

CMM, PMW Manual

Table of contents

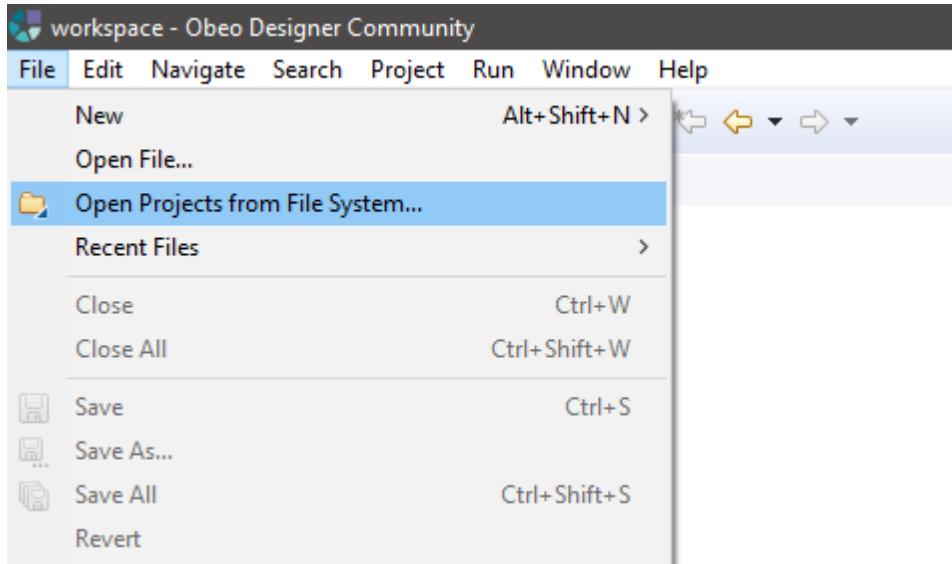
Section 01 - Experimenting/ extending and customizing CMM/ CMM tree Editor/ PMW	3
Using CMM (Accessing the ecore meta-model)	3
Class Diagram Representations	5
Instantiating CMM Tree Editor	7
Using Pandemic Modeling Workbench (PWM)	11
Section 02 - Eclipse based Plugin for PMW	15
Plugin Installation	15
Running PMW Modeler	18
Running PMW Graphical Editor	24

Created with the Personal Edition of HelpNDoc: [Generate EPub eBooks with ease](#)

CMM.zip contains the Eclipse Modeling Project in which CMM or COVID-19 Management Meta Model has been developed.

In order to use, extend and adopt this Meta-Model for modeling of COVID-19 and for model-based development of other pandemics, following steps need to be followed.

1. Download and place CMM.Zip on a location on a hard disk. Unzip the Folder.
2. Open Obeo Designer Community Workspace.
3. New->Open Project from File System as under:-

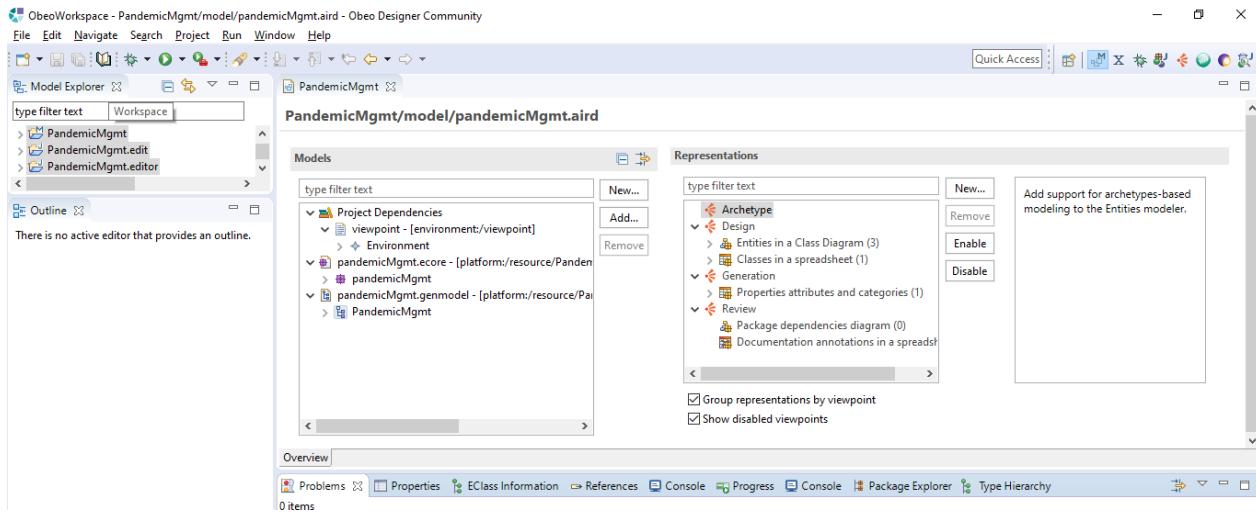


4. Select import source Directory and select the unzipped folder. Select all 3 folders as shown below.

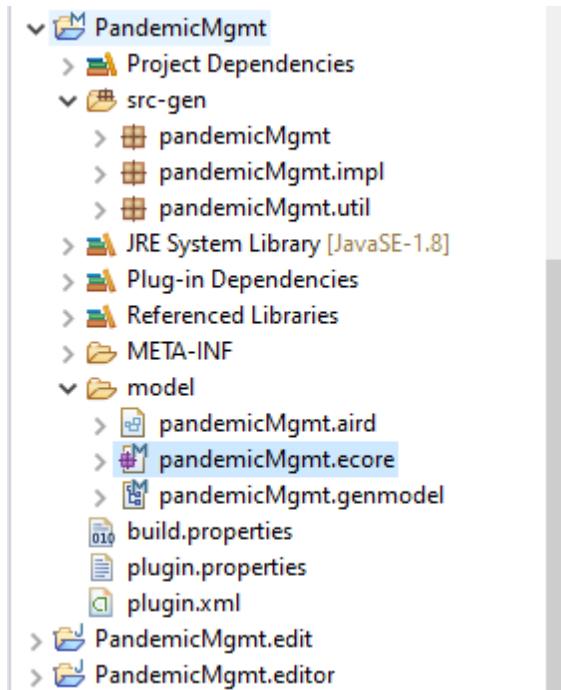
A screenshot of a Windows File Explorer window. The table lists three items in a table format:

	Name	Date modified	Type	Size
	PandemicMgmt	10/1/2021 11:25 AM	File folder	
	PandemicMgmt.edit	10/1/2021 11:25 AM	File folder	
	PandemicMgmt.editor	10/1/2021 11:25 AM	File folder	

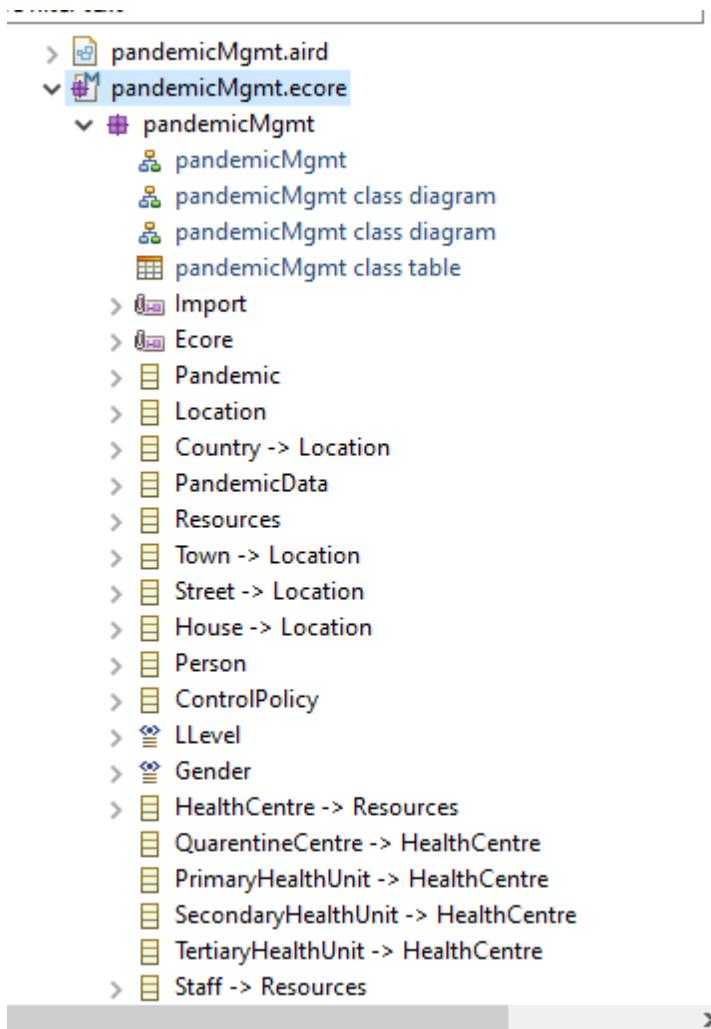
5. Click OK. The folders are opened in Obeo Model Explorer view and Aird File is automatically opened.



6. Now we may open CMM.ecore Model and its graphical class diagram representation.
7. To open the ecore meta-model, Go to the modeling project, under the 'model' folder, double click on pandemicMgmt.ecore model file.

