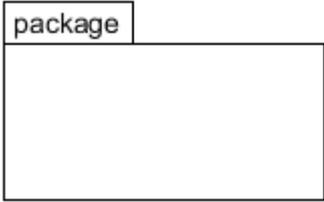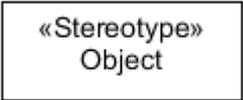# Notation of Science Viewpoint Models

Communities

SV communities are modelled using an object diagram. The following table describes the elements used in that diagram.

Table 1 Notation for community diagrams

Figure	Description
package	A Package, in UML notation, is a grouping element. Package is used "to group elements, and to provide a namespace for the grouped elements". A package may contain other packages, thus providing for a hierarchical organization of packages. Classes, objects, use cases, components, nodes, node instances etc. can all be organized as packages, enabling a manageable organization of the elements of UML models.
«Stereotype» Object	Objects are used to represent communities and objectives in the RM. The name refers to the represented entity(community or community objective). The stereotype indicates the namespace where the object is grouped. Sometimes the stereotype can be an image. The image can be used in place of the figure. The ODP stereotype for community is an icon of group of people with keyboards: The ODP stereotype for notation is an icon of group four black and grey arrows converging to a point: Each community is linked to its corresponding objective by a line

In the following example diagram (Figure 1) the package represents an Environmental research infrastructure. The infrastructure contains five objects which are all communities and each community is linked to a community objective.
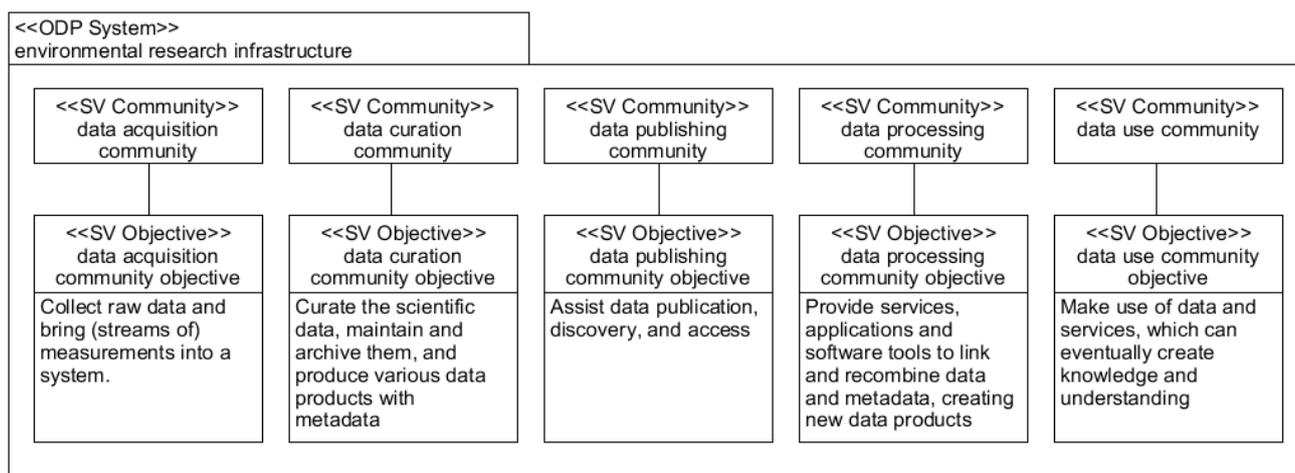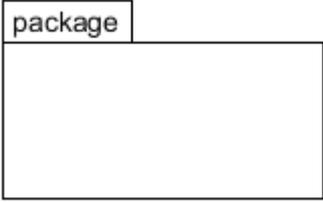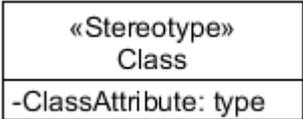
<<ODP System>>
environmental research infrastructure

