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Points of view

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Agile Enterprise Architecture (AEA) – 7 Steps to Success

Context

Governments around the world are being challenged to deliver an increasingly broader range of services in an era of flat or reducing budgets. This has resulted in government agencies being challenged to:

- Find innovative ways of reducing the ratio of non-core to core-mission related spend.
- Be strategic in making investments and containing costs, demonstrate the business value returned for investment decisions -- especially how these investments relate to support of agency mission.
- Enhance the efficiency and effectiveness of processes and technologies by rationalizing services delivered by multiple agencies to eliminate redundancies (e.g. consolidation of all security related matters under the new Department of Homeland Security in the US, consolidation of collection and management of multiple sources of revenues, etc.).
- Rationalize, eliminate and/or find alternate ways of performing functions more efficiently and effectively (e.g. use of shared services for common functions such as procurement, travel, etc.).

In order to meet these challenges, these agencies are implementing initiatives to:

- Improve efficiency, (increase productivity and reduce costs) by rationalizing processes, improving technology infrastructure and consolidating service delivery mechanisms.
- Develop a long-term roadmap (Enterprise Architecture) to address capability gaps.
- Develop a framework to guide investment strategies and selection of solutions.
- Meet legislative mandates in developing business cases for implementation as well as operation of new IT solutions (e.g. Office of Management and Budget (OMB) exhibit 300).
- Benchmark (and meet) agency cost and performance metrics to best-of-breed agencies or commercial enterprises.

Funding for agencies is often linked to agencies developing an Enterprise Architecture (to specified Government standards and guidelines) that provides a consistent and clear framework for process and technology improvements, a strategy and an implementation plan for investments and resulting improvements, and associated business cases demonstrating costs and benefits. Agile Enterprise Architecture (AEA) is one that enables agility. As determined by the recently conducted AT Kearney study on Agile Governments, the primary drivers of agility in governments that allow for the sustained creation of value to citizens and constituent groups are abilities to:

- Anticipate changing dynamics in the environment and being able to respond from a policy perspective;
- Adapt to those dynamics in terms of internal processes and systems; and
- Accelerate change in the enterprise faster than the rate of change in the environment.

It has been our experience that agencies often lack appropriately trained resources to develop robust Agile Enterprise Architectures, a fact that has significantly hampered efforts in this area.

This Point of View presents 7 lessons learned that can make a significant difference to an Enterprise Architecture effort – transforming the outcome to be one that truly becomes a blueprint for the future. These lessons can be utilized by agencies to either jump-start or assist in improving their EA initiatives.

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7 Strategic Lessons

Distilling our years of experience in successfully developing and implementing AEA for large government clients helped us identify 7 factors that spell the difference between success and failure. These lessons, captured here in the form of critical success factors, are universal and may be applied to all levels of governments and in every country.

The 7 CSF's are:

- Incorporating robust business foundations – the DNA for AEA;
- Ensuring that methodology and process underpinnings are robust;
- Developing a strategic EA metamodel, and incorporating framework flexibility;
- Implementing semantic and standards-based interoperability between tools/repositories;
- Embedding and instituting sustainable governance;
- Reengineering infrastructure from a strategic perspective; and
- Demonstrating commitment and engagement with EA and Standards Community.

CSF 1 -Incorporate robust business foundations – the DNA for AEA

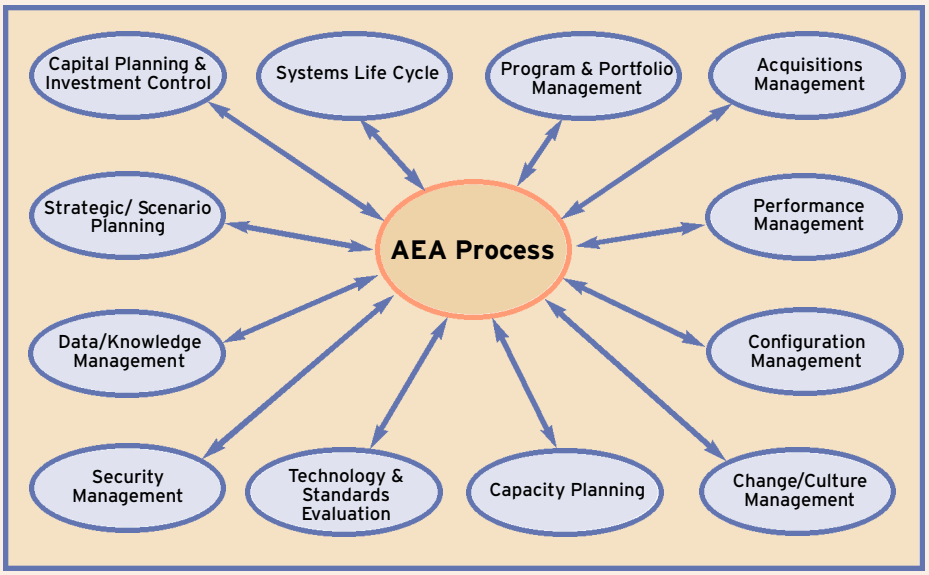
Identifying a business sponsor is paramount to AEA. This must be complemented with buy-in and sustained commitment from the entire business stakeholder community—a community that exemplifies cross-functionality. The business context for AEA must include customers – both internal and external—partners, and suppliers. It is imperative to link AEA to business strategy, strategic plan, strategic goals and objectives. Sound business-oriented principles to guide the evolution and implementation of AEA must be established. EA drivers must be clearly identified. Developing stakeholder scenarios or use cases are key to understanding the needs and providing actionable products to business people. That said, producing a Strategic Business Architecture inclusive of business drivers, business requirements, business models, business rules, BPM, and workflow strategies become foundational for AEA. This strategic business architecture must be tied to other domains: information, data, business-oriented services, application, infrastructure, security, and, privacy. Doing so will enable cost and risk management, facilitate process innovation, and lead to enterprise transformation — the ultimate objective of AEA.

