Federal Enterprise Architecture
Program Management Office

Status of the
Federal Enterprise Architecture

Briefing to the Computer System Security and Privacy Advisory Board
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December 3, 2002

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- Overview of the Federal Enterprise Architecture (FEA)
- FEA Business Reference Model
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- Additional Draft FEA Reference Models
- Use of Component-Based Architectures
- Solution Architects Working Group
- Next Steps
The Federal Enterprise Architecture is a business-focused framework for cross-agency, Government-wide improvement

- The Federal Enterprise Architecture (FEA) is providing OMB and Federal agencies with a new way of describing, analyzing, and improving the Federal Government and its ability to serve the citizen
- The FEA will eliminate the organizational obstacles that have historically hindered improvement without forcing reorganization
- The FEA is a business-focused approach and is not just for IT
- The FEA provides a common framework for improving a variety of key areas:
  - Budget allocation
  - Horizontal and vertical information sharing
  - Performance measurement and budget/performance integration
  - Cross-agency collaboration
  - Improved service to the citizen
  - e-Government
  - Component Based Architecture
  - and more

The FEA is being constructed through a collection of inter-related "reference models" designed to facilitate cross-agency analysis and opportunities for collaboration

Federal Enterprise Architecture (FEA)

Performance Reference Model (PRM)
- Government-wide Performance Measures & Outcomes
- Line of Business-Specific Performance Measures & Outcomes

Business Reference Model (BRM)
- Lines of Business
- Agencies, Customers, Partners

Service Component Reference Model (SRM)
- Capabilities and Functionality
- Services and Access Channels

Data Reference Model (DRM)
- Business-focused data standardization
- Cross-Agency Information exchanges

Technical Reference Model (TRM)
- IT Services
- Standards
The Federal Enterprise Architecture Management System (FEAMS) is being used to house and maintain the FEA and associated reference data

- Being constructed using a Component-Based Architecture
- Will contain all FEA reference models mapped to Federal agencies' major IT initiatives
- Ready to deploy proof-of-concept
- Will grant agencies read-only access by mid-November, with full search and reporting capability
- Will eventually leverage FirstGov hosting capabilities
- FEA-PMO determining appropriate access and level of security required

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The foundation of the FEA is an “architected” view of the government’s business operations – the Business Reference Model

**The Current Approach ...**

- **Agency-focused**
  - Citizen Service: Many agencies and offices; not one government
  - Performance: No common framework for performance measurement across agencies; minimal budget-performance integration
  - IT: Redundancy within and across agencies
  - Budget Allocation: Allocation of funds by Agency; minimal cross-Agency analysis

- **Mission-focused**
  - Citizen Service: One government
  - Performance: Common performance measurement framework for CMB and all agencies; robust budget-performance integration
  - IT: Minimal redundancy in IT spending; component-based architecture promotes reuse
  - Budget Allocation: Budget analyses take business lines into consideration; funds allocated to support cross-agency collaboration

The FEA Business Reference Model is organized as a functional hierarchy with Business Areas at the highest level followed by Lines of Business and Business Sub-Functions

**Business Areas**

- **Lines of Business**
  - **Internal Lines of Business**
  - **Sub-Functions**

**Three Business Areas** provide a high-level view of the types of operations the Federal Government performs.

The three Business Areas decompose into two sub-areas and 35 **Lines of Business** and **Internal Lines of Business**. These Lines of Business describe more specifically the services and products the Government provides to its stakeholders, while the Internal Lines of Business describe the inter- and intra-Agency back office and support activities that enable the Government to operate.

There are **137 Sub-Functions** which form the final level of decomposition within the FEA and communicate the specific activities that Federal Agencies perform within each Line of Business and Internal Function.
Support Delivery of Services: Lines of Business and Sub-Functions

Internal Operations/Infrastructure: Lines of Business and Sub-Functions
Other models build upon the BRM to define desired goals for the Government's business lines and help agencies determine how to best allocate resources to meet those goals.

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The Performance Reference Model consists of five measurement categories that address cross-cutting drivers of performance and span internal/external perspectives and outputs and outcomes.

Each performance measurement category includes standard measures that can be operationalized for the Lines of Business and Sub-Functions within the Business Reference Model.

<table>
<thead>
<tr>
<th>PEOPLE</th>
<th>PROCESS</th>
<th>TECHNOLOGY</th>
<th>CUSTOMER</th>
<th>BUSINESS RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Satisfaction and Quality of Work Life</td>
<td>Productivity &amp; Efficiency</td>
<td>Quality &amp; Efficiency</td>
<td>Customer Satisfaction</td>
<td>Mission Achievement / Outcomes*</td>
</tr>
<tr>
<td>Recruitment &amp; Retention</td>
<td>Quality</td>
<td>Reliability &amp; Availability</td>
<td>Service Coverage</td>
<td>Financial Value</td>
</tr>
<tr>
<td>Employee Development</td>
<td>Financial</td>
<td>Security</td>
<td>Timeliness &amp; Responsiveness</td>
<td></td>
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<tr>
<td>Management Ratios</td>
<td>Cycle Time &amp; Resource Time</td>
<td>User Satisfaction</td>
<td>Quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infrastructure</td>
<td>Core Management Processes</td>
<td>Accessibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innovation &amp; Learning</td>
<td>Technology Infrastructure &amp; Costs</td>
<td>Customer Benefit</td>
<td></td>
</tr>
</tbody>
</table>

* Each Line of Business and Sub-Function will have a set of mission-specific outcomes that must be defined.
The Performance Reference Model will complement OMB's Program Assessment Rating Tool (PART) and Common Measures Initiative, as well as GPRA requirements, by defining output and outcome measures for each Line of Business and Sub-Function.

