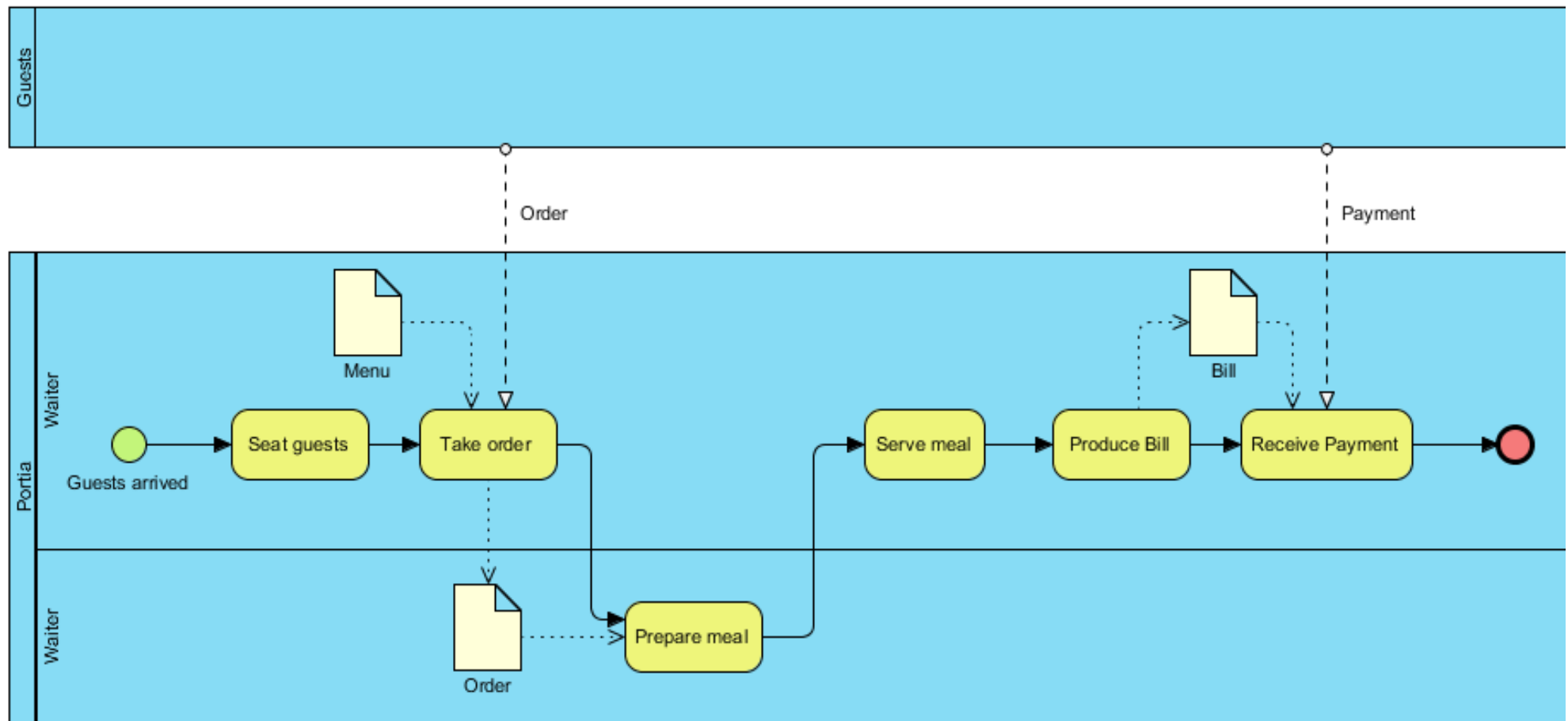# Modeling Data and Documents

An Example Process

■ This is a simplified version of the process for serving guests

■ There are three data objects. Can you see a difference between these data objects?

Modelling Data

■ Data objects in BPMN can represent different kinds of data

- ♦ structured data

- ♦ documents

■ Documents themselves either represent

- ♦ **a document class** represents a generic documents for which a specific instance exists for each process instance
  - ● Example: The bill

- ♦ a **specific document**
  - ● Example: The menu which the guests get to choose their meals
  - ● Hint: For a specific document we can specify a file name or a URL

■ Another example: An application form is a specific document while an application would be represented as a class

Modelling Structured Data

- Structured data can be represented for example as
  - ♦ Entity Relationship Diagram
  - ♦ UML Class Diagram/Object Diagrams

ERD:

- Data models represent
  - ♦ entities/classes
  - ♦ columns/attributes
 - ♦ relations/associations

UML Class Diagram:

ADONIS document model:

Document modeling

- Although some tools like ADONIS have a model type for documents, there is no standard for modeling documents

