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Information & Technology Standards

Government of Ontario IT Standard (GO ITS)

GO-ITS Number 56

OPS Enterprise Architecture:

Principles and Artefacts

Version 1.7

Status: Approved

Prepared under the delegated authority of the Management Board of Cabinet

Last Review Date: 2012-09-06

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Template Info

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2009-07-02	Architecture Review Board approval
2009-12-11	Updated: ▪ Version number incremented to 1.4 to synchronize with the versioning of the Corporate EA Review Requirements ▪ The following changes to the appendices are based on updates to the Corporate EA Review Requirements Guidebook approved by the Architecture Core Team/Architecture Review Board during the 2009 calendar year: ○ Appendix B ▪ Replaced version 1.3 of the Corporate EA Review Requirements Guidebook with version 1.4. ○ Appendix C ▪ Updated Section 2, Artefact/Template File Cross Reference, with minor revisions to artefact and file names. ○ Appendix D

Date	Summary
	○ Replaced templates with approved updated versions.
2010-04-16	Updated: ▪ The following changes to the appendices are based on updates to the Corporate EA Review Requirements Guidebook approved by the Architecture Core Team/Architecture Review Board during the 2010 calendar year: ○ Appendix B ▪ Replaced version 1.4 of the Corporate EA Review Requirements Guidebook with version 1.5. ○ Appendix C ▪ Updated Section 2, Artefact/Template File Cross Reference, with minor revisions to artefact and file names. ○ Appendix D ▪ Replaced templates with approved updated versions.
2011-06	Updated: ▪ Replace all references to the Office of the Corporate Chief Technology Officer (OCCTO) and its intranet site with references to the I&IT Innovation, Controllership and Strategy Division (ICS). ▪ The following changes to the appendices are based on updates to the Corporate EA Review Requirements Guidebook approved by the Architecture Core Team/Architecture Review Board during the 2011 ▪ 1 calendar year: ○ Appendix B ▪ Replaced version 1.5 of the Corporate EA Review Requirements Guidebook with version 1.6. ○ Appendix C ▪ Updated Section 2, Artefact/Template File Cross Reference, with minor revisions to artefact and file names. ○ Appendix D ▪ Replaced templates with approved updated versions
2012-06	Updated: • Improved instructions in the following templates: ○ Application-Inventory.dot ○ Application-Usage-Pattern.dot ○ Disaster-Recovery-View.dot ○ Infrastructure-Usage-Pattern.dot ○ Logical-Application-Deployment-Model.dot ○ Logical-Application-Design-Document.dot ○ Logical-Operating-Schedule-and-States.dot ○ Physical-Application-Design-Document.dot ○ Physical-Deployment-Model.dot ○ Quality-Level-Metrics.dot ○ SOA-Application-Service-Model.dot

Date	Summary
	○ Solution-Pattern-Match.dot ○ Supplementary-Specification.dot ○ System-Functional-Requirements.dot • Enhanced security requirements displayed in the following examples: ○ logical-deployment-component-diagram-model-example.doc ○ logical-deployment-location-diagram-model-example.doc ○ physical-deployment-model-example.doc
2012-09-06	Approved: I&T Executive Leadership Council (ITELC)

Table of Contents

1. Foreword

Government of Ontario Information Technology Standards (GO ITS) are the official publications on the IT standards adopted by the Ministry of Government Services for use across the government's IT infrastructure.

These publications support the responsibilities of the Ministry of Government Services (MGS) for coordinating standardization of Information & Information Technology (I&IT) in the Government of Ontario.

In particular, GO ITS describe where the application of a standard is mandatory and specify any qualifications governing the implementation of standards.

2. Introduction

2.1. Background and Rationale

The I&IT Strategy, as approved by Cabinet in February 1998, initiated a project to establish an OPS *Enterprise Information and Information Technology Architecture* (the "EIA Project"). This was to be a business driven, top-down, government-wide architecture providing a framework and foundation for the information and information technology strategy infrastructure projects, the major business initiatives and other ministry activities. It was also to serve as a management tool to coordinate infrastructure initiatives across government and to gauge the impact of emerging technologies.

