

Understanding Enterprise Architecture Continuum and Repository

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"Exchange gifts to exchange love."

Mohammad (PBUH)

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Understanding Enterprise Architecture Continuum and Repository

Abstract

Among many concepts of Enterprise Architecture, which in many cases are explained and perceived as abstract ideas, we deal in this paper with the concepts of Continuum and Repository as related to Enterprise Architecture practices. These two terms are interrelated and applied together when implementing tools for performing enterprise architecture activities, and they are core for successful adoption of enterprise architecture practices, either at the first creation of these elements, or for repetitive use in the long run. We are explaining these concepts, relating them together, and looking at how they are used in enterprise architecture, including how to create the repository, and continual maintenance and population. This is intended to be a practical look at the subject which is otherwise sometimes seen theoretical. This paper presumes that the reader is aware of what constitutes an architecture.

Keywords: *Enterprise Architecture, TOGAF, Enterprise Architecture Continuum, Enterprise Architecture Repository, Enterprise Architecture Artifacts, Enterprise Architecture Implementation, Continuum and Repository Relationship*

Definition and Relationship

According to TOGAF 9.1 standard, the **Architecture Repository** is defined as "A system that manages all of the data of an enterprise, including data and process models and other enterprise information. Hence, the data in a repository is much more extensive than that in a data dictionary, which generally defines only the data making up a database".

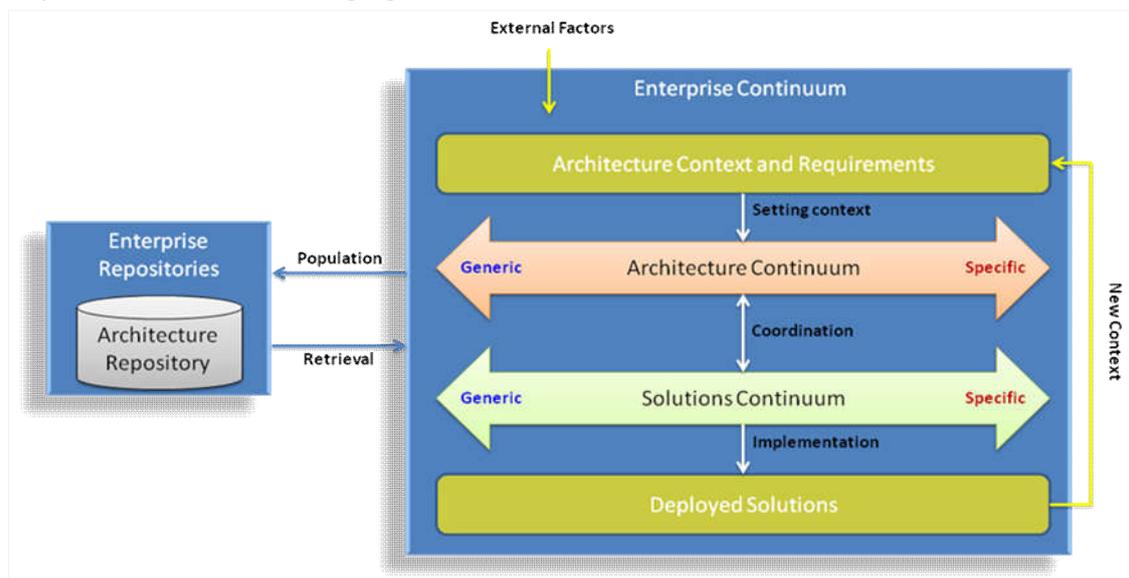
The Architecture Repository is one of various Enterprise Repositories existing within the organization, which may include: Requirements Repository, Design stores, CMDDB, etc. So simply the repository is a management system for architectural artifacts and work products.

A related concept is the **Enterprise Continuum** which is defined as "A categorization mechanism useful for classifying architecture and solution artifacts, both internal and external to the Architecture Repository, as they evolve from generic Foundation Architectures to Organization-Specific Architectures".