- However, we can use UML class diagrams and object diagrams to model documents [1]

  - ♦ A document class is represented as a class object with attributes describing the meta-data

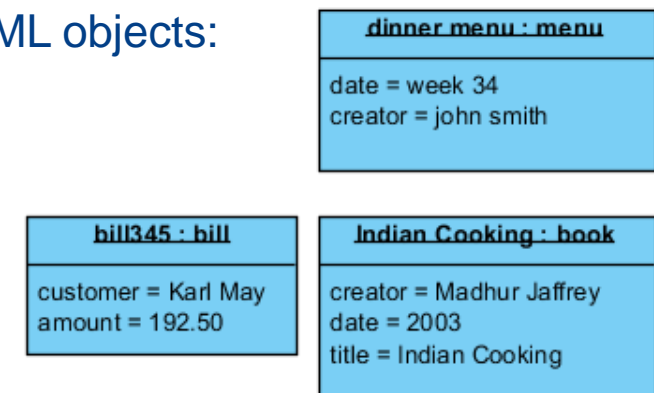 - ♦ A specific document is an object (i.e. an instance of a class)
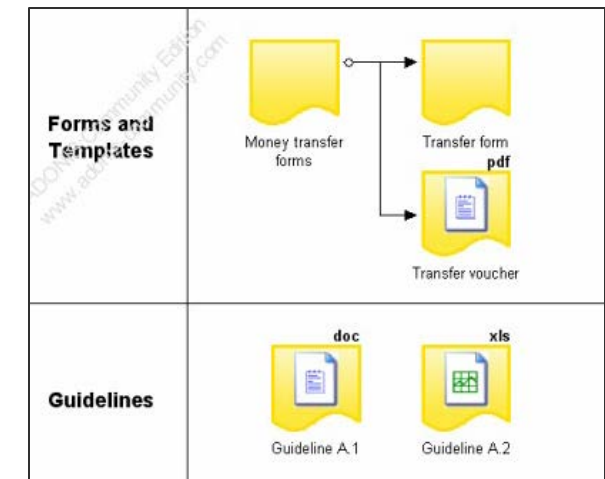
Document classes as a UML class diagramm:
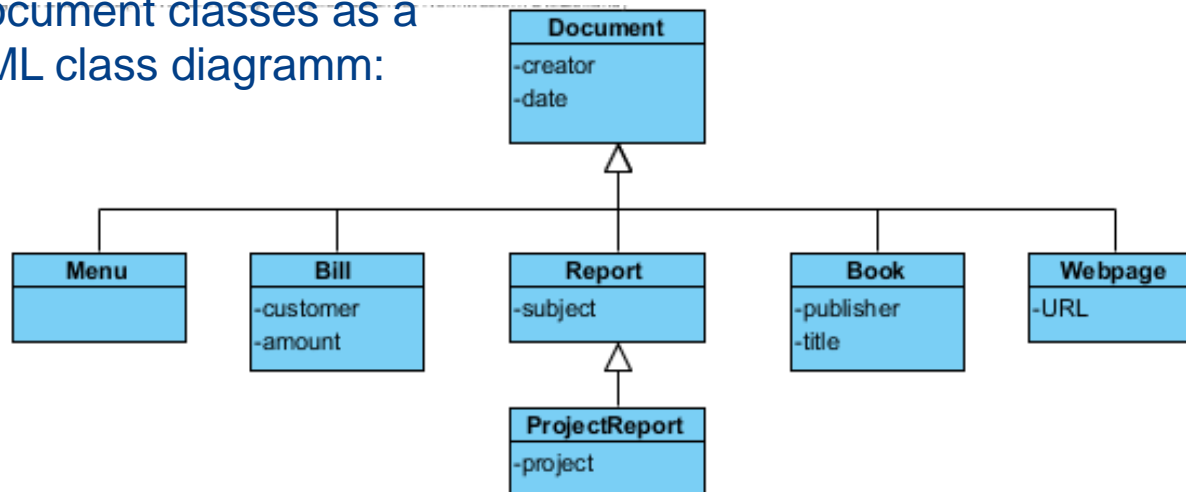

Specific documents as UML objects:

Document Models

- Documents can be grouped into **document classes** (also called document types) according to their usage:
    - ♦ Examples: invoice, application, menu, report

- There can be specialisations of document classes.
    - ♦ Example: There can be special kinds of reports like project report, expert opinions, or reviews.

- **Metadata** are attribute values which describe documents.
    - ♦ Example: a report might have an creator, a creation date and a subject.

