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Fusion Center Technology Resources Road Map

Elements of an Enterprise Architecture for State and Major Urban Area Fusion Centers

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About Global

The U.S. Department of Justice's Global Justice Information Sharing Initiative (Global) serves as a Federal Advisory Committee to the U.S. Attorney General on critical justice information sharing initiatives. Global promotes standards-based electronic information exchange to provide justice and public safety communities with timely, accurate, complete, and accessible information in a secure and trusted environment. Global is administered by the U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance.

This project was supported by Grant No. 2007-NC-BX-K001 awarded by the Bureau of Justice Assistance, in collaboration with the U.S. Department of Justice's Global Justice Information Sharing Initiative and the U.S. Department of Homeland Security. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime. Points of view or opinions in this document are those of the author and do not represent the official position or policies of the U.S. Department of Justice or the U.S. Department of Homeland Security.

Introduction

General Overview

The function of a fusion center is to provide a collection, analysis, and dissemination point for classified and unclassified data relevant to terrorism and potentially other crimes and "all-hazards" intelligence approaches. In this regard, technology plays an important role in advancing the ability to share this information among a variety of partners across the public and private sectors.

At the end of 2008, there were more than 70 state and major urban area fusion centers in various stages of implementation in the United States. Many of these centers are still in the early stages of technology implementation. The U.S. Department of Justice, the U.S. Department of Homeland Security (DHS), and the Office of the Program Manager for the Information Sharing Environment (PM-ISE) provide technical assistance related to a variety of business needs, including governance and organizational structure, concept of operations development, privacy policy and civil liberties protection implementation, and administration and management. Additionally, training on state and local anti-terrorism methods, criminal intelligence, 28 CFR Part 23 compliance, and information sharing utilizing the National Information Exchange Model (NIEM) are available to fusion centers.

The value of technology linked to business processes and performance is quickly apparent when one focuses on the challenges and hurdles to information sharing and the broader concepts of information management. From defining the common data standards to facilitate common understanding and interpretation of information to protecting privacy rights through electronic management and enforcement of access controls and retention policies, adequate technology planning and utilization can be a critical enabler to sharing information responsibly and fostering safer communities. Fusion centers that are able to adopt and benefit from emerging technologies and standards to meet their business objectives will be better-prepared to handle the challenges today and in the future.

Purpose

The purpose of this document is to provide fusion center leaders—in particular, senior technology managers[1]—with guidance on how information, technology infrastructure, applications, performance metrics, and business processes align with the core business capabilities of a fusion center. Leaders can use this document to assist in formulating a strategic technology vision and plan for their centers and to support sound investment and technology selection decisions within such a plan.

The document accomplishes this purpose largely by referencing existing guidelines and recommendations published by the Global Justice Information Sharing Initiative (Global), the Bureau of Justice Assistance (BJA), DHS, and PM-ISE. The intent is to link the existing work into a cohesive, more usable framework for fusion center decision making.

Approach

As fusion center operations continue to mature, the adoption of a proven methodology for the selection, acquisition, and implementation of technology solutions is highly recommended. It is imperative that a fusion center's technology strategy and plan recognize the principle that technology supports business operations and not vice versa. It is important that a clear understanding of the fusion business needs and business priorities be established before a supporting technology strategy is developed and implemented.

This document leverages best practices of enterprise architecture, business process, information flow, and exchange identification to tie together existing fusion center planning and guidance documents.

Since its introduction in the 1990s, enterprise architecture has become a mainstream approach to technology planning in the public sector. Various approaches have evolved to support the development of enterprise architectures in the public and private sectors, including (but not limited to):

- The Federal Enterprise Architecture Reference Models
- The National Association of State Chief Information Officers' *Enterprise Architecture Development Tool-Kit*
- The Open Group Architecture Framework

Regardless of the framework used, enterprise architecture aims to address three common concerns of a technology manager:[2]

- Technology Planning and Alignment
- Technology Innovation
- Technology Standards

The *Planning and Alignment* function of enterprise architecture establishes a future vision for the technology portfolio (applications, infrastructure, information exchanges, etc.) that aligns with business strategy and ensures that technology investment decisions move the organization ever closer to achieving this vision. The *Innovation* function of enterprise architecture provides a mechanism for research and development into new technologies that could increase the organization's efficiency or enable new business capabilities. The *Technology Standards* function of enterprise architecture reduces unnecessary (and potentially wasteful) variation in the technology portfolio by establishing and enforcing best practices. Each of these functions is a necessary component in effective governance of a fusion center's technology portfolio.

