

IMPLEMENTING ENTERPRISE ARCHITECTURE AT THE UNITED STATES SECRET SERVICE

Andrew Blumenthal

ABSTRACT

This article describes a ten-step process used by the United States Secret Service to build its Enterprise Architecture (EA) program. EA is the discipline that synthesizes key business and technical information across the organization to support better decision-making. The Secret Service program improves on the traditional approach to EA by going beyond the collection of voluminous information to synthesize and present it in a useful and useable format for decision-makers. It achieves this by using a clear framework, incorporating a three-tier approach to displaying the information, and drawing on principles of communication and design in a 10-step process.

KEYWORDS

enterprise architecture, secret service, information technology, strategic planning, investment management, knowledge management, information sharing, information visualization, Clinger-Cohen Act

INTRODUCTION

Enterprise Architecture (EA) is the discipline that synthesizes key business and technical information across the organization to support better decision-making, as shown in Figure 1. The information in the EA includes, among other things, descriptions of business functions and activities, information requirements, and supporting applications and technologies.

In my experience, before EA existed, such data was often difficult to get, cumbersome to access, and challenging to use. Information Technology (IT) was organized functionally, not holistically; the relationship between business and IT stakeholders was often confrontational rather than collaborative; and documentation on technology and applications was often difficult to obtain, if it existed at all.

In 1996, the federal government addressed this issue by passing the Information Technology Management Reform Act, also

known as "Clinger-Cohen." This Act, among other things, charged federal agency Chief Information Officers (CIOs) with "developing, maintaining, and facilitating the implementation of a sound and integrated information technology architecture" (110 Stat. 685). This legislation was significant because it recognized the centrality of EA to good decision-making in the organization.

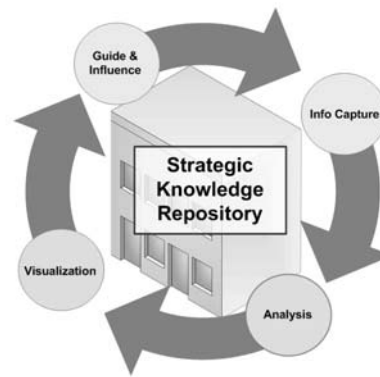


Figure 1. EA Support for Decision-Making

In this article, I describe the experience of building the Enterprise Architecture at the United States Secret Service (Secret Service) — how we launched the EA program, built demand around it, and created a structure and information ‘products’ to satisfy that demand systematically. I also explain how we ensured that the EA information we provided would be accurate, accessible, intuitive, and meaningful for both the technical and the non-technical business user.

SITUATION

The Secret Service launched its EA program in 1998. The program was based on a strategy of building grassroots demand rather than implementing it through the more traditional top-down approach.

In accordance with Office of Management and Budget (OMB) Circular A-130 requirements — that federal agencies ensure information systems align with federal, agency, and bureau architectures — the Secret Service established an Enterprise Architecture Working Group (EAWG) (OMB, 2000). The EAWG was charged with reviewing IT investments to ensure they were consistent with both IT and business strategies. The EAWG was composed of management-level representatives from IT and the major lines of business. It soon became apparent to the members of this group that better information about our IT environment (such as IT product standards, applications, security parameters, and so forth) was needed to meet these review responsibilities.

By 2003, demand increased to the point where we needed to develop a formal framework, policy, governance, and EA product set. Demand was coming from a variety of user groups, including:

- EAWG members. These individuals needed better information to evaluate proposed IT investments.
- Project managers. Business and technical project managers needed EA information to guide IT development efforts.
- Department of Homeland Security (DHS). DHS required extensive EA information from the Secret Service after the creation of the Department in 2002, including business

functions, data sources, applications, and technologies.

In addition, the Secret Service experienced a convergence of situational factors that further supported its EA development. These included:

- Management commitment. We had support from the senior management team of the Secret Service’s Information Resources Management Division (IRMD) and from the EAWG.
- Funding. The Secret Service allocated funding for contractors to support program requirements.
- Human capital. We put together a talented EA team with many diverse skills and backgrounds, including business management, advanced technology, and graphic design.

In the second half of 2003, I joined the Secret Service as the EA program manager. Under the leadership of the then-chief enterprise architect and working with our dedicated team, we set out to build a more robust EA.

