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Policy No: 183.30.30-Solution Integration Design Standards
Information Services Board
ISB Standards
Version 5

Table of Contents

1. Document History

Date	Version	Editor	Change
February 3, 2006	1.0	Scott Came	Initial draft

Date	Version	Editor	Change
April 14, 2006	1.1	Scott Came	Change to standards
May 26, 2006	1.2	Scott Came	Plain talk / usability edits
June 9, 2006	1.3	Scott Came	Change to guidelines
June 14, 2006	2.0	Scott Came	Endorsed by EAC
September 14, 2006	4.0	Scott Came	Adopted by ISB
October 25, 2006	4.1	Trina Regan	Change guidelines to standards Endorsed by EAC
November 9, 2006	5	Paul Douglas	Adopted by ISB as Standards

2. Document Context

This document currently has ISB Standards status. This status signifies that the document was adopted as standards by a vote of the Information Services Board. For more information about the ISB Enterprise Architecture Committee and its initiative, please visit the EA Committee website at: http://isb.wa.gov/committees/enterprise/Default.aspx.

3. Description and Purpose

System designers, implementers, and purchases must use the Solution Integration Design Standards in this document on the following decisions:

- When purchasing a solution, what design qualities would improve the ability to integrate the solution with existing and future systems?
- When designing and building a software system internally, how should implementation teams design the system to improve the ability to integrate it with existing and future systems?

3.1. Summary of Standards

These standards are for the design of information systems that have (or are likely to have) interfaces to other systems across the state enterprise:

Systems that make functionality or information available to other systems shall do so through a software interface that is separate from the system's user interface.

Systems that use functionality or information provided by other systems shall access that functionality or information in a way that minimizes dependencies on those other systems' implementation details.

Integration interfaces between systems shall be based on open industry standards, though the implementations of the systems themselves need not be based on open industry standards (note specific definition of the term "open industry standards" in section 5.1.3).

4. Compliance Component Information

This section includes key information that is required for all compliance components in the architecture.

4.1. Basic Component Metadata

Component Identifier:

Adoption Date:

Effective Date:

4.2. Statutory Authority

Not yet assigned Not yet Determined Not yet Determined

The provisions of RCW 43.105.041 detail the powers and duties of the Information Services Board (ISB), including the authority to develop statewide or interagency information services and technical policies, standards, and procedures.

4.3. Scope

These standards apply to executive and judicial branch agencies and educational institutions. Academic and research applications at institutions of higher education are exempted.

In this document, the terms "state agency" and "agency" mean any agency or institution within the scope of the previous paragraph, and the term "state enterprise" means all agencies and institutions (collectively) within the scope of the previous paragraph.

Starting November 9, 2006, the Integration Architecture Standards will govern the planning and construction of all applications that share data with other agencies.

Exemption requests must be submitted to DIS MOSTD and will be forwarded to the ISB for decision. Applications existing or under construction as of November 9, 2006, are not required

to immediately comply, but will be required to comply when redesigned or replaced.

4.4. Relationship to Other Components, Policies, Standards, or Guidelines

None.

5. Solution Integration Design Standards

This section includes the Solution Design Standards and the rationale behind them.

5.1. Standards

A STATEWIDE INTEGRATED SYSTEM is any information system that agencies can use in one or more of the following ways:

To connect to, interface with, or use the functionality of one or more information system(s) provided by agencies other than the agency in which it resides (such a system is called a CONSUMER SYSTEM)

To provide functionality to one or more information system(s) in agencies other than the agency in which it resides (such a system is called a PROVIDER SYSTEM) Information systems are statewide integrated systems if they do not currently have these characteristics, but are likely to have these characteristics in the future. Designers and purchasers of information systems should recognize that most systems eventually become consumer systems or provider systems (or both), even if the initial set of system requirements do not include integration requirements.

State agencies that are building and maintaining or purchasing (with or without modification) statewide integrated systems shall incorporate the following design characteristics.

5.1.1. Provider system functionality shall be accessible through separate software interfaces

Most software systems have a graphical user interface, consisting of screens, windows, forms, and reports that provide human users with access to the system's functionality. The user interface is the part of the system that users actually see, and with which they interact.

Designs for provider systems shall provide access to the system's functionality through one or more software interfaces that are separate and distinct from the system's user interface. The system designer or vendor shall provide thorough and complete documentation of all software interfaces.

