



THE LEADING PRACTICE REQUIREMENT REFERENCE CONTENT #LEAD-ES20012BC

A Requirement Ontology & Requirement Semantic Description, Views,
Stakeholders and Concerns

Version Status: LEAD 3.0

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Overview of the Requirement Reference Content

Introduction

The LEADIng Practice Requirement Reference Content provides requirement ontology with its requirement description, specific requirement semantic relations and correlations. It is based on a collection of best and leading practice around how to work with requirements within enterprise modelling, enterprise engineering and enterprise architecture disciplines. The Requirement Reference Content is therefore an essential part for any practitioner working with and around requirement aspects. It provides a structural way of thinking, working, modelling, implementation and governance around requirement definitions, and how requirements are applied within business functions, services, processes as well as applications. The Requirement Reference Content also provides an overview of the key requirement aspects of the organisation and how they relate to the various business aspects, e.g. organizational construct, competencies, roles, resources, objects, rules, compliance, channel, media as well as reporting. The Requirement Reference Content therefore provides a way of analysing, appraising, approximating, assessing and capturing requirement related objects to enable innovation and transformation.

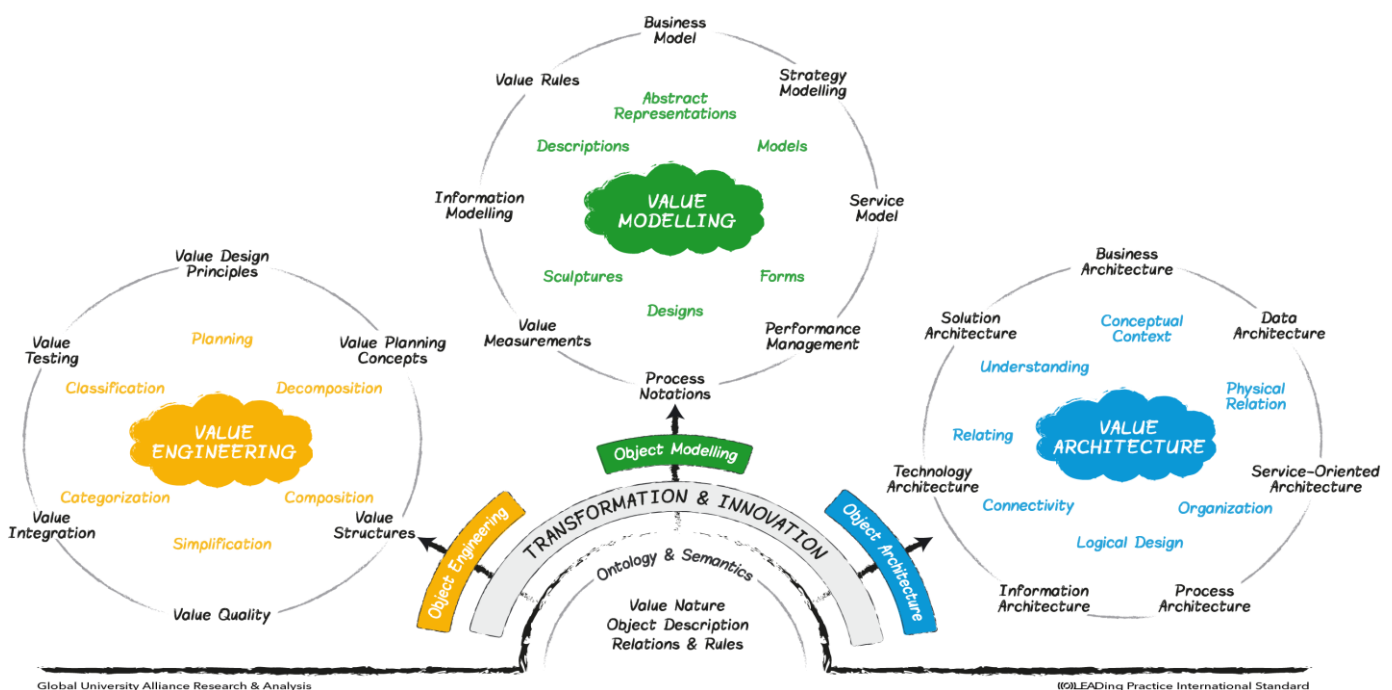


Figure 1) The Requirement Objects are part of the many semantic relations between the enterprise engineering, enterprise modelling, and enterprise architecture enabling transformation and innovation.

Why use the Requirement Reference Content?

- It provides requirement ontology with its specific requirement descriptions, semantic relations and correlations.

- It defines how to organize and structure the viewpoints and objects associated with requirement engineering, requirement modelling, and requirement architecture.
- Established guiding principles for creating, interpreting, analysing and using requirement objects within a particular domain and/or layers of an enterprise or an organization.
- Using the requirement Reference Content is done through a set of principles e.g. how and where can the requirement objects be related (and where not).
- It is vendor neutral and agnostic and can therefore be used with most existing frameworks, methods and or approaches that have any of the meta-objects mentioned in this document.
- It has captured a repeatable pattern for requirement related objects, structures as well as artefacts (the basis of our standards). The definition of a pattern used here is the description of the repeatable and mostly used/generic specifications and relations of a topic, not all theoretically possible specifications or relations.
- It has requirement standards that increase the level of re-usability and replication for requirement identification, requirement planning, requirement creation, and requirement realization as well as requirement management and requirement governance.
- It has a fully integrated and standardized requirement maps, matrices and models that allow for advanced ways of requirement thinking, working, modelling and implementation.

LEAD Objects relevant to Requirement aspects within the Templates

As almost all of the LEAD Objects of the LEAD Objects Description list are relevant to requirement aspects within the templates, there is no added value to repeat all LEAD Object descriptions here. Figure 2 in paragraph 'Requirement Objects and their usage in the Requirement templates' below provides an overview of all requirement related LEAD Objects in a schematic format.