CHALLENGE

In taking the EA to the next level, we faced a difficult challenge: people were hesitant to share their information. This resistance was natural. Employees of any organization, especially in law enforcement, are cautious about giving out information, because they fear that it could compromise the security of the mission. More generally, in any organization people feel that knowledge is power, and fear losing power if they share it.

To help overcome this, we concentrated our efforts on aligning the EA with the mission of the Secret Service and presenting it in a useful and useable format, through what eventually became a 10-step process.

PROCESS

In developing the EA for the Secret Service, we did not consciously set out these 10 steps in advance. We started with OMB’s Federal Enterprise Architecture (FEA) and built on it through the team’s collective professional experience and education, and simple trial-and-error. The process evolved from there.

★ United States Secret Service EA Value Proposition

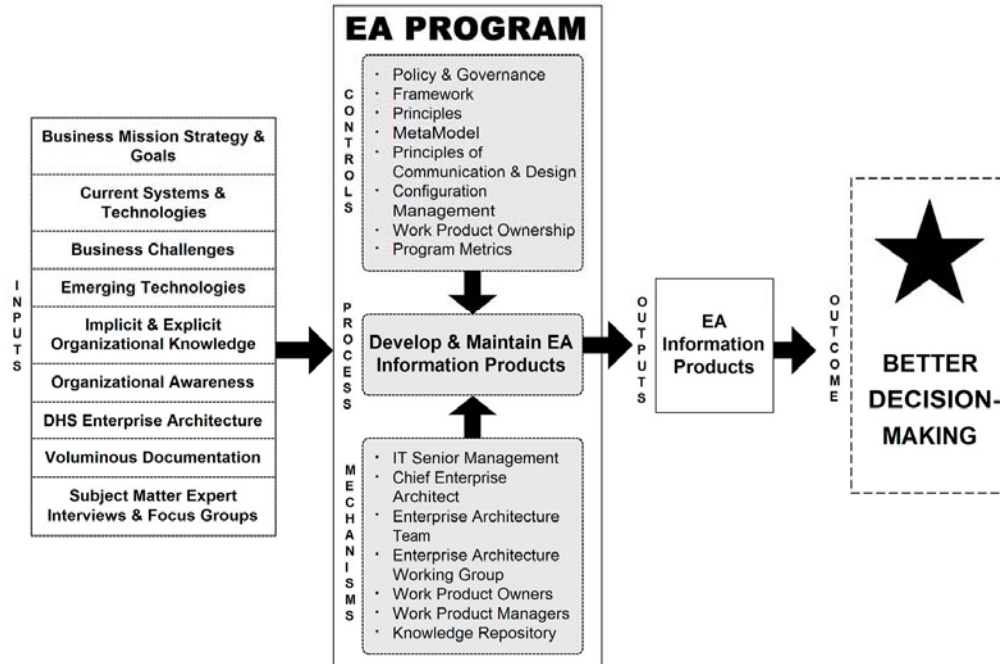


Figure 2. EA Value Proposition

Step 1: Clearly articulate the value proposition

In order for everyone to understand the benefit of what we were doing, we needed to clearly articulate the value that the architecture would bring to the organization. In the case of the Secret Service, the value proposition of EA was creating “order out of chaos.” Accordingly, we identified the value proposition by creating an overview map of the EA process.

Figure 2 above shows how a wide range of data is transformed into information products that are easily used by business and technical users to support enhanced decision-making outcomes. It resembles an integrated definition function (IDEF) activity diagram in that it depicts how an input is processed by the EA program function (which is moderated by mechanisms and controls) to become an output. However, it was not intended, in and of itself, for business process improvement. Rather, the purpose was to comprehensively yet simply portray the EA value proposition.

We also realized that we needed a real-world,

physical example to explain to others why EA is important. We selected the famous Winchester House built in San Jose, CA in the late 1800’s as our example of what happens when you build without planning first. Shown in Figure 3, this house was also used as an example of what not to do by Dr. Steven Spewak in his pivotal book on EA Planning (Spewak, 1992). This bizarre house had 147 builders but not a single architect. Therefore, \$5.5 million and 38 years later, this 160-room Victorian mansion had 65 doors that opened to blank walls, 13 abandoned staircases, and 24 skylights built into the floor.



