

Government of Ontario

Information
&
Technology
Standards



Government of Ontario IT Standard (GO-ITS)

Number 56

OPS Enterprise Architecture:

Principles and Artefacts

Version 1.6

Status: Final

Prepared for the Information Technology Standards Council (ITSC) under the delegated authority of the Management Board of Cabinet

Foreword

Government of Ontario Information Technology Standards (GO-ITS) are the official publications on the guidelines, preferred practices, standards and technical reports adopted by the Information Technology Standards Council (ITSC) under delegated authority of the Management Board of Cabinet (MBC). 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. Publications that set new or revised standards provide enterprise architecture guidance, policy guidance and administrative information for their implementation. In particular, GO-ITS describe where the application of a standard is mandatory and specify any qualifications governing the implementation of standards.

CONTENTS

1. INTRODUCTION	4
1.1 BACKGROUND AND PURPOSE	4
1.2 SCOPE	4
1.3 APPLICABILITY STATEMENTS	4
1.4 REQUIREMENTS LEVELS	5
2. CONTACT INFORMATION.....	5
2.1 ROLES AND RESPONSIBILITIES	5
2.2 RECOMMENDED VERSIONING AND/OR CHANGE MANAGEMENT	7
2.3 PUBLICATION DETAILS	7
3. COMPLIANCE REQUIREMENTS	8
4. TECHNICAL STANDARDS AND SPECIFICATIONS.....	9
4.1 OPS EA PRINCIPLES.....	9
4.1.1 Introduction.....	9
4.1.2 Standard Categories of EA Principles.....	9
4.1.3 Standard Specification of EA Principles.....	9
4.2 ZACHMAN FRAMEWORK AND OPS EA ARTEFACTS.....	10
4.2.1 Introduction.....	10
4.2.2 Standard Set of EA Framework Artefacts	11
4.2.3 Standard Specification of EA Framework Artefacts	14
4.3 FURTHER ELABORATION	15
5. RELATED STANDARDS	15
5.1 IMPACTS TO EXISTING STANDARDS.....	15
5.2 IMPACTS TO EXISTING ENVIRONMENT	15
6. INFORMATIVE REFERENCES	15
7. DOCUMENT HISTORY	16
8. COPYRIGHT INFORMATION.....	17
APPENDICES	18
APPENDIX A – “OPS ENTERPRISE ARCHITECTURE PRINCIPLES”	18
APPENDIX B - “CORPORATE ENTERPRISE ARCHITECTURE REVIEW REQUIREMENTS GUIDEBOOK”	18
APPENDIX C – “CORPORATE ENTERPRISE ARCHITECTURE ARTEFACT TEMPLATE INFORMATION”	18
APPENDIX D - “ARTEFACT TEMPLATE FILES”	18

1. Introduction

1.1 Background and Purpose

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, 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.

1.2 Scope

1.2.1 In Scope

- OPS Enterprise Architecture:
 - Principles
 - Artefact definitions and templates

1.2.2 Out of Scope

- Review and Governance processes for OPS EA

1.3 Applicability Statements

1.3.1 Organization

Government of Ontario IT Standards and Enterprise Solutions and Services apply (are mandatory) for use by all ministries/clusters and to all former Schedule I and IV provincial government agencies under their present classification (Advisory, Regulatory, Adjudicative, Operational Service, Operational Enterprise, Trust or Crown Foundation) according to the current agency classification system.

Additionally, this applies to any other new or existing agencies designated by Management Board of Cabinet as being subject to such publications, i.e. the GO-ITS publications and enterprise solutions and services - and particularly applies to Advisory, Regulatory, and Adjudicative Agencies (see also procurement link, OPS paragraph). Further included is any agency which, under the terms of its Memorandum of Understanding with its responsible Minister, is required to satisfy the mandatory requirements set out in any of the Management Board of Cabinet Directives (*cf.* Operational Service, Operational Enterprise, Trust, or Crown Foundation Agencies).

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 and I&IT Cluster 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.

1.4 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.

2. Contact Information

2.1 Roles and Responsibilities

Accountable Role:

Title: Head Architect, Corporate Architecture Branch
 Ministry/Cluster: Ministry of Government Services
 Division: Innovation, Controllershship and Strategy

Responsible Organization:

Ministry/Cluster: Ministry of Government Services

Division: Innovation, Controllershship and Strategy
 Branch: Corporate Architecture Branch

Support Role (Editor):

Ministry/Cluster: Ministry of Government Services
 Division: Innovation, Controllershship and Strategy
 Branch: Corporate Architecture Branch
 Job Title: Methodology Specialist
 Name: Dale Hunter
 Phone: (416) 327-4858
 Email: Dale.Hunter@ontario.ca

Consulted

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

Committee/Working Group Consulted	Date
AADWG, BADWG, IADWG, EAMWG, SAWG, TADWG	1998 – ongoing (through EA governance processes)

Informed

Organization Informed (Ministry/Cluster)	Division	Branch	Date
ACT			1998 – ongoing (through EA governance processes)
ITELC			
ARB			

Committee/Working Group Informed	Date

2.2 Recommended Versioning and/or Change Management

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

Once a determination has been made by the responsible organization to proceed with changes, the Standards Section, Corporate Architecture Branch, ICS, 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:

1) Minor changes - requiring communication to stakeholders. No presentations required; No ITSC or ARB approvals required. Changes are noted in the “Document History” section of the standard;

2) Major changes - requiring a presentation to ITSC for approval and ARB for approval (Note: ARB reserves the right to delegate their approval to ITSC)

Below are guidelines for differentiating between minor and major changes:

Major:

- represents a major version change to one or more specifications
- impacts procurement
- requires configuration changes to current solutions
- impacts other standards
- responds to legislative, policy or procurement changes

Minor:

- represents incremental version changes to one or more specifications
- does not impact procurement (other than informational)
- does not require configuration changes to current solutions
- does not impact other standards
- is not related to legislative, policy, or procurement changes

For example, a change to the list of artefacts (section 4.2.2 “Standard Set of EA Framework Artefacts”), or a significant change to an artefact definition would represent a major change. A formatting or minor clarification would represent a minor change.

