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## Literate Data Model

## Preliminaries

the basic structure of the model

In Literate Data Modeling, the main components of interest are typically Classes, Attributes, Models, and Subjects. However, to streamline the model and promote reusability, we introduce a supertype called Component. By defining common attributes and behaviors in the Component class, we can inherit them in the subclasses, ensuring consistency and reducing duplication throughout the model.

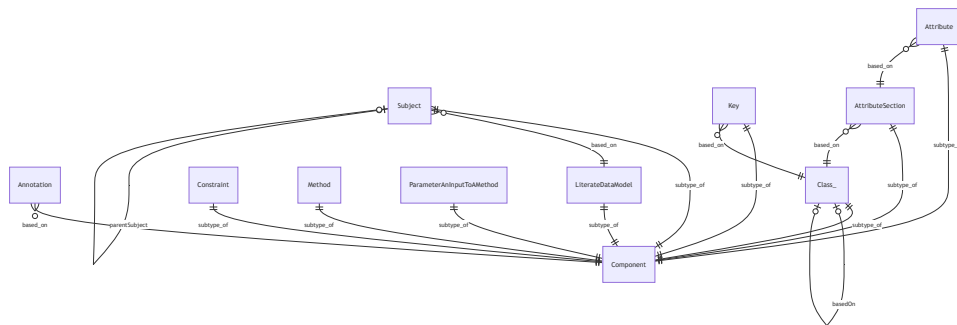
We present the Component class first because it is a best practice in modeling to introduce supertypes before their subtypes. This approach allows readers to understand the general concepts and shared properties before delving into the specifics of each specialized component.

<b>Component</b> An element or building block of the literate data model Components <b>Components</b> <a href="#">Annotation</a> <a href="#">LiterateDataModel</a> , <a href="#">Subject</a> , <a href="#">Class</a> , <a href="#">Key</a> , <a href="#">AttributeSection</a> , <a href="#">Attribute</a> , <a href="#">Constraint</a> , <a href="#">Method</a> , <a href="#">ParameterAnInputToAMethod</a>
the name of the component, not in camel case ( <a href="#">String</a> value O_O ) This is a warning with emoji
The name of the component ( <a href="#">CamelName</a> value O_O )
( <a href="#">QualifiedCamel</a> value O_O )
a short form of the component's name, used for cross references and improved readability. ( <a href="#">CamelName</a> value O_O ) "LDM" is the short form of "Literate Data Model". name - how do you say name in english? x.name == y the abbreviated name should be shorter than the actual name len(abbreviatedName) < len(name) Why have an abbreviation longer than the name? Warning Does this annotation find it's way to the Constraint? YES! It's fixed!
A brief, one-line definition or description of the component, suitable for use in a descriptive table of contents. _ ( <a href="#">OneLiner</a> value O_O )
A more detailed explanation or discussion of the component _ ( <a href="#">RichText</a> value O_O )
mechanical attributes
Indicates whether this component is an embellishment added during post-parsing processing _ ( <a href="#">Boolean</a> value O_O ) false

This attribute is set to true for components that are automatically generated or added during the fleshing out, review, or rendering processes, such as implied attributes or suggested model elements. It helps distinguish embellishments from the core model elements defined in the original LDM source.

## Diagram produced for Component erDiagram

Annotation }o--|| Component : based\_on  
 LiterateDataModel ||--|| Component : subtype\_of  
 Subject ||--|| Component : subtype\_of  
 Subject }o--|| LiterateDataModel : based\_on  
 Subject |o--o| Subject : parentSubject  
 Class\_ ||--|| Component : subtype\_of  
 Class\_ |o--o| Class\_ : basedOn  
 Key ||--|| Component : subtype\_of  
 Key }o--|| Class\_ : based\_on  
 AttributeSection ||--|| Component : subtype\_of  
 AttributeSection }o--|| Class\_ : based\_on  
 Attribute ||--|| Component : subtype\_of  
 Attribute }o--|| AttributeSection : based\_on  
 Constraint ||--|| Component : subtype\_of  
 Method ||--|| Component : subtype\_of  
 ParameterAnInputToAMethod ||--|| Component : subtype\_of



### AnnotationType

a kind of note, or aside, used to call attention to additional information about some Component.

Each LDM declares a set of Annotation Types, with defined labels, emojis, and clearly documented purposes. These are *recognized* or *registered* Annotation Types.

AnnotationTypes

AnnotationTypes

[LiterateDataModel](#)

an emoji

( [Emoji](#) value O\_O )

an emoji

( [String](#) value O\_O )

the Unicode for the emoji

( [String](#) value O\_O )

A short label to indicate the purpose of the annotation \_

( [LowerCamel](#) value O\_O )

the plural form of the label

( [UpperCamel](#) value O\_O )

based on label

the intended reason for the annotation.

( [OneLiner](#) value O\_O )

A link back to the LiterateDataModel on which this AnnotationType depends.

( [LiterateDataModel](#) value M\_1 )

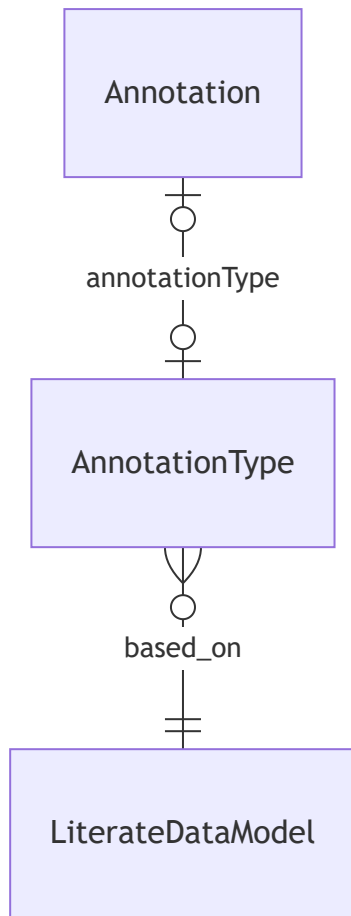
reverse attribute for Annotation.annotationType from which this was implied.