- There are standards for metadata like the Dublin Core Metadata Initiative (http://dublincore.org)

Data and Meta-data – Examples

user data (document)
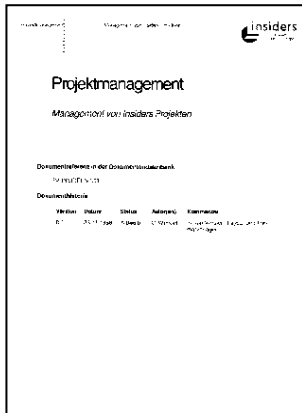
meta-data

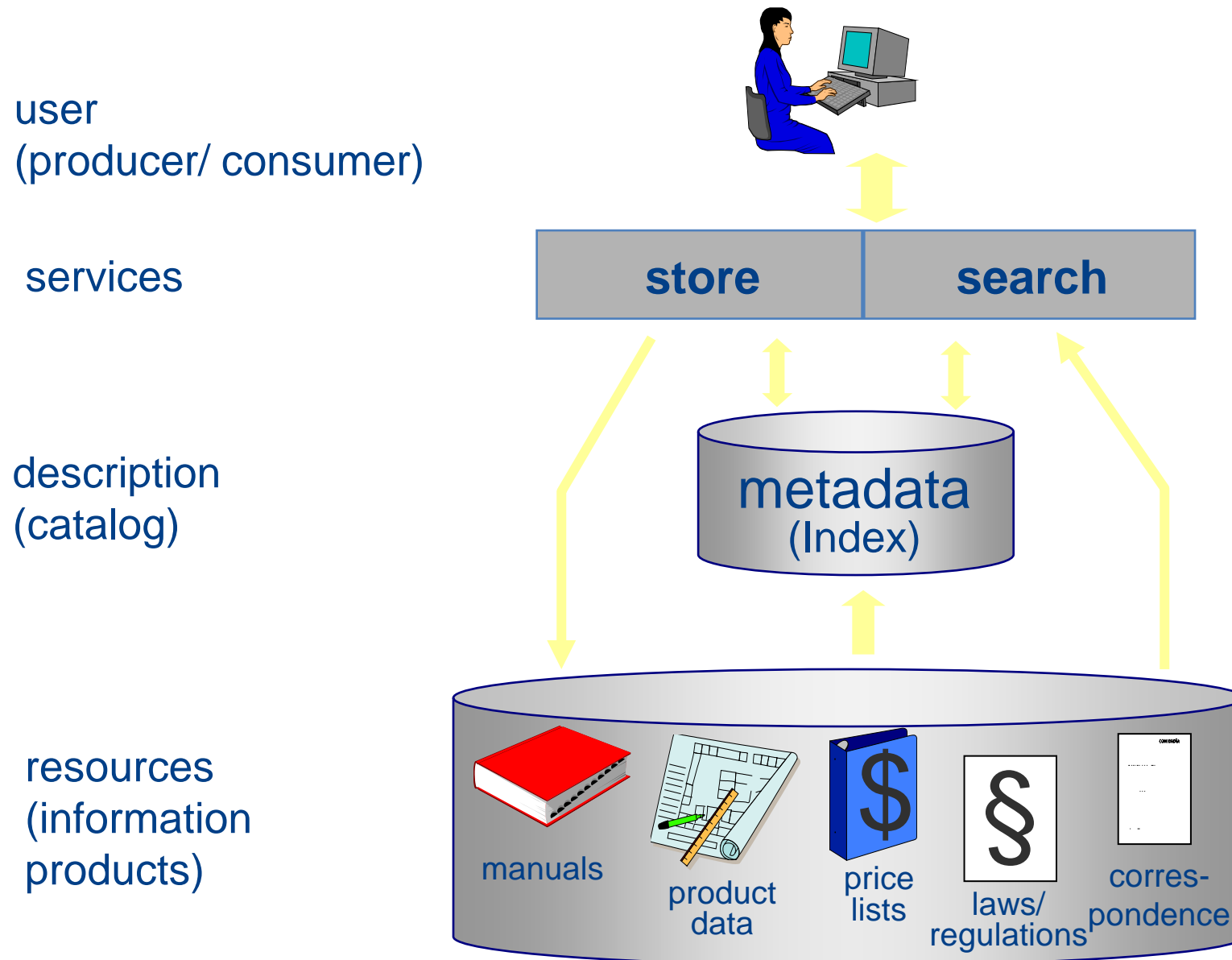|	
name:	ELENA-Ber
creation:	18.3.2001
modification:	25.6.2001
format:	Word
document type:	project report
recipient:	All Life Insurance Inc.
author:	Smith

- Each document consists of the
  - ♦ usage data (document itself, content)
  - ♦ meta-data