Significant business benefits that result from incorporating robust business foundations are:

- An AEA that is aligned with the strategy and mission of the agency.
- Management of IT that has a clearly understood and articulated relationship to costs, business value, performance, and risk. These linkages provide enhanced capabilities to understand what is important to the business and also ensures that the dollars are spent in areas that enable organizational agility.
- Facilitates enterprise transformation and innovation.

CSF 2 - Ensure that methodology and process underpinnings are robust

AEA must be delivered in 90 day "time-boxed" iterations to: demonstrate quick value, synchronize with budget cycles, and sustain momentum. AEA process must include evergreening, benchmarking with "best in class", Independent Validation and Verification (IV&V), and validation with accepted EA maturity frameworks (e.g. US General Accounting Office-- GAO). As-is and to-be states must be compelling. Inter-domain traceability must be instituted to enable change impact analyses. Aside from providing multiple channels or touch points for AEA, it must be augmented with multiple entry points. As an example, entering AEA from any domain (e.g., business, information/data, services, security) and visualize the entire context, end-to-end. AEA strategy must embrace flexibility: balance, reconcile, and synchronize with inter-departmental and line-of-business (LOB) initiatives. Shared assets—processes, data, infrastructure, people, policies, facilities—must transcend functional and LOB boundaries, breaking organizational silos. AEA implementation must be driven through established systems life cycle processes. Training, communications, change management, metrics, and data management strategies must be institutionalized across the continuum spanning not just the Government agency, but also customers, partners, stakeholders, and suppliers. AEA process needs to be totally integrated within an agency's ecosystem if it is to achieve enterprise results and transformation. AEA process should interact and collaborate with 12 other enterprise-level processes as illustrated in the diagram below.



Significant business benefits are:

- Provides end-to-end visibility across the entire enterprise.
- Helps manage change, flexibility, and complexity in a holistic manner.
- Ensures repeatability and predictability.

CSF 3 - Develop a strategic EA metamodel and incorporate framework flexibility

Identification and selection of a strategic and enduring EA framework is critical to AEA. Such a framework and the work products emanating from that framework must provide cross-walks with other frequently-used frameworks such as Zachman, OMB's Federal Enterprise Architecture (FEA), and DoD's Architecture Framework in, preferably, an automated way. The metamodel must be driven by the requirements and scenarios as discussed in lesson 1 (CSF 1). The AEA metamodel must be synchronized through the entire AEA process to ensure evergreening. The AEA metamodel must be leveraged to define higher-level EA or even enterprise ontologies. The AEA strategy must embrace best-of-breed standards encompassing Information Engineering (IE), Unified Modeling Language, Business Process Modeling Notation (BPMN), Extensible Markup Language (XML), and Web Ontology Language (OWL).

Significant business benefits are:

- Produce a metamodel that is responsive to business needs.
- Provides a sound base for establishing communication with business stakeholders and partners—enhancing collaboration across departmental lines.

