in the enterprise than does DODAF.

Our guidance from DoD will help us less here. This is not to say DoD does not have management mechanisms at this level, they do have these, but they are not formally part of DODAF.

So where can we look for guidance on how system engineering and enterprise architecture relate? Martin wrote a book on something called "Enterprise Engineering." It explicitly identifies drawing from system engineering. It has a scope that is wider than most enterprise architecture frameworks claim, as it claims organizational culture and continuous methods as within its scope. So we might say that enterprise architecture is a subset of Martin's construct that draws on system engineering. This is perhaps a weak argument.

We can also note that the strategy of the organization, its mission or goals and objectives, its policies, are delivered to enterprise architecture and not produced by enterprise architecture. This is how it happens in practice, in my experience anyway. You could claim a partial exception for the "IRM Strategic Plan," a.k.a. the "IT Strategic Plan" required of the CIO in US Federal Government, but

Volume 1: Enterprise Level Architecture

no further. This is analogous to the requirements being handed to architecture at the solution and segment levels. (At least one book has this backwards, though.)

You can link this, again, to the notion of a "System of Systems" and SOA. I will explore that elsewhere.

CONCLUSION

We can probably say that in theory enterprise architecture is a subset of system engineering. We can probably say that a concrete standardized conceptual framework for this across all three of Burk's three levels of EA is missing or not well enough known to have come to my attention at least. (I hear some are working on this problem at Stevens Institute of Technology.)



FIGURE 34 THE IMAGE REFERS TO SCIENCE AND ENGINEERING

Back to basics:

SCIENCE

Science is about discovering or stating the underlying laws by which the physical or natural world operates. In the scientific method we:

- Form a good question
- Research the area
- Form a hypothesis
- Test the hypothesis in an experiment
- Analyze the data from the experiment
- Publish some results

After this another third party may try to duplicate your experiment. People may debate the validity or meaning of the findings. They may publish as well. The whole process leads to a written record of progress in understanding.

ENGINEERING

Volume 1: Enterprise Level Architecture

Science is different from engineering. In engineering we attempt to construct something of use. When the commercial on TV shows a scientist building something useful it is actually an engineer doing so or perhaps more the scientist is acting as an engineer. Equally when the engineer is discovering underlying principles he is doing science. The process of devising some useful thing is called design.

There is an engineering design method:

- State the problem (and you may have to restate the problem several times to get to one that is solvable)
- Hypothesize solutions to the problem (often with research)
- Select a solution
- Build it
- Evaluate what you built
- Improve what you built, iterate (built, evaluate, improve, repeat)
- At some point you do not publish so much as produce or manufacture the item in many cases.

Engineering is often said to be applied science. We do not randomly produce solutions but use science to design them. We calculate bridge loadings, we calculate in circuit design, we calculate in aircraft design, all using models and laws discovered by science.

SYSTEM ENGINEERING

System engineering is a branch of engineering where we build complex systems applying methods across many disciplines. Note that those claiming system engineering is about software alone or primarily are spouting hogwash. It has specific methods as well:

- The System Development Lifecycle
- The V model of subsequently more detailed design and testing at each level of depth
- Multidisciplinary interaction
- "Systems Theory" (Ludwig Von Bertalanffy) and "Systems Thinking"

Anything may be a system, a device, a country, a company, a tree, an ecosystem. In systems engineering we still apply science and still use the engineering design method.

ENTERPRISE ARCHITECTURE

EA is often described a sub-discipline of system engineering. It has methods in collections called frameworks. It still uses the underlying methods of science, engineering and system engineering. EA as a term has been applied (in the broad sense) to producing architecture of systems, lines of business, and enterprises among other things.

Enterprise architecture is not about technology alone, but also the management of technology. It mixes technology with the principles of scientific management (Taylor and many subsequent).

It is difficult to find qualified enterprise architects because they must have a diverse background. EA is often performed in teams allowing specialization so to more easily find knowledge covering the areas required. A set of methods, concepts and organization called a framework allows these disciplines to cooperate.

DRAFTSMEN

In engineering there are people who assist in creating drawings, called "draftsmen" or "draftspersons" I suppose in more modern terms. Such persons are not full engineers but are technicians who assist engineers. Sometimes engineers will produce their own drawings, acting as their own assistants.

Similarly in EA a person who only produces drawings dictated by others is not acting as a full architect but assisting them. Some call them "modelers." To be an architect you must add something from that depth of science, engineering, system engineering and EA methods and understandings.

CONCLUSION

In practicing or describing EA some have lost their way. Try to raise the bar. This year is the 25th birthday of EA and the 30th birthday of the Zachman Institute for Framework Advancement. Pitch in to improve the profession.

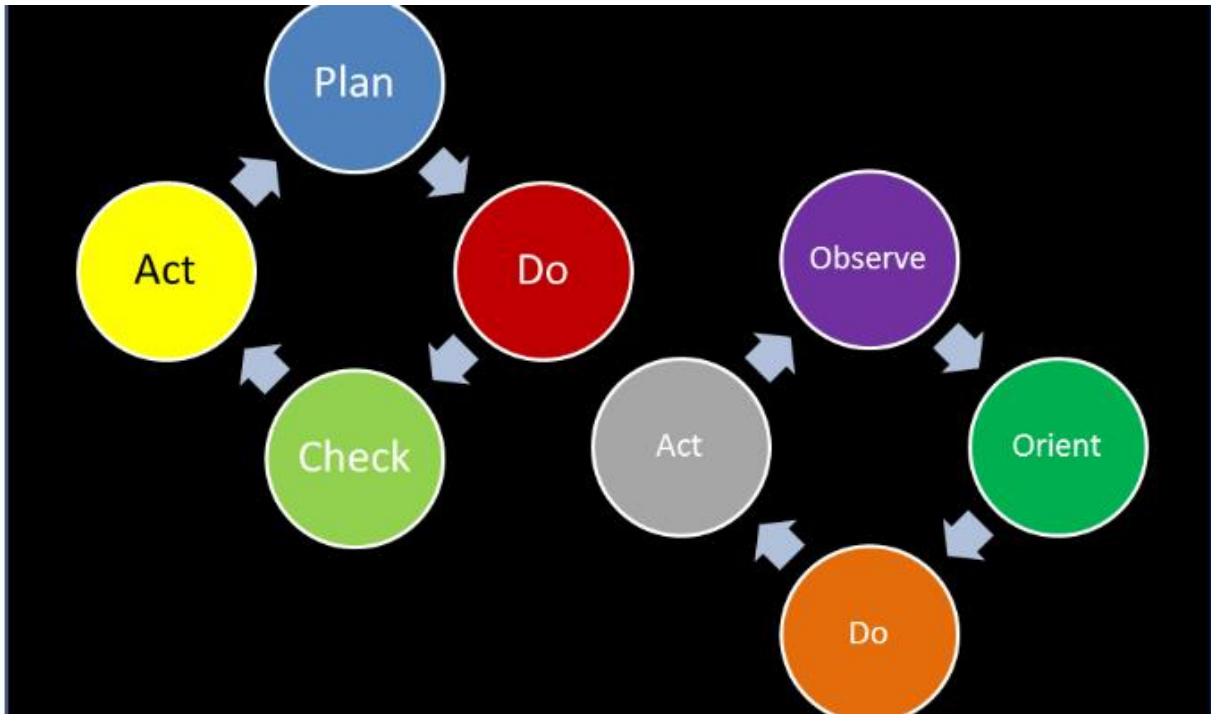


FIGURE 35 VAARIOUS FEEDBACK CYCLES FOR ACTION IN A DYNAMIC ENVIRONMENT

As an enterprise architect, business architect, data architect, system architect, or network architect if you do not implement and test your architecture, it is fantasy. As an engineer or scientist, empiricism is central to what you do.

RATIONALISM

Some believe you just know things; they come from some intrinsic knowledge inside you. Follow what you know, inside, they would say. Some of this may come from inherited memory perhaps or from silent messages from God whispered in your ear at birth. The Pope or the Patriarch may tell you for God, some say. Smart people somewhere may figure this out, in their conversations with God and internal debates. Just trust that.

Maybe they set themselves up as the expert instead of God. You can have 100+ folks in a room debating, but without experimenting, testing and checking the effects of the results, it's rationalism.

DARK AGES

Have you heard of the "Dark Ages"? For centuries Western Civilization took authority from old books and authoritative people. If the Pope said it, it was true. If Aristotle said it, it was true. The result was near total technological and social stagnation. How do you recreate social stagnation and technological standstill: Rely on authoritative persons to define truth?

RENAISSANCE

Volume 1: Enterprise Level Architecture

Have you heard of the Renaissance? It was a revitalization of Western Civilization, social progress and technological progress. The poster child for this advance was Galileo Galilei, the leading example of a scientist writing and speaking the truth and opposed by authoritarian dictators controlling truth. He was jailed and silenced.

SECRET WEAPON

What was the "secret weapon" of Renaissance science that allowed it to reverse centuries of stagnation in society and technology? It was empiricism, the belief that you should experiment and test. The telescope and the microscope were technological tools used to support experimentation and testing that helped to cause this revolution.

TRUST BUT VERIFY

"Trust but verify" was a Cold War saying. It meant that we would believe the other side but would still check, observe the truth with our own eyes. You need to do this with any authority that dictates the truth to you, be they petty office tyrant or senator. Always test, experiment, observe. They may have an agenda. They do lie sometimes. Never trust blindly.

DEMING

William Edwards Deming, an electrical engineer, pioneered the popularization of work by a Dr. Shewhart. This work said you should use a repeating cycle (Plan, Do, Check, Act) to apply feedback and increase quality. This became the basis for Japanese management techniques, 6 Sigma, Kanban, Lean and Agile. These methods revolutionized manufacturing. If you support any of these, you support Deming and the PDCA cycle as their basis. This is empiricism in practice.

BOYD

US Air Force Colonel John Boyd described a cycle for use in defeating an enemy originating from aircraft dogfights. In it you observe, orient, do, act (ODDA). You apply feedback. You apply empiricism. Boyd's work is at the center of military strategy and management agility.

If you do not apply empiricism you are not Agile, not Lean, not sigma anything, not Kanban, not KaiZen, and not really with the program at all. You have somehow ignored the last 75 years of operational improvement.

LAYERS

These feedback loops operate at all levels. They operate at the strategic level, where strategy or mission is first determined and later adjusted. They operate at the operational level where normal planning and results are formulated and achieved. They operate at the tactical level where tools and technologies are created and employed. They operate most importantly at the top levels and most frequently at the lower levels.

EXAMPLE

In the system engineering V diagram we visually depict the simultaneous feedback at multiple levels of test and evaluation. To refine strategy, test and evaluate strategy. To refine tactical tools, test your tools. Do all in parallel.

MEASUREMENT AND MEASURES

There can be no empiricism, no Agile, no Lean, no Kanban without measures and measurements. If you do not measure in your tests, you are improving nothing. To measure, test, evaluate and imply empiricism you need baselines and objectives.

OPS-TEMPO

To defeat the enemy, in OODA, according to Boyd and company, you must iterate through your cycle and adjust more rapidly than the enemy. The strategy cycle is inherently slower than the tactical cycle. No one said to increase your strategy cycle to be faster than your own operational cycle or tactical cycle. Your strategy cycle must only be faster than the enemy strategy cycle.

Empiricism, experimentation and testing in the basement, garage or office are at the heart of US know-how. Just ask those Wright Brothers or your local garage band.