The three main properties characterizing the Meta-Objects

In order to have a structured way of thinking, working and modelling within the Requirement Reference Content, the three main properties characterizing the meta-object relevant to modelling and architecture principles are applied:

- **Identity:** the decomposed requirement objects that distinguishes it from other meta-object areas.
- **State:** describes the purpose of the composed object.
- **Behaviour:** describes how the decomposed or composed objects can be used with other meta-object's relations across other modelling disciplines and architectural layers.

Requirement Objects and their usage in the Requirement Templates

The Requirement Reference Content templates consist of both requirement maps, requirement matrices and requirement models that capture the relevant requirement meta-objects. Each of these is based on a specific view to a related requirement topic and thereby with particular stakeholder concern, modelling and architecture rules related to enable requirement identification, creation, and realization in achieving the outlined needs and wants. For this the Requirement Reference Content templates identify the relevant stakeholders, their requirement object descriptions (including concerns) and their modelling and architecture rational, the corresponding rules, architecture views and viewpoints; each of these artefacts are built as templates to support a particular need and want.

Fully integrated and standardized requirement templates enable the strategist, requirement expert/practitioner or architect (requirement or business architect) to work with the relevant requirement meta-objects throughout all the architectural layers (business, application and technology). Advanced requirement modelling and relating the relevant objects throughout the layers is one of the strengths of the Requirement Reference Content. Not only are the requirement objects governed by its connection modelling rules, but also how and where the requirement templates interlink and share common objects is defined and standardized.

LEAD Templates & LEAD Meta Object Relations		LEAD TEMPLATES (MAPS, MATRICES AND MODELS)																												
		Force M (External/Internal)	Drivers (External/Internal)	Driver Type (Value)	Driver Type (Performance)	Goal (e.g. Business, Application, Etc.)	Objective	Business Function	Business Roles	Business Owner	Service Owner	Business Process	Object (Business & Information & Data)	Process Owner	Application Feature	Application Function	Application Service	Application/System Owner	Data Service	Data Owner	Platform Function	Platform Service	Platform Owner	Infrastructure Function	Infrastructure Feature	Infrastructure Service	Infrastructure Owner	Virtualization (V)	High Availability (H)	
Force M (External/Internal)	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Drivers (External/Internal)	1,2,3	2,3	2	2	2	1,2	2	2	2	2,3	2	2	2	2	2	2	2	2	2	2	2,3	2,3	2	2	2	2	2	2	2	2
Driver Type (Value)	1,2,3	2,3	1,2	2,3	2,3	1,2,3	2	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2,3	2,3	2	2	2	2	2	2	2	2	2
Driver Type (Performance)	1,2,3	2,3	2	2	2	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Goal (e.g. Business, Application, Etc.)	2	1,2	2	2	2,3	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Objective	2	2	2	2	2,3	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Business Function	2	2	2	2	2,3	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Business Roles	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Business Owner	2	2	1,2	1,2,3	2,3	2,3	2,3	2,3	2,3	2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Service Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Business Process	2	2	1,2	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Object (Business & Information & Data)	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Process Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Application Feature	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Application Function	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Application Service	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Application/System Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Data Service	1,2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Data Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Platform Function	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Platform Service	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Platform Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Infrastructure Function	2,3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Infrastructure Feature	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Infrastructure Service	1,2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Infrastructure Owner	2	2	1,2,3	1,2,3	2,3	2,3	2,3	1,2,3	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	

Figure 2: The requirement decomposition related objects and their Maps, Matrices & Models.

The requirement templates are ether maps, matrices and models. The maps are often in the form of a list and are a representation of the decomposed requirement objects, while the matrices are the continuity of and interconnection between a map (a representation of decomposed objects) and a representation of interconnected and related objects. Models often show the graphical representation of the relations and connections. The maps, matrices and models are used in the decomposition and composition work within and throughout the layers. The specific templates do not only show which objects are within what template, thereby specifying if it is a map, matrix or model, it furthermore shows where the object of one template can be reused in another template.

Requirement Object Specifics (e.g. Definition, Decomposition)

A **requirement** is an agreed upon statement as to 'what must be delivered to provide requirement'. It is therefore the measure to which a business or some of its objects (solution/product, service, or any element of the business required to address factors from the environment, execute the strategy, perform operations or maintain control) should conform. A business requirement may lead, through some business element, to the recognition of an application requirement to the need or opportunity to create an application feature to enable features within the business, conceptually a requirement is therefore a thing, it has its own existence and life cycle, can be stewarded, and has properties which are uniquely its own.

The requirement object can be **decomposed** into the following objects:

- Requirement (Business Requirement, Service Requirement, Process Requirement, Application Requirement, Data Requirement, Information Requirement, Infrastructure Requirement, Platform Requirement, Channel Requirement, Governance Requirement)
- Requirement Stakeholder
- Requirement Owner
- Requirement Process
- Requirement Service
- Requirement Layer
- Requirement Object
- Requirement Forces & Driver
- Requirement Goal
- Requirement Objective

Way of Thinking around Requirement aspects

The Way of Thinking around Requirement disciplines essential, as it is the basis of the guiding principles around the Requirement Reference Content. It provides a structural concept around the value specifications around Requirement definitions e.g. wants, needs, identification, goals, issues and problems. The way of requirement thinking around working with requirements furthermore postulates about what ought to be, including specifying the right requirement abstraction level. The way of thinking does the following; it analyses, appraises, approximates, assesses and captures requirement objects and artefacts; their idea, design, plan, scheme and structure. This is all done in order to understand the underlying requirement concept, thought, view, vision as well as perspective, philosophy and belief.

