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Activity Explorer in Eclipse Amalgam

OPEN

Version 1.0.0

THALES



1 Introduction



2 User Perspective



3 Developer Perspective

Context

- An end-user must be guided to apply domain activities
- The activities must be easily accessible to be executed and well organized

Need

- Providing an interface with the main following features:
 - Ability to be declined by domain (e.g., technical, process)
 - Presentation of the activities by main topics and sub-topics
 - Ability to be customized

Objective

- The Activity Explorer provides the main following features:
 - The entry point is an overview of pages; each page contains sections of activities
 - Navigation between pages
 - Extensibility by contribution of new pages, sections and activities

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1 Introduction

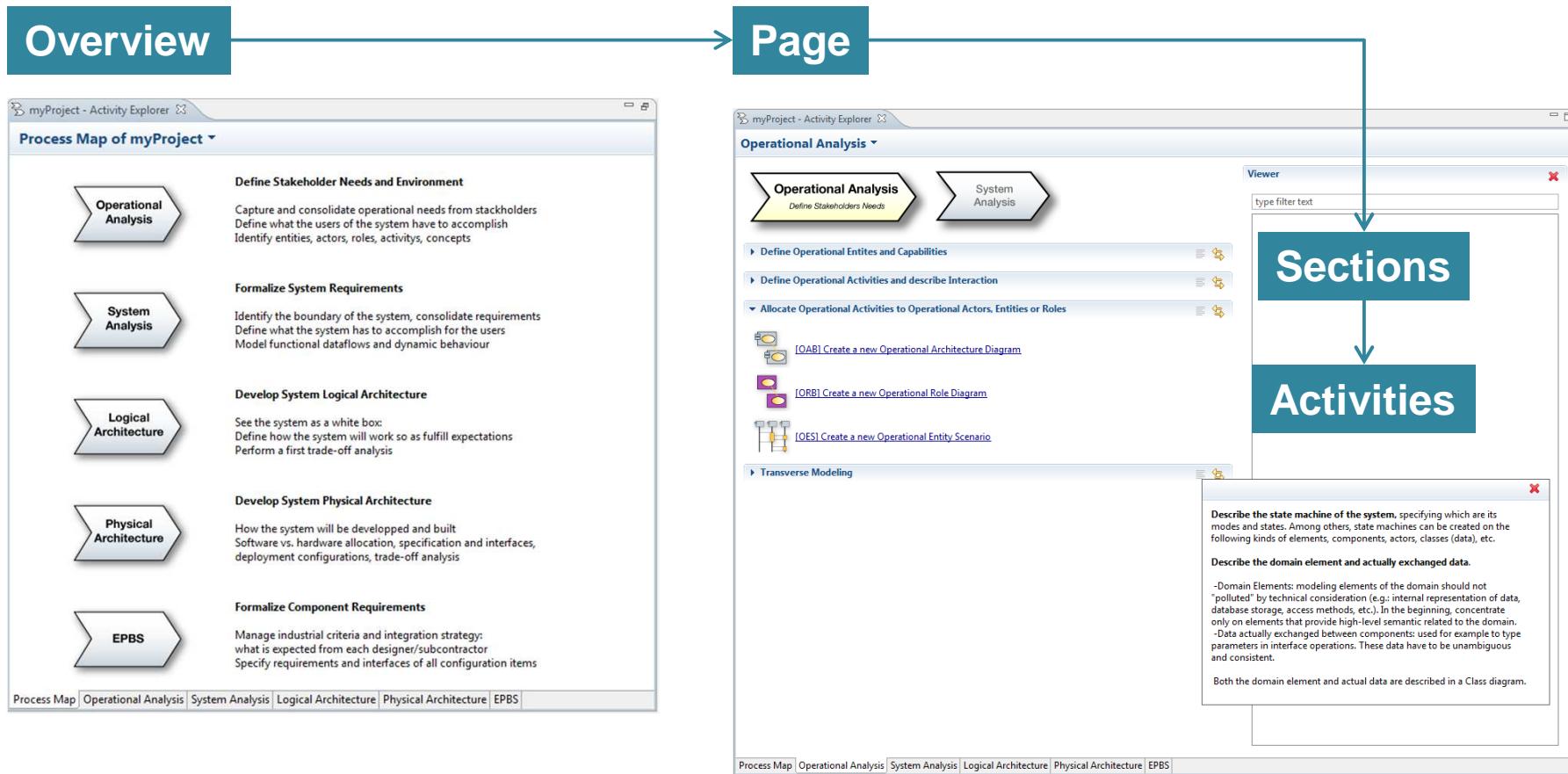


2 User Perspective



3 Developer Perspective

The Activity Explorer is exemplified on a system engineering process



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Link to Activity Explorer page

Process Map of myProject

- Operational Analysis**
- System Analysis**
- Logical Architecture**
- Physical Architecture**
- EPBS**

Description

Define Stakeholder Needs and Environment
Capture and consolidate operational needs from stakeholders
Define what the users of the system have to accomplish
Identify entities, actors, roles, activitys, concepts

Formalize System Requirements
Identify the boundary of the system, consolidate requirements
Define what the system has to accomplish for the users
Model functional dataflows and dynamic behaviour

Develop System Logical Architecture
See the system as a white box:
Define how the system will work so as fulfill expectations
Perform a first trade-off analysis

Develop System Physical Architecture
How the system will be developed and built
Software vs. hardware allocation, specification and interfaces,
deployment configurations, trade-off analysis

Formalize Component Requirements
Manage industrial criteria and integration strategy:
what is expected from each designer/subcontractor
Specify requirements and interfaces of all configuration items

Page

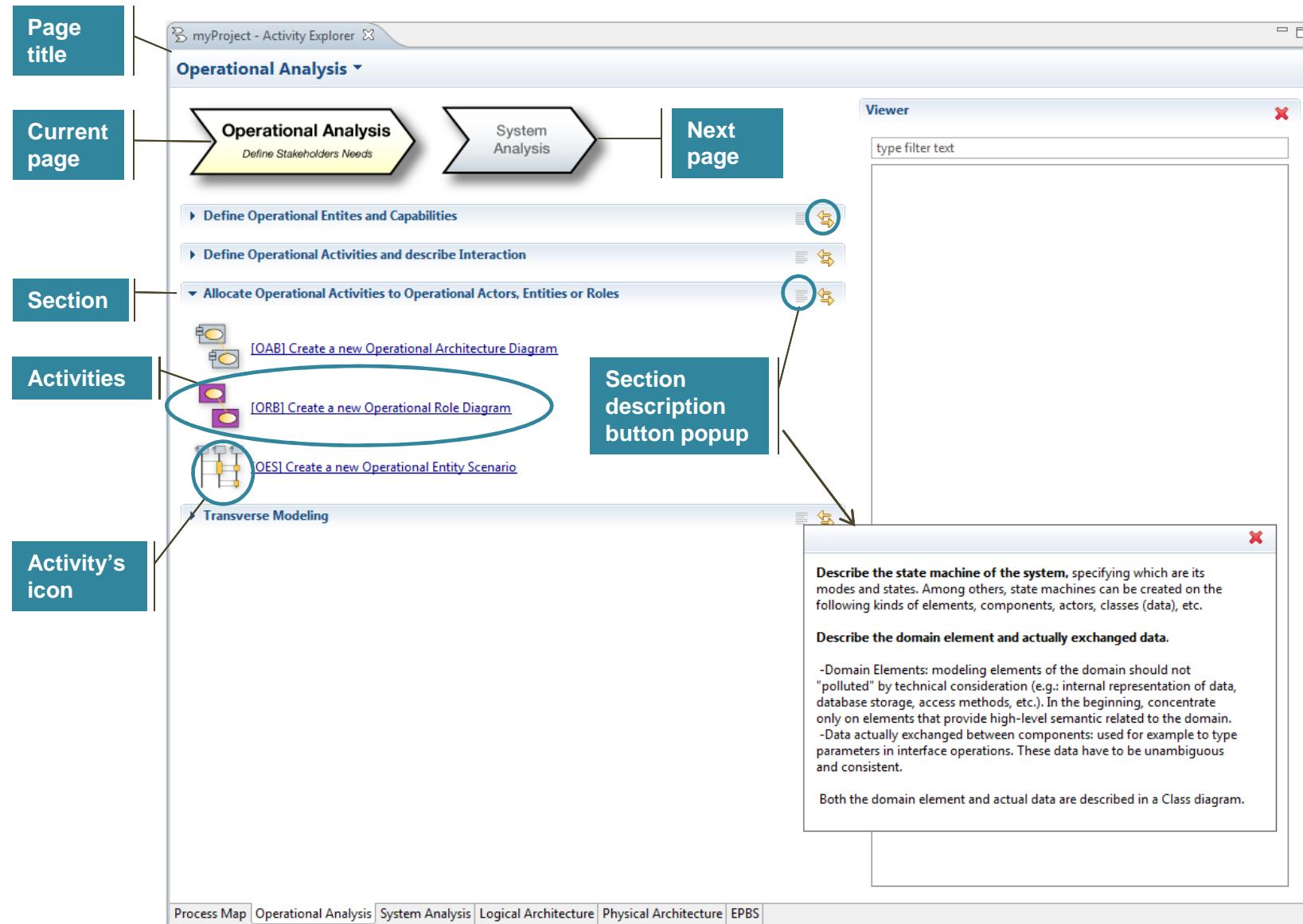
Process Map | Operational Analysis | System Analysis | Logical Architecture | Physical Architecture | EPBS | **OPEN**

