Virginia Information Technologies Agency

VITA

Commonwealth Enterprise Information Architecture (EIA) Strategy: 2014-2020

One Commonwealth, Well Informed

Virginia Information Technologies Agency

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Commonwealth of Virginia
Enterprise Information Architecture (EIA) Strategy: 2014-2020

One Commonwealth, Well Informed

Vision

The Commonwealth of Virginia will achieve the highest level of excellence in its enterprise approach to managing, securing, sharing, and using its information assets.

Mission

The Commonwealth of Virginia's Enterprise Information Architecture (EIA) approach promotes availability of consistent, secure, high quality, timely and accessible information to enable quality service to citizens of the Commonwealth.

Background, Purpose and Statutory Authority

In July 2012, the Secretary of Technology adopted into [Enterprise Architecture (EA) Policy 200-02](#) a more robust definition of enterprise information architecture (EIA) and an EIA Maturity Model designed to guide the Commonwealth toward its desired "future state" in four program areas: data governance, data standards, data asset management, and data sharing.

The Commonwealth EIA Strategy represents the next step toward a mature EIA approach and a formal statement of Virginia's vision for maximizing its information assets. The strategy has been developed to align with the Commonwealth Strategic Plan for Information Technology and respond to key business drivers.

The purpose of the Commonwealth EIA Strategy:

- Articulate a strategic vision for EIA aligned with business drivers and focused on achieving EIA outcomes

- Establish measurable EIA goals and objectives designed to track progress toward the desired EIA "future state"

- Serve as a roadmap for EIA to fully align solutions and technical infrastructure, data management, and business processes and objectives

- Provide a strategic EIA framework that will support development of agency-level implementation plans across the Commonwealth

The Commonwealth EIA Strategy has been developed and adopted pursuant to the statutory authority granted by the *Code of Virginia*, as referenced below:

Secretary of Technology
§ 2.2-225. Position established; agencies for which responsible; additional powers (As Amended)

Chief Information Officer (CIO) of the Commonwealth
§ 2.2-2007. Powers of the CIO (As Amended)

Virginia Information Technologies Agency
§ 2.2-2010. Additional powers of VITA (As Amended)

VITA staff drafted the strategy based on input from more than 120 data stewards and other stakeholders from across 25 executive branch agencies. A series of three stakeholder engagement sessions was facilitated by VITA staff from February through April 2013.

The following Commonwealth agencies participated in the planning, development and review process for this strategy:

Auditor of Public Accounts
Cardinal Team
Department of Aging and Rehabilitative Services
Department of Agriculture and Consumer Services
Department of Alcoholic Beverage Control
Department of Behavioral Health and Developmental Services
Department of Corrections
Department of Education
Department of General Services
Department of General Services,
    Division of Consolidated Laboratory Services
Department of Health
Department of Health Professions
Department of Housing and Community Development
Department of Juvenile Justice
Department of Medical Assistance Services
Department of Motor Vehicles
Department of Planning and Budget
Department of Social Services
Department of Transportation
Office of Comprehensive Services (Comprehensive Services Act)
State Board of Elections
Virginia Board for People with Disabilities
Virginia Community College System
Virginia Information Technologies Agency
Virginia State Police

Enterprise Architecture Framework and EIA Maturity Model

The Commonwealth's EIA Strategy resides within the broader Enterprise Architecture (EA) framework, as established in the Information Technology Resource Management (ITRM) Policies, Standards, and Guidelines. The EA framework is a strategic asset used to manage and align the Commonwealth's business processes and IT infrastructure and solutions with the state's IT strategy.

As shown in **Figure 1**, the EA framework represents a comprehensive model and repository which defines (from EA Policy 200-02):

- Models that specify the current ("as-is") and target ("to-be") architecture environments

- Information necessary to perform the Commonwealth's EA mission

- Solutions and technologies necessary to perform the EA mission

- Processes and work flow necessary for implementing new technologies in response to the Commonwealth's changing business needs.

