Adichatz

Version 0.8.4 of 03-02-2014

Current version of Adichatz plugins is a beta version i.e. a development version.

www.adichatz.org

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1 Introduction

1.1 Foreword

An ideal application should be:	Adichatz, in its own ways, gathers all these features:
➢ Rich and efficient to bring maximum of added value to user.	➢ Final application rallies Eclipse 4.3 Kepler rich features, many SWT, Forms and Nebula controls and advanced Adichatz components.
➢ Flexible and pluggable to ensure future requirements.	➢ Adichatz component are customizable and extensible. Your development can be divide in structured plugins.
➢ Maintainable to avoid entropy.	➢ Most of development process is to drive generation tools, assemble components and customize them.
➢ End-user and developer friendly to provide an easy support.	➢ No particular skills are needed to develop and delivery your first application.

Adichatz covers a very broad spectrum of development needs for a Company:

- A beginner will create its database. Without any knowledge of Java, it is possible to create and customize a RCP application in a 3-tier or Client Server context. Similarly, the difficult phase for creating layout in java is radically simplified by the use of MigLayout Layout manager.
- A Java specialist use its own components, will build their own scenarios. He very quickly will design an application with a rich and flexible ergonomics. However, his work remains scalable, maintainable and scalable.
- We invite Eclipse experts to reflect on the matter of how to make Eclipse 4 RCP features and 3-tier technologies easy to be used and copyable. We believe that our approach is a real response.

1.2 Purpose of this document

This document is intended to introduce Adichatz product. It shows:

- How to install Adichatz framework.
- How to create your first Adichatz application.
- First manipulations to customize the project.
- Main features.

1.3 Get a deeper insight

1.3.1 Prerequisites

- Java version 7 from web site.
- A SQL database with JDBC driver. You can download the example here. This test database is an arranged version of the “sakila” test database provided by MySql.

1.3.2 Installation

- Jboss 7.1.1 (recommended): download and unzip (**10 mn**).
- Choose a version of Eclipse IDE from Eclipse Kepler download web site (**15mn**):
  - Eclipse for RCP and RAP developers 4.3 (Kepler) for Windows (236 MB).

  or
  - Eclipse IDE for Java developers 4.3 (Kepler) for Windows (151 MB).
- Install a database: MySql (recommended) or Postgresql (**15mn**).

1.3.3 Development and deployment

- Generate my first complete application: **3mn**.
- Customize my application: **5mn** to **1h**).
- Deliver an Eclipse executable application: **5mn**.

2 Use of Adichatz

2.1 Installation

2.1.1 Install JBoss (optional but recommended) -

Adichatz was tested with JBoss 7.1.1 and 4.2.3 (JEE or 3-tier context). You can choose to use JSE (client/server version) context. Adichatz provides in standard a plain solution for managing locks in JEE context so JBoss 7.1.1 is recommended.

Download **JBoss 7.1.1 final** (optional but recommended) from web site.
Unzip downloaded zip file on your computer in a specific folder (e.g. C:\ApplicationServer).

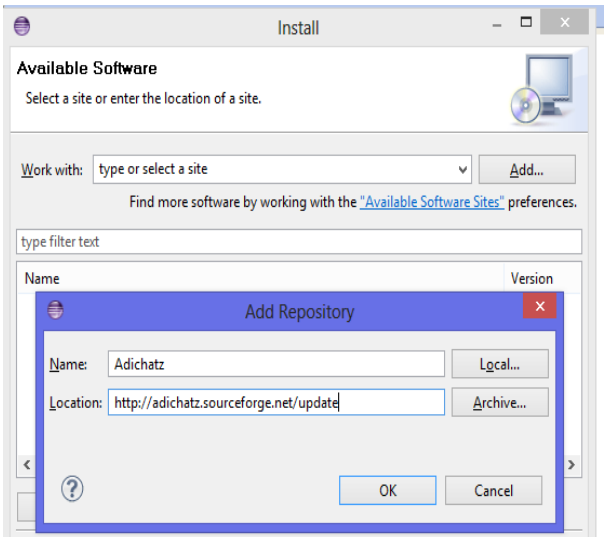
2.1.2 Install Adichatz plugins

Open Eclipse and start the install manager:
Help / Install new Software...

The a window opens.
Add a new Site clicking button Add... .