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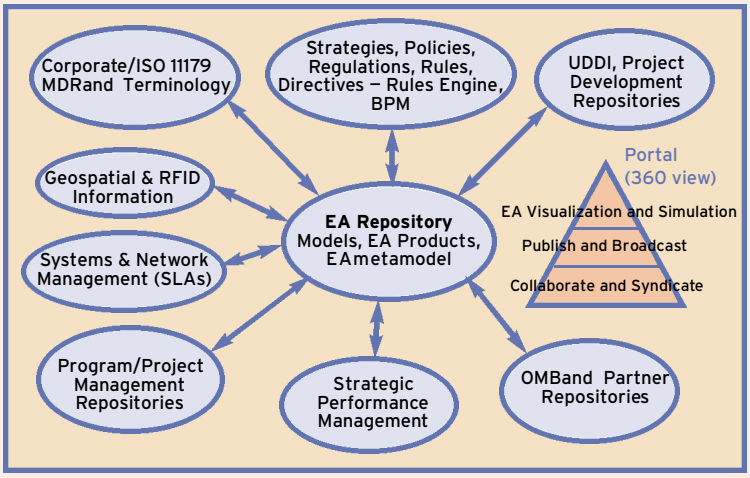
CSF 4 - Implement semantic and standards-based interoperability between tools/repositories

Semantic and standards-based integration and interoperability between repositories is strategic to agility to enable connecting the dots across the enterprise spectrum and produce a full 360-degree view. This is a challenge and a strategic opportunity for agile governments. This concept is illustrated in the following diagram.

It is recognized that governments -- big or small, irrespective of GDP—have federated and loosely coupled repositories that must interoperate. The overarching framework must be tool agnostic, and promote the exchange of products and metadata across lines of business, project teams, management levels, partners, and suppliers in a secure and seamless manner. XML and Extensible Markup Language for Interchange XMI must be leveraged for interchange, in addition to Object Management Group's Common Warehouse Metamodel (CWM). World Wide Web Consortium (W3C) Standards such as Web Document Authoring and Versioning (WebDAV) must be incorporated for collaborative authoring. Also, strategic interoperability must realize the full potential of service-oriented architecture and web services. As these repositories coexist with each other and realize enterprise synergies, semantic consistency throughout the life cycle and business ecosystem is critical.



Significant business benefits are:

- Helps achieve significant automation – by reducing cycle time and costs, and enhancing quality -- of work-products or artifacts that are architecturally significant, strategically-oriented, and programmatic in nature.
- Enables 360-degree views of the enterprise, its ecosystem, and the ability to conduct enterprise-level business simulations and forecasting.
- Enables governments to increase velocity of its response to changing business conditions.

CFS 5 - Embed and institute sustainable governance

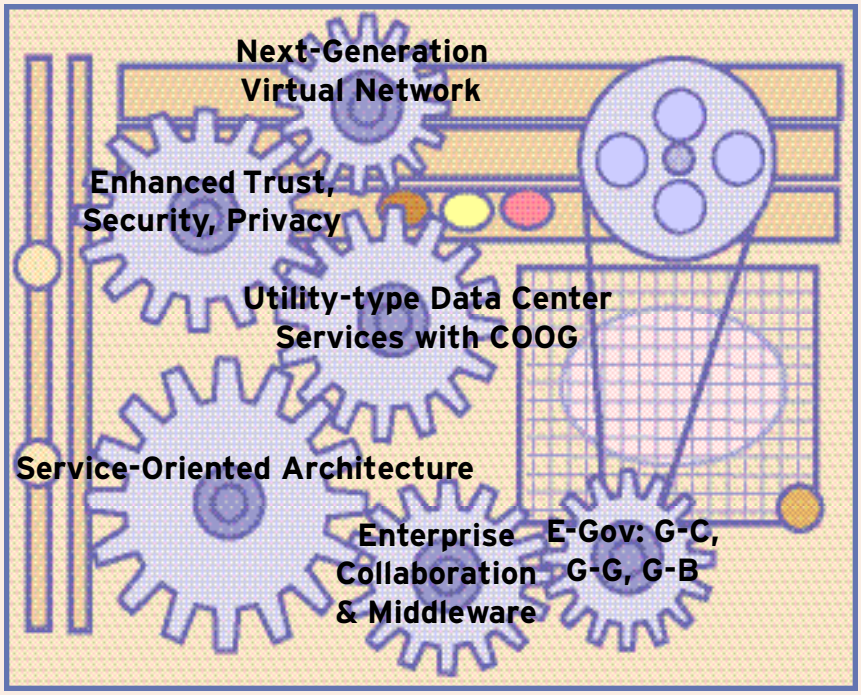
Governance is one of the cornerstones of AEA. Governance is embedded into the AEA process. An Enterprise Architecture Council (EAC) – responsible for AEA development and maintenance—must be established. The EAC must report to higher level executive leadership committees, and must sustain communication and collaboration with business strategy groups, business units, business process innovation teams, development, and operations unit within a Government agency. Additionally, the business, technical, and investment review boards must be established with well-understood charters and oversight controls. These groups must meet on a bi-weekly basis. Governance strategy must include diverse investment types—new investments, R&D, sustaining, enterprise licensing, e-gov, and transformational initiatives. The governance team must assess architectural alignment through the project continuum: concept phase through post-implementation. The CIO must formulate, ratify, and enforce policies in areas such as AEA development, maintenance, compliance, technology standards, product profiles, data management, data quality, procurements, privacy, and security. AEA sequence plan, enterprise/programmatic risks, and waivers must be managed. Service-level agreements must be established and enforced (or adhered to) with customers, partners, and suppliers. Metrics within the context of an IT Balanced Score Card must be implemented.