The purpose of having a common way of thinking around requirement concepts is to define how to organize and structure the viewpoints and requirement objects associated with the various disciplines e.g. business requirements, service requirements, process requirements, application requirements, platform requirements and infrastructure requirements, applying the concepts. The requirement reference concept has proven to help companies with some of the most common and complex advanced requirement principles, dilemmas and challenges that companies has to confront today.

This includes, but is not limited to:

- What is a requirement, and how is it related to e.g. goals, compliance, rules, performance, and measurement and reporting.
- How can requirements be managed at the right way (right capturing and usage).
- Relate the applicable requirements to services, processes, applications et cetera.
- All aspects of requirement architecture and business architecture.
- Analyse and develop requirement maturity levels and create a requirement development path
- Interlink the requirement aspects to the innovation and transformation programs and projects.

What many organizations do not realize is that there is something common within all the mentioned areas where requirement aspects need to be applied. The common things are the requirement objects. We have through research and analysis identified the semantic relations of the various requirement objects and how they can be applied within different disciplines. The relations of the requirement objects are built into our requirement templates e.g. requirement maps, requirement matrices and or requirement models.

Usage of Requirement Maps

A requirement map is an accurate list and representation of the decomposed and/or composed requirement objects. Therefore the requirement map provides an overview of the key requirements of the organisation and their drivers & forces, strategy, requirement driver, goal, objective, performance, and their requirement proposition. The requirement maps are often portrayed in the form of a list, which can range from a simple row to a catalogue of requirement objects. It has the purpose of building an inventory or index list of the requirement objects that are

to be decomposed and/or composed and thereby applied in the different Layers (business, application and technology).

The LEADIng Practice Enterprise Requirement Standard Map will enable the practitioner with the following important Enterprise Modelling, Enterprise Engineering and Enterprise Architecture principles by:

1. Linking a concept and its details or properties to the circumstances that form its setting, which are relevant subject or objects within the Requirement Map, for example the concept shown by a requirement map may show who is involved or in terms of owner or stakeholders.
2. Creating a conceptual, or high level description of features of the objects within the Requirement Map by describing the objects, for example the concept shown by a requirement map will define the purpose or nature of the specific high level or detailed requirement.
3. Providing a means of making the properties of business, application, or technology relevant requirements concrete to a specific layer, object, or area.
4. Concept to or of an object by allowing the practitioner to understand or expose the nature of the properties of each object that is related to any requirement perspective.
5. Specifying the properties of an object within the requirement, as with the requirement of, for example, a process activity, which will expose the relation and content of the task it executes, the service it delivers and the possible desired automation.
6. Detailing descriptions or explanations of aspects of the properties of the high level or detailed requirements, including such elements as the impact of the requirement not being addressed.
7. Understanding the boundary or design of the requirement by situating it relative to the environmental variables it responds to or leverages.
8. Mapping relevant aspects of requirements that are necessary for both the modelling disciplines and architectural realization to permit execution.

Summarized; the purpose of the Requirement Map is to provide a centralised and formal overview of all requirements throughout the organisation.

The Requirement Reference Content Architecture & Modelling Rules

The requirement map should capture the decomposed and/or composed requirement objects, the various practitioners e.g. business analyst, requirement expert, process specialist, business architect, and/or enterprise architect, working with requirements, would want to capture them in a map as shown below. The requirement map is a standardized template that can be amended to include additional details should they be required. The requirement map is in the form of a list that can start as a simple row and when information is added to produce a catalogue of rows. It has the purpose of building an inventory or index list of the relevant requirement objects that later in the requirement process are to be either decomposed and/or composed in the different relevant architectural layers. For example the requirement map may include within its catalogue aspects of

the business layer such as business functions/ tasks, business services, business process, application layer aspects like application tasks, application services, measurements, reporting and/or technology layer aspects like platform and infrastructure.

Requirement #	Who/Whom specification e.g. Stakeholder/Owner	Where specification e.g. Layer, Objects, Area (process, service, data, infrastructure) etc	What specification: High Level Requirements	What specification: Detailed Requirements
#				
#				
#				

Figure 3: Requirement map with decomposed requirement objects.

The requirement map’s capturing should be based on enterprise modelling- and architecture rules and is related to LEAD tasks. Therefore for each individual column of the requirement map their applicable decomposition- (D), primary- (P) and secondary (S) relationship related rules (Rule) as well as the related tasks (Task) are described below:

The ‘who/whom’ specification in terms of which stakeholder/owner.	
Rules	(S) Requirement relates to Owner.
Tasks	<ul style="list-style-type: none"> Identify, classify and label the business, application and/or technology requirements of the (and to the) business owner/service owner/process owner/data owner/application-system owner/platform owner/infrastructure owner/... owner.
The ‘where’ specification in terms of which layer, objects, area (process, service, data, infrastructure) et cetera.	
Rules	(S) Requirement relates to Competency, Object, Process, Service, Data, Application, Platform, Infrastructure, Channel, Media, Resource, Requirement, Rule, Measurement & Reporting, Performance, et cetera.
Tasks	<ul style="list-style-type: none"> Identify and categorize where specification in terms of the layer, objects, area (process, service, data, infrastructure) et cetera.
The ‘what’ specification in terms of requirement type (high-level).	
Rules	(D) Requirement relates to Requirement Type (high level/detailed level).
Tasks	<ul style="list-style-type: none"> Identify and label the high-level requirements.
The ‘what’ specification in terms of requirement type (detailed level).	

Rules	(D) Requirement relates to Requirement Type (high level/detailed level).
Tasks	<ul style="list-style-type: none">• Identify and label the detailed-level requirements.

