

**WRITTEN STATEMENT OF  
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**BEFORE THE  
COMMITTEE ON GOVERNMENT REFORM  
SUBCOMMITTEE ON TECHNOLOGY, INFORMATION POLICY,  
INTERGOVERNMENTAL RELATIONS, AND THE CENSUS  
U.S. HOUSE OF REPRESENTATIVES**

**MAY 19, 2004**

Good afternoon, Mr. Chairman, Ranking Member Clay, and Members of the Committee. Thank you for inviting me to speak about the “Federal Enterprise Architecture (FEA): A Blueprint for Improved Federal IT Investment Management & Cross-Agency Collaboration and Information Sharing.”

My name is Venkatapathi Puvvada (PV) and I am the Chief Technology Officer (CTO) for Unisys Global Public Sector. However, today I am honored to be speaking on behalf of the Industry Advisory Council (IAC) in my role as the Chairman of its Enterprise Architecture Shared Interest Group. Before I speak on our view of FEA, please let me briefly introduce IAC, its role, and activities.

IAC is an advisory body to the American Council for Technology (ACT), a membership-driven nonprofit organization established in 1979 with the purpose of leading the Information Technology (IT) community to improve government. ACT facilitates and encourages education, communication and collaboration across all levels of government.

ACT created the Industry Advisory Council in 1989, with the goal of working to improve communications and understanding between government and industry. Today, IAC is comprised of more than 400 private sector firms that provide information resources, management products and services to government. Our member firms include hardware manufacturers, software companies, systems integrators, consulting service providers, telecommunications companies and professional services companies, comprised of small and large businesses.

IAC’s mission is to bring industry and government executives together to exchange information, support professional development, improve communications and understanding, solve issues, and build partnership and trust, thereby enhancing government’s ability to serve the nation’s citizenry. This is accomplished by providing a forum for the study and analysis of public sector management and technology issues, advising ACT on the possible impacts of industry trends on government technology issues, serving as a sounding board for changes to federal regulations, assisting in public relations and public affairs programs aimed at improving the health of government; and providing education and training to industry and government personnel.

## Enterprise Architecture Shared Interest Group

As a part of this mission, IAC established the IAC Enterprise Architecture Shared Interest Group (IAC EA SIG) because of the crucial role of Enterprise Architectures in achieving improved citizen services, cross agency information sharing and effective mission fulfillment as the Federal Agencies continue their transformation initiatives. IAC has collaborated closely with the Office of Management and Budget (OMB) Federal Enterprise Architecture Program Management Office (FEA-PMO) and the Architecture and Infrastructure Committee (AIC) of the CIO Council in an effort to extend, enhance, and enable the Federal Enterprise Architecture (FEA). The IAC EA SIG is made up of a diverse range of thought-leaders, enterprise architects and solution architects with working knowledge and extensive experience in various aspects of architecture, IT governance and solutions implementation. Our focus and vision has been the following:

- **Purpose:** Establish a forum for government and industry to identify and candidly discuss Enterprise Architecture and issues related to it.
- **Mission:** Provide a practical implementation approach for utilization of the FEA Reference Models in alignment with the agency EA efforts.
- **Objective:** Bring industry best practices in EA and identify opportunities to support Federal government partners in articulating and enhancing the value of architectural approach.

As a part of fulfilling this mission, the IAC EA SIG successfully assembled industry best practices, views and experience into five white papers. The papers discuss the process, modeling, and implementation issues associated with the FEA and Department/Agency-wide EA. These papers are available at <http://www.actgov.org>.

We are very pleased to report that this work has been widely recognized throughout government and industry for its innovative insights, in-depth analysis and suggestions for practical approach to enable implementation of FEA and achieve cross agency collaboration and interoperability. Brief summaries of these white papers are attached in Exhibit A for your convenience. Currently, IAC EA SIG is actively working with the Office of Management and Budget (OMB), CIO Council, National Association of State CIOs (NASCIO) and Federal Departments and Agencies in providing its views and best practices on a number of initiatives related to FEA and EA. This includes our efforts to

enable approaches for collaboration and information sharing across various boundaries of the government at Federal, State and Local levels.