Figure 1. Commonwealth's Enterprise Architecture Framework
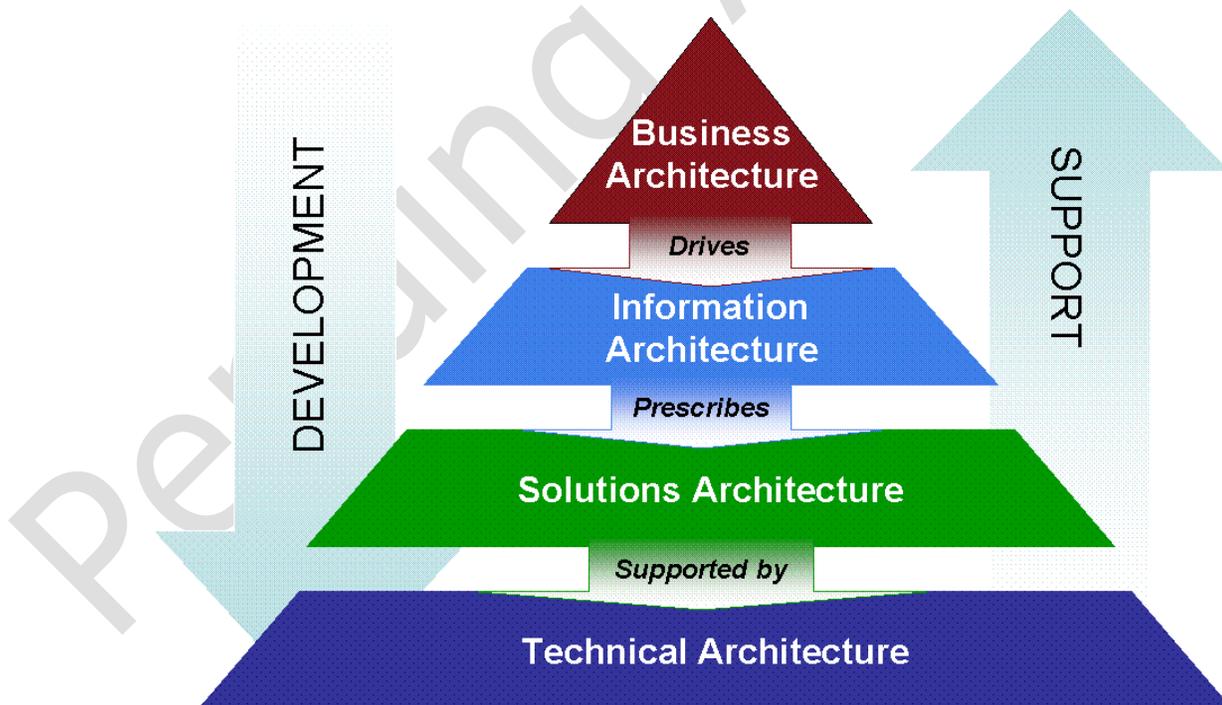
The EIA elements adopted into the EA framework promote the governance, management, and sharing of the Commonwealth's data assets. The EIA elements have been structured based on an EIA Maturity Model, shown in **Figure 2**. Maturity models describe the levels of evolutionary progress in systems change. Lower maturity levels represent the system's early stage of development; higher maturity levels serve as outcome targets for the desired "future state."

The EIA Maturity Model features three stages beginning with the Informal Level, through the Emerging Level and toward the desired Enterprise Level. Each stage has been described around the Commonwealth's EIA program areas – data governance, data standards, data asset management and data sharing – with benchmarks to track progress within each area.

The Informal Level of the EIA Maturity Model is characterized by an array of data silos with no meaningful governance or integration. The Emerging Level features the first steps toward a systematic, integrated approach to data management. Finally, the desired "future state" outcome at the Enterprise Level consists of a fully developed, Commonwealth-wide EIA.