<<SV Community>> data acquisition community	<<SV Community>> data curation community	<<SV Community>> data publishing community	<<SV Community>> data processing community	<<SV Community>> data use community
<<SV Objective>> data acquisition community objective	<<SV Objective>> data curation community objective	<<SV Objective>> data publishing community objective	<<SV Objective>> data processing community objective	<<SV Objective>> data use community objective
Collect raw data and bring (streams of) measurements into a system.	Curate the scientific data, maintain and archive them, and produce various data products with metadata	Assist data publication, discovery, and access	Provide services, applications and software tools to link and recombine data and metadata, creating new data products	Make use of data and services, which can eventually create knowledge and understanding

Figure 1 Example of a community diagram

Community Roles

SV Roles are represented using a class diagram with packages and classes

Table 2 Notation for role diagrams

Figure	Description

![package](package figure)	A Package, in UML notation, is a grouping element. Package is used "to group elements, and to provide a namespace for the grouped elements". A package may contain other packages, thus providing for a hierarchical organization of packages. Classes, objects, use cases, components, nodes, node instances etc. can all be organized as packages, enabling a manageable organization of the elements of UML models. 2 / 3
«Stereotype» Class -ClassAttribute: type	Classes are used to represent roles in the RM. Classes can have additional compartments to express properties (called attributes) and behaviours (called methods). Omitting the compartments means that the behaviour and attributes are undefined at the time of building the diagram. Name tag indicates the name of the class. Typically, classes are named using no spaces and starting each word that makes up the name, i.e., camelcase. The stereotype indicates the namespace where the class is grouped. Sometimes the stereotype can be an image. The image can be used in place of the figure. For ODP, the stereotype for role is a mask:

In the example diagram the package represents the data curation community. The community contains eight role classes. The ENVRI RM provides a detailed description of each role in text.
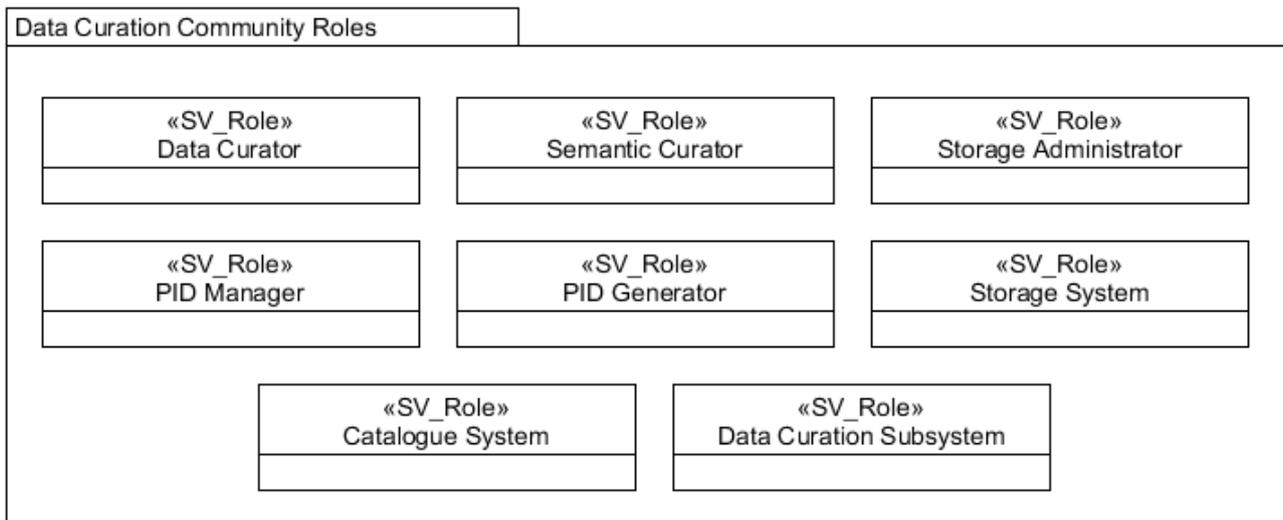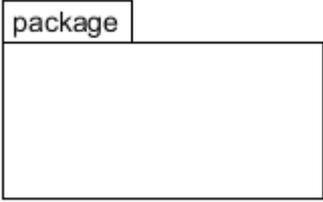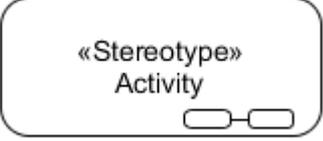
Data Curation Community Roles