The EIA project established an OPS Enterprise Architecture practice (EA practice), as well as review and governance processes. The EA practice and processes have evolved over time through very broad OPS consultation and senior management approval mechanisms (see Section 3, "Compliance Requirements" below for further information).

As part of the EA practice, I&IT projects generate architectural work products called "artefacts". Projects often use external consultants to create these. Also, vendors of IT products and services to the OPS will often need to understand requirements and facets of OPS systems design as expressed in EA artefact format.

Therefore, the purpose of this standard is to take key parts of existing authoritative OPS EA practice and encapsulate it in GO-ITS format in order to:

- Improve EA artefact visibility to external parties (as well as internally to the OPS);
- Enhance vendor understanding of, and compliance with, the OPS EA practice;
- Strengthen the management of EA artefact change by engaging the GO-ITS standards process.

2.2. Target Audience

Applies to all Government of Ontario ministries and advisory and adjudicative agencies subjected to the Management and Use of Information & Information Technology (I&IT) Directive.

2.3. Scope

2.3.1. In Scope

OPS Enterprise Architecture:

- Deliverable definitions and templates
- Review and governance processes for OPS Enterprise Architecture

2.3.2. Out of Scope

Development of solution

Operation of solution

2.4. Applicability Statements

2.4.1. Organization

All ministries, advisory and adjudicative agencies and clusters are subject to Government of Ontario IT Standards.

All other agencies that are using OPS information and information technology products or services are required to comply with Government of Ontario IT standards if they are subject to either the *Management and Use of I& IT Directive* OR Government of Ontario IT Standards by Memorandum of Understanding.

As new GO IT standards are approved, they are deemed mandatory on a go-forward basis (Go-forward basis means at the next available project development or procurement opportunity).

When implementing or adopting any Government of Ontario IT standards or IT standards updates, ministries, I&IT Clusters and applicable agencies must follow their organization's pre-approved policies and practices for ensuring that adequate change control, change management and risk mitigation mechanisms are in place and employed. For the purposes of this document, any reference to ministries or the Government includes applicable agencies.

2.5. Roles and Responsibilities

2.5.1. Contact Information

Accountable Role:
Title: Assistant Head Architect, I&IT Controllership Branch
Ministry/Cluster: Ministry of Government Services
Division: I&IT Innovation, Controllership and Strategy

Responsible Organization:
Ministry/Cluster: Ministry of Government Services
Division: I&IT Innovation, Controllership and Strategy
Branch: I&IT Controllership

Support Role (Editor):
Ministry/Cluster: Ministry of Government Services

Division: I&IT Innovation, Controllership and Strategy
Branch: Strategy, Policy and Planning
Job Title: Methodology Specialist
Name: Dale Hunter
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3. Technical Specification

3.1. Ontario Public Sector Enterprise Architecture Deliverables

3.1.1. Introduction

The architecture of an enterprise is the set of models that represent and describe it. Enterprise models serve as a basis for analysis; aiding managers determine the changes needed to achieve government and ministry goals and objectives. They act as blueprints to guide and coordinate the efforts of those engaged in building new enterprises or changing existing ones. In addition, enterprise models act as “standard interchangeable parts” as they are re-used within and across enterprises, thereby contributing to the goals of integration and reduced systems development time. Enterprise Architecture as a discipline consists of the process and methods used to develop and implement enterprise models.

In large organizations, enterprise models are developed in different locations and by different teams, who, unless they work within a common framework, tend to create architecture products that may meet their own requirements but usually cannot be applied elsewhere without a great deal of modification. Accordingly, when an organization wishes to standardize the work products of all its teams who are engaged in any aspect of Enterprise Architecture, one of the first measures that must be implemented is to establish a common Enterprise Architecture framework.