CAUTION

Beware the moron who insists that an Agile tactical cycle means you should disassemble your strategy cycle or ignore it. Beware the poor student who does not understand that tactics serve strategy. Beware the idiot who would shorten your strategy cycle so much that operations and tactics cannot respond. While your ops-tempo must defeat the enemy, it should not defeat your own efforts. Beware the cowboy who would trade required precision and accuracy for speed. These are not Agile, not Lean, just foolish.



FIGURE 36 TRUTH IN A QUANTUM-MECAHICAL WORLD OF STATISTICAL REALITY.

I happen to know that John Zachman and I share a passion. It is not enterprise architecture but what underlies it. It is the physics of information. What does physics tell us about architecture, about movement of information, about limits of information, etc. We "believe in" an objective reality, an external physics, which describes how things operate. We are not alone in that, either.

Now a century ago physicists were disassembling the notion of objective reality. They were emphasizing that the observer affects what is observed. They were focused on quantum physics and its effects. They, and many who followed, were concerned with the macroscopic (people scale) effects of the quantum physics. Yet here I am today writing about objective reality. How can this be?

MODELS, NOT TRUTH

In engineering we use models. Some are mathematical, some logical, some "rule of thumb," and some good old know-how. We use what we have, what works. To us, quantum physics is a model. To us Newtonian physics is also a model, as is information theory and so too systems theory. We deal in facts and models. We use them to solve problems.

Many an engineer will give you an odd look when you speak of "truth." "Truth" has been said to belong to philosophers. Our models and facts do not often constitute "truth." Yet sometimes, occasionally, we retain an intuitive certainty. You can call that faith, or truth, or what fancy may dictate to you.

EXPERIMENT

We use what models, what facts, what intuition we have. We calculate, contemplate, clarify, quantify—and then we have a prediction. Rarely do we just guess. The idea is to get into the ballpark of a solution to a problem, a notion that is good enough, and not to find eternal truth.

Then we prototype, experiment, test and measure. Why? Because all models have limits.

LIMITS

All models have a range of applicability. They have assumptions that can be violated. Some assumptions may be hidden. Not all physics has been discovered. Engineers are rarely certain, unless you ask about an area where they have prototyped, piloted, experimented before. Then they may know with some certainty.

ENTERPRISE ARCHITECTURE

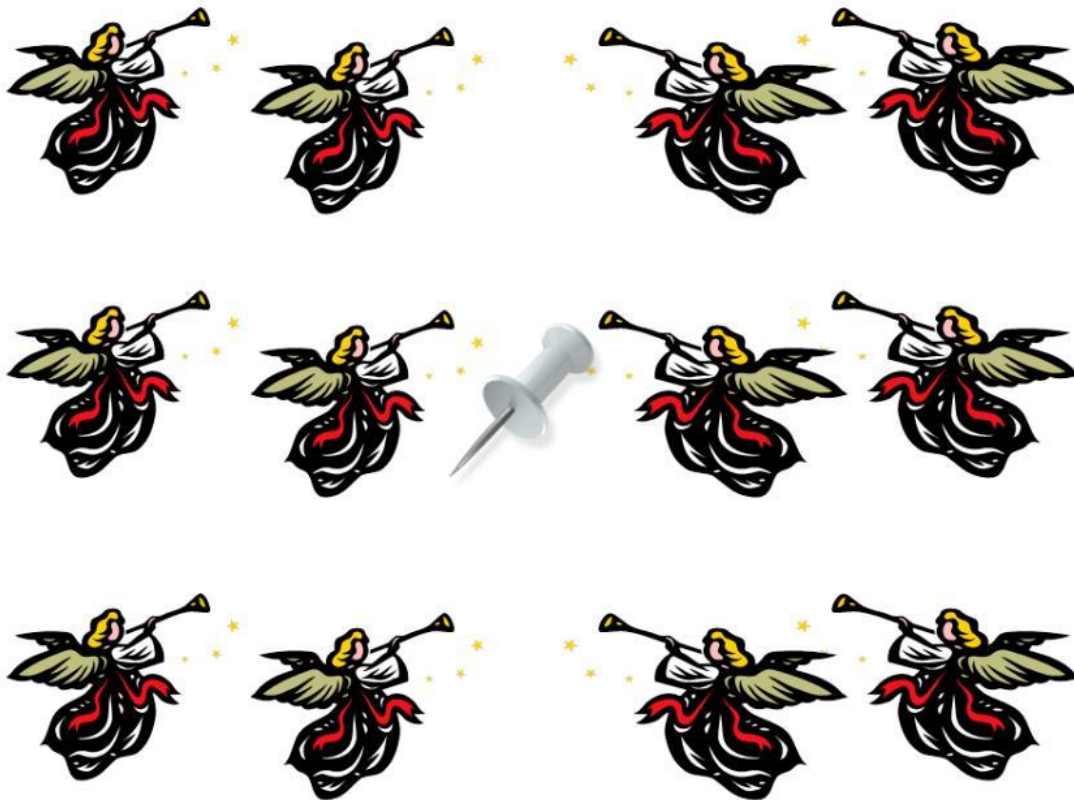
Enterprise Architecture is like the rest of engineering. We have models. Those models have limits. We are not certain, but we have the best proposed solution given the available facts and models. Enterprise Architecture is also tied to scientific management. It too has models, facts, and predictions.

OBJECTIVITY

In the end we let nature tell us what the truth is. She and the philosophers can converse about it; they are the experts. We take our best guess and then ask her where we have failed by means of experiment. Objective reality is what she tells us.

Objectivity is a model. It has a range of applicability. It has assumptions that may be violated. If we reach an area where we need another model, we are OK with that. Experiment will tell us if we have found such an area.

4.11 SPLITTING HAIRS IN ENTERPRISE ARCHITECTURE, OCTOBER 24, 2014



To "split hairs" is to argue trivial detail, to dwell on excess distinction. It is a piece of common American vernacular. If Sam sees a car and says it is blue but Harry says "no," that is completely wrong, it is slightly greenish and, therefore, teal, then Harry is "splitting hairs." If Suzy says that the tree is an Oak, but Sally say Suzy is wrong as it is a pin Oak, Sally is splitting hairs.

William of Ockham and the various philosophers so inclined have argued that the set of constructs we use in analysis should be parsimonious, deliberately limited. When you have a complete model capable of all analysis required, but then insist on adding another thing to track, another category of data to include, then you too are "splitting hairs."

MIDDLE AGES

In the Middle Ages philosophers and theologians were known to argue obscure points based on abstract constructs to the point of absurdity. The common example is the debate of how many angels might dance on the head of a pin. Another such debate is if God might create a rock so heavy he could not lift it. Entire volumes were devoted to tests determining who is a witch. These arguments formed the basis of societal and technological stagnation lasting centuries.

ENTERPRISE ARCHITECTS

Enterprise architects, being cerebral types, sometimes tend toward such over-analysis. They may build excessive models containing additional unneeded constructs, at times. A common term related to this kind of behavior is "analysis paralysis." A common term associated with pushing past such issues is "actionable architecture." The debate continues.

PRIME EXAMPLE

The primary example of such excess in enterprise architecture is the simultaneous presence of business functions, process steps and capabilities in the very same model. Many senior architects have noted that, in practice, even the most skilled among us have great difficulty distinguishing between the three. This causes great difficulties in actual use of models containing all three.

SIMILARITY

In that example, a process step is the conjunction of input, output, constraints (doctrine, policy, training, etc.) and resources—executed by a particular role or roles. Process steps are a hierarchy and any step may be further broken down into another process full of steps. Upwards process steps roll-up into a top-level process step often called a business function. A business function is some operation necessary to the conducting of the business. Functions are often broken down into a hierarchy.

Capabilities are something the business can or might do, something it is possible to do, essentially a function or process step that is optional. It is often strongly associated with some mechanism or tool (resource), conducted by highly trained persons (role), with some sequence or pattern of operations and producing some outcome (inputs, outputs), guided by some doctrine or approach (constraints).

To be sure this similarity makes it difficult for me to differentiate. I have been accused of doing this EA thing adequately. I will presume myself to be an adequate example architect.

OTHER EXAMPLES

Business rules and requirements also overlap. (A biz rule might say: "two persons must review an invoice before payment," and a requirement might say "invoices shall be approved by two independent parties before payment.") (Note that I did not just say a process step, function or capability is likely to be redundant with a requirement. That would be a misreading.) Some organizations categorize work for tracking finances, then track the same work differently in EA. People make up new constructs routinely, thinking EA can be anything they like. Organizations may produce two sets of performance parameters and not unify them. Organizations may produce a separate transformation plan, not linked to EA. The issue is not restricted to capabilities, functions and process steps.

In the LI Enterprise Architecture Network, today, there are people debating the difference between architecture and design. I thought these words were synonyms? Somebody has to inform Webster.

WHERE HAIRSPPLITTING APPLIES

When creating new models from scratch or updating your existing model in continuous improvement, sometimes broad rethinking is warranted. This all occurs in the internal EA

Volume 1: Enterprise Level Architecture

maturity management process. An example might be creating a framework from scratch but using Zachman's work as a pattern for logistics management. Such a framework does not exist for reuse, published and piloted (but it should!). During the creative process a few hairs might get split, and beers consumed, or whatever. I am not including any of that activity in the scope of this post.

REDUNDANCY

Redundant analysis wastes effort. It can be as wasteful and ineffective as the redundant systems we look to eliminate.

BLOATED FRAMEWORKS

You may use some published base framework as the basis of your practice, which is wise. All frameworks should be tailored for local use. Simply because the base framework has redundant or overlapping constructs does not mean you should retain those. Indeed the bloating common in recent popular framework versions almost ensures some redundancy. Base frameworks are what you could do; your tailored version is what you will do.

EA MATURITY

As an enterprise architecture practice matures, these kinds of redundancies should be eliminated. Such redundancies are a sign of EA practice immaturity. Enterprise architecture is now at its 25th birthday, old in the "dog years" of technology. However, individual practitioners may have immature practices and claim, therefore, that EA is not mature when their understanding or use is the actual problem. Do not be confused by their claims or think these redundancies and poor choices of model flow from EA itself.

The practices of excess analysis and excess numbers of constructs should be avoided. They give EA the appearance of ineffective medieval academics chasing abstract fantasy.

SECTION 5: EXAMPLES AND COUNTEREXAMPLES

[Section 5: Examples and Counterexamples](#) 118

[5.1 Implementable Public Health Care, August 9, 2014](#) 119

[5.2 Disaster Currency Proposal, November 27, 2014](#) 122

[5.3 The Baltimore Riots vs A National Civilian Service Corps, April 28, 2015](#) 125

[5.4 A National Intranet, November 27, 2014](#) 128

[5.5 How to do Architecture: X-Browser, Jul 2, 2015](#) 131

[5.6 Nation as Enterprise, November 22, 2014](#) 134

[5.7 Global Enterprise Architecture, October 27, 2014](#) 137

[5.8 Two Visions of the World Enterprise, November 15, 2014](#) 140

[5.9 ITIL vs EA, January 26, 2015](#) 144

[5.10 Enterprise Architecture vs SAFe, November 16, 2014](#) 147

[5.11 Risk Management vs Enterprise Architecture, December 21, 2014](#) 151

[5.12 Enterprise Architecture vs Digital Transformation, November 8, 2014](#) 153

This section starts out with several examples of possible transformational initiatives. Public Health Care, Disaster Currency, NCSC, and a National Intranet are all possible initiatives. However, the X-Browser section is provided to contrast with the National Intranet.

Then we examine the notions of enterprise architecture generalized to support the nation as a whole and the globe.

