GAO

August 2000

INFORMATION TECHNOLOGY

INS Needs to Better Manage the Development of Its Enterprise Architecture

GAO

Accountability ★ Integrity ★ Reliability

United States General Accounting Office
Washington, D.C. 20548

Accounting and Information
Management Division

B-285590

August 1, 2000

The Honorable Janet Reno
The Attorney General

Dear Madam Attorney General:

Effectively and efficiently investing in new and existing information
systems requires, among other things, an institutional systems blueprint
that defines in both business and technology terms the organization's
current and target operating environments and provides a road map for
moving between the two. This institutional systems blueprint, commonly
called an enterprise architecture, is a recognized hallmark of successful
public and private sector organizations. For this reason, Congress and the
Office of Management and Budget (OMB) require that federal agencies
establish enterprise architectures.[1]

The Immigration and Naturalization Service (INS), which invests hundreds
of millions of dollars each year in information technology (IT), recognizes
the value of and need for an enterprise architecture and has recently begun
to develop one. Because of the importance of this architecture to INS'
ability to effectively and efficiently invest in IT, we reviewed (1) the status
of INS' efforts to develop an enterprise architecture and (2) the
effectiveness of INS' structures and processes for managing this
development effort. The scope of our review did not extend to INS' efforts
to implement its enterprise architecture because this issue is part of a
separate review we have underway to review INS' information technology
investment management processes. We performed our review at INS
headquarters in Washington, D.C., from December 1999 through May 2000
in accordance with generally accepted government auditing standards.
Details of our scope and methodology are contained in appendix I.

We requested comments on a draft of this report from you or your
designee. INS provided written comments that are discussed in the

---

[1]Public Law 104-106, section 5125(b), 110 Stat., 679, 685 (1996). The act established CIOs in
all federal agencies. We support establishing such CIOs in agencies' major components and
bureaus. OMB Memorandum M-97-02, *Funding Information Systems Investments*,
October 25, 1996, and OMB Memorandum M-97-16, *Information Technology Architectures*,
June 18, 1997.

"Agency Comments and Our Evaluation" section and are reprinted in appendix II.

Results in Brief

INS recognizes that it does not have an enterprise architecture and has taken some limited steps to develop one. However, it has considerable work left to accomplish before it will have a complete, and thus useful, enterprise architecture. Moreover, its current approach to managing the development of its architecture lacks fundamental controls.

Specifically, INS' Office of Information Resources Management (OIRM), which is the organization responsible for managing INS' IT functions and assets, has, in isolation from INS business owners, put together a bottom-up description of INS' current IT environment (e.g., hardware and system software computing platforms, data structures and schemas, software applications), and it has mapped its software applications to INS' three major business areas. This is a reasonable start to describing INS' current architectural environment. However, important steps still need to be accomplished, such as linking the systems environment description to a decomposed view of INS' business areas, including each area's component business functions and subfunctions, and information needs and flows among functions and subfunctions. Doing this with any degree of reliability, however, requires business owners to validate the resultant linkages.

Also, INS has not begun developing either a target architecture or a plan for sequencing between its current architecture and a target architecture. In lieu of the target architecture, OIRM is developing what it calls an "initial" target architecture that, according to the architecture team leader, is a 2-year plan for correcting known system-level problems. However, such an approach does not satisfy federal and private sector guidance on the origin, content, and purpose of a target architecture. Rather, this plan will basically describe near-term system maintenance efforts and will not provide a definition of the business and systems environments needed to optimize INS' mission performance.

INS' limited steps to date to develop an enterprise architecture are due to the absence of certain fundamental management structures and processes associated with successful architecture development. In particular, INS' efforts have been solely an OIRM endeavor, rather than a corporate (i.e., agencywide) effort that includes participation by INS business owners. As a result, INS has focused on the technology layers of the enterprise architecture (e.g., hardware and system software computing platforms,

data structures and schemas, software applications). This focus is not consistent with federal and private sector architecture guidance, which advocates that the target architecture definition process be top-down, beginning with the institution's mission and a business concept of operations and continuing with the definition of supporting business functions, processes, and information needs and flows, and then using the target business environment to define a target system environment (software, hardware, network, data and security standards, characteristics, and protocols). Equally important, INS' architecture development efforts are not being managed as a formal program, including meaningful plans that provide a detailed breakdown of the work and associated schedules and resource needs. Also, these efforts do not include performance measures and progress reporting requirements to ensure that the effort is progressing satisfactorily.