EIA Scorecard

In August 2012, VITA implemented the EIA Scorecard – a survey instrument designed based on Gartner's IT Score for EA methodology – to assess the current state of EIA across executive branch agencies and identify strategies for moving the Commonwealth toward its desired future state in the EIA Maturity Model. For a full set of summary tables for the EIA Scorecard results, visit http://www.vita.virginia.gov/oversight/dm/default.aspx?id=6442470851

Highlights from the EIA Scorecard:

- Respondents covered a range of Commonwealth agencies, with a high degree of representation from across small, medium, and large size agencies

- More than 70 percent of respondents said they agreed or strongly agreed that their agency engaged in EIA activities

- Most respondents (50 percent or more) also said their agency was actively implementing or preparing to implement primary EIA deliverables

- A majority of respondents (60 percent) said their agency had internal governance-related activities but only limited engagement in Commonwealth-wide governance

- Just over half (56 percent) of the respondents said their agency maintained metadata for their enterprise information assets

- More than 80 percent of the respondents said their agency implemented data standards

- However, these tended to be internal standards (63 percent) rather than Commonwealth (20 percent) or external (11 percent) standards

- More than half (50-55 percent) gave favorable responses to the Commonwealth's EIA program on each of the key measures

- Commonwealth EIA received the highest rating (72 percent) on its publication of adopted standards in the Web-based standards repository

- A majority (84 percent) of the respondents said their agency actively exchanges data with other entities, of these agencies

  o 76 percent said the exchanges helped to maximize the value of their data assets

  o 90 percent viewed data sharing critical for achieving business objectives

  o 80 percent had integrated shared data into their performance/outcome measurement systems

Findings from the EIA Scorecard have been used to inform the articulation of an enterprise-level vision statement for the Commonwealth's EIA, to align the EIA Strategy with key business drivers and to establish measurable EIA goals and objectives. These elements have been covered in the remaining sections of this strategy document.

Figure 2. EIA Maturity Model (Adopted July 3, 2012)

	Level of Maturity	Characteristics and Performance Benchmarks
1	*Informal Level*	▪ *Data Governance – Data management functions reactive and distributed across agency data silos; very little governance, more of an "ownership" approach to data; poorly defined roles for data stewards; no meaningful data strategy; no valuation model for data inventory or data management functions.* ▪ *Data Standards – Low levels of standardization; data maintained in redundant silos with diverging semantics; minimal data integration or integrity.* ▪ *Data Asset Management – Very little, if any, metadata or data documentation in agency source systems.* ▪ *Data Sharing – High degree of agency resistance to data sharing; no business involvement in data management to drive trust or data-sharing agreements.*
2	*Emerging Level*	▪ *Data Governance – Data "ownership" begins to give way to clearer roles for data stewards; increased executive awareness of information assets; governance limited to ad hoc activities; no clearly defined data strategy at the enterprise level; some valuation and cost recognition of data.* ▪ *Data Standards – Standardization begins in specific domains but still lacking full semantic interoperability; first steps toward master data management; standards tend to be internal (agency) in nature.* ▪ *Data Asset Management – Documentation and metadata emerge as new systems come online; still no documentation for existing or legacy systems.* ▪ *Data Sharing – Contention remains against enterprise data-sharing, but point-to-point agreements emerge at the agency and program level.*
3	*Enterprise Level*	▪ *Data Governance – Governance driven by relationships among data stewards at the enterprise, agency and program level; central data governance organization with executive sponsorship; enterprise data strategy and well-defined Policies, Standards and Guidelines (PSGs); feedback loops in place to support continuous improvement; data governance staff, data stewards, and business leaders monitor and promote strategies to enhance the value chain of information architecture and assets.* ▪ *Data Standards – Semantic interoperability across domains based on adopted standards; emphasis away from internal standards and toward external standards maintained by national/international Standard Development Organizations; standards reinforce strategies for data quality and integrity; compliance monitoring and tracking; central standards repository.* ▪ *Data Asset Management – Enterprise data-asset management program; metadata taxonomy, subject areas, and information classes in central repository; data assets mapped to enterprise data standards.* ▪ *Data Sharing – Enterprise data-sharing built on a solid trust framework and legal agreements; security, privacy, consent and authorization addressed based on applicable law; Commonwealth interoperability with other states and national information exchanges.*

Business Drivers

The Commonwealth EIA Strategy has been designed in response to key business drivers impacting the state's information management activities. Business drivers represent the principal needs to be addressed by the EIA program. Current business drivers for the Commonwealth EIA Strategy have been outlined below and their alignment with EIA program areas shown in **Figure 3**.