Type:
Name: Adichatz
Location: http://adichatz.sourceforge.net/update

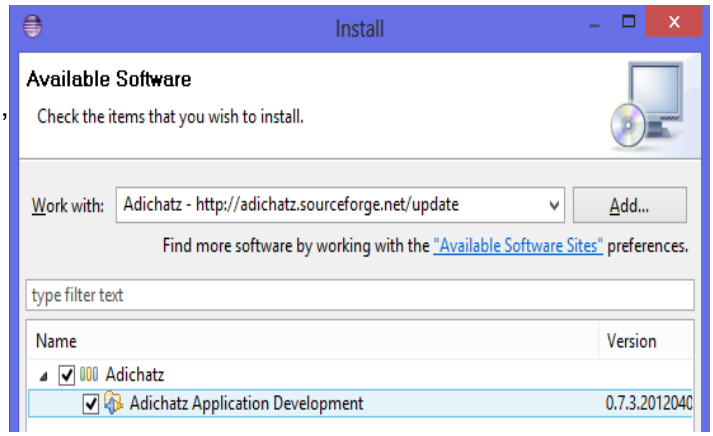
Click on button **OK** .



Then select all items,

Click on button next at the bottom, then accept license, click **Finish** .

Valid warning message on unsigned content.
Adichatz plugins are installing.



2.1.3 Install JBoss plugins (optional)

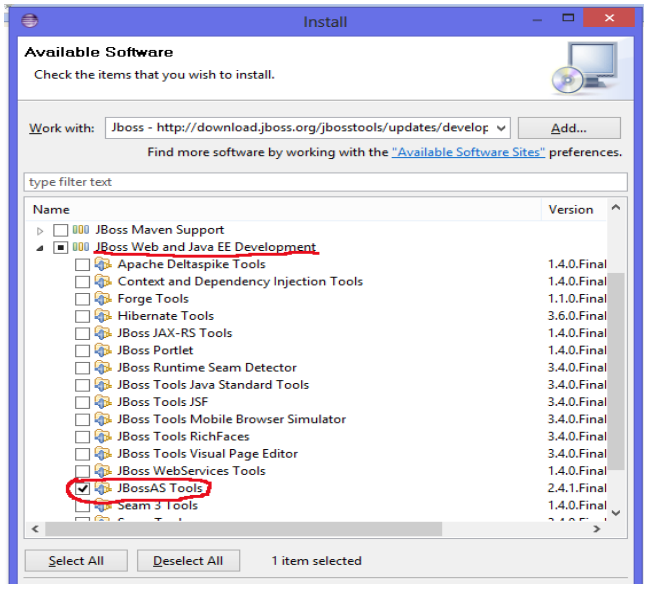
Start the install manager:

Help / Install new Software...

As for Adichatz plugin add a new site:

Name: JBoss
Location: http://download.jboss.org/jbosstools/updates/stable/kepler/

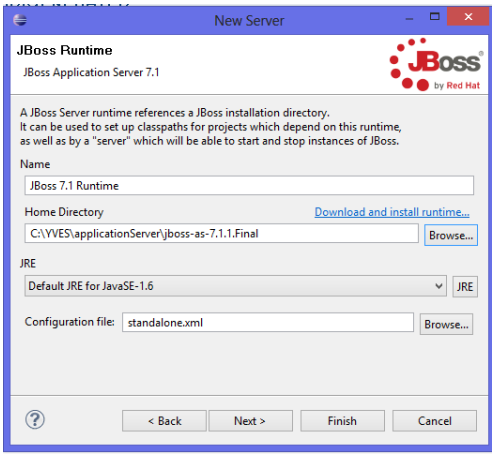
Select only item JBossAS Tools
In category JBoss Web and Java EE Development, select item JBossAS Tools (only this one is needed).



2.2 Customize Intallation

Three new icons appear in Tool bar.
Select **New Server...** option.

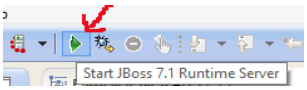
A new window appears.



In JBoss Communauty category select **JBoss AS 7.1** item.
Click **Next...** .

Specify JBoss AS 7.1 home directory.
Specify the JRE you want to use for AS server.
Click Finish .