Without these management controls, it is unlikely that INS will produce a complete and useful enterprise architecture. Moreover, until INS has such an architecture, it will be unable to fully ensure that the hundreds of millions of dollars it spends each year on new and existing information systems will optimally support mission needs.

Background

The mission of the INS, an agency of the Department of Justice, is to administer and enforce the immigration laws of the United States. To accomplish its mission, INS is organized into three core business areas—enforcement, immigration services, and corporate services. Enforcement includes, among other things, conducting inspections of travelers entering the United States as they arrive at officially designated ports of entry, detecting and preventing the smuggling and illegal entry of aliens between ports of entry, and identifying and removing people who have no lawful immigration status in the United States. Immigration services, which involve regulating permanent and temporary immigration to the United States, include granting legal permanent residence status, nonimmigrant status (e.g., tourists and students), and naturalization. Corporate services include records management, financial management, personnel management, and inventory management.

In fiscal year 1999, INS removed about 180,000 illegal aliens from the country and granted naturalization to over 1.2 million legal immigrants. INS' field structure consists of 3 regional offices, 4 regional service centers, 4 administrative centers, 33 district offices, 21 Border Patrol sectors, and more than 300 land, sea, and air ports of entry.

To carry out its responsibilities, INS relies on information systems to assist staff in (1) receiving and processing naturalization and other benefit applications, (2) processing immigrants and nonimmigrants entering and leaving the United States, and (3) identifying and removing people who have no lawful immigration status in the United States. For example, Computer-Linked Application Information Management System (CLAIMS 4) is a centralized case management tracking system, which offers support for a variety of tasks associated with processing and adjudicating naturalization benefits. In addition, INS uses its Arrival/Departure Information System (ADIS) to store arrival and departure data for non-U.S. citizens and legal permanent residents.

Value of an Enterprise Architecture

Enterprise architectures are essential for organizations to effectively and efficiently develop new and evolve existing information systems. These architectures systematically detail the full breadth and depth of an organization's mission-based "modus operandi" (1) in logical terms, such as business functions and high-level descriptions of information systems and their interrelationships and (2) in technical terms, such as hardware, software, data, communications, security, and performance characteristics. If defined properly, enterprise architectures can assist in optimizing the interdependencies and interrelationships among organizations' business operations and the underlying information technology supporting these operations. Our experience with federal agencies has shown that attempting to define and build major systems without first completing an enterprise systems architecture often results in systems that are duplicative, not well integrated, unnecessarily costly to maintain and interface, and do not effectively optimize mission performance.[2]

Congress and OMB have recognized the importance of agency enterprise architectures. The Clinger-Cohen Act, for example, requires that agency Chief Information Officers (CIO) develop, maintain, and facilitate the implementation of enterprise architectures. OMB has issued guidance that, among other things, requires agency information systems investments to be consistent with agency architectures. OMB has also issued guidance on the

---

[2]See, for example, *Air Traffic Control: Complete and Enforced Architecture Needed for FAA Systems Modernization* (GAO/AIMD-97-30, February 3, 1997) and *Customs Service Modernization: Architecture Must Be Complete and Enforced to Effectively Build and Maintain Systems* (GAO/AIMD-98-70, May 5, 1998).

development and implementation of agency information technology architectures.

