

U.S. DEPARTMENT OF AGRICULTURE  
WASHINGTON, D.C. 20250

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	OPI: Office of the Chief Information Officer, Information Resource Management

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## 1. PURPOSE

This Departmental Regulation (DR) establishes the United States Department of Agriculture (USDA) policy and approach to Enterprise Architecture (EA) as outlined in the [E-Government Act of 2002](#), [The Common Approach to Federal Enterprise Architecture \(Common Approach\)](#), and various Office of Management and Budget (OMB) guidance documents.

## 2. SCOPE

This DR applies to all USDA agencies, staff offices, employees, appointees, contractors, and others who work for or on behalf of USDA and are responsible for performing EA activities.

### 3. SPECIAL INSTRUCTIONS/CANCELLATIONS

This DR supersedes [DR 3600-000](#), *USDA Information and Technology Transformation*, Section 8, "USDA's Enterprise Architecture," dated November 2, 2004. The remainder of DR 3600-000 remains intact as written.

### 4. BACKGROUND

The *Common Approach* provides guidance for a common methodology for the practice of EA throughout the Executive Branch of the U.S. Federal Government and promotes increased levels of mission effectiveness by standardizing the development and use of architectures within and between Federal Agencies and external stakeholders. EA supports planning and decision-making through documentation and information that provides a summarized view of an enterprise at various levels of scope and detail. EA also provides an integrated view of strategic, business, and technology domains across all lines of business, services, and systems, which is key to optimizing mission capabilities and resource utilization.

A documented and understood EA provides a framework for the organization to respond quickly to changes in its operating environment. It serves as a ready reference that enables the organization to assess the impact of the changes on each of the six EA components (business, data, infrastructure, technology, applications, and security), as well as ensuring the components continue to operate smoothly through the changes.

The Consolidated Reference Model found in the *Federal Enterprise Architecture Framework (FEAF v2)* is constructed of a collection of interrelated "reference models" designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across Federal Agencies. These reference models are described as: the Performance Reference Model (PRM), Business Reference Model (BRM), Application Reference Model (ARM), Data Reference Model (DRM), Infrastructure Reference Model (IRM), and Security Reference Model (SRM).

USDA is using a federated approach for EA development and utilization. A federated EA is a business-based framework for government-wide improvement developed by the OMB to facilitate efforts to transform the Federal Government to one that is citizen-centered, results-oriented, and market-based. A federated EA approach has been determined to be the best way to effectively describe the Department's EA activities and provide the necessary context and guidance for governing, managing, and accomplishing its various missions.

The USDA federated approach recognizes the need for autonomy but requires linkages and alignment of architectures from the (agencies/staff offices) level up to the (department/USDA) level. The USDA federated EA should be an internally-consistent, agency-supportive architecture as well as recognize the uniqueness and specific purpose of disparate architectures, and allows for their autonomy and local governance, while enabling

the enterprise to benefit from the combined content of these disparate architectures that span the enterprise.

## 5. POLICY

- a. All USDA agencies and staff offices shall adhere to the *FEAF v2* and *Common Approach* in all EA development, operations, and maintenance efforts, including the following activities: enhancing access to and delivery of government information and services to the public, , and other government entities; baselining, planning, developing, and implementing architectures (e.g., agency, staff office, program, segment, and/or solution); developing, implementing, and measuring improvements in government services, operations, processes and procedures.
- b. Agencies and staff offices shall create, use, and maintain the EA framework and reference models as described for EA and EA-related planning, development, and/or reporting activities. (e.g., portfolio reviews (as noted in Section 5e))
  - (1) The EA framework shall be used to guide both strategic and operational information resource management planning; and
  - (2) In addition to the *FEAF v2*, the Object Management Group (OMG) *Business Process Model and Notation (BPMN) v2.0* and/or *Unified Modeling Language (UML)* will be used for modeling of EA artifacts to maintain consistency throughout the enterprise, dependent on current modeling tools.
- c. Agencies and staff offices shall use the *FEAF v2*, *BPMN v2.0*, and/or *UML* models in the identification and documentation of the following information:
  - (1) Linkages between Department, agency and staff office mission needs, goals, objectives, and information technology (IT) capabilities, to include the logical dependencies and relationships among business activities;
  - (2) Business processes which identify the work performed to support its mission, vision, and performance goals;
  - (3) Applications that capture, collect, manage, transform, protect, or support business data, information, and/or processes;
  - (4) Data descriptions and relationships which identify how data is created, maintained, accessed, and used. At a high level, agencies and staff offices must define the data which utilizes standard metadata schema and describe the relationships among data elements used in the agency's or staff office's information systems;