This standard does not require that every function of an information system be available through
a separate software interface. Only those functions that are used (or are likely to be used in the
future) by a consumer system must be available through an interface.

Many system designers and vendors label a system's set of software interfaces as an Application
Programming Interface (API). An API that represents a set of open software interfaces, as defined in section 5.1.3 below, satisfies the terms of this standard.

Agencies that purchase a software system from a commercial vendor shall verify that the

purchase agreement includes clear terms and conditions governing the use of separate software
interfaces. System vendors shall be familiar with interface-based integration requirements and shall have a licensing model to accommodate them.

System designers may provide software interfaces through the use of "adapters." An adapter is a
software component, supplied either by a system vendor or a third party, that translates a system's native, closed, or vendor-proprietary interface into an open software interface (as defined in section 5.1.3). An adapter-based design satisfies the terms of this standard. However,
the selection of an adapter component often depends on the enterprise integration infrastructure
(such as middleware) being used to integrate systems. Consequently, when selecting adapter components, decision-makers shall consult integration infrastructure standards in the statewide
Enterprise Architecture to ensure that the components will fit within that infrastructure.

5.1.2. Consumer systems shall be insulated from changes in provider systems' implementation System designers shall design consumer systems in such a way as to minimize direct dependency on the implementation details of provider systems. This allows the agency that hosts a provider system to change its implementation at will, without requiring consumer system owners to redesign or re-implement their systems.

If an agency makes its provider system functionality accessible through separate software interfaces (as described in section 5.1.1), then consumer systems must access that provider system functionality through those interfaces only.

If an agency's provider system does not offer a separate software interface, then designers of consumer systems must include an internal interface (within the consumer system) through which all consumer system interaction with the provider system takes place.

5.1.3. Software interfaces shall conform to open industry standards
Designers of software interfaces to provider system functionality shall ensure that those interfaces conform to open industry standards.

An "open industry standard" is a standard that has been:

Developed and adopted by a standards development organization, participation in which is permitted for any organization (commercial or otherwise) that wishes to contribute

Developed through a process that makes discussions, deliberations, and decisions about the content of the standard available to the public

Implemented by at least two separate commercial vendors, or implemented in a solution that is available to the public under an open source license, or both (an "open source license" is a license approved by the Open Source Initiative (http://www.opensource.org/licenses/)).

Note that this standard applies only to interfaces, not system implementation techniques or technologies. It is common for a system implementer or vendor to implement a system using technologies that do not conform to open industry standards (as defined above), yet still offer interfaces into the system that do conform to open industry standards. Such a system would

conform to this standard. Systems implemented by agencies on the Microsoft .NET and Java 2 platforms align with this standard if the separate software interfaces conform to open industry standards, as defined above.

Packaged software solutions (such as Enterprise Resource Planning (ERP) solutions) align with this standard if the separate software interfaces conform to open industry standards, as defined above.

There is nothing inherent in these technologies or solutions that prevent systems that use them from aligning with this standard.

Interfaces that do not satisfy these criteria shall still be considered conformant to open industry standards if they are based on technical implementation techniques (such as programming languages or platforms) commonly in use in state agencies.

5.2. Rationale

The rationale for these standards is that they improve alignment of information systems investments with the emerging statewide integration architecture and with the over-arching enterprise architecture principles adopted by the Information Services Board.

5.2.1. Alignment with Statewide Integration Architecture
The Integration Architecture Initiative of the Enterprise Architecture Committee (EAC) has endorsed a statewide technical reference architecture for integration (see [CITRA]), which will be presented to the Information Services Board (ISB) for consideration for adoption. The EAC intends for this architecture to guide agencies' solution/system design and investment decisions to minimize the cost and risk and maximize the effectiveness of systems integration.

The conceptual integration architecture calls for a "service-oriented" approach to systems integration. This approach views provider systems as capabilities that agencies offer to their partners' consumer systems through service interfaces. The extent to which statewide integrated systems conform to the standards above will determine the degree to which those systems can be used as services. The availability of a separate software interface to a provider system demonstrates an intent on the part of the system designer to have the system participate in a broader set of scenarios than those enabled by the system's user interface.