You can launch and stop JBoss server from Eclipse



2.3 Creating my first Adichatz project

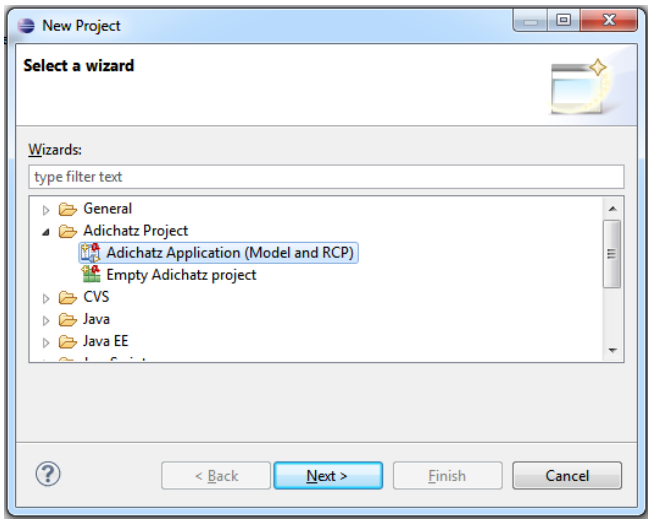
2.3.1 Creation of the project

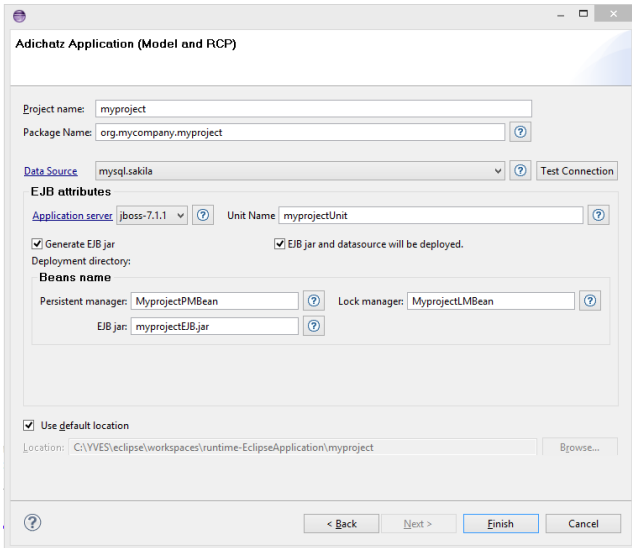
In the Package Explorer right-click and select:

- new / Project…
- Adichatz Application (Model and RCP).

This option provides the quickest way to generate an Application wich contains Model and UI aspects.

You can choose to create one or several Empty projects and decide to split in a Model project then an RCP project (UI).



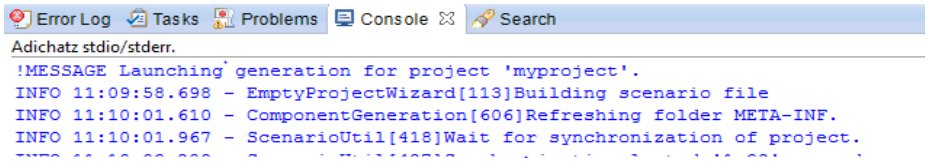


- Type the name of the project
- Datasource parameters can be changed by clicking Data Source hyperlink.
- Test the connection.
- Choose a connector between (*jboss-7.1 is recommended*):
  - jse
  - jboss-4.2.3
  - jboss-5.0.0
  - **jboss-7.1**
- then click Finish .

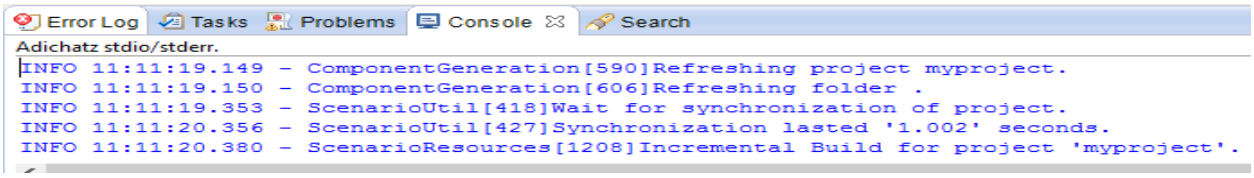
for bean components of the EJB jar. JNDI name and datasource file name are needed. These four properties must be unique on the application server which can host several Adichatz projects

You can change datasource specifications in clicking Data Source hyperlink field.
You can change application server specifications in clicking Application server hyperlink field.
Specifications are stored in file ***{eclipse.dir}\plugins\org.adichatz.template\template\connectors\connector.xml****.*

In the console view, you can see the unfolding of the creation of the project. Logs start like this:



and finish like this:



If you have a look to the Application server logs, you can see that the EJB is deployed (*Application server must obviously be started*):

```
11:10:50,690 INFO  [org.hibernate.service.jdbc.connections.internal.ConnectionProviderInitiator] (MSC service thread 1-2) HHH000130: Instantiating
11:10:51,345 INFO  [org.hibernate.dialect.Dialect] (MSC service thread 1-2) HHH000400: Using dialect: org.hibernate.dialect.MySQLDialect
11:10:51,360 INFO  [org.hibernate.engine.transaction.internal.TransactionFactoryInitiator] (MSC service thread 1-2) HHH000268: Transaction strategy:
11:10:51,362 INFO  [org.hibernate.hql.internal.ast.ASTQueryTranslatorFactory] (MSC service thread 1-2) HHH000397: Using ASTQueryTranslatorFactory
11:10:52,741 INFO  [org.jboss.as.server] (DeploymentScanner-threads - 2) JBAS018559: Deployed "myprojectEJB.jar"
```

Your project is created:

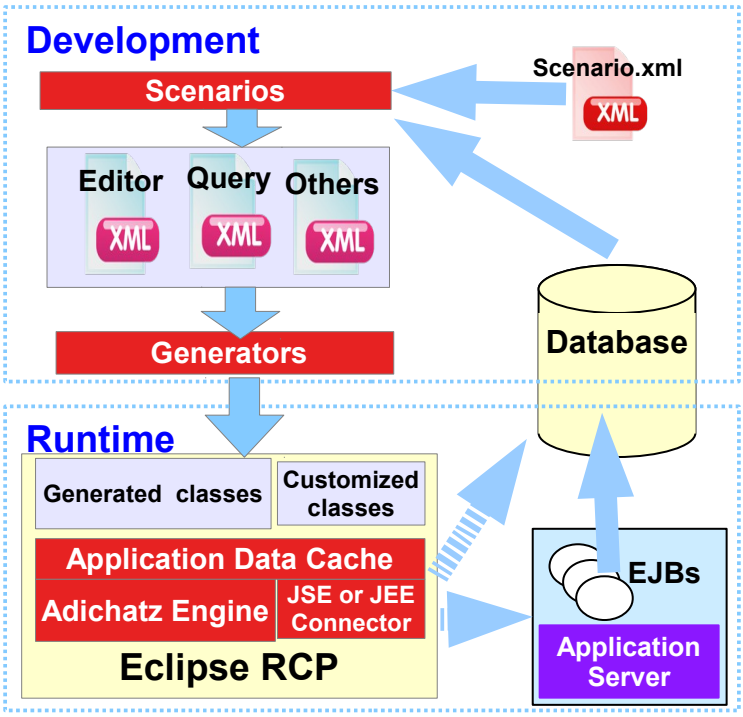
- Model POJOs are generated by Hibernate tools
- an EJB is built and deployed to the Jboss Application Server.
- Queries, Table and detail parts, editors, navigator are generated.

This part need less than 2 minutes.

2.3.2 Global Architecture

The project generation is determined by 3 factors:

- Database schema (*POJOs are generated from tables and constraints or copied from existing folder*)
- Scenarios, which can be customized, determine how to generate XML files(*these files describe how adichatz components are assembled)*).
- Generators generate Java classes used by the application at runtime from XML files.



Project could be completely customized:

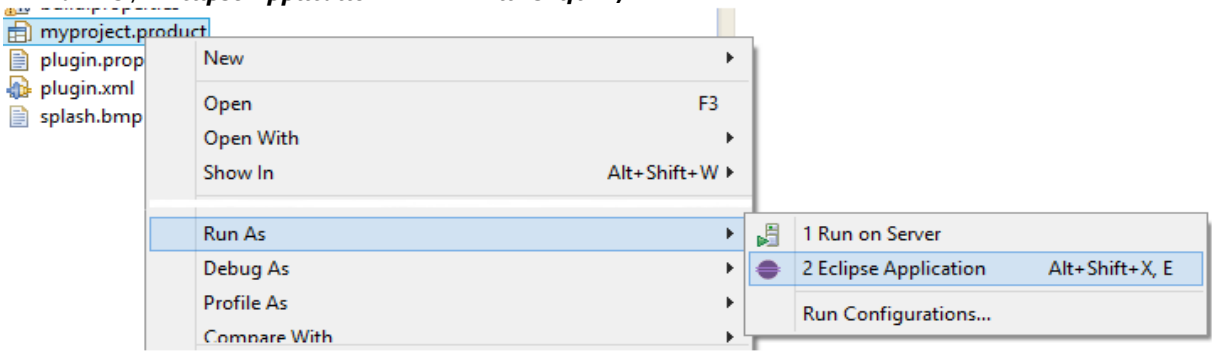
- Change on generated XML files is the easiest way to customize behavior of Adichatz Components.
- All Adichatz Components can be extended.
- Listeners on component Life Cycles provide a way to complete customization.
- Code could be added inside XML file.

2.4 Running my first Adichatz Application

2.4.1 Run Eclipse Application