- (5) Infrastructure, which describes and identifies the functional characteristics, capabilities, and interconnections of the hardware, software, and telecommunications;
- (6) Change agents, such as laws, regulations, mandates, guidance, administrative initiatives, or new technologies that will drive changes in the EA;
- (7) Information flows and relationships that identify business processes and associated information exchanges. By indicating where information is needed, when it is shared, and how it supports mission functions, these information flows provide the necessary context for analyzing process efficiencies;
- (8) Standards profiles, as defined in [DR 3180-001](#), *Information Technology Standards*. Agencies and staff offices shall adopt standards necessary to support their entire EA and enforce the standards consistently throughout the agency or staff office.

Adoption of standards facilitates the uniform application of engineering and/or technical criteria, methods, processes, and practices when evaluating and procuring new technologies; ensures new technologies align with USDA EA business goals and processes; and meets requirements to improve consistency, accuracy, and timeliness of information shared across the USDA enterprise;

- (9) Security architecture which covers such services as identification, authentication, and non-repudiation; audit trail creation and analysis; access and privacy controls; cryptography management; virus protection; fraud prevention; detection and mitigation; intrusion prevention and detection; and supporting confidentiality, integrity, and availability to a degree acceptable for the Authorizing Official (AO);
  - (10) Reduction or elimination of duplicative IT, increase shared services, close performance gaps, and promote engagement among the Government, industry, and citizens; and
  - (11) Current performance assessments, opportunities for performance improvement, and translation of opportunities into specific actions.
- d. Agencies and staff offices shall assess the architecture for completeness and accuracy in context to supporting specific decisions and addressing the mission, information, service, and technology areas aligned to the EA Framework and reference models.
  - e. Full program portfolio reviews shall be conducted for completeness in accordance with: [DR 3130-010](#), *USDA Enterprise Information Technology Governance* and [DR 3130-009](#), *Non-Major Information Technology (IT) Investments*.
  - f. At a minimum, the following artifacts as described in the *Common Approach* shall be provided as part of the portfolio reviews:

- (1) A-1 – Application Interface Diagram;
  - (2) A-3 – Application Interface Matrix;
  - (3) B-1 – Business Process Diagram;
  - (4) D-1 – Logical Data Model; and
  - (5) I-3 - Technical Standards Profile
- g. Agencies and staff offices shall:
- (1) Assess the architecture for its accessibility to decision-makers and their support staff, and identify gaps and redundancies across the enterprise to inform investment decisions;
  - (2) Assess the architecture for technical feasibility, business/mission capability, and financial feasibility;
  - (3) Assess the architecture for consistency between the business/mission, information, service, and technology areas and their connections;
  - (4) Assess the architecture for its ability to accommodate alternatives based on changes in the environment;
  - (5) Assess the architecture to ensure that solution requirements for interoperability are appropriately represented and that standard interfaces (internal and external) utilize standardized vocabularies to include ontology and semantic standards as established by the National Agricultural Library NAL and cross-agency working groups;
  - (6) Assess the architecture for human factors, including hardware, software, and human systems (computer and machine) integration and interactions;
  - (7) Assess the architecture against certification criteria as established by the *FEAF v2* and *Common Approach*;
  - (8) Assess the architecture from a technical and overall design perspective to understand whether the right technical approaches are being applied for the given solution requirements and whether the collection of technologies will work together seamlessly;
  - (9) Comply with appropriate laws, regulations, and policies and their associated review, inspection, and audit requirements based on the stated purpose and scope of the architectures; and