The conceptual integration architecture also identifies, as a service design principle, that service implementations (in the form of statewide integrated systems) should minimize inter-system dependencies, in order to maximize flexibility, agility, and responsiveness to business change. The standards above align with this principle by calling for separate software interfaces to provider system functionality, and by calling for consumer systems to access the functionality in provider systems through such interfaces. The standards result in provider and consumer systems being dependent on the interface, rather than directly on each other. By encouraging separate software interfaces, the standards reduce the dependency of consumer systems on the provider system's user interface design and implementation. This is important because provider system user interfaces tend to change frequently, and often these changes are cosmetic in nature; the standards seek to prevent cosmetic user interface changes from affecting consumer system implementations.

5.2.2. Alignment with Over-Arching Enterprise Architecture Principles
The standards above will improve the alignment of statewide integrated systems with three of

the over-arching enterprise architecture principles adopted by the Information Services Board (http://isb.wa.gov/committees/enterprise/architecture/overarchingprinciples.doc): Natural Boundaries, External Linkages, and Interoperability.

5.2.2.1. Alignment with the Natural Boundaries Principle

The Natural Boundaries principle suggests that information systems should be designed around natural boundaries. In its simplest form, this principle calls for identifying groups of system functions that tend to exhibit "implementation covariance". That is, the grouping of functions within a natural boundary represents an expectation that the implementation of those functions will happen within a single system (or closely-linked group of systems) and at a single point in time.

Within a natural boundary, agencies can streamline business processes by creating tight coupling (or linking) of functions. The standards above will align system mplementations with this principle by: representing natural boundaries as interfaces allowing provisioners of provider systems the freedom to change the implementation of those systems as long as they continue to satisfy the requirements of the interface promoting the tight linking and streamlining of processes within systems, while promoting agility and flexibility between systems.

5.2.2.2. Alignment with the External Linkages Principle

The External Linkages principle suggests that information system designs should facilitate linkages with external partners. This principle relies on the definition of clearly defined interfaces for systems that have external linkages. The principle also suggests a migration to open industry standards (as defined above in section 5.1.3).

The standards above promote the definition of clear interfaces to system functionality. In fact, they extend beyond the definition of interfaces by suggesting that, at integration points, provider and consumer systems shall be dependent only on their shared interface, not on the implementation details of each other.

In addition, the standards suggest a preference for interfaces based on open industry standards (as defined above in section 5.1.3). Designing consumer and provider systems so that they are dependent on open-standard interfaces positions the state enterprise to integrate in the future with external partners who have chosen diverse service implementation paths.

5.2.2.3. Alignment with the Interoperability Principle

The Interoperability principle suggests that information system designs and implementations should facilitate the sharing of information and functionality with other systems. Interoperability generally means the definition of standards for inter-system interaction with which all participating systems are expected to comply. The selection of a standards-compliant system will provide a level of assurance that the system will "interoperate" with other compliant systems.

The standards above support this principle by encouraging integration across interfaces. Interfaces establish a clear, standard way of accessing provider system functionality. Without a focus on interfaces, integration architectures tend to promote several ways of accessing the same functionality in the same provider system, rather than a standard way of doing so. Designing and implementing a new consumer system typically involves the definition of a new integration point between the consumer and provider. The standards suggest establishing a

standard interface to provider system functionality, and integration across this interface simply becomes a required capability of each consumer.

By encouraging open industry standards-based interfaces, the standards further promote interoperability by broadening the range of tools, programming languages, and developers/integrators capable of supporting the interface

6. References

CITRA
Washington State Information Services Board, Enterprise Architecture Committee (2006). Conceptual Integration Technical Reference Architecture, Enterprise Architecture Committee Document.

Appendix A:

Documenter Team
This document was developed through the Integration Architecture enterprise architecture initiative, chartered December 14, 2005. The following individuals were members of the Documenter Team for this initiative, and participated in review of this document.

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Appendix B:

Review Log
The following feedback on this document was received by the Enterprise Architecture Program; the response to each contribution is noted below.

Review by whom and when	Contribution	Response
Documenter Team March 16, 2006	Change guidelines to standards	Incorporated into document
EA Committee May 31, 2006	Change standards to guidelines	Incorporated into document
ISB September 14, 2006	Adopted as Guidelines	Adopted and posted as Guidelines
EA Committee October 25, 2006	Added Grandfather language to Scope Changed Guidelines to Standards	Endorsed as Standards

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