Business Driver 1: Data Quality

The National Association of State Chief Information Officers (NASCIO) has referred to information as the "currency" of state government (NASCIO 2011, *Capitals in the Cloud*s). This means that each action taken by the state depends upon information, with the value of the action dependent upon the quality of the data. Data may be considered "high quality" if they present an accurate and reliable reflection of the "real world" entities they describe and provide a solid "fit for their intended uses in operations, decision making and planning." (J. M. Juran, quoted in Wikipedia, April 15, 2013). Accordingly, ensuring data quality continues to be a primary objective for the Commonwealth's information management initiatives.

Business Driver 2: Standardized Data and Shared Definitions

Government's business outcomes rarely fall into single domains. Commonwealth agencies must work across lines of business and share information with partners at multiple levels of governance to achieve outcomes. However, such information-sharing and business partnerships become hindered by disparate data definitions, specifications and terminology. At the organizational level, such partnerships also become impacted by cultural and institutional barriers, such as agency or system "silos." Without standardized data and shared data definitions and specifications, supported by collaboration between agencies and their business partners, the Commonwealth lacks the information sharing capacity needed for meeting performance outcomes.

Business Driver 3: Data Accessibility, Reuse, and Reduced Data Redundancy

Commonwealth agencies spend millions of dollars each year to collect, manage and utilize data on persons and other entities. Agencies frequently collect the same data from the same persons as other agencies, storing these data in agency or system-centric data "silos." Such data redundancy presents an unnecessary cost and negatively impacts the value of government's data assets.

Business Driver 4: Informed Decision Making and Public Service

The public and their governmental leaders expect accurate, timely and reliable data to make informed decisions. This requires transparency and engagement between agencies and their stakeholders. Demand for collaborative, informed decision making cuts across branches and levels of government, with the emphasis on getting the right information into the right hands at the right time for public service.

Figure 3. Business Drivers and EIA Program Alignment

	Business Driver	EIA Program Alignment
1	Data Quality	- Data Governance – Formal roles and responsibilities for Commonwealth data stewards/data owners; training and technical support focused on data quality enhancement. - Data Standards – Shared implementation of adopted data standards to increase data quality; shared terminology around highest quality data sources. - Data Asset Management – Focus on Commonwealth data as an enterprise asset, with objectives around enhancing the quality and value of the data resources. - Data Sharing – Information exchange across domains of government based on an enterprise trust framework with clear performance and service specifications.
2	Standardized Data and Shared Definitions	- Data Governance – Partnership with Commonwealth data stewards/data owners to implement adopted standards and address cultural/institutional barriers to information exchange. - Data Standards – Shared data elements, definitions, and specifications through data standardization. - Data Asset Management – Metadata documenting alignment of data assets with adopted standards. - Data Sharing – Enterprise information exchange supported by data exchange standards, shared data definitions and specifications.
3	Data Accessibility, Reuse, and Reduced Data Redundancy	- Data Governance – Engagement with data governance stakeholders to compile information on enterprise data systems. - Data Standards – Documented alignment between data assets, common data elements, and adopted standards. - Data Asset Management – Strategies to build metadata repository to support discovery and reuse of information assets. - Data Sharing – Enterprise reuse of data assets supported by a trust framework and compliance with applicable law for security, privacy and confidentiality; inventory of applicable legal, statutory, and regulatory constraints for information sharing.
4	Informed Decision Making and Public Service	- Data Governance – Established communication processes to align EIA program activities with business processes and objectives. - Data Standards – Consistency, integrity, and quality of data to support informed decision making. - Data Asset Management – Discovery of information sources available to decision-makers; support for agency or domain data warehousing and effective use of archived data. - Data Sharing – Information exchange across domains of government and with the public to support collaborative decision making and enhance public service.

