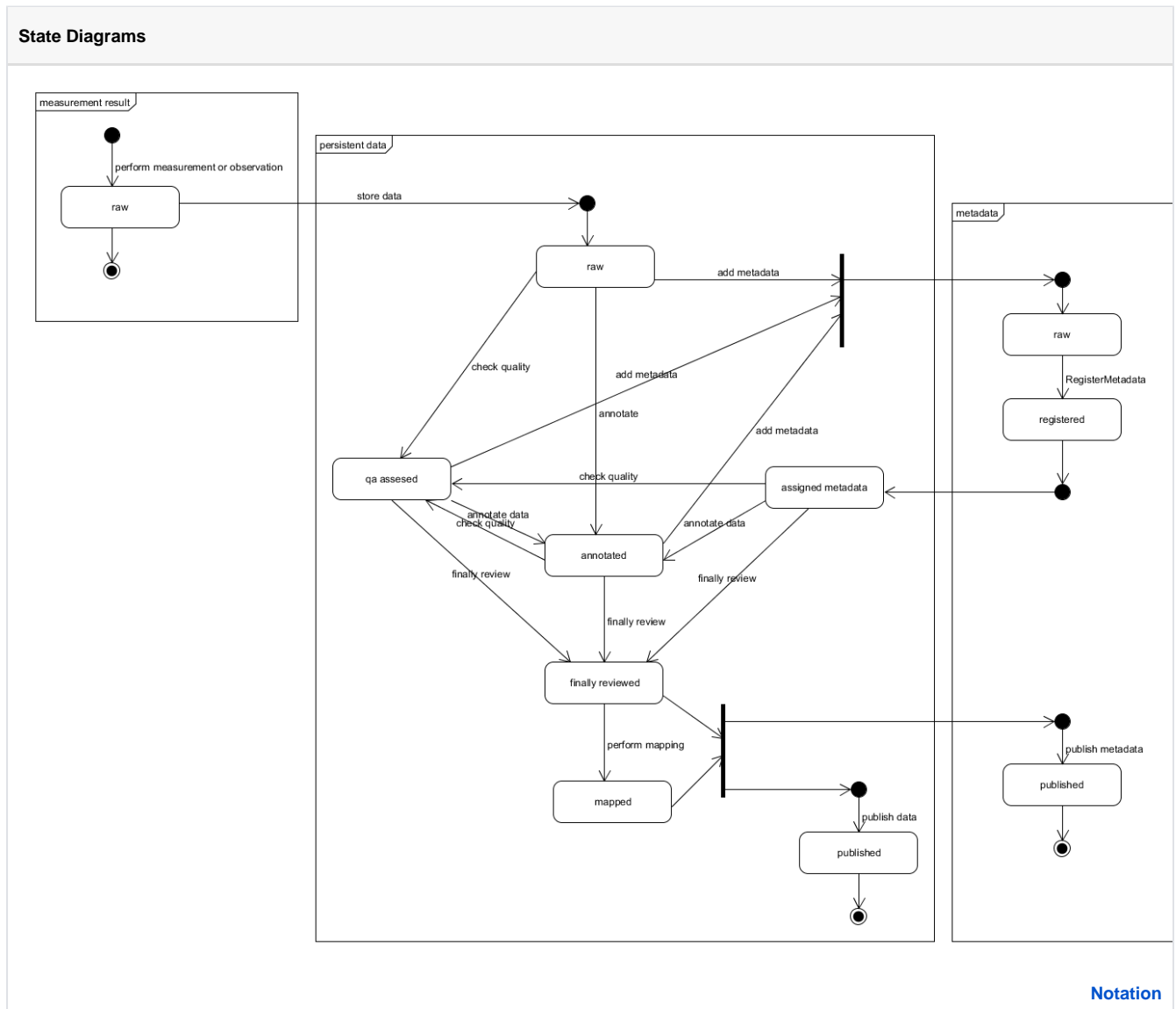


# IV States

The ENVRI RM IV defines **data state** and **metadata state** as the set of attributes which determine the actions that can be performed over a given information object.

The state changes, together with the **IV Information Action Types** can be used to model the behaviour of data as it is managed by the RI.

The diagram below shows the states of three IV objects (Measurement Result, Persistent Data and Metadata) and their relationships.



This diagram shows all the possible states for each of the IV Objects.

The first IV object (left) is Measurement Result object. The object is created from a **PerformMeasurementOrObservation** action. The Measurement Result has only one state "raw".

The second IV object (middle) is PersistentData object. The **StoreData** action triggers the creation of the new Persistent Data object in the RI which has a raw state. This object can have six states. The transitions shown in the figure indicate possible transitions which can occur during the lifetime of the object.