Objective

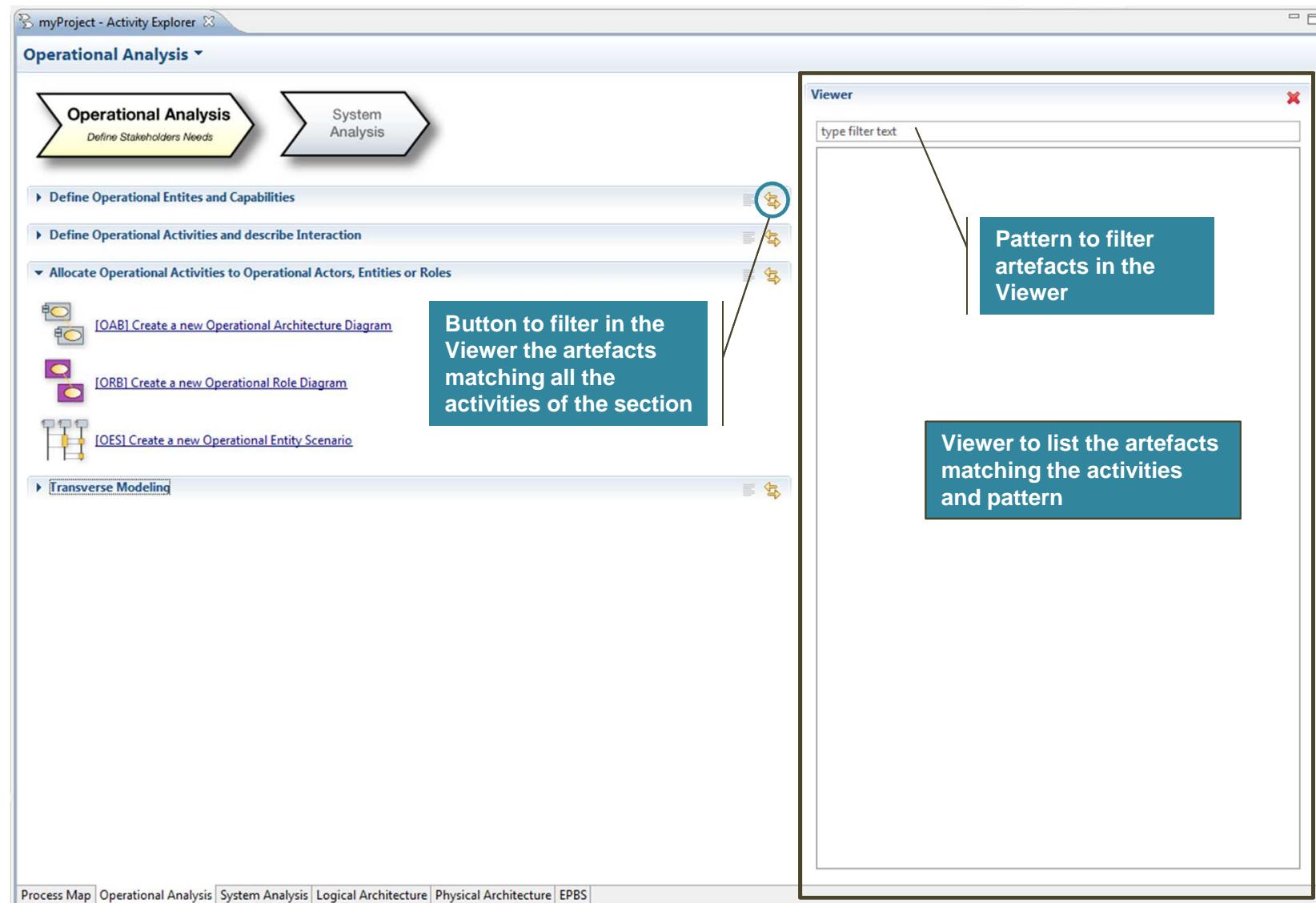
- Providing the entry point of the activities
- Providing an overview of the activities organized by pages

User Actions

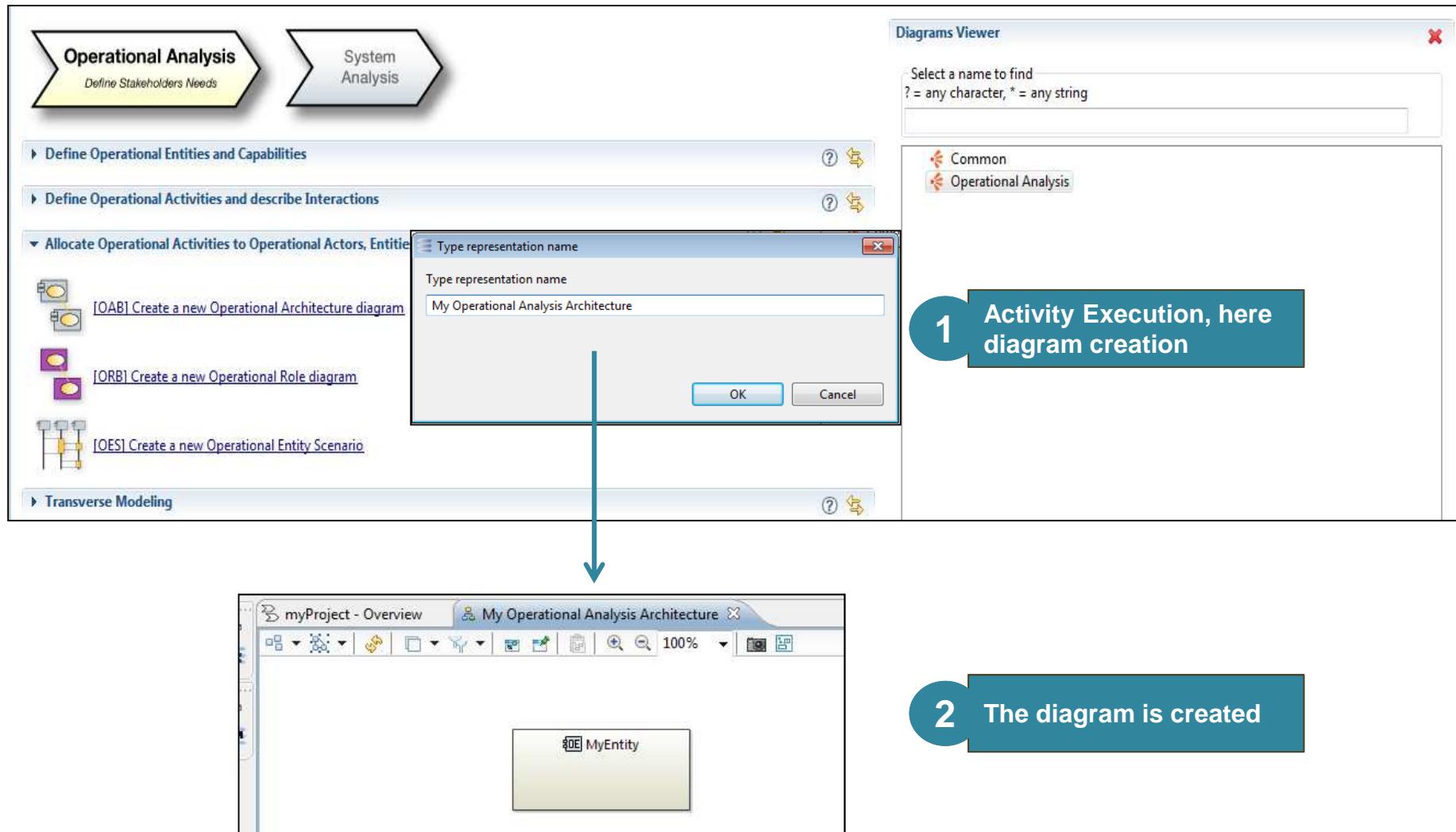
- Displaying the overview page
- Navigating between activity pages
- Selecting an activity page