Figure 3. Winchester House
(Used with permission from Winchester Mystery House)

The Winchester House became a metaphor for what could happen to an organization's information technology without EA: It could easily descend into chaos in a variety of ways. For example:

- A mission could fail because information was there, but not shared
- A manager might purchase technology that conflicts with the underlying infrastructure or is not fully mature
- Multiple departments could independently purchase different software products that perform the very same function and not even know it, or
- The organization could be left inadvertently vulnerable to cyber-attack

Step 2: Institutionalize through policy

Something we say is “you can have agreement and buy-in to do the EA, but if you do not formalize it in policy, you cannot make it stick.” Therefore, once executive buy-in and management commitment were obtained, we turned to establishing an EA policy that clearly defined the EA's purpose, scope, structure, and governance. In any organization, including the Secret Service, policy has the effect of legitimizing the program by requiring compliance by all. Here is an excerpt from ours:

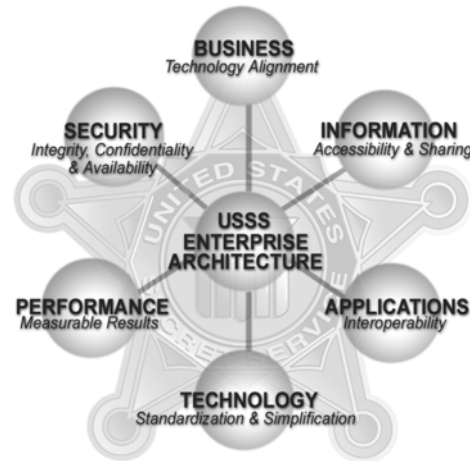
“The purpose of the Secret Service Enterprise Architecture program is to develop and maintain a baseline and target enterprise architecture, to develop a transition strategy, and to facilitate use of the enterprise architecture in IT investment management decisions, strategic and operational planning, and IT program management.”

Step 3: Establish a simple and well-rounded framework

An EA framework is a basic blueprint for all of its products. The framework we chose was largely derived from the Federal Enterprise Architecture (FEA). As is shown in Figure 4, our EA framework uses six perspectives through which one can look at business and IT information. These are used simultaneously to obtain a well-rounded view of the organization, and are mutually reinforcing.

Enterprise Architecture

A Blueprint for Enhancing Mission Performance



Planning Strategically, Investing Wisely, Managing Effectively
A CIO Program

Figure 4. EA Framework

The following is a brief description of each of our EA perspectives:

- *Business*: What are the functions and activities of the organization with respect to the mission?
- *Information*: What information is needed to support the mission?
- *Applications*: How do applications support information needs or requirements?
- *Technology*: How does the technology support the applications?
- *Performance*: How is performance measured?
- *Security*: How is information protected?

The EA perspectives are presented visually in the shape of the Secret Service star, with each perspective labeled as a point on the star. Again, the overall message is that the EA truly represents the organization and is integrated into its mission and culture.

Step 4: Identify the core principles

Once the EA framework was established, we developed a set of core principles that each perspective would support. The purpose for doing this was to more fully explain the

perspectives and make them pertinent to the Secret Service environment. The core principles are:

- *Business-technology alignment:* IT investments must be aligned with the mission.
- *Information accessibility and sharing:* Information should be accessible and shared appropriately across the enterprise.
- *Interoperable applications:* Our applications should work together.
- *Technology standardization and simplification:* IT should be standardized and simplified to the greatest extent possible.
- *Measurable results:* The results of investment activity should be measured.
- *Integrity, confidentiality, and availability:* We must assure the integrity, confidentiality, and availability of our information assets.

To promote agency-wide awareness of and support for the EA program, we hung posters of the EA framework and core principles (as seen in Figure 4) throughout the headquarters building of the Secret Service.

Step 5: Create a meta-model

A meta-model is a "model of models" that explains how information will be catalogued and presented. It ensures consistency in how information is demonstrated for each perspective of the framework. As far as we know, the meta-model that we developed for the Secret Service is unique. It is based on a three-tier architecture, as follows:

- *High-level profile:* Provides a "20,000 mile-high view" or executive summary
- *Mid-level model:* Shows relationships, and is typically a diagram that demonstrates how items relate to each other
- *Inventory:* The detailed information

As is shown in Figure 5, the three information levels help us to distinguish the details from the bigger picture.