( [Annotation](#) value M\_1 )

[Annotation.annotationType](#)

Diagram produced for AnnotationType  
erDiagram

AnnotationType }o--|| LiterateDataModel : based\_on  
Annotation |o--o| AnnotationType : annotationType





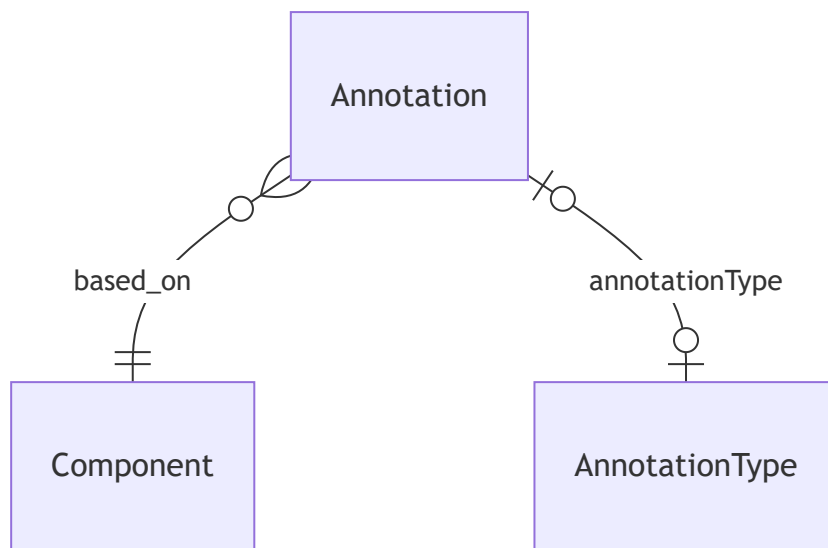
Annotation	
A note or comment associated with a model element	
Annotations	
Annotations	
Component	
	( Optional AnnotationType value O_O )
An Annotation is considered to <i>recognized</i> if the label is associated with an Annotation Type. otherwise it is <i>ad hoc</i> .	
Should be a Value Type	
AnnotationType.inverseOfAnnotationType	
A short label to indicate the purpose of the annotation _	( CamelName value O_O )
But any short label is valid.	
from annotationType	
	( Optional Emoji value O_O )
from annotation type	
The content or body of the annotation	( RichText value O_O )
Indicates whether this annotation is an embellishment added during post-parsing processing _	( Boolean value O_O )
false	
This attribute is set to true for annotations that are automatically generated or added during the fleshing out, review, or rendering processes, such as suggestions, issues, or diagnostic messages. It helps distinguish embellishment annotations from the annotations defined in the original LDM source.	
A link back to the Component on which this Annotation depends.	( Component value M_1 )

Diagram produced for Annotation

erDiagram

Annotation }o--|| Component : based\_on

Annotation |o--o| AnnotationType : annotationType



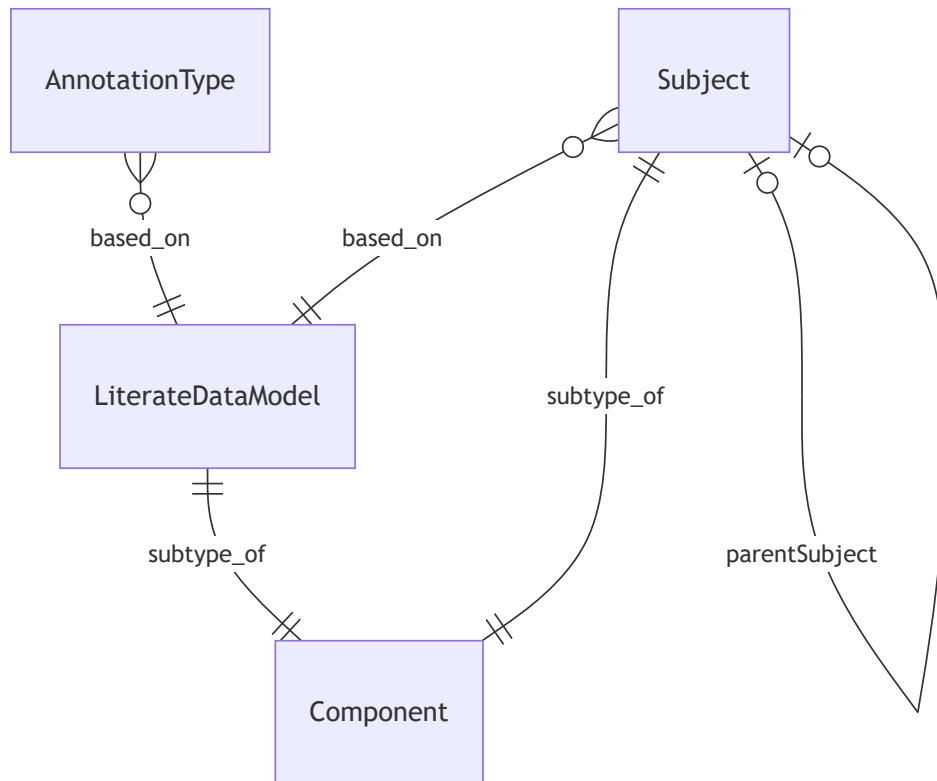
The Model and its Subjects

<b>LiterateDataModel</b>
A representation of a domain's entities, attributes, and relationships, along with explanatory text and examples
LiterateDataModels <a href="#">AnnotationType</a> , <a href="#">Subject</a> <a href="#">Component</a>
( <a href="#">UpperCamel</a> value O_O )
<a href="#">Component.name</a>
list of all classes in the model, as ordered in the definition of the model.
( <a href="#">List of Classes</a> value O_O )
<a href="#">Class.inverseOfAllSubjects</a> gathering s.allSubjects over s in subjectAreas Subject names must be unique across the model.
list of all classes in the model, as ordered in the definition of the model.
( <a href="#">List of Classes</a> value O_O )
<a href="#">Class.inverseOfAllClasses</a> gathering s.allClasses over s in allSubjects. Class names must be unique across the model.
( <a href="#">List of AnnotationTypes</a> value O_O )
the recommended language for expressing derivation, defaults, and constraints
( <a href="#">CodingLanguage</a> value O_O )
OCL
<a href="#">Languages</a> ( <a href="#">Optional List of CodingLanguages</a> value O_O )
the recommended language for expressing derivation, defaults, and constraints
( <a href="#">TemplateLanguage</a> value O_O )
Handlebars
<a href="#">Languages</a> ( <a href="#">Optional List of TemplateLanguages</a> value O_O )
A list of functions that require sophisticated AI-powered implementation *
( <a href="#">List of String</a> value O_O )

['aiEnglishPlural()']

|

Diagram produced for LiterateDataModel  
erDiagram  
AnnotationType }o--|| LiterateDataModel : based\_on  
LiterateDataModel ||--|| Component : subtype\_of  
Subject ||--|| Component : subtype\_of  
Subject }o--|| LiterateDataModel : based\_on  
Subject |o--o| Subject : parentSubject



<b>Subject</b> A specific topic or theme within the model
--

Subjects are the chapters an sections of the model.