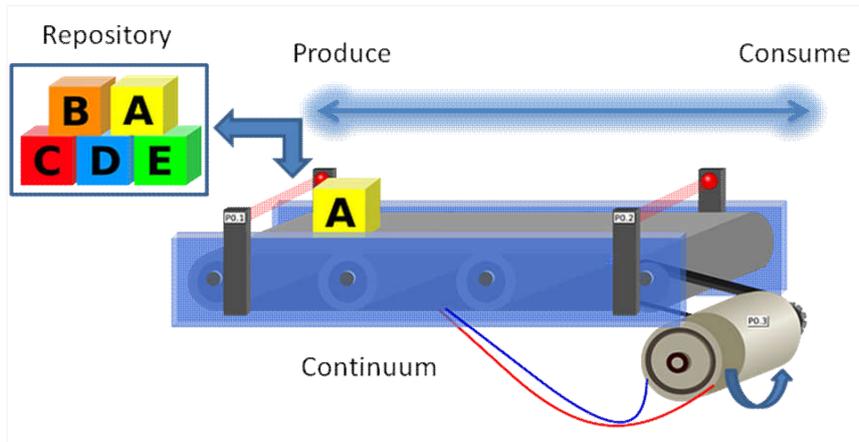
The Enterprise Continuum is comprised of two main parts, the first is the **Architecture Continuum** which is "A part of the Enterprise Continuum. A repository of architectural elements with increasing detail and specialization. This Continuum begins with foundational definitions like reference models, core strategies, and basic building blocks. From there it spans to Industry Architectures and all the way to an organization's specific architecture".

The second is the **Solution Architecture** which is defined as "A part of the Enterprise Continuum. A repository of re-usable solutions for future implementation efforts. It contains implementations of the corresponding definitions in the Architecture Continuum".

The relationship between these concepts and how they interact together can be depicted as in the following figure:



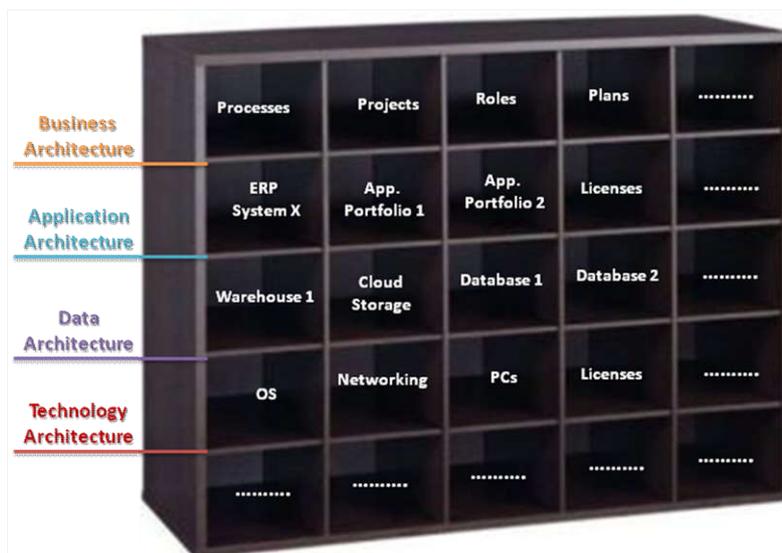
The Enterprise Continuum provides structure and classification for assets in Enterprise Repositories, while Enterprise Repositories provide resources to be classified within the Enterprise Continuum. The repository is a warehouse, and the continuum is a view and interface for interacting with the repository and accessing its contents. You can think of the continuum as a bi-directional conveyor of item processing lines in a manufacturing plant, and the repository as the store for stocking items classified by type in their correct place so that they are retrieved again for reuse when needed.



Artifacts and Building Blocks

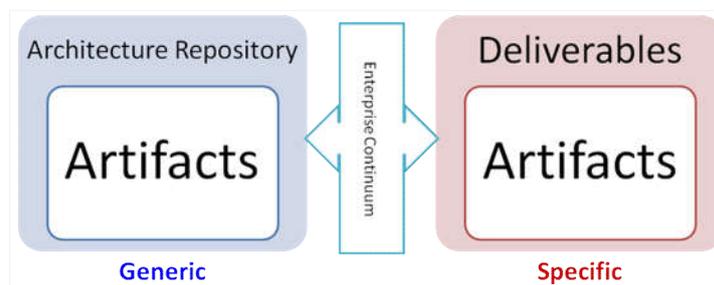
An **Artifact** is defined as "An architectural work product that describes an aspect of the architecture". A **Building Block** is defined as "A (potentially re-usable) component of business, IT, or architectural capability that can be combined with other building blocks to deliver architectures and solutions". Building Blocks can be part of the composition of 'architectures' or 'solutions'.

