

**Archived Information**

**IT ARCHITECTURE  
PRINCIPLES  
GUIDANCE**

DEPARTMENT OF EDUCATION

OFFICE OF THE CHIEF INFORMATION OFFICER

March 1999

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## **IT ARCHITECTURE PRINCIPLES GUIDANCE**

Architecture principles are simple, direct statements of how an organization wants to use information technology in the long term. Architecture principles are derived primarily from business drivers, but also may be influenced by organizational practices and policies, existing architectures, strategic business decisions, and trends in information technology. The architecture principles are expressed at a high level and do not define standards and technology choices. The rationale for each principle also includes discussion of the kinds of benefits associated with its application.

The Department of Education architecture principles contain guidance for program managers and system developers and they impact acquisition practices. This document presents the Department's Architecture Principles Guidance to be used by all parties involved in planning and executing information technology systems and services in the Department. It should be used in conjunction with the Product Support Plan and the following materials when they are completed: the Office of Student Financial Assistance Programs (OSFAP) Technical Reference Model and the Department's Systems Life Cycle Management guidance. The Department's Acquisition Planning Guidance should also be used, as appropriate.

The migration to a standards-based IT architecture will require investment not only in technology but also in the cultural and institutional changes needed to support reinvented work processes in an IT environment based on open systems and shared resources. The Department must be careful to strike the right balance between the application of enterprise-wide IT principles and standards and the need to encourage creativity and entrepreneurial behavior in the pursuit of strategic goals and objectives.

The IT Architecture Principles therefore are guiding principles, rather than directive in nature. A proposed investment's compliance with the principles will be assessed but deviation from a principle might be allowed under compelling business case circumstances. The ED Information Technology Investment Review Board will use the ED Architecture Principles Guidance when measuring the potential return and risk of a proposed IT investment. Adherence to the principles will enhance the likelihood of the investment having a high return and of being successful.

**Principle 1 The ED information technology architecture will be designed and periodically updated to support the Department's Strategic Plan goals, objectives and strategies.**

Rationale: The ED IT architecture is intended to ensure that IT investments are aligned with the agency mission and goals. An effective IT architecture will guide the acquisition of the technology needed to manage the information the agency uses to accomplish its work. This and the subsequent principles represent that linkage.

Guidance: In preparing the business case for the IT Investment Review Board, project managers must identify the connection of a proposed investment with a goal or objective in the Department Strategic and Annual Plan or to a specific law or regulation that requires compliance. If the proposed investment eliminates or reduces an information gap required by GPRA then this should be described. In addition to validating a connection of a proposed investment to the Strategic and Annual Plans, the architecture itself is linked to those plans, thus the need to adhere to the Enterprise Architecture's vision, principles, standards, timetable and other attributes.

**Principle 2 An enterprise-wide, open systems standards-based common operating environment (COE) will be established.**

Rationale: An open systems standards-based COE facilitates development of common applications, supports interoperability, and encourages resource sharing. Setting enterprise-wide COE standards will reinforce centralized policy making while encouraging data sharing and automation of shared functions. The OSFAP Technical Review Model and the Department's Product Support Plan set forth the COE standards. These are both subject to periodic change and update, but should be adhered to at any decision point. The Information Technology Investment Review Board (ITIRB) will ensure enforcement of standards through implementation of the information technology investment management program.

Guidance: The Product Support Plan stipulates minimum product standards that will be centrally supported in the Department. Although it does not give guidance for buying new equipment, organizations requiring new products should use the supported products (such as a brand of hardware or a version and vendor of software) but acquire the most capacity (such as memory on a personal computer) they can afford. Principal Office IT technical representatives are encouraged to participate in the Product Support Plan on-going review and upgrade process through participation on the agency's Technical Review Group.