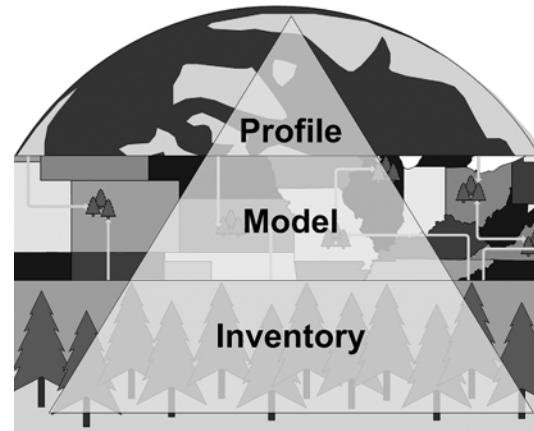


Figure 5. Three-Tier EA Meta-Model

While the models and inventories are important, we found that the high-level profiles were the most valuable products of all. After collecting the information and inventorying it, we spent significant time analyzing the information in order to develop one-page profiles of the key information that provides decision-makers with large amounts of information in quick, easy-to-use formats. We developed multiple profiles for every perspective of the architecture. An example of a profile is our business profile, which succinctly identifies all the Secret Service's core functions and sub-functions.

Step 6: Incorporate principles of communication and design

Before we actually developed any EA products, we decided on a core set of design principles that would guide us in developing the full set of EA work products. This was a unique step that we initiated in developing EA for the Secret Service. These principles included the following:

1. Focus on the mission.
2. Develop work products that are useful and usable.
3. Simplify complex information.
4. Organize and classify information based on a structured taxonomy.
5. Create a common look and feel.
6. Provide easy access to work products through our intranet.
7. Maximize use of information visualization.
8. Be creative.

Based on these principles, we developed EA products, such as the concept of operations (CONOPS) shown in Figure 6. It illustrates focus on mission and use of information visualization.

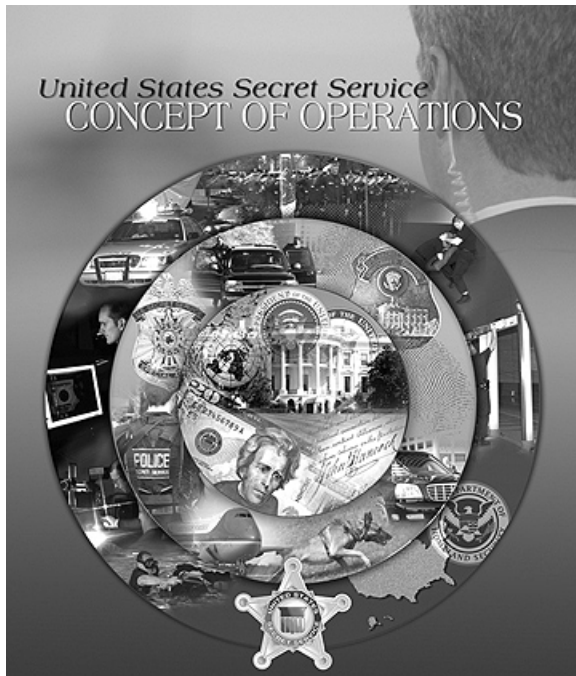


Figure 6. Secret Service CONOPS

The CONOPS not only helped us to better understand the mission and functions of the agency, but also helped to integrate this information into a unifying representation that everyone could understand and relate to. An added benefit is that, like the six-perspective EA framework poster, it provides a useful communication vehicle for the EA program.

Step 7: Define, develop, and maintain information products

At this point, we were ready to develop EA products: to find existing information, bring it into the EA, organize it, and present it effectively.

We started by defining a consistent set of information products for each perspective that would align with each level of the meta-model. For example, under the business perspective, we committed to developing such things as:

- A *high-level business profile* that would identify the major functions performed by the

Secret Service.

- A *mid-level business process model* that would break down the functions of the Secret Service into specific activities.
- A *business inventory* that would detail all the functions, sub-functions, and services that the Secret Service performs, and align these to the DHS parent functions.

However, in order to develop these products, we needed subject matter expertise. More than that, we needed ongoing commitment from the subject matter experts to collaborate with us on developing, and ultimately maintaining, the EA products. Accordingly, we worked through a senior management team and designated subject matter experts from the operational areas as the "product owners" for each EA product, who were to be responsible for content. The actual design and development of the product was assigned to individuals on the EA team, and we designated these individuals as the "product managers". Together, the product owners and the product managers develop and maintain our EA.