- A subject need not contain any Classes if it's just expository.

Subjects  
[LiterateDataModel](#)  
[Component](#)  
[SubjectArea](#)

	( <a href="#">UpperCamel</a> value O_O )
<a href="#">Component.name</a>	

The parent subject, if any, under which this subject is nested _	( <i>Optional</i> <a href="#">Subject</a> value O_O )
<a href="#">Subject.inverseOfParentSubject</a>	

The major classes related to this subject, in the order in which they should be presented _	( <i>List of</i> <a href="#">Classes</a> value O_O )
define chapter, section, subsection as levels? <a href="#">Class.inverseOfClasses</a>	

Any child subjects nested under this subject, in the order in which they should be presented _	( <i>List of</i> <a href="#">Subjects</a> value O_O )
--	---

**DSL** : the Classes within a Subject are always displayed before the childSubjects.

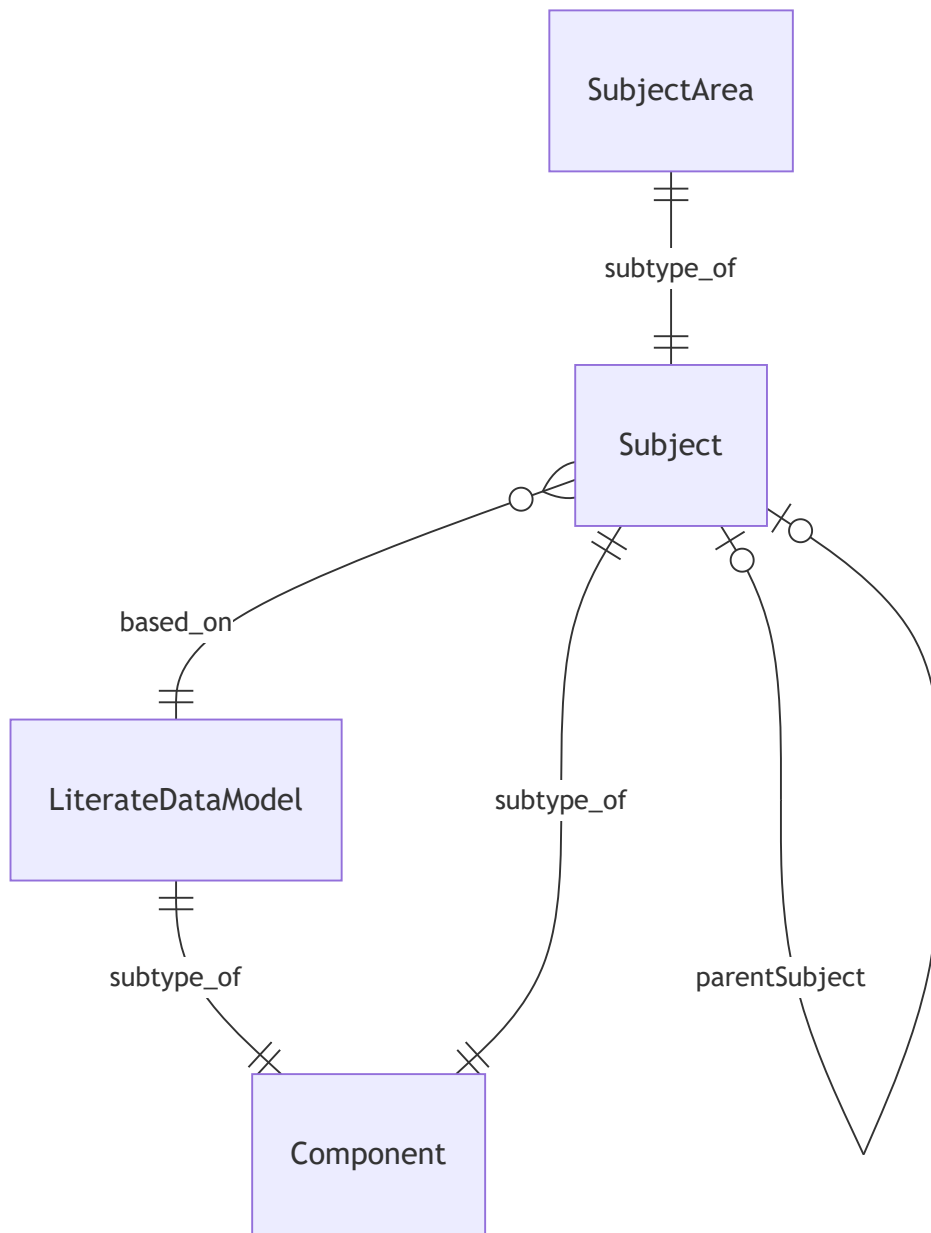
[Subject.inverseOfChildSubjects](#)

A link back to the LiterateDataModel on which this Subject depends.	( <a href="#">LiterateDataModel</a> value M_1 )
Inverse attribute for Subject.parentSubject from which this was implied.	( <a href="#">Subject</a> value M_1 )
<a href="#">Subject.parentSubject</a>	
Inverse attribute for Subject.childSubjects from which this was implied.	