Figure 4: How requirement is based on rules and relates to LEAD tasks

Way of Working around Requirement aspects

Description

The Requirement Way of Working is critical discipline of translating both strategic planning and effective execution. Structure the arrangement of effort and work, by translating the “Way of Thinking” into a structural way of working. The Way of Working organizes, classifies, aligns, arranges, quantifies, recommends and selects the requirement objects and with it the relevant requirement template in a systemized and categorized way they need to be de-composed (broken down) or composed (related) together.

The Way of Working is where one defines the best suitable technique, manner, routine and method that will help the practitioner to ensure integrity, accuracy and completeness of each particular task related to the rule that ensures the right requirement relation. The requirement way of working is therefore a series of phases with a collection of activities that the user of the requirement methods needs to follow and undertake in order to reach a specific goal/outcome. The below specified way of working therefore structures the practitioner’s techniques in applying the right semantic principles, rules, procedures and practices.

Usage of Requirement Matrices

The requirement matrices are a representation that accurately shows the relationship between specific decomposed and composed requirement objects. The core idea of a the requirement matrices is that they consists of the requirement objects that have primary and thereby direct natural relations, these are always in a list form (row and columns) and the requirement objects that need to be related to them. This is seen in the requirement matrices as the cross product between the rows and columns. This allows within the requirement matrix to relate the unfamiliar to the familiar requirement objects in the different layers (composition), which represents the matrix diagram (rows and columns). These ontology and semantic based requirement relations have been standardized to ensure reusability and replication of success in outlining the right connection points that is actually based on a common relationship pattern of the requirement objects.

Usage

The use of the LEADIng Practice Enterprise Requirement Standard Matrix will enable the practitioner with the following important Enterprise Modelling, Enterprise Engineering and Enterprise Architecture principles:

1. Situating a concept by setting the relationships between objects into their perspective
2. Applying a combination of concepts in a linked construct to describe the relationships between two or more objects

3. Making the concepts concrete by capturing the existing or desired relationships between two or more objects
4. Conceptual, where it appropriates, connects & relates the relevant requirement aspects
5. The specification of the requirements of the relationships between two or more objects
6. Description, in terms of explanation, depiction/sketch and portrayal
7. Design, in enabling the plan, intent, and aim.
8. Execution, through relating the objects to each other furthering the requirement performance definition and realization
9. Execution, in terms of relating requirement relevant aspects to each other and that are part of both the modelling disciplines and architectural realization, and therefore key to execution.

It is the requirement of a matrix to relate the unfamiliar to the familiar objects in the different layers (composition), usually through the form of a table or chart e.g. rows and columns in a matrix, providing a means of exposing direct connection points across the LEAD objects, and showing a common pattern of the objects relevant to the requirement.

Within the LEAD Enterprise Standard Frameworks, the LEADIng Practice Enterprise Requirement Standard Matrices are used in multiple ways, but for the most part as a means to accurately show the relationship between specific decomposed and composed requirements. The core idea of the Requirement Matrix, is that it typically consists of requirement aspects of one idea e.g. stakeholders/ owners, the detailed areas, layers or objects and their specific requirement e.g. high level or detailed, each in a row, another idea as a set of columns and a third as the cross product between the rows and columns.

The Requirement Reference Content Architecture & Modelling Rules

The requirement matrices should capture requirements and their related competency, forces & drivers, strategy, goal, performance and measurement & reporting. These are captured in separate matrixes as described below.

Requirement-Forces & Driver Matrix

This matrix shows the columns of the requirement map in combination with the forces & driver; did an external or internal force or driver created the requirement?

	Requirement #	Who/Whom specification e.g. Stakeholder/Owner	Where specification e.g. Layer, Objects, Area (process, service, data, infrastructure)	What specification: High Level Requirements	What specification: Detailed Requirements
Force/Driver 1	#				
Force/Driver 2	#				
Force/Driver N	#				

Figure 5: A matrix showing how requirement relates to forces & drivers.

The requirement matrix's capturing should be based on enterprise modelling- and architecture rules and is related to the LEAD tasks as described under the requirement map. In addition to those rules and tasks, the following rules and tasks are related to the forces & drivers:

The 'whither' specification in terms of which force and driver created the requirement.	
Rules	(S) Requirement relates to Forces & Drivers
Tasks	<ul style="list-style-type: none"> • Associate and connect the internal forces; • Associate and connect the external forces; • Associate and connect the internal drivers; • Associate and connect the external drivers; to all of the identified business, application and technology requirements

Figure 6: A table showing that requirement objects relate to forces and drivers and the tasks associated with it.

Requirement-Strategy/Goal/Objective Matrix

This matrix shows the columns of the requirement map in combination with the strategy, goal and objective; to which strategy, goal or objective can the requirement be related (depending on its level of detail).

	Requirement #	Who/Whom specification e.g. Stakeholder/Owner	Where specification e.g. Layer, Objects, Area (process, service, data, infrastructure)	What specification: High Level Requirements	What specification: Detailed Requirements
Strategy/Objective/Goal 1	#				
Strategy/Objective/Goal 2	#				
Strategy/Objective/Goal N	#				

Figure 7: A matrix showing how requirement relates to strategy/goal/objective.

The requirement matrix's capturing should be based on enterprise modelling- and architecture rules and is related to the LEAD tasks as described under the requirement map. In addition to those rules and tasks, the following rules and tasks are related to the strategy, goal and objectives:

The 'whither' specification in terms of which strategy, goal or objective created the requirement.	
Rules	(S) Requirement relates to Strategy (Strategic Business Objectives) (S) Requirement relates to Goal (Business Goal, Application Goal, Technology Goal) (S) Requirement relates to Objective (Critical Success Factor, Plan, Forecast, Budget)
Tasks	<ul style="list-style-type: none"> • (Strategy) Connect, attach and associate each individual strategic business objective to the different business, application and technology requirements. • (Goal) Associate and correlate business goals, application goals and technology goals to the different business, application and technology requirements. • (Objective) Associate and correlate critical success factors, plans, forecasts and budgets to the different business, application and technology requirements.

