

Commonwealth of Virginia



Information Technology Resource Management Policy

Open Systems Environment (OSE)

Preface

PUBLICATION DESIGNATION

COV ITRM Policy 96-1.

SUBJECT

Open systems environment.

EFFECTIVE DATE

May 24, 1996.

SCHEDULED CIM REVIEW

One (1) year from effective date.

AUTHORITY

Code of Virginia, § 2.1-563.31 (Powers and Duties of the Council on Information Management).

SCOPE

This policy is applicable to all State agencies and institutions of higher education (hereinafter collectively referred to as "State agencies") that are engaged in such functions as planning, managing, developing, purchasing, and using information technology resources in the Commonwealth.

PURPOSE

To establish direction and a conceptual framework for developing standards and guidelines to move the Commonwealth's information technology infrastructure to a more open systems environment.

OBJECTIVES

Establish an information technology infrastructure that will:

- Improve user productivity;
- Improve applications systems efficiency;
- Improve applications portability and scalability;
- Improve interoperability across applications;
- Promote vendor independence;
- Reduce applications life cycle costs; and
- Improve security across applications and missions.

DEFINITIONS

Interoperability—The ability to communicate, execute programs or transfer data among various computing environments in a manner that requires the users to have little or no knowledge of the unique characteristics of those environments.

Open Systems Environment (OSE)—An OSE is a computing environment that supports interoperable, portable, and scalable applications through standard services, interfaces, data formats, and protocols. The standards defining these elements may consist of international, national, industry, or de facto specifications that are available to any user or vendor for use in building systems and products that meet OSE criteria.

Portability—The ability to transfer data or applications software from one computer environment to another without being required to recreate or re-enter data descriptions or significantly modify the application being transferred.

Scalability—The ability to move application software source code and data into systems and environments that have a variety of performance characteristics and capabilities without significant modification. The concept extends portability to various scales of operating environments, such as local area networks versus wide area networks, distributed databases versus centralized databases, etc.

GENERAL RESPONSIBILITIES

In accordance with the *Code of Virginia*, the following provisions apply:

The Council on Information Management (CIM)

Responsible for directing the development and promulgation of policies, standards, and guidelines for managing information technology resources in the Commonwealth.

Advisory Committees

Responsible for meeting, conferring with, and advising the Council in the development of the Commonwealth's policies, standards, and guidelines for managing information technology resources.

All State Agencies

Responsible for complying with the Council's policies, standards, and guidelines for managing information technology resources in the Commonwealth.

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SECTION 1

INTRODUCTION

BACKGROUND

Information technology infrastructure includes applications, computing platforms and communications networks. In the Commonwealth, most mission critical applications are single-purpose, stand-alone systems that were developed around proprietary computing platforms using dedicated telecommunications networks. This infrastructure is becoming inflexible and extremely costly to maintain and operate.

Public and private sector organizations are moving away from stand-alone systems and proprietary computing platforms to distributed client/server computing environments that promote data sharing, accessibility of information, integrated applications and network connectivity. Cost considerations, evolving computing environments and requirements to connect users for the purpose of sharing and exchanging electronic data are promoting increased efforts to develop and implement standards based solutions that promote interoperability, portability and scalability of applications and data.

The Commonwealth must establish an information technology infrastructure that promotes the long term development of an application systems environment that is standards based, supports data sharing and permits state agencies to effectively use information technology resources to deliver services to citizens.