INS' Current System Investment Efforts

INS has multiple efforts underway to develop and acquire new information systems and to maintain existing ones. For example, INS plans to spend about $11 million in fiscal year 2000 and another $10.5 million in fiscal year 2001 to continue development of its CLAIMS 4, which supports the processing of applications and petitions for immigrant benefits and is intended to fully replace CLAIMS 3. In addition, INS plans to spend about $10 million and $20 million in fiscal years 2000 and 2001, respectively, to develop its Integrated Surveillance Intelligence System (ISIS), which includes the deployment of intelligent computer-aided detection systems, unattended ground sensors, and fixed cameras along the northern and southern borders to provide around-the-clock visual coverage of the border. Overall, INS plans to spend about $300 million on information technology activities in fiscal year 2000, including about $75 million for new development and the remaining amount for operations and maintenance. For fiscal year 2001, INS plans to spend about $288 million on information technology activities.

Recent Reviews Have Identified Weaknesses in INS' Management of Information System Investment Processes

In August 1998, the Logistics Management Institute (LMI)[3] reported that INS' investment management processes were ineffective because OIRM (1) did not maintain accurate cost estimates for the complete life cycle of projects and (2) did not track and manage projects to a set of cost, schedule, technical, and benefit baselines.[4] Finally, LMI noted that while INS' System Development Life Cycle (SDLC)[5] manual provides a good model for systems development projects, OIRM did not consistently follow it, often bypassing key SDLC phases.

---

[3]LMI is a private, nonprofit corporation that provides management consulting, research, and analysis to governments and other nonprofit organizations.

[4]*Reengineering Information Technology Management at the Immigration and Naturalization Service*, Logistics Management Institute, August 1998.

[5]System development life cycle is a term used to refer to the phases of a system's development from beginning to end (i.e., from perceived need for a system extending through systems design, development, implementation, operations, and maintenance).

Similarly, in July 1999, the Justice Inspector General (IG) reported that INS had no assurance that systems under development would meet performance and functional requirements.[6] Specifically, the IG reported that INS could not (1) sufficiently track the status of its information system projects to determine whether progress was acceptable given the amount of time and funds already spent, (2) determine actual costs incurred for a project or reliably estimate projected costs, (3) adequately monitor contracts, and (4) ensure the integrity and reliability of the data used by its systems.

Recognizing the need to address these weaknesses, INS established an Operational Assessment (OA) Team to analyze these reported weaknesses and recommend specific actions to address them. The OA team validated the deficiencies identified in the LMI and Justice IG reports and identified additional ones. For example, the team found that system requirements were not consistently collected, recorded, documented, tracked, and controlled. To illustrate, of 105 projects reviewed by the team, fewer than 50 percent had documented functional requirements and most of those that had been documented were not current. The OA team also reported that INS did not have an enterprise architecture and that efforts to develop one had been started and never completed.

Framework for Developing an Enterprise Architecture

Enterprise architectures should be derived through a systematic and thorough top-down analysis of an organization's target or "to be" operating and systems environment—including business functions, information needs and flows across functions, and systems characteristics (hardware, software, data, communications, and security). Enterprise architectures should also define in similar terms the organization's current or "as is" operations and systems environments and specify an implementation plan for transitioning over time from the "as is" to the "to be" environments. The analyses of the "as is" and "to be" environments are documented in a current architecture and a target architecture, respectively.

---

[6]*Follow-up Review: Immigration and Naturalization Service Management of Automation Programs*, Office of the Inspector General, Audit Division, U.S. Department of Justice, July 1999.

In 1992, we issued a framework for designing and developing enterprise architectures.[7] This framework divides the current and target architectures into two principal components—a logical component and a technical component. The logical component provides a high-level description of the organization's mission and target concept of operations, the business functions being performed and the relationships among the functions, the information needed to perform the functions, the users and locations of the information, the information systems, and the information flows and interfaces among the systems. An essential element of the logical architecture is the definition of the component interdependencies. The technical component details specific technology and communications standards and approaches that will be used to build the systems, including those that address critical hardware, software, communications, data management, security, and performance characteristics.

Other organizations, such as OMB, the National Institute of Standards and Technology (NIST), and the CIO Council, have also issued guidance and frameworks for developing enterprise architectures.[8] Each of these models is generally consistent with our guidance.