1 In this document, the term "technology manager" refers to a staff member employed by (or detailed to) a fusion center with the overall responsibility for planning, implementing, and maintaining technology to support the fusion center's mission. Generally, the technology manager is the individual with approval authority for technology purchases, management authority over information technology staff, and final decision-making authority over technology selection. The individual's title may be technology director, chief information officer, or related titles.

2 Nick Malik, Microsoft's Chief Architect, has an excellent discussion of these three viewpoints in a blog entry at http://blogs.msdn.com /nickmalik/archive/2008/06/11/one-ea-team-three-ea-functions.aspx.

At its core, enterprise architecture is a decision-making framework or toolkit that the technology manager uses to make decisions more efficiently, more consistently, and better aligned with business objectives. For example, a fusion center technology manager would look to an enterprise architecture when making the following decisions:

- What information exchanges will best support a given business objective or capability?
- What application(s) will fusion center staff use to accomplish a given task?
- What infrastructure (networks, devices, physical plant, etc.) is necessary to support the envisioned application and information exchange portfolio?
- What technology investments should a technology manager plan for in next year's budget or grant cycle in order to meet the business objectives established by the center leadership?
- What technology standards should the fusion center follow in order to best ensure interoperability with other fusion centers, federal partners, and local law enforcement?

Enterprise architecture frameworks generally address these concerns by organizing the description of the technology portfolio and standards (both current or "as-is" and future or "to-be") in a set of separate subarchitectures along these lines:

- **Business architecture (external):** Identifies the capabilities, products, services, and value the organization supplies to the "market" (that is, to its external stakeholders or customers); often, this information is represented in a strategic plan that articulates the organization's mission, vision, and strategic goals.
- **Business architecture (internal):** Identifies business processes, roles/responsibilities, agreements, and policies necessary to support the organization's mission, vision, and strategic goals.
- **Information architecture:** Establishes the meaning, location, and ownership of data stored and managed within the organization in support of its mission, vision, and strategic goals and identifies the semantics and structure of information exchanges that the organization performs with external partners.
- **Technology architecture:** Identifies the technology infrastructure necessary to support the organization's mission, vision, and strategic goals; infrastructure generally includes networks, devices (server computers, workstation computers, mobile devices, etc.), storage, physical plant (floor space, climate control, power, etc.), provision for business continuity (backup power, disaster recovery, fire suppression, etc.), and provision for physical security (access control, intrusion detection, etc.).
- **Solutions architecture:** Applications and automated workflows that support the organization's mission, vision, and strategic goals and are scoped to describe the particular functions or processes that will be implemented, identify methods for achieving operational outcomes, and define specific information technology assets, applications, and components for procurement and implementation.

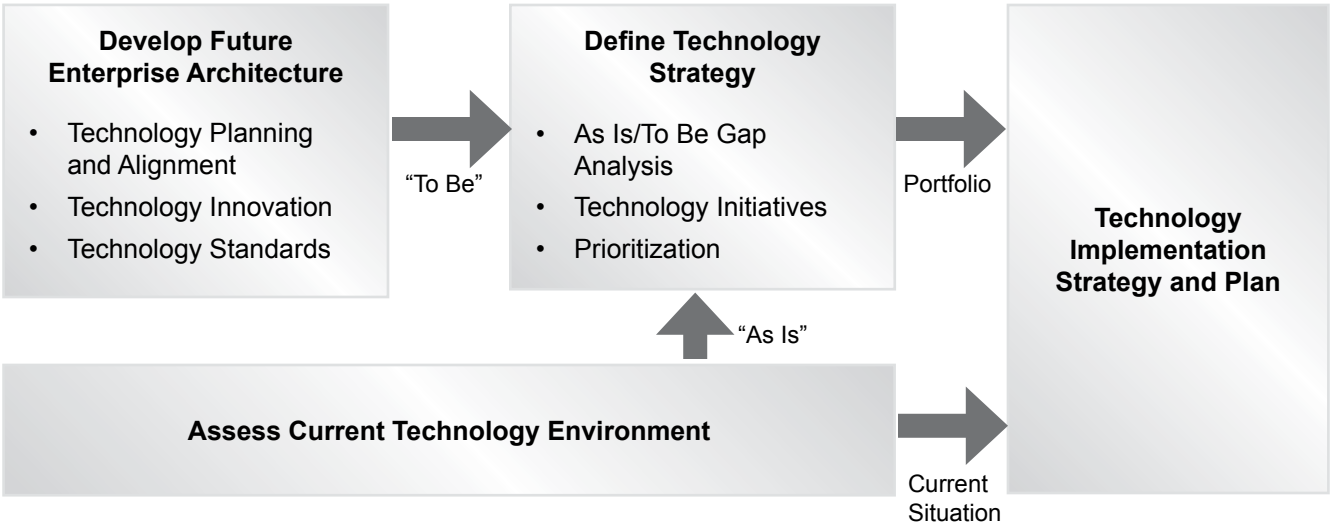
As the external business architecture represents the external world view of the organization—that is, its reason for existence—the other elements should all align or "map" to the external business architecture. The others also have many important interrelationships. Enterprise architecture tools assist in modeling these interrelationships and allow an architect to query an architecture instance for "what-if" scenarios or dependency analyses. These analyses allow the organization to use the architecture in making decisions such as the examples listed above.