- Kinds of meta-data
  - ♦ General metadata
    - can be used for any kind of information
    - Examples: author, date of creation, subject
  - ♦ Application-specific metadata
    - Examples:
      - For a letter: sender and recipient
      - For a report: project name
 - ♦ Meta-data are structured data and can easily be modeled in UML

Information as product
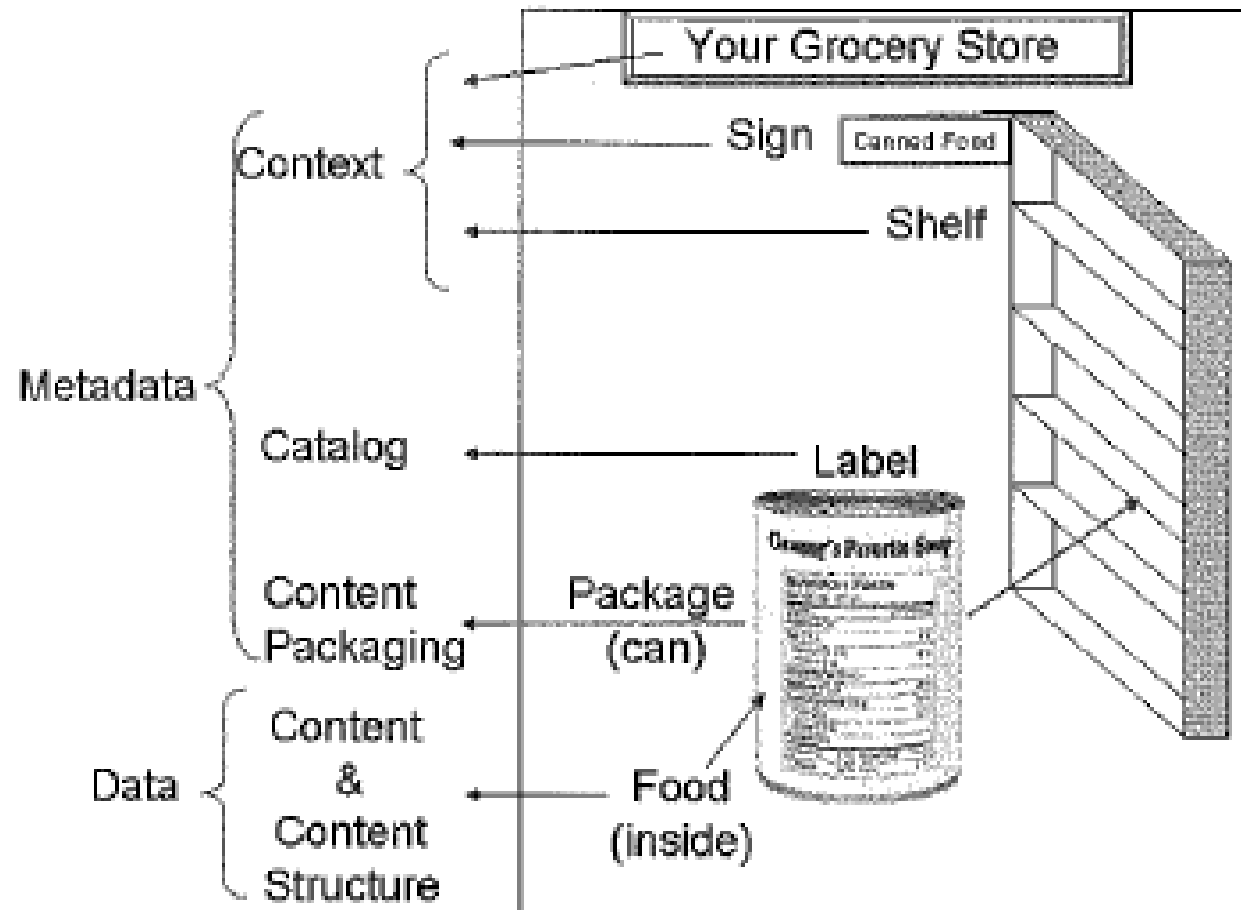
Michael C. Daconta: Information as Product, 2007

Meta-data

user
(producer/ consumer)

services

store | **search**

description
(catalog)

metadata
(Index)

resources
(information
products)

manuals

product
data

price
lists

laws/
regulations

corres-
pondence

Modeling Documents in Visual Paradigm

- In the Visual Paradigm tool we can use stereotypes to specialize UML class diagrams for modeling documents.