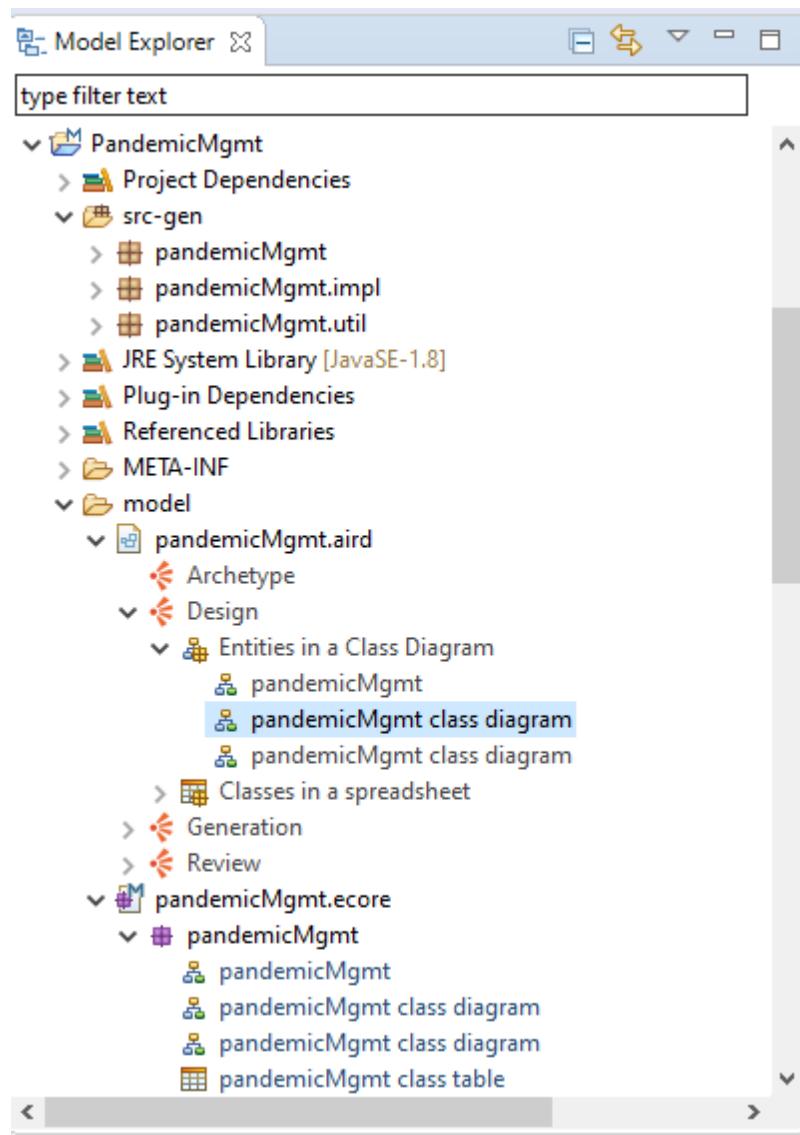


8. Complete ecore meta model is available in tree view to be used, adapted, customized and enhanced.

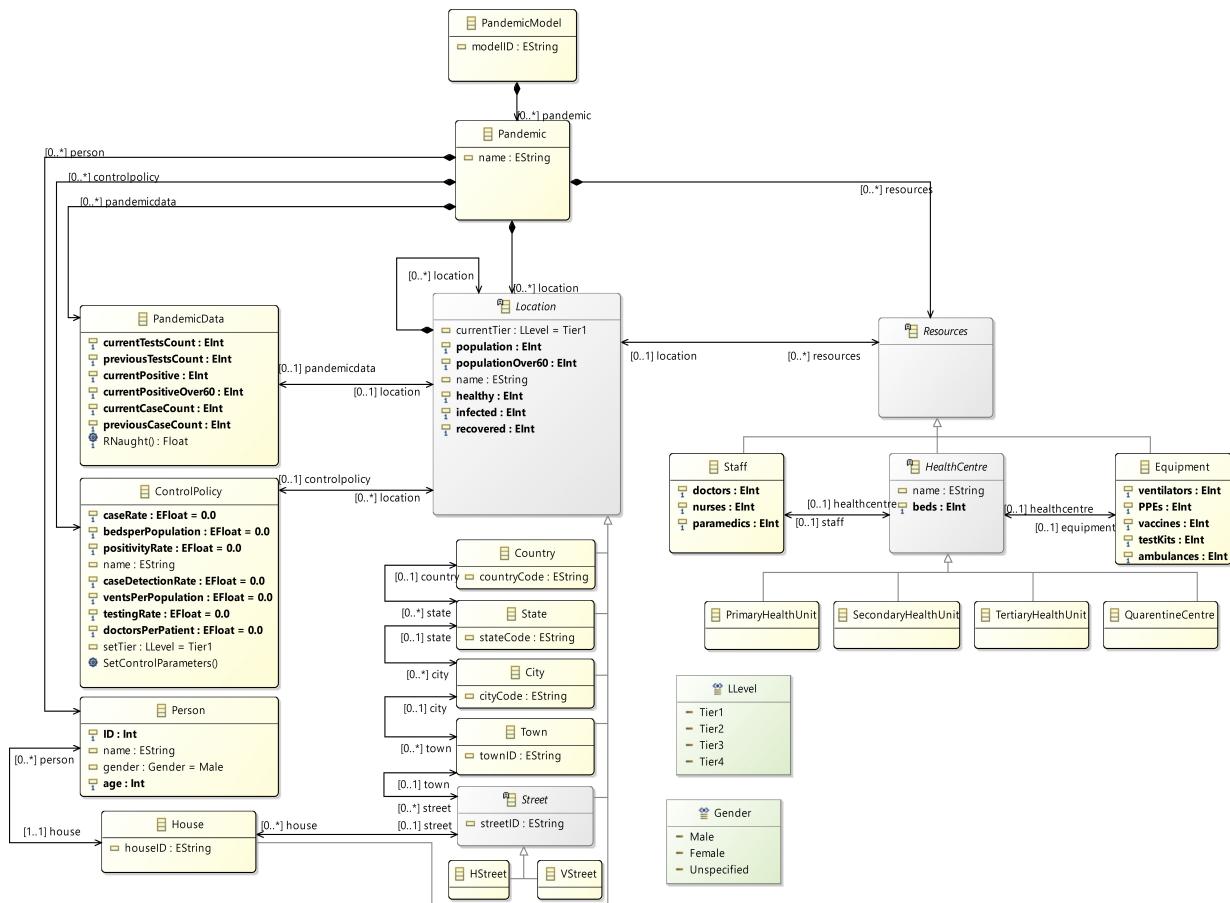


Created with the Personal Edition of HelpNDoc: [Produce online help for Qt applications](#)

1. In order to open class diagram representation of ecore meta model, Go to Model Explorer, double click model->CMM.aird->model>Design> Entities in Class Diagram> pandemicMgmt class Diagram as shown below.

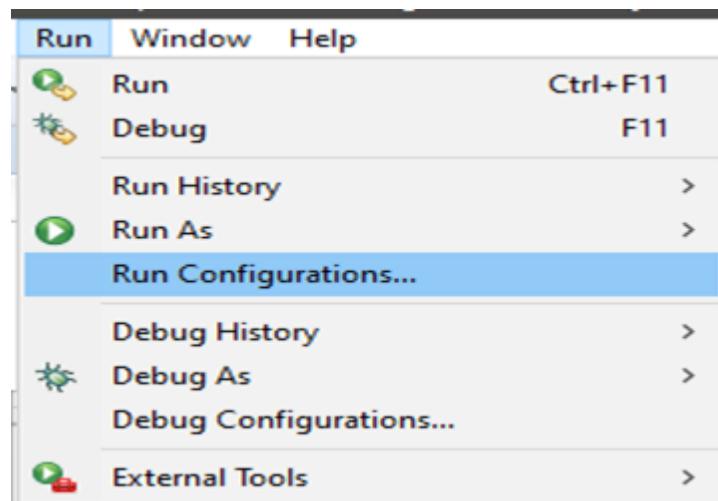


2. CMM class diagram is now available to be extended, adapted, used and enhanced.

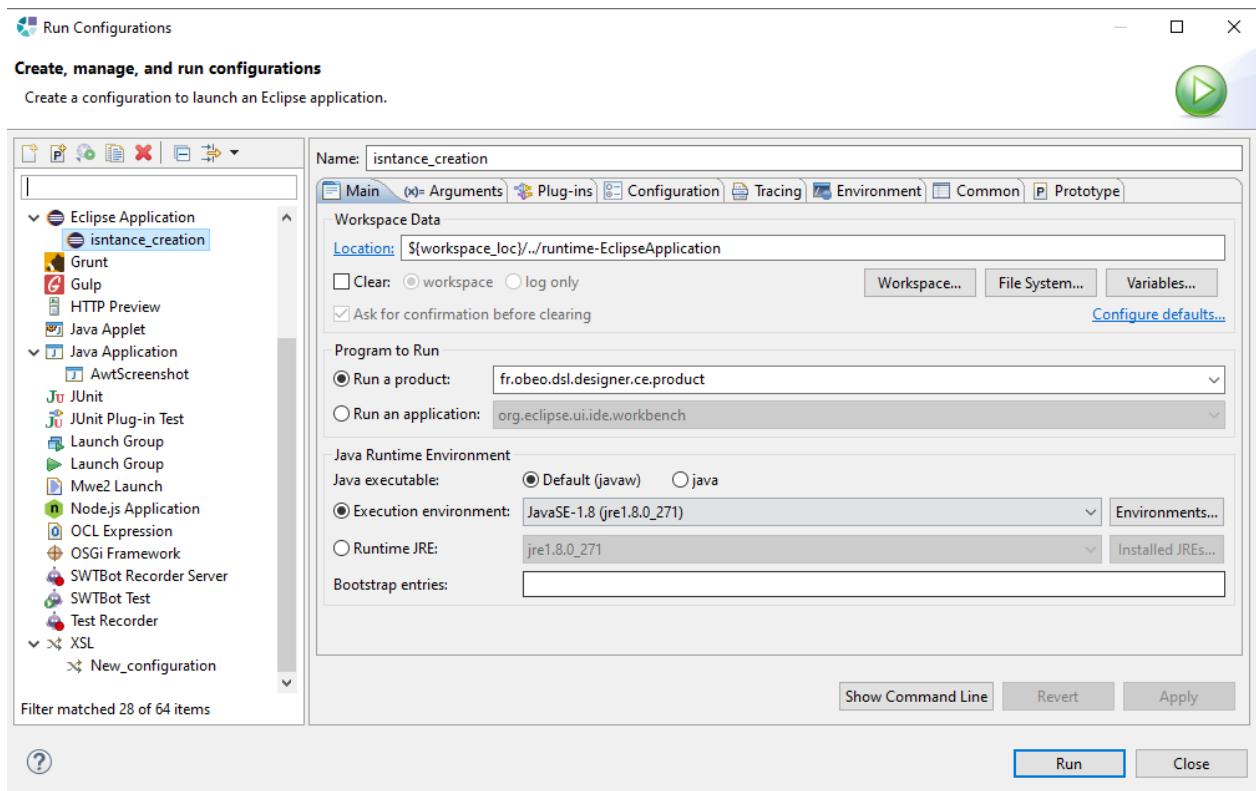


Created with the Personal Edition of HelpNDoc: [Produce online help for Qt applications](#)