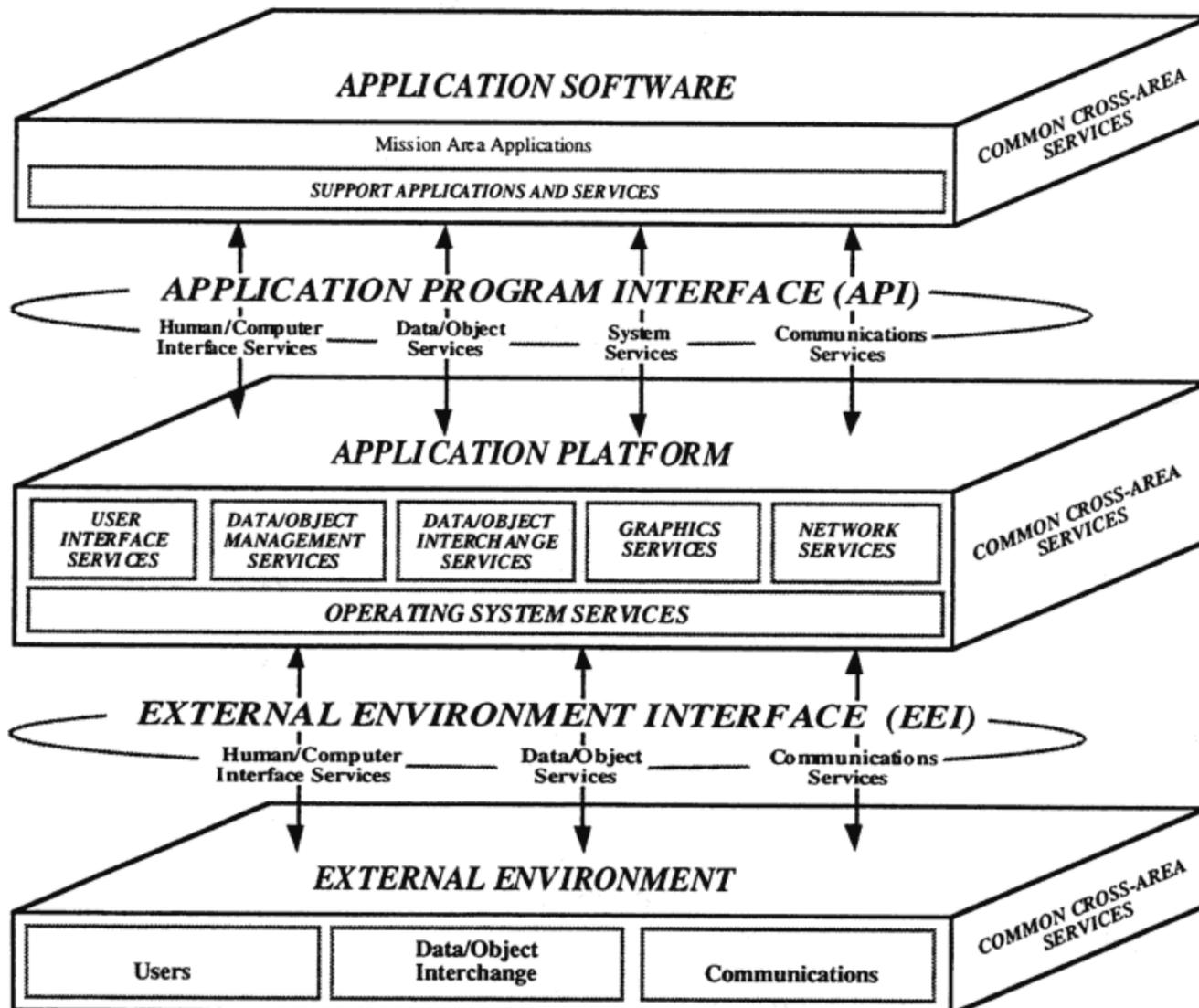
OPEN SYSTEMS ENVIRONMENT

It is the policy of the Commonwealth to seek to maximize the potential use of information technology resources to better serve the citizens of Virginia through the implementation of a more open systems environment.

The OSE Technical Reference Model shown in Figure 1 shall serve as the conceptual model for developing a standards based solution to move the Commonwealth into an open systems environment (OSE). The model establishes a common vocabulary for a set of services and interfaces common to application systems and will serve as the basis for developing the Commonwealth's OSE profile of implementable standards and guidelines.

In creating an OSE profile of standards and guidelines, it is the Commonwealth's objective to only adopt those international, national, industry or de facto standards or specifications that promote and support the acquisition or development of applications capable of executing in almost any computing environment, regardless of the hardware, software or communications networks in that environment. It is not the intent to create an OSE profile that is an all inclusive set of standards and guidelines that govern all facets of the computing environments of state agencies, but to create a profile of basic standards that improves productivity, connectivity, access to information and data sharing in a cost effective computing environment.

Figure 1
Virginia OSE Technical Reference Model (TRM)



Source: Adapted from the Texas OSE Technical Reference Model

- (1) *The TRM describes the logical relationships between components in the model--not necessarily physical relationships.*
- (2) *The TRM concept of an application platform does not imply or constrain any specific computing environment implementation beyond the basic requirement to supply services at the application program and external environment interfaces.*

OSE TECHNICAL REFERENCE MODEL

The basic elements of the technical reference model include three classes of entities and two types of interfaces.

Application Software (Entity)

Applications are divided into mission area applications and support applications and services. A common set of support applications forms the basis for the development of the mission area applications.

Mission area-specific applications support particular state agency needs (e.g., budgeting, accounting, inventory management, purchasing, personnel). The application software may

be common-off-the-shelf software, custom-developed, or a combination of these. Each application includes data (user data, reports, application parameters, screen definitions, diagnostics, etc.), documentation and training, as well as application software.

Support Applications and Services

Support applications are common applications (e.g. E-mail, word processing, spreadsheets) that can be standardized across individual or multiple mission areas. Support applications can also manage a complete processing or communications environment.