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The screenshot illustrates the process of creating a new diagram within the Activity Explorer. On the left, a navigation path shows 'Operational Analysis' leading to 'System Analysis'. The main workspace displays a tree structure under 'Allocate Operational Activities to Operational Actors, Entities':

- [OAB] Create a new Operational Architecture diagram
- [ORB] Create a new Operational Role diagram
- [OES] Create a new Operational Entity Scenario

A context menu is open over the first item, showing a 'Type representation name' dialog box with the text 'My Operational Analysis Architecture'. In the top right corner, a 'Diagrams Viewer' window is open, showing a search bar and a tree view:

```

    viewer
      |
      +-- Common
      |     |
      |     +-- Operational Analysis
      |             |
      |             +-- My Operational Analysis Architecture
      |
      +-- Operational Architecture Blank
  
```

A callout bubble with the number '3' and the text 'The viewer is updated after the creation of the diagram' points to the 'Operational Analysis' node in the viewer tree.

Below the workspace, a preview window titled 'myProject - Overview' shows a single entity named 'MyEntity'.

The screenshot shows the Activity Explorer interface with the following components:

- Operational Analysis Phase:** Contains arrows for "Define Stakeholders Needs" and "System Analysis".
- System Analysis Phase:** Contains arrows for "Define Operational Entities and Capabilities", "Define Operational Activities and describe Interactions", "Allocate Operational Activities to Operational Actors, Entities", and "Transverse Modeling".
- Type representation name Dialog:** A modal dialog titled "Type representation name" with a text input field containing "My Operational Analysis Architecture". It has "OK" and "Cancel" buttons.
- Diagrams Viewer Window:** A floating window titled "Diagrams Viewer" with a search bar and a tree view. The tree shows "Common" and "Operational Analysis" nodes, with "Operational Analysis" expanded to show "Operational Architecture Blank" and "My Operational Analysis Architecture". A context menu is open over "My Operational Analysis Architecture" with options: "Show in Explorer", "Open", "Clone Diagram", "Delete", "Rename", "Patterns", and "REC / RPL".
- Annotations:**
 - Annotation 4: A blue callout pointing to the "Operational Analysis" node in the tree view of the Diagrams Viewer. The text reads: "Actions available on the artefact type".
 - Annotation 5: A blue callout pointing to the "Open" option in the context menu. The text reads: "Open action for navigation".

Objective

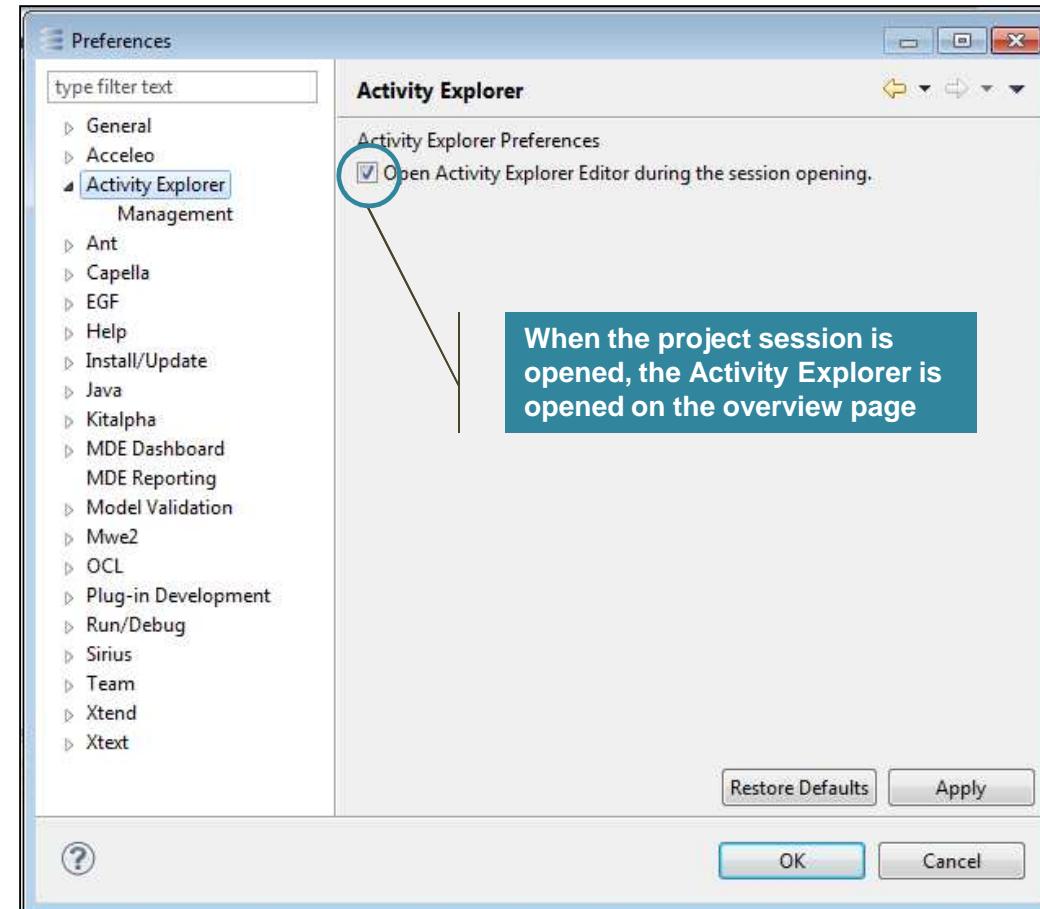
- Presentating the activities by page and sections
- Displaying in a viewer the artefacts which match the page / section activities
- Executing an action on an artefact