The Architecture Repository holds abstract versions of reusable artifacts that can be instantiated and realized for building new architectures (architectural components) or for deployment of actual solutions (solution components) that are defined in various domains (business, application, data, technology). You can think of the repository as a store organizing items in separate shelves for management and ease of access and retrieval.



Artifacts describe Building Blocks. For example, a building block can be a process or an actor class, which is described by artifacts like flowcharts, diagrams, matrices, etc. An architecture or solution deliverable will contain specific (specialized) artifacts that are instantiated from the abstract (generalized) artifacts included in the architecture repository, and describing conceptual building blocks composing the architecture or solution.

In the opposite direction, newly developed architectures or implemented solutions represent sources of new entry components into the Architecture Repository. So the repository is continually being updated and populated with new or modified items, and over time its value and usefulness to the organization becomes greater.



Characteristics and Uses

In order to know how to make use of these concepts, we need to understand what are the characteristics that should be existing in repository systems. The following are general characteristics that make repositories fit for purpose:

- **Reusability:** components stored within the repository are in reusable form; they can be instantiated for creating specialized versions for new architectures or solutions. Additions of new components to the repository is occurring all the time along with continual operation of the enterprise.
- **Interoperability:** the existence of the repository and the associated continuum interface serve for supporting the interoperability principle by providing for a common language for all architectures and sub-architectures created across all segments of the enterprise. The Architecture Repository is interfacing with other Enterprise Repositories, including the Requirements Repository and the Solutions Repository.
- **Progression:** the continuum is conceptually spanning a spectrum of gradually specialized stages of architectures and solutions, starting from generic Foundation, to Common Systems, to Industry, and ending by Organization-specific.

- **Governance:** the repository is always under control of an Architecture Board, which guarantees compliance with applicable standards and policies adopted in the enterprise, as well as with decisions and plans approved by the board. Governance logs, including decisions, calendars, portfolios, assessments, are all part of the repository itself.
- **Enterprise Architecture Organizational Capability:** there is supposed to be skills and structures that enable application of enterprise architecture practices. The skills repository, organizational structures, and architecture charters are all part of the repository also.

Implementation

When starting adoption of Enterprise Architecture practices for the first time, we need to create a system to be the Architecture Repository, with the associated interface of the continuum. General steps to be followed in creating such a repository system can be as follows:

- **Inventory of items:** the organization had probably worked on some kind of architectural work in the past as part of developments and implementations of previous projects. Architectural components in historical records are collected to represent the initial population of the repository.
- **Defining categories:** architectural components vs. solution components, and respective domains (business, application, data, technology), in addition to functional categorization of components.
- **Roles, authorities, and access rights:** those are defined as part of the continuum interface to define privileges and authorities of each role involved in a certain architecture in manipulating components of that architecture.

Normally, and as intended from the repository system in the first place, it will be in continual use, continually being populated and updated by components resulting from architecture works.

Needless to say, all of the architectural activities are done with assistance of tools, because actually these systems are implemented using software tools, which can be sophisticated management systems, or simple semi-manual systems using spreadsheets and other office tools. The following are sample snapshots from software tools used mainly in performing activities of enterprise architecture. We can see from these samples how the repository functionality is implemented.