Mr. Chairman, on behalf of IAC, I owe a debt of gratitude to my IAC colleagues for their commitment and passion to help improve government by generously providing their valuable time, practical insights and expertise on their own initiative. I would also like to point out that most of our IAC EA SIG members are from small and medium businesses, bringing their innovative ideas and unique perspectives to these issues.

### **Enterprise Architecture: A Blueprint Analogy**

Most often EA has been construed as a technical exercise, probably because the underlying concepts and benefits are not articulated in simple business terms. To address this issue as well as to set the stage for this discussion, we would like to simplify the EA concepts, nature and value through an analogy that is easily understood and appreciated by non-technical users.

Enterprise Architecture is very similar to the blueprints used everyday in county planning, community development, building design and construction. To deliver high quality of life for its citizens, this carefully planned and organized blueprinting ensures availability of common infrastructure, standards, codes, and processes resulting in economic vitality, collaboration and efficiency.

- The county planning level blueprint (as akin to FEA), at a macro level, specifies the roadmap of its enterprise with policies, standards, budget processes, and governance through a common shared vision for its citizens. This blueprint also provides a mechanism for interconnecting various communities as well as a framework for common infrastructure.
- The community level blueprint (as akin to agency EA) specifies the requirements, scope and the context of the community within its over-arching county blueprint. One is essentially zooming in on the details of a community needs, goals and transformational plans. This is typically done by the planners and policy makers by recognizing common design patterns and requirements; resulting in effective re-use of previously successful community architectures.
- The individual building design blueprint (as akin to solution architecture for a business line or a system) provides the detailed drawings and specifications

(through a common notation) so that a builder can construct a building with accuracy, consistency and is able to connect to the common infrastructure as specified in the community level blueprint. When an inter-operable infrastructure is clearly specified and available for connection, a building owner does not invest in his or her own expensive and redundant infrastructure or component such as an electric/gas utility plant, water treatment facility, sewer system or a telephone exchange. This allows for a faster and cost-effective way to develop and construct individual buildings while still ensuring high quality.

This analogy illustrates in very simple terms the value of Enterprise Architecture as a proven, carefully planned and collaborative method to achieve mission and business results consistently just as envisioned by the Clinger-Cohen Act and FEA.

### **Need for Federal Enterprise Architecture**

In our view, FEA is very critical to the government to be able to achieve significant improvements in the way it conducts itself. The development of department, agency, and lines of business using a consistent Federal Enterprise Architecture style and process can provide a range of benefits. This is the only practical way cross-agency information sharing and processing can be accomplished. It provides a consistent basis for comparison of investment decisions by the department and agency business leaders and for use by the OMB and Congressional oversight organizations. It can provide a consistent method to make business oriented trade-offs and determine the expected and actual outcomes and performance changes based on changes in legislation, process, organizational structure, and the delivery of services to citizens, government, employees, and to other government agencies including state and local government.

Enterprise Architecture provides the information needed to incrementally or dramatically modernize and transform government based on the facts of how the services are delivered today and how they can be delivered based on changes in the business process, changes in the roles, responsibilities of people, and of course the focused use of technology. The set of Federal Enterprise Architecture activities along with those of states, local government and non-government organizations can create a blueprint for defining the transformation steps to deliver of more efficient and effective government services. There are many opportunities for improvement but the active use of an Enterprise Architecture as the implementation planning tool can help make “investment” and action decisions on where to put not only the IT dollars but more importantly where

to spend the “time and effort” of the government staff and the leadership based on those areas with the highest potential benefit and return on investment.

One of the benefits of Enterprise Architecture is to establish a governance decision-making framework that typically identifies re-usable business and technical patterns such as shared solutions and components, interoperable data management, and data sharing without having to start from scratch every time.