Support services provide capabilities that are used to define, acquire and develop common, shared applications. Support services include, but are not limited to, multimedia, business processing, database utilities, environment management, engineering support and communications services.

Application Program Interface (API)

The API is the interface between the application software and the application platform across which all services are provided. Its primary function is to support portability of application software. The API specifies a complete interface between the application and the underlying application platform and may be divided into human/computer interaction, data/object, system and communications services APIs.

System Services API is required to provide access to services associated with the application platform internal resources. The other three APIs are required to provide the application software with access to services associated with each of the external environment entities shown in Figure 1.

Application Platform (Entity)

The application platform is defined as the set of resources that support the services on which application software will execute. It provides services at its interfaces that make the implementation-specific characteristics of the platform transparent to the application software.

In order to ensure system integrity and consistency, application software competing for application platform resources must access all resources via service requests across the application program interface (API).

User Interface Services

User interface services define the methods by which people may interact with an application. Depending on the capabilities required by users and the applications, these interfaces may include the specifications for graphical client-server operations, display objects, window management and dialogue support services.

Data/Object Management Services

Central to most systems is the management of data that can be defined independent of the processes that create or use it, maintained indefinitely and shared among many processes. Data/object management services include, but are not limited to, data dictionary/directory

and database management systems (DBMS).

Data/Object Interchange Services

Data/object interchange services provide specialized support for the exchange of data and objects between applications on the same or different (heterogeneous) platforms. These services include, but are not limited to, document, graphics data, product data and electronic data interchange services.

Graphics Services

Graphics services provide functions required for creating and manipulating displayed images. These services include, but are not limited to, display element definition and management and image attribute definition services.

Network Services

Network services provide the capabilities and mechanisms to support distributed applications requiring data access and applications interoperability in heterogeneous, networked environments. These services include, but are not limited to, data communications, transparent file access and personal/micro computer support services.

Operating Systems Services

Operating systems services are the core services needed to operate and administer the application platform and provide an interface between application software and the platform.

External Environment Interface (EEI)

The EEI is the interface between the application platform and the external environment across which data and objects are exchanged. Consisting chiefly of protocols and supporting data formats, the EEI supports interoperability to a large extent. The EEI specifies a complete interface between the application platform and the underlying external environment and may be divided into human/computer interaction, data/object and communications services.

- The human/computer interaction services EEI is the boundary across which physical interaction between the human being and the application platform takes place. Standardization at this interface will allow users to access the services of compliant systems without costly retraining.
- The data/object services EEI defines a boundary across which external, persistent storage service is provided, where only the format and syntax are required to be specified for data portability and interoperability.
- The communications services EEI provides access to services for interaction between application software and entities external to the application platform. The services provided are those where protocol state, syntax and format all must be standardized for application interoperability.

External Environment (Entity)

The external environment contains the entities that are external to and exchange information with the application platform. These entities are classified into the general categories of human users, data/object interchange and communications. Data/object interchange entities include, for example, removable disk packs, floppy disks and security badges. Communications entities include telecommunications physical infrastructure and local area networks.

Common Cross-Area Services

Common cross-area services include software engineering, security, management and distributed computing services.

- Software engineering services provide the infrastructure to develop and maintain software.
- Security services are provided to support the secure distribution and integrity of information and to protect the computing infrastructure from unauthorized access.
- Management services provide the mechanisms to monitor and control the operation of individual applications, databases, systems, platforms, networks and user interactions with these components.
- Distributed computing services provide specialized support for applications that may be physically or logically dispersed among computer systems in a network.

These services have a direct affect on the operation of one or more of the services shown in the technical reference model. In some cases cross-area services affect each of the model's services in a similar fashion while in other cases a cross-area service has an influence that is unique to a particular service.

SECTION 2

IMPLEMENTING AN

OPEN SYSTEMS ENVIRONMENT IN VIRGINIA

The Commonwealth will migrate to an open systems environment over the next several years as state agencies develop new applications and replace aging hardware, software and application systems. Adopted OSE profile standards and guidelines will define appropriate statewide requirements, applicability and implementation criteria for the services shown in the technical reference model (Figure 1).

As the OSE profile evolves, state agencies shall develop strategies, plans and schedules to implement relevant provisions of each adopted standard and guideline. At a minimum, state agencies shall establish an internal agency profile (set of standards) with a defined implementation schedule that is consistent with the Commonwealth's OSE profile of standards and guidelines. Agency profiles should satisfy user requirements, accommodate officially recognized or de facto standards and promote interoperability, application portability and scalability by defining interfaces, services, protocols and data formats favoring the use of nonproprietary specifications.

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