Figure 8: A table showing that requirement objects relate to strategy/goal/objective and the tasks associated with it.

Requirement-Competency Matrix

This matrix shows the columns of the requirement map in combination with the competency type; does the requirement relates to core-competitive, core-differentiated or non-core aspects of the organisation.

	Requirement #	Who/Whom specification e.g. Stakeholder/Owner	Where specification e.g. Layer, Objects, Area (process, service, data, infrastructure)	What specification: High Level Requirements	What specification: Detailed Requirements
Competency Type 1	#				
Competency Type 2	#				
Competency Type N	#				

Figure 9: A matrix showing how requirement relates to competency type.

The requirement matrix's capturing should be based on enterprise modelling- and architecture rules and is related to the LEAD tasks as described under the requirement map. In addition to those rules and tasks, the following rules and tasks are related to the competency type:

The 'whither' specification in terms of which competency type (core-differentiated, core-competitive or non-core) relates to the requirement.	
Rules	(S) Requirement relates to Competency (Competency Type)
Tasks	<ul style="list-style-type: none"> • Identify and categorize the business requirements of; <ol style="list-style-type: none"> 1. differentiating competencies 2. competitive competencies 3. non-core competencies • Identify and categorize the application requirements of; <ol style="list-style-type: none"> 1. differentiating competencies 2. competitive competencies 3. non-core competencies • Identify and categorize the technology requirements of; <ol style="list-style-type: none"> 1. differentiating competencies 2. competitive competencies 3. non-core competencies

Figure 10: A table showing that requirement objects relate to competency type and the tasks associated with it.

Requirement-Measurement & Reporting Matrix

This matrix shows the columns of the requirement map in combination with the measurement & reporting aspects; which requirements are applicable for the measurements and for the reports, including the measurements and reports related to requirements themselves.

	Requirement #	Who/Whom specification e.g. Stakeholder/Owner	Where specification e.g. Layer, Objects, Area (process, service, data, infrastructure)	What specification: High Level Requirements	What specification: Detailed Requirements
Measurement/Report 1	#				
Measurement/Report 2	#				
Measurement/Report N	#				

Figure 11: A matrix showing how requirement relates to measurement & reporting.

The requirement matrix's capturing should be based on enterprise modelling- and architecture rules and is related to the LEAD tasks as described under the requirement map. In addition to those rules and tasks, the following rules and tasks are related to measurements & reporting:

The 'how' specification in terms of how the requirement is measured and reported on.	
Rules	(S) Requirement relates to Measurement & Reporting (Service Measurement, Process Measurement, System Measurement, Reports)
Tasks	<ul style="list-style-type: none"> • Connect the service/process/system/... measurements to the business, application and/or technology requirements. • Connect the reports to the business, application and/or technology requirements.

Figure 12: A table showing that requirement objects relate to measurement & reporting and the tasks associated with it.

Way of Modelling around Requirement aspects

The Requirement Way of Modelling provides the means for the various practitioners working with requirement aspects to assist them in defining the modelling principles required to make an objective assessment of the possible requirement object relationships with other objects. It provides a uniform and formal description of the models where the requirement objects and artefacts within one or more different types of models can be portrayed.

The requirement models are a representation that graphically represent and shows the requirement relationship and the interconnection of specific composed objects and complies with a specific set of rules for what the graphical components mean, and how they are connected to the rest of the business. The key ideal of a requirement model is that it is a representation, an illustration, of a composition of information intended to represent an aspect of an enterprise (e.g. business, application and/or technology), using a specific set of rules, which express a logic or grammar.

Each practitioner working with requirement aspects has to be able to translate the “Way of Working” into a “Way of Modelling”, which for the most part include the following:

- **Expressiveness:** the degree to which a given modelling technique is able to denote the models of any number and kinds of layered domains (business, application and technology).
- **Arbitrariness:** the degree of freedom one has when decomposing and composing different models on the same domain.
- **Suitability:** the degree to which a given modelling technique is specifically tailored for a specific kind of wanted output/result.
- **Comprehensibility:** the ease of how the way of working and way of modelling techniques are understood by participants.
- **Coherence:** the degree to which the individual sub-models of a way of modelling constitute a whole.
- **Completeness:** the degree to which all-necessary concepts of the application domains are represented in the way of modelling.
- **Efficiency:** the degree to which the modelling steps (e.g. LEADIng Practice steps) uses resources such as time and people.
- **Effectiveness:** the degree to which the modelling principles achieve its goals.
- **Audit:** the degree to which the end results of the models achieve its goals.

Based on already acquired information from the requirement maps and/or a requirement matrices (or both), a requirement model is usually crafted to enable complex information to be used in different disciplines and within this to be communicated more easily to stakeholders, management and leadership. The fully integrated and standardized requirement templates enable the practitioner to work and model with the requirement objects throughout all the aspects of the enterprise (business, application and technology). Not only are the objects governed by its semantic relations and connection, also the specified requirement modelling rules and tasks, which ensure how and where the requirement templates interlink and share common requirement objects is defined and standardized.

As we explore earlier is the requirement matrix is the continuity of and interconnection between a requirement map (a representation of decomposed and/or composed objects) and a requirement model (a representation of interconnected and related objects). The requirement maps, matrices and models are therefore used in the decomposition and composition work (within and throughout the layers).