Lastly we compare enterprise architecture to other activities it is commonly confused with, including Agile Software Architecture, Risk Management and ITIL.

QUESTIONS FOR SECTION FIVE

1. What is hype? Is the term “digital transformation” hype? What does the word digital mean and how has its meaning changed?
2. Is enterprise architecture about producing software?
3. Can enterprise architecture be generalized? Can it apply to the world? Does it really then only apply to the UN?
4. Should the White House have an enterprise architecture effort directed at the nation, not internal issues?
5. Pick one of the proposed transformation initiatives. What are the costs, risks, returns and performance measures you initially see in analyzing them? Is your chosen initiative any good; should it be implemented? Why or why not?
6. Of the X-Browser and the National Intranet, which is the program and which is the project? Should one be encapsulated inside the other effort?

5.1 IMPLEMENTABLE PUBLIC HEALTH CARE, AUGUST 9, 2014

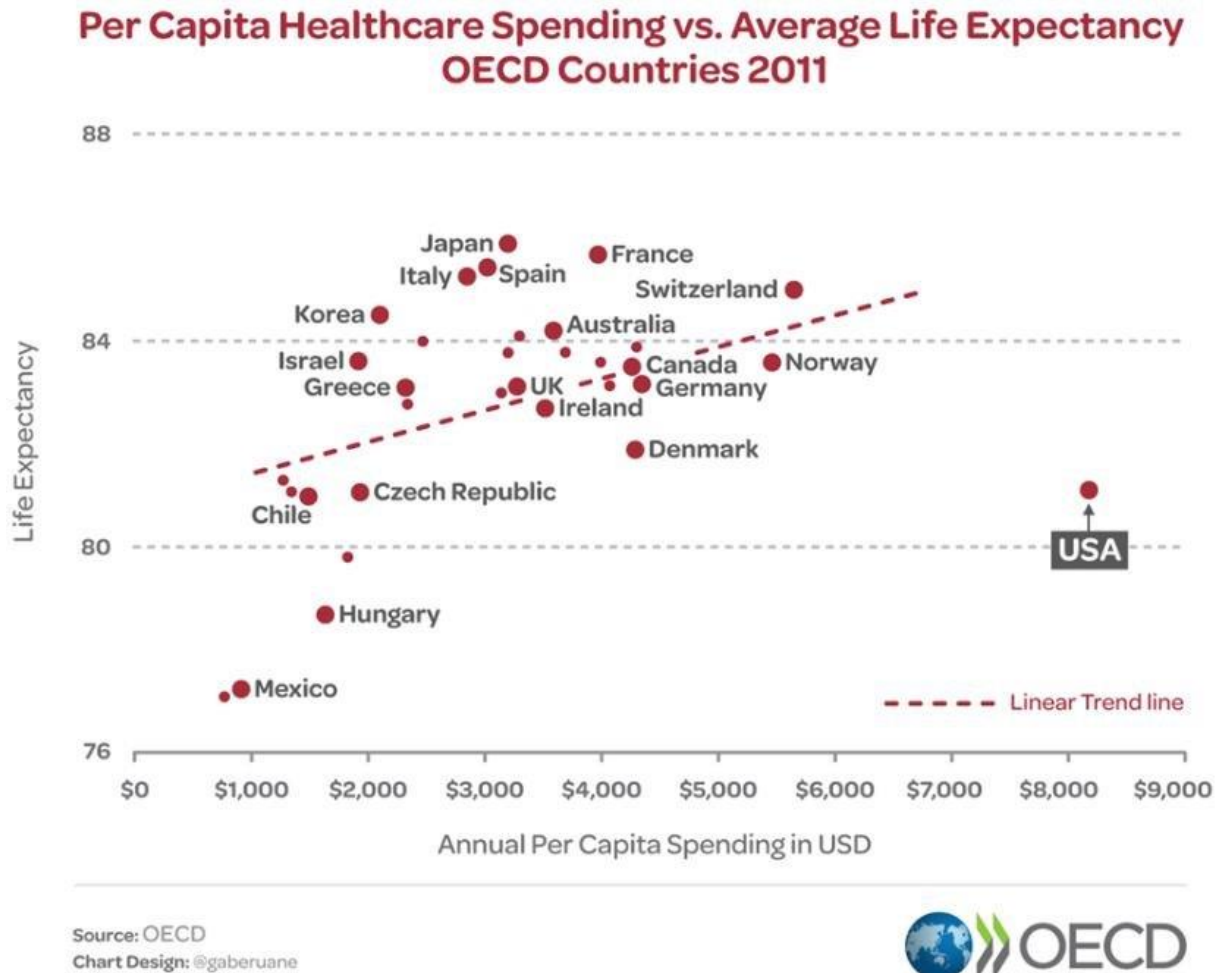


FIGURE 37 PUBLISHED IMAGE FROM OECD, REPRINTED UNDER "FAIR USE"

I learned recently that the gap between Congress and the experts among my government-side colleagues on what can really be implemented is both well-known and widely studied. Who knew? The Lobbyists, of course, write the details of law these days, pushing staffers aside in a cavalier ways. Many laws are not well connected with reality.

The Affordable Care Act (ACA) may be the very queen of dysfunctional laws—1,000 pages is too large and too detailed for any law. It seems very difficult to implement.

I was surprised at the ACA in many ways. It was not what I would expect from government. I thought I would take a moment to jot down my ideas of what implementable affordable care would look like.

DEFINED BUDGET

Each year the President sends a budget to Congress and the Congress is supposed to approve or change it. We in America would like our Congress to authorize, each year, the amount of money spent on public/universal health care, a strict ceiling of taxpayer dollars.

WE WOULD, EACH YEAR, BUY ONLY AS MUCH UNIVERSAL HEALTH CARE AS WE CAN AFFORD.

OVERSIGHT VS CONTRACTING

We Americans dislike too much of government in our commercial operations, even health care. Too much oversight leads to massive inefficiency, loss of privacy, and other problems. This is part of the trouble with our present health care industry. On the other hand, our government is not bad, perhaps good, at letting contracts and releasing grants.

COMPETITION

We Americans like competition that increases cost effectiveness. Each year care providers and hospitals or groups of them should bid to provide universal care. Grants or contracts should be awarded on projected cost of services, quality of service, number of persons to be served, range of services, and past performance. Geographic coverage would be a consideration.

Contract or grant awards, and allocations of funding, would be largely based on proposed efficiency and proven past performance.

THE CONTRACT

Each care provider or hospital (group) would then be responsible for serving the contracted number of persons, providing the specified level and type of care, within the awarded amount of money (as per their proposal). Insurance need not be involved, thank you very much, but can be if it somehow adds value to the contract. The service need not be restricted to one year; once the money is awarded the service can continue until the awarded amount is exhausted. However, the money in any contract would be dispensed from a single year of the Federal budget.

WHO IS SERVED

Each provider, under contract, would be free to determine who should be served and who should not. If they specialize in heart disease or cancer, they can restrict customers (patients) to their specialty. If they decide they need to limit inpatient stays to meet their contracted measures of performance, so be it. They manage the whole deal, to the levels of service and types of service and other quantified goals of their proposal and contract.

THE RULES AND MECHANISMS FOR FAIRLY DETERMINING WHO SHOULD BE SERVED WOULD BE PROPOSED AND INCLUDED IN EACH CONTRACT AWARD.

OTHER HEALTH CARE

Outside this public or universal health care the private health care industry would still exist. Insurers would provide this part of the market its services. It would be ordinary health care as we have known it, with a few new rules about pre-existing conditions and being able to take your insurance with you to the next company.

Charitable health care would also still exist. The Shriners would be free to operate, as would St. Jude's, and the others. Medicare, Medicaid and Social Security would all continue to exist. The VA would continue to function. However, everything would be augmented by a safety net. Over time the mechanisms could be integrated, bit by bit, where that makes sense.

CONCLUSION

This is just my opinion. I know that my government colleagues have far more qualifications in this area, but they seem to be restrained by various forces. I believe what I have outlined here could be easily implemented in real government programs. It could be more easily managed than ACA. It would not require 1,000 pages of law. When the second wave of contracts was released and providers were measured against real metrics in real past performance, significant new efficiencies would result.

POSTSCRIPT

I am an enterprise architect, why did I write this? This post demonstrates the kind of insight you can get by asking an enterprise architect. Here I describe using an alternative business function to achieve the strategic goal and how that process might work. The more detailed implementation of IT to expedite and automate the process could have been planned and designed as well, for public health care, if anyone had only asked.

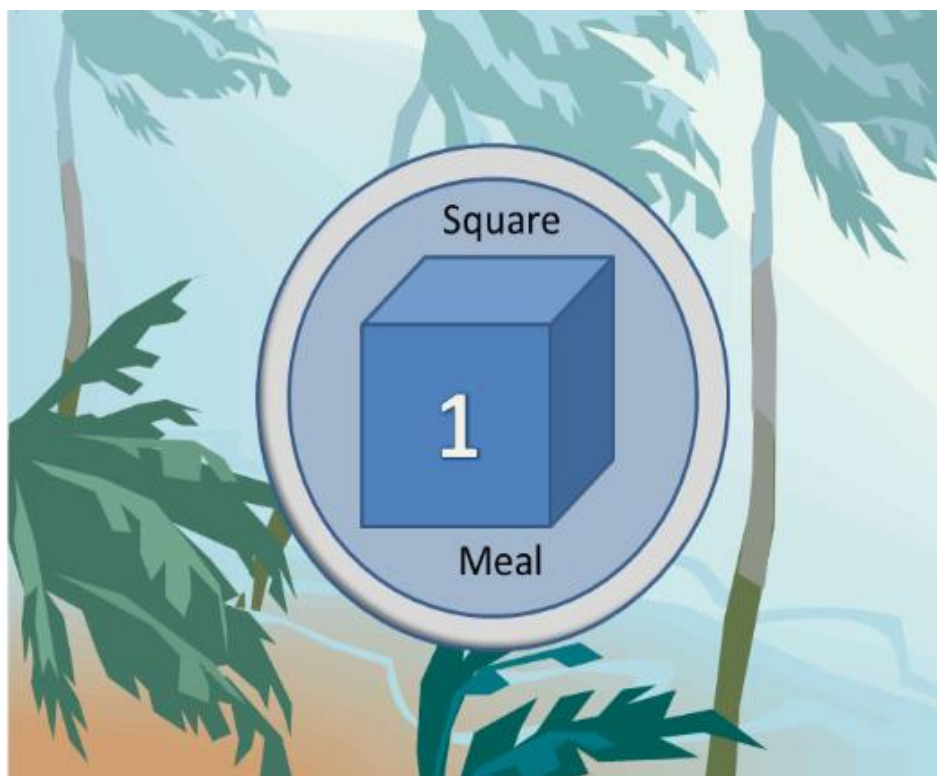


FIGURE 38 DEPICTS THE NOTION OF A COIN WORTH 1 STANDARD MEAL.

It is Thanksgiving. Having a roof over my head and food to eat causes me to think of what others may not have. Here is an idea to get you thinking.

In disasters there is significant difficulty delivering benefits to victims. Often we give out debit cards, but those require some infrastructure to use. Sometimes we just hand out stuff to people who have nothing in an area where nothing is working. This started me thinking.

THE DOLLAR

The Dollar is a reserve currency. Its value is artificially elevated by our trade partners, as any time there is a problem they rush to find something that will retain its value. This has a negative effect on our ability to manufacture and grow food for export, among other things.