**Principle 3 ED will use a structured investment management process to evaluate and approve investments in major information systems.**

Rationale: A fully matured IT investment management program will ensure that the Department's information technology investments support ED business objectives, comply with the enterprise IT architecture, focus on the total costs of ownership, and provide reasonable returns on investment. Senior officers serving on the ITIRB will make decisions based on business cases, such as financial analyses and business case presentations. The ITIRB has decision-making responsibilities for major information technology projects throughout the Department. IT investments will be assessed for expected return on investment, as well as compliance with the IT Architecture. Better project selections will result, as well as improved decision making if a project deviates from cost, schedule, or performance goals. IT investments will return higher value.

Guidance: An enterprise IT investment management process is under development. Separate guidance will be provided when the process is complete. The IT Architecture will serve as a pivotal component of the process. IT projects will be evaluated for compliance with the IT architecture as part of the Department's selection of IT projects to fund.

**Principle 4 ED will adopt standardized information technology management practices and products.**

Rationale: Standard information technology management practices and products are not in use across the Department today making it difficult to assess status and progress of IT investments. Use of standard management practices and products by all the offices and programs will enable the Department to review the enterprise investment portfolio objectively and comparably, and to make sound planning, funding and operational decisions. Use of standardized information technology management practices and products, ones that provide accurate status measurements, will allow managers to anticipate and diagnose problems and take corrective actions. Standardized information technology management practices will also give the Department the capacity to view project status across the board and determine the condition of the IT Investment Portfolio as a whole. Use of standardized information technology management practices and products will also reduce operations and maintenance costs over the long-term. The Department will be using the ITIPS capital planning management information system and will adopt and promulgate internal standard management practices including use of ITIPS.

Guidance: An IT Systems Life Cycle Methodology (SLCM) is under development. Separate guidance will be provided when the SLCM is complete. The SLCM will provide a structured and repeatable process for developing and maintaining IT projects. The Department has acquired ITIPS and will begin implementation in the second quarter of FY99. Training will be provided to IT project managers and senior personnel in the use of the system when it is fully implemented.

**Principle 5 New or replacement information systems will be implemented only after work processes have been examined for possible simplification or reinvention.**

Rationale: The Clinger-Cohen Act requires that work processes be streamlined or otherwise redesigned prior to investing in information technology to support those processes. The emphasis is on process improvement, not just applying new technology to old processes. Work processes will be streamlined and efficient. Systems will no longer be developed using antiquated work processes. Business and work processes will be well documented and understood. Systems will be most responsive to business needs. Software will be developed with tools based on business rules. Investment proposals will include documentation of work process review and reengineering. Standard data and work process modeling tools will be adopted and required for use in this process.

Guidance: Technology enables new ways of doing business. New or redesigned systems should support work processes that have been simplified or otherwise redesigned to reduce costs and improve effectiveness while making best use of technology. When program requirements change, or when we become aware of technology capabilities that did not previously exist, we need to reexamine business needs for efficiency, effectiveness, and for maximum accomplishment of the goals and objectives of the Department Strategic and Annual Plans, and of these IT Architecture Principles. Project managers are required to document this reexamination in IT investment proposals (at budget time) and show evidence as projects get underway that work processes have been reengineered. A set of standard process analysis tools will be adopted by the Department at which time it should be used for documenting reengineered data flows and work processes (see Principle 3). The Department's revised Systems Life Cycle Guidance, to be updated in Fiscal Year 1999, will give specific guidance for these activities.

**Principle 6 Applications and infrastructure components will be designed and implemented to facilitate monitoring and measurement.**

Rationale: To assure an appropriate return on IT investments, ED must be able to measure the performance of these investments, consistent with the Government Performance and Results Act, the Paperwork Reduction Act and the Clinger-Cohen Act. Consistent business management information will result in better investment management decisions, thus better returns on investment. The ITIPS standard IT project management information system will provide access to comparable data and analyses for all IT projects, both for initial and ongoing IT investment decision-making. Project monitoring and reporting will help business and IT managers prevent cost overruns, project delays, and system failures.

Guidance: Project managers will be required to prepare business case information for proposals for funding by the ITIRB. This information will be collected and maintained in the ITIPS project management system. ITIPS is designed to track progress regarding schedule, costs, and progress toward benchmarks during the project life cycle. Major IT projects with deviations exceeding 10% will require special reports to the ITIRB, including descriptions of corrective actions planned, underway, or already taken.