( [Subject](#) value M\_1 )

[Subject.childSubjects](#)

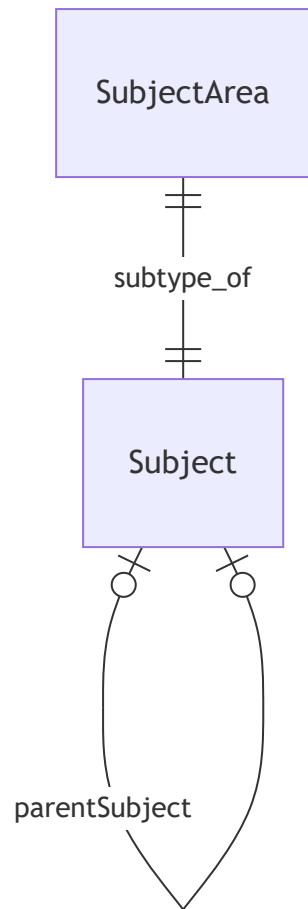
Diagram produced for Subject  
erDiagram  
LiterateDataModel ||--|| Component : subtype\_of  
Subject ||--|| Component : subtype\_of  
Subject }o--|| LiterateDataModel : based\_on  
Subject |o--o| Subject : parentSubject  
SubjectArea ||--|| Subject : subtype\_of





<b>SubjectArea</b> A main topic or area of focus within the model, containing related subjects and classes parentSubject is absent SubjectAreas <a href="#">LiterateModel</a> , <a href="#">Xyz</a> <a href="#">Subject</a>
A link back to the LiterateModel on which this SubjectArea depends. ( <a href="#">LiterateModel</a> value <i>M_1</i> )
A link back to the Xyz on which this SubjectArea depends. ( <a href="#">Xyz</a> value <i>M_1</i> )

**Diagram produced for SubjectArea**  
**erDiagram**  
**Subject** |o--o| **Subject** : parentSubject  
**SubjectArea** ||--|| **Subject** : subtype\_of



<b>Classes</b>
----------------

## Class

A key entity or object type in the model, often corresponding to a real-world concept

Classes

[Subtyping](#), [Key](#), [AttributeSection](#), [ClassConstraint](#)

[Component](#)

[ReferenceType](#)

Within each Class, attribute names must be unique.

the normal English plural form of the name of the Class

( [UpperCamel](#) value O\_O )

Might be Books for the Book class or other regular plurals.

- But also might be People for Person.

When inputting a model, you will rarely need to specify the plural form. The input program will just look it up.

the regular plural, formed by adding "s" or "es".

the Class or Classes on which this class is dependent

( [Set of Class](#) value O\_O )

This is solely based on **Existence Dependency**. A true dependent entity cannot logically exist without the related parent entity. For instance, an Order Item cannot exist without an Order. If removing the parent entity logically implies removing the dependent entity, then it is a dependent entity.

that basedOn and dependentOf are being used synonymously in this metamodel.

[Class.inverseOfBasedOn](#)

The parent class

( [Es](#) value O\_O )

the criteria, or dimensions, by which the class can be divided into subtypes

( [List of Subtypings](#) value O\_O )

in a library model, the Book class could have subtypings based on genre (e.g., Fiction, Non-fiction), format (e.g., Hardcover, Paperback), or subject (e.g., Science, History).

[Subtyping.inverseOfSubtypings](#)

Any subtypes or specializations of this class based on its subtypings.

( [List of Classes](#) value O\_O )

For instance, using the `Book` example, the subtypes could include `FictionBook` , `Non-fictionBook` , `HardcoverBook` , `PaperbackBook` , `ScienceBook` , and `HistoryBook` .

[Class.inverseOfSubtypes](#)

The attributes or properties of the class, in the order in which they should be presented \_  
( *List of [Attributes](#) value O\_O* )

[Attribute.inverseOfAttributes](#)

additional attributes or properties of the class, grouped for clarity and elaboration. \_  
( *List of [AttributeSections](#) value O\_O* )

[AttributeSection.inverseOfAttributeSections](#)

Any constraints, rules, or validations specific to this class \_  
( *List of [Constraints](#) value O\_O* )

Constraints may be expressed on either the `Class` or the `Attribute`. Always?

Any behaviors or operations associated with this class \_  
( *List of [Methods](#) value O\_O* )

[Method.inverseOfMethods](#)

the Classes which are basedOn this Class  
( *Optional Set of [Classes](#) value O\_O* )

[Class.basedOn](#)

( *Optional Set of [UniqueKeys](#) value O\_O* )  
[UniqueKey.basedOn](#)

Inverse attribute for `LiterateDataModel.allSubjects` from which this was implied.  
( *[LiterateDataModel](#) value M\_1* )

[LiterateDataModel.allSubjects](#)

Inverse attribute for `LiterateDataModel.allClasses` from which this was implied.  
( *[LiterateDataModel](#) value M\_1* )  
[LiterateDataModel.allClasses](#)

Inverse attribute for Subject.classes from which this was implied.	( <a href="#">Subject value M_1</a> )
<a href="#">Subject.classes</a>	
Inverse attribute for Class.basedOn from which this was implied.	( <a href="#">Class value M_1</a> )
<a href="#">Class.basedOn</a>	
Inverse attribute for Class.subtypes from which this was implied.	( <a href="#">Class value M_1</a> )
<a href="#">Class.subtypes</a>	
Inverse attribute for Subtyping.classes from which this was implied.	( <a href="#">Subtyping value M_1</a> )
<a href="#">Subtyping.classes</a>	
Inverse attribute for SimpleDataTypeSubtpeOfDataType.coreClass from which this was implied.	( <a href="#">SimpleDataTypeSubtpeOfDataType value M_1</a> )
<a href="#">SimpleDataTypeSubtpeOfDataType.coreClass</a>	

Diagram produced for Class\_

erDiagram

Class\_ ||--|| Component : subtype\_of

Class\_ |o--o| Class\_ : basedOn

Subtyping }o--|| Class\_ : based\_on

ReferenceType ||--|| Class\_ : subtype\_of

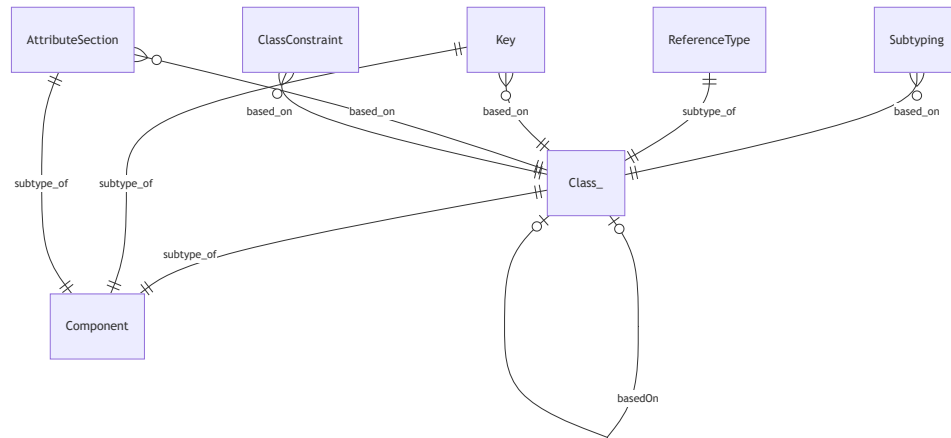
Key ||--|| Component : subtype\_of

Key }o--|| Class\_ : based\_on

AttributeSection ||--|| Component : subtype\_of

AttributeSection }o--|| Class\_ : based\_on

ClassConstraint }o--|| Class\_ : based\_on



**Subtyping**  
a way in which subtypes of a Class may be classified

Subtypings  
 Subtypings  
[Class](#)