User Actions

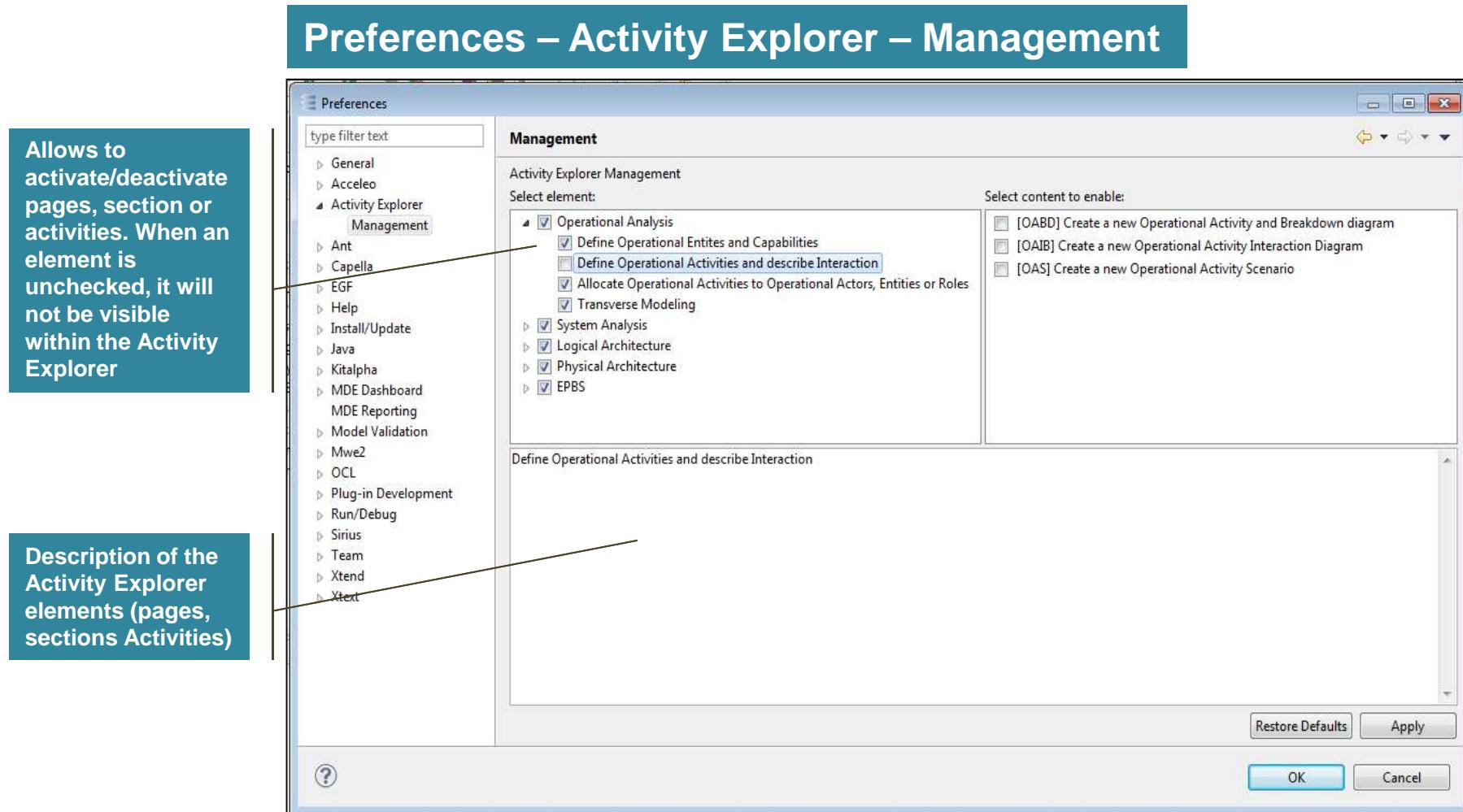
- Folding/unfolding an activity section
- Navigating between previous and next pages
- Filter and displaying in a viewer artefacts which match activity criteria
- Executing an activity
- Executing an action on an artefact

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Preferences – Activity Explorer



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Objective

- Customizing the Activity Explorer with options

User Actions

- In the Preferences view, proposing options to active/deactivate pages, sections