The Concept of Segment Architectures

Segment architectures are logically arranged documents that lay the foundation for building executable operational solutions (or systems) that meet or exceed mission performance goals for a particular line of business and are derived from a concept of operations. Segment architectures achieve this by documenting the set of business and information requirements, outcomes, and constraints—scoped to a line of business such as information sharing. The ISE architecture program is leveraging guides such as the *Federal Segment Architecture Methodology* to develop various segment architectures across the ISE. The ISE architecture program is leveraging the concepts of segment architectures to help link federal departments and agencies and fusion centers' information resources.

Segment architectures can be thought of as organized, logically consistent "views" or "segments" of an overall enterprise architecture that are focused on solving one particular kind of problem or addressing a specific business need or area (such as information sharing).

Technology Implementation Strategy and Planning



Implementation Planning

The enterprise architecture approach drives planning for technology implementation from a strong foundation in business needs. As a fusion center completes the development of its enterprise architecture, center management will gain a view of the current business and technology situation ("As Is") and their desired future environment ("To Be"). The center can then develop implementation strategies and plans focusing on the gap between the "As Is" and "To Be" views within each of the architectures described above—business, information, technology, and solutions. A fusion center then prioritizes the gaps (leveraging its technology governance and decision-making processes), the closing of which will occur through technology investments, projects, and policies. Among other factors, the prioritization may be based upon a business-case evaluation of the budgetary viability (affordability) and feasibility (cost/benefit) to the fusion center operation. The prioritization of requirements may result in definition of a technology portfolio for future technology initiatives.

A fusion center's implementation plan should seek to leverage solutions available via national standards and technology initiatives, specifically those supported by Global and PM-ISE. Fusion center leaders should pay particular attention to policy considerations that affect technology, such as adequate security controls and protections of privacy and civil liberties for individuals that may be affected by the system.

This approach supports the development of a technology implementation strategy and plan for fusion centers that are in a start-up situation or those seeking to expand existing technology services. The key to developing an effective technology implementation strategy is leveraging cross-community concepts, tools, and artifacts that help guide both internal and external interface development of fusion center infrastructures. The following section identifies such resources available to fusion centers.

A Reference Enterprise Architecture for Fusion Centers

The remainder of this document provides a list of the principal documents, tools, and other artifacts that the national fusion center partner organizations have developed to guide the development and operation of fusion centers—including the provisioning of technology. The list is organized in the tables below according to the architectural areas described above, to help orient the reader to the documents most relevant to his or her current needs.

The list provides a link to the document/artifact (where available online) or contact information. There is also a very brief description of each document/artifact, and the principal use cases (usage scenarios) for each.

Under each architectural area, the table identifies the extent to which the document/artifact provides guidance in that area, according to the following key:

F Document provides a **framework** (or at least part of a framework) in this area of the architecture but not actual architectural elements.

S Document provides **summary-level** architectural elements (e.g., general categories of capabilities, information, technology, solutions).