**Principle 7 Acquisition strategies will appropriately allocate risk and effectively use competition, and will be performance-based.**

Rationale: In order for the agency itself to focus on results and meet or exceed its performance objectives, it is critical that the resources ED needs to acquire from the private sector are competitive and represent the best value. Performance based contracts will help the Department focus on outcomes which meet specific measurable objectives. In this manner, scarce personnel resources can be relieved of having to direct minute, individual tasks, that in and of themselves may not have much value, by placing responsibility on contractors to deliver agreed upon results with minimal staff intervention. Best value investments will result by competitively seeking commercial solutions. By holding contractors accountable for the quality of their performances, ED can reward good performances and assure the contractor bears appropriate negative consequences for bad performance.

Guidance: Early in the process, project managers should refer to the IPO acquisition planning guide which gives directions for constructing performance based contracts. In the IT investment business case presentation to the ITIRB, plans for performance based contracts should be specified, with descriptions of how risk is being allocated and competition effectively used.

**Principle 8 To achieve open systems, accepted industry and government standards will be adopted for all ED systems, unless waived by the Secretary under extraordinary circumstances.**

Rationale: Accepted industry and government standards encourage vendor-neutrality. Use of standards based products supports open systems, re-use of standard components, cross-functional systems, and transportability between host locations and service support providers. This will lead to reduced use of high cost custom developed and maintained systems and reduced reliance on outdated, difficult to replace, incompatible legacy systems. Open systems can be maintained and sustained at optimal levels over long periods of time. Their use will increase opportunity for data sharing. Open systems supports the ability to utilize current market tested commercial products and implement commercially available upgrades upon release. The result should be improved opportunities for interacting with the education community and ED business partners.

Guidance: Standards based products appropriate for use in the Department environment are defined in the OSFAP Technical Reference Model. The products that the Department will centrally support are specified in the Product Review Plan. The order of priority for selection of products for a new or renovated system is to select products listed in the Level One support category in the Product Support Plan. If appropriate products are not found there, select a product identified in the OSFAP Technical Reference Model. A proposal can be made to the Technical Review Group for addition of the proposed product to the Product Support Plan. Only in the most extraordinary circumstance is it acceptable to use a product not found in either source. In such a case the office proposing a deviation from the policy will have to submit a strong business case justifying exemption from the policy. Such a request will be submitted to the ITIRB which will review the case and act on the Secretary's behalf. See guidance under Principle 13.

**Principle 9 Vendor independence will be promoted through the use of non-proprietary specifications and interchangeable components.**

Rationale: Independence from computing and network platform vendors supports modular system development and the achievement of the best return on ED IT investments. The agency will be less vulnerable to being held hostage to complex proprietary systems. Competition from technology service providers will improve. Components can be more easily replaced, whether because of reaching ends of useful lives, incorporating new capabilities, or failing to meet expectations.

Guidance: It is important to protect current investments for future usefulness by adhering to this Principle. Vendor independence is achieved through the use of standards based products. The guidance found under Principle 8, Principle 13, and Principle 20 applies in this case as well.

**Principle 10 When most cost-effective and beneficial, systems and components of systems will be implemented using commercial off-the-shelf (COTS) and Government off –the-shelf (GOTS) products.**

Rationale: The use of COTS and GOTS products in a standards-based environment is potentially more cost-effective and efficient than other approaches because of reduced development, implementation, maintenance, and training costs. Buying existing commercial services may provide the best value solution for parts of work processes. Moving from customized solutions will significantly reduce costs for development and maintenance. Use of commercial services in lieu of owned services may yield considerable savings. The use of COTS solutions offers promise of reduced development time, increased development productivity and improved system quality. Marketplace competition leads to alternative sourcing for many technologies.