The OPS has adopted the *“Zachman Framework for Enterprise Architecture”*™*, a* widespread de facto standard, as the basis of a common Enterprise Architecture framework to be applied throughout the Ontario Government.

The Zachman Framework is a structure for identifying, classifying and organizing the descriptive representations (models) that are significant to the management of an enterprise as well as to the development of the enterprise's systems.

Alignment in the context of an enterprise is the state that is achieved when the physical implementation of an enterprise – the funding, the staff, the systems, the infrastructure, etc. – is entirely accounted for and aligned with the mission and goals of the enterprise as expressed by senior management in strategic and business plans. An aligned enterprise is one whose resources are all employed to achieve enterprise.

To assist with such alignment, business and system projects follow an approach such that all levels of design, from conceptual to physical, are aligned with each other when meeting a defined business requirement. This approach is the current focus of the OPS Enterprise Architecture Program.

Besides the normal documentation associated with project management, these projects produce specified mandatory and optional design artefacts (models).

Alignment is confirmed by means of "checkpoint reviews" by an Architecture Core Team (ACT) and Architecture Review Board (ARB), often with representation from various architectural domains.

The purpose of the reviews is to ensure that the models align with the business requirement for the project and with each other, leading to the implementation of a new or changed capability. In addition, the various models created by projects are assessed for compliance with any applicable enterprise and domain-specific standards.

Checkpoint reviews occur at the following stages:

Checkpoint 0: This is a planning, discovery, and guidance checkpoint to assist projects with understanding the Enterprise Architecture requirements at the inception and concept stages of a project. With a clear understanding of the Enterprise Architecture requirements, project managers can effectively plan the related activities and deliverables necessary to meet them.

Checkpoint 1: Typically known as the "Business Architecture" of the project. Deliverables for this checkpoint involve the Scope / Contextual / Planner and Owner / Conceptual deliverables that occur in Rows 1 and 2 of the Zachman Enterprise Architecture Framework™.

Checkpoint 2: Typically known as the "Logical Architecture" of the project. Deliverables for this checkpoint are developed with a Systems / Logical / Designer perspective and are based on further elaborations of the deliverables produced during Checkpoint 1 development phase.

Checkpoint 3: The final "physical" description of the technology implementation of the project – presented from the Builder/Sub-Contractor perspective.

Checkpoint 4: The purpose here is to:

- discuss the implementation of the project's deliverables and any architectural implications of which the architecture governance bodies need to be aware of;
- discuss lessons learned as part of quality improvement;
- provide feedback on architecture services.

Variations on these checkpoints can occur depending on the nature of the project and as determined by the Corporate Architecture Review Board.

3.1.2. Standard Set of Enterprise Architecture Framework Artefacts

The set of OPS EA Framework Artefacts **shall** consist of the following:

Row 1

Column	Artefact Type	Mandatory / Optional
1	Resource Type	M
2	Line of Business Profile	O
	Program	O
	Service	O
	Program Profile	M
3	Location Type	M
	Geographical Area Type	O
4	Party Type	M
	Role Type	M
	Target Group Type	M
5	Event Type	M
	Cycle Type	O
6	Goals	M
	Need	M
	Mandate (Program)	M
	Target Group/Need Cross-Reference	M

Row 2

Column	Artefact Type	Mandatory / Optional
1	Conceptual Data Model	M
	Information Model	O
	Semantic Model	O
	Fact and Dimension Matrix	O[1]
	Interface Data Requirements Document	M[2]
2	Service Life Cycle	O
	Business Function Model	M
	Service Integration and Accountability Model	M
	Service Profile	M
	Business Process Model	M
	SOA Service Specification	O[3]
3	Business Network Model	M
4	Governance Model	O
	Organization Chart	O
5	State Transition Diagram	O
	Business Scenario	M
6	Service Objectives	M
	Business Rule Source	M
	Business Rule Profile	M
	Program Logic Model	O

[1] This is a mandatory artefact for projects developing or acquiring data warehouse and/or data mart based solutions.
[2] Mandatory only for acquired solutions where there are application interface data requirements between the acquired solution and other business applications.
[3] This is a mandatory artefact for projects following a service-based approach to assemble an application.