1. To use the developed metamodel at M!, we need to instantiate it. We do so by Running a new configuration of Obeo Designer community from the Run> Run Configuration tab



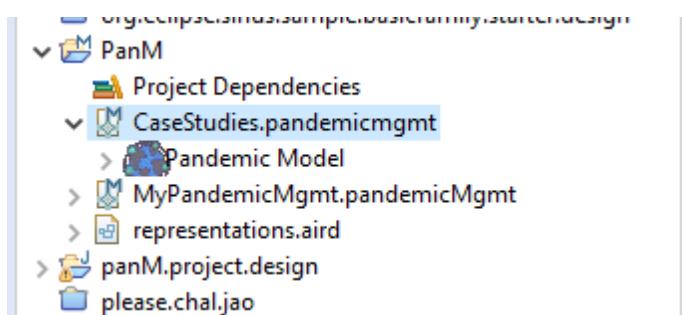
2. Double click on Eclipse application to get a new runtime configuration as under:-



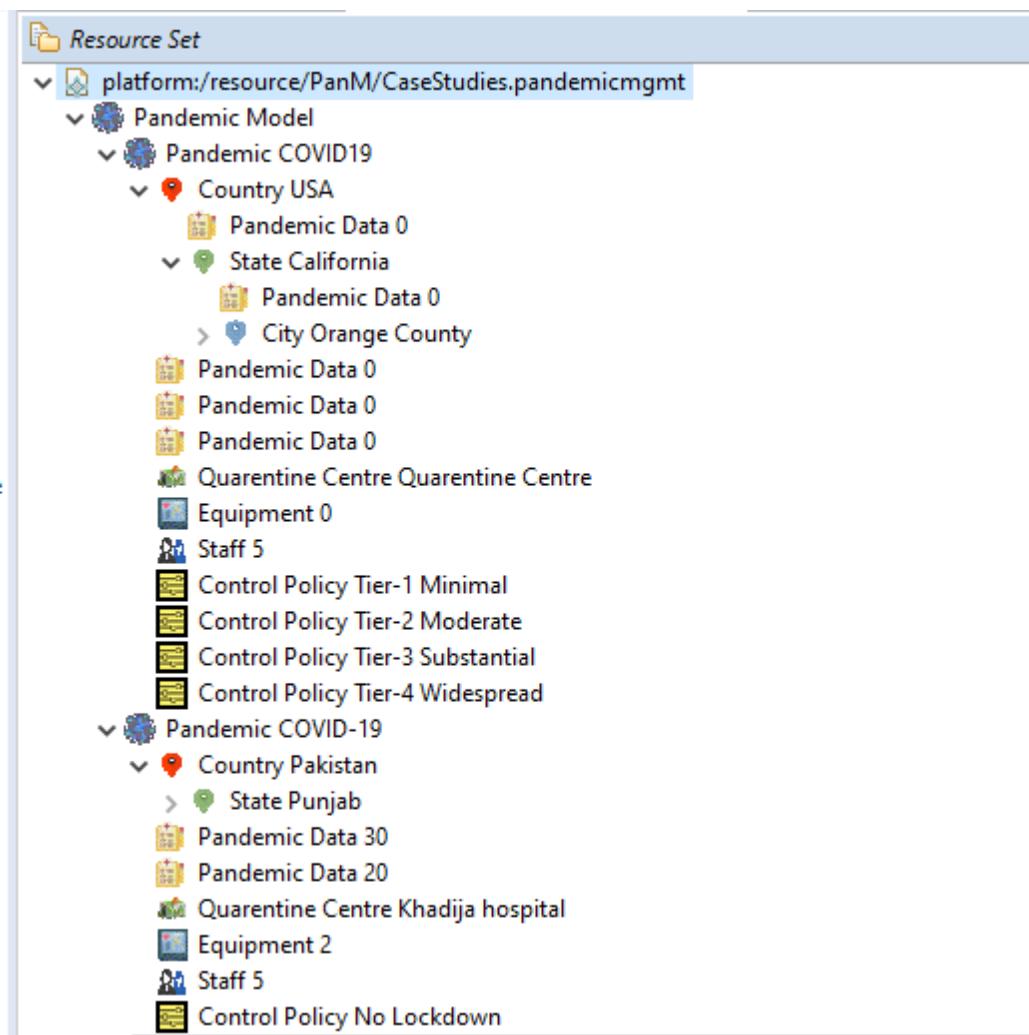
3. Click Run.
4. New Runtime Will open after the splash screen.
5. Now we need to instantiate the the M1 instance of the metamodel.
6. As a proof of concept we have modeled two case studies of a COVID-19 Management of localities in USA and Pakistan. Conforming to the concepts of CMM meta-model , we have modeled the pandemic in a tree view editor (with extension .pandemicMgmt).
7. We can import the editor project after unzipping RuntimePWM.zip and following the same steps of accessing the metamodel in previous section.
8. After importing, 2 projects will be opened in the model explorer



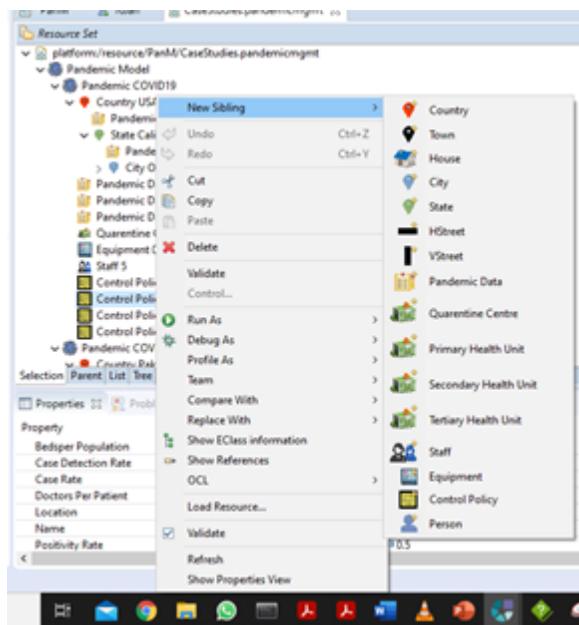
9. Now we can open the tree editor as under by PanM>CaseStudies.pandemicmgmt> Right Click>OpenWith>PandemicMgmt Model Editor



10. Tree based editor will be opened as under.



11. New nodes can be added inside containers as child nodes and sibling nodes in a tree based pattern



12. Attributes and associations can be set from properties pane as under

The screenshot shows the 'Resource Set' interface. The tree view on the left displays the following structure:

- platform:/resource/PanM/CaseStudies.pandemicmgmt
 - Pandemic Model
 - Pandemic COVID19
 - Country USA
 - Pandemic Data 0
 - State California
 - Pandemic Data 0
 - City Orange County
 - Pandemic Data 0
 - Pandemic Data 0
 - Pandemic Data 0
 - Quarantine Centre Quarantine Centre
 - Equipment 0
 - Staff 5
 - Control Policy Tier-1 Minimal
 - Control Policy Tier-2 Moderate

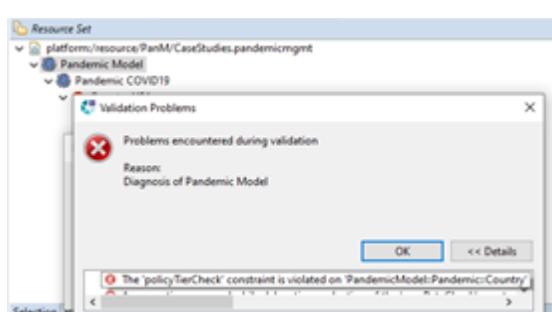
Below the tree view is a navigation bar with tabs: Selection, Parent, List, Tree, Table, Tree with Columns. The 'Table' tab is selected.

At the bottom of the interface are several tabs: Properties, Problems, Console, Interpreter, Call Hierarchy, and Error Log. The 'Properties' tab is selected.

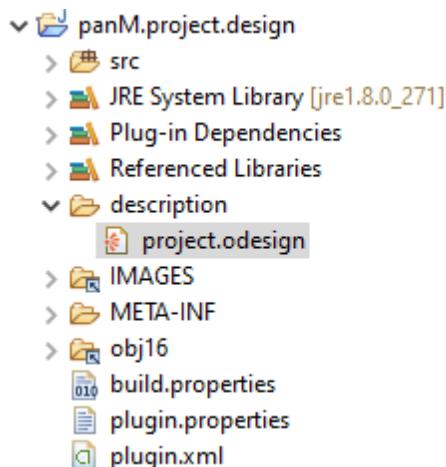
A table showing properties and their values is displayed:

Property	Value
Bedsper Population	0.5
Case Detection Rate	0.7
Case Rate	4.0E-4
Doctors Per Patient	0.7
Location	
Name	Tier-2 Moderate
Positivity Rate	0.5
Set Tier	Tier2
Testing Rate	0.6
Vents Per Population	0.0

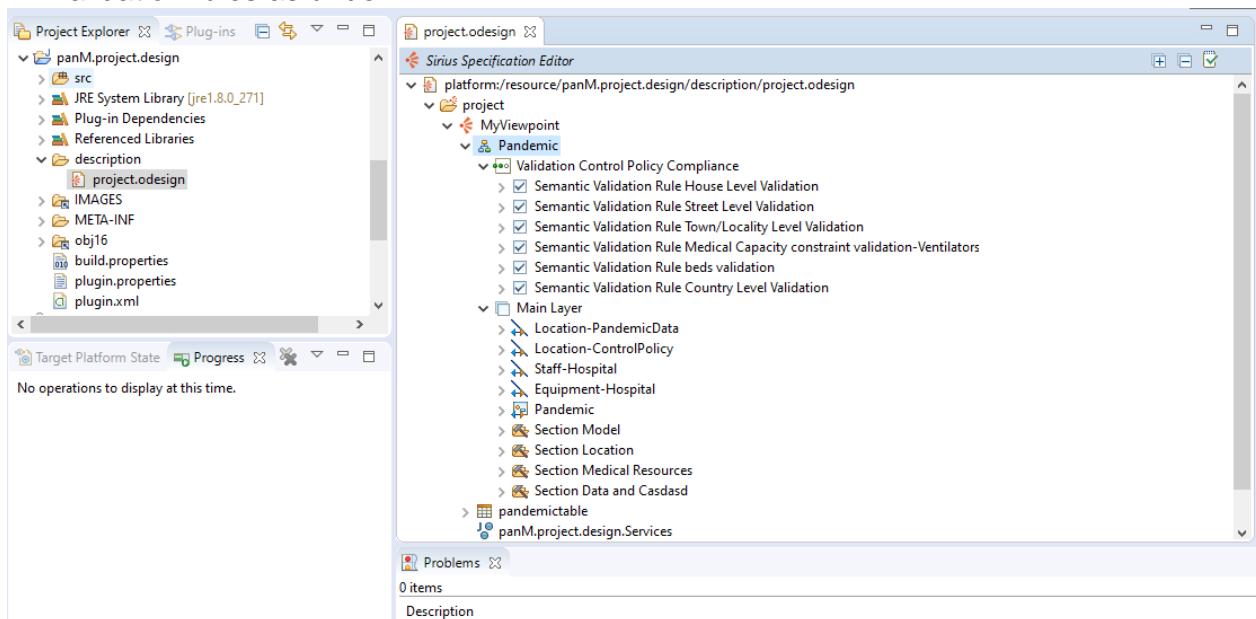
13. We can delete the existing nodes, can add new nodes and can also set the attributes of nodes very interactively.
14. We can also perform analysis to find any policy violations by validating the model as Rt Click model>OCL>Validate