«SV_Role» Data Curator	«SV_Role» Semantic Curator	«SV_Role» Storage Administrator
«SV_Role» PID Manager	«SV_Role» PID Generator	«SV_Role» Storage System

«SV_Role» Catalogue System	«SV_Role» Data Curation Subsystem

Figure 2 Example of a SV Role diagram

Community Behaviours

SV Behaviours are represented using an activity diagram with packages and activities

Table 3 Notation for behaviour diagrams

Figure	Description

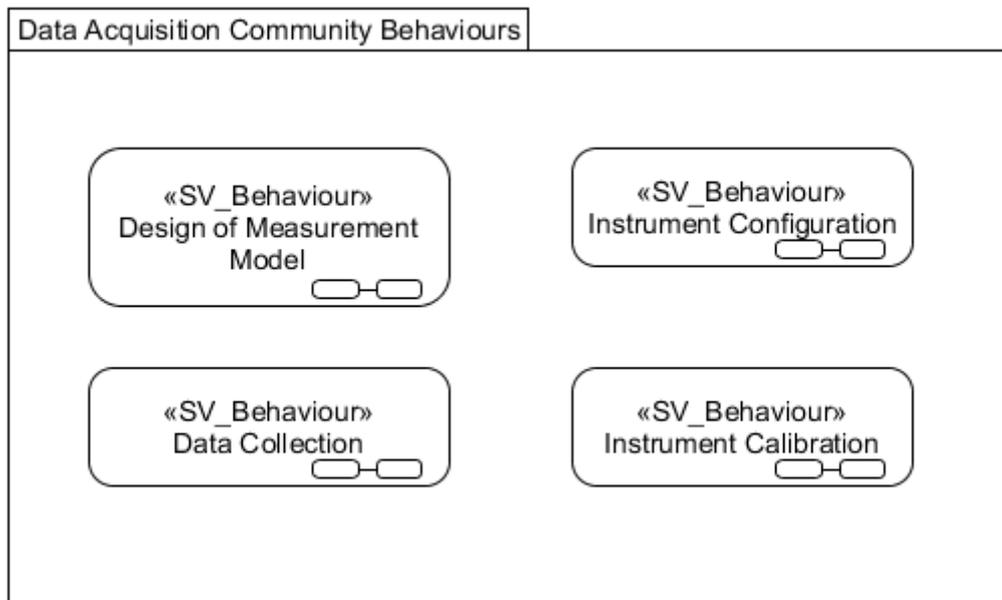|	
  package 	A Package, in UML notation, is a grouping element. Package is used "to group elements, and to provide a namespace for the grouped elements". A package may contain other packages, thus providing for a hierarchical organization of packages. Classes, objects, use cases, components, nodes, node instances etc. can all be organized as packages, enabling a manageable organization of the elements of UML models.
 «Stereotype» Activity 	Activities are used to represent behaviours in the RM. Name tag indicates the name of the behaviour. Behaviours are named using a short phrase that describes the event or action being represented. The small decoration in the activity indicates that the activity is complex and can be subdivided into smaller tasks. A stereotype can be used to indicate the namespace where the activity is grouped. Sometimes the stereotype can be an image. The stereotype image can be used in place of the figure. For ODP, the stereotype for behaviour is process icon:

Figure 3 Example of a SV Behaviour diagram

In the example diagram the package represents a community, data acquisition. The community implements four basic behaviours. The RM also provides a detailed description of each behaviour in text.