### **FEA Provides Transformational Opportunities**

As is known from private sector experience, substantial use of an EA can and, especially the first time used, will lead to major transformation of an organization, its operations and its results. While IT enables the mechanism for implementing such a transformation, as with most human enterprises, it is the change process for the people involved that is the most critical effort. For this most important reason, the IAC EA SIG focused its first efforts, correctly positioning the Business Reference Model (BRM) as the central driver for change within the organization, with the Performance Reference Model (PRM) as the appropriate measuring stick.

However, there is no easy silver bullet that enables an organization to painlessly create and adopt an EA within the context of FEA. The creative involvement of affected stakeholders early in the process--so that both high-level executives and the employees at all levels have input and the feeling of ownership of the implementation of the EA--is essential for success in transforming an organization. Industry has learned many hard lessons, often more than once, in creating and implementing EA. Industry fully supports the FEA approach and through the IAC EA SIG, we are prepared to provide a means for the federal government to capitalize on these best practices as much as possible.

### **Status of the FEA Initiatives: Good Progress, But A Long Way To Go**

Even with the Clinger-Cohen Act mandate, developing the framework for the diverse range of Federal entities to each define and implement their EA has been a significant challenge. We believe that the establishment of the FEA PMO and the development of the interlinked reference models are very positive and steps in the right direction. These reference models have the potential to form the basis for a common framework to improve IT investment management and enterprise-wide integration of business lines across agencies. OMB has led this effort very thoughtfully. They involved the stakeholders as the reference models are being developed and have gone through extensive discussion and revisions before they are published.

Even though initially, the need for FEA framework grew out of the realization that the eGov initiatives would benefit from some standardization in terms of approach, process and components; it allowed for significant progress in the quality of FY 2005 agency budget preparation and the subsequent OMB budget analysis.

The FEA initiative enabled the government to identify opportunities for improvement through business process integration with the five predominantly administrative/back-office Line of Business (LoB) such as Human Resource Management, Financial Management, Grants Management, Case Management and Federal Health. The General Services Administration (GSA) Office of Government wide Policy (OGP) is currently seeking industry input for some of these LoBs. This provides for an opportunity to have a common architecture approach for these LoBs in time to have a major impact on the FY06 budget recommendation to Congress by the Executive Branch. However, this integration effort will take a number of years to be implemented unless strong executive leadership, clear governance, and positive incentives are provided for agencies to collaborate.

Various departments and agencies are making good progress in maturing and aligning their EA in the context of the FEA. EA products are being used effectively by several CIOs as a decision-making framework in their capital planning, portfolio management, policy compliance, and IT governance. There is evidence of tangible results being produced by EA efforts at agencies such as the US Patent and Trademark Office (USPTO), the Executive Office of the President (EOP), the Department of Housing and Urban Development (HUD), the US Environmental Protection Agency (EPA), the US Agency for International Development (USAID), and the Department of Veterans Affairs (VA). We are monitoring and supporting, where appropriate, the continued progress being made on some major transformation initiatives such as the Department of Homeland Security (DHS) EA and the Department of Defense (DoD) Business Enterprise Architecture (BEA).

We would like to applaud the efforts of the OMB, GAO and the CIO Council in reaching out to industry in a real partnership mode not only to communicate their vision and plans, but also to seek ideas, input and expertise from us. We appreciate the leadership demonstrated by Mr. Mark Forman, Ms. Karen Evans, Mr. Bob Haycock, Mr. John Gilligan, Mr. Randy Hite, Ms. Kim Nelson, Mr. Dan Mathews, Mr. Marty Wagner and other executives for making this one of their top priorities.

We are very encouraged by the approach taken by GAO with their common EA Maturity Model Framework (EAMMF) to measure the progress of agency EA efforts in a very consistent and quantitative fashion. As illustrated by the recent survey, agencies have a long way to go to achieve the goals of EA; however we recognize that the agency EA efforts are maturing steadily. This improvement probably did not translate to an increased overall GAO EAMMF score as the current evaluation mechanism counts all or nothing rating for each factor and the progress at sub-factor level is not completely transparent.