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The FEA reference models can be easily integrated along business lines, providing a foundation for Component-Based Architecture design.

Performance Reference Model (PRM)

Outputs and Outcomes

Business Reference Model (BRM)
- Support Delivery of Services
  - Regulatory Management
    - Policy and Guidance Development
    - Public Comment Tracking
    - Regulatory Development
    - Rule Publication

Service Component Reference Model (SRM)
- Rule Publication
  - Knowledge Management
  - CRM
  - PRM
  - Content Management
  - Collaboration
  - Search
  - Reporting

Technical Reference Model (TRM)
- Content Management
  - Platforms and OS
  - J2EE
  - .NET
  - Windows NT
  - Data Management
  - JDBC
  - Business Logic

Component-Based Architecture

| Enterprise Products | Functional Products | Services |

The FEA Service Component Reference Model will support investment planning by providing a framework by which agencies can leverage existing services and components.

1. A new concept or business function is identified
2. Is the business function being performed across the Government?
3. What Service Components are being used to support the business?
4. Will the Components support the business need? What modifications are needed?
5. What Access Channels can be used to access the Component (i.e., Web Service, Portal, etc.)

FEA Business Reference Model

Service Level Agreements

Create Service Component, Advance SRM Capability
The FEA Technical Reference Model provides an effective means by which Service Components can be leveraged, built, and deployed across the Federal Government.

The FEA Technical Reference Model also provides guidance and technology recommendations supporting the development and implementation of Service Components that embrace a Component-Based Architecture.

- X.509
- NIST / FIPS 186
- Secure Socket Layers (SSL)

- HTML
- JSP, ASP, ASP.Net
- DHTML, CSS, XHTML, MIP

- XBRL, XOLAP, OLAP
- JDBC, ODBC
- ADO, ADO.Net

- XML
- ebXML
- RDF, WSUI
- XSLT

- Java/J2EE (EJB)
- C, C++, JavaScript
- COM/COM+, C#
- Visual Basic
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Component-Based Architectures, and our ability to embrace them, can support the rapid assembly of E-Gov solutions

- The E-Gov Initiatives are positioned to transform existing thinking in how the Federal Government leverages technology to satisfy complex business objectives
- Priority funding consideration will be provided to IT investments that leverage technology purchases across multiple entities*

- Component-Based Architectures (CBA) will:
  - Support reusability, portability, and interoperability
  - Leverage existing cross-agency investments
  - Leverage emerging and industry-proven technologies
    - J2EE, .NET, XML, SOAP, Web Services, UDDI
  - Reduce costs and risks associated with legacy integration, technology selection, maintenance and support
  - Improve:
    - Quality and consistency of services
    - Customer support (citizen and intra-governmental)
    - Delivery and speed to market

*OMB Circular A-11, Section 53
Component-Based Architectures can provide the basis for cross-Agency collaboration and E-Gov transformation

- Online Rulemaking and Management -
  (Conceptual Design)

Components - and their supporting architectures - provide a "building block" approach to effectively leverage disparate business services and technologies

GovBenefits
(Eligibility Assistance Online)
To support development and reuse of components, best practices outline the use of a tiered solution architecture.

- Solution Design and Development -

(Conceptual Framework)

- **Security**
  Security provides an overarching framework that includes a series of defensive mechanisms and functions designed to protect the system, data and information from unintentional or malicious threats.

- **Presentation/Interface**
  Abstracts the complexity of the application from the user or interfacing applications.

- **Business Logic**
  Business functionality is modular and component based, enabling greater maintainability and interoperability.

- **Transaction Mgmt.**
  Ensures optimizes access, quality, consistency, and integrity of operational data.

- **Information Storage**
  Information stored in persistent relational, object-based, and/or file-based repositories is abstracted to hide the complexity of the storage system from the interfacing applications.