Significant business benefits of are:

- Enables robust investment management controls – recognize business value of investments.
- Establishes a performance, service, and quality-based culture.
- Helps manage programmatic risks.

CSF 6 - Reengineer infrastructure from a strategic perspective

A technical reference model and standards-profile must be established. The two must be enduring and tightly aligned. Linkages between business imperatives and infrastructure must be explicit. AEA must identify infrastructure vulnerabilities and implement countermeasures. Open Source strategies must be explored. As the infrastructure is reengineered from a service and utility orientation, it must be conceived as a system of six key interlocking gears: next generation virtual network encompassing wireless and wireline; enhanced trust, security, and privacy components; utility-type data center services with continuity of government (COOG); business driven service-oriented architecture; enterprise collaboration and middleware strategy; and e-gov infrastructure enabling business-government, government-government, and government-citizen transactions. This concept is illustrated in the following diagram.



Significantbusiness benefits are:

- Helps achieve business and infrastructure alignment both in the short as well as long term.
- Facilitates managing infrastructure costs, risks, and vulnerabilities.
- Achieves benefits of enterprise licensing and leveraging.

CSF 7 - Demonstrate commitment to and engagement with EA and Standards Communities

EA as a discipline is still morphing from being in a state of awareness to being mature with standard vocabularies, practices, etc. As a learning organization, agile governments must participate in and influence standard development organizations such as Health Level Seven (HL7), W3C, Object Management Group (OMG), American Society for Testing and Materials (ASTM), International Standards Organization (ISO), Carnegie Mellon's Software Engineering Institute, Internet Engineering Task Force (IETF), and Institute of Electrical and Electronics Engineers (IEEE) to name a few. Industry conferences, federal level user groups, communities of interest, and "birds of a feather" are other avenues to share experiences. Agile governments must implement interdepartmental tools and registries to enhance collaboration—and minimize duplication. As agile governments mature and learn, it must provide sufficient architectural vetting to strategic initiatives such as global public health monitoring, health care, law enforcement, and bio surveillance.

Significant business benefits are:

- Promotes better leveraging and sharing of best practices and standards.
- Ensures better interoperability across business and departmental lines.
- Leads to standardization of off-the shelf products.

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Drivers for Agile Enterprise Architecture

Numerous drivers propel the need to develop, implement, and sustain an agile enterprise architecture (AEA). Drivers – some of which are U.S. Government-centric – that provide the context for AEA are:

- President's Management Agenda that is characterized by the need to provide solutions that are citizen-centered, market-based, and performance-oriented;
- Legislative, General Accounting Office (GAO), and Office of Management and Budget (OMB) mandates, including:
  - Information Technology Management Reform Act (ITMRA)/Clinger-Cohen Act of 1996;
  - GAO's Framework for Assessing and Improving EA Management version 1.1;
  - OMB mandates to justify business value, enhance interoperability, and reduce duplicative investments: Circular A-130, Federal Enterprise Architecture Reference Models, and exhibit 300 investment process;
- E-Gov Act of 2002, Government Performance and Results Act of 1993, Chief Financial Officers Act, Federal Financial Management Information Act, Health Insurance Portability, and Accountability Act (HIPAA);
- Commitment from the US Federal Government to potentially invest $1 billion for EA.
- IT consolidation and commoditization—an industry-wide macro trend;
- Changing demographics characterized by aging population and workforce;
- Departmental consolidation—e.g., Homeland Security;
- Increased need to collaborate and interoperate across departmental boundaries in areas such as process collaboration (common process views), data and metadata sharing, sharing metrics, and information technology consolidation. Examples include Federal Health Architecture, Project Bio-shield, Veterans Affairs and Department of Defense Collaboration, and Seamless Homeland Security transcending federal, state, and local governments;
- Enhanced privacy and security – physical, organizational, and IT.

The EDS Advantage

EDS has accumulated sufficient body of Enterprise Architecture knowledge and experience supporting clients such as the US Veterans Administration, US Veterans Health Administration, Military Health, US Immigration and Naturalization Service, and US Army. Additionally, EDS' Government Enterprise Architecture Service (GEAS) offering provides the framework to help governments achieve and sustain robust enterprise architecture. The 7 CSFs, when applied in its totality alongside the GEAS methodology, will result in dramatic synergies moving an agency/department toward agility.

Additionally, we view that the AEA payback in areas such as public health, health care, national defense, homeland security, and law enforcement will be significant. These domains normally consume substantial portions of national GDP, embrace complexity and change, and engage in cross-border collaboration.

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