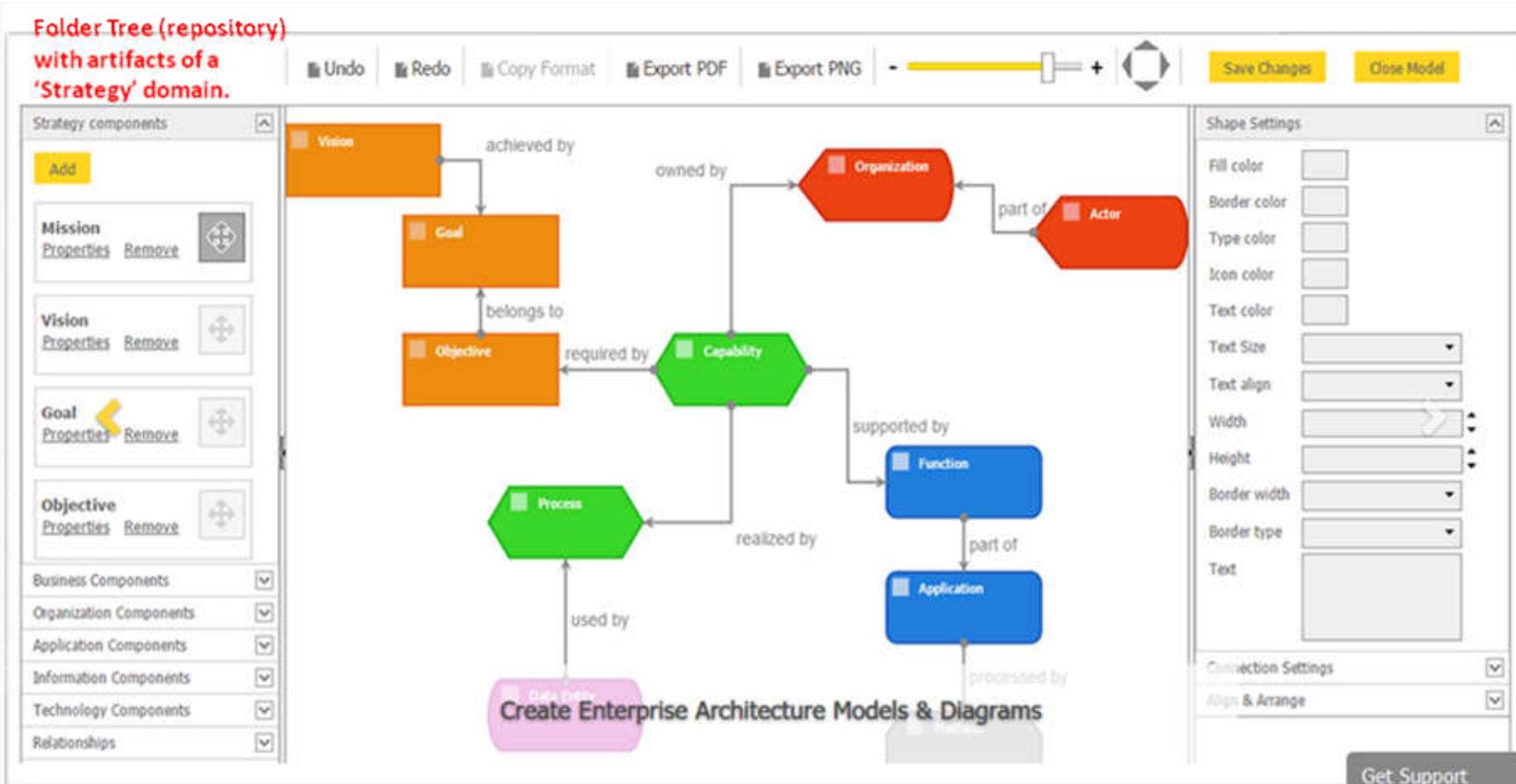
The screenshot shows the Eclipse IDE interface with a SysML diagram titled 'ListeningDomain'. The diagram features a package boundary containing a system block and a listener actor. A 'Runtime Comparison' window is open, displaying a table of properties for the 'Listener' model element. A callout box points to the system block with a note about its internal block diagram. Red text labels identify the 'Folder Tree (repository)' and 'Object (artifact) details'.