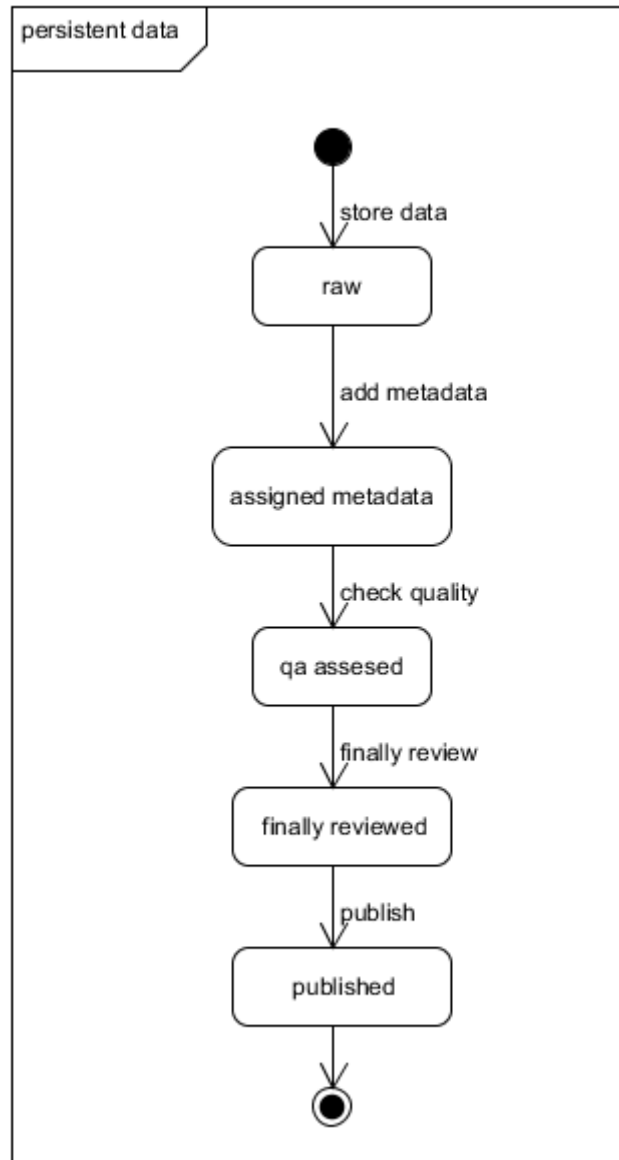
The third IV object (right) is a "Metadata" object. The **AddMetadata** action triggers the creation of the new Metadata object in the RI. This object can have three states. However, the transitions from registered to published is not directly triggered. The diagram indicates that publish metadata must occur simultaneously with publish data

In the diagram the filled circle indicates a starting point or a junction. Used as starting point, a filled circle indicates a pseudo-state which represents the start of the lifetime of an object instance. Used as a junction, the filled circle indicates a pseudo-state where paths merge or split. The Rectangles with a label in the upper left corner are used to indicate the object whose states are represented. The rectangles with rounded corners are used to indicate states. Each arrow indicates a transition between states. The label of the arrow indicates the activity that triggers the transition. The bar figure in the diagram indicates a pseudo-state that can represent a fork or a merge of paths. The type of diagram presented is an UML state machine diagram [40].

## Simple use example

The diagram shows the series of actions applied change the state of the IV object until it reaches a "published" state. In this diagram, only the persistent data object is shown. The diagram is linear and depicts contains only a subset of the allowed states and actions. This subset can vary from one RI to another. RIs can model their data lifecycles using state machine diagrams. The states described in the IV States diagram indicate a set of possible paths to follow when representing the data lifecycle. The instances developed by RIs may chose the states they need to include to represent their corresponding data lifecycles. RIs can also include additional states which help them better represent their data processing flows.