Guidance: Use of COTS and GOTS has long been advocated by procurement guidance. More recently it has become part of the specific guidance issued by OMB. The purpose is to move away as completely as possible from custom-designed solutions which have historically been expensive to build and particularly costly to maintain. The use of off-the-shelf products, which may be modified to meet the specific needs of the requirement if necessary, reduces the risk of higher costs and riskier solutions. In addition to giving preference to using off-the-shelf products, preference should be given to acquiring sources to perform the function outside the agency or even outside the government. Project managers are required to demonstrate that their proposed solutions have considered both outsourcing the service and using off-the-shelf products in their business case presentations to the ITIRB.

**Principle 11 ED will support a common network environment using a standard set of protocols to interconnect workstations, computers, and communications devices and provide such services as file transfer, electronic mail, directory management, and network management.**

Rationale: Network connectivity is essential for linking Department employees with each other and with their partners and customers. The communications and information sharing capabilities provided by networks are critical for empowering staff, improving productivity, and meeting customer needs. Communications among staff and with customers will be easier and faster. Staff productivity and efficiency will improve. Customer services will be more responsive to customer needs. Divestiture of non-compliant devices will result in support cost savings. A common network operating environment will support scalability to meet future requirements.

Guidance: Network devices are acquired, managed and maintained by the OCIO. Other Principal Offices do not directly participate in this process. OCIO proposals regarding major changes to the network that impact the services provided to the desktop will be reviewed with Principal Office representatives and, if appropriate, brought to the ITIRB for action. Because most applications or systems in the Department depend on the network for their operations, any new system must receive network certification before it may become operational. The OCIO provides the certification services and will be pleased to advise systems designers early in the development process in order to assure a successful certification process. Project managers should seek the OCIO's Technology Center's involvement early in the project design phase. This will allow OCIO to review capacity and be sure the network has the capability to support the new system.

**Principle 12 Applications will present a consistent user interface that meets ED standards for accessibility.**

Rationale: A consistent user interface can improve user productivity by supporting integrated use of applications. A consistent user interface also facilitates training staff on how to use new applications. Ease of use will improve productivity. Training will be less costly and time consuming. Staff will intuitively learn new applications. Persons with disabilities will be able to use all applications. Applications using interfaces shared by ED partners (e.g. web browsers) will be more readily accepted and widely used. And a consistent user interface promotes application portability and facilitates development of future applications.

Guidance: The Department standard user interface must be fully accessible to the disabled. OCIO supports a Technology Center in which products are tested for accessibility and technical assistance is available for any Department system developer. Project managers may call the Technology Center for technical assistance and testing services.

**Principle 13 Reduce integration and complexity. Select open standards based products, tools, designs, applications, and methods to reduce integration and infrastructure complexity.**

Rationale: To achieve open systems, standards-based products are required. The use of standard interfaces and products that adhere to open standards will help reduce the complexity associated with the IT environment. Use of open standards-based products reduces the need to develop custom solutions to make components interoperable, thus reducing time and cost of developing and supporting new systems and upgrades. Costs associated with help desk support, training and total cost of ownership can also be reduced through the reduction in the complexity of the information infrastructure. Less complex structures and better integration means easier information access and sharing, encouraging use of the resources. Risks associated with system implementation and upgrades will be reduced. Applications will behave in a logically consistent manner across user environments.

Guidance: Many open standards based products are available but there are several significant information technology areas where there is not yet agreement on the standard. The OSFAP Technical Review Model lists the open standards products that meet the Department's requirements. The Product Support Plan further refines that list for most product categories to identify those products for which the Department provides centralized support services. Project managers should assure that open standards requirements are understood from a project's initial concept of operations and that developers are fully aware of the open standards requirement. If a product is being proposed that is not on the Product Support Plan, project managers may propose inclusion to the Technical Review Board. If the Technical Review Board recommends against central support to the proposed new product, the sponsoring office either should not further consider using the product or make a business case for separately supporting this product for this particular application. The sponsoring office should develop a business case for the Technical Review Board and, if large enough an investment, for the ITIRB to consider as an exception. See guidance under Principle 8.