GOLD & SILVER

Some people keep gold or silver coins in the event of disaster. This creates a trade in gold and silver that somewhat undermines its role in disaster. The value changes. One gold coin might buy you a house or a cracker in a disaster area, depending on circumstances.

Bitcoin: The market needs another currency. The market is quite ready for one.

NEW STANDARD

Volume 1: Enterprise Level Architecture

We have had currencies based on the gold standard, the silver standard and so-called fiat currencies based on not much but a promise. What if we had a currency based on the standard square meal. One coin gets you one square meal, no matter where or when or in what circumstance.

The standard meal would be regulated, standardized, containing all the nutrition and calories required for a large adult male. Three square meals will support a large adult male at hard labor for one day.

INFLATION

Official inflation does not include food and fuel. Such a currency would act as a hedge against this un-tracked inflation. (My wife gave me this idea.)

The proposed currency could help to uncouple cost of living from the Dollar. Think about that one.

WELFARE PROGRAMS

Such a currency could be dispersed as the majority of benefits in welfare programs. What it can be traded for can be better controlled than dollars. It could act as a sort of standardized food stamp.

ALTERNATE ECONOMY

In times of national emergency, this currency could act as a sort of controlled black market. During the emergency the amount of such currency in circulation could be increased, and it could be decreased as the crisis ends. Plans concerning the collapse of the dollar could be significantly simplified and improved, for example.

TAXATION

Taxation of this currency could be based on sales tax only, at different rates, allowing policy control to meet odd circumstances.

This is a new currency BTW, no one said the exchange rate needs to float, not need it be fixed. Another policy tool.

WPA

In the Great Depression there were giant national programs to create great works and put people back to work. If such a need arose people could be paid mostly in this disaster currency.

STORES

Retail and wholesale stores could be partially stocked in the surplus waste our country creates. The food we pay farmers to destroy could instead be packaged for long-term storage alongside MREs.

AUTOMATS

Automated food dispensing machines could dispense supplies at propositioned locations. Put in the right coin and get out a case of rations for your family. Another denomination may get you a tent. These automated stores could be available nationwide, in all major cities, dispensing a variety of

Volume 1: Enterprise Level Architecture

medicine, food, and emergency supplies as well as other surplus. These could be configured to run when the power fails, no matter what, while we all wait to restore order and services.

This currency could also be used to purchase lodging at predetermined rates and food at restaurants certified to produce standard square meals. Hardware stores might also be certified to accept and trade in this currency. Ad-hoc use by everyone might happen naturally in an emergency.

LOGISTICS

You could put automats in standard shipping containers. You could move them in trucks, via helicopter, or drop them from airplanes.

BUREAUCRACY

There is considerable opportunity for the many levels of government and agencies to complicate disaster aid. Such a currency could streamline that significantly, if accompanied by some small law policy changes.

PHYSICAL FORM

I imagine coins of many denominations, resistant to destruction by fire and flood, with metal circumference. Centers might be transparent material containing holograms highly resistant to duplication. Just coins, no flimsy paper to burn or rot or be eaten.

PEOPLE

You could give families a budget of coins before the disaster hits. This would increase confidence and service to victims. Also, all those survivalists might mellow out a good bit if they thought Government had the problem covered.

IT'S JUST AN IDEA

What does this have to do with EA? Well, this could be thought of as a transformation initiative for the country, I suppose. Maybe some of my FEMA friends will ponder this a bit. Happy Thanksgiving. International use? I suppose. How about that UN?

5.3 THE BALTIMORE RIOTS VS A NATIONAL CIVILIAN SERVICE CORPS, APRIL 28, 2015

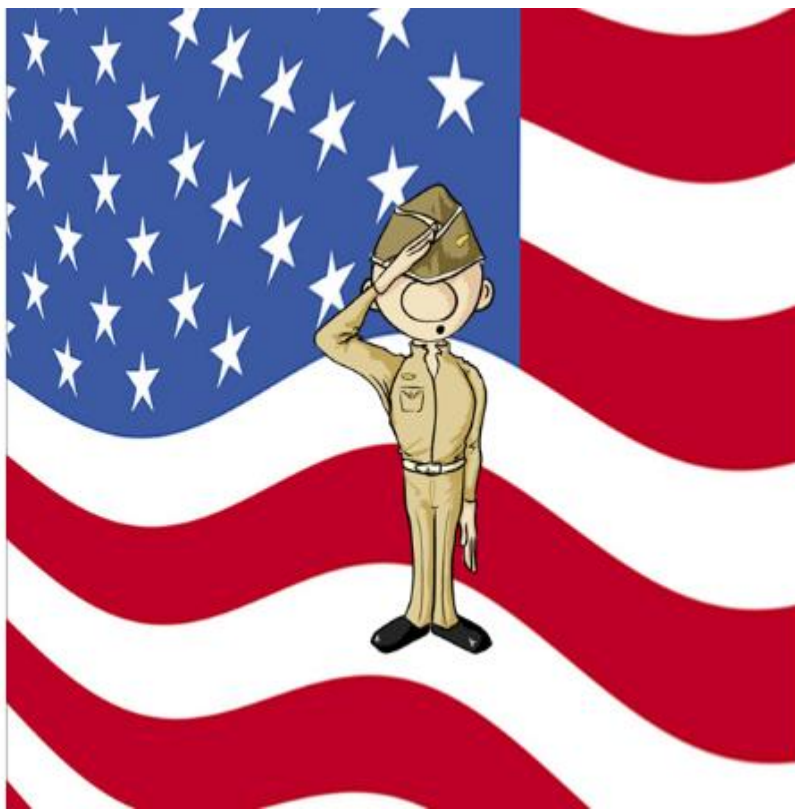


FIGURE 39 NATIONAL SERVICE, WITHOUT A GUN.

I have been watching the Baltimore riots. Something must be done. I will try to reiterate the concept of a civilian national service. The idea is not the watered-down thing that AmeriCorps became, nor what Senior Corps is, not what Peace Corps is—but something both more and universal. It would not be as narrow as the Uniformed Medical Service but that could become part of it.

Imagine that young Kevin graduates from high school but has no future. The economy is bad and he has no money for education. He lives in poverty, or near poverty, and his life is hopeless. Even the military will not have him, as there is no war.

NCSC

Now let us introduce the National Civilian Service Corps (NCSC) (The name is coined, to support telling the story.). Kevin can go and enlist in the NCSC regardless of color or religion or whatever else. They will give him food, clothes, a small bit of spending money, training, opportunities for education, all in return for hard work in service to our country.

When young Kevin goes to enlist, they give him the Armed Services Vocational Aptitude Battery (ASVAB), borrowed from the military like most of NCSC practices and methods. He can choose a career field based on his aptitude from the needed skills.

Volume 1: Enterprise Level Architecture

He will then be sent to basic training, just like military basic training, but lacking weapons; NCSC is not about weapons. He will learn to behave and cooperate with his unit, his team, regardless of race or religious issues or he will be tossed out to return to the street. He will learn to march, and clean his area, and make his bed, and show up on time. He will learn that others may be more important than himself, and that cooperation may meet everyone's needs rather than just his.

If Kevin graduates from basic training they will give him a stripe, which a signature of grade, authority and accomplishment. In the NCSC, as in the military, the senior person makes the decisions. His stripe will be placed on the NCSC uniform: blue jeans and a sweatshirt. With improved self-esteem and confidence that he has a future, young Kevin will now be sent to technical training.

WORK

The NCSC has need for construction workers to repair infrastructure, for environmental workers to clean up ecosystems, for electricians to wire new community centers and schools. It has need for many more skills, and Kevin has chosen to be a plumber. Over a course of six months, Kevin learns all about plumbing. Then he spends the next two years in what is essentially apprenticeship learning to be a plumber.

(The NCSC, by the way, has a branch dedicated to surveillance of cops to document cases of abuse of power. It has 1,000 agents in the field. NCSC is also bringing the Internet to a million underserved rural households.)

In four years Kevin helps to repair old buildings for aging and impoverished families and fix old sewers and water mains. He gains an exceptionally wide range of experience. After his four years are up, Kevin must choose to remain in the NCSC for low pay doing public service or to leave and get a job with his new skills. (The NCSC grows much of its own food, prepares and serves it in NCSC cafeterias, and pays very little.)

The construction and environmental work, creating fixing American infrastructure, would be a bit dangerous. Having retired from NCSC, a member would be eligible for VA benefits. Having achieved an honorable discharge, a member would be eligible for veterans hiring preference in government jobs.

BRIGHT FUTURE

Because of the NCSC, youth across America have a future, hope, training or education according to their abilities. The NCSC grows in times of recession and shrinks in times of full employment. You can have a career in the NCSC if you like and retire from it. Because of the NCSC, youth are protected from robots, layoffs and poor growth. The NCSC avoids competition with business and focuses only on the overwhelming number of problems left over and not addressed in free-enterprise America.

The NCSC turns children into responsible and capable adult citizens. That, I believe is the idea. I am not here to sell you; I am not a salesman. I am neither Republican nor Democrat nor supporting any other party. However, something must be done and this is an alternative. As we veterans know, after working in uniform together we can all get along much better and serve society much more capably. Just sayin'.



FIGURE 40 NOTIONAL DEPICTION OF A NATIONAL INTRANET

Many pundits, politicians and generals advocate stronger network security and defense. I somewhat doubt their sincerity, as the most basic of measures has not been proposed or undertaken. Here is a description of that most basic defense.

NETWORK

In the beginning there were networks of computers. These usually involved one central computer and several attached or subordinate terminals or computers. Networks were formed of various technologies: point-to-point lines, Ethernet, Arc-Net, whatever.

AN INTERNET

An "internetwork" was a set of connections between networks. It was a network of networks. It required a change in technology, demanding for example both a network address and the prior address within that network. It demanded means to check reliable transmission across various linkages to get between networks. Any group of connected networks would have an internet between them.

THE INTERNET

The Internet as a proper noun, the name of a unique thing, occurred when the TCP/IP Internet between all computers became international and pervasive. It was not just another internet but "The Internet."

AN INTRANET

Any internet restricted or limited to a range of computers and not directly accessible via the Internet then needed a new name to avoid confusion. The term "intranet" was devised to describe a set of networks belonging to a group and not part of "The Internet." Most companies and large organizations have an intranet today for the purpose of protecting data and applications from broad access and misuse.

THE ENEMY CANNOT HACK WHAT IT CANNOT ACCESS.

AMERICAN INTERESTS ON THE INTERNET

Yes, we created it, but our generous sharing of technology and our open society are getting our collective carcasses kicked. Today American companies and organizations are losing billions of dollars and the vast majority of our intellectual properties to theft via the Internet. We need to do something to erect a barrier between our bits and bytes and international criminals, terrorists or state sponsored cyber-warriors. We are being robbed blind.

NATIONAL INTRANET

We need a network of networks that is not open to international use to protect our national interests. We need an intranet not connected to the Internet. It might have properties like this:

- Only US citizens can use the National Intranet
- Only US Companies can use the National Intranet
- All US/State/Local government entities will use the National Intranet
- All US PII and IP Data will reside only on the National Intranet
- Severe criminal penalties may be imposed for interconnecting the National Intranet to the Internet
- The National Intranet cannot be routed outside US territorial areas
- The US Intranet may not even use TCP/IP
- The US Intranet may use a special type of encrypted browser not available outside the US

XNS

I propose the National Intranet might use the now discarded XNS protocol. It would be harder to hack the US Intranet across a TCP/IP to XNS protocol barrier, requiring a "gateway."