1 Introduction



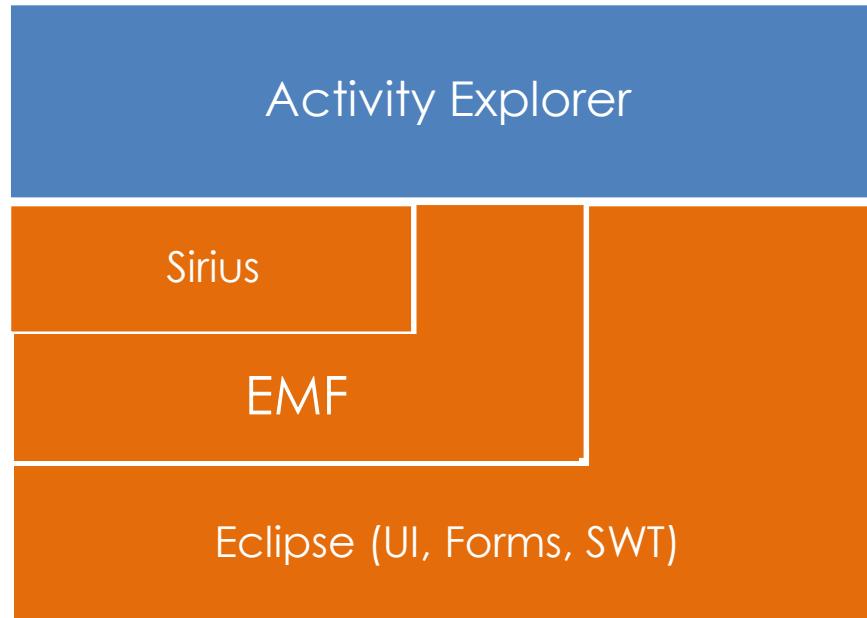
2 User Perspective



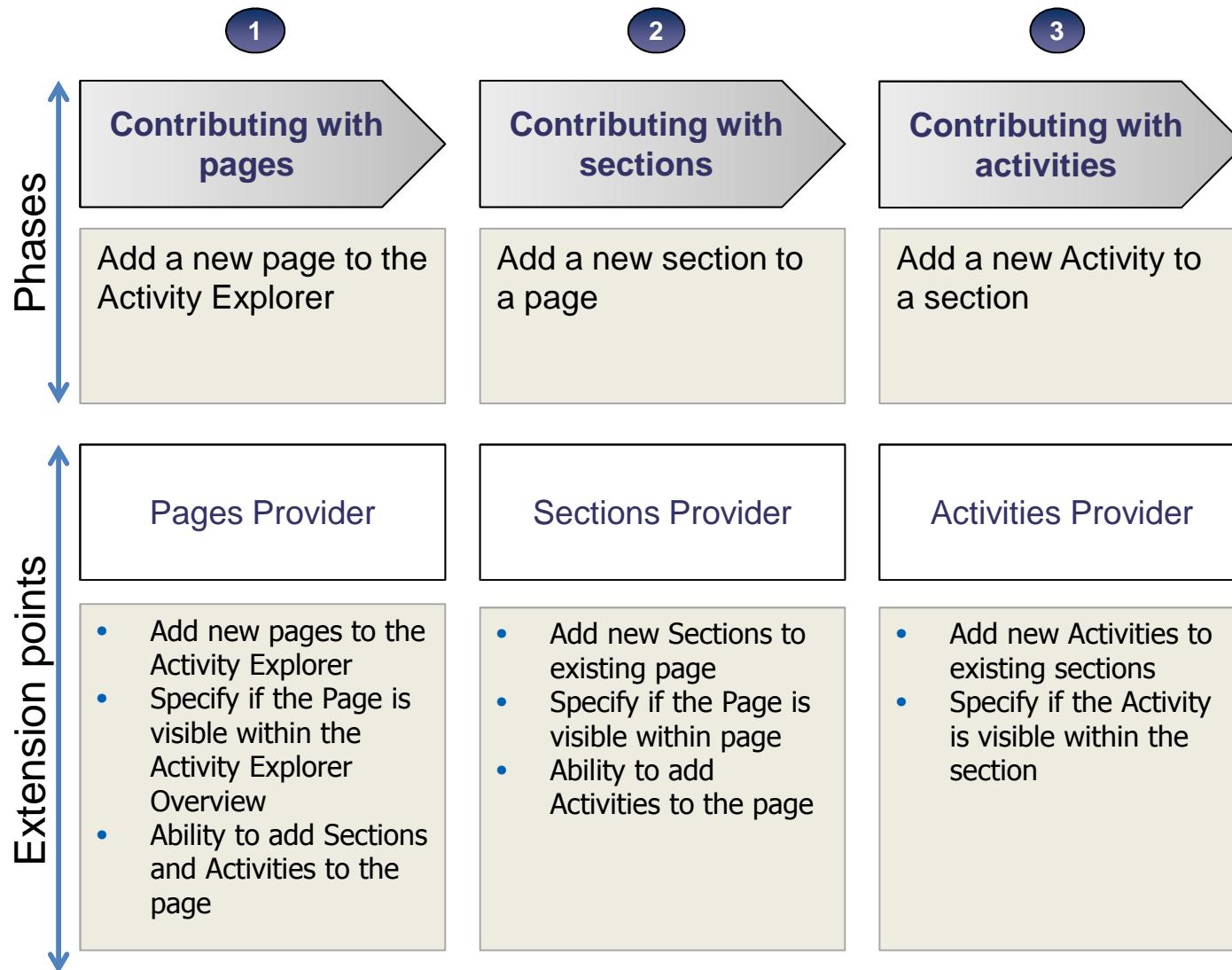
3 Developer Perspective

Foundations

Activity Explorer component
 Used components



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Page Contribution

- Implementation

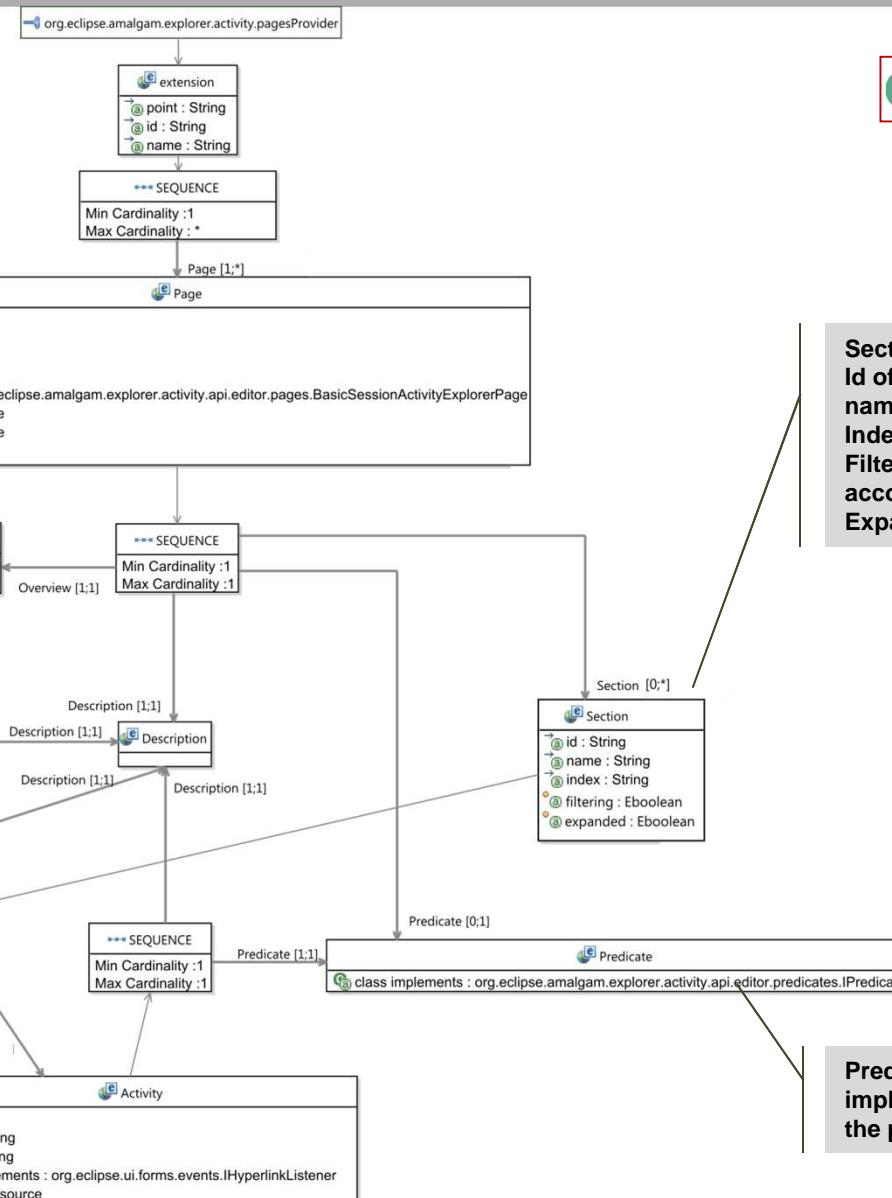
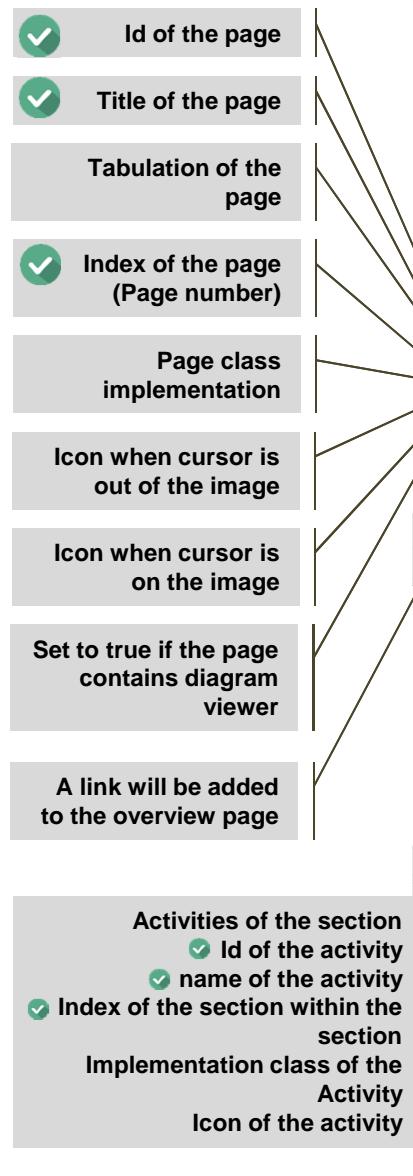
Plugin name	org.eclipse.amalgam.explorer.activity
Java Package	org.eclipse.amalgam.explorer.activity.api.editor.pages
Class name	BasicSessionActivityExplorerPage

- Extension point(s)

Name	Plugin	Schema
pagesProvider	org.eclipse.amalgam.explorer.activity	pagesProvider.exsd

- Default implementation

Description	Empty page, it is used when contribution to the page without class implementation
Java Package	org.eclipse.amalgam.explorer.activity.api.editor.pages
Class name	BasicSessionActivityExplorerPage