- (10) Include the USDA Office of the Chief Information Officer (OCIO) management stakeholders, USDA Office of General Counsel (OGC) where regulatory and statutory analysis is the principle component of the deliverable, agency and staff office Chief Information Officers (CIOs), and USDA Enterprise Architects on the Enterprise Architecture Board.
- h. The USDA CIO and agency/staff office CIOs shall certify for architectures that have interdependencies with other architectures, in accordance with DR 3130-010, and DR 3130-009. Architecture certification is intended to streamline the architecture development process over time by reducing rework and lowering costs of integration and interoperation.
- i. At a minimum, the following information is required in an architecture certification submission:
  - (1) The architecture has been developed to ensure the architecture information is authoritative, discoverable, and useable;
  - (2) The architecture has been approved by internal and external stakeholders based on *FEAF v2* guidelines and approval has followed a documented process as described in the *Common Approach*;
  - (3) The architecture contains valid data/information;
  - (4) The architecture has been assessed for how it supports the defined consumers (purpose) and decisions it will be informing;
  - (5) The architecture has related or aligned subordinate and parent architectures via the mapping of common architecture information and architecture artifacts are visible and accessible to analysts, planners, and decision makers at all levels; and
  - (6) The architecture has addressed compliance requirements based on the stated purpose and scope.

## 6. ROLES AND RESPONSIBILITIES

- a. The USDA CIO shall:
  - (1) Develop and publish policies, regulations, and compliance requirements for the USDA IT environment and provide channels for agency and staff office input to those policies, regulations, and compliance requirements;
  - (2) Ensure that the Enterprise Architecture program complies with applicable laws, OMB, OGC and USDA policies and procedures, and has an effective governance process;

- (3) Issue procedures/instructions concerning the ongoing development, maintenance, and maturity of the USDA EA in accordance with OMB and Government Accountability Office directives, instructions, policies, and memoranda of EA;
  - (4) Ensure that EA practices, principles, and information are incorporated into IT governance, portfolio management, capital planning, investment management, and other processes related to the planning, acquisition, and maintenance of IT;
  - (5) Establish annual performance goals for each agency and staff office EA as well as the overall USDA EA, measure the performance of each of the agency's and staff office's EA program and overall USDA EA, and provide guidance on methods for continuous improvement;
  - (6) Be the neutral arbiter, master planner of innovation, and co-lead on compliance; and
  - (7) Provide management and oversight activities related to EA in the areas of business, performance, application, data, infrastructure, and security configurations, to include:
    - (a) Reviewing and monitoring compliance with established policy requirements; and
    - (b) Reporting compliance and deviations from the *FEAF* v2 to OMB.
- b. The USDA Associate Chief Information Officer (ACIO), Information Resource Management shall:
- (1) Assist the USDA-OCIO-EAD with Department-level planning and development activities;
  - (2) Review and approve EA policy waiver requests in consultation with the USDA CIO;
  - (3) Develop an investment and technology driven strategy for accomplishing USDA's IT strategic goals and objectives; and
  - (4) Publicize and promote the strategic use and value of EA throughout the USDA.
- c. The USDA Chief Enterprise Architect (CEA) shall:
- (1) Lead, manage, and oversee the development and maintenance of the Department's EA documentation including the current "as is" architecture, target "to be" architecture, and the enterprise roadmap;