( [LowerCamel](#) value O\_O )

( [Boolean](#) value O\_O )

true

( [Boolean](#) value O\_O )

true

( [List of Classes](#) value O\_O )

**DSL** : Shown in the DSL as

- Subtypes: byBrand - Brand1, Brand2,... (non exclusive, exhaustive)
- on the super class. And as
- Subtype of: SuperClass byBrand
- on the subclass.

every class can have an unnamed subtyping.

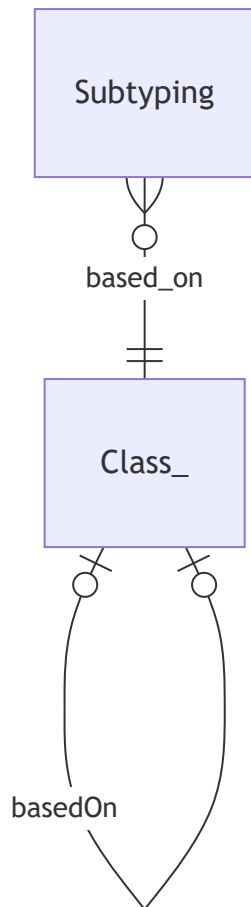
[Class.inverseOfClasses](#)

Inverse attribute for Class.subtypings from which this was implied. ( <a href="#">Class</a> value M_1 )
<a href="#">Class.subtypings</a>
A link back to the Class on which this Subtyping depends. ( <a href="#">Class</a> value M_1 )

Diagram produced for Subtyping  
 erDiagram  
 Class\_ |o--o| Class\_ : basedOn



Subtyping }o--|| Class\_ : based\_on



## ReferenceType

A class that is presumed to be used as a reference, rather than a value

ReferenceTypes

RAIReferenceTypes

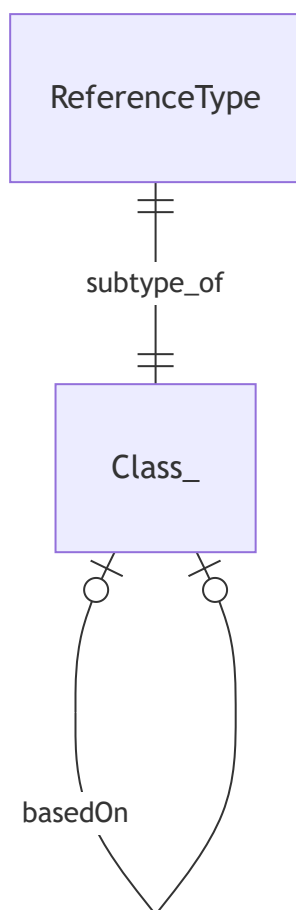
[Class](#)

Diagram produced for ReferenceType

erDiagram

Class\_ ||--o| Class\_ : basedOn

ReferenceType ||--|| Class\_ : subtype\_of



## CodeType

A data type or enumeration used in the model

CodeTypes

CodeTypes

[CodeValue](#)

the code type was implied by use in an attribute and is only used for that attribute

( [Boolean](#) value O\_O )

Diagram produced for CodeType  
erDiagram  
CodeValue }o--|| CodeType : based\_on

CodeValue

A possible value for an enumerated data class

CodeValues

CodeValues

[CodeType](#)

A short code or abbreviationi for the value \_

( [NameString](#) value O\_O )

an explanation of what the code means

( [RichText](#) value O\_O )

Often, a CodeType will be assigned to just one attribute in the model. In such cases, there's no need to declare a new Code Type and invent a name for it. Instead:

A link back to the CodeType on which this CodeValue depends.

( [CodeType](#) value M\_1 )

Diagram produced for CodeValue

**erDiagram**  
**CodeValue }o--|| CodeType : based\_on**

erDiagram CodeValue }o--|| CodeType : based\_on

**Key**  
a list of attributes of a class

Keys  
**Key**  
[Class](#)  
[Component](#)  
[UniqueKey](#)

the attributes of the base Class.  
*( List of [Attributes](#) value O\_O )*

[Attribute.inverseOfKeyAttributes](#)  
each attribute must be a direct or inherited of the base class.  
no repetitions allowed in keyAttributes

👍 **Issue** : introduce PureLists?

need ascending descending to support index keys or ordering keys.

A link back to the Class on which this Key depends.  
*( [Class](#) value M\_1 )*

**Diagram produced for Key**  
**erDiagram**  
**Class\_ ||--|| Component : subtype\_of**  
**Class\_ |o--o| Class\_ : basedOn**  
**Key ||--|| Component : subtype\_of**  
**Key }o--|| Class\_ : based\_on**  
**UniqueKey ||--|| Key : subtype\_of**

erDiagram Class\_ ||--|| Component : subtype\_of Class\_ |o--o| Class\_ :  
basedOn Key ||--|| Component : subtype\_of Key }o--|| Class\_ : based\_on  
UniqueKey ||--|| Key : subtype\_of

**UniqueKey**  
a list of attributes on which instances of the base class may be keyed.

order unimportant for Unique Keys.

UniqueKeys

UniqueKeys

[Key](#)

**Diagram produced for UniqueKey**

**erDiagram**

**UniqueKey ||--|| Key : subtype\_of**

erDiagram UniqueKey ||--|| Key : subtype\_of

Attributes
------------

### AttributeSection

a group of attributes for a class that merit a shared explanation.

AttributeSections

AttributeSections

[Class](#)

[Attribute](#)

[Component](#)

whether the attributes in this section, taken together, are optional.

( [Boolean value O\\_0](#) )

If the Attribute Section is required, then each Attribute within the section is optional or required, depending on how it is marked.