D Document provides **detail-level** architectural elements (e.g., specific capabilities, information, technology, solutions). Note: D generally implies S as well; also, note that D does not necessarily imply "complete."

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
Fusion Center Guidelines www.it.ojp.gov/documents/fusion_center_guidelines_law_enforcement.pdf Provides a comprehensive set of guidelines for developing and operating a fusion center. Use this document to target resource investments to highest-priority needs, leverage best practices from other centers, improve coordination and partnerships, develop policies, plan services, and set up fusion center governance.	S				
Baseline Capabilities for State and Major Urban Area Fusion Centers www.it.ojp.gov/documents/baselinecapabilitiesa.pdf Identifies capabilities and related operational guidance necessary for a fusion center to be considered capable of performing basic functions. Use this document to identify capability gaps, and plan to close those gaps through investments, recruiting, training, technology, and other means to identify, prioritize, and allocate resources most effectively and efficiently.	D	D			
Defining Fusion Center Technology Business Processes: A Tool for Planning www.it.ojp.gov/documents/Defining_Fusion_Center_Business_Processes.pdf Provides a framework for documenting fusion center business processes and capabilities and mapping them to technology. Use this document to leverage a useful framework and document templates for describing business processes.		F[3]			

F provides a **framework** but not architectural elements

S provides **summary-level** architectural elements

D provides **detail-level** architectural elements

3 While this document provided "case studies" of a small number of business processes, its primary purpose was to establish a methodology and framework for developing a business architecture for fusion centers.

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
ISE EA Framework www.ise.gov/pages/eaf.html Provides a common architectural structure for federal, state, local, tribal, foreign partner, and private sector participants to incorporate their information sharing capabilities into the Information Sharing Environment. Use this document to understand the logical structure of ISE business processes, information flows and relationships, services, and high-level data packet descriptions and exchange relationships.	S	S	S	S	
ISE Common Terrorism Information Sharing Standards www.ise.gov/pages/ctiss.html Establishes functional and technical standards for sharing information within the ISE. Note that the functional standards include NIEM Information Exchange Package Documentations (IEPDs). Use this document to understand the rules, guidelines, technical methodologies, and practices underlying the operation of the ISE.		S	D	S	
ISE Implementation Plan www.ise.gov/docs/reports/ise-impplan-200611.pdf Establishes the vision, goals, and recommendations for setting up the ISE. Use this document to understand the background of the ISE and its origins.	F		F		

F provides a **framework** but not architectural elements

S provides **summary-level** architectural elements

D provides **detail-level** architectural elements

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
ISE Profile and Architecture Implementation Strategy www.ise.gov/pages/eaf.html Provides guidance for ISE participants on how to develop enterprise, segment, and solution architectures and systems using practical ISE implementation guidance on protecting their information and identifying appropriate candidates for information sharing. Use this document to guide the development of processes, approaches, and artifacts for implementing and building operational, compliant ISE segment architectures, including an ISE Shared Space.				D	S
ISE Privacy Guidelines www.ise.gov/pages/privacy-overview.html Provides a privacy protection framework that requires ISE participants to implement core privacy protections, such as data quality, redress, and data security, for ISE information. Use this document to understand the privacy requirements of ISE participation.		D			
ISE Suspicious Activity Reporting (SAR) Evaluation Environment (EE) Segment Architecture www.ise.gov/docs/sar/ISE-SAR_EE_Segment_Architecture_v1(Dec_2008_Final).pdf Provides a logical arrangement of business and functional drivers, information exchange requirements, outcomes, and constraints for building the operational ISE-SAR EE. This document assists program managers, chief architects, and systems designers and implementers at fusion centers and at federal departments and agencies as they determine programmatic and solution architecture strategies supporting the ISE-SAR EE business case.	D	D	D	S	S

F provides a **framework** but not architectural elements

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D provides **detail-level** architectural elements