2.3 Publication Details

All approved Government of Ontario IT Standards (GO-ITS) are published on the ITSC 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.)	Yes
--	-----

3. Compliance Requirements

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

- Information and Information Technology Directive (August 24, 2006)
- ITELK Terms of Reference (August 2006)
- IITDC Terms of Reference (April 2010)
- PMA Terms of Reference (April 2010)
- ITPAC Terms of Reference (April 2006)
- OPS Gating Process – Operational Policy (January 2007)

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

- Architecture Review Board (ARB)
- Architecture Core Team (ACT)
- Information Technology Standards Council (ITSC)

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

4. Technical Standards and Specifications

4.1 OPS EA Principles

4.1.1 Introduction

Transformation of the Ontario Government is an ongoing, multidisciplinary endeavour, involving strategic planning, business process modeling, business planning, enterprise architecture, project management, and systems development. Enterprise architecture (EA) in the OPS is used to define and scope the projects needed to enable ministry business plans and to ensure that all new information systems contribute to an increasingly integrated government business and technology environment.

The overarching vision for the EA is that it will be iterative and evolving, and will guide the development of an integrated environment that will enable cost effective solutions to meet new business requirements. EA Principles will act as a “roadmap” to guide further architecture development and to confirm that the architecture continues to fulfill its intended purpose.

An Architecture Principle **should** be guided by the following criteria:

- States a fundamental belief of the enterprise in one or two clearly written sentences
- Recommends an action against which some arguments could be made
- Has relevance to an architecture domain – business, information, application, technology, security
- Is worded directly and simply in terms understandable by both business and I&IT managers
- Has business-wide applicability
- Is durable; will not be outdated quickly by advancing technology
- Has objective reasons for advancing it instead of the alternatives that were considered
- Has impacts that need to be documented

4.1.2 Standard Categories of EA Principles

OPS Enterprise Architecture Principles **shall** address the following categories:

- Global EA
- Business Architecture
- Information Architecture
- Application Architecture
- Technology Architecture
- Security Architecture
- Privacy Design

4.1.3 Standard Specification of EA Principles

OPS Enterprise Architecture **shall** follow the EA Principles as detailed in Appendix A, “*OPS Enterprise Architecture Principles*”, Version 1.6.

4.2 Zachman Framework and OPS EA Artefacts

4.2.1 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. EA 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 EA, one of the first measures that must be implemented is to establish a common EA framework.

The OPS has adopted the “Zachman Framework for Enterprise Architecture”™, a widespread de facto standard, as the basis of a common EA 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 EA 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) or 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 (EA) 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. The artefacts involved in this checkpoint involve the Scope/Contextual/Planner and Owner/Conceptual artefacts that occur in Rows 1 and 2 of the Zachman Enterprise Architecture Framework™.

Checkpoint 2: Typically known as the “Logical Architecture” of the project. Artefacts for this checkpoint are developed with a Systems/Logical/Designer perspective and are based on further elaborations of the artefacts 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 ACT and ARB needs to be aware;
- 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 Architecture Review Board.

4.2.2 Standard Set of EA Framework Artefacts

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

4.2.2.1 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

4.2.2.2 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.

4.2.2.3 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.

4.2.2.4 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

4.2.3 Standard Specification of EA Framework Artefacts

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

- “*Corporate Enterprise Architecture Review Requirements Guidebook*”
Version 1.6
Approval Date: June, 2011
Effective Date: July 25, 2011
- “*Corporate Enterprise Architecture Artefact Template Information*”
- “*Artefact Template Files*”

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.

4.3 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).

5. Related Standards

5.1 Impacts to Existing Standards

GO-ITS Number	Describe Impact	Recommended Action (alternatively provide a page number where details can be found)
None	Not Applicable	Not Applicable

5.2 Impacts to Existing Environment

Impacted Infrastructure (includes Common Components and other applications)	Describe Impact	Recommended Action (alternatively provide a page number where details can be found)
None	Not Applicable	Not Applicable

6. Informative References

- "Using Information Technology to Transform Government for the 21st Century – Ontario Government Information and Information Technology Strategy", March 1998
- Information & Information Technology (I&IT) Directive:
 - <http://intra.collaboration.gov.on.ca/mgs/occio/it/policies-directives-guidelines>
- Operational Policy on the I&IT Project Gateway Process:
 - <http://intra.collaboration.gov.on.ca/mgs/occio/it/policies-directives-guidelines>
- 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>

7. Document History

Endorsed: 2009-06-17

- IT Standards Council endorsement

Approved: 2009-07-02

- Architecture Review Board approval
- Approved version number set to 1.0

Updated: 2009-12-11

- 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
 - Replaced templates with approved updated versions.

Updated: 2010-04-16

- 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.

Updated: 2011-06

- 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 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

8. Copyright Information

© Queen's Printer for Ontario 2011

Appendices

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.