- 
- But if the Attribute Section is optional each attribute in the section is only required if any attribute in the section is present.

reverse attribute for Class.attributeSections from which this was implied.

( [Class value M\\_1](#) )

[Class.attributeSections](#)

A link back to the Class on which this AttributeSection depends.

( [Class value M\\_1](#) )

Diagram produced for AttributeSection

erDiagram

Class\_ ||--|| Component : subtype\_of

Class\_ }o--o| Class\_ : basedOn

AttributeSection ||--|| Component : subtype\_of

AttributeSection }o--|| Class\_ : based\_on

Attribute ||--|| Component : subtype\_of

**Attribute }o--|| AttributeSection : based\_on**

erDiagram Class\_ ||--|| Component : subtype\_of Class\_ |o--o| Class\_ :  
basedOn AttributeSection ||--|| Component : subtype\_of AttributeSection }o--||  
Class\_ : based\_on Attribute ||--|| Component : subtype\_of Attribute }o--||  
AttributeSection : based\_on



## Attribute

A property or characteristic of a class

Attributes

[AttributeSection](#)

[AttributeConstraint](#)

[Component](#)

( [LowerCamel](#) value O\_O )

[Component.name](#)

The kind of object to which the attribute refers. \_

( [DataType](#) value O\_O )

But,

- - List of Editions
- - Set of Edition
- - ... and more complicated cases.

the section below on Data Type Specifiers.

Indicates whether the attribute must have a value for every instance of the class \_

( [Boolean](#) value O\_O )

\*\*\* False

The cardinality of the relationship represented by the attribute \_

( [CardinalityCode](#) value O\_O )

\*\*\* For a singular attribute, the default cardinality is N:1. If the attribute is 1:1, it must be stated explicitly. For a collective attribute, the default is 1:N. If the attribute is N:M, it must be stated explicitly.

( [InventedName](#) value O\_O )

( [Optional](#) [InventedName](#) value O\_O )

how this works with optionality

( <a href="#">Boolean</a> value O_O )
true if the data type is a class or a simple collection of members of a class.
the class which contains, or would contain the inverse attribute
( <a href="#">Optional Class</a> value O_O )
from the data type. Null unless attribute is invertible.
( <a href="#">Optional Attribute</a> value O_O )
( <a href="#">Optional Attribute</a> value O_O )
The rule or formula for calculating the value, if no value is supplied Now running to a second line with the parenthetical on yet a third line
( <a href="#">Optional Derivation</a> value O_O )
even when an Attribute has a default derivation, there's no guarantee that every instance will have an assigned value. Example needed.
For derived attributes, the rule or formula for calculating the value _
( <a href="#">Optional Derivation</a> value O_O )
on insert vs on access?
Any validation rules specific to this attribute _
( <a href="#">List of Constraints</a> value O_O )
from Class.constraints
Inverse attribute for Class.attributes from which this was implied.
( <a href="#">Class</a> value M_1 )
<a href="#">Class.attributes</a>
Inverse attribute for Key.keyAttributes from which this was implied.
( <a href="#">Key</a> value M_1 )
<a href="#">Key.keyAttributes</a>
A link back to the AttributeSection on which this Attribute depends.

( [AttributeSection](#) value M\_1 )

Diagram produced for Attribute

erDiagram

AttributeSection ||--|| Component : subtype\_of

Attribute ||--|| Component : subtype\_of

Attribute }o--|| AttributeSection : based\_on

Attribute |o--o| DataType : dataType

AttributeConstraint }o--|| Attribute : based\_on

erDiagram AttributeSection ||--|| Component : subtype\_of Attribute ||--||  
Component : subtype\_of Attribute }o--|| AttributeSection : based\_on Attribute |o-  
-o| DataType : dataType AttributeConstraint }o--|| Attribute : based\_on

#### Derivation

A rule or formula for deriving the value of an attribute

Derivations

An English language statement of the derivation rule \_

( [RichText](#) value O\_O )

The formal expression of the derivation in a programming language \_

( [CodeExpression](#) value O\_O )

No diagram produced for Derivation

#### Constraint

A rule, condition, or validation that must be satisfied by the model

Constraints

[Component](#)

[ClassConstraint](#) , [AttributeConstraint](#)

An English language statement of the constraint \_

( [RichText](#) value O\_O )

The formal expression of the constraint in a programming language

( [InventedName](#) value O\_O )

( [Code](#) value O\_O )

Warning, nothing fatal; just a caution  
Error, serious. Fix now

Diagram produced for Constraint  
erDiagram  
Constraint ||--|| Component : subtype\_of  
ClassConstraint ||--|| Constraint : subtype\_of  
AttributeConstraint ||--|| Constraint : subtype\_of

erDiagram Constraint ||--|| Component : subtype\_of ClassConstraint ||--||  
Constraint : subtype\_of AttributeConstraint ||--|| Constraint : subtype\_of

Message

Messages

⌘ Messages

Message is trivial; no diagram

ClassConstraint

ClassConstraints

⌘ ClassConstraints

[Class](#)

[Constraint](#)

A link back to the Class on which this ClassConstraint depends.  
( [Class value M\\_1](#) )

Diagram produced for ClassConstraint  
erDiagram  
Class\_ }o--o| Class\_ : basedOn  
ClassConstraint ||--|| Constraint : subtype\_of  
ClassConstraint }o--|| Class\_ : based\_on

erDiagram Class\_ }o--o| Class\_ : basedOn ClassConstraint ||--|| Constraint :  
subtype\_of ClassConstraint }o--|| Class\_ : based\_on

AttributeConstraint

AttributeConstraints

⌘ AttributeConstraints

[Attribute](#)  
[Constraint](#)

A link back to the Attribute on which this AttributeConstraint depends. ( <a href="#">Attribute</a> value <i>M_1</i> )

**Diagram produced for AttributeConstraint**  
**erDiagram**  
**AttributeConstraint ||--|| Constraint : subtype\_of**  
**AttributeConstraint }o--|| Attribute : based\_on**

erDiagram AttributeConstraint ||--|| Constraint : subtype\_of AttributeConstraint  
}o--|| Attribute : based\_on

<b>CodeExpression</b>
CodeExpressions ⌘ CodeExpressions
the programming language ( <a href="#">Code</a> value <i>O_O</i> )