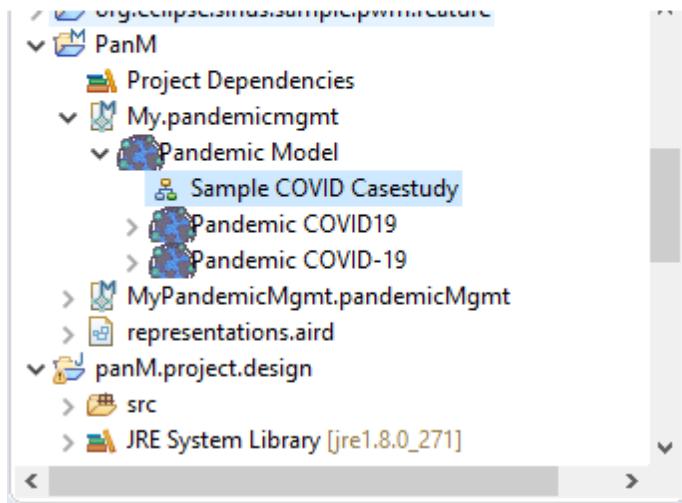
1. We have developed a prototype Sirius Workbench (PMW) which allows graphical modeling and visualization of infrastructures with the help of drag drop palette functionality.
2. Nodes and associations have been created for some concepts of our metamodel.
3. We can access the nodes in odesign file as under by double clicking panM.project.design>project.odesign in our runtime instance of Obeo:-



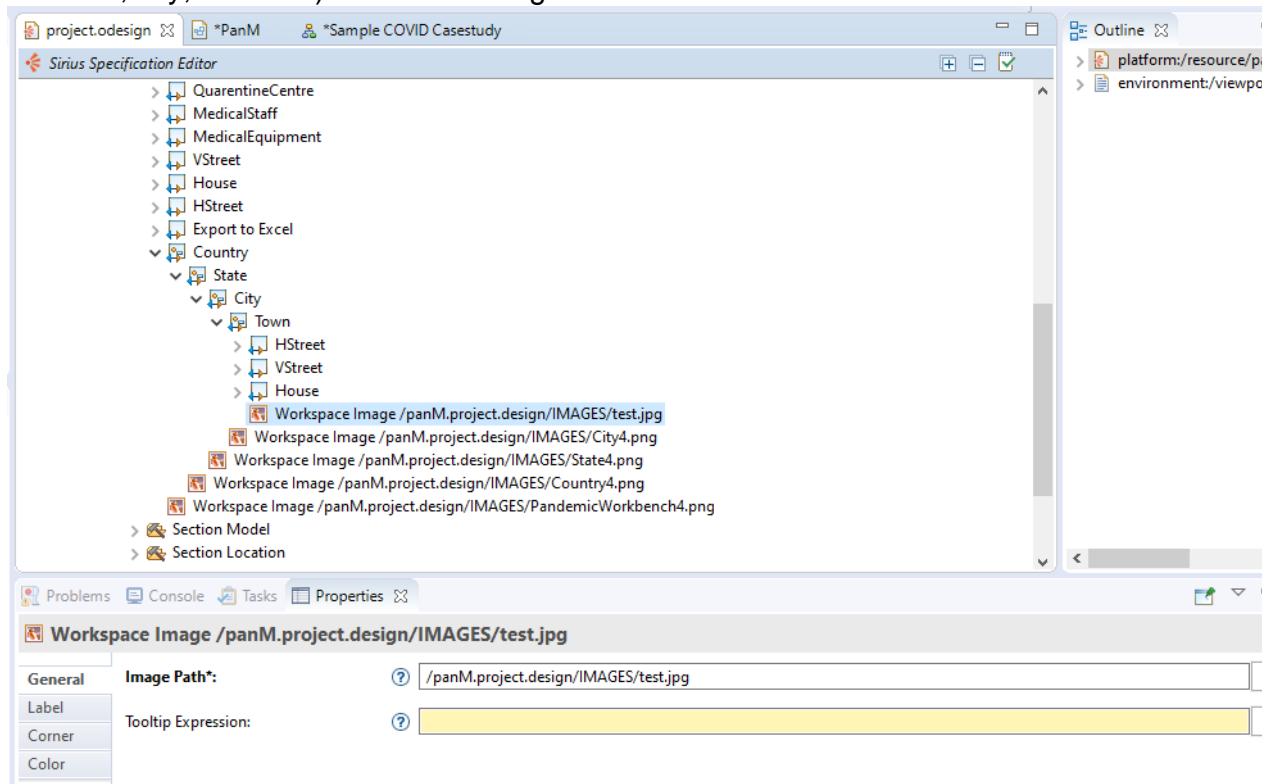
4. After the project.odesign editor is opened we can see the hierarchy of nodes,edges, validation rules as under



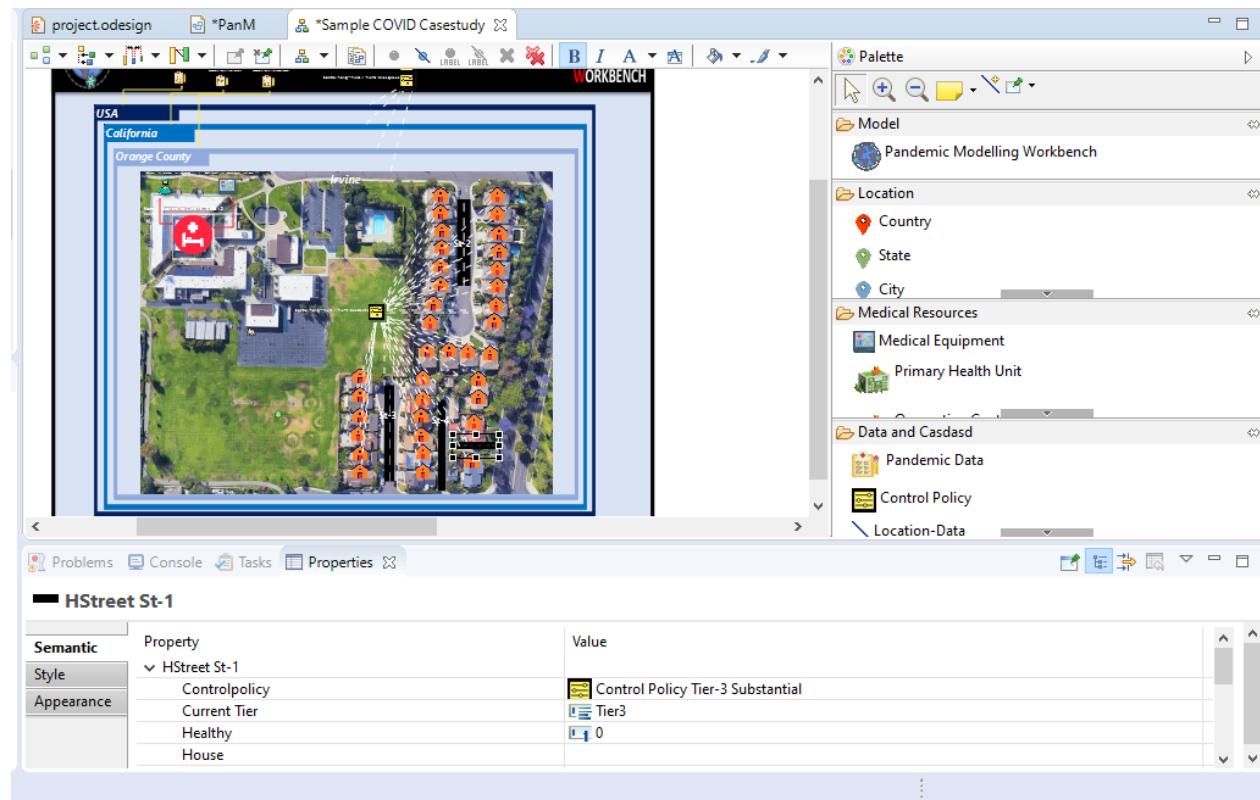
5. This is the PMW source file, you can experiment with it, add,delete and modify nodes,edges,validation rules etc.
6. Based on this source odesign file, our Sirius workbench PMW is generated and can be accessed as under by double clicking the diagram representation Sample COVID Casestudy in the PanM Modeling project:



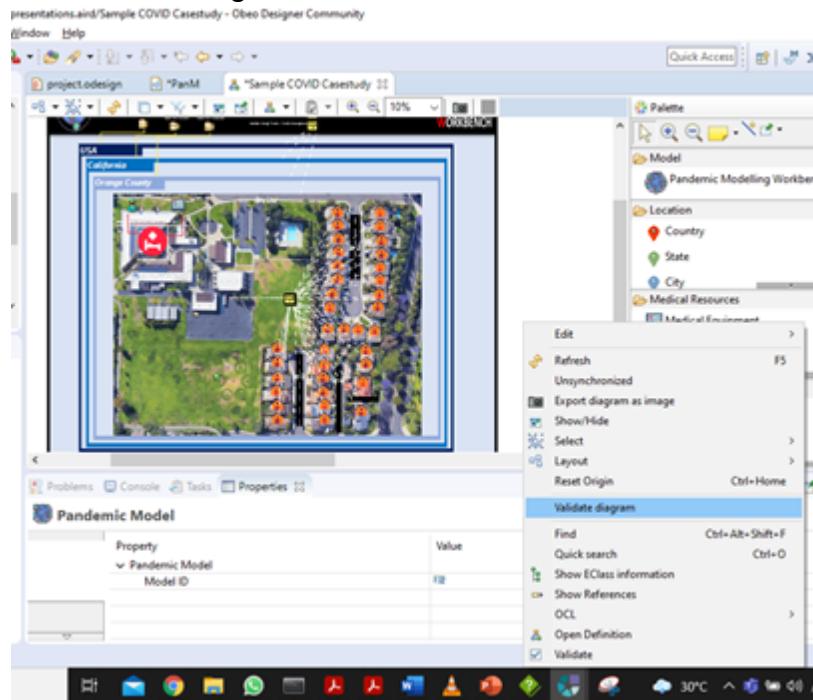
7. This opens the modeled town-level casestudies as under
8. For starting modeling of any new area from scratch, you first need to set the google imagery of area u want to model as the image for your desired location. This is optional and can be done by changing the background image of your desired location (country, state, city, town etc) from the odesign file as a shown below.