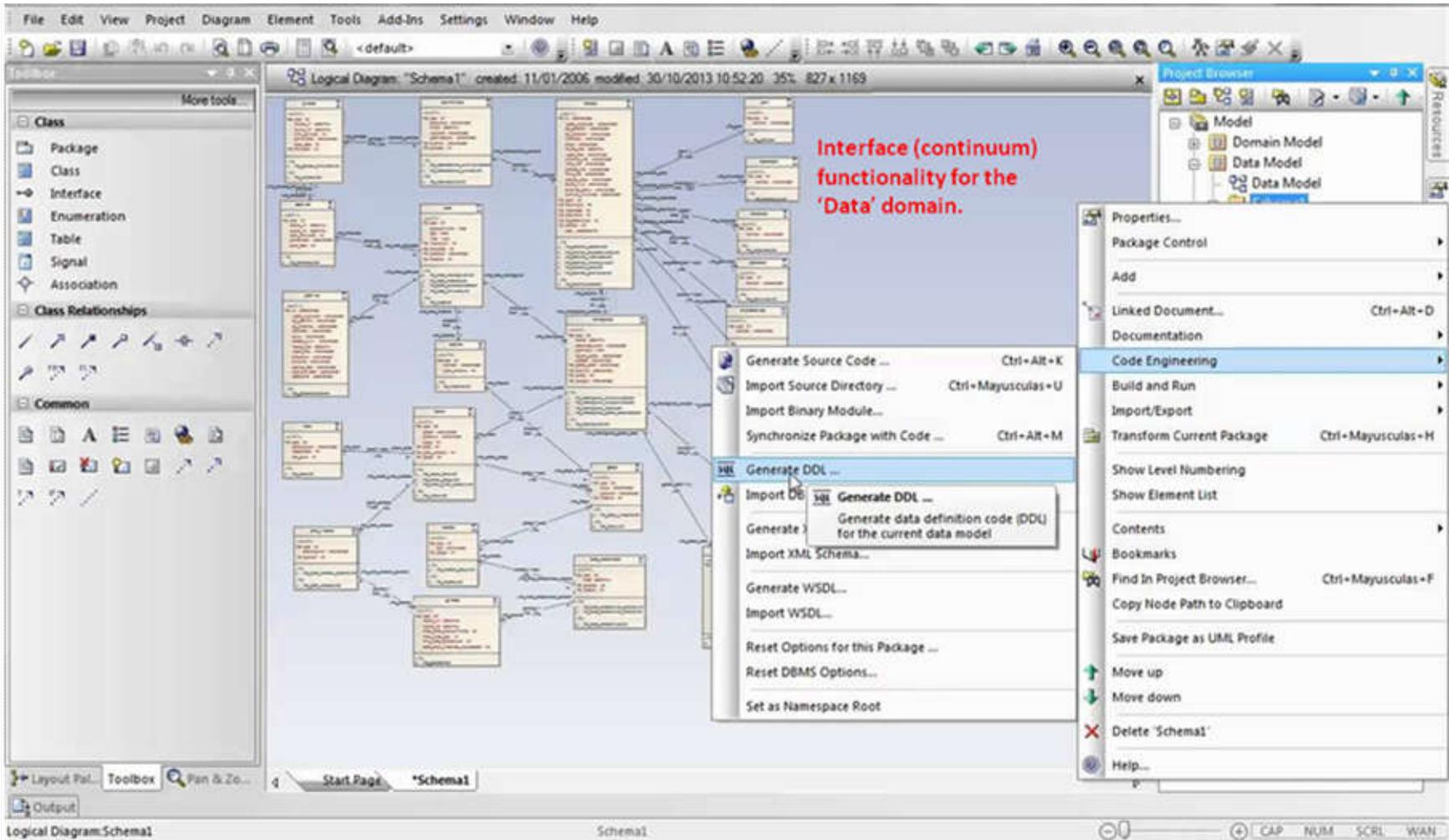
Property	Value
Abstract	false
Author	Larry Holman
Date Created	8/10/2015 10:26:13 AM
Date Modified	8/10/2015 10:29:03 AM
Complexity	1
Release	
Language	java
Model	false
Namespace	Listener
Multiplicity	
Name	Listener
Notes	
Parent Package	ListeningDomain
Resistance	1.0
Phase	Public
Scope	Proposed
Status	
Stereotype	Actor
Type	1.0
Version	
Classifier	
Visibility	
Concurrency	
Cardinality	
Style	

The SysML block which describes the operating context of the Portable Audio Player. Double-click on it to view the Internal Block Diagram.

Folder Tree (repository)

Object (artifact) details





Almost always, the repository is visualized as a folder tree, with folders and subfolders being the categories defined for various artifacts, which are created as objects within the appropriate folders. The continuum interfacing mechanism is implemented as settings and attributes related to the repository functionality within the software tool, for example there can be settings related to access rights and authorization, change management, version control, event management, storage location (local / remote server / cloud), folder sharing, and other relevant settings.

Usually the repository system involves features of portfolio management, to deal with groupings and portfolios of components, like application portfolios, project portfolios, service portfolios, etc.

Maintenance

The contents of the repository are maintained through the lifecycle management of each type of items (document management, project management, application development, application management, etc.), starting from inception of the item and up to archival or disposition. Configuration management activities also apply in maintenance of contents of the repository, for version control, change management, and release management.

References

- [1] TOGAF Version 9.1 Enterprise Edition, The Open Group, 2011
- [2] Websites of various software tools for Enterprise Architecture