EIA Goals and Objectives

The enterprise approach envisioned in the desired "future state" of the EIA Maturity Model and aligned with the key business drivers has been articulated into actionable, measurable EIA goals and objectives. These goals and objectives represent the required steps and milestones for achieving an enterprise, Commonwealth-wide approach to information management through the 2020 planning horizon.

VITA will work with agencies to track performance on the EIA Goals and Objectives on an annual basis. Detailed milestones, performance targets and deadlines will be established in the EIA program implementation plans.

Goal 1: Data Governance. Forge a disciplined approach to data governance across the Commonwealth with formal roles for data stewards and other stakeholders.

> Objective 1.1: Formally adopt an EIA governance framework with enterprise-level policies, standards, guidelines, and performance metrics.

> Objective 1.2: Establish clearly defined enterprise-level roles for data stewards and other EIA stakeholders across Commonwealth agencies.

> Objective 1.3: Provide training, technical assistance, and other resources to enhance the EIA knowledge, skills, and abilities Commonwealth data stewards, particularly those in small agencies.

> Objective 1.4: Support agency-level implementation planning and data governance activities.

Goal 2: Data Standards. Promote the use of standardized data and shared data definitions as a means of supporting business-driven information exchange across agency systems, government domains, and levels of governance.

> Objective 2.1: Continue to develop policies, standards, and guidelines to promote data standardization and the use of standardized data.

> Objective 2.2: Continue to develop and submit for adoption data standards for the seven business areas pursuant to Chapter 879 of the 2008 Appropriation Act ("the Act"), as amended. (Note: Remaining business areas cited in the Act requiring data standards include Receiving Information, Invoice Information, Purchase Information, and Agency Identification Information.)

> Objective 2.3: Refine and implement the governance and process model established for developing, identifying, accessing, adopting, and maintaining Commonwealth standards.

> Objective 2.4: Support agency-level implementation planning and agency use of Commonwealth standards.

Goal 3: Data Asset Management. Manage information as an enterprise asset, with an emphasis on quality, security, efficiency, accessibility, reduced redundancy, and a higher return on investment.

Objective 3.1: Complete an inventory of enterprise data assets across the Commonwealth and compile metadata on each enterprise asset.

Objective 3.2: Develop a taxonomy with information classes to structure the metadata from the enterprise data asset inventory.

Objective 3.3: Design, develop, and implement an enterprise metadata repository to support discovery and reuse of enterprise data assets.

Objective 3.4: Map metadata on agency systems to business, solutions, technology architecture, and adopted Commonwealth data standards.

Goal 4: Data Sharing. Leverage the sharing of information based on business need and in compliance with governing laws, statutes, and regulations to increase government performance, improve service to citizens and more effectively achieve business outcomes.

Objective 4.1: Secure an executive-level directive to Commonwealth agencies to establish a trust framework – a formal agreement among participants implemented through common policies and procedures – in support of business-driven, compliant data sharing.

Objective 4.2: Form a governance committee to develop, implement, and maintain an enterprise trust framework to support business-driven, compliant data sharing.

Objective 4.3: Identify applicable legal, regulatory, policy, and technical constraints impacting data sharing and orient the trust framework to address these requirements.

Objective 4.4: Develop policies, standards, guidelines, and procedures to govern the operations, onboarding, maintenance, breach resolution, and certification processes associated with the implementation of the trust framework.

Glossary of Key Terms

Data/Information assets – An enterprise's data and information resources viewed as having a measurable value and used to achieve business objectives.

Data management – Development and execution of architectures, policies, practices, and procedures for managing the full data lifecycle: define, obtain/create, store/maintain, use, share, archive, and destroy.

Data standards – Mutually accepted agreements governing the data elements, representations, formats, and definitions of common or shared data.

Data stewards – Agency staff responsible for managing or overseeing all or part of the data lifecycle.

Interoperability – Ability of diverse information systems to share or exchange data regardless of differences in applications or system platforms.

Metadata – A set of data that describes and gives information about other data.

Trust framework – A formal agreement and supporting policies and procedures executed among agencies or other organizational entities that enforces the requirements, specifications, and permitted purposes for the participants to exchange, view, access or otherwise share data.