- We can define a new stereotype "Document" and
  - ♦ change color
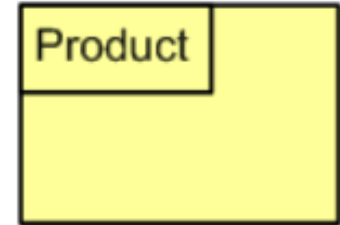 - ♦ add an icon
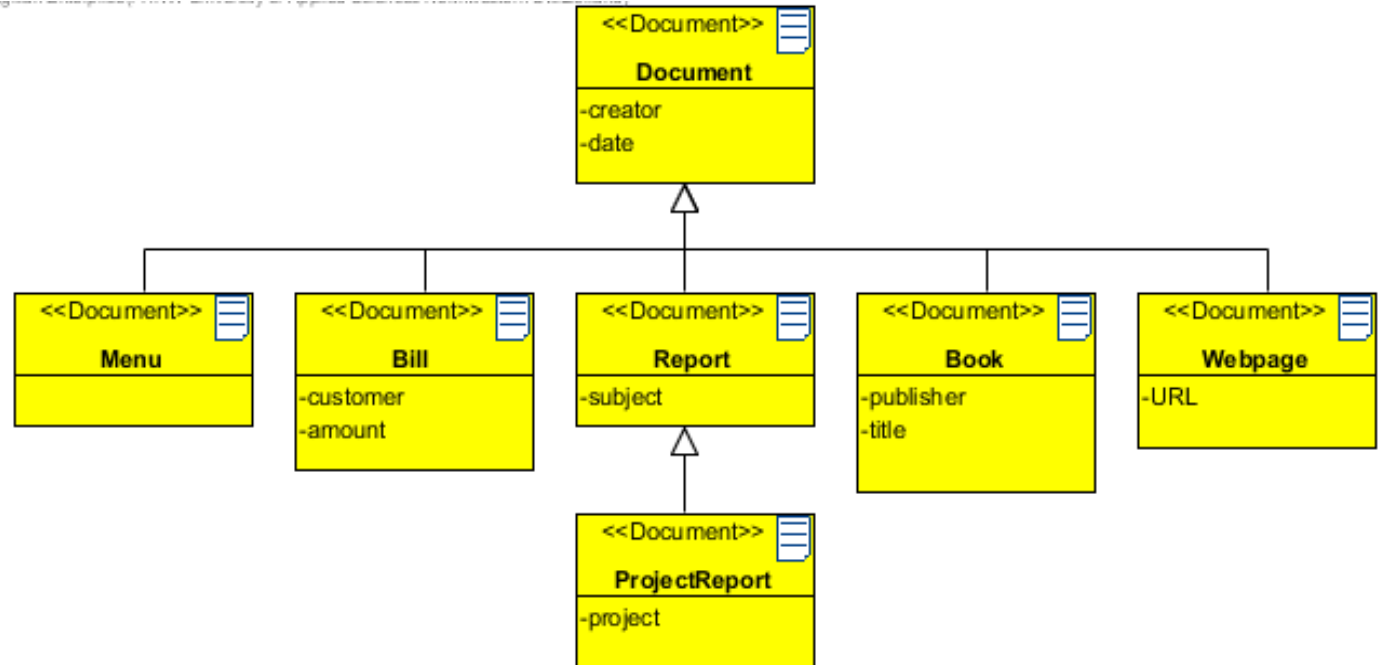
Combining Document and Data Modeling