Row 3

Column	Artefact Type	Mandatory / Optional
1	Logical Data Model	M
	Logical Dimensional Model	O[4]
2	System Functional Requirements	M
	System Architecture Document	O
	Logical Application Design Document[5]	M[6]
3	Solution Pattern Match	M
	Logical Application Deployment Model	M
6	Supplementary Specification	M

[4] Mandatory artefact for projects developing or acquiring data warehouse and/or data mart based solutions.
[5] Projects following a service-based approach to assemble an application must also complete the SOA Application Service Model Template.
[6] For acquired solutions see the Corporate EA Review Requirements Guidebook.

Row 4

Column	Artefact Type	Mandatory / Optional
1	Physical Data Model	M
	Database Inventory	O
	Physical Dimensional Model	O[7]
2	Physical Application Design Document	M[8]
	Application Implementation Document	M[9]
	Application Inventory	M
3	Physical Deployment Model	M
4	User Interface Design	O
5	Operating Schedule	M

3.1.3. Standard Specification of EA Framework Deliverables

Artefact descriptions provided in Appendix B, Corporate Enterprise Architecture Review Requirements Guidebook will often refer to one or more corresponding artefact template(s). When producing artefacts, business and system change initiatives **must** also use and complete any specified templates **according to the instructions in the artefact description and the template(s)**.

When producing Enterprise Architecture artefacts, projects **must** follow the artefact specifications and templates as prescribed in the following documents (attached as Appendix C, and D respectively):

- *Appendix B, Corporate Enterprise Architecture Review Requirements Guidebook*

  Version 1.7
  Approval Date: September 6, 2012

[7] Mandatory artefact for projects developing or acquiring data warehouse and/or data mart based solutions.
[8] For acquired solutions see the Corporate EA Review Requirements Guidebook.
[9] Optional artefact for projects implementing an acquired solution.

Effective Date: October 1, 2012

- *Artefact Template Files*

3.2. Further Elaboration

OPS architectural practice is further elaborated in the *Enterprise Architecture Process & Methods Handbook* (as revised from time to time, with approval of the corporate Enterprise Architecture governance process).

4. Related Standards

4.1. Impacts to Existing Standards

GO-IT Standard	Impact	Recommended Action
None	Not Applicable	Not Applicable

4.2. Impacts to Existing Environment

Impacted Infrastructure	Impact	Recommended Action
None	Not Applicable	Not Applicable

5. Compliance Requirements

The Enterprise Architecture, I&IT Standards programs are based upon requirements extracted from the following source documents:

- Management and Use of Information & Information Technology (I&IT) Directive (July 26, 2011)
- I&IT Deputy's Committee Terms of Reference (May 2010)
- Policy Management Authority Terms of Reference (April 2010)
- I&IT Project Approval Committee Terms of Reference (January 2012)
- Operational Policy on the I&IT Project Gateway Process (January 26, 2007)

These requirements provide the basic mandate, rationale, and conditions for the:

- Corporate Architecture Review Board;
- Corporate Architecture Core Team;
- Information Technology Executive Leadership Council;

to define, provide, and authorize the methods, processes, and standards of the OPS Enterprise Architecture. This includes Enterprise Architecture review of projects and the artefacts that they are required to produce.

5.1. Implementation and Metrics

The intention of the OCCIO is to advertise and promote this standard as being a mandatory component throughout government. However, in order to effectively manage its implementation, ministries, clusters and applicable agencies are expected to adopt and monitor compliance to this standard.