⌘ OCL, Object Constraint Language  
Java, Java

( <a href="#">String</a> value <i>O_O</i> )
---

**CodeExpression is trivial; no diagram**

Methods

<b>Method</b> A behavior or operation associated with a class Methods <a href="#">Component</a>
The input parameters of the method _ <div style="text-align: right;">( <i>List of <a href="#">Parameters</a> value O_O</i> )</div> <a href="#">ParameterAnInputToAMethod.inverseOfParameters</a>
The data type of the value returned by the method _ <div style="text-align: right;">( <i><a href="#">DataType</a> value O_O</i> )</div>
<div style="border: 1px solid black; height: 30px;"></div>
Inverse attribute for Class.methods from which this was implied. <div style="text-align: right;">( <i><a href="#">Class</a> value M_1</i> )</div> <a href="#">Class.methods</a>

**Diagram produced for Method**  
**erDiagram**  
**Method ||--|| Component : subtype\_of**  
**Method |o--o| DataType : returnType**  
  
 erDiagram Method ||--|| Component : subtype\_of Method |o--o| DataType : returnType

ParameterAnInputToAMethod
Parameters <a href="#">Component</a>
The data type of the parameter _ ( <a href="#">DataType</a> value O_O )
The cardinality of the parameter ( <a href="#">InventedName</a> value O_O )
Inverse attribute for Method.parameters from which this was implied. ( <a href="#">Method</a> value M_1 ) <a href="#">Method.parameters</a>

Diagram produced for ParameterAnInputToAMethod  
erDiagram

ParameterAnInputToAMethod ||--|| Component : subtype\_of  
ParameterAnInputToAMethod |o--o| DataType : type

erDiagram ParameterAnInputToAMethod ||--|| Component : subtype\_of  
ParameterAnInputToAMethod |o--o| DataType : type



Data Types
------------

## DataType

DataTypes  
RAIDataTypes

Diagram produced for DataType

erDiagram

Attribute |o--o| DataType : dataType

Method |o--o| DataType : returnType

ParameterAnInputToAMethod |o--o| DataType : type

erDiagram Attribute |o--o| DataType : dataType Method |o--o| DataType :  
returnType ParameterAnInputToAMethod |o--o| DataType : type

## SimpleDataTypeSubtpeOfDataType

SimpleDataTypeSubtpeOfDataTypes  
RAISimpleDataTypeSubtpeOfDataTypes

( [Class](#) value O\_O )

[Class.inverseOfCoreClass](#)

SimpleDataTypeSubtpeOfDataType is trivial; no diagram

## ComplexDataType

ComplexDataTypes  
RAIComplexDataTypes

( [AggregatingOperator](#) value O\_O )

( [List of DataTypes](#) value O\_O )

Diagram produced for ComplexDataType

erDiagram

erDiagram

## AggregatingOperator

AggregatingOperators  
RAIAggregatingOperators

( [Code](#) value O\_O )

SetOf  
ListOf  
Mapping

	( <u>Integer</u> value O_O )
	( <u>Template</u> value O_O )

**AggregatingOperator is trivial; no diagram**

## Low level Data Types

insert Camel Case.md

Emoji

Emojis  
rAlEmojis

**Emoji is trivial; no diagram**

String

Strings  
rAlStrings

**String is trivial; no diagram**

CamelName

A short string without punctuation or spaces, suitable for names, labels, or identifiers and presented in camel case.

CamelNames  
rAlCamelNames  
[String](#)  
[UpperCamel](#), [LowerCamel](#)

( [String](#).value O\_O )

Must follow the camel case naming convention and not be empty.  
"firstName", "orderDate", "customerID"

- *CamelName* is presented here, just after its first usage by another class (Component), to provide context and understanding before it is used further in the model.

**CamelName is trivial; no diagram**

UpperCamel

a CamelName that begins with a capital letter

\_ "Customer", "ProductCategory", "PaymentMethod"  
content begins with an upper case letter.  
UpperCamels

RAUpperCamels

[CamelName](#)

**UpperCamel is trivial; no diagram**

LowerCamel

a CamelName that begins with a lower case letter

"firstName", "orderTotal", "shippingAddress"

content begins with a lower case letter.

LowerCamels

RALowerCamels

[CamelName](#)

**LowerCamel is trivial; no diagram**

QualifiedCamel

an expression consisting of Camel Names separated by periods

QualifiedCamels

RAQualifiedCamels

[String](#)

content consists of CamelNames, separated by periods. Each of the camel names must be Upper Camel except, possibly, the first.

**QualifiedCamel is trivial; no diagram**

### ValueTypeRichText

A string with markup for block level formatting.

ValueTypeRichTexts

ValueTypeRichTexts

[String](#)

the string content

( [String](#).value O\_O )

the rich text coding language used

( [Code](#).value O\_O )

HTML  
MarkDown

**ValueTypeRichText is trivial; no diagram**

### OneLiner

String with markup for line level formatting.

OneLiners

OneLiners

[RichText](#)

the string content

( [String](#).value O\_O )

must not contain a line break or new line character

A line can't span two lines

**OneLiner is trivial; no diagram**

### PrimitiveType

A basic, built-in data type

PrimitiveTypes

PrimitiveTypes

[String](#), [Integer](#), [Decimal](#), [Boolean](#), [Date](#), [Time](#), [DateTime](#)

**PrimitiveType is trivial; no diagram**

### String

Strings

RAIStrings

[PrimitiveType](#)

[CamelName](#), [QualifiedCamel](#), [ValueTypeRichText](#)

**String is trivial; no diagram**

Integer

Integers

RAIIntegers

[PrimitiveType](#)

**Integer is trivial; no diagram**

Decimal

Decimals

RAIDecimals

[PrimitiveType](#)

**Decimal is trivial; no diagram**

Boolean

Booleans

RAIBooleans

[PrimitiveType](#)

**Boolean is trivial; no diagram**

Date

Dates

RAIDates

[PrimitiveType](#)

**Date is trivial; no diagram**

Time

Times

RAITimes



[PrimitiveType](#)

**Time is trivial; no diagram**

DateTime
----------

DateTime

DateTime

[PrimitiveType](#)

**DateTime is trivial; no diagram**

### Annotation Types Used

These are the recognized Annotation Types for the LDM model.

And this is how you register the AnnotationTyped for a model. By including this sort of array in the DSL document for the model.