XNS BROWSER

A version of the modern browser, or several, could be built that only use XNS. All connections could require encryption (such as HTTPS). FTP file sharing and telnet/ssh could be built in, as could email and netnews. All local file use could be encrypted. Other protections could be mandatory and built in. All valid distributions could be via the Intranet or a CD whose install checks against eVerify.

ALTERNATIVE

We could share the thing with Canada, New Zealand, UK, and the Aussies (the Five Countries Conference), as trustworthy and relatively free of corruption and Internet crime. (Mexico might be

Volume 1: Enterprise Level Architecture

a bad example to share with, for example, unless we wanted a healthy intranet trade in cocaine and human slaves.)

CONCLUSION

The Internet has become a liability for American interests. A US Intranet could be constructed. It could use readily available technology without much change. Such an effort would not be difficult and would protect American interests and citizens from crime, cyber-terrorism and espionage. In all cases we would also keep the Internet, such as it is.

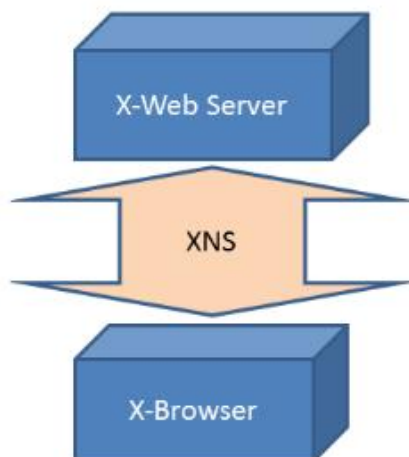


FIGURE 41 SHOWS ASPECTS OF THE PROPOSED ARCHITECTURE

This is an example of architecture, applied to security. There are three main platform components that cause the majority of vulnerability exposures in the enterprise. This is not news to practitioners. These are email, the web browser, and the web server. What if we fundamentally changed the way this technology is configured? Could we reduce the exposed footprint to be exploited, without too much expense?

We will take some existing technologies and rearrange the relationships between them, providing some new operating principles, to create a new architecture. The components themselves will be little changed. Because new technologies will not be developed, the proposed architecture should be inexpensive to implement. The result should be an example of thinking like an architect. The technologies we will refer to will be the browser, the web server, email, the old XNS protocol, and virtualization. We will also mention FTP.

Now here is the use case, for you who are into use cases. You have a corporate/enterprise user, at home or at work, and he needs to run the enterprise applications securely, access enterprise resources securely, free of various common threats in today's Internet. Call it an epic, if you like. To follow along you might stop thinking about what code to write, as that will not be the main point.

So let us first rethink some old notions. We will put Joe User in a different, secure virtual machine on his PC. He has an insecure standard VM, but this is different. It contains secure approved tested versions of applications only, and he cannot install new insecure software here. This VM cannot access the Internet, and no TCP/IP is configured here. Joe and the enterprise are safe here.

Now let's conjecture a company or enterprise intranet. It is not the Internet and is distinct from it. But rather than running new wires or whatever, we will simply use a different protocol, so the intranet traffic can run side by side next to the vulnerable TCP/IP traffic. To avoid any new, expensive development we will use plain old XNS. XNS is a network protocol stack developed in the

Volume 1: Enterprise Level Architecture

early days by Xerox(tm) and used by Netware(tm) and Banyan(tm) and others for many years. It is proven and tested and once supported massive networks like the US Marine Corps Intranet.

Now lets take the open source browser code from your favorite supplier and bind it to use only XNS. It will no longer be capable of using TCP/IP at all. Otherwise, all the features will be present. (Some coding is implied here, but it is not the point, so we will move on.) We will call it the X-Browser.

To serve Web pages to our browser we will need a web server. We will take an open source Web server and cause it to use only XNS and TCP/IP will not be available to it. Otherwise all features will be present. (Again some coding is implied here, not the point.) We will call it the X-Server.

Now our corporation can use the X-Server and X-Browser for all Web-enabled enterprise applications without fear of the vast majority of exploits on the Web. But function is limited by this choice, so lets make the X-browser and X-Server more capable with some other features.

If an external TCP/IP link is accessed in the browser, the X-Server will act as a proxy to retrieve the page and will clean it thoroughly to remove threats before passing it on. Worms, cross-site scripting, viruses, keystroke loggers will all be removed and the content blocked. It will not be possible for the user to decrease the filtering and some function will be lost in the secure intranet to preserve security.

While browsers currently only handle HTTP, the X-Browser (and designated/configured X-Servers) will also handle enterprise email and FTP in the same tool. This will simplify distribution and support. Lets assume drag and drop functionality for all this, a slick implementation. All will use only XNS between X-Browser and X-Server. Security filtering will also be applied here, without exception.

Will this remove all vulnerabilities? No, not all. Disconnecting the X-Server from TCP/IP except in specific controlled instances will help. Altogether, the approach should eliminate the majority of routine enterprise vulnerabilities, won't it? Here is a new architecture, an example, constructed of mainly existing technology. The job is now to analyze and see if the proposed architecture meets the needs. What did we leave out? What could be removed? Is it better that way?

Once we have figured that out, separately, we can predict the ROI. Then we can compare the notion of transforming IT and the enterprise using this approach, comparing it to other proposed operational changes and see if this initiative should be funded. The former, above, is solution architecture and the later, in this paragraph, is enterprise architecture.

What do you think: Is this a worthy effort? Why or why not? How would you compare it to the value of other efforts? Will the costs be high or low? Will the returns be high or low? If this were a product line, could it be used by the small enterprise as well as the large enterprise (does it scale well)?

You can share XNS with partners. Suppose all your partner companies share the XNS intranet. All B2B traffic happens over the intranet. How does that affect ROI and security? What if there was a national intranet? How would that affect Advanced Persistent Threats (APT) and state sponsored intellectual property theft?

THINK LIKE AN ARCHITECT.



FIGURE 42 CAN WE SEE THE NATION AS AN ENTERPRISE?

We examined the world as an enterprise; perhaps we should look at nations. I will, of course, use the US as an example a bit, as it is my nation.

(Please note that I am an Independent. I am neither Republican nor Democrat. My statements here are not based on any particular fanatic ideology but merely apply the same logic as one might apply to any organization.)

My interest, as in the prior post on the global enterprise, is in examining if the methods of enterprise architecture may be applied on this scale; to see if they are relevant.

ENTERPRISE

An enterprise is a set of resources or assets organized for a deliberate purpose. The first thing we must do to analyze the nation as an enterprise is to identify its purpose. This first step is problematic and has been politicized.

When we speak of nations we often speak of two resources primarily: 1) citizens, and 2) land or territory. The mission or purpose of nations may relate to that.

PROPOSED MISSION

Volume 1: Enterprise Level Architecture

A nation exists to support the well-being of its citizens. This kind of national mission statement is supported by a long history of thought on "commonwealth" (see <http://en.wikipedia.org/wiki/Commonwealth>).

We might add a secondary statement about the stewardship of other resources to support this primary purpose. We have a start.

TESTING THAT

Suppose the nation exists to support non-citizens, all the persons not involved in the nation. That seems nonsensical and no long history supports such a notion. I will reject this as a reasonable mission statement

Suppose the nation exists to support the well-being of all persons in the territory? Any invader or interloper, anyone making war or breaking law to enter the territory, is also the beneficiary of the nation's efforts? This runs contrary to the common-sense notion of national defense. It is the existing society and citizens, those who constructed and maintain the nation, who will benefit from their common efforts, not interlopers. To this you might add any who immigrate via legal processes to become citizens.

As the enemy troops invading your country would not commonly receive benefits from the action of that invaded nation, I will reject the notion that those benefits from a nation are conferred on anyone in the territory. Further a tourist would presumably not receive such benefits, whatever they might be (education for example or the right to vote and determine long-term national direction), simply for visiting. The notion is nonsensical.

Communism might disagree but communism advocates the abolishment of nations. I cannot see this as a cogent argument.

Glen Gage indicates that some nations exist to enrich a small number of elite persons at the cost of the citizens. I will reject that as a mission statement on ethical grounds. I realize and acknowledge that it is common.

POLITICAL ISSUES WITH OUR MISSION STATEMENT

In many countries there is a current immigration problem. Persons who are not citizens demand the benefits of the nation. They have entered by breaking laws and now demand equal benefit.

Clearly this is self-serving. Many politicians support such claims in an equally self-serving effort to gain new votes from citizens created by edict. Such efforts are suspect as corruption. France, Spain, various northern European nations, the UK have such issues. Australia also has issues.

(No, it is not just the US, and it is not about any particular minority. It is a global phenomenon. Various ethnicities occur on both sides.)

IGNORING POLITICS

The mission of a nation is to serve its citizens, and promote their well-being. Secondly, a nation exists as a steward of shared national resources or assets. This is a bit like an employee-owned company. Other alternatives seem nonsensical.

VISION STATEMENT

Volume 1: Enterprise Level Architecture

In EA, any enterprise needs a vision statement. Here we have a "Declaration of Independence" and the preamble to the Constitution.



FIGURE 43 DECLARATION OF INDEPENDENCE

gain of members (citizens). I will assume nations compete and can be further analyzed in this light, following Michael Porter, Adam Smith and others. Cooperation is also possible and competition is probably the norm (see <http://en.wikipedia.org/wiki/Coopetition>).

I will conjecture that if we begin to treat our nation as an enterprise, we might prosper again. Further, this might hold true for any nation.

John Westra has published a response here:

<https://www.linkedin.com/pulse/article/20141122181446-10498160-the-roi-of-freedom>

These describe what we want our nation to become, to be.

PRINCIPLES

I will apply the "Bill of Rights" and the body of the "Constitution" as principles in our national enterprise. This tells us what is good and what is bad in various national efforts. EA principles in a normal enterprise do the same of enterprise efforts, distinguishing what is good from the rest.

STILL MISSING

We need a SWOT analysis and some national goals.

CONCLUSION

All nations, including the USA, can probably be analyzed as an enterprise. The mechanisms of enterprise architecture can probably be applied without much difficulty. Nations seem to be a pooling of efforts and resources for the common



FIGURE 44 DEPICTS GOLBAL HUB CITIES FOR ENTERPRISE ARCHITECTURE

Everyone is big on globalization. I think retrenchment is starting but still the drumbeat continues. Let's examine global enterprise architecture for a moment.

GLOBAL HUBS

Suppose you go take a master's degree emphasizing global business and global teams. I did (thanks National University). And then you take a class on globalization and global business ... I did. What do you learn? One of the first things you learn is that any globalized business is not distributed randomly or evenly and instead global hubs emerge.

A global hub is a city or area that specializes in some business, or more accurately, performs a good deal of that business. They emerge. The globalized business continues to concentrate there. Schools serve that community with specialized programs. Research in whatever business it is will concentrate there. Specializing firms will find a home there.

If you want to discuss EA as a globalized activity, you need to find the global hubs for EA.

DC

One such global hub for EA is in little doubt. That is Washington, DC. The evidence is overwhelming:

- There may just be upwards of 100 firms who do, or have done, enterprise architecture in DC.
- There are more EA jobs in DC than anywhere else.
- When you Google DC and EA you get over 600,000 hits. That's more than Kansas.
- The biggest aggregate customer is here, the US Federal Government.
- The first paper that ever used the term was NIST SP 500-167. NIST is just outside DC. The conference this paper covered was actually in Florida but was populated mostly by people from DC and government contractors who do business in DC.
- DC has FEAC Institute, working with Cal State, teaching EA down the street here.
- The National University MS specializing in EA is conducted in conjunction with FEAC, in DC.
- DC has the program at "The Graduate School" formerly USDA Graduate School, granting a certificate in EA.
- CMU started a program in nearby Pittsburgh, started by Scott Bernanrd of DC fame, and the school mostly serves the DC market.
- Penn State started an EA program, invited dozens of architects from DC to help, and provides it online so all the folks from DC can take it.
- Zachman now owns FEAC. Many of his ZCEA candidates come from DC.
- The National Defense University has a course in EA.
- Most of the papers on EA came from DC and were written for or by the US Federal Government.
- We have more conferences in EA.