**Principle 14 Data processing resources (hardware, software, and data) will be shared by all users who require the services of those resources.**

Rationale: Many information technology resources, especially computing platforms and storage, can be shared efficiently. Traditional work patterns called for dedicated resources for applications, resulting in inefficient use of the resources. Fewer resources will be easier to manage. Maintenance and support costs will reduce over time.

Guidance: The Department is moving from a stove-piped operational structure used to having dedicated resources to a shared resource environment. While this is still a process in transition, every effort should be made to consider sharing resources. This applies not only to hardware items such as servers, but also, and most significantly, to data. Project managers should consult OCIO about resource requirements early in a system development or reengineering process. OCIO will facilitate resource sharing activities.

**Principle 15 Data will be entered once, and only once, as close to its source as possible.**

Rationale: Data collection burdens for both the Department and its customers will be reduced. Collecting data once at its source reduces multiple copies of information that characterize existing ED databases. The level of effort for managing data will be reduced. Duplicate and inconsistent database copies will be eliminated. Reliable information will result. Redundancies in collection, storage, processing, and dissemination of data will be eliminated. Costs will be reduced in the long term. Collection burdens on the customer will be reduced.

Guidance: Collective, inter-Principal Office initiatives are encouraged to accomplish this objective. The K-12 Auditing, Monitoring, and Technical Assistance Project is an example of a significant step toward reducing data redundancy and applying the principle. Use of the Web for data collection and update is encouraged. Project managers are encouraged to consult with the Data Coordination Committee for data collection consolidation efforts; with the Internet Working Group for Web based data collection and update efforts; and with the OCIO for assistance in conceptualizing and proposing solutions that will honor this principle.

**Principle 16 Applications will be based on object-oriented design and structure, in which objects encapsulate data structures and present a functional interface to application logic.**

Rationale: Objects create a functional interface to data elements and permit developers to modify access methods and underlying data structures independent of the application. Object-oriented design supports re-use of objects across many applications and improves flexibility. Object-oriented design supports the reuse of application components in the development and maintenance of systems. It speeds development and modification and improves flexibility. Objects utilize data encapsulation and permit developers to modify the underlying data structures and methods independent of the interface to the object.

Guidance: Object-oriented design should be given consideration in the undertaking of an IT project. Guidance for this principle is beyond the scope of this document.

**Principle 17 Applications will be event-driven, employing a real-time processing methodology versus batch processing.**

Rationale: Real-time event processing supports rapid response to business events and an up-to-date data environment. Real-time event processing is essential to 7 days a week and 24 hours a day operations, ensuring that customers have access to current data on an as-needed basis.

Guidance: More and more of the applications supporting work within the Department as well as applications supporting services to our customers will be based on web technology and will be interactive in nature. To the extent that such a solution is feasible its use is encouraged and highly recommended. Event-driven real-time processing methods should be used; batch processing should not be used unless a compelling business case can justify its use.

**Principle 18 New systems will be designed to be flexible enough to evolve with changing business, functional, and technology requirements.**

Rationale: Periodic re-engineering of ED work processes, new programmatic demands, and the rapid pace of technological change require IT systems that can adapt to new demands. Flexible systems based on industry-accepted open standards and modular components facilitate change to meet new requirements and accommodate technology options. Modular components reduce risk by limiting scope of investment while providing functionality.

Guidance: Project managers are expected to plan system development or renovation on a modular basis, in addition to planning systems that are standards-based. OMB guidance directs that projects be implemented in phased, successive chunks as narrow in scope and brief in duration as practicable, each of which solves a specific part of an overall mission problem and delivers a measurable net benefit independent of future chunks. In the business case proposal brought to the ITIRB, description of how the project is modularized must be clearly presented, and performance goals, costs and schedules in place for individual modules.

## **Principle 19 Applications will be portable and scalable.**

Rationale: Portability and scalability of applications will assure that technological upgrade and change can be carried out with a minimum of risk and disruption to operations. By making applications portable they can be moved from one platform to another with minimum change, thus allowing opportunities for technological change and upgrade. By making applications scalable they can be adjusted for size without incurring additional costs of redevelopment, thus supporting responses to program and requirements growth. Many existing applications are neither portable nor scalable..