By using the requirement templates to manage the different kinds of highly connected information and relations, the requirement creation is ensured. The requirement map (which list the various related objects in order to capture the decomposed unrelated objects) is vital as well as the requirement matrix (which composes in terms of relating specific objects together) and the requirement model (which graphically represent the decomposed and composed objects) are both critical in integrating and standardizing the requirement templates and tools of the practitioner. Furthermore, it is an essential part of supporting as well as integrating and standardizing the practitioner's Way of Thinking, Working and Modelling.

Last but not least, it ensures integration of the Enterprise Modelling and Enterprise Architecture objects and artefacts. Bringing an organization that uses the requirement way of modelling templates to the highest maturity possible of working not only documented (level 3) or managed (level 4) but enabling optimization, governance and continuous improvement (level 5).

Requirement Model

The Requirement Model illustrates the relationship between the business requirements, application requirements and technical requirements with:

1. Performance indicator: 1. Strategic KPI's, 2. Tactical KPI's, Operational KPI's.
2. Objects: 1. Business objects, 2. Information objects, 3. Data objects.
3. Process tier
4. Process event
5. Process gateways
6. Process flow: 1. Process flow input, 2. Process flow output
7. Service flow: 1. Service flow input, 2. Service flow output
8. Service tier
9. Service construct (setup & delivery).

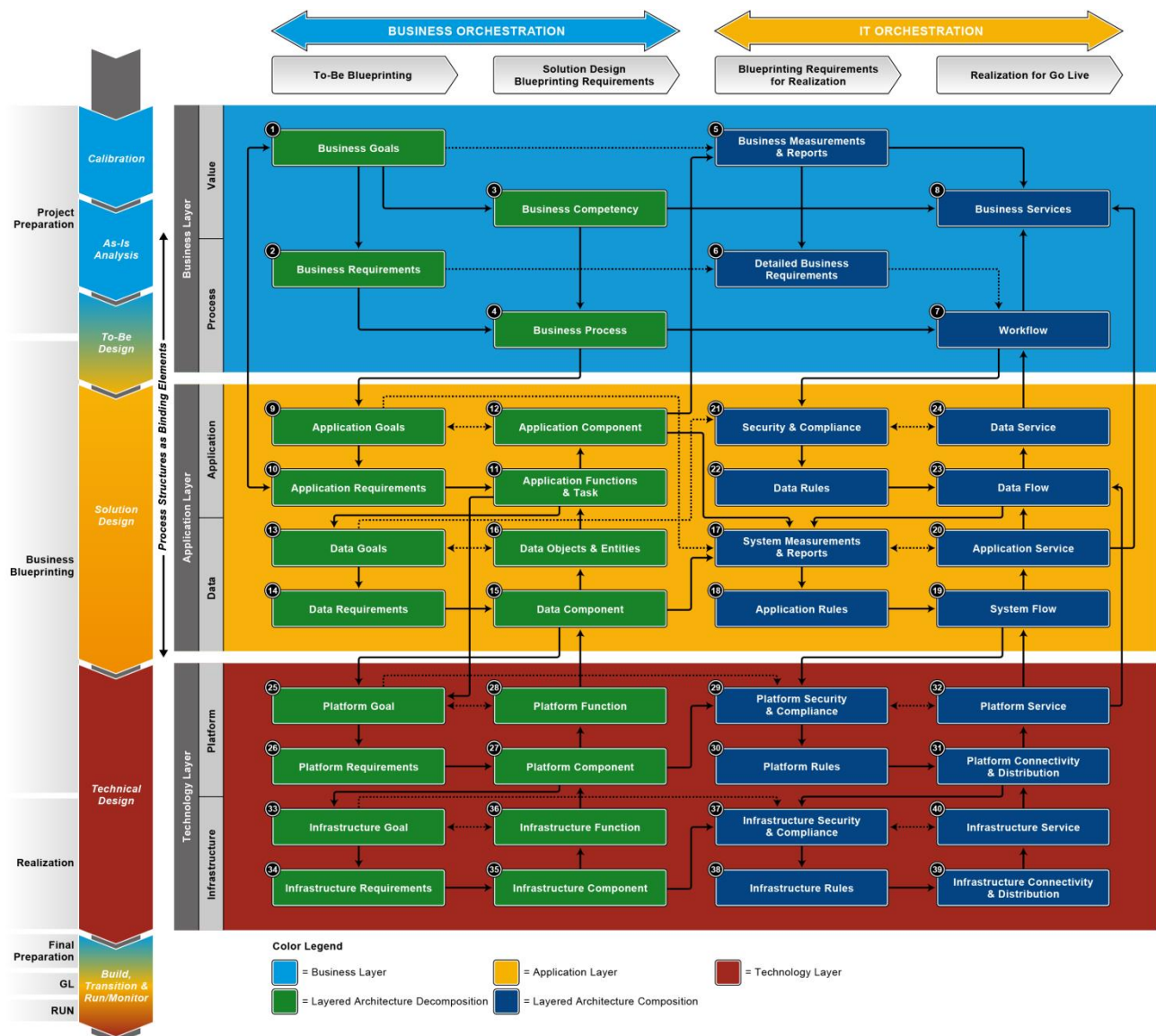
The Requirement Model is developed applying the corresponding architectural modelling rules. These have been described above in chapter 'Way of Working around Requirement aspects'. The corresponding tasks are included in chapter 'Way of Implementing' below.

Way of Implementing

The Requirement Reference Content's Way of Implementation combines the enterprise engineering, enterprise modelling and enterprise architecture principles in an order to apply the way of requirement thinking, requirement working and requirement modelling into the physical and thereby the requirement execution.

Most implementations fall short of transforming the business and creating real requirement due to the fact that they automate the existing Way of Working around Requirement concepts. Thereby actually reinforcing a siloed and ineffective way of automation. It is about the possibility to totally rethink the requirement flow within the information flow, the service flow, the process flow as well as the measurement and reporting flow. It can fundamentally rethink and transform the different ways of working within an organization.