INS Has Taken Some Limited Steps Toward Developing an Enterprise Architecture

INS recognizes that it needs an enterprise architecture and it has initiated some limited efforts to develop one. In December 1999, INS' investment resources board (IRB), which is chaired by the Deputy Commissioner and composed of INS senior executives, approved OIRM's project for developing the architecture. Also, OIRM has selected the CIO Council's *Federal Enterprise Architecture Framework* as the template for constructing its architecture and it has developed an automated tool, called Visual Information Technology Architecture (VITA), to assist it in documenting and maintaining configuration control of the architectural artifacts it produces. OIRM has also made a reasonable start in describing the agency's current or "as is" architecture; however, important tasks remain to fully describe its current architecture. Also, INS has not begun to

---

[7]*Strategic Information Planning: Framework for Designing and Developing System Architectures* (GAO/IMTEC-92-51, June 1992).

[8]OMB Memorandum M-97-02, Funding Information Systems Investments, October 25, 1996, and OMB Memorandum M-97-16, *Information Technology Architectures*, June 18, 1997; NIST Special Publication 500-167, *Information Management Directions: The Integration Challenge*, September 1989; and Chief Information Officers Council, *Federal Enterprise Architecture Framework*, version 1.1, September 1999.

define a target, or "to be" architecture, or an implementation plan to transition from the current to the target environment, and it does not have plans for doing so.

Current Architecture Description Is Not Complete

OIRM's approach to describing its current architectural environment is basically to "reverse engineer" its existing current systems' configuration. Restated, OIRM has inventoried the agency's current system assets and populated its VITA tool with this information. Our review of VITA found that INS' current architecture includes descriptions of hardware (e.g., mainframe and client server computers); system software (e.g., operating systems and database management systems); application development standards (e.g., programming languages and test tools); some, but not all security software (e.g., access control and virus protection software for desktops, but not for network, LAN, and client-servers); the locations of its communications nodes; and its logical and physical data models. OIRM has also identified its major system applications and, using VITA, linked each of the applications to the aforementioned system assets that support the application and to the physical data models. Relying on available application documentation (e.g., requirements and design documents), OIRM has associated the applications with its three high-level business areas—enforcement, immigration services, and corporate services. INS has also identified users and locations (e.g., regional office, border patrol sector, and district offices), but it has not linked these to its high-level business areas.

While INS has made a reasonable start, it has yet to complete its description of its current architecture. For example, OIRM has not identified the relationships among its high-level business areas and their component business functions and its information flows and users and locations, nor has it defined the business processes that support these functions and identified the information needed to support the business functions. In addition, INS has not identified its communications network components (e.g., routers, communications switches).

Definition of Target Architecture Has Not Begun

OIRM has yet to begin defining its target architecture and a road map for moving between its current and target environments and it does not have any immediate plans for doing so. As described earlier, this target would specify how INS wants to operate in the future to meet its mission, including what core business processes will be performed, what these business processes will consist of and how they would interrelate to

optimally support INS' mission, what work locations will perform the business processes, what information will be required to optimally support these processes and work locations, what system applications are needed to support the business processes, and what technology standards, rules, protocols, products, etc. will be employed to support these processes.

In lieu of developing a target architecture, INS has begun to define an "initial" target architecture. According to the OIRM architecture team leader, this initial target architecture is intended to address existing deficiencies in INS' systems environment, such as system incompatibilities that preclude data exchange. These incompatibilities are the result of INS historically building new systems in a "stovepipe" fashion, independent of one another and without the use of common standards and rules that an enterprise architecture provides.

Such system incompatibilities unnecessarily increase the costs of developing and maintaining systems since they require additional hardware and software to provide interoperability between systems and extra user time and effort to access data from multiple, disparate systems. For example, INS is developing an interface designed to provide a common view of alien status-related information. Currently, to verify an alien's status for federal benefits, such as housing, INS personnel must individually log on to five mainframe applications and traverse approximately 32 screens to locate the information that they need from different databases. According to INS, development costs alone for the interface from fiscal year 1998 through fiscal year 2000 are about $800,000. The more significant but hidden costs, however, are the reduced productivity of INS personnel who have to access multiple applications and the reduced quality of service provided to the benefit-granting agencies.