Guidance: Changing existing applications to meet this principle will require significant initial investment and may not give back a significant return on the investment. Because portability and scalability provide a future return on the current investment, often depending upon unknown future conditions, it may be difficult for program managers to understand the need for applying this principle. The effort taken now will, however, make future system changes and upgrades significantly easier and less costly than converting today's systems. Applying this principle along with the other principles, such as those about standards based products and open systems, will assure a future environment that can be more easily kept current and upgraded than is the case today.

**Principle 20 Information systems will be designed and implemented using standards-compliant system components.**

Rationale: Use of standards-based components supports incremental acquisition of systems, as required by the Clinger-Cohen Act. It assures that new and redesigned systems will be open, that is they will be upgradable because old components can be replaced with new improved components that use the same standard interfaces, thus assuring continuing functionality. Standards-based components, using supported standards-compliant products, will keep product support costs manageable. Significant time will be saved when selecting products for system design and implementation.

Guidance: This principle also relates to the several other principles that speak to use of standards based products, modularized system design, and use of standard interfaces. The component concept allows future system upgrade and modernization to be undertaken in parts as needed, keeping down future costs. As with all these principles, project managers should apply this principle in planning and design phases, and should address it when evaluating alternatives and presenting a business case to the ITIRB.

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**Principle 21 ED will implement cross-functional systems that take advantage of common software modules that may be shared and reused for similar business functions.**

Rationale: Many ED offices share common work processes with similar information requirements (*e.g.* announcing competitions, processing applications, making grant awards) and may be able to reuse applications, data, and related information technology across the Department. Common software modules may be reused for similar functions. OCIO will support a library of shared common software modules accessible to business and IT managers. Systems based on standard software modules can be implemented faster and with better quality than systems based on newly designed components. An enterprise-wide, cross-functional review will identify similar functions, thus eliminating duplicative design and development activities. Office work processes will need to be re-engineered to support common functions and common software module usage; efficiencies may be expected as a result.

Guidance: When seeking automated solutions to work requirements, project managers are encouraged to seek out other offices with similar requirements and see if automated solutions exist that could be shared or jointly upgraded. Many departmental offices have similar functions, but differ mainly in subject matter. These offices are candidates for sharing software modules or even of developing shared solutions to similar requirements. The Data Coordination Committee may be consulted for assessing shared requirements. OCIO is prepared to offer technical assistance.

**Principle 22 Applications and information technology assets that are common to multiple mission areas will be centrally developed or acquired.**

Rationale: Because many ED offices share common work practices with similar information requirements, central acquisition or development of applications and information technology assets that are common to multiple mission areas will provide the Department economies of scale advantages and will reduce the risk of redundancy and unnecessary support resources. Central management of development or acquisition of applications and information assets will provide the Department with economies of scale efficiencies. Central management will ease the cost burden for license management, support services, and maintenance of applications.

Guidance: The OCIO office now centrally manages the network and the devices attached to it. OCIO also provides services to support enterprise wide applications such as the Internet or the ConnectED intranet. OCFO likewise centrally supports EDCAPS the Department's integrated financial services and grants management system. The Product Support Plan sets forth guidance about what items are centrally supported. Replacement of PCs to meet Year 2000 compliance requirements were centrally acquired, setting a new precedent for the Department.

**Principle 23 Standardized information system tools will be used for systems design, development, and configuration management.**

Rationale: Standardized system analysis, design, and development tools will help IT managers create a consistent and repeatable systems development life cycle, resulting in a predictable and efficient process that will improve over time. Standard computer assisted software engineering (CASE) tools will support enterprise information repositories, including data definitions, work process definitions, functional modules, and component development. Department ownership, control, and management of the primary repository will assure compliance with the standards by contractors. An eventual standardized development environment will result in long-term cost savings and elimination of redundancies in data management and systems design. Standard tools will ensure continuity in the systems development life cycle across contractor transitions. Contractors will be required to use the standard ED tools rather than their own preferred tools although this may reduce competition for development work.