### **Major Challenges Lie Ahead**

We believe there are major challenges and obstacles that exist to be able to fully realize the intended benefits of FEA, especially for cross-agency collaboration and information sharing. Some of the major challenges that we see are:

- EA efforts must be adopted as the main enterprise transformation mechanism by the mission, program and business line owners. The EA context, direction, development and the underlying details must be clearly driven by each owner. Otherwise, the value of EA will continue to be perceived as a technical exercise for CIOs to manage their IT infrastructure. This is a significant challenge that must be overcome if the agency business strategies and goals are to drive the alignment of IT capabilities and initiatives.
- Lack of sufficient positive incentives for Federal Departments and Agencies to collaborate and develop common business process integration and secure information sharing are a cause for concern. This must be addressed quickly to enable a win-win scenario with the FEA and the Line of Business integration activities.
- While progress has been made in integrating and improving business processes and the underlying systems for the administrative and back office functions, there is not a major thrust on the core mission functions and this could limit the return on investments in architecture efforts.
- Lack of sufficient emphasis in overcoming cultural, organizational, leadership, transformational, and change management issues could limit progress.

- Lack of sufficient funding, key resources, and skills to lead and implement this effort across the Federal enterprise could slow the momentum gained so far and derail future progress.
- Security has not been tightly integrated into the EA efforts and will be a major obstacle for federal agencies to collaborate and share information securely while maintaining an appropriate level of privacy.

### **Critical Success Factors**

There are several critical success factors for FEA to fully realize its potential benefits. We have highlighted some important factors below:

- **Timely completion and availability of the Data and Information Reference Model (DRM) is very important.** The ability of the Federal Agencies to understand and map to each other’s data is a major factor in achieving the cross agency collaboration and information sharing. Data sharing has been difficult to achieve even in fully integrated private organizations. This must be given the highest priority within the FEA initiative in the short term.
- **Development and implementation of the “baked-in” Enterprise Security Architecture (ESA) aligned with FEA is paramount to the success of the initiative.** The basic essence of ESA must be to ensure privacy while allowing for secure information sharing across the boundaries of the government.
- **Continued maturity and commitment to leverage FEA (by OMB) and EA (by the Federal Agencies) as a management tool for budgeting and performance management is very important.**
- **Adoption of open standards that enable the consistent expression of EA artifacts so that they can be inter-operable and re-used is very important to the future viability of EA.** Some of these important standards are Meta Object Facility (MOF), Business Process Modeling Notation (BPMN) and Unified Modeling Language (UML) and the adoption of these into EA tools will accelerate the cross-agency collaboration.
- **FEA must be relevant and capable of adapting to emerging and future architecture concepts so that industry innovation is continually leveraged to improve government services.**

- A systematic way to achieve cross agency collaboration and information sharing could be through intra-department (agency) transformation initiatives that form the basis for proof points and lessons learned in a smaller scale. **Continued funding and support for these pilot initiatives could be a key factor in validating the emerging FEA models.**
- **More pro-active communication, detailed guidance documentation, exchanges and documented examples will be critical to implement the architectures successfully.**
- **The legislative branch has a key role to play in advancing this initiative as well.** We appreciate the pro-active and continual involvement demonstrated by the Government Reform Committee. We believe that articulation of legislative priorities and appropriation activities in the context of FEA would be very useful in advancing the maturity of Federal IT initiatives.
- Last but not least, industry has a major role to play in this as a government partner. **We strongly encourage that industry best practices, expertise and capabilities continue to be leveraged.**

## **Conclusion and Recommendations**

Mr. Chairman, IAC is very supportive of the FEA initiative as a major priority and agrees with its general direction. We acknowledge the significant progress made by OMB and many of the federal agencies.

As we gauge the progress of this initiative by the two main subjects of this hearing, we conclude that:

- High marks should be given for progress on “A Blueprint for Improved Federal IT Investment Management” aspect of the FEA initiative.
- Major hurdles exist for the “Cross-Agency Collaboration and Information Sharing” aspect of the FEA initiative; however these hurdles can be overcome with commitment and leadership in stewarding collaborative efforts across agencies.