Information about Documents and Data can be combined in one model

♦ Document classes

♦ Objects

♦ Structured Data

♦ Associations
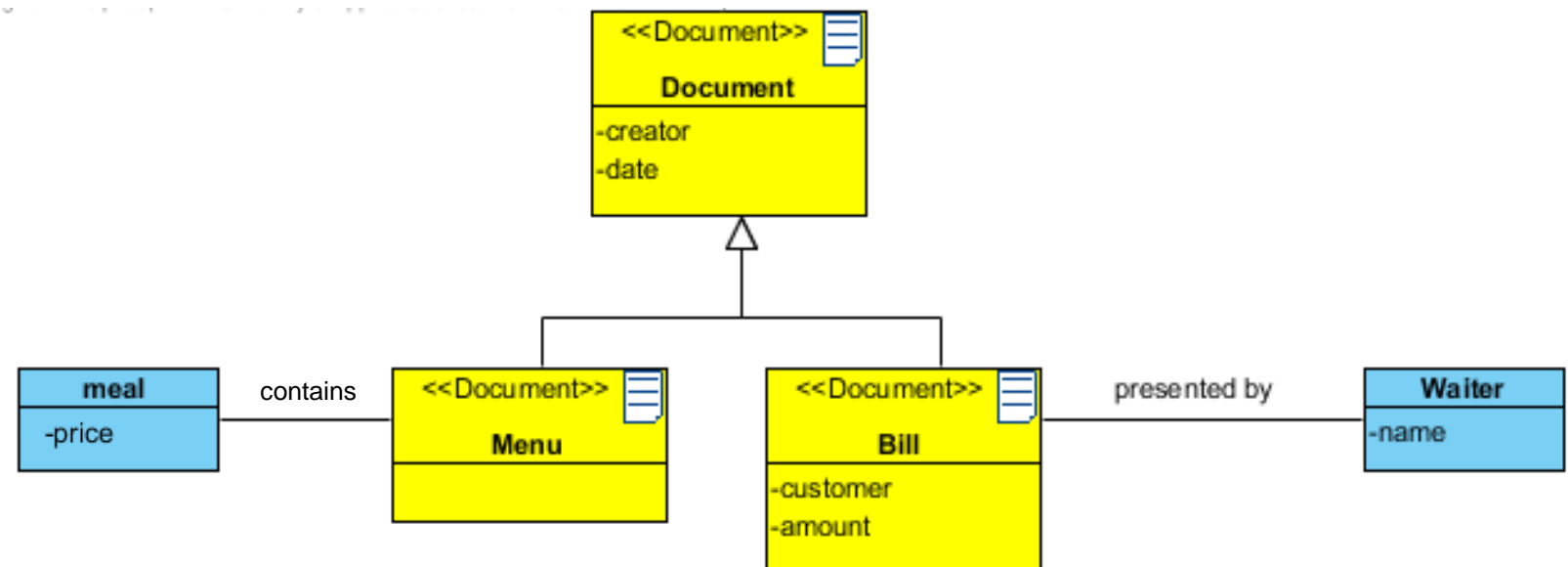
Modeling Products

Product Models

Product

- Products are another aspect that can be modeled in the business layer of an Enterprise Architecture (c.f. ArchiMate).

- Products can be physical products, financial products, information products orservices.

- Product models list products (goods or services) created by processes.

- Products can be composed of other products or components.

- In a product model we do not model individual products but product types.

- There are no standard model types for products or services.

Products in ArchiMate

■ In ArchiMate a product may aggregate business services or application services, as well as a contract

■ This is an example showing two products and the services they consist of. The insurance policy is a contract for the Insurance product.
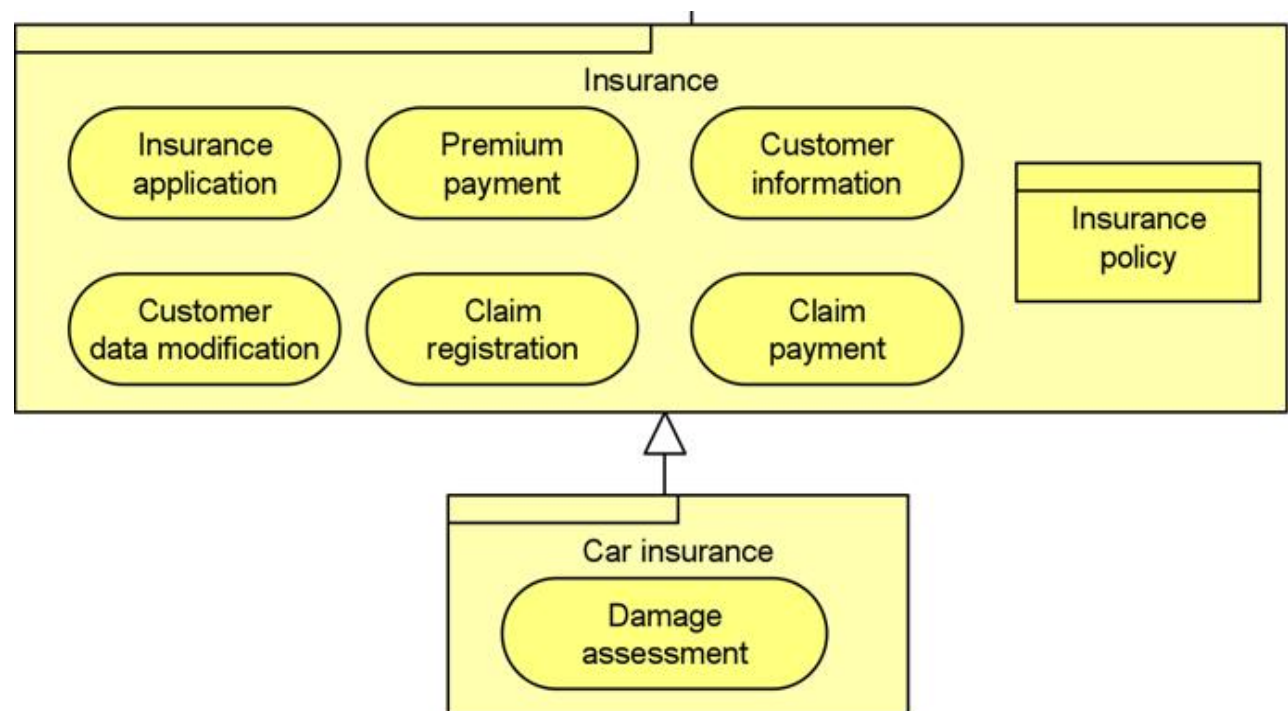
Product Models in ADONIS