Mandatory field

Sections of the page

Id of the section

name of the section

Index of the section within the page

Filtering the diagram viewer according to the section

Expand the section at the opening

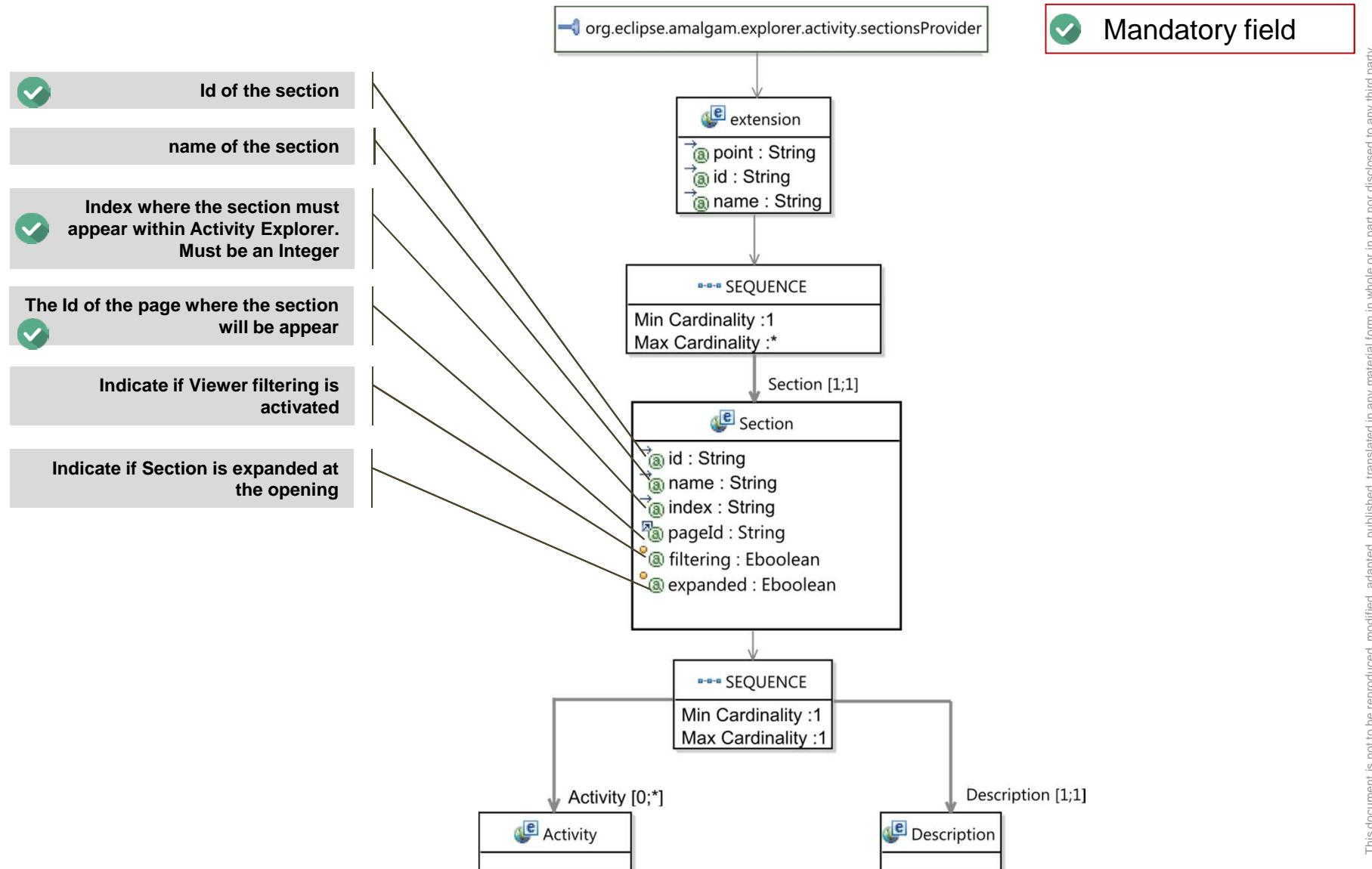
Section Contribution

- Implementation

Description	Add a section to a page. The section doesn't need to provide class at the extension.
Plugin name	org.eclipse.amalgam.explorer.activity
Java Package	org.eclipse.amalgam.explorer.activity.api.editor.sections
Class name	ActivityExplorerSection

- Extension point(s)

Name	Plugin	Schema
sectionsProvider	org.eclipse.amalgam.explorer.activity	sectionsProvider.exsd



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Activity Contribution

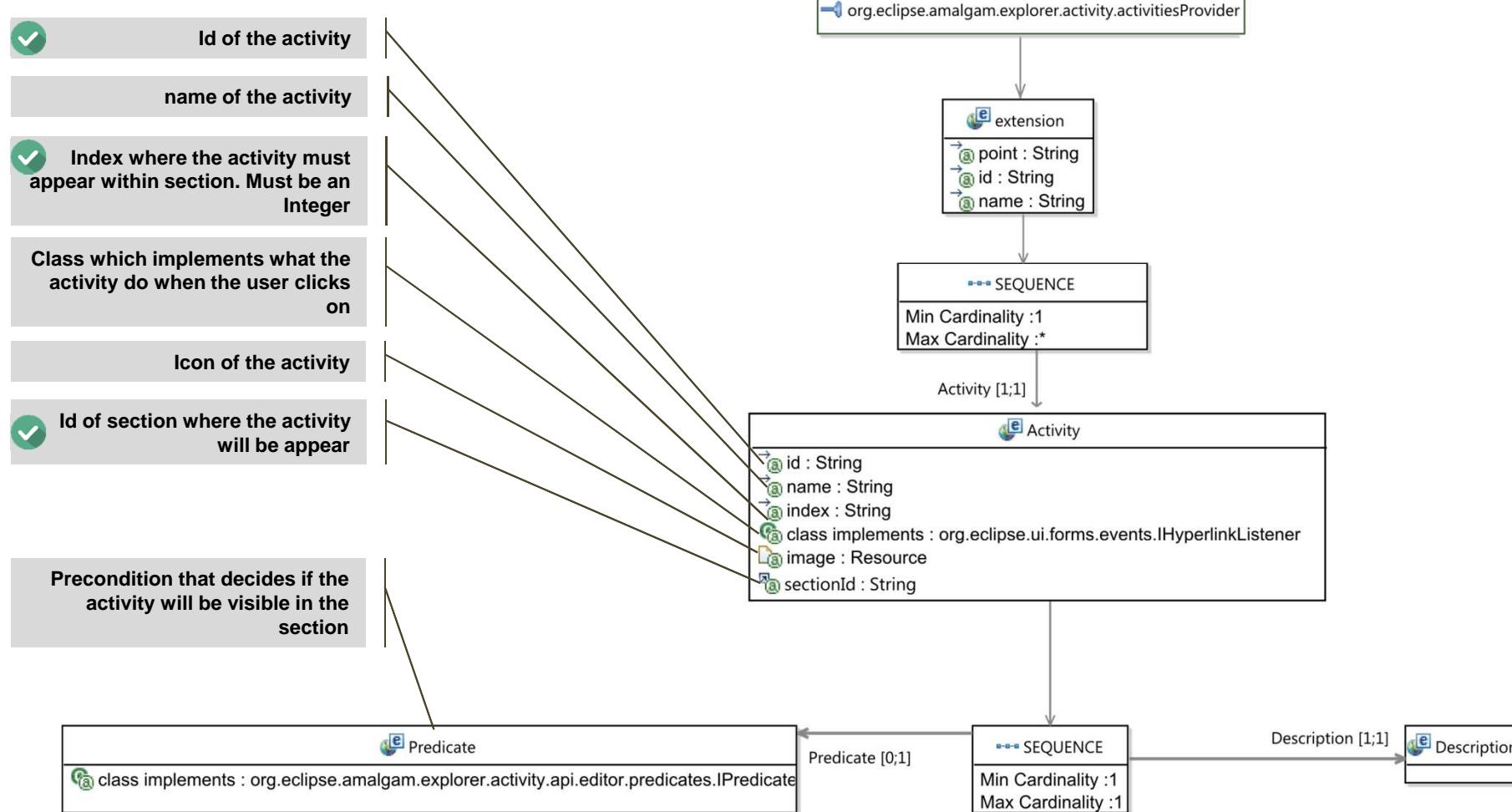
- Implementation

Plugin name	org.eclipse.amalgam.explorer.activity
Java Package	org.eclipse.ui.forms.events
Interface name	org.eclipse.ui.forms.events.IHyperlinkListener

- Extension point(s)

Name	Plugin	Schema
activitiesProvider	org.eclipse.amalgam.explorer.activity	activitiesProvider.exsd

Mandatory field



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- Predicate
 - A page or an activity can be associated to a predicate
 - Allows to put visibility conditions on the page/activity within the Activity Explorer
- Implementation

Plugin name	org.eclipse.amalgam.explorer.activity
Java Package	org.eclipse.amalgam.explorer.activity.api.editor.predicates
Interface name	org.eclipse.amalgam.explorer.activity.api.editor.predicates.IPredicate

- Extension point(s)

Name	Plugin	Schema
PagesProvider	org.eclipse.amalgam.explorer.activity	pageProvider.exsd

Example

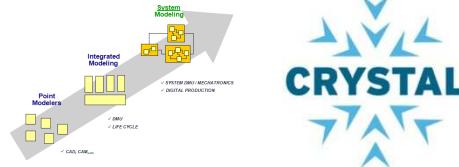
The Activity Explorer has been developed in the context of PolarSys by Capella and Kitalpha



<http://polarsys.org/capella/>



<http://polarsys.org/kitalpha/>



Purpose

- Implement a partial Capella-like activity Explorer
 - Operational Analysis page with all functionalities ([Sections](#), [Activities](#))
 - [Define Operational Entities and Capabilities](#)
 - [OEBD] Create a new Operational Entity Breakdown
 - [OCB] Create a new Operational Capability diagram
 - [Allocate Operational Activities to Operational Actors, Entities or Roles](#)
 - [OAB] Create a new Operational Architecture Diagram
 - [ORB] Create a new Operational Role diagram
 - [OES] Create a new Operational Entity Scenario
 - [Transverse Modeling](#)
 - [CDB] Create a new Class Diagram
 - [M&S] Create a new Modes & States Machine
 - Create a new State & Mode / Operational Activities matrix
 - Other pages without functionalities
 - System Analysis page
 - Logical Architecture Page
 - Physical Architecture Page
 - EPBS page

Steps

1. Open Capella studio
2. Create a new plugin: org.polarsys.capella.core.activity.explorer
3. Add dependencies to:
 - org.eclipse.amalgam.explorer.activity
 - org.eclipse.sirius
 - org.eclipse.sirius.ui
 - org.eclipse.sirius.diagram
 - org.polarsys.capella.core.ui.toolkit
 - org.polarsys.capella.core.model.helpers

4. Go to the extensions tab
5. Add extension to: org.eclipse.amalgam.explorer.activity.pageProvider
6. Set values of created first page as in the capture (Operational Analysis page)

Extension Element Details

Set the properties of "Page". Required fields are denoted by "*".