9. U can give the image path for your desired location to be modeled and start dragging dropping, resizing the icons from the palette and setting attributes.



10. You can perform analysis by selecting an empty space in the diagram area Right click> Validate Diagram



11. This performs analysis and gives prompts of policy violations as per the modeled parameters.



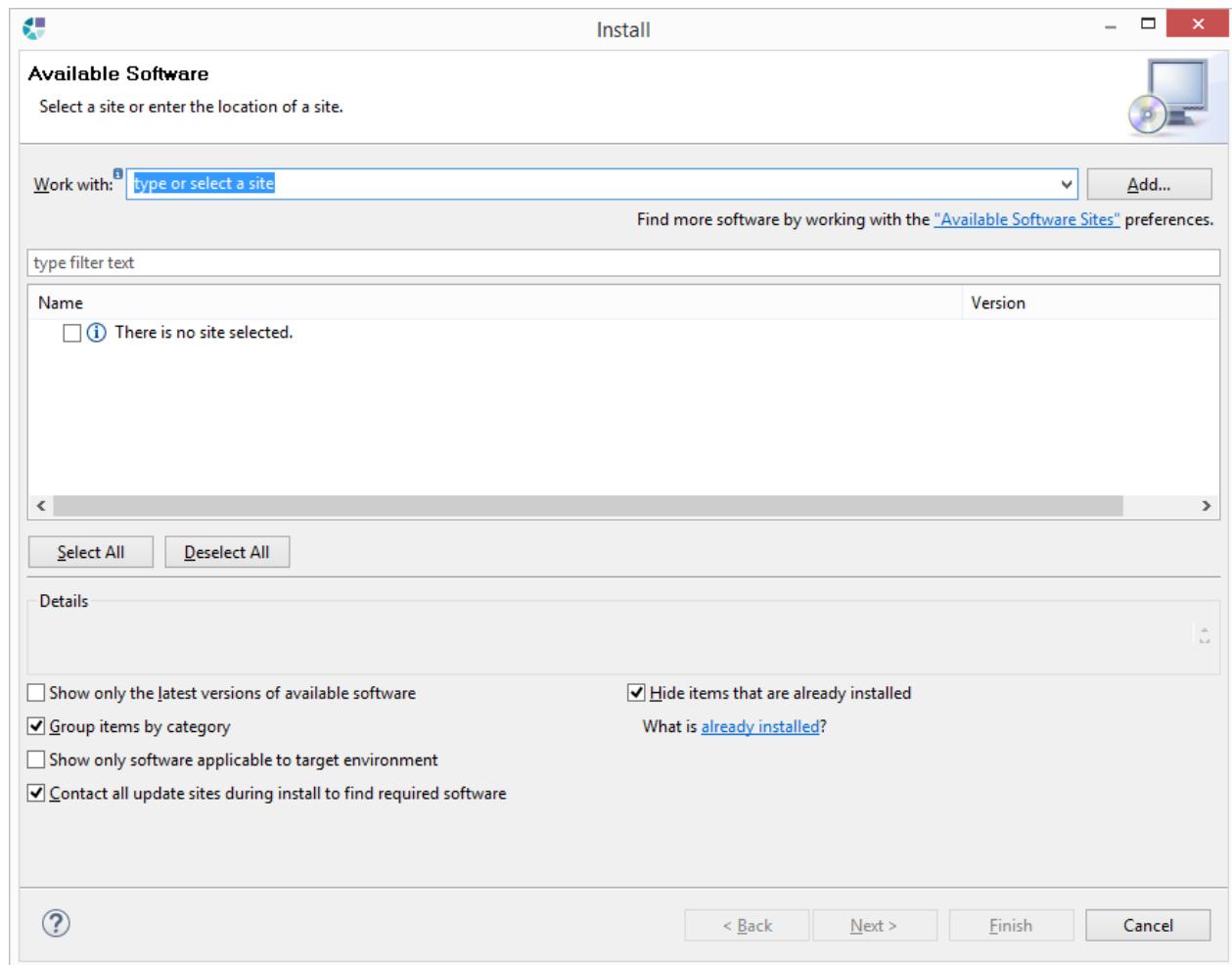
12. We can interactively experiment with the workbench by dragging the nodes to the diagram area. We must first understand the metamodel completely in order to drag-drop the nodes from palette to correct location and link them accordingly. Contained nodes can be seen inside the containers like country can not be modeled/ dropped inside a city etc.

Created with the Personal Edition of HelpNDoc: [Full-featured Documentation generator](#)

1. Up till now, we have discussed how projects can be imported to the oboe designer and can be experimented with. However, after successfully demonstrating the proof of concept we are now ready to distribute our graphical modeling editor, tool as plugin. For that we have developed an Eclipse plugin with the help of eclipse IDE/ Obeo Designer. This plugin can be easily installed just like all Eclipse plugins for pandemic modeling. In this section we will explain how to use our plugin. It is also highlighted that this plugin can be extended further in future to include new concepts after incorporating necessary adaptations in meta-model.

Created with the Personal Edition of HelpNDoc: [What is a Help Authoring tool?](#)

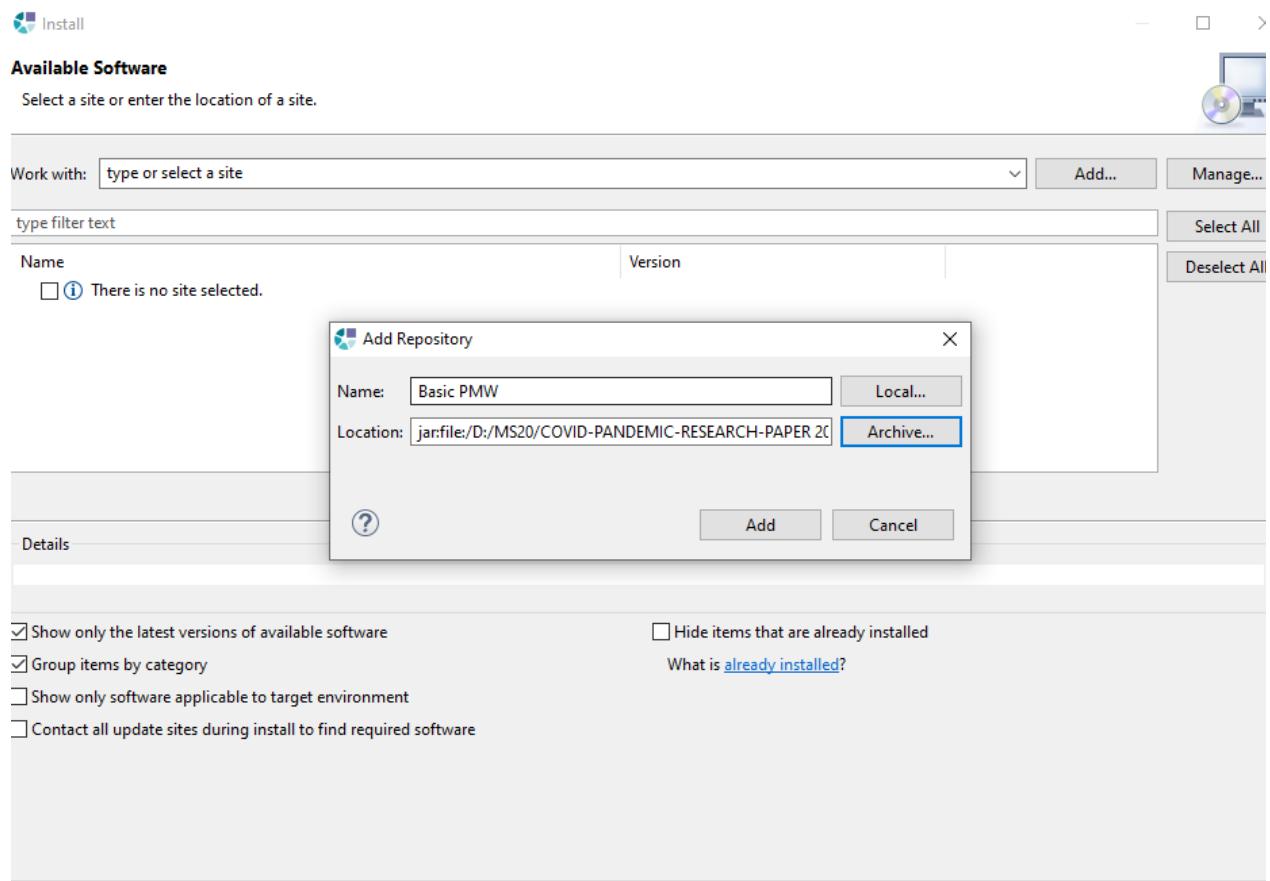
1. The plugin files are contained in 'basicPMW.zip'. The zip file can be downloaded from <https://github.com/aonsafdar/PMW>
2. You can install the Pandemic Modelling Workbench in a new Sirius environment or in a new Obeo Designer.
3. After downloading, Open your Eclipse environment and select **Help > Install New Software....**