... and so on.

OTHER HUBS

So where are the other global hubs?

- We can probably safely say London is a hub. A large amount of UK government EA work, plus financial market EA work, occurs there.
- Australia has a hub. I'll say Brisbane. They started early with a guy named Clive.
- India probably has a hub, focused on a bunch of Zachman followers at iCMG in Bangalore.
- Singapore wants to have a hub. So does Paris. Germany is closer than either of them, IMO. There are also efforts in Canada, Brazil, South Africa and who knows where else. Lets not leave out Chicago or San Diego.
- We could use a formal study.

GLOBAL CONVERGENCE

Being globalized, you would expect some convergence via standards. How is that going?

- IEEE and ISO have some stuff. They mistake EA for software a bit too much to be useful. So then only a few use it.
- The Open Group has TOGAF, which is accumulating EA like a big ball of lint. It has everything but might lack some structure or guidance to use it all.

Volume 1: Enterprise Level Architecture

- DODAF and FEAF have derivatives in use in governments worldwide.
- Zachman is everywhere.
- We still lack a common vocabulary, glossary, model, story.

GLOBAL ARCHITECTURES

Does this affect global systems? Well, global systems were being built long before anyone thought of EA as globalizing. I myself participated in two global logistics systems for DoD. Individual organizations produce global systems.

INTER-OPERATION

How has globalization affected inter-operation? Well, inter-operation is in decline right now, albeit temporary. Instead of the use of standards for communication between systems, the myth of a single centralized system used by all is common. (That never happens. If it did we would require global fascism to enforce it.) I would have to say that globalization of EA has not yet helped inter-operation.

WHAT THEN

What has globalization wrought for EA? Not much, in practice. I routinely speak to colleagues from other countries and so do others. We exchange views. Not much else has changed yet, it seems. Maybe that is as far as it goes.

(If I left out your favorite hub city candidate, please leave me a reply so I can add it to the list.)

5.8 TWO VISIONS OF THE WORLD ENTERPRISE, NOVEMBER 15, 2014



FIGURE 45 DEPICTS A TRADEOFF BETWEEN MONEY AND LAW, ENFORCED BY GUNS

Presumably you could view the whole world as a big enterprise. I have said in the past that you could use Zachman's approach to analyze almost anything, for example. Let's examine application of EA to the globe for a bit. What does this tell us?

I am no expert on international affairs or politics, and my interest is in applying what I know something about to this greater scale. Do these methods scale? What can we learn?

MISSION/GOALS

Our conjectured world enterprise would need a purpose: some mission or goals. Let's say that is a prosperous humanity as a mission, a bit self-serving, but it is supposed to be. Health, long life, quality of life, human rights and other goals would follow.

PRINCIPLES

The UN Charter has some. The UN is HQ for managing global issues, right? Perhaps we can hijack those principles for our world enterprise?

- Article 1 (2) - Equal rights and self-determination of peoples
- Article 2 (4) - Prohibition of threat or use of force in international relations
- Article 2 (5) - Obligation to give assistance to the United Nations and refrain from assisting States targeted with preventive or enforcement action

Volume 1: Enterprise Level Architecture

- Article 2 (6) - Need to ensure that non-United Nations Members act in accordance with its Principles
- Article 2 (7) - Non-intervention in domestic affairs by the United Nations

Um ... eh maybe. Even the UN does not follow these well. We may need better principles for the world as an enterprise not for the limitation of the governing organization.

VISION

Here it gets interesting. Right now we have competing visions of how the world should be organized. In the past such differences have often resulted in conflict.

The first vision of the global future organization is one of enforced harmony. It arose from the failed League of Nations and WW II. It is the current standard notion of the global future. This vision contains several concepts, arising from various sources:

- All nations will live in harmony and avoid war.
- Globalization the phenomenon and Globalism the belief. We are all familiar with the effects of globalization and increased world trade. Globalism, different from that, is the belief that increased trade and interaction is always good. A Nobel Laureate said that in "zero sum games" it is best to cooperate. Politicians ran with that and painted all international endeavor as zero sum games. (Some are not, and competition is the correct response.)
- Harmonization of Law is the process of rewriting national law so it allows increased cooperation. Constitutions and whatever are unimportant relics of a less cooperative past to the folks in this work.
- Everybody gets equal rights. Self-determination is apparently OK in practice as long as the result is the standard set of equal rights. Religious and cultural variation is less important than this vision of equal rights. Everything will be homogenized. Don't get me wrong, I am a big fan of individual rights. I am only saying that the current standard view tends to homogenize cultural variation and societal difference into mush.
- Nations are becoming obsolete to some. Corporations will replace or supplant them.

COMPETING VISION

We now have a new vision arising from China and Russia. We will return to global division into two camps: China plus Russia against the US and Europe. I will draw from the Cold War for some probable points of difference with the vision above.

- Within each side, order will presumably be maintained by hierarchy and subjugation of client states, like the Cold War. No alternative transformative processes are present.
- The Russo-Sino side seems to be perfectly happy with a partner in the returned Ottoman Empire, the Islamic Caliphate of ISIS and Bin Laden. However, they seem to be willing to take the Middle East in whatever form, so long as it is on their side.
- South America and Africa hang in the balance. A battle for influence is underway. They must pick sides. All must pick sides.
- In this world view, it seems that nations may remain predominant and corporations had better get in line.
- Global trade will be reduced. Harmonization of culture will be allowed and human rights may vary more with local cultural norms and societal roles. Laws need not be harmonized.

So long as the lines of power and authority are maintained, these other items may vary—as per the Cold War.

COMPARING

The competing vision does not seem to agree with the UN vision much. To examine which would result in greater human prosperity, we would first have to look at the situation we face in the world. Let's do some SWOT analysis.

- There are too many people. Population keeps increasing.
- There is too little food. Growing more is hard.
- Some resources are finite. No matter how much you cooperate, the total mass of titanium on earth remains fixed. Shortages are now common.
- We may be increasing global CO2 levels, producing a massive change in climate.
- Weapons capable of total annihilation have been invented. Someone might use them.
- Technology offers constantly expanding vistas of new possibility.
- Most people are rational, and do not desire to destroy all mankind.
- And so on...

So which vision of world transformation better meets the threats and exploits the opportunities we face? I don't know. Neither seems to address the threats or opportunities very well. The existing vision would be best, if execution were better. Some tweaks in the existing vision, ending denial, would help.

RECOMMENDATION

Modify the existing vision and improve execution. If you want to fight the competing vision based on world division and a renewed Cold War, improve the UN and its partner organizations. For example:

- Efficiency: Ensure that money spent by contributing nations (especially the US) does not require redundant expenditures and efforts within the US as "world cop." (Get other nations to pay for more of this activity, while you are at it.)
- The UN should fight the notion of obsolete nations replaced by corporate fascism. Coexistence is not pretty; it looks like corruption.
- Respect national constitutions. Reign in the World Court. Stop excess harmonization of world law to benefit big business only, allow greater variation.
- Respect and promote social and cultural differences. Diversity is the basis for a happier world.
- International Monetary Fund operations have had mixed effectiveness. Great treatises have been written about enslaving entire nations to debt.
- The Global Economic Forum has been tied to the reduction in profit sharing to labor and destruction of the middle class, the foundation of democracy. Reverse that.
- Stop promoting excess trade and excess competition. It has had an adverse impact on people everywhere. Insisting that food grown next door is less desirable than shipping in identical food from the opposite side of the globe is clearly not a sustainable position.
- Be responsive to the people. Be accountable. An unelected and distant bureaucracy should be hypersensitive to the people who will naturally distrust it.

SYSTEMS ENGINEERING

Volume 1: Enterprise Level Architecture

System engineering applies to all systems, regardless of scale. It is loosely associated with enterprise architecture. What does it tell us?

In systems engineering you pick subsystems based on internal cohesion (many internal interactions) and external independence (fewer external interactions). Subsystem dependencies should not be multiplied or it will result in a less stable and less reliable system.

In large system, a clear set of organizing principles in combination with better selection of subsystem boundaries can create less complexity at the system level. Complexity should be encapsulated. The top-level organization should be simple.

Presumably we could say the same about constituent nations of the globe and the UN.

CONCLUSIONS

I think the methods and approach of EA do apply to the globe as an enterprise. We might all argue about the recommendations, but they seem to be in the right area of further discussion. The areas also seem to agree with widely expressed common sense.

As for the rest, well you can't really start transformation until you get your mission, goals, principles and vision set. Its true for the whole globe, and it is certainly true for ACME as well.

5.9 ITIL VS EA, JANUARY 26, 2015

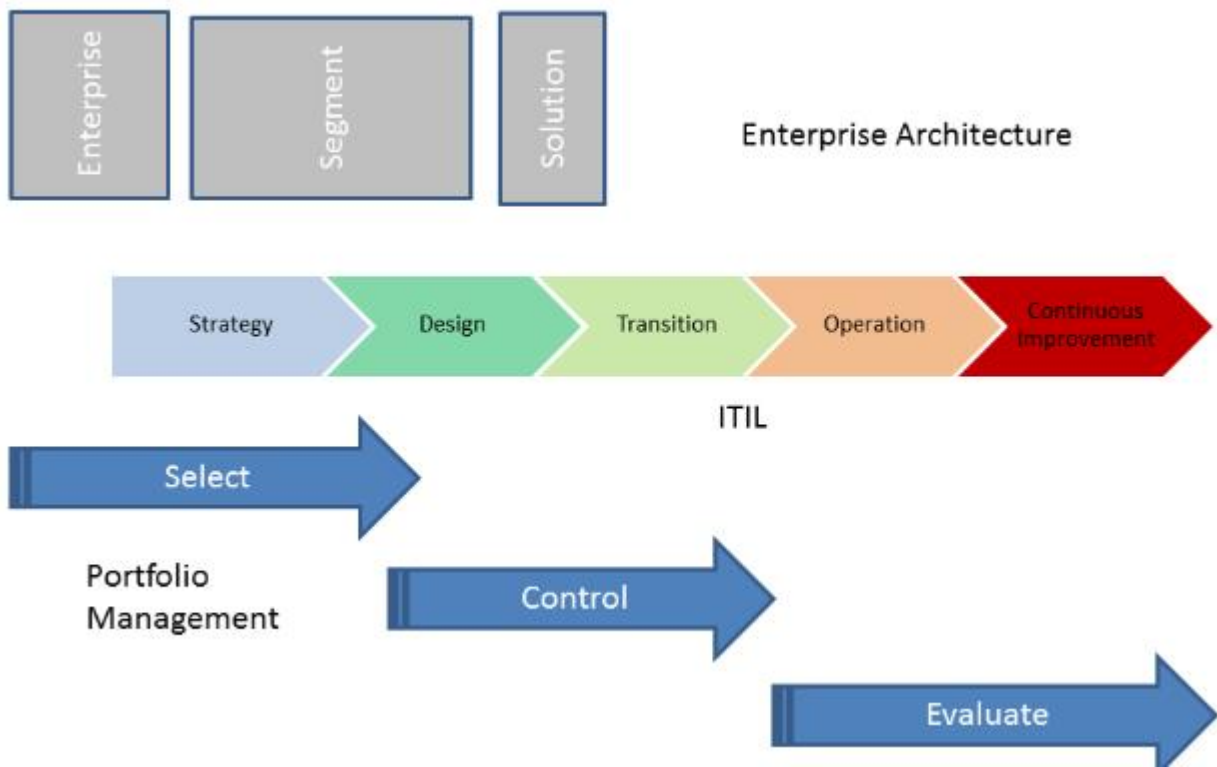


FIGURE 46 RELEVANT ASPECTS OF ENTERPRISE ARCHITECTURE AND ITIL ARE SHOWN IN RELATION

One of our colleagues (Ramesh) is up at the Food and Drug Administration (FDA) doing architecture. He asked me how Information Technology Service Management (ITSM) and EA relate. I owe him and Health and Human Services (HHS)/FDA a better answer. (I went to school [FEAC] with a few architects from HHS and two were on my project team there.) Here is how I would characterize the relationship between ITSM and EA. This is my second, revised, attempt at a simple and clear explanation.