<u>id</u> *:	org.polarsys.capella.core.activity.explorer.OA
<u>title</u> *:	Operational Analysis
<u>index</u> *:	1
<u>tabName</u> :	Operational Analysis
<u>class</u> :	<input type="text"/> <input type="button" value="Browse..."/>
<u>imageOff</u> :	icon/full/overview/oa/operationalanalysis_overview_01.png <input type="button" value="Browse..."/>
<u>imageOn</u> :	icon/full/overview/oa/operationalanalysis_overview_02.png <input type="button" value="Browse..."/>
<u>viewer</u> :	true <input type="button" value="▼"/>



We don't need to provide implementation in our case because the default implementation is enough

7. Specify the icons of the page in Overview section

All Extensions

Define extensions for this plug-in in the following section.

type filter text

- org.eclipse.amalgam.explorer.activity.pagesProvider
- org.polarsys.capella.core.activity.explorer.OA (Page)
 - (Description)
 - (Overview)**
 - (Description)

Add... Remove

Extension Element Details

Set the properties of "Overview". Required fields are denoted by "*".

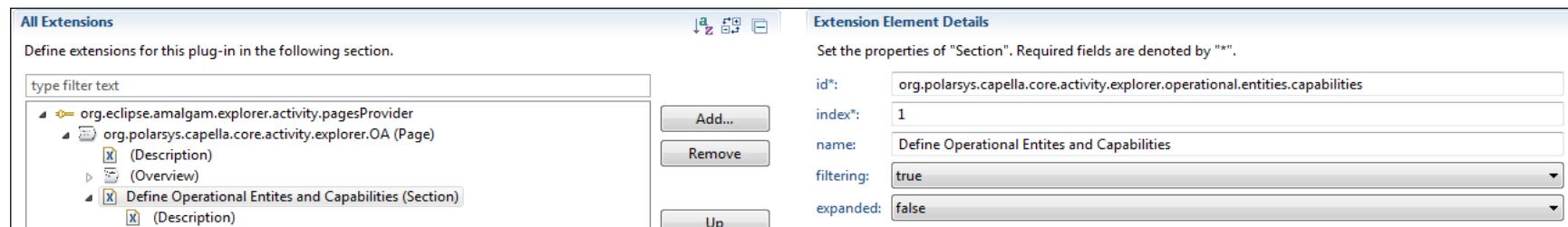
imageOff: icon/full/overview/oa/welcome-operational-analysis-off.png [Browse...](#)

imageOn: icon/full/overview/oa/welcome-operational-analysis-on.png [Browse...](#)

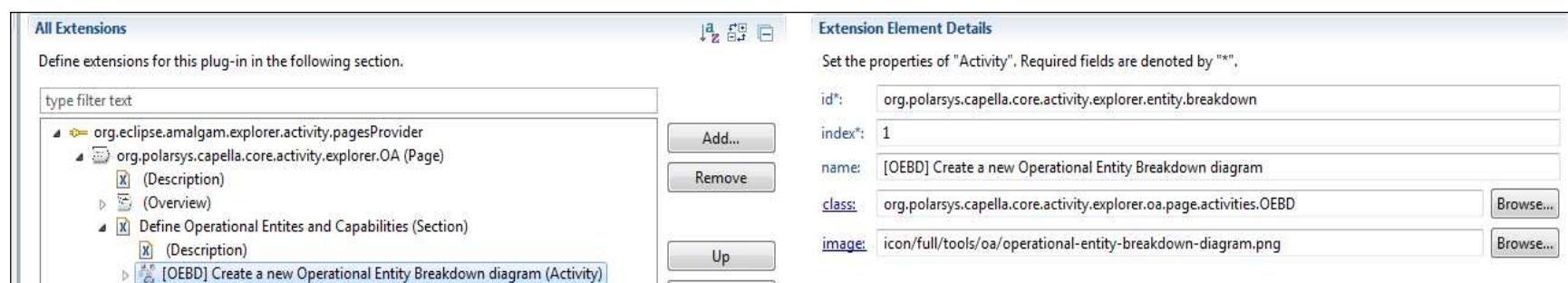
8. Specify the description below of the page in Overview section

```
<p>
<b>Define Stakeholder Needs and Environment</b><br/><br/>
Capture and consolidate operational needs from stakeholders<br/>
Define what the users of the system have to accomplish<br/>
Identify entities, actors, roles, activitys, concepts
</p>
```

9. Add a new Section by right click on the page, new menu, then Section
10. Fill the fields of the new section as in the capture below



11. Add a new Activity to the Section by right click on section, new menu, then Activity
12. Fill the fields of the new Activity as in the capture below



13. Create an abstract class: AbstractCapellaNewDiagram which extends AbstractNewDiagramHyperLinkAdapter

```
public abstract class AbstractCapellaNewDiagram extends AbstractNewDiagramHyperLinkAdapter {  
    public AbstractCapellaNewDiagram(EObject project_p) {  
        super(project_p, ActivityExplorerManager.INSTANCE.getSession());  
    }  
}
```

14. For The activity “Create a new Operational Entity Breakdown diagram”, the implementation class look like below

```
public class OEBD extends AbstractCapellaNewDiagram {  
    public OEBD() {  
        /*  
         * Get the right level in Capella project where create the element  
         */  
        super(ModelQueryHelper.getOperationalContext((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));  
    }  
  
    @Override  
    public String getRepresentationName() {  
        //The name of the visual description that allows to get the right diagram for the element  
        return "Operational Entity Breakdown";  
    }  
}
```

15. Do the same steps to add sections and activities to Operational Analysis Pages

Implementation classes for Operational Analysis' activities (1/5)

```
public class OCB extends AbstractCapellaNewDiagram {  
  
    public OCB () {  
        /*  
         * Get the right level in Capella project where create the element  
         */  
        super(ModelQueryHelper. getRootOperationalCapability((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));  
    }  
  
    @Override  
    public String getRepresentationName() {  
        //The name of the visual description that allows to get the right diagram for the element  
        return "Operational Capabilities Blank";  
    }  
}
```

```
public class OABD extends AbstractCapellaNewDiagram {  
  
    public OABD () {  
        /*  
         * Get the right level in Capella project where create the element  
         */  
        super(ModelQueryHelper. getRootOperationalActivity((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));  
    }  
  
    @Override  
    public String getRepresentationName() {  
        //The name of the visual description that allows to get the right diagram for the element  
        return "Operational Activity Breakdown";  
    }  
}
```

Implementation classes for Operational Analysis' activities (2/5)

```
public class OAIB extends AbstractCapellaNewDiagram {

    public OAIB () {
        /*
         * Get the right level in Capella project where create the element
         */
        super(ModelQueryHelper. getRootOperationalActivity((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "Operational Capabilities Blank";
    }
}
```

```
public class OASextends AbstractCapellaNewDiagram {

    public OAS () {
        super(ActivityExplorerManager.INSTANCE.getRootSemanticModel());
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "Activity Interaction Scenario";
    }

    @Override
    protected void linkPressed(HyperlinkEvent event_p, EObject root_p, Session session_p) {

        root_p = ModelCreationHelper.selectOperationalCapabilityAndCreateInteractionScenario((Project) root_p);

        if (!createDiagram(root_p, session_p)) {
            handleDiagramCreationError(event_p, root_p);
        }
    }
}
```