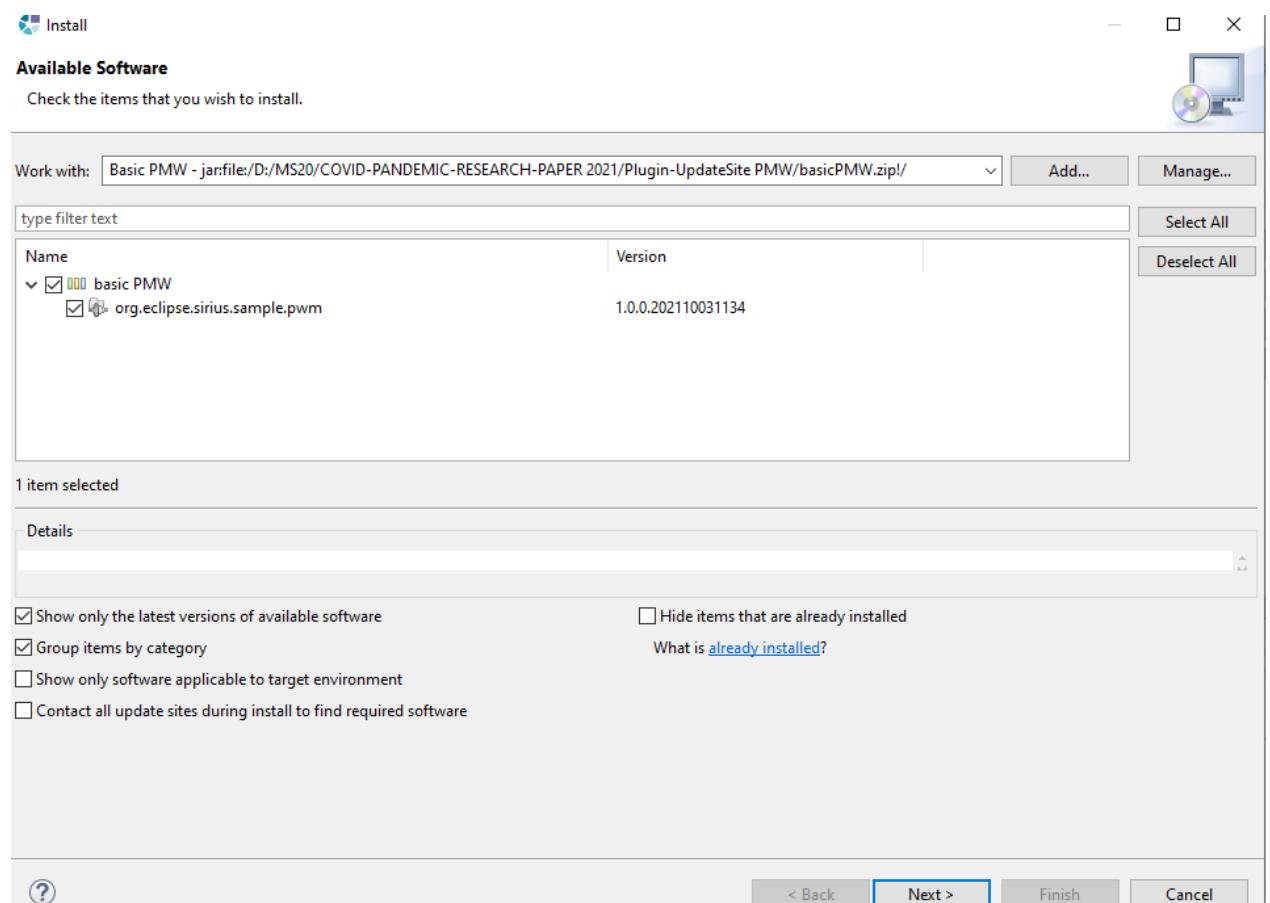
4. Click on *Add...* and fill the fields

- **Name:** Basic PMW
- **Location:** Click on "Archive..." button and retrieve the archive (zip) downloaded previously

5. Click on *Add...* and fill the fields and press Add.



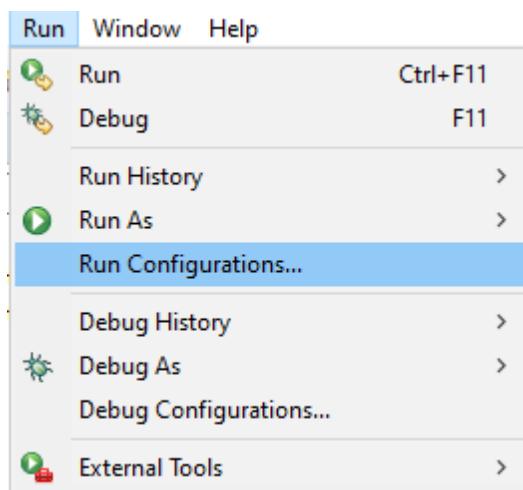
6. Click Ok Button and then click Next. Follow the instructions



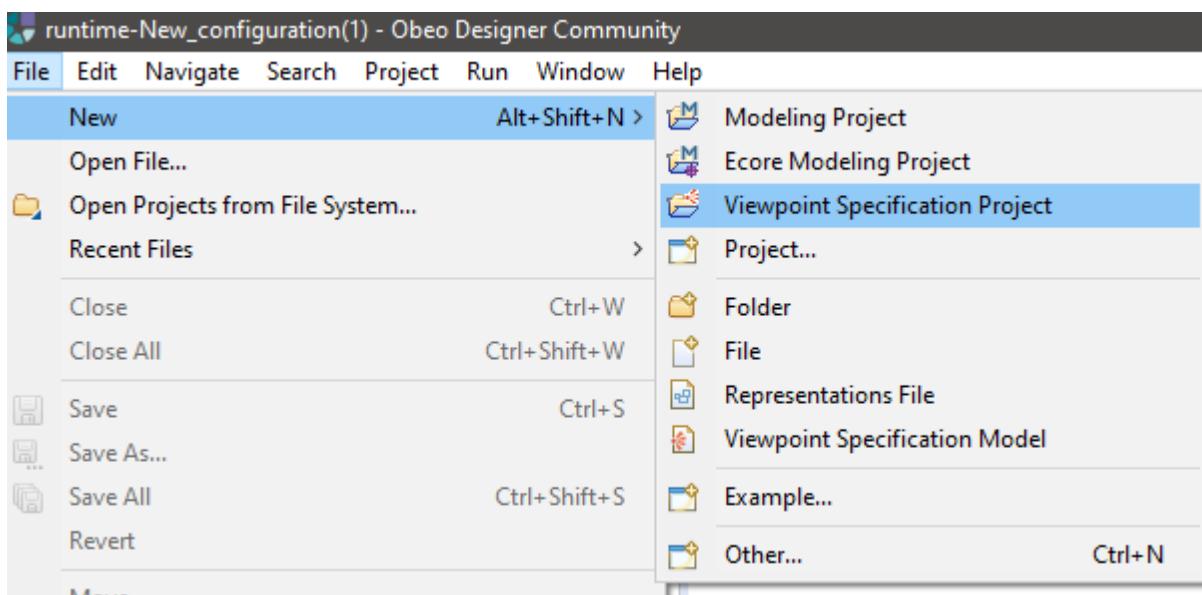
7. After that Sirius or Obeo Designer will restart.

Created with the Personal Edition of HelpNDoc: [Free PDF documentation generator](#)

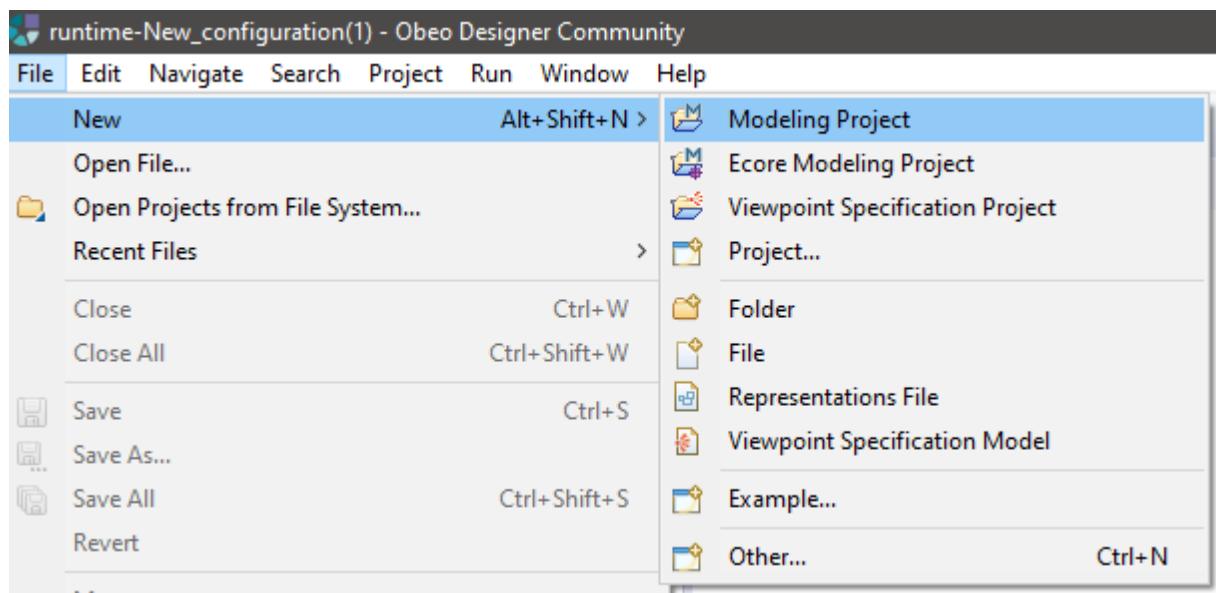
1. After successful Plugin Installation, you will be asked to restart the environment.
2. After the Oboe closes and reopens, launch a new Runtime configuration again as under:-