6. Acknowledgements

Consulted

Organization Consulted (Ministry/Cluster)	Division	Branch	Date
All ministries and clusters			1998 – ongoing (through EA governance processes)

Committee/Working Group Consulted	Date
Application Architecture Domain Working Group, Business Architecture Domain Working Group, Information Architecture Domain Working Group, Enterprise Architecture Methodology Working Group, Security Architecture Working Group and Technology Architecture Domain Working Group	1998 – ongoing (through EA governance processes)

Informed

Organization Informed (Ministry/Cluster)	Division	Branch	Date
Corporate Architecture Core Team			1998 – ongoing (through EA governance processes)

7. Recommended Versioning and/or Change Management

Changes (i.e. all revisions, updates, versioning) to the standard require authorization from the "responsible" organization(s).

Once a determination has been made by the responsible organization to proceed with changes, ICS as custodians of the I&IT Rules Refresh Plan will coordinate and provide assistance with respect to the approvals process.

The approval process for changes to standards will be determined based on the degree and impact of the change. The degree and impact of changes fall into one of two categories:

Minor updates *- require confirmation from ARB, and communication to stakeholders and ITELC. Changes are noted in the "Document History" section of the standard. Minor updates generally consist of:*

- Editorial corrections (spelling, grammar, references, etc.) made with the intention to eliminate confusion and produce consistent, accurate, and complete work.
- Formatting changes (due to template updates or to improve readability of document).
- Documented organizational changes e.g. renaming of committees, approved transition of committee responsibilities, approved reporting relationship changes.

Standard revisions *- require consultation with stakeholders, ARB endorsement, and ITELC approval. Standard revisions consist of any updates to the I&IT Rules Refresh Plan that are not considered minor and may:*

- represent new standard or significant revision to an existing standard
- represent a major version change to one or more specifications
- impact procurement
- require configuration changes to current solutions
- impact other standards
- respond to legislative, policy or procurement changes

7.1. Publication Details

All approved Government of Ontario IT Standards (GO ITS) are published on the OCCIO Intranet web site. Please indicate with a checkmark below if this standard is also to be published on the public, GO ITS Internet Site.

Standard to be published on both the OPS Intranet and the GO ITS Internet web site (available to the public, vendors	☑

etc.)	

8. Requirements Levels

Within this document, certain wording conventions are followed. There are precise requirements and obligations associated with the following terms:

Must	This word, or the terms "REQUIRED" or "SHALL", means that the statement is an absolute requirement.
Should	This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in particular circumstances to ignore the recommendation, but the full implications (e.g., business functionality, security, cost) must be understood and carefully weighed before choosing a different course.

9. Appendices

9.1. Normative References

Appendix A – OPS Enterprise Architecture Principles

- *Under separate cover*
- *Contains architectural principles for each category.*

Appendix B - Corporate Enterprise Architecture Review Requirements Guidebook

- *Under separate cover*
- *Contains artefact descriptions and specifications.*

Appendix C – Corporate Enterprise Architecture Artefact Template Information

- *Under separate cover*
- *Contains artefact/template cross reference and instructions for accessing artefact template files.*

Appendix D - Artefact Template Files

- *Under separate cover*
- *Consists of a compressed collection of artefact template files.*

9.2. Informative References

- Management and Use of Information & Information Technology (I&IT) Directive:

http://intra.ops.myops.gov.on.ca/cms/tiles.nsf/(vwReadResourcesByRefId_Content)/cpd2008.04.11.09.46.33.J6N_res/$File/ManagementOfITDir.pdf

- Operational Policy on the I&IT Project Gateway Process:

  http://intra.ops.myops.gov.on.ca/cms/tiles.nsf/(vwReadResourcesByRefId_Content)/cpd2008.08.18.15.46.12.R7F_res/$File/Operational%20Policy%20on%20the%20I&IT%20Project%20Gateway%20Process.pdf

- Detailed documents and information (terms of reference, guidebooks, templates, checklists, mandatory/optional processes and deliverables, etc.) regarding the OPS Enterprise Architecture practice, review, and governance processes can be found at:

  http://intra.collaboration.gov.on.ca/mgs/occio/occs

  In particular, the *Enterprise Architecture Process & Methods Handbook* can be found at:
  http://intra.collaboration.gov.on.ca/mgs/occio/occto/our-resources/eapm