Implementation classes for Operational Analysis' activities (3/5)

```
public class OAB extends AbstractCapellaNewDiagram {  
  
    public OAB () {  
        /*  
         * Get the right level in Capella project where create the element  
         */  
        super(ModelQueryHelper. getOperationalContext((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));  
    }  
  
    @Override  
    public String getRepresentationName() {  
        //The name of the visual description that allows to get the right diagram for the element  
        return "Operational Capabilities Blank";  
    }  
}
```

```
public class ORB extends AbstractCapellaNewDiagram {  
  
    public ORB () {  
        /*  
         * Get the right level in Capella project where create the element  
         */  
        super(ModelQueryHelper. getOperationalContext((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));  
    }  
  
    @Override  
    public String getRepresentationName() {  
        //The name of the visual description that allows to get the right diagram for the element  
        return "Operational Role Blank";  
    }  
}
```

Implementation classes for Operational Analysis' activities (4/5)

```
public class OES extends AbstractCapellaNewDiagram {

    public OES () {
        super(ActivityExplorerManager.INSTANCE.getRootSemanticModel());
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "Operational Interaction Scenario";
    }

    @Override
    protected void linkPressed(HyperlinkEvent event_p, EObject root_p, Session session_p) {
        root_p = ModelCreationHelper.selectOperationalCapabilityAndCreateInteractionScenario((Project) root_p);
        if (!createDiagram(root_p, session_p)) {
            handleDiagramCreationError(event_p, root_p);
        }
    }
}
```

```
public class CDB extends AbstractCapellaNewDiagram {

    public CDB () {
        /*
         * Get the right level in Capella project where create the element
         */
        super(ModelQueryHelper. getOAPkg((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "Class Diagram Blank";
    }
}
```

Implementation classes for Operational Analysis' activities (5/5)

```
public class Mands extends AbstractCapellaNewDiagram {

    public Mands () {
        super(ActivityExplorerManager.INSTANCE.getRootSemanticModel());
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "Modes & States";
    }

    @Override
    protected void linkPressed(HyperlinkEvent event_p, EObject root_p, Session session_p) {
        root_p = ModelCreationHelper. selectOperationalEntityAndCreateStateMachineRegion((Project) root_p);
        if (!createDiagram(root_p, session_p)) {
            handleDiagramCreationError(event_p, root_p);
        }
    }
}
```

```
public class CreateMatix extends AbstractCapellaNewDiagram {

    public CreateMatix () {
        /*
         * Get the right level in Capella project where create the element
         */
        super(ModelQueryHelper. getOperationalAnalysis((Project) ActivityExplorerManager.INSTANCE.getRootSemanticModel()));
    }

    @Override
    public String getRepresentationName() {
        //The name of the visual description that allows to get the right diagram for the element
        return "State And Mode - Matrix";
    }
}
```

16. Add predicate on Operational Analysis page and check if the semantic root model is Capella Project

Define extensions for this plug-in in the following section.

The screenshot shows the 'Extensions' tab of the Eclipse Activity Explorer configuration. On the left, there's a tree view under 'org.eclipse.amalgam.explorer.activity.pagesProvider' with several sections like 'Description', 'Overview', and 'CapellaProjectPredicate (Predicate)'. On the right, there's a panel for setting properties of a 'Predicate'. It has a 'class*' dropdown set to 'org.polarsys.capella.core.activity.explorer.predicate.CapellaProjectPredicate' with a 'Browse...' button. Below it are buttons for 'Add...', 'Remove', 'Up', and 'Down'.

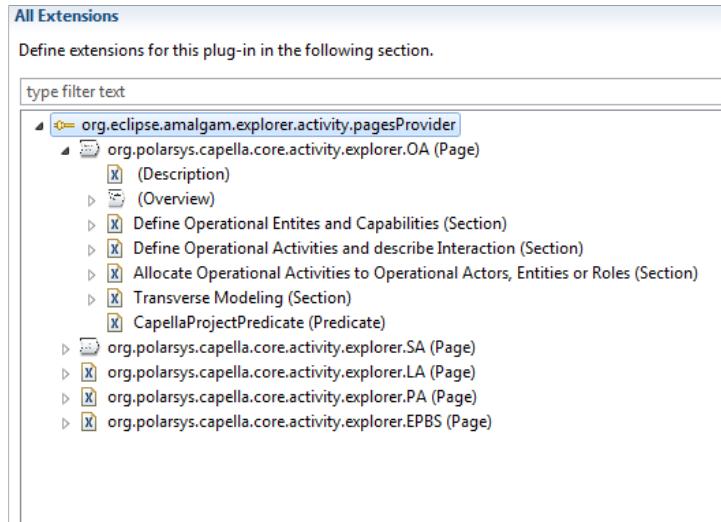
The implementation class of the predicate

```
public class CapellaProjectPredicate implements IPredicate {
    public CapellaProjectPredicate() {
    }

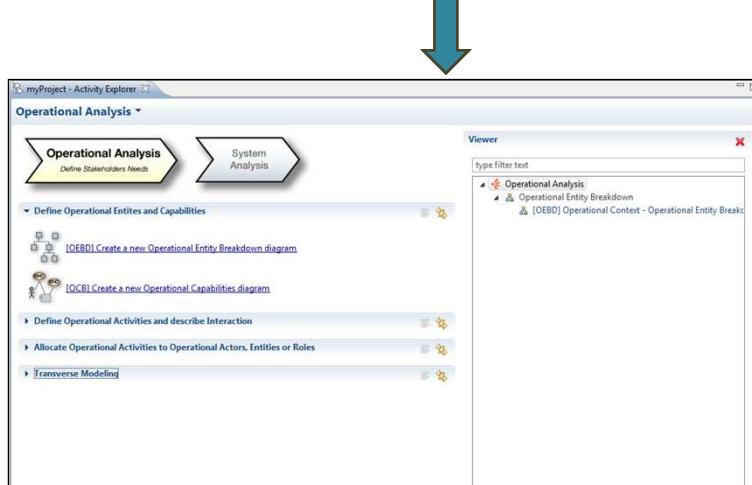
    @Override
    public boolean isOk() {
        return ActivityExplorerManager.INSTANCE.getRootSemanticModel() != null &&
               ActivityExplorerManager.INSTANCE.getRootSemanticModel() instanceof Project;
    }
}
```



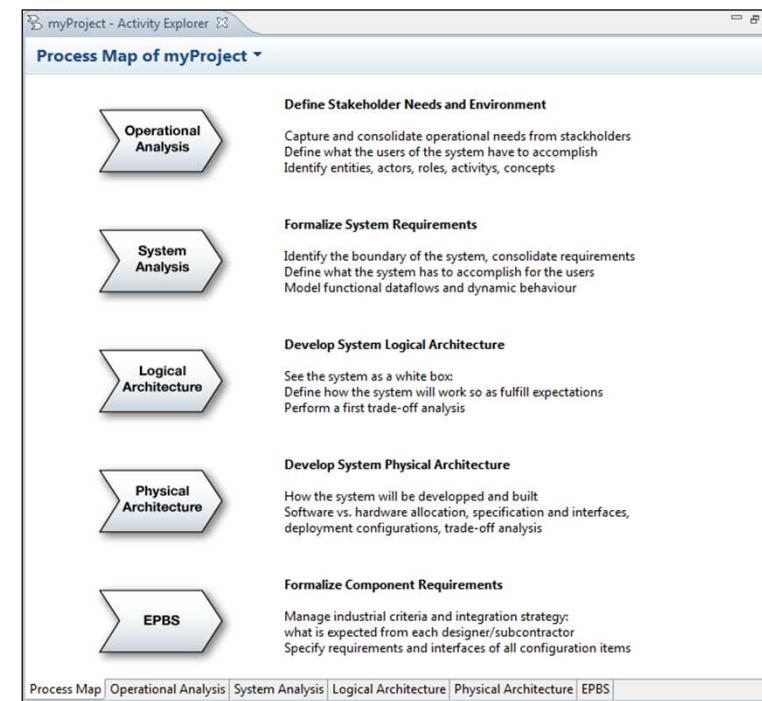
When the Activity Explorer is opened on not Capella project, the page will be never be visible. Do the same the same on other pages than Capella.



Final Extensions of Activity Explorer for Capella Example



The resulting Operational Analysis page



The resulting Process Map page

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