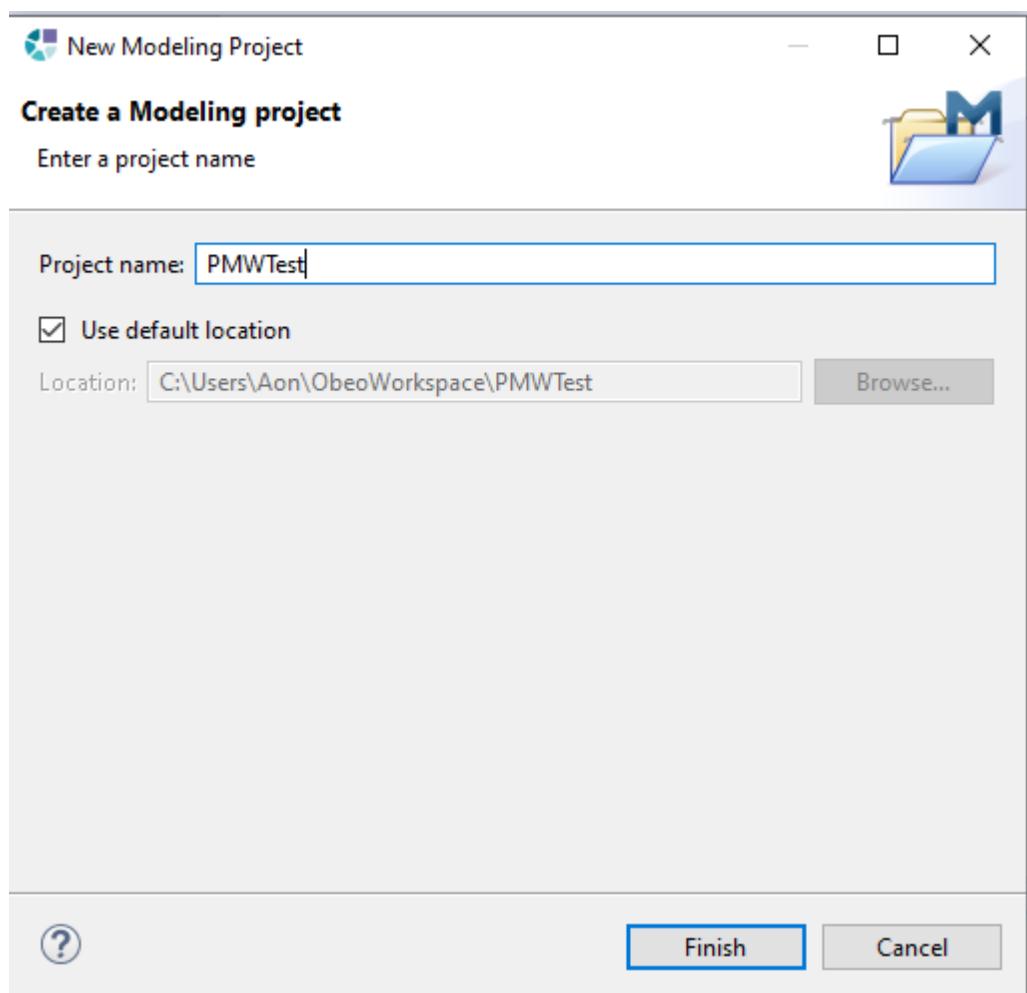
3. In the new Runtime configuration. Open a viewpoint specification project



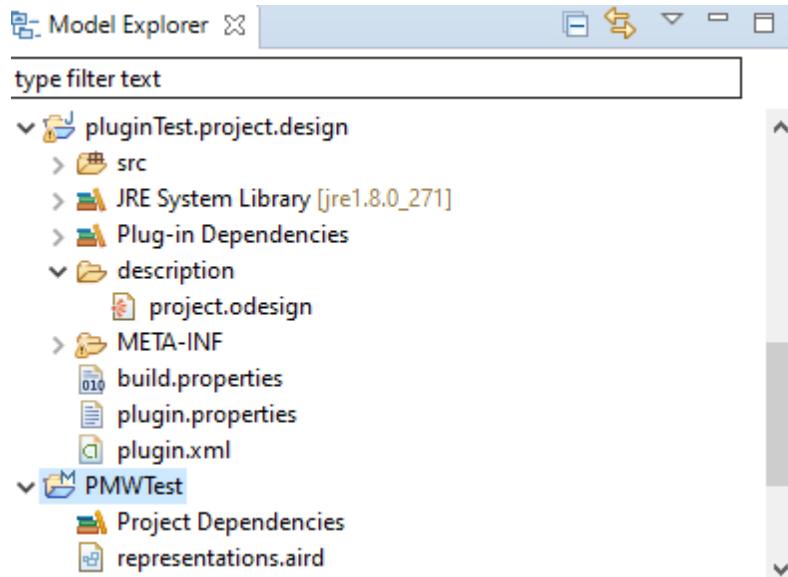
4. Name it and click Finish.
5. In the same Runtime Environment click on new->Modeling project and name it.



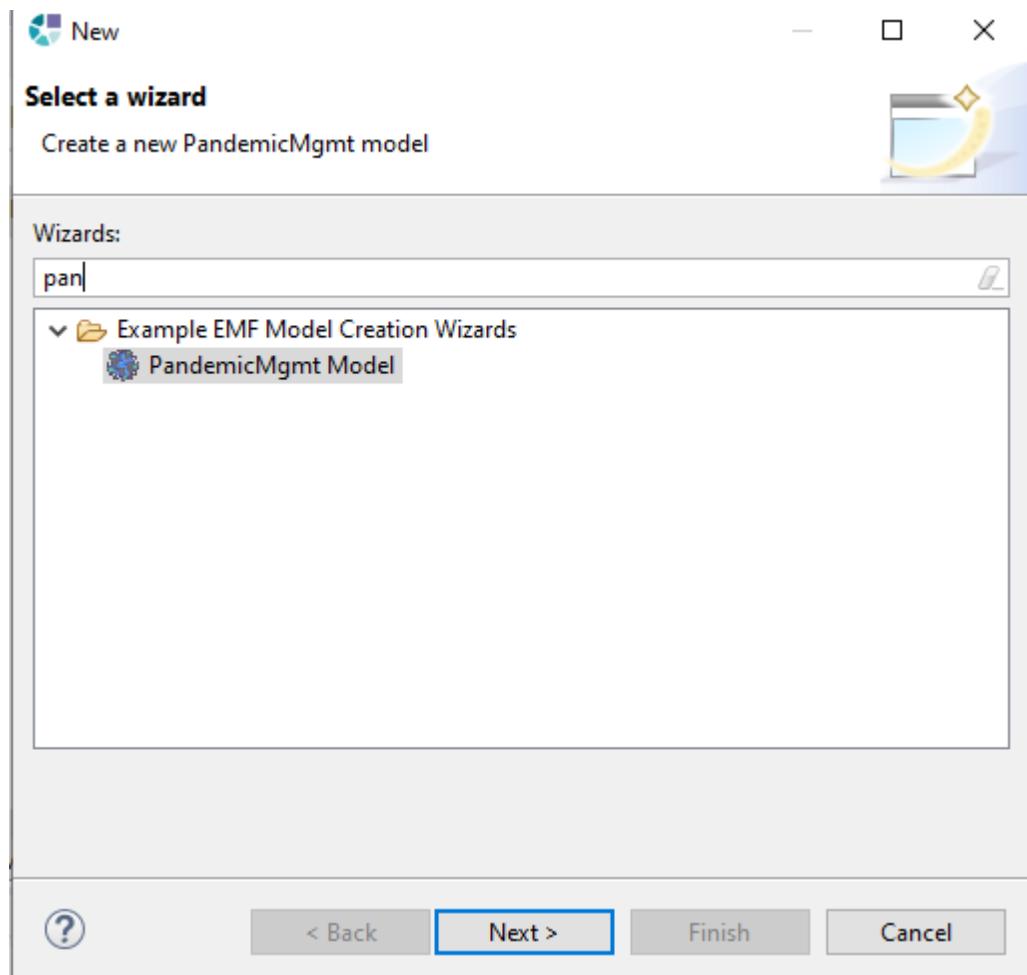
6. Name it and Click Finish



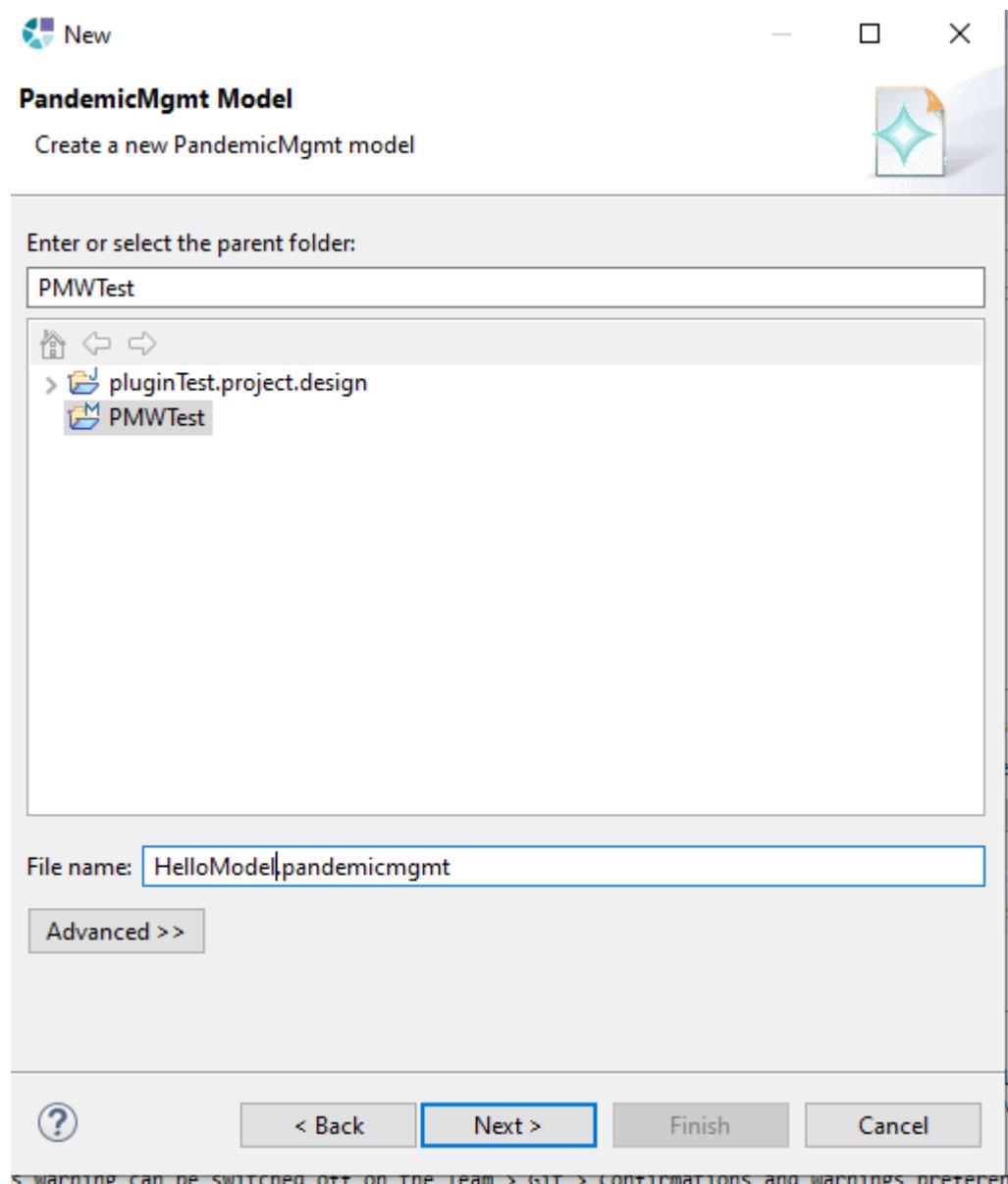
7. The 2 newly created projects are opened in the model explorer