To overcome these deficiencies, and as an interim step, INS plans to build interfaces[9] between existing legacy systems to allow them to exchange data. The architecture team leader acknowledged that this initial target does not represent INS' target architecture. Instead, it is designed to make marginal improvements to INS' current technology infrastructure. INS plans to complete the initial target by the end of fiscal year 2000. In defining this initial target architecture, the architecture team leader told us that they are employing relevant Department of Justice guidance and standards,

---

[9]A system interface is hardware and software that acts as an interpreter to interconnect different systems and allow for the exchange of data.

such as Justice's Information Technology Architecture (ITA).[10] Justice's ITA is basically a reference document that specifies departmental architecture principles, goals, and objectives; required information services (e.g., communication services and security management services); and technology standards (e.g., information infrastructure standards and communications infrastructure standards).

INS Does Not Have the Management Structures and Controls to Effectively Develop Its Enterprise Architecture
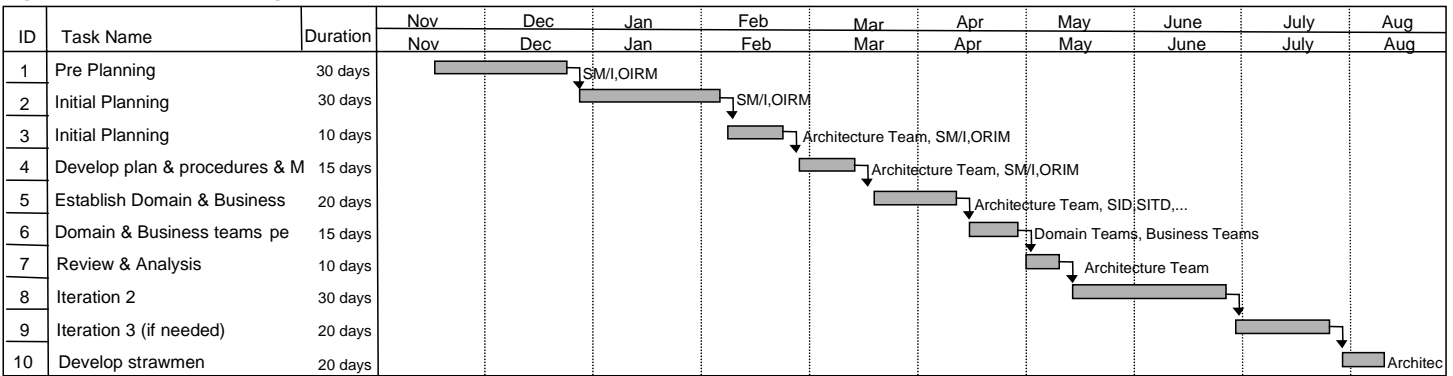
Effectively developing an enterprise information systems architecture requires formal management structures and processes to guide and manage its development. First, because an enterprise architecture, by definition, is a corporate representation in both business and technical terms of how the organization operates today and in the future, it must be approached as an enterprise endeavor with senior executive management sponsorship. This requires establishing an entity or individual with organizational authority, responsibility, and accountability for managing the enterprise architecture development as an agencywide project and providing the appropriate resources to develop it completely. Moreover, given the size and complexity of such a project, it should be managed as a formal program, which includes developing a detailed breakdown of the tasks and subtasks necessary to develop the enterprise architecture, developing associated schedule and resource estimates, and establishing progress reporting requirements and performance measures.

Even though INS has begun to develop an enterprise architecture, it has not yet established structures and processes that are fundamental to successfully developing one. For example, INS is not managing its architecture development effort as an enterprise program. To date, all of INS' enterprise architecture development efforts have been conducted within OIRM and have not actively involved INS' business components. Further, INS' architecture team, which has been chartered within OIRM, does not have the authority to secure the participation and involvement of representatives outside of OIRM, namely business owners. In fact, until recently, business representatives have not participated in INS' efforts to document its current architecture.