#### State Diagram - Simple use example



Notation

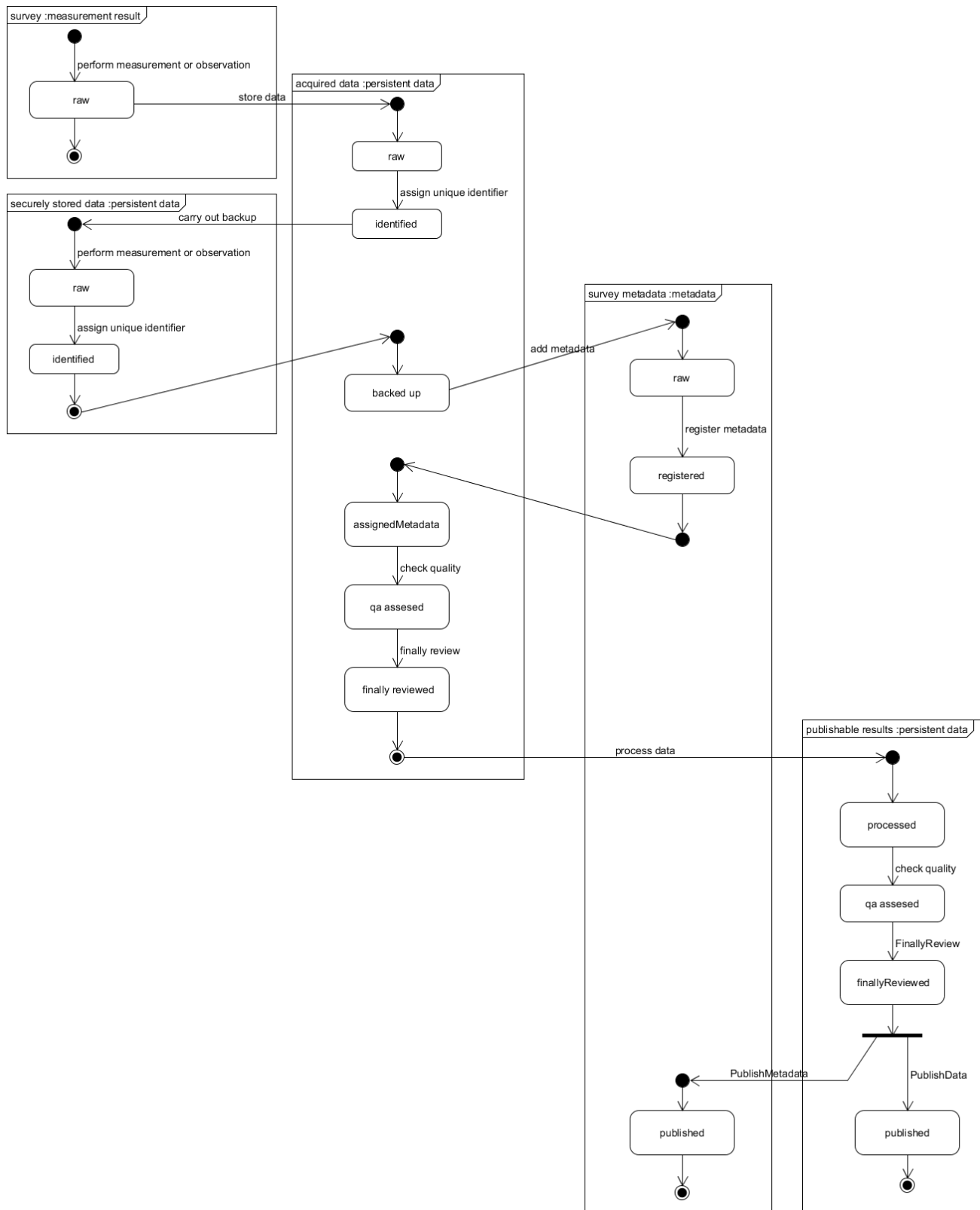
#### Advanced use example

The diagram shows the lifecycles of five IV objects and the way in which they relate to each other. The example is more complex but it is still linear and easy to follow.

Reading the diagram from the left to right and top to bottom it is possible to describe the lifecycles of the five IV objects. The first object is a called Survey. The diagram indicates that Survey is a type of MeasurementResult, when the Survey object is stored a new object is created SurveyData, a type of PersistentData object. The SurveyData object is then Identified, after identifying, a back up copy of the object, named SecuredStoredData, is created. Once the SecuredStoredData is stored and identified, the state of the SurveyData object changes to backedup. After backup, the RI adds metadata to the SecuredData object. The SurveyMetadata object is created and registered. This causes the change in the state of the SurveyData object to assignedMetadata. Subsequently the object is QA assessed and reviewed. Once the SurveyData is finally reviewed, the RI creates a new PersistentData object, PublishableResult, which results from the processing of the SurveyData object. The published result data object is then QA assesed and finally reviewed. The final pair of activities publish both the PublishableResult and the SurveyMetadata objects.

In this example, most of the states and actions are still subsets from the ones originally introduced on the IV State Diagram. The only exception is the backed up state. This is still valid, RIs can adapt the diagrams to their particular needs adding states and actions to better illustrate their data lifecycles as close to reality as possible.

### State Diagram - Advanced use example



Notation