In this collaborative relationship, we asked product owners to provide information that they already had. The product managers brought it into the architecture, organized it, identified relationships, and developed effective visualizations. The product owners made sure certain the data stewarded by the product managers was accurate.

Finally, in developing our products, we aligned our architecture with the DHS's architecture by using their taxonomies as a starting point and then modifying, nesting, and extending the Secret Service architecture taxonomies as appropriate.

Step 8: Set up a single information repository

In amassing information, it was tempting to store it in different databases, or "buckets," for the sake of convenience. However, we realized early on that we would reap the real benefits of this information only by capturing all of it in a single repository. We selected and implemented Telelogic's (formerly Popkin Software) System Architect™ software product as our EA repository and modeling tool to

achieve this objective.

Although it is still in a relatively early stage of implementation, we can already see a number of benefits including ease of use through centralization, enhanced data integrity, and the ability to show relationships between elements of the architecture.

Step 9: Apply strict configuration management

Configuration Management (CM) is the process of identifying, controlling, and reporting on changes. It was important to integrate CM into our EA because of the need to capture and manage a mass of critical information across the enterprise. Specifically, we needed to track changes to the original EA products, so that we could ensure the accuracy and integrity of the information contained in them. Therefore, we developed a CM plan that provides for the maintenance of logs that track changes to EA products; created a quarterly release schedule for new or changed products; and instituted review and approval by product owners of new or modified products (and their change logs) before each quarterly release of the EA.

Step 10: Use EA for everyday decision-making

EA enhances decision-making by providing services and information in support of strategic planning, IT investment management, and knowledge management. The EA program at the Secret Service guides strategic and tactical planning, helps conduct IT investment reviews, and enables us to respond to business and technical questions from our stakeholders.

We measure the use of EA for these functions as a benchmark of our performance against the goal of providing an EA that furthers the agency's business mission. For example, we track the number of investment reviews conducted, as well as responses to internal and external requests for EA information. While not conclusive, these metrics provide helpful indices for determining how useful our EA is to the Secret Service.

In addition, we engage in various formal and informal activities to enhance our users'

awareness of the EA's day-to-day value. These include briefings, demonstrations, posters, business cards, and booths at various internal IT fairs. Further, we make the EA information available to all employees on our intranet.

LESSONS LEARNED

In the process of creating an EA process and set of associated products for the Secret Service, we have learned a number of lessons:

- *Focus on the mission.* Use EA to capture and organize voluminous organizational information to support better decision-making, rather than as an end in itself.
- *Keep it simple.* Don't develop esoteric models and frameworks. Instead, concentrate on creating a few useful and useable products.
- *Be flexible.* Develop products as the need for them becomes apparent, rather than pre-define what you will offer.
- *Capitalize on information visualization.* As the saying goes, "a picture is worth a thousand words." By summarizing EA information into high-level visual profiles, we have distilled massive amounts of information in a concise and useful manner.
- *Communicate early and often.* Take the time to tell your story. No program can succeed without awareness, acceptance, and support among key stakeholders.

CONCLUSION

We can never go back to the days of "build it and they will come." Rather, everyone in the organization, particularly those in support functions like IT, must make it his/her job to understand and respond to the needs of the business. In my view, this is the real strength and importance of EA. EA integrates the business and technical information of the organization to enhance decision-making.

Our own program improves on the traditional approach to EA by going beyond the collection of voluminous information to synthesize and present it in a useful and useable format for decision makers. We achieved this goal by using a strong framework, incorporating a

three-tier approach to displaying the information, and using principles of communication and design.

EA is a vital tool for supporting the mission of the Secret Service. Its benefits are maximized when EA program leaders deliver a clear and relevant business value proposition, work openly and collaboratively with business customers, and provide meaningful and easily accessible information.

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AUTHOR BIOGRAPHY

Andrew Blumenthal is chief enterprise architect at the United States Secret Service. He is a certified enterprise architect (CEA) and project management professional (PMP) specializing in the implementation of best-practice information technology solutions. In addition to his work with the Secret Service, his two decades of professional experience include service at a range of leading public and private sector organizations, including the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Treasury; the Dreyfus Corporation; and International Business Machines (IBM). With an MBA in organizational behavior and a BBA in accounting, as well as numerous advanced certifications in IT, including CIO certification, Blumenthal has unique insight into the importance of IT to business success, and focuses on synthesizing IT practices with business needs, so as to provide demonstrated results in supporting the broader mission of the organization.

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