---

[10]Department of Justice *Information Technology Architecture, Architectural Requirements and Supporting Analyses*, Volume I, October 1998 and Department of Justice *Information Technology Architecture, Technical Reference Model*, Volume II, December 1998.

Also, INS is not managing the enterprise architecture development effort in a structured and disciplined manner. The architecture team has not defined a plan for developing an enterprise architecture, including a breakdown of the tasks and subtasks necessary to produce the enterprise architecture (i.e., current and target architectures, and implementation plan), and related work schedules and resource requirements. Instead, the team only has a very high-level plan for developing the "initial" target architecture, and this plan is not sufficiently detailed to be useful. (Figure 1 contains INS' initial target architecture plan). In addition, INS has not developed progress reporting requirements and performance measures to ensure that the development effort is progressing satisfactorily. Without effective management structures and controls, it is unlikely that INS will be able to produce a complete and enforceable enterprise systems architecture that optimizes its systems business value and mission performance.

Figure 1: INS' Initial Target Architecture Development Plan

ID	Task Name	Duration	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
1	Pre Planning	30 days	▓▓ SM/I,OIRM									
2	Initial Planning	30 days		▓▓ SM/I,OIRM								
3	Initial Planning	10 days			▓ Architecture Team, SM/I,ORIM							
4	Develop plan & procedures & M	15 days				▓ Architecture Team, SM/I,ORIM						
5	Establish Domain & Business	20 days					▓ Architecture Team, SID,SITD,...					
6	Domain & Business teams pe	15 days						▓ Domain Teams, Business Teams				
7	Review & Analysis	10 days						▓ Architecture Team				
8	Iteration 2	30 days							▓▓▓			
9	Iteration 3 (if needed)	20 days									▓▓	
10	Develop strawmen	20 days										▓ Architec

Source: Immigration and Naturalization Service.

Conclusions

INS officials acknowledge that INS does not have an enterprise architecture, and OIRM, with the investment review board's approval, has initiated some limited efforts to develop one. However, INS' limited efforts to date and plans for the future are unlikely to result in a complete and useful enterprise architecture. Unless INS establishes the management structures and processes to effectively develop its enterprise architecture, it has little assurance that it will be able to produce a complete and enforceable enterprise architecture that optimizes its systems business value and mission performance. Without a complete and enforceable

architecture, INS risks continuing to build and buy systems that are not well-integrated, are incompatible, and do not effectively support mission needs.

Recommendations

We recommend that you direct the Commissioner of INS to designate development of a complete enterprise architecture, to include both a current and target architecture and a plan for moving between the two, as an agencywide priority and manage it as such.

To accomplish this, we recommend that the Commissioner

- assign responsibility and accountability for overseeing the development of an enterprise architecture to INS' IRB or some other corporate executive steering committee that the Commissioner may choose to establish;
- establish an enterprise architecture program office and program manager, reporting to this corporate oversight body, and assign the program office and manager responsibility, authority, and accountability for developing an enterprise architecture;
- require that the enterprise architecture be developed in accordance with federal guidance and relevant Department of Justice policies and guidance;
- require that the program be formally managed, including having detailed plans, performance measures, and progress reporting;
- ensure that the program office receives the resources necessary to meet approved plans; and
- submit the complete enterprise architecture to the Department of Justice Chief Information Officer for approval.

Agency Comments and Our Evaluation

In its written comments on a draft of this report, INS agreed with the findings, conclusions, and recommendations, with one exception. INS took exception to our recommendation that the Commissioner assign responsibility and accountability for overseeing the development of an enterprise architecture to its IRB. In its comments, INS stated that the IRB is not best suited to manage the enterprise architecture at INS and that it is currently evaluating the appropriate INS structure for doing so.