ARCHITECTURE FROM AN ITIL PERSPECTIVE

Information Technology Infrastructure Library (ITIL) has become synonymous with ITSM. The ITIL consists of five phases in a lifecycle, expressed in five main publications. These are:

- ITIL Service Strategy
- ITIL Service Design
- ITIL Service Transition
- ITIL Service Operation
- ITIL Continual Service Improvement

From an ITIL perspective, architecture overlaps with the first two phases: ITIL Service Strategy and ITIL Service Design.

Volume 1: Enterprise Level Architecture

FROM AN ITIL PERSPECTIVE, ARCHITECTURE IS ONLY PART OF THE LIFECYCLE.

ITIL FROM AN EA PERSPECTIVE

In the three levels of architecture of FEA, the bulk ITIL architecture efforts would fall firmly in the middle level, segment architecture. (Subordinate solution architecture efforts would then also result.) Segment architecture deals with lines of business. This might be a product line with several products, a service line with several services, or a mixture. ITIL focuses on services, not products, but this focus is not absolute.

Any service may have an IT part and a non-IT part. Some have no IT-part at all. Some services, not many, are all IT (online banking or online retail). EA treats IT as a supporting enabler to the total service—the focus is overall transformation. If the service has no IT, it is included. If the thing has only products and no services, it is included. If by some rare circumstance it is completely executed and delivered via IT, then it is included.

FROM AN EA PERSPECTIVE, IT SERVICES (AND ITIL) ARE ONLY A PART OF THE ENTERPRISE.

INTERSECTION

ITIL and EA intersect at the corner of segments and service strategy/design. There is an obvious intersection. This is depicted in the accompanying figure.

In 1999 FEAF 1.1 spoke of segments and segment architecture. In 2007, P 1-5, Burk at OMB spoke of segment architecture. From the later:

"By contrast, segment architecture defines a simple roadmap for a core mission area, business service or enterprise service. Segment architecture is driven by business management and delivers products that improve the delivery of services to citizens and agency staff. From an investment perspective, segment architecture drives decisions for a business case or group of business cases supporting a core mission area or common or shared service. The primary stakeholders for segment architecture are business owners and managers."

From that let's pull out the key point here: "IMPROVE THE DELIVERY OF SERVICES TO CITIZENS AND AGENCY STAFF." Now lets translate from government to commercial language: improve the delivery of services to customers and the company. This last sounds like it could be a description of the purpose of ITSM.

"IT Service Management (ITSM) is a process-based approach to aligning the delivery of information technology (IT) services with the needs of the

Volume 1: Enterprise Level Architecture

organization that uses them." FOUND

AT [HTTP://SEARCHCIO.TECHTARGET.COM/DEFINITION/ITSM](http://SEARCHCIO.TECHTARGET.COM/DEFINITION/ITSM)

"ITIL is the most widely accepted approach to IT service management in the world. ITIL can help individuals and organizations use IT to realize business change, transformation and growth." FOUND

AT [HTTPS://WWW.AXELOS.COM/ITIL](https://www.axelos.com/itil)

THE FIGURE

The figure shows the ITIL lifecycle. The figure gives a false impression that enterprise and segment architecture have a beginning and an end, but they do not; they continue throughout the year (or budget cycle). Instead, the times implied are those times when the ITIL lifecycle interacts with a specific EA activity. The CPIC or portfolio management cycle is also shown for convenience. These CPIC arrows show the times when the specific service in ITIL is under each CPIC stage in the lifecycle.

Note that some solution architecture may be expected to build out the support for a business service, either IT or non-IT. Note that some interaction between ITIL strategy and the enterprise level of IT is involved in the production of the business case, the review and selection by CPIC, and the accompanying EA analysis. Mostly, the interconnection and overlap is with segment level architecture as mentioned above.

CONCLUSION

Both EA and ITIL seek to merge business with IT. EA (in FEA, DODAF) positions IT as an optional enabler or supporting component. ITIL has IT in the name and seems to focus on what IT can do for business. ITIL is a lifecycle and EA is not. EA has levels and ITIL fits most closely with one of these.

EXCEPTIONS AND CAVEATS

EA produces principles, standards and vision at the top (enterprise) level. ITIL would be a standard in that set. ITIL principles might be adopted at the enterprise level. ITIL "strategy" might be reflected as part of the enterprise vision.

What ITIL calls "strategy" applies ostensibly to one operational mission, one line of services. This would be "operational planning" in the view from enterprise-wide "strategic planning." The whole subject line of services of ITIL may be a minor player in the enterprise.

ISO 20000 and COBIT, sometimes connected with ITSM, would be related to EA governance and not segment architecture.

5.10 ENTERPRISE ARCHITECTURE VS SAFE, NOVEMBER 16, 2014



FIGURE 47 THE IMAGE IMPLIES COMPARISON OF APPLES VS ORANGES, ART VERSUS INDUSTRY

Tim Reynolds, my MBA TOGAF buddy, asked me to compare EA and the Scalable Agile Framework (SAFe). Apparently the SAFe is being suggested as a replacement for EA in some shops. First let me say that I like Leffingwell's work, and it represents an important step forward for Agile software methods, IMO. However, it is not the same as enterprise architecture; it has a slightly different purpose. I will explain below.

GROUND RULES

I will use EA as described in various sections of this text. This includes some FEAF at the top, some DODAF at the bottom, and some segment architecture functional extensions. Throw in the EAMMF and my governance writing. I will use the 2011 poster of SAFe from Leffingwell and supporting information from Rally Blogs at RallyDev. We will examine these in regard to fulfilling EA policy, and I will use OMB A-130 for that.

I will compare the three levels of SAFe to the three levels of EA per Burk 2006, and then hit governance and maturity management. This will cover the five areas of EA at: http://unauthorizedprogress.com/images/EA_as_5_activities_2014.pdf.

ENTERPRISE LEVEL VS PORTFOLIO LEVEL OF SAFE

Both purport to deal with portfolio support. In FEAF or modified Zachman we are looking at software plus hardware plus infrastructure plus security plus business processes. Accompanying FEAF we have CPIC, which takes investments described by the business case and chooses those with the highest ROI.

In EA the tangible and intangible costs and returns define cost and ROI. Risks are explicit. In SAFE "investment themes" drive portfolio choice. Objective criteria vs subjective criteria ... if "epics" are modified to include tangibles and intangibles and risks as in a standard business plan, these become comparable. Otherwise, SAFE is not as defensible or compatible with fiduciary controls and executive responsibilities in portfolio management. SAFE has a gap, a shortfall, in comparison with standard practice.

The "roadmap" is a FEAF artifact adopted by others. It shows how the set of selected investments lead to the target architecture; it is a schedule or Gantt chart at the portfolio level. In SAFE it is relegated to an operational position supporting releases.

Alignment to strategy is not sufficiently addressed in SAFE. Objective metrics are present but derivation from strategy and mission is absent. SAFE is software centric and not as holistic as EA.

THE SEGMENT (LINE OF BUSINESS) LEVEL VS PROGRAM LEVEL IN SAFE

I have written about what the EA segment level SHOULD be. It should address the customer, markets, physical production line, product line structure, distribution, product logistical supply chain, and value chain/value stream. It should produce the business cases for evaluation above at the portfolio level.

In SAFE, the program level addresses releases. This is important and missing from EA, although software centric to some extent. SAFE does address the value stream.

SAFE has many features to prioritize and manage software features. SAFE does not address the supply chain or customer markets for the product (not the internal software but the organizational product produced by the line that uses the software). The customer of the organizational product, not the software product, is absent.

Think of it this way: you are Ford and you manufacture cars. Segment architecture addresses the cars and how they are built, purchased. SAFE program level addresses the software for the robots that make the cars. In EA, the organizational product is the focus, the service to the citizen or external customer. In SAFE, the internal customer for the software utility, not a product of the company, is the focus. Features and releases are central, not external product lines, products, or models. The robot software may need to be created as a side effect of organizational transformation in EA, and will have to support a specific new process.

Feel free to substitute "service" for "product" where required and then apply some ITIL.

THE SYSTEM LEVEL IN EA VS THE TEAM LEVEL IN SAFE

To me the system or solution level in EA is typified by DODAF. DODAF describes the business process improvements, the hardware, the network, the services as well as the software. SAFE focuses on the software and Agile software stories.

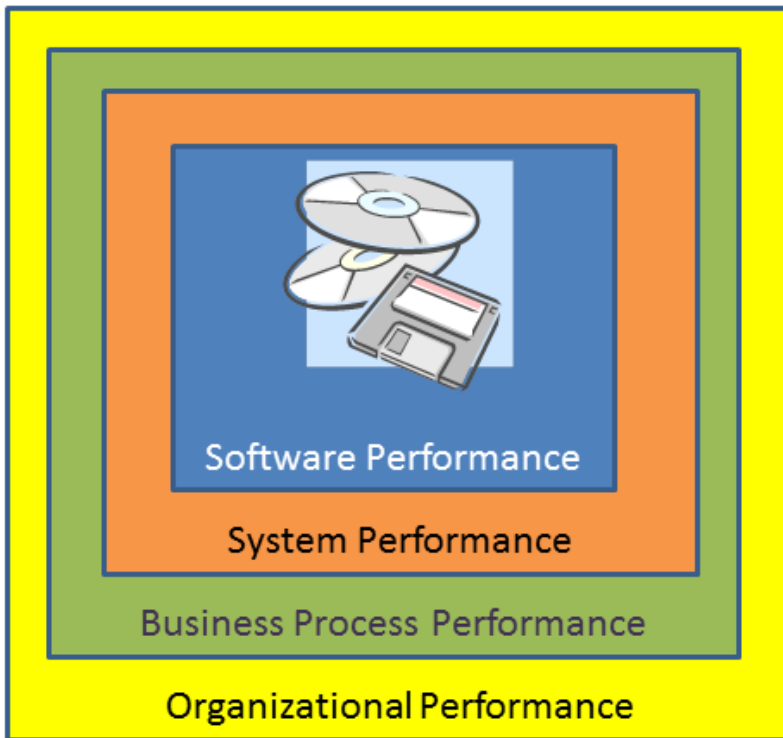


FIGURE 48 SOFTWARE VALUE MUST BE DETERMINED BY SEVERAL LAYERS OF CONTEXTUAL EVALUATION

Software impact is only partially about the software. The system in which it is embedded must perform adequately to improve the business process. The correct processes must be changed in the correct ways to impact the organization. This is only partially addressed by SAFe.