- (2) Collaborate with stakeholders across the USDA enterprise to identify strategic improvement opportunities, define target architectures, establish EA transition plans, and monitor the implementation of EA transition plans;
  - (3) Promote the practice of EA by establishing and delivering USDA-wide training programs on EA;
  - (4) Work with executives, managers, staff, and enterprise architects to identify requirements and solutions for all IT-related architectural domains;
  - (5) Maintain the Departmental EA repository for centralized collection of all USDA IT EA data in order to facilitate management and oversight activities related to business, performance, application, data, infrastructure, and security configurations;
  - (6) Identify and select frameworks, models, methodologies, techniques, and standards (as noted in Section 5c) for EA projects;
  - (7) Conduct the initial review of submitted EA policy waiver requests and provide to the ACIO, Information Resource Management a recommendation to accept or reject the request;
  - (8) Ensure agency and staff office EAs align with the Department's goals and objectives, as identified in the [\*USDA Strategic Plan FY2014-2018\*](#) and [\*USDA Information Technology Strategic Plan 2014-2018\*](#); and
  - (9) Publish and update annually the Department's EA standards, architecture principals, and roadmap to assist with and promote business transformation and IT modernization plans Department-wide.
- d. Agency and Staff Office CIOs shall:
- (1) Develop internal policies, procedures, and controls in support of this DR;
  - (2) Serve as the liaison between internal stakeholders and the USDA OCIO;
  - (3) Submit EA policy waiver requests to the USDA Chief Enterprise Architect (CEA);
  - (4) Incorporate EA policies, requirements, and standards into agency and staff office IT governance and Capital Planning and Investment Control (CPIC) processes; and
  - (5) Implement and maintain business, performance, application, data, infrastructure and security configuration settings/controls by:
    - (a) Providing the CEA an overview of the entire agency or staff office with consistent, decomposable views of all sub-agencies, offices, business units,

programs, systems, networks, and mission or support services on an annual basis, to coincide with Portfolio Reviews;

- (b) Facilitating collaboration between USDA leadership and agency and staff office stakeholders in the definition, validation, and prioritization of EA goals and objectives;
- (c) Working with USDA leadership and agency and staff office stakeholders to establish target performance metrics for EA maturity;
- (d) Supporting USDA leadership in identifying and initiating appropriate IT EA governance at the agency and staff office level that complies with USDA governance policies;
- (e) Leveraging industry best practices and lessons learned in the development of solutions to address mission needs; and
- (f) Providing the required artifacts identified in the *FEAF v2* and the *Common Approach* utilizing BPMN and/or UML modeling language to the OCIO ACIO, Information Resource Management.

e. Agency and Staff Office Enterprise Architects shall:

- (1) Document, analyze, develop, and maintain the EA, IT modernization and transition plans, and associated artifacts;
- (2) Enable evidence-based architecture decision by providing to decision-makers actionable data for each EA domain;
- (3) Ensure enterprise architects and decision makers share a consistent understanding of the unique requirements for each EA subject area;
- (4) Develop and maintain architecture for area of responsibility;
- (5) Define and follow a documented change management process as defined by the agency or staff office CIO;
- (6) Evaluate commercial products related to architecture and document product suitability;
- (7) Develop technical forecasts related to architecture;
- (8) Initiate and submit EA policy waiver requests to the agency or staff office CIO;
- (9) Stay current on trends, developments, and innovations pertaining to EA-related tools, methods, and frameworks in the public and private sectors; and

- (10) Identify, document, assess, and develop a standard profile related to their organization's architecture and shall comply with the standards proscribed by the USDA-OCIO-EAD.

## 7. COMPLIANCE

- a. All USDA agencies and staff offices shall be in compliance with this DR by providing required artifacts identified during applicable IT Governance gate reviews.
- b. Agencies and staff offices are required to submit EA artifacts as noted in Section 5f and/or brief USDA leadership on EA at various stage gate reviews portfolio reviews, etc. Failure to do so could result in a decision to freeze or terminate a project and/or program. Agencies and staff offices that are not able to create the required artifacts shall submit waiver requests as noted in Section 8 of this DR.

## 8. POLICY EXCEPTIONS

All USDA agencies and staff offices are required to conform to this policy; however, in the event that a specific policy requirement cannot be met as explicitly stated, agencies and staff offices may submit a waiver request. The waiver request shall explain the justification for the request, identify compensating controls/actions that meet the intent of the policy, and identify how the compensating controls/actions provide a similar or greater level of defense or compliance than the policy requirement. Agencies and staff offices shall address all policy waiver request memorandums to the OCIO ACIO, Information Resource Management and submit the request for review and decision via email to [enterprise.architecture@ocio.usda.gov](mailto:enterprise.architecture@ocio.usda.gov)

Unless otherwise specified, agencies and staff offices shall review and renew approved policy waivers every fiscal year. Approved waivers shall be tracked as a Plan of Action and Milestones (POA&M) item if remediation is needed. The USDA ACIO, Information Resource Management, shall review and approve all waivers to this policy in consultation with the USDA CIO.