An enterprise architecture, by definition, is a corporate representation in both business and technical terms of how the organization operates today,

how it expects to operate in the future, and how the enterprise intends to move over time between the two. As a result, it is essential that it be approached as an enterprise endeavor with agencywide executive sponsorship and leadership. Our intent in recommending that INS' IRB be responsible and accountable for overseeing the development of INS' enterprise architecture was to enable this program to benefit from agencywide direction and oversight and that executive ownership of the architecture be established. Currently, the only such executive body that INS has is the IRB. However, if INS wishes to establish and charter another executive body with agencywide representation to guide and oversee the development of its enterprise architecture, the intent of our recommendation would still be met. We have modified our recommendation to recognize this option.

Also, INS stated in its comments that it has progressed in developing the technical layer of its enterprise architecture. While we acknowledge in the report that INS has progressed in describing the technical component of its current or "as is" architecture, INS has not yet begun developing its target or "to be" architecture, including both the technical and business components.

This report contains recommendations to you. The head of a federal agency is required by U.S.C. 720 to submit a written statement on actions taken on these recommendations. You should submit your statement to the Senate Committee on Governmental Affairs and the House Committee on Government Reform within 60 days of the date of this report. A written statement also must be sent to the House and Senate Committees on Appropriations with the agency's first request for appropriations made over 60 days after the date of this report.

We are sending copies of this report to Senator Judd Gregg, Chairman, and Senator Ernest F. Hollings, Ranking Minority Member, Senate Appropriations Subcommittee on Commerce, Justice, State, the Judiciary; Senator Spencer Abraham, Chairman, and Senator Edward M. Kennedy, Ranking Minority Member, Senate Judiciary Subcommittee on Immigration; Representative Harold Rogers, Chairman, and Representative Jose E. Serrano, Ranking Minority Member, House Appropriations Subcommittee on Commerce, Justice, State, the Judiciary, and Related Agencies; Representative Lamar Smith, Chairman, and Representative Sheila Jackson Lee, Ranking Minority Member, House Judiciary Subcommittee on Immigration and Claims; the Honorable Jacob J. Lew, Director, Office of

Management and Budget; and the Honorable Doris Meissner, Commissioner of the Immigration and Naturalization Service. Copies will also be made available to others upon request. If you have any questions, please call Randolph C. Hite at (202) 512-6240 or Keith A. Rhodes at (202) 512-6415 or by e-mail at *hiter.aimd@gao.gov* or *rhodesk.aimd@gao.gov.* Key contributors to this assignment were Deborah A. Davis, Bryan S. Finefrock, William Lew, and Sabine R. Paul.

Sincerely yours,

Randolph C. Hite
Associate Director, Governmentwide
  and Defense Information Systems

Keith A. Rhodes
Director, Office of Computer
  and Information Technology
  Assessment

Objectives, Scope, and Methodology

The objectives of our review were to determine (1) the status of INS' efforts to develop an enterprise architecture and (2) the effectiveness of INS' structures and processes for managing this development.

To determine the status of INS' efforts to develop an enterprise architecture, we reviewed published architectural guidance, including Office of Management and Budget memoranda, the Chief Information Officer (CIO) Council's Federal Enterprise Architecture Framework, and the National Institute of Standards and Technology (NIST) architecture model to determine key requirements for developing an enterprise architecture and compared them to our framework.[1] Each of these models is generally consistent with our guidance.

In addition, we reviewed relevant documentation, including INS' architecture team charter and meeting minutes, the framework and tools that INS is using to guide its development efforts (e.g., INS' Visual Information Technology Architecture,[2] project plans and schedules for developing an enterprise architecture, and contractor task orders that define activities in support of INS' architecture development effort. We also interviewed INS officials to discuss INS' plans for completing its enterprise architecture.

We then reviewed VITA and INS' data repository and enterprise data model and analyzed the information to identify any variances with the published architectural guidance. We also interviewed INS officials to (1) seek clarification and explanation of VITA's contents and (2) identify instances where the architectural artifacts in VITA did not satisfy generally accepted requirements of an enterprise architecture.