- These are examples of product models as the are modeled in ADONIS[*)]

- The modeling elements are represents products and product components
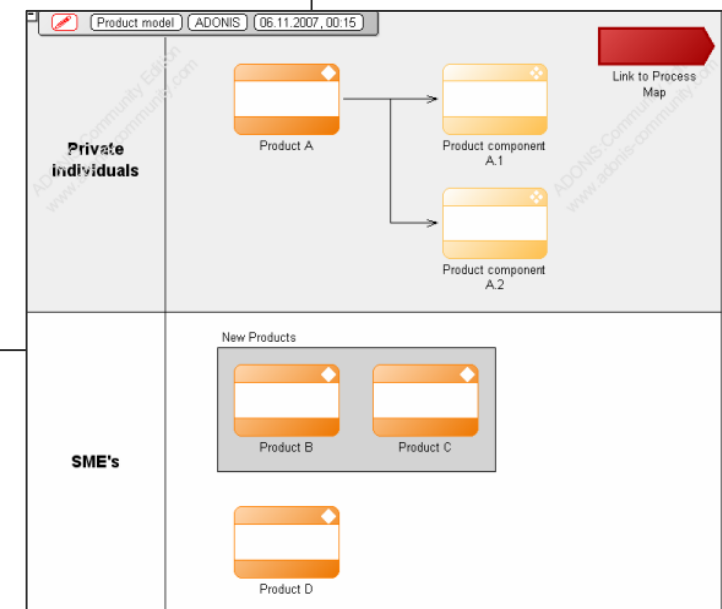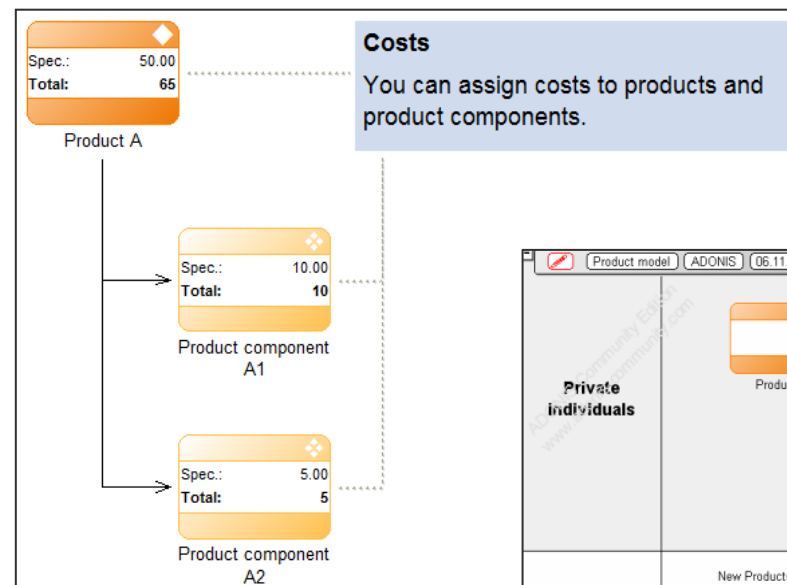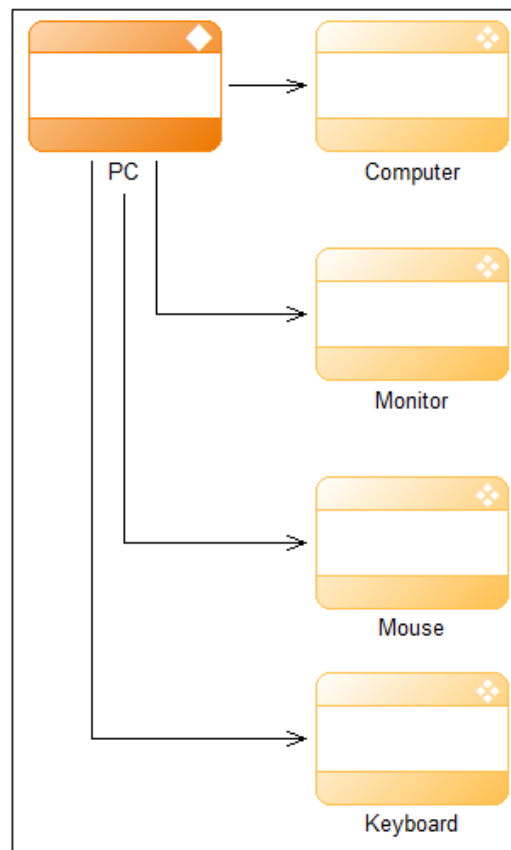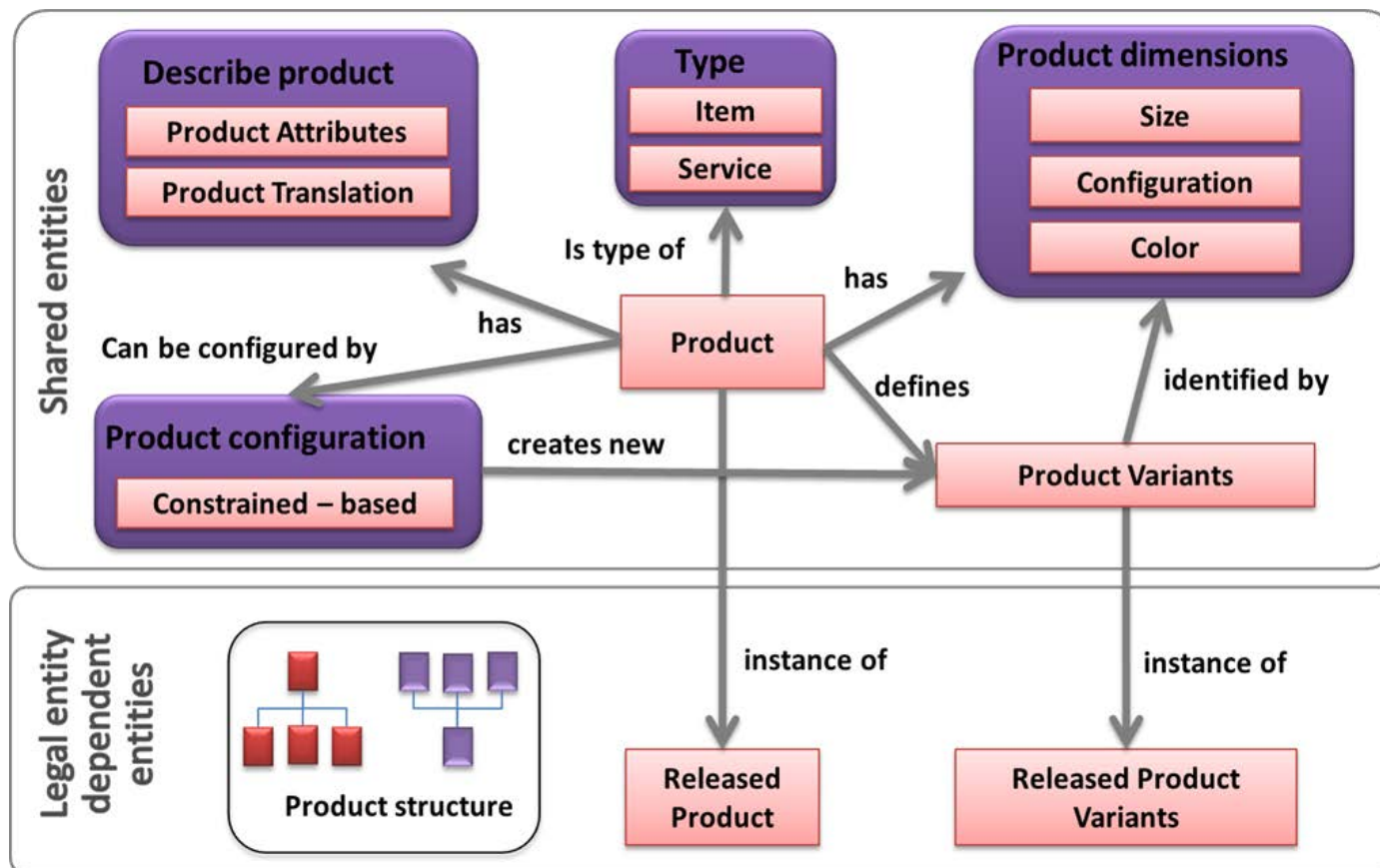

*) ADONIS is a tool from BOC GmbH, Austria

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Product Model as a Class Diagram

■ This Product model consists of classes with attributes and associations

Product Models

- If we do not have an model type for products, we can use ML class diagrams to model products (similar as for documents)

- In Agilian we can again define specific sterotypes