The Way of Requirement Implementation has been developed as a fully integrated part of a Blueprinting and Implementation concept. In this way, the requirement aspects can be integrated to any other engineering, modelling or architecture discipline e.g. process, service, application/software, data etc. With this the Way of Implementation provides a uniform and formal implementation concept of where the Requirement meta-objects and artefacts can be used. By using decomposition and composition modelling techniques within the 40 steps of the Way of Implementation, the requirement objects within the templates can be applied to the relevant subjects within the different layers (business, application or technology).



LEADing Practice Information & Technology Standard: Blueprinting Reference Content

Figure 20: A model showing the 40 Blueprinting & Implementation steps across the Business, Application and Technology Layer.

Example of the Business Layer where the Requirement Objects are used or applied within the implementation steps:

Step 1: Requirement Objects and the tasks to apply them within the Business Goals step:

- ✓ Matrix: Associate and connect the internal and external **forces & drivers** to all of the identified business, application and technology requirements (Figure 6).
- ✓ Matrix: Connect, attach and associate each individual **strategy** (strategic business objective) to the different business, application and technology requirements (Figure 8).
- ✓ Matrix: Associate and correlate **goals** (business goals, application goals and technology goals) to the different business, application and technology requirements (Figure 8).
- ✓ Matrix: Associate and correlate **objectives** (critical success factors, plans, forecasts and budgets) to the different business, application and technology requirements (Figure 8).

- ✓ Model: Develop a Requirement Model that illustrates the connection between strategic, tactical and operational key **performance** indicator and the different business, application and technology requirements.

Step 2: Requirement Objects and the tasks to apply them within the Requirement step:

- ✓ Map: Identify and label the **high-level requirements** (Figure 4).
- ✓ Map: Identify and categorize the **where specification** of the high-level requirements in terms of the layer, objects, area (process, service, data, infrastructure) et cetera (Figure 4).
- ✓ Map: Identify, classify and label the business, application and/or technology high-level requirements of the (and to the) **owner**: business owner, service owner, process owner, data owner, application-system owner, platform owner, and infrastructure owner (/... owner) (Figure 4).
- ✓ Map: Label and catalogue the high-level business, application and/or technology requirements of the **business rules**.
- ✓ Matrix: Correlate and connect each **business rule** to the high-level business, application and/or technology requirements.
- ✓ Map: Identify and categorize the high-level business, application and/or technology requirements of the **business compliance**.
- ✓ Matrix: Associate and connect **business compliance** to high-level business, application and/or technology requirements.
- ✓ Map: Classify and categorize the high-level business, application and/or technology requirements of the **business channels**.
- ✓ Matrix: Link and associate each individual high-level business, application and/or technology requirement to **business channels**.
- ✓ Map: Classify and categorize the high-level business, application and/or technology requirements of the **business media**.
- ✓ Matrix: Link and associate each individual high-level business, application and/or technology requirement to **business media**.

Step 3: Requirement Objects and the tasks to apply them within the Business Competency step:

- ✓ Matrix: Identify and categorize the business requirements per **competency type**; 1. Core differentiating competencies, 2. Core competitive competencies, 3. Non-core competencies (Figure 10).
- ✓ Matrix: Identify and categorize the application requirements per **competency type**: 1. Core differentiating competencies, 2. Core competitive competencies, 3. Non-core competencies (Figure 10).
- ✓ Matrix: Identify and categorize the technology requirements per **competency type**: 1. Core differentiating competencies, 2. Core competitive competencies, 3. Non-core competencies (Figure 10).
- ✓ Map; Identify and categorize the business requirements, application requirements and technology requirements per **object**; 1. Business objects, 2. Information objects, and 3. Data objects.
- ✓ Matrix; Associate and connect each business-, application- and technology requirement to **objects**: 1. Business objects, 2. Information objects, and 3. Data objects.

- ✓ Model: Develop a Requirement Model that illustrates the connectivity and relationship between business-, application- and technology requirements and **objects**: 1. Business objects, 2. Information objects, and 3. Data objects.

Step 4: Requirement Objects and the tasks to apply them within the Business process step:

- ✓ Map: Identify and categorize the business, application and/or technology requirements of the **process area and group**.
- ✓ Matrix: Link and attach the business, application and/or technology requirements to each individual **process area and group**.
- ✓ Map: Categorize, label and group the business, application and/or technology requirements of the **business process**.
- ✓ Matrix: Associate and tie the business, application and/or technology requirements to each individual **business process**.
- ✓ Matrix: Associate and relate business-, application- and technology requirements to the **process tier**: 1. Strategic process tier, 2. Tactical process tier, 3. Operational process tier.
- ✓ Model: Develop a Requirement Model that illustrates the connectivity and relationship between business requirements and **process tier**: 1. Strategic process tier, 2. Tactical process tier, 3. Operational process tier.
- ✓ Matrix: Associate and tie the business, application and/or technology requirements to each individual business **process event**.
- ✓ Model: Develop a Requirement Model that illustrates the relationship between business, application and technology requirements and business **process events**.
- ✓ Matrix: Associate and tie the business, application and/or technology requirements to each individual business **process gateway**.
- ✓ Model: Develop a Requirement Model that illustrates the relationship between business, application and technology requirements and business **process gateways**.
- ✓ Matrix: Associate and connect each business requirement to **process type**: 1. Main processes, 2. Management processes, 3. Supporting processes.