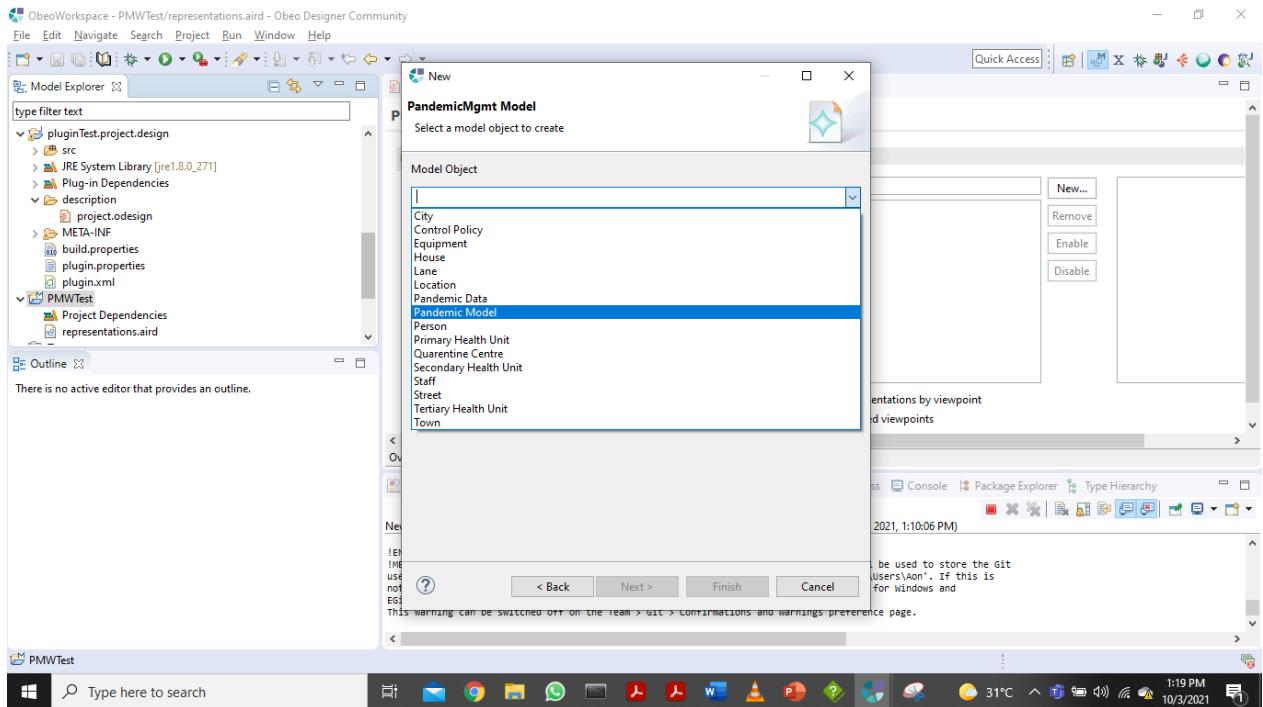
8. On the PMWTest Modeling project Right click> New>Others. In the window that opens search pandemicMgmt Model under the Example EMF Model Creation Wizard



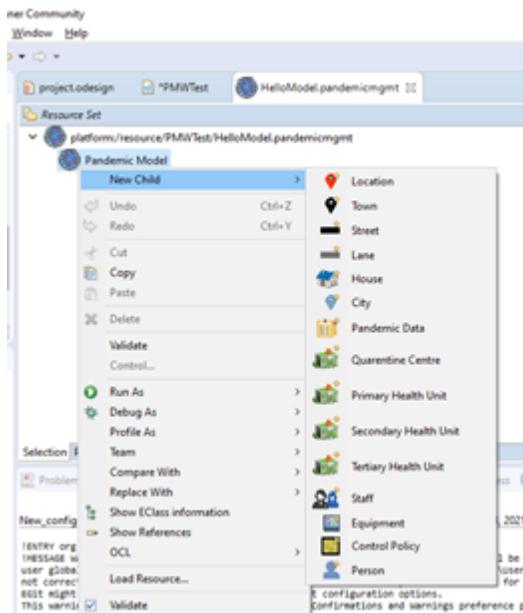
9. Name the model and click Next



10. Select the Parent Class to be 'Pandemic Model' and click Finish



11. This creates the model with .pandemicmgmt extension in which tree based modelling can be done by rightclick>add child.sibling etc

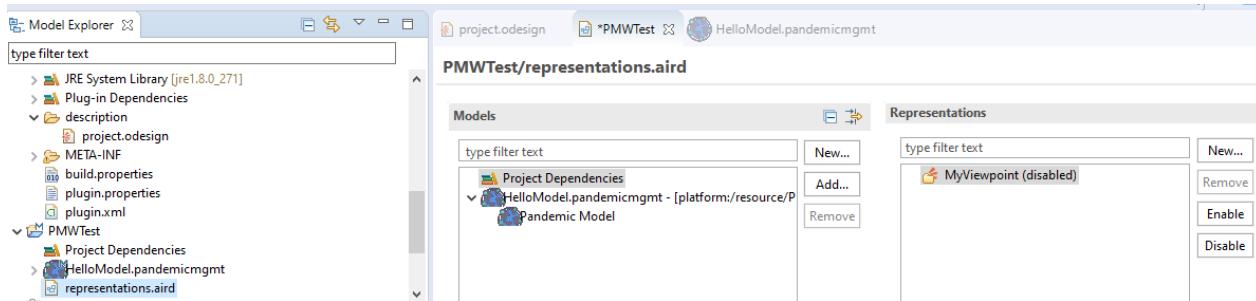


12. All concepts and associations can be added as per concepts of our metamodel.

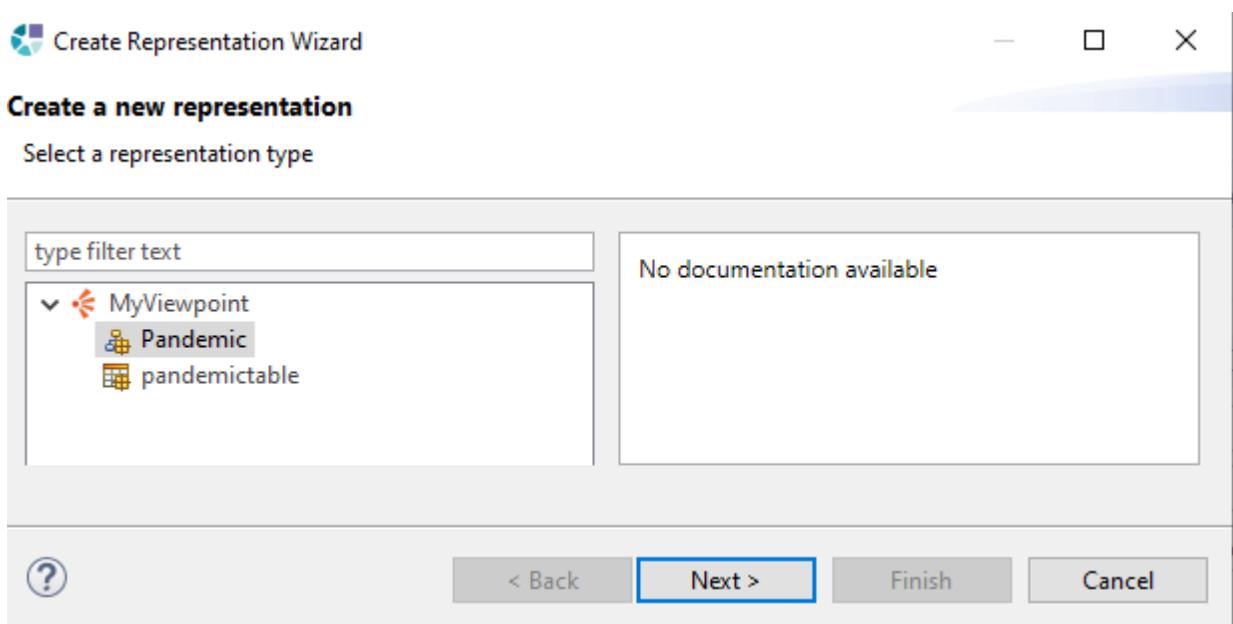
13. analysis and Policy violations can be performed using RightClick>OCL>validate model on the model object. OCL Validity view can also be used for further analysis of policy violations

Created with the Personal Edition of HelpNDoc: [News and information about help authoring tools and software](#)

1. In the previously opened Runtime Configuration, double click on representation.aird of the modeling project



2. representations.aird editor will be opened. Click on 'Enable' and 'New' under the 'Representations' pane. In case the model is not added, it can be added using 'New' under the 'Model' Pane and select 'pandemicMgmt' model.
3. Create a new Representation of 'Pandemic' and click next



4. Name it and click Finish. A new Diagram Representation will be opened which is our modeling environment of PMW.

Created with the Personal Edition of HelpNDoc: [Full-featured multi-format Help generator](#)