The written exception shall be in the form of a decision memorandum and shall include:

- a. Indication of Request for Exception;
- b. Name of submitting agency or staff office;
- c. Name, title, signature, and date of the submitting agency or staff office CIO;
- d. Corrective action plan to include cost benefit analysis; and

- e. Information technology description (hardware/software exception):
  - (1) Justification to show good cause for the exception. The waiver request should document the justifications for the exception; and
  - (2) The impact of granting versus not granting the waiver request.

## 9. INQUIRIES

All inquiries in regards to this DR shall be directed to the USDA OCIO Information Resource Management/EAD at [enterprise.architecture@ocio.usda.gov](mailto:enterprise.architecture@ocio.usda.gov)

-END-

## APPENDIX A

### AUTHORITIES AND REFERENCES

[The Clinger-Cohen Act of 1996](#), 40 U.S.C. §1401, et seq. (1996)

[E-Government Act of 2002](#), 44 U.S.C. §3501 (2002)

*Government Paperwork Elimination Act* ([GPEA](#)), 44 U.S.C. §3504, et seq. (2000)

[National Technology Transfer and Advancement Act of 1995](#), 15 U.S.C. §3701 et seq. (1996), March 7, 1996

OMB, [Circular A-11](#), *Preparation, Submission, and Execution of the Budget*, July 2013

OMB, [Circular A-130](#), *Management of Federal Information Resources*, November 28, 2000, Revised

OMB, [The Common Approach to Federal Enterprise Architecture](#), May 2, 2012

OMB, [Digital Government: Building a 21st Century Platform to Better Serve The American People](#), May 23, 2012

OMB, *Federal Enterprise Architecture Framework Version 2* ([FEAF v2](#)), January 29, 2013

OMB, [Federal Information Technology Shared Services Strategy](#), May 2, 2012

OMB, Memorandum [M-00-10](#), *OMB Procedures and Guidance on Implementing the Government*, April 25, 2000

OMB, Memorandum [M-11-29](#), *Chief Information Officer Authorities*, August 8, 2011

OMB, Memorandum [M-12-10](#), *Implementing PortfolioStat*, March 30, 2012

OMB Memorandum [M-15-14](#), *Management and Oversight of Federal Information Technology*, June 10, 2015

OMB, Memorandum for Chief Information Officers of Executive Departments and Agencies, [Transition to IPv6](#), September 28, 2010

OMG, *Business Process Model and Notation* ([BPMN](#)), Version 2.0, January 2011

OMG, *Unified Modeling Language* ([UML](#))

USDA, [DR 3130-009](#), *Non-Major Information Technology (IT) Investments*, November 18, 2015

USDA, [DR 3130-010](#), *USDA Enterprise Information Technology Governance*, December 3, 2015

USDA, [DR 3180-001](#), *Information Technology Standards*, May 12, 2015

USDA, [DR 3600-000](#), *USDA Information and Technology Transformation*, November 2, 2004

USDA, [USDA Information Technology Strategic Plan 2014-2018](#), April 1, 2014

USDA, [USDA Strategic Plan FY2014-2018](#), 2014

## APPENDIX B

### ACRONYMS AND ABBREVIATIONS

ACIO	Associate Chief Information Officer
AO	Authorizing Official
ARM	Application Reference Model
BPMN	Business Process Model and Notation
BRM	Business Reference Model
CEA	Chief Enterprise Architect
CIO	Chief Information Officer
CPIC	Capital Planning and Investment Control
DR	Departmental Regulation
DRM	Data Reference Model
EA	Enterprise Architecture
EAD	Enterprise Architecture Division
FEAF	Federal Enterprise Architecture Framework
GPEA	Government Paperwork Elimination Act
IPv6	Internet Protocol version 6
IRM	Infrastructure Reference Model
IT	Information Technology
NAL	National Agricultural Library
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
OMG	Object Management Group
POA&M	Plan of Action and Milestones
PRM	Performance Reference Model
SRM	Security Reference Model
UML	Unified Modeling Language
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture

## APPENDIX C

### DEFINITIONS

Application Reference Model (ARM): Categorizes the system- and application-related standards and technologies that support the delivery of service capabilities, allowing agencies to share and reuse common solutions and benefit from economies of scale. (Source: FEAF V2)

Business Reference Model (BRM): Describes an organization through taxonomy of common mission and support service areas instead of through a stove-piped organizational view, thereby promoting intra- and inter-agency collaboration. (Source: FEAF V2)

Data Reference Model (DRM): Facilitates discovery of existing data holdings residing in “silos” and enables understanding the meaning of the data, how to access it, and how to leverage it to support performance results. (Source: FEAF V2)

Enterprise Architecture (EA): A strategic information asset base which defines the mission, the information necessary to perform the mission, the technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to changing mission needs. The EA includes baseline architecture, target architecture, and a sequencing plan. It is a framework for streamlining business processes, information flows, applications, and infrastructure to support agency and interagency goals. (Source: Circular A-130)

An EA is the explicit description and documentation of the current and desired relationships among business and management processes and IT. It describes the "current architecture" and "target architecture" to include the rules and standards and systems life cycle information to optimize and maintain the environment which the agency or staff office wishes to create and maintain by managing its IT portfolio. The EA must also provide a strategy that will enable the agency or staff office to support its current state and also act as the roadmap for transition to its target environment. These transition processes will include an agency's or staff office's CPIC processes, agency and staff office EA planning processes, and agency and staff office systems life cycle methodologies. The EA will define principles and goals and set direction on such issues as the promotion of interoperability, open systems, public access, and compliance with the *Government Paperwork Elimination Act (GPEA)*, 44 U.S.C. §3504, end user satisfaction, and IT security. The agency or staff office must support the EA with a complete inventory of agency and staff office information resources, including personnel, equipment, and funds devoted to information resources management and IT, at an appropriate level of detail.

Federated Architecture: Federated architectures define common or shared architecture standards across autonomous program areas, enabling state government entities to maintain diversity and uniqueness, while providing interoperability. (Source: FEAF V2)

Federal Enterprise Architecture: A business-based framework for Government-wide improvement developed by the OMB to facilitate efforts to transform the Federal Government to one that is citizen-centered, results-oriented, and market-based. The Federal EA is constructed through a collection of interrelated "reference models" designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across Federal Agencies. These models are defined as: Performance Reference Model (PRM), Business Reference Model (BRM), Application Reference Model (ARM), Infrastructure Reference Model (IRM), Data Reference Model (DRM), and Security Reference Model (SRM). (Source: Common Approach)

Infrastructure Reference Model (IRM): Categorizes the network/cloud related standards and technologies to support and enable the delivery of voice, data, video, and mobile service components and capabilities. (Source: FEAF V2)

Ontology: A set of concepts and categories in a subject area or domain that shows their properties and the relations between them (Source: Oxford Dictionaries)

Performance Reference Model (PRM): Links agency strategy, internal business components, and investments, providing a means to measure the impact of those investments on strategic outcomes. (Source: FEAF V2)

Portfolio Review Artifact A-1: Application Interface Diagram: The identification of application resource flows and their composition. (Source: Common Approach)

Portfolio Review Artifact A-3: Application Interface Matrix: The interface relationship between systems. (Source: Common Approach)

Portfolio Review Artifact B-1: Business Process Diagram: Presents the hierarchical structure of organizational activities and activities performed by organizational performers to consume and produce resources. (Source: Common Approach)

Portfolio Review Artifact D-1: Logical Data Model: Presents data requirements that verify the information concepts identified by corresponding conceptual information models. (Source: Common Approach)

Portfolio Review Artifact I-3: Technical Standards Profile: Collects the various systems standards rules that implement and sometimes constrain the choices that can be made in the design and implementation of architecture. (Source: Common Approach)

Security Reference Model (SRM): Provides a common language and methodology for discussing security and privacy in the context of federal agencies' business and performance goals. (Source: FEAF V2)