To determine the effectiveness of INS' structures and processes for managing its enterprise architecture development, we identified INS' management controls and compared them to industry practices. We also compared INS' management controls with those of federal agencies that have successfully developed enterprise architectures, such as the Customs

---

[1]OMB Memorandum M-97-02, *Funding Information Systems Investments*, October 25, 1996, and OMB Memorandum M-97-16, *Information Technology Architectures*, June 18, 1997; Chief Information Officers Council, *Federal Enterprise Architecture Framework*, version 1.1, September 1999; and NIST Special Publication 500-167, *Information Management Directions: The Integration Challenge*, September 1989.

[2]INS' web-based tool for documenting and maintaining its enterprise architecture.

Service. Specifically, we reviewed INS' architecture team charter, and project plans and schedules for an enterprise architecture. In addition, we interviewed INS officials to discuss instances where INS' management controls did not comply with the generally accepted management structures and processes.

We conducted our work at INS headquarters in Washington, D.C., from December 1999 through May 2000 in accordance with generally accepted government auditing standards.

Comments From the Immigration and Naturalization Service

U.S. Department of Justice
Immigration and Naturalization Service

HQOIA 110/8.1-C

425 I Street NW
Washington, DC 20536

II II I 3 2000

Mr. Jeffrey C. Steinhoff
Assistant Comptroller General
Accounting and Information Management Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Steinhoff:

We have received the General Accounting Office draft report GAO/AIMD-00-212, entitled Information Technology: INS Needs to Strengthen Management of its Enterprise Architecture Development Efforts," that you have transmitted to the Attorney General. This letter serves as the Department's comments on this report.

The Immigration and Naturalization Service (INS) is fully committed to having a useful enterprise architecture. We clearly understand the statutory requirements and the value of and need for an enterprise architecture that allows the INS to efficiently and effectively invest its available resources in information technology (IT).

We fully agree with the recommendations of the report and will proceed in accordance with those recommendations, with one exception. The report recommends that the responsibility and accountability for overseeing the development of an enterprise architecture, including the establishment of an enterprise architecture program office and manager, be assigned to the INS Investment Review Board (IRB). The INS IRB operates as a deliberative body for the purpose of making informed decisions as to the agency's IT investment priorities. We believe the IRB is not best suited to manage and oversee the enterprise architecture of the INS. We are evaluating the appropriate INS structure for development of our enterprise architecture program, and also working to identify funds for the project. When we have this information, we will transmit it to the GAO as soon as possible. Under any scenario, however, the INS Office of Information Resources Management (OIRM) would provide technical support to the effort as needed.
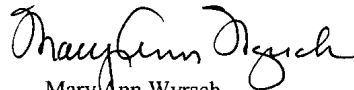
Mr. Jeffrey C. Steinhoff
Page 2

The INS' enterprise architecture element is comprised of two layers: a business layer and technical layer. INS has made progress in developing the technical layer. We are currently evaluating the appropriate model for the structure and management of business components. This evaluation is consistent with the agency's goal of an evolving an enterprise architecture that integrates customers' requirements and realistic solutions into a coherent and cost-effective overall information technology environment.

Thank you for your consideration of these comments.

Sincerely,

Mary Ann Wyrsch
Deputy Commissioner

Ordering Information

The first copy of each GAO report is free. Additional copies of reports are $2 each. A check or money order should be made out to the Superintendent of Documents. VISA and MasterCard credit cards are accepted, also.

Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:
U.S. General Accounting Office
P.O. Box 37050
Washington, DC 20013

Orders by visiting:
Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders by phone:
(202) 512-6000
fax: (202) 512-6061
TDD (202) 512-2537

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (202) 512-6000 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

Orders by Internet:
For information on how to access GAO reports on the Internet, send an e-mail message with "info" in the body to:

info@www.gao.gov

or visit GAO's World Wide Web home page at:

http://www.gao.gov

To Report Fraud, Waste, or Abuse in Federal Programs

Contact one:

- Web site: http://www.gao.gov/fraudnet/fraudnet.htm
- e-mail: fraudnet@gao.gov
- 1-800-424-5454 (automated answering system)

United States
General Accounting Office
Washington, D.C. 20548-0001

Official Business
Penalty for Private Use $300

Address Correction Requested