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
Law Enforcement Intelligence Unit (LEIU) Criminal Intelligence File Guidelines www.it.ojp.gov/documents/LEIU_Crim_Intell_File_Guidelines.pdf Defines a criminal intelligence file and recommends policies and guidelines for evaluation, classification, dissemination, and management of a criminal intelligence file. Use this document to develop and adopt standards-based practices for managing intelligence files.		D	D		
National Criminal Intelligence Sharing Plan www.it.ojp.gov/documents/National_Criminal_Intelligence_Sharing_Plan.pdf Provides a plan, with detailed action items and recommendations, for the effective sharing of criminal intelligence among law enforcement agencies. Use this document to align local activities with an overall national strategy for sharing criminal intelligence.	S				
National Strategy for Information Sharing http://georgewbush-whitehouse.archives.gov/nsc/infosharing/index.html Establishes a shared vision and recommended action items and capabilities for the nationwide sharing of information and intelligence. Use this document to align local activities with an overall national strategy for sharing information and intelligence.	S				

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D provides **detail-level** architectural elements

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
Law Enforcement Analytic Standards www.it.ojp.gov/documents/law_enforcement_analytic_standards.pdf Establishes standards for law enforcement analysts and analysis based on the intelligence cycle. Use this document to understand standard practices of law enforcement analysis.		D			
Privacy and Civil Liberties Policy Development Guide and Implementation Templates www.it.ojp.gov/documents/Privacy_Guide_Final.pdf Provides guidance for the process of developing agency policy that articulates agency privacy and civil liberties obligations and supports information sharing, as well as protects privacy and information quality interests. Use this document to guide the analysis of privacy requirements and the development of privacy policies.		D			
Fusion Center Technology Guide www.it.ojp.gov/documents/Fusion_Center_Technology_Guide.pdf Provides a methodology that fusion center directors can use to facilitate communications and planning for technology adoption among all levels of fusion center personnel. Use this document to understand baseline technologies common in the fusion centers and how those technologies enable various elements of the fusion center mission.				D	D

F provides a **framework** but not architectural elements

S provides **summary-level** architectural elements

D provides **detail-level** architectural elements

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
Fusion Center Information Technology Capability Assessment [Assessment results forthcoming] Provides data on the usage of various technologies and tools across all fusion centers. Use this resource to understand which fusion centers are using what technologies/tools and to identify points of contact at other fusion centers who have knowledge/expertise in tools/technologies being considered.				D	D
Fusion Center Service Specifications will be www.it.ojp.gov/globaljra Provides reference specifications and associated business process models for key, high-priority information flows between fusion centers and state/local/tribal partners. Use these resources to understand common information flows and how those flows can be organized into services, leverage reference specifications to accelerate information sharing with a fusion center, and align sharing with best practices.		D	D		
SAR IEPD Standard http://niem.gtri.gatech.edu/niemtools/iepdt/display/container.iepd?ref=ntsXeIX7M6Q%3D A NIEM-conformant IEPD for suspicious activity reporting. Use this document to accelerate interoperable implementation of SAR with and among fusion centers and to align implementation with national best practices.			D		

F provides a **framework** but not architectural elements

S provides **summary-level** architectural elements

D provides **detail-level** architectural elements

	Business Architecture (External)	Business Architecture (Internal)	Information Architecture	Technology Architecture	Solutions Architecture
Implementing Privacy Policy in Justice Information Sharing: A Technical Framework www.it.ojp.gov/documents/Privacy_Report_Release_Candidate_v_1_0_10-31-2007_with_cover_(final).doc Provides a set of technical requirements, specifications, industry standards, guidelines, and recommendations for applying technology mechanisms to support the electronic expression and enforcement of privacy policy. Use this document to understand how to leverage industry standards, such as Extensible Access Control Markup Language (XACML), in implementing technology solutions that enforce privacy policies.		D	D		
Justice Information Exchange Model www.search.org/programs/info/jiem.asp Provides a methodology for capturing information exchange requirements and a "jumping-off point" for developing services (in conformance with the Justice Reference Architecture) and NIEM-conformant exchange specifications (IEPDs). Use this resource to document information exchange requirements and drive consensus-based and mission-oriented planning for information sharing.	F		S		
Justice Reference Architecture Framework www.it.ojp.gov/globaljra Provides a set of specifications and a common terminology for implementing a service-oriented architecture (SOA) for information sharing. Use this document to implement SOA efficiently and effectively and align SOA implementation with national justice standards, such as NIEM.		F	F		

F provides a **framework** but not architectural elements

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BJA

Bureau of Justice Assistance
U.S. Department of Justice

For More Information

Please call (850) 385-0600 or e-mail it@it.ojp.gov.
For more information about DOJ information sharing initiatives, go to

www.it.ojp.gov

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