- **Customer**
  
- **Interfacing System**
  
- **Presentation/Interface**
  
- **Business Logic**
  
- **Transaction Mgmt.**

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- **Draft FEA Performance Reference Model**
- **Additional Draft FEA Reference Models**
- **Use of Component-Based Architectures**
- **Solution Architects Working Group**
- **Next Steps**
The Solution Architects Working Group (SAWG) is focused on assisting the 24 Presidential Priority E-Gov Initiatives in areas related to:

- **Solution Architecture Planning**
  - Review and/or creation of supporting documentation
  - Forward-thinking approaches – aimed at risk mitigation
  - Conveyance of best practices and lessons learned based on years of knowledge and expertise

- **Architecture Design**
  - Identification of components, buy vs. build methodologies
  - Component-Based Implementations – leveraging existing capabilities across the Federal Government (i.e., Pay.Gov, FirstGov.gov, etc.)
  - Rapid Development and Enterprise Architecture methodologies – what are the critical successes, minimize stranded investments

- **Expertise and Knowledge**
  - XML, Web Services (what’s the right approach)
  - Security, Authentication (what you need to plan for now)
  - Hosting and Platforms (leveraging what’s available now)

- **Relationships with other Federal, State and Industry Working Groups**
  - XML Working Group, Federal Architecture Working Group (FAWG)
  - NASCIO
  - Industry Advisory Council (IAC), OASIS (Interoperability)

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The SAWG Leadership Team consists of solution architects who are focused across vertical areas of expertise

<table>
<thead>
<tr>
<th>Expanded structure based on demand of skills</th>
<th>Solution Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Architect</td>
<td>Solution Architect</td>
</tr>
<tr>
<td><strong>PRESENTATION</strong></td>
<td><strong>PLATFORMS &amp; DB</strong></td>
</tr>
<tr>
<td>HTML, XSL, XML, JSP, ASP, JavaScript</td>
<td>SQL, Databases, Services, Architecture</td>
</tr>
<tr>
<td><strong>BUSINESS LOGIC</strong></td>
<td><strong>SECURITY</strong></td>
</tr>
<tr>
<td>EJB, COM, UML, Use Cases</td>
<td>SSL, 3G, Authentication, Encryption, Security</td>
</tr>
<tr>
<td><strong>Supporting Partners</strong></td>
<td><strong>MESSAGES</strong></td>
</tr>
<tr>
<td>CMI Portfolio Managers, Managing Partners</td>
<td>SOAP, Web Services, XML, eXSLT</td>
</tr>
<tr>
<td>State, Local</td>
<td>Industry Working Groups (e.g., NASCIO, w3.org), others</td>
</tr>
<tr>
<td>Industry</td>
<td></td>
</tr>
</tbody>
</table>
While still in development, the SAWG has defined the following high-level SDLC areas to support the e-Gov Initiatives:

- Business Case
  - Performance Measures, Objectives, Outcomes (PRM)
  - Business Objectives (BOH)
  - Funding, Partnering Strategies
- Discovery
  - "As Is" – Partner Components, Technology, Processes
  - Existing Industry Components, Technology, Processes
  - Existing Delivery and Access Channels
- Critical Success Factors
  - Must Have Functions, Features, and Components
  - Existing Industry Components, Technology, Processes
  - Existing Delivery and Access Channels
- Component Architecture
  - Define Component Relationships
  - Wiring / Activity Diagrams, Data Arch
  - Define Access and Delivery Channels
- Component Acquisition
  - Define / Align Service Components
  - Component Sourcing Strategy
  - Component Service Level Agreements
- Iterative Development
  - Evolving Business Strategy

Solution Development
- Design Initiative
  - Develop Initiative
  - Test Initiative
  - Implement Initiative

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Near-Term Next Steps for the SAWG and FEA

<table>
<thead>
<tr>
<th>Solution Architects Working Group</th>
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<tbody>
<tr>
<td>✦ Continue to engage with E-Gov Initiatives</td>
</tr>
<tr>
<td>✦ Continue creation of the E-Gov Solution Development Life Cycle (SDLC)</td>
</tr>
<tr>
<td>• Intended to supplement existing SDLC's</td>
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<tr>
<td>• Focused on cross-agency collaboration and development</td>
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<tr>
<td>• Will identify and provide examples of supporting Artifacts</td>
</tr>
<tr>
<td>✦ Continue to create and deliver Intellectual Capital</td>
</tr>
<tr>
<td>• Best Practices</td>
</tr>
<tr>
<td>• Lessons Learned</td>
</tr>
<tr>
<td>• Case Studies, White Papers</td>
</tr>
<tr>
<td>• Delivered through <a href="http://www.feapmo.gov">http://www.feapmo.gov</a></td>
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<thead>
<tr>
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<tr>
<td>✦ Issue FEA Management and Maintenance Plan to describe continued upkeep and agency use of the FEA reference models</td>
</tr>
<tr>
<td>✦ Continue to define and validate the draft Service Component, Technical and Data Reference Models</td>
</tr>
<tr>
<td>✦ Work with OMB and Federal Agencies to define government-wide and Line of Business-specific performance measures and outcomes (Performance Reference Model)</td>
</tr>
<tr>
<td>✦ Continue consultations with defense and intelligence agencies to obtain their input on the Business Reference Model</td>
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<tr>
<td>✦ Continue to collect agency comments on the Business Reference Model, Version 1, issue draft revision in December 2002 for agency review, and issue updated model in February 2003</td>
</tr>
<tr>
<td>✦ Launch FEAMS on <a href="http://www.feapmo.gov">www.feapmo.gov</a></td>
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