GOVERNANCE

In EA, from early papers, three or four levels of committees make governance decisions. I have noted that this includes the board or public sector equivalent, the investment board, the stage-gate board, and the configuration management board.

In SAFe the investment board is implied, but its workings based on ROI are not adopted. The stage-gate board is not mentioned. The configuration management board, where implied, is focused on software only. Security, for example is missing.

Maturity Management: EA has the EAMMF, a framework to analyze, measure and guide maturity management. SAFe uses lean or Kanban methods but does not describe in sufficient detail all the stages and areas to measure IMO.

(SAFe might work well with COBIT, which seems to mistake enterprise level architecture for solution architecture. COBIT might be unable to discern the missing elements in SAFe. I'm not certain.)

CONCLUSIONS

This comparison is a DRAFT, and I am not yet an expert in SAFe. It is based on what I do know. I invite SAFe experts to clarify selected points of comparison.

SAFe is a way to extend the creation of small software projects to huge enterprise software systems. THIS IS ENORMOUSLY VALUABLE. It does not, IMO, address systems of systems well. It does not address mixed legacy COTS and new development well yet. It is very valuable, but it DOES NOT ANSWER THE NEEDS OF OMB A-130 in terms of ROI, security, TRM, and other items. They have different purposes.

Volume 1: Enterprise Level Architecture

There is a construct known as the "four pillars of FEAF." This was ostensibly extended to five with the recent addition of security architecture. The others are: 1) business architecture; 2) data architecture; 3) application (read as equivalent to software) architecture; and 4) technology architecture (sometimes including standards and infrastructure). SAFe addresses one of these directly and indirectly two more to a limited extent. The two do not have the same scope or purpose and are not directly comparable. SAFe addresses a narrow subset of conventional EA.

The scope of EA covers hardware, solutions without any material component (hardware or software), software you write (including Agile or not Agile), software you do not write, software someone wrote years ago, software products, software provided as a service, infrastructure and networks, protocols, and more.

A hybrid approach is possible. I would love to work with Leffingwell on extension of SAFe in the identified areas. Some funding for that would be great.

5.11 RISK MANAGEMENT VS ENTERPRISE ARCHITECTURE, DECEMBER 21, 2014

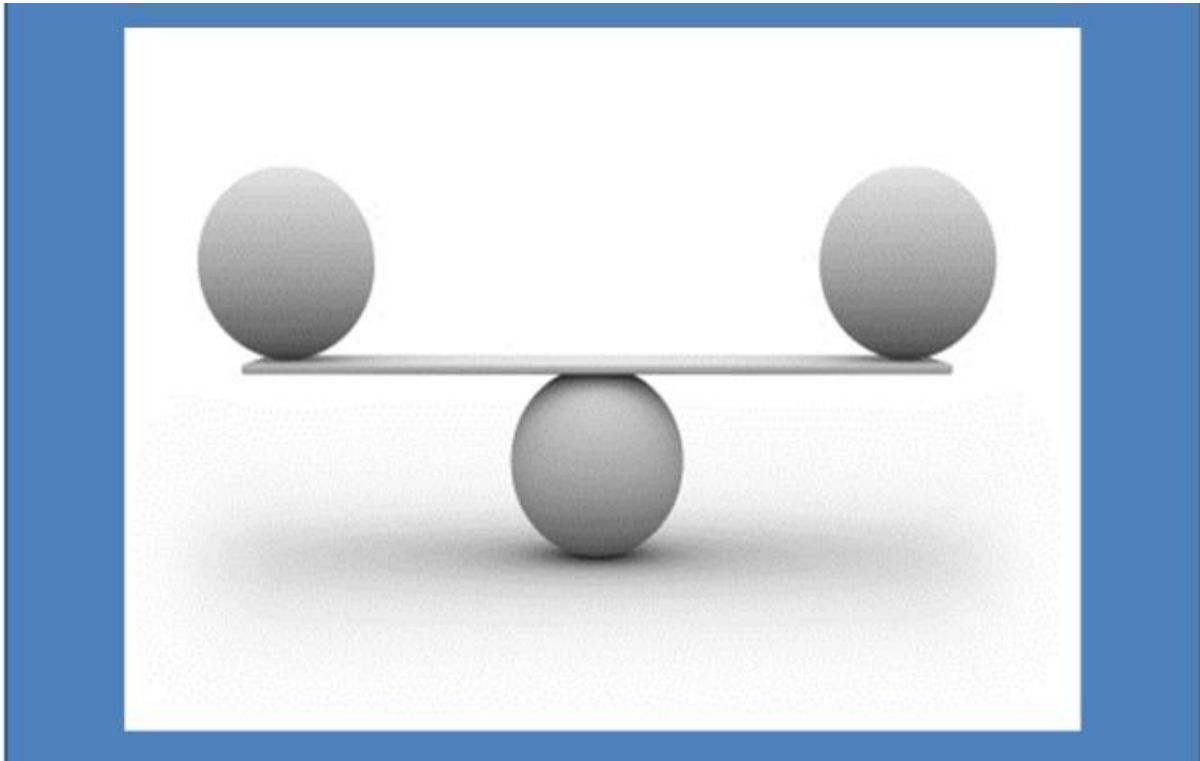


FIGURE 49 THE IMAGE DEPICTS A BALANCE, A POSITION HOLDING FORCES IN OPPOSED STASIS

Several persons have asked me about risk management enterprise architecture. I will answer in terms of the Five Activities Model. Enterprise architecture is a term used in both an exclusive and inclusive way. The inclusive meaning encompasses all five activities listed below. The exclusive meaning includes only the first (see http://www.unauthorizedprogress.com/images/EA_as_5_activities_2014.pdf).

ENTERPRISE LEVEL ARCHITECTURE

There is remarkably little risk management activity in enterprise level architecture. It is surrounded by activities that include risk management, and its inclusion here would be mostly redundant. While risks could be added to the list of "why" in the ZIF, this is uncommon. (Within security architecture at the enterprise level there is a narrow exception, as threats may be tracked there in a global fashion.)

SEGMENT LEVEL ARCHITECTURE

Segment or "Line of Business" architecture exists in large part to create business cases. Each business case lists risks and balances them against returns.

SYSTEM OR SOLUTION LEVEL ARCHITECTURE

Here risk management is managed in choice of technology and in reliability and redundancy features built in to the solution or system.

ENTERPRISE ARCHITECTURE MATURITY MANAGEMENT

This does not commonly address risk.

ENTERPRISE ARCHITECTURE GOVERNANCE

Risk is managed in portfolio management, stage-gate reviews and in configuration management boards, essentially at all levels.

OUTSIDE THE FIVE ACTIVITIES

In the production of organizational strategy, risk is commonly addressed via SWOT analysis and other methods. Enterprise risk management and safety management are also sometimes conducted in parallel with enterprise architecture.

CONCLUSION

When I am asked if EA includes risk management, I often think of the exclusive meaning first and say no. In the broad and more nebulous meaning it occurs everywhere but the core. Stranger than fiction, I suppose.

5.12 ENTERPRISE ARCHITECTURE VS DIGITAL TRANSFORMATION, NOVEMBER 8, 2014



FIGURE 50 THE IMAGE DEPICTS A TRADEOFF OR COMPARISON

What the heck is "Digital Transformation" and how is it different from "Enterprise Architecture"?
Semantics.

.DIGITAL TRANSFORMATION

WIKIPEDIA: DIGITAL TRANSFORMATION REFERS TO THE CHANGES ASSOCIATED WITH THE APPLICATION OF DIGITAL TECHNOLOGY IN ALL ASPECTS OF HUMAN SOCIETY.

ALTIMETER GROUP: DIGITAL TRANSFORMATION: "THE REALIGNMENT OF, OR NEW INVESTMENT IN, TECHNOLOGY AND BUSINESS MODELS TO MORE EFFECTIVELY ENGAGE DIGITAL CUSTOMERS AT EVERY TOUCHPOINT IN THE CUSTOMER EXPERIENCE LIFECYCLE."

[HTTP://EN.WIKIPEDIA.ORG/WIKI/DIGITAL_TRANSFORMATION](http://en.wikipedia.org/wiki/digital_transformation)

Volume 1: Enterprise Level Architecture

<http://www.forbes.com/sites/jasonbloomberg/2014/07/31/digital-transformation-by-any-other-name/>

ENTERPRISE ARCHITECTURE

- **US Federal Enterprise Architecture Framework:** “Enterprise architecture is a management practice to maximize the contribution of an agency’ s resources, IT investments, and system development activities to achieve its performance goals. Architecture describes clear relationships from strategic goals and objectives through investments to measurable performance improvements for the entire enterprise or a portion (or segment) of the enterprise”
- **MIT Center for Information Systems Research:** “Enterprise Architecture is the organizing logic for key business processes and IT capabilities reflecting the integration and standardization requirements of the firm’ s operating model.”
- **Forrester, Gene Leganza, 2001:** “Enterprise architecture consists of the vision, principles and standards that guide the purchase and deployment of technology within an enterprise.”

.(Retrieved from <http://www.ariscommunity.com/users/koiv/2009-08-20-10-definitions-enterprise-architecture-which-corresponds-yours> I picked only relevant ones I liked.)

Enterprise architecture is about managing the transformation of an enterprise by incorporating technology. Digital transformation is the process of doing roughly the same thing. Lets examine some areas of comparison:

PORTFOLIO MANAGEMENT

In Federal enterprise architecture, portfolio management of IT investments is called CPIC. In civilian enterprise architecture, EA is also tied to portfolio management. Altimeter Group also assigns a role of portfolio management of investments to "Digital Transformation."

TECHNOLOGY

In enterprise architecture the focus was originally on Internet-based applications to replace desktop applications. It moved on to customer-facing Internet applications providing "service to citizens." This includes mobility and mobile applications. Keeping that intact, it has also moved to inclusion of cloud technology and increased security required for Internet-facing applications. Digital transformation speaks less specifically to customer-facing digital technology.

SCOPE

Some focus "digital transformation" on all of society, some do not. Enterprise architecture can be scoped for various areas of purposeful endeavor.

CUSTOMER FOCUS

In "digital transformation," the customer is mentioned in a central way. Enterprise architecture has been criticized by some for a lack of external customer focus, but FEA was focused on "service to citizens" during the Bush Administration. I have argued that the middle level or "segment architecture" of EA used in a broad way is customer and logistics chain (i.e., externally) focused.

BUSINESS FOCUS

EA includes business process modeling in all major (reputable) frameworks. Digital transformation mentions business models.

STRATEGY

EA is driven by strategy. Digital transformation is driven by Internet marketing and ultimately marketing strategy. In either case, you can fool yourself into thinking you have avoided strategy, but you have only selected a strategy (and goals) in ignorance or without examination.

CONCLUSION

It is difficult not to see these two things as synonymous or so closely related as to be inseparable unless to the nit-picker. Differences may be attributable to marketing hype and profit motive.

(Below found at: https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&es_th=1&ie=UTF-8#q=nit%20picking%20definition)

NIT·PICK·ING NIT PIKING/INFORMALadjective

1. LOOKING FOR SMALL OR UNIMPORTANT ERRORS OR FAULTS, ESPECIALLY IN ORDER TO CRITICIZE UNNECESSARILY. "A NITPICKING LEGALISTIC EXERCISE"

noun

1. FUSSY FAULT-FINDING. "NITPICKING OVER TINY DETAILS"