Guidance: OSFAP is selecting a standard tool set for systems analysis, design and development. Once selected, OSFAP project managers will be required to use these tools in the specified activities. The remainder of the enterprise has not yet embarked on a standard tool selection process. Project managers are advised to use the same tool set adopted by OSFAP until an enterprise selection is made. It is likely to be the same tool set, however.

**Principle 24 Security policies and practices will be consistently implemented across ED systems.**

Rationale: ED applications and data must be readily available and accessible to authorized users without compromising the security, integrity, and confidentiality of those systems and data -- particularly for data on individuals and financial information. Enterprise-wide policies and standards for security will apply. Security policies and standards will be reviewed in terms of the ITA, published, promulgated, and kept current. Staff will be aware of and practice security and privacy policies. Security policy practices will be systematically assessed and policies and standards enforced. Local security officers will be fully aware of applicable enterprise wide security policies and standards. Security policies and standards will be enforced locally. Security of equipment, data and intellectual property will be improved. Expenses associated with equipment loss and theft will be reduced.

Guidance: Security guidance for executives, managers, users and those who maintain and operate the Department's information technology, government or contractor is found in the Department's IT Security Manual. The manual is located, along with other reference documents, on the OCIO Intranet and can be downloaded or reviewed at any time. In addition, each Principal Office has a Computer Security Officer to assist personnel and manage the IT Security Program within their area of responsibility. A list of those officers is also published on the OCIO Intranet. At the local level a System Security Officer has been assigned to each IT system. To ensure awareness of security needs and practices, a training course has been developed that will be provided over the Intranet to every desktop. This training course will be mandatory for all personnel and will be used during new employee indoctrination to ensure everyone is aware of their responsibilities to the security of the Department's vital IT resources.

**Principle 25 Data is a Department asset and does not belong to any particular office, program, or individual.**

Rationale: Data is a strategic asset to be shared and easily accessed across the Department X and with customers and partners X to support better customer service and management decision making. This requires a shift in ED culture regarding data from Aownership≅ to Astewardship,≅ which includes responsibility for the accuracy, timeliness, and integrity of data without any proprietary restriction on its use. Enterprise-wide standards governing the availability, accessibility, and security of ED data will be the responsibility of the Department data oversight body. Data management owners will follow an established change management process and will notify all affected parties when changes are made to the data. The needs of the Department as a whole will be considered in every collection, creation, storage, processing, and dissemination activity. Data and thus information will be reliable. Customers will receive faster and better quality service. The data management process will need to be thoroughly revamped and a new data management structure implemented.

Guidance: The Chief Information Officer is responsible for managing information throughout the Department and is assisted by the Data Coordination Committee which is made up of information officers from the Principal Offices. The Information Management Group in the Office of the Chief Information Officer is responsible for assisting the program offices in maximizing the utility of their information while minimizing the paperwork burden on the public. See guidance under Principle 26 below.

**Principle 26 ED data will conform to a standardized set of data elements and definitions.**

Rationale: Effective information sharing and exchange depends on a shared definition of standard data elements throughout the Department. To support program decision making, the timeliness and integrity of each data element should meet the information needs of the most demanding Department user. ED data definitions should be consistent with definitions used by the Department's suppliers of information, the customers who use that information, and all applicable standards (e.g. Federal, national, international). Definitions included in laws and regulations will be clearly stated and, if possible, will reflect the most useful common definition. Collaboration among program and appropriate staff offices will result in clearly defined information and data needs. Redundant data collection, storage, processing, and dissemination will be eliminated. Information will be more easily exchanged and shared with customers and constituents using data standards.

Guidance: Program offices, when developing their data collection instruments, will use the Education Department's Information Collection System (EDICS) to determine what information is currently being collected and the definitions that are currently being used. These definitions constitute the emerging departmental standard definitions. Justification is required for establishing a new definition. Data definitions used by the Department of Education will always be those used by the stewards of the education information, at its original source. The National Center for Education Statistics Student Data Handbook contains data whose definition has been standardized. The process is ongoing.