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WIT 2016 ITA Module

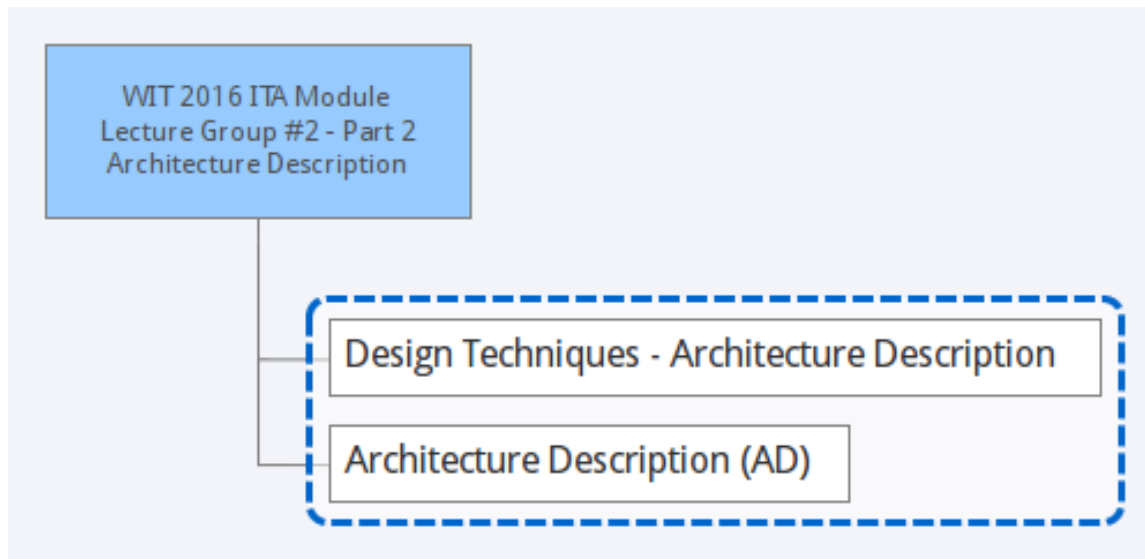
# Lecture Group #2 - Part 2

## Architecture Description



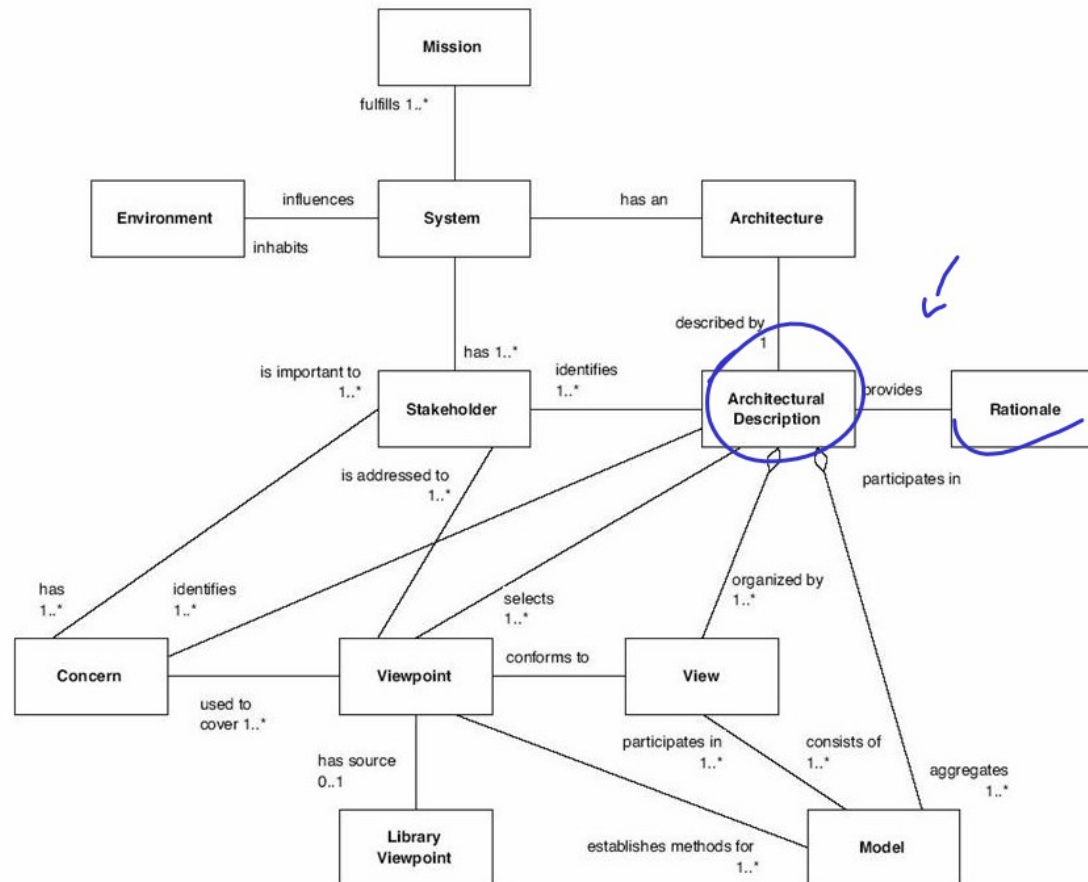
# Architecture Description (AD)

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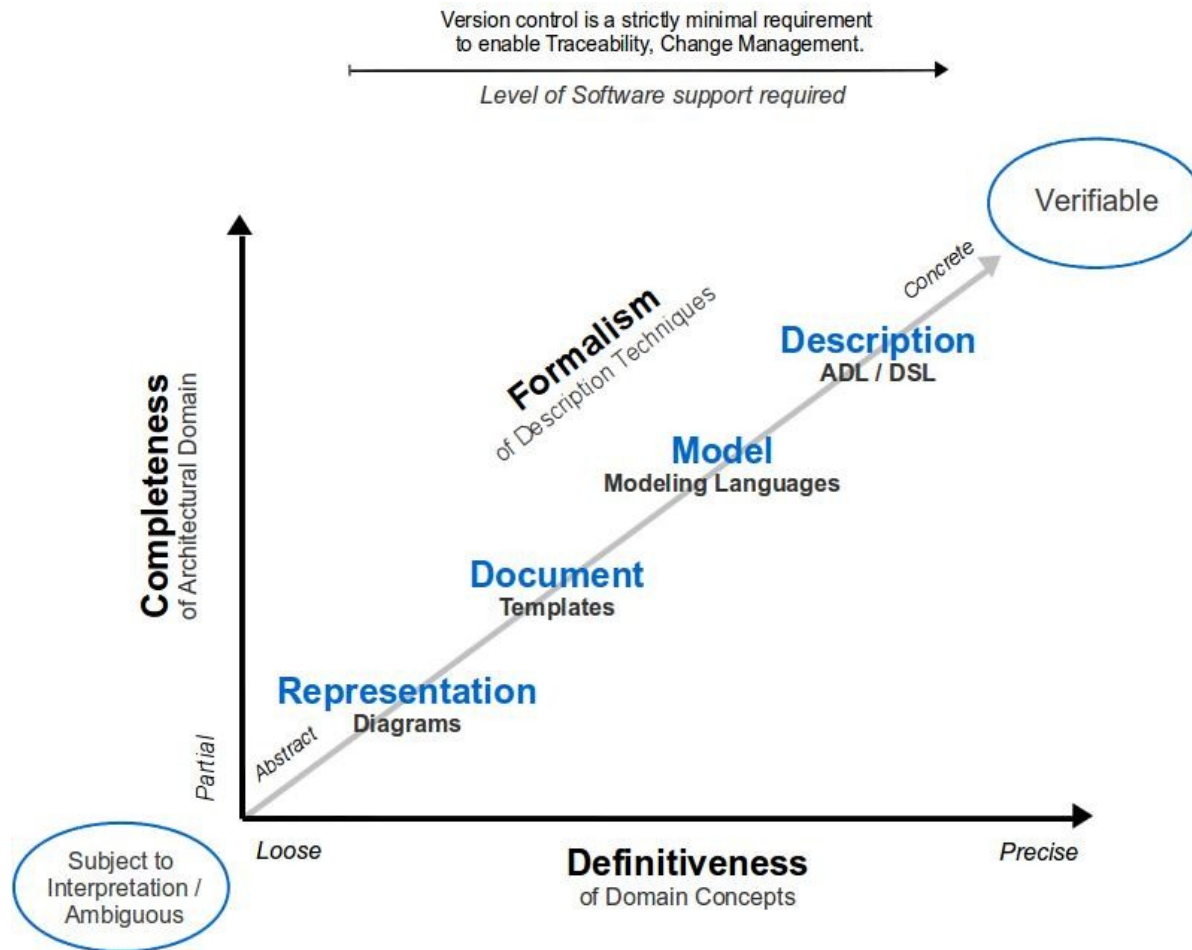




# AD Concepts in ISO/IEC 42010:2007



# Architecture Work-Products Specification Power



# Architecture Work-Products Specification Power

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The degree of specification of any Work-Product (WP) can be expressed in terms of its: (1.) Definitiveness, (2.) Completeness and (3.) Formalism.

A work-product with a low specification power is ambiguous and subject to interpretation. A work-product with a high specification power is "verifiable".

The higher the specification power, the better candidate the work-product is for knowledge transfer.

An architect chooses the appropriate degree of specification of a work-product to CONVEY the key elements of the solution design to stakeholders.



# About Work-Product Artifacts

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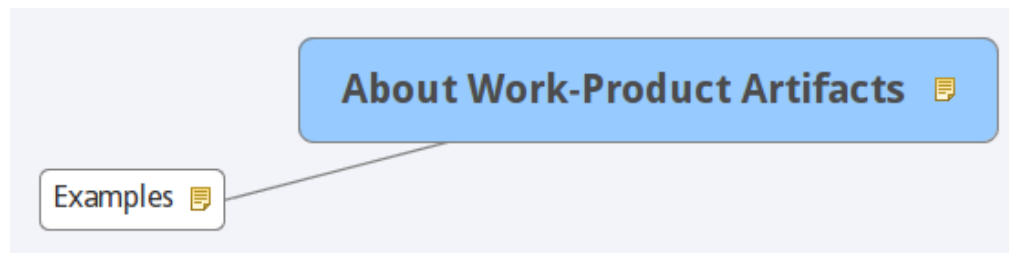
A work-product "artifact" is a focused aspect or PART OF a more holistic design, also named a documentation/design PRIMITIVE.

It represent one building block of a design and can be composed, reviewed, or used in a wide variety of ways.

It captures enough information about the "part" of the design so that it can be thoroughly analysed and described (e.g. modeled).

Often detail-oriented, the audience for architecture artifacts are the stakeholders of the solution.

Artifacts are working documents, but in time become precious knowledge assets. As such, these must be version-controlled, maintained and periodically refreshed.



# Examples

MODEL ARTIFACTS making use of diagramming notations inherited from UML or Archimate Model Kinds (also referred as Model Types),

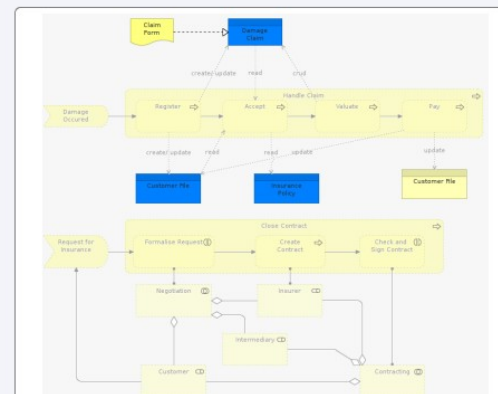
...present an ACCEPTABLE level of completeness, definitiveness and formalism.

Since VIEWS are a composition of the above they inherit the same characteristics.

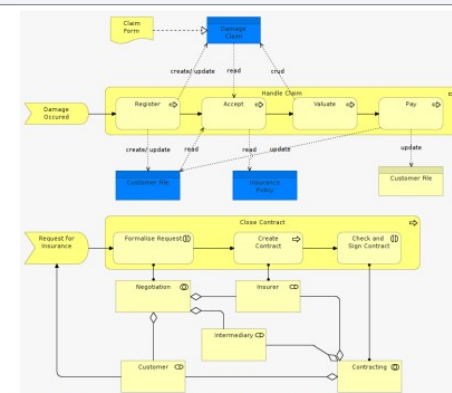
HOWEVER, only when based on Viewpoints, expressing rules on how to construct a view,

...MODEL VIEWS can reach an APPROPRIATE of completeness, definitiveness and formalism.

The same remark goes for View MAPPINGS.



Example: Model elements allowed in a Information Structure Viewpoint

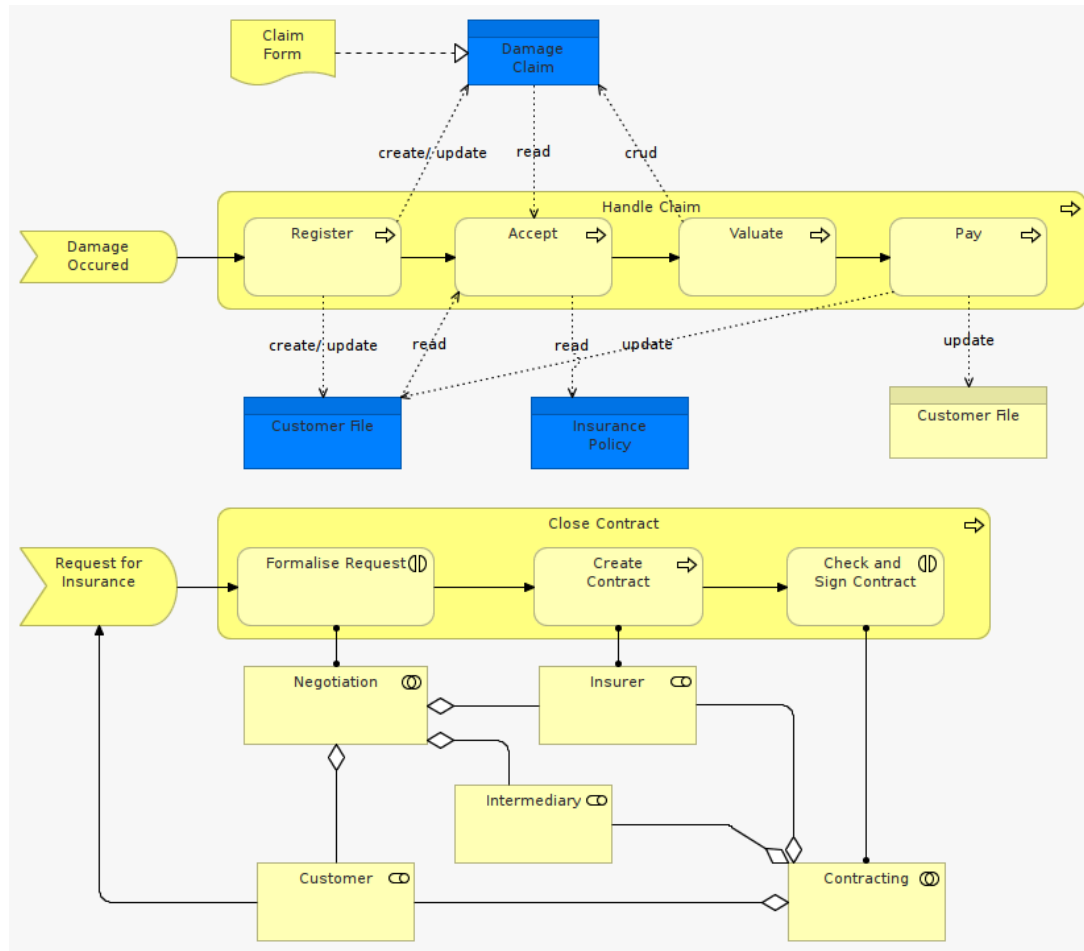


Example: Model elements allowed in a Business Process Viewpoint

Examples

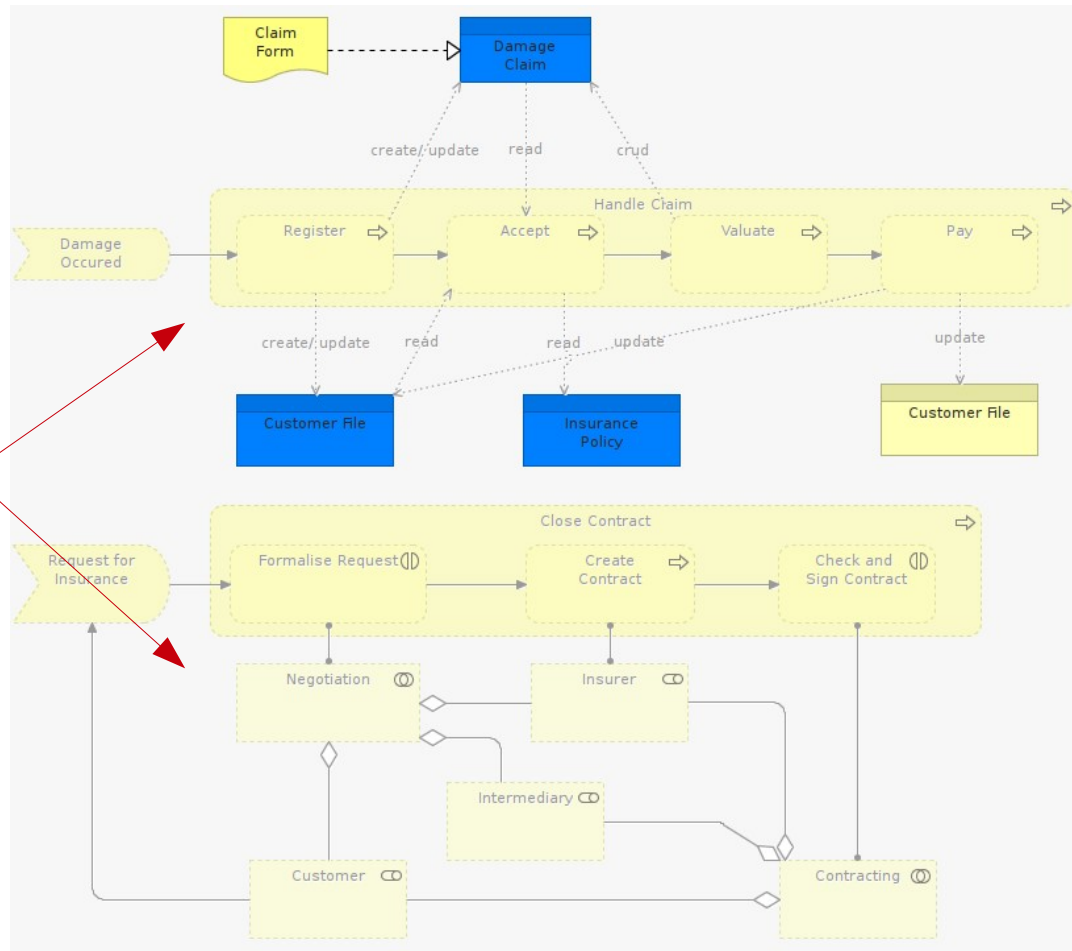


# Example: Model elements allowed in a Business Process Viewpoint

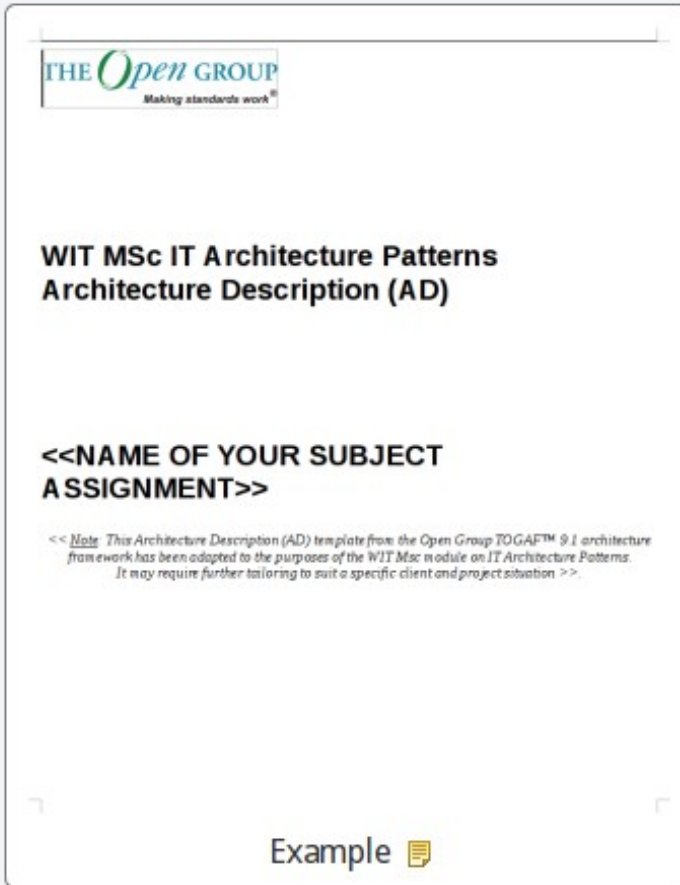


# Example: Model elements allowed in a Information Structure Viewpoint

Model elements not permitted by this Viewpoint's convention rules



# About Work-Product Deliverables



About Work-Product Deliverables 📄

# Example

An Architecture Description (AD) is a document authored by an Architect.

A partial description of an architecture solution is referred as a work-product ARTIFACT.

A COMPLETE description of the solution architecture - i.e. the AD - is a work-product DELIVERABLE.



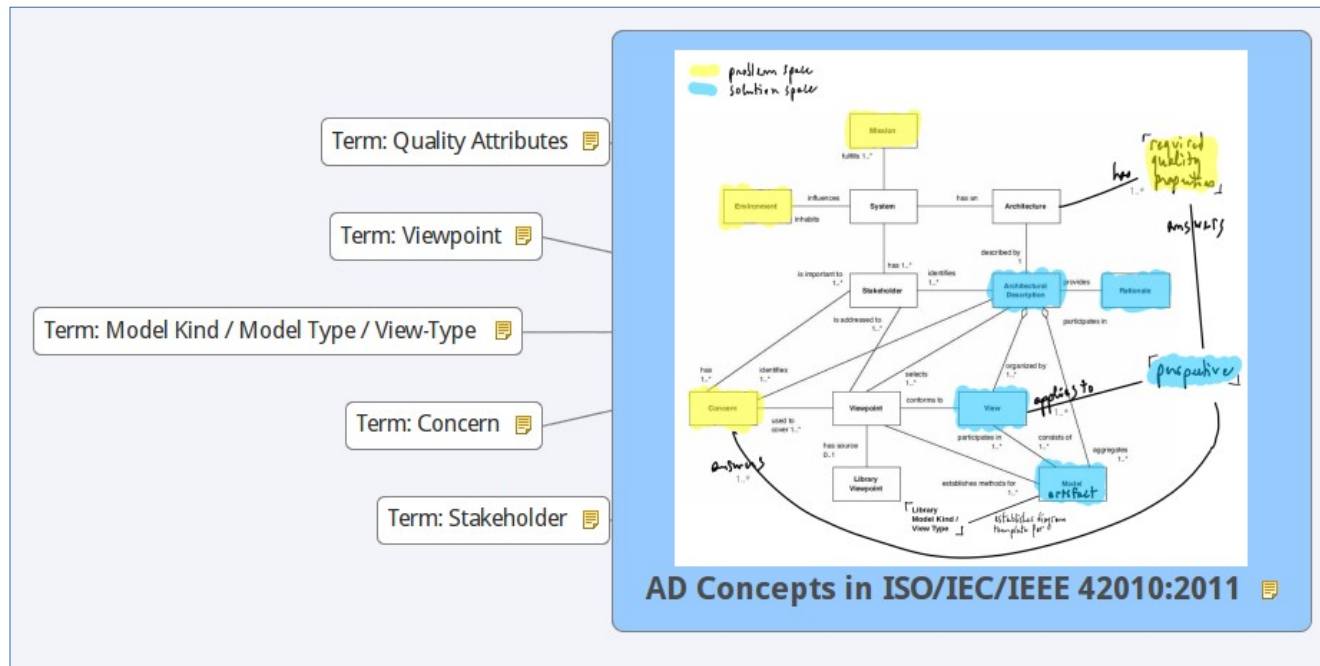
## WIT MSc IT Architecture Patterns Architecture Description (AD)

**<<NAME OF YOUR SUBJECT  
ASSIGNMENT>>**

*<< Note: This Architecture Description (AD) template from the Open Group TOGAF™ 9.1 architecture framework has been adapted to the purposes of the WIT Msc module on IT Architecture Patterns. It may require further tailoring to suit a specific client and project situation >>.*



# AD Concepts in ISO/IEC/IEEE 42010:2011



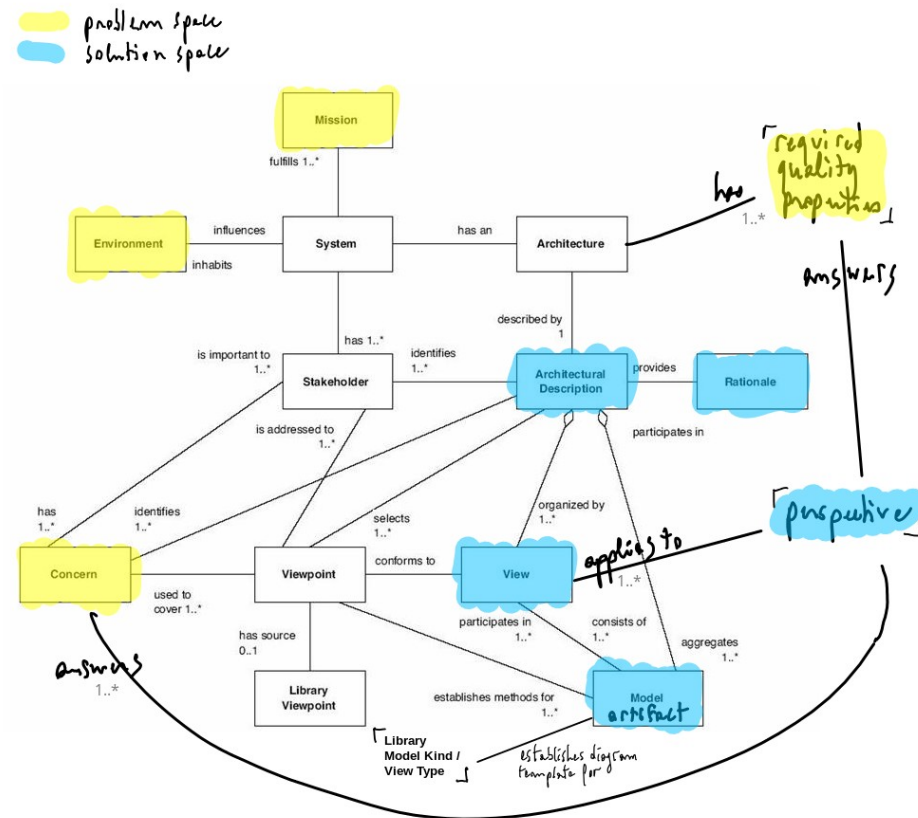
# AD Concepts in ISO/IEC/IEEE 42010:2011

Once Stakeholder Concerns have been identified, they must be framed by one or more VIEWPOINTS.

Once Viewpoints have been selected, these are used to establish Views with their Models.

Model artifacts express Views of the architecture solution using MODEL KINDS (also referred as model-types or view-types) as templates for diagraming.

Once Views are established, the quality attributes of each View are assessed using PERSPECTIVES.



# Term: Stakeholder

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A stakeholder is anyone who has an interest in or concern about in the system designed ...and/or people who need to use the results of these Views for another task.

Stakeholders REVIEW/APPROVE architectural artifacts and views.

Stakeholders to consider include:

- users of a system
- operators of a system
- acquirers of a system
- owners of a system
- suppliers of a system
- developers of a system
- builders of a system
- maintainers of a system



# Term: Concern

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A concern pertains to any influence on a system from environment, (e.g. operational, organizational, economic, regulatory, social, technological, etc.)

Architects looking for an architecture viewpoint suitable for their purposes often listen to concerns (i.e. interests) from stakeholders to guide them in their search.

Once identified, these concerns act as "forces" or "constraints" on the solution scope.

It is important to document the concerns and stakeholders for which a viewpoint is intended.





# Term: Model Kind / Model Type / View-Type

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An architecture view consists of multiple architecture models. Each model is "governed" by a model kind which establishes the diagramming conventions for models of that type.

Conventions include languages, notations, modeling techniques, analytical methods and other operations.

These are key modeling resources made available to architects.

Examples of model kinds include structural diagrams (component, package, organization charts, ...) or behavioral diagrams (data flow, process flow, ...).



# Term: Viewpoint

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Establishes the modeling elements, modeling concepts, conventions and rules to model a Viewpoint.

Determine the vocabularies and rules for constructing models and how those models are interpreted and used by stakeholders.

When used in an architecture description, the viewpoint becomes a “contract” between the architect and stakeholders that their concerns will be addressed in the view resulting from this viewpoint.



# Term: Quality Attributes

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Quality Attributes (also referred as required Quality Properties, or Perspectives) are “areas of interest” in a system pervasive to all views of this system.

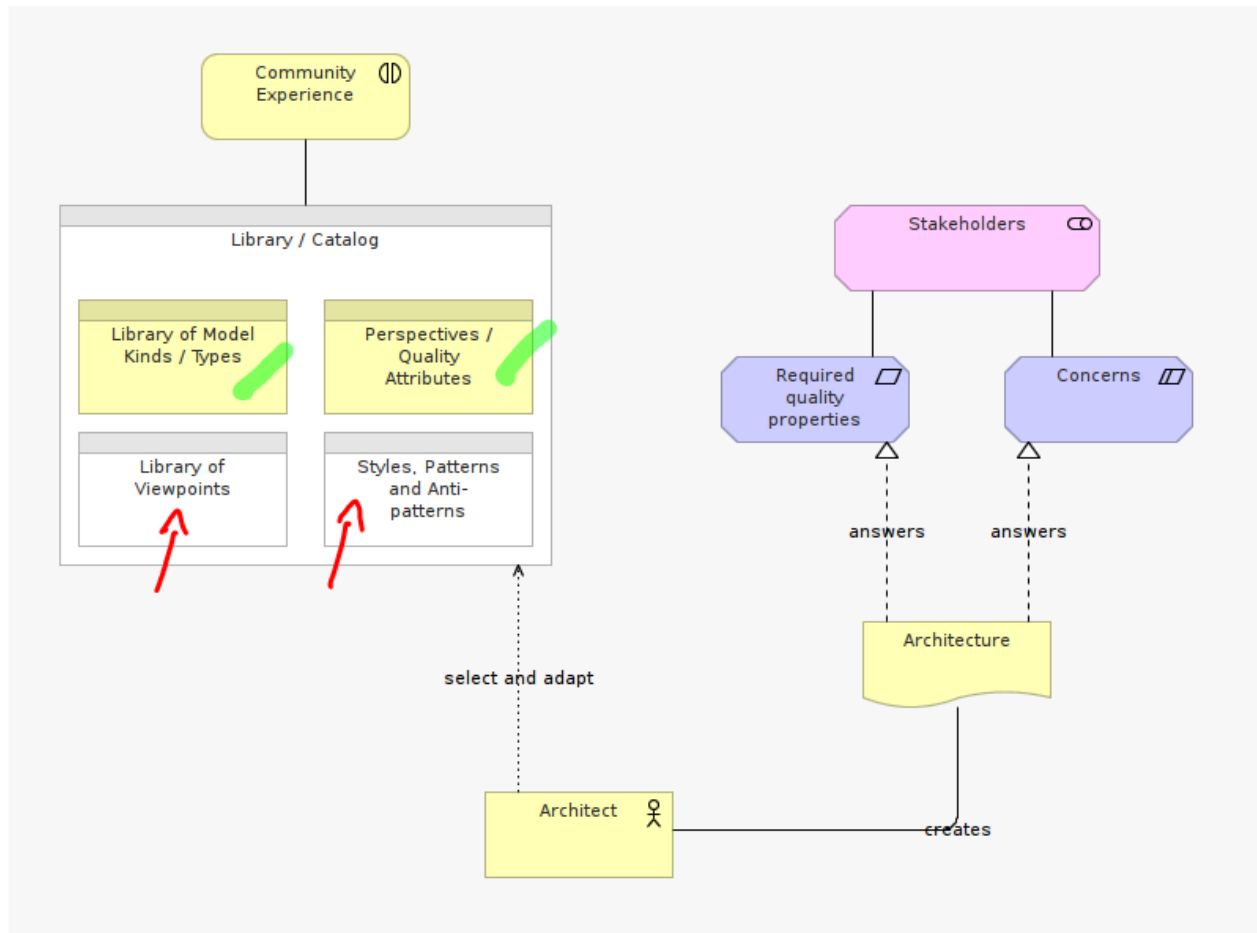
Some specific concerns are driven by the need for the system to exhibit a certain quality properties, independently from stakeholder concerns, rather than to provide a particular function.

Trying to address these aspects of an architecture by using Viewpoints does not work well, hence the concept of Architecture Perspective, horizontal to all Views of a solution.

Example of quality properties are; security, performance, availability, or usability.

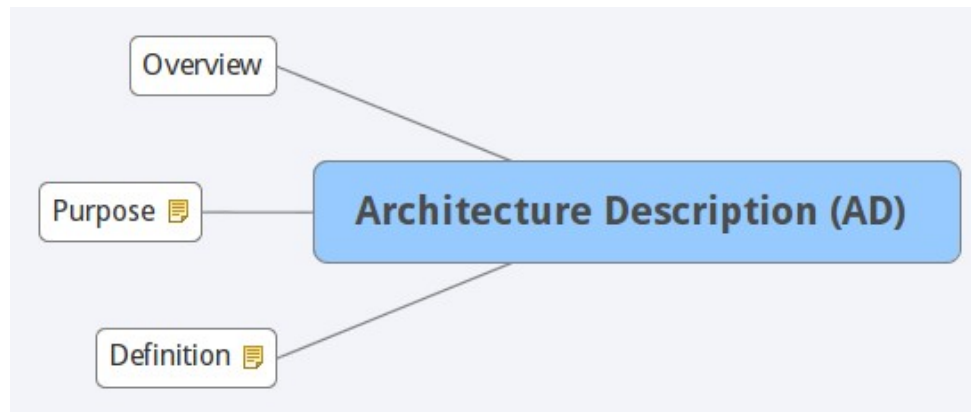


# Terms left to be introduced



# Architecture Description (AD)

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# Definition

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An Architecture Description (AD) expresses the Architecture of a System of interest (ISO-IEC-IEEE 42010-2011).

It is a composition of model artifacts used to define, describe and detect gaps in the architecture - to demonstrate coverage COMPLETENESS of stakeholders requirements.

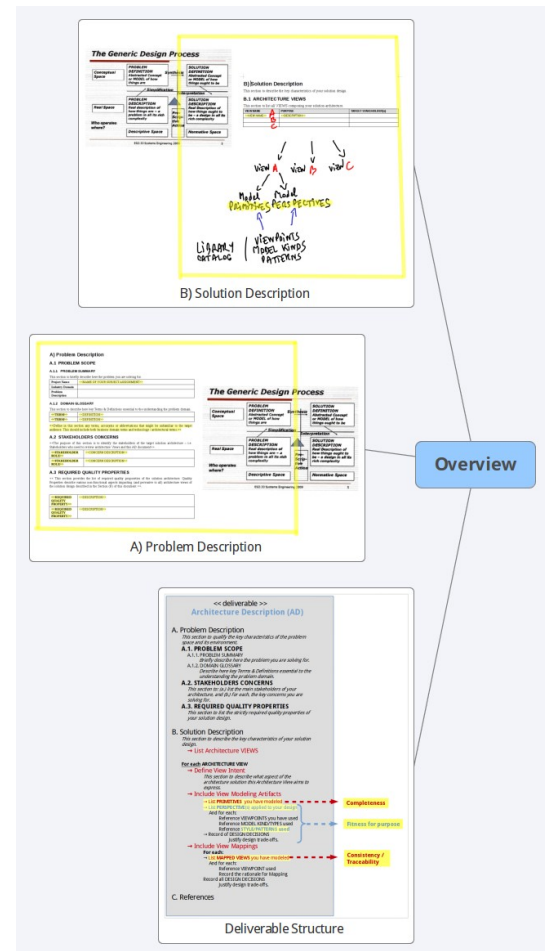
It links together views of the solution architecture, and records the reasons for decisions made - to demonstrate design CONSISTENCY and TRACEABILITY between design primitives.

It uses Perspectives to assess that all required quality properties are met all through the system, and across all views - to demonstrate that the solution is FIT FOR PURPOSE.

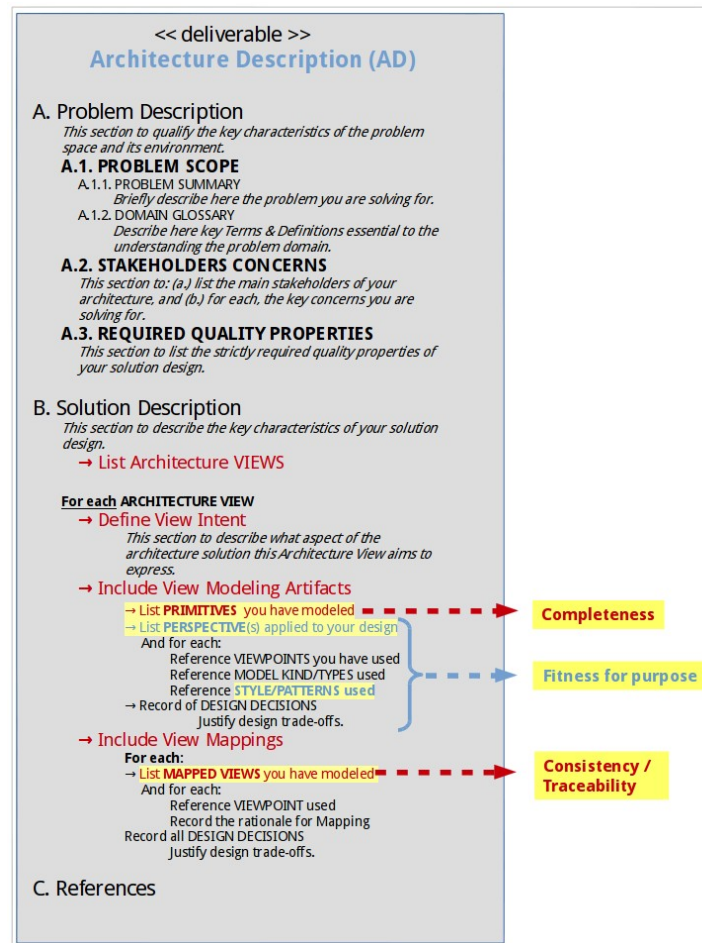
# Purpose

The purpose of an Architecture Description (AD) is to:

- document all stakeholders of the system and document their concerns
- select the Viewpoints that best frame, or cover, those concerns
- document the Views of the architecture, such that each satisfies one of those viewpoints
- link together those Views with correspondences and recording any known inconsistencies between Views
- document the Perspectives of the architecture, such that each satisfies its required quality properties
- provide rationale for key decisions made in the architecture design.



# Deliverable Structure





# A) Problem Description

## A) Problem Description

### A.1 PROBLEM SCOPE

#### A.1.1 PROBLEM SUMMARY

This section to briefly describe here the problem you are solving for.

Project Name	<<NAME OF YOUR SUBJECT ASSIGNMENT>>
Industry Domain	
Problem Description	

#### A.1.2 DOMAIN GLOSSARY

This section to describe here key Terms & Definitions essential to the understanding the problem domain.

<<TERM>>	<<DEFINITION>>
<<TERM>>	<<DEFINITION>>

<<Define in this section any terms, acronyms or abbreviations that might be unfamiliar to the target audience. This should include both business domain terms and technology / architectural terms.>>

### A.2 STAKEHOLDERS CONCERNS

<<The purpose of this section is to identify the stakeholders of the target solution architecture – i.e. Stakeholders who need to review architecture Views and this AD document>>.

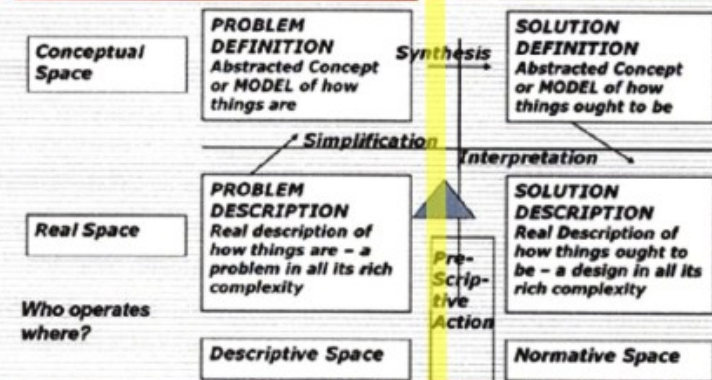
<<STAKEHOLDER ROLE>>	<<CONCERN DESCRIPTION>>
<<STAKEHOLDER ROLE>>	<<CONCERN DESCRIPTION>>

### A.3 REQUIRED QUALITY PROPERTIES

<< This section provides the list of required quality properties of the solution architecture. Quality Properties describe various non-functional aspects impacting (and pervasive to all) architecture views of the solution design described in the Section (B) of this document >>.

<<REQUIRED QUALITY PROPERTY>>	<<DESCRIPTION>>
<<REQUIRED QUALITY PROPERTY>>	<<DESCRIPTION>>

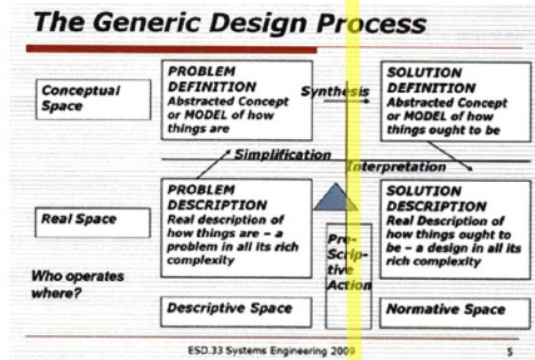
## The Generic Design Process



ESD.33 Systems Engineering 2009

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## B) Solution Description



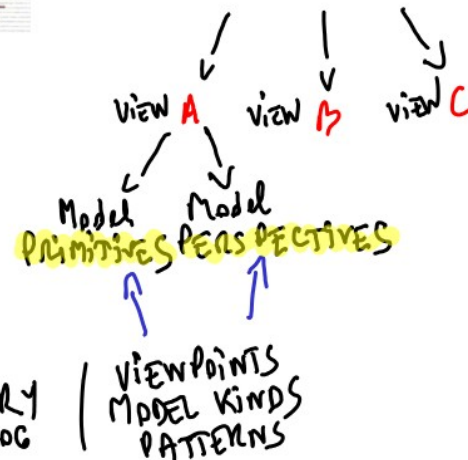
### B) Solution Description

This section to describe the key characteristics of your solution design.

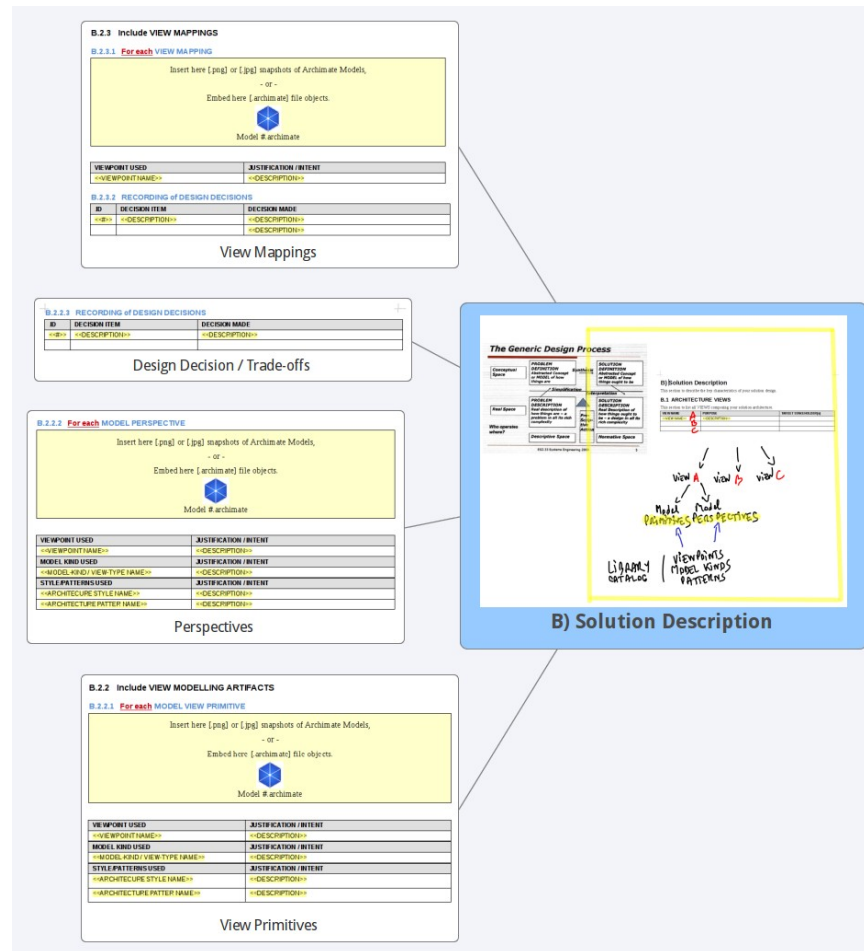
#### B.1 ARCHITECTURE VIEWS

This section to list all VIEWS composing your solution architecture.

VIEWNAME	PURPOSE	TARGET STAKEHOLDER(s)
<<VIEW NAME>>	<<DESCRIPTION>>	
A		
B		
C		



# B) Solution Description



# View Primitives

## B.2.2 Include VIEW MODELLING ARTIFACTS

### B.2.2.1 For each MODEL VIEW PRIMITIVE

Insert here [.png] or [.jpg] snapshots of Archimate Models,

- or -

Embed here [.archimate] file objects.



Model #.archimate

VIEWPOINT USED	JUSTIFICATION / INTENT
<<VIEWPOINT NAME>>	<<DESCRIPTION>>
MODEL KIND USED	JUSTIFICATION / INTENT
<<MODEL-KIND / VIEW-TYPE NAME>>	<<DESCRIPTION>>
STYLE/PATTERNS USED	JUSTIFICATION / INTENT
<<ARCHITECTURE STYLE NAME>>	<<DESCRIPTION>>
<<ARCHITECTURE PATTERN NAME>>	<<DESCRIPTION>>

# Perspectives

## B.2.2.2 For each MODEL PERSPECTIVE

Insert here [.png] or [.jpg] snapshots of Archimate Models,

- or -

Embed here [.archimate] file objects.



Model #.archimate


VIEWPOINT USED	JUSTIFICATION / INTENT
<<VIEWPOINT NAME>>	<<DESCRIPTION>>
MODEL KIND USED	JUSTIFICATION / INTENT
<<MODEL-KIND / VIEW-TYPE NAME>>	<<DESCRIPTION>>
STYLE/PATTERNS USED	JUSTIFICATION / INTENT
<<ARCHITECTURE STYLE NAME>>	<<DESCRIPTION>>
<<ARCHITECTURE PATTERN NAME>>	<<DESCRIPTION>>

# View Mappings

## B.2.3 Include VIEW MAPPINGS

### B.2.3.1 For each VIEW MAPPING

Insert here [.png] or [.jpg] snapshots of Archimate Models,  
- or -  
Embed here [.archimate] file objects.



Model #.archimate

VIEWPOINT USED	JUSTIFICATION / INTENT
<<VIEWPOINTNAME>>	<<DESCRIPTION>>

### B.2.3.2 RECORDING of DESIGN DECISIONS

ID	DECISION ITEM	DECISION MADE
<<#>>	<<DESCRIPTION>>	<<DESCRIPTION>>
		<<DESCRIPTION>>

# Design Decision / Trade-offs

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## B.2.2.3 RECORDING of DESIGN DECISIONS

ID	DECISION ITEM	DECISION MADE
<<#>>	<<DESCRIPTION>>	<<DESCRIPTION>>