@startjson

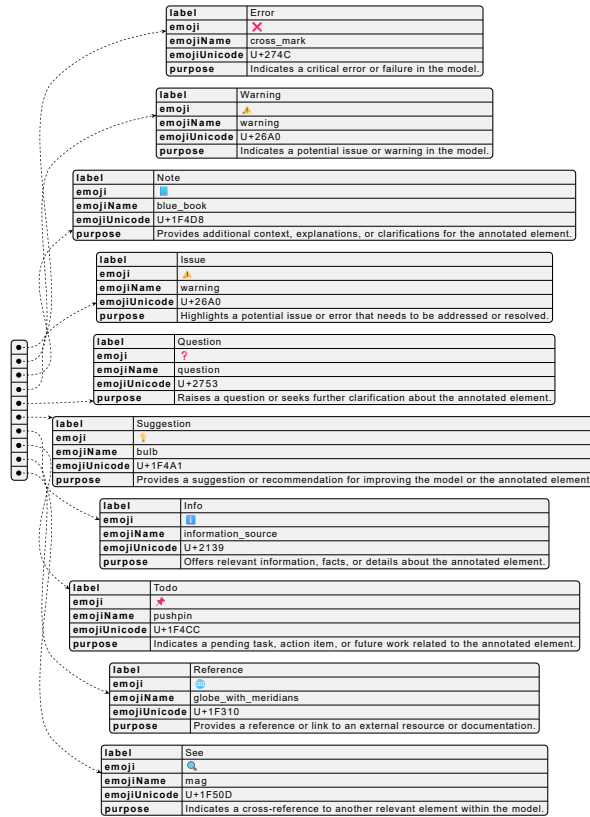
```
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{
"label": "Error",
"emoji": "❌",
"emojiName": "cross_mark",
"emojiUnicode": "U+274C",
"purpose": "Indicates a critical error or failure in the model."
},
{
"label": "Warning",
"emoji": "⚠️",
"emojiName": "warning",
"emojiUnicode": "U+26A0",
"purpose": "Indicates a potential issue or warning in the model."
},
{
"label": "Note",
"emoji": "📘",
"emojiName": "blue book",
"emojiUnicode": "U+1F4D8",
"purpose": "Provides additional context, explanations, or clarifications for the annotated element."
},
{
"label": "Issue",
"emoji": "⚠️",
"emojiName": "warning",
"emojiUnicode": "U+26A0",
"purpose": "Highlights a potential issue or error that needs to be addressed or resolved."
},
{
"label": "Question",
"emoji": "❓",
"emojiName": "question",
"emojiUnicode": "U+2753",
"purpose": "Raises a question or seeks further clarification about the annotated element."
},
{
"label": "Suggestion",
"emoji": "💡",
"emojiName": "bulb",
"emojiUnicode": "U+1F4A1",
"purpose": "Provides a suggestion or recommendation for improving the model or the annotated element."
},
{
"label": "Info",
"emoji": "📘",
"emojiName": "information_source",
"emojiUnicode": "U+2139",
"purpose": "Offers relevant information, facts, or details about the annotated element."
},
{
"label": "Todo",
"emoji": "📌",
"emojiName": "pushpin",
"emojiUnicode": "U+1F4CC",
"purpose": "Indicates a pending task, action item, or future work related to the annotated
```

```

element."
},
{
  "label": "Reference",
  "emoji": "🌐",
  "emojiName": "globe_with_meridians",
  "emojiUnicode": "U+1F310",
  "purpose": "Provides a reference or link to an external resource or documentation."
},
{
  "label": "See",
  "emoji": "🔍",
  "emojiName": "mag",
  "emojiUnicode": "U+1F50D",
  "purpose": "Indicates a cross-reference to another relevant element within the model."
}
]
@endjson


```


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	<table><tr><td>label</td><td>Warning</td></tr><tr><td>emoji</td><td>⚠️</td></tr><tr><td>emojiName</td><td>warning</td></tr><tr><td>emojiUnicode</td><td>U+26A0</td></tr><tr><td>purpose</td><td>Indicates a potential issue or warning in the model.</td></tr></table>	label	Warning	emoji	⚠️	emojiName	warning	emojiUnicode	U+26A0	purpose	Indicates a potential issue or warning in the model.
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emojiName	mag										
emojiUnicode	U+1F50D										
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## Annotation types as CSV


label,emoji,emojiName,emojiUnicode,purpose


Error, ,cross mark,U+274C,Indicates a critical error or failure in the model.


Warning, ,warning,U+26A0,Indicates a potential issue or warning in the model.


Note, ,blue book,U+1F4D8,"Provides additional context, explanations, or clarifications for the annotated element."


Issue, ,warning,U+26A0,Highlights a potential issue or error that needs to be addressed or resolved.


Question, ,question,U+2753,Raises a question or seeks further clarification about the annotated element.











Suggestion, ,bulb,U+1F4A1,Provides a suggestion or recommendation for improving the model or the annotated element.

Info, ,information\_source,U+2139,"Offers relevant information, facts, or details about the annotated element."

Todo, ,pushpin,U+1F4CC,"Indicates a pending task, action item, or future work related to the annotated element."

Reference, ,globe with meridians,U+1F310,Provides a reference or link to an external resource or documentation.

See, ,mag,U+1F50D,Indicates a cross-reference to another relevant element within the model.

	label	emoji	emojiName	emojiUnicode	purpose
0	Error		cross_mark	U+274C	Indicates a critical error or failure in the model.
1	Warning		warning	U+26A0	Indicates a potential issue or warning in the model.
2	Note		blue_book	U+1F4D8	Provides additional context, explanations, or clarifications for the annotated element.
3	Issue		warning	U+26A0	Highlights a potential issue or error that needs to be addressed or resolved.
4	Question		question	U+2753	Raises a question or seeks further clarification about the annotated element.
5	Suggestion		bulb	U+1F4A1	Provides a suggestion or recommendation for improving the model or the annotated element.
6	Info		information_source	U+2139	Offers relevant information, facts, or details about the annotated element.
7	Todo		pushpin	U+1F4CC	Indicates a pending task, action item, or future work related to the annotated element.
8	Reference		globe_with_meridians	U+1F310	Provides a reference or link to an external resource or documentation.
9	See		mag	U+1F50D	Indicates a cross-reference to another relevant element within the model.

## Appendices

various sidebars to include Insert More Sidebars.md Insert Overrides.md insert  
LDM Intro.md Insert OCL.md Insert Camel Case.md

== content to add