Step 5: Requirement Objects and the tasks to apply them within the Measurement & reporting step:

- ✓ Matrix: Connect the service-, process-, system- and other **measurements** to the business, application and/or technology requirements (Figure 12).
- ✓ Matrix: Connect the **reports** to the business, application and/or technology requirements (Figure 12).
- ✓ Model: Develop a Measurement & Reporting Model to depict the relationship between Measurement & Reporting and the **performance indicators**: 1. Strategic KPI's, 2. Tactical KPI's, 3. Operational KPI's.

Step 6: Requirement Objects and the tasks to apply them within the Detailed Requirement step:

- ✓ Map: Identify and label the **detailed-level requirements** (Figure 4).

- ✓ Map: Identify and categorize the **where specification** of the detailed-level requirements in terms of the layer, objects, area (process, service, data, infrastructure) et cetera (Figure 4).
- ✓ Map: Identify, classify and label the business, application and/or technology detailed-level requirements of the (and to the) **owner**: business owner, service owner, process owner, data owner, application-system owner, platform owner, and infrastructure owner (/... owner) (Figure 4).
- ✓ Map: Label and catalogue the detailed business, application and/or technology requirements of the **business rules**.
- ✓ Matrix: Correlate and connect each **business rule** to the detailed business, application and/or technology requirements.
- ✓ Map: Identify and categorize the detailed business, application and/or technology requirements of the **business compliance**.
- ✓ Matrix: Associate and connect **business compliance** to detailed business, application and/or technology requirements.
- ✓ Map: Classify and categorize the detailed business, application and/or technology requirements of the **business channels**.
- ✓ Matrix: Link and associate each individual detailed business, application and/or technology requirement to **business channels**.
- ✓ Map: Classify and categorize the detailed business, application and/or technology requirements of the **business media**.
- ✓ Matrix: Link and associate each individual detailed business, application and/or technology requirement to **business media**.

Step 7: Requirement Objects and the tasks to apply them within the Workflow step:

- ✓ Matrix: Associate and connect **business workflows** to business, application and/or technology requirements.
- ✓ Matrix: Link each business-, application-, and technology requirement to **service flow**; 1. Service flow input, 2. Service flow output.
- ✓ Model: Develop a Requirement Model that illustrates how business-, application- and/or technology requirements relate to **service flow**: 1. Service flow input, 2. Service flow output.
- ✓ Matrix: Link each business-, application-, and technology requirement to **process flow**; 1. Process flow input, 2. Process flow output.
- ✓ Model: Develop a Requirement Model that illustrates how business-, application- and/or technology requirements relate to **process flow**: 1. Process flow input, 2. Process flow output.

Step 8: Requirement Objects and the tasks to apply them within the Business Service step:

- ✓ Map: Identify and categorize the business, application and/or technology requirements of the **service area and group**.
- ✓ Matrix: Link and attach the business, application and/or technology requirements to each individual **service area and group**.
- ✓ Map: Categorize, label and group the business, application and/or technology requirements of the **business services**.
- ✓ Matrix: Associate and tie the business, application and/or technology requirements to each individual **business service**.

- ✓ Matrix: Associate and relate business-, application- and technology requirements to **service tier**: 1. Strategic service tier, 2. Tactical service tier, 3. Operational service tier.
- ✓ Model: Develop a Requirement Model that illustrates the connectivity and relationship between business requirements and **service tier**: 1. Strategic service tier, 2. Tactical service tier, 3. Operational service tier.
- ✓ Matrix: Associate and connect **service constructs** (both setup and delivery) to business, application and/or technology requirements.
- ✓ Model: Develop a Requirement Model that illustrates how business, application and/or technology requirements relates to the **service construct**.

Roles involved

The following roles are involved in the definition and maintenance of the requirement templates:

ENTERPRISE MODELLERS	ENTERPRISE ENGINEERS	ENTERPRISE ARCHITECTS
Business Analyst (P)	Requirement Engineer (P)	Business Architect (P)
Process eXpert (P)	Technology Engineer (P)	Solution Architect (P)
Requirement eXpert (P)	Process Engineer (P)	Requirement Architect (P)
Information eXpert (S)	Test Engineer (P)	Data Architect (P)
Service eXpert (P)	Quality Engineer (P)	Service Architect (P)
Transformation eXpert (P)	Change Engineer (P)	Technology Architect (P)
	Software Engineer (P)	Process Architect (P)
		Enterprise Architect (P)
		Information Architect (P)

(P) = Primary object/requirement

(S) = Secondary object/requirement

Conclusion

While this document should be seen and used as a detailed description of how the requirement reference content can be used, it does not have all aspects of the requirement reference content and thereby its requirement engineering, modelling and architecture content. It attempted to build a basis of a structured way of thinking, working, modelling and implementation of requirement objects. It endeavoured to provide a standardized terminology, build common understanding and make available the standardized and integrated requirement templates. Enabling practitioners to use the requirement reference content to:

- Identify the relevant requirement objects.
- Decompose the requirement objects into the smallest parts that can, should and needs to be modelled, and then compose the requirement objects entities before building them (through mapping, simulation and scenarios).
- Visualize and clarify requirement object relationships with the requirement artefacts by using maps, matrices and models (alternative representation of information).
- Reduce and/or enhance complexity of requirement modelling, requirement engineering and requirement architecture principles applying the requirement decomposition and composition standard (see Decomposition and Composition Reference Content)
- Model the relevant requirement objects through the architectural layers (see Layered Architecture Reference Content).
- Adding Requirement Requirements (see Requirement Reference Content)
- Provide a structured Requirement Blueprinting and Implementation (see Blueprint & Implementation Reference Content).

For further learning around semantic object relations, decomposition and composition, layered modelling, engineering and architecture or how the requirement reference content can be used within the other LEADIng Practice Reference Contents we refer both to the LEADIng Practice Body of Knowledge document as well as the other LEADIng Practice Enterprise Standards and their Reference Content on www.LEADIngPractice.com.

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