We applaud your efforts in keeping Enterprise Architecture initiatives as a priority and we believe that significant challenges must be overcome to stay the course.

We appreciate the continued partnership between the government and industry and believe that this model will enable the government to continue to leverage industry best practices, which will form the basis for future success.

Thank you for the opportunity to appear before you today and I will be very happy to answer your questions.

# EXHIBIT A

## SUMMARY OF IAC EA SIG WHITE PAPERS

[www.actgov.org](http://www.actgov.org)

### 1. Business Integration Driven by Business Lines

The first part of this paper discusses the needs for data modeling and how, with federation and modeling along business lines, the information and data models can evolve and be examined from a business centric point of view. This is not done from a purely technical perspective but rather from the perspective of the virtual “information communities” that share the common business goals within the lines of business that exist across various government agency boundaries. The process of gathering information into these communities is referred to as the “Federated Data Model.” and is based on open standards such as Unified Modeling Language (UML), Meta Object Facility (MOF) and eXtensible Markup Language (XML).

### 2. Advancing Enterprise Architecture Maturity

This paper describes key lessons learned from successful Enterprise Architecture programs and the steps they have taken to achieve their success. Specifically, the report: (1) identifies successful Enterprise Architecture practices, and (2) provides recommendations for cross-agency documentation, evolution and where appropriate, sharing of successful practices. This paper presents a number of practices that have been successful in advancing federal government organizations through the Enterprise Architecture process as presented in the CIO Council Practical Guide to Federal Architecture. The practices, processes, and product artifacts presented/referenced in this white paper are intended to provide insights gained by IAC Enterprise Architecture practitioners, and to serve as a mechanism for strengthening EA efforts throughout government.

### 3. Business Line Architecture & Integration:

This paper presents an overview of a Business Line oriented Solution approach with both an overall process and top-level reference model. The process defined uses a community based funding strategy and multiple levels of involvement, from the executive team to business line leaders and technical leaders. The approach integrates concepts and approaches from many disciplines such as enterprise architecture, business process management, supply-chain management, cooperative information systems, federated resource and data management, component-based development, declarative and template development, and model-based architecture and integration. The paper proposes a model-driven architecture made up of a combination of commercial products and “open standards” elements based on both open source communities and academic research initiatives that are integrated into

concepts such as Business Line Development Environment, Business Line Hub and the Business Partner Gateways.

#### **4. Interoperability Strategy Concepts, Challenges, and Recommendations**

The purpose of this paper is to provide some background on the issues underlying the interoperability challenges, to shed some light on potential approaches to dealing with the problem, and to offer some specific recommendations, based on industry experience, that government at all levels can implement to rapidly address this challenge. The Industry Advisory Council (IAC) brings an industry perspective to the issues facing government and offers solutions that have succeeded in commercial settings that may be useful in addressing the issues facing government. These recommendations are “No Regret” proactive actions that our government should take to move forward. This paper represents a starting point, a basis for initiating a dialog on how to address the issues of interoperability and information sharing. Concepts and Context at its most fundamental level, the concept of interoperability is simply about making things work together. This can be accomplished in a number ways and this paper discusses various options and approaches.

#### **5. Succeeding with Component-Based Architecture in e-Government**

Industry’s shift to Component-Based Architectures (CBA), a new Enterprise Architecture (EA) process for delivering applications, has fueled a tremendous amount of interest in the IT community over the past few years. With the search for the silver bullet that solves the continuing problems of integrating enterprise solutions as fervent as ever, IT organizations everywhere have jumped on the CBA bandwagon in hopes that it might finally ease the IT planning burden. As one might guess, it is not that simple. The purpose of this white paper is to provide a context for the rise of CBA, sort through the major issues, and provide guidance to the government business and technical managers so that sound business decisions can be made with respect to this key technology approach.

This paper outlines the challenges and enablers of CBA, and provides some guidance on implementing CBA in government organizations. These issues are discussed at a high level this paper and several recommendations are provided for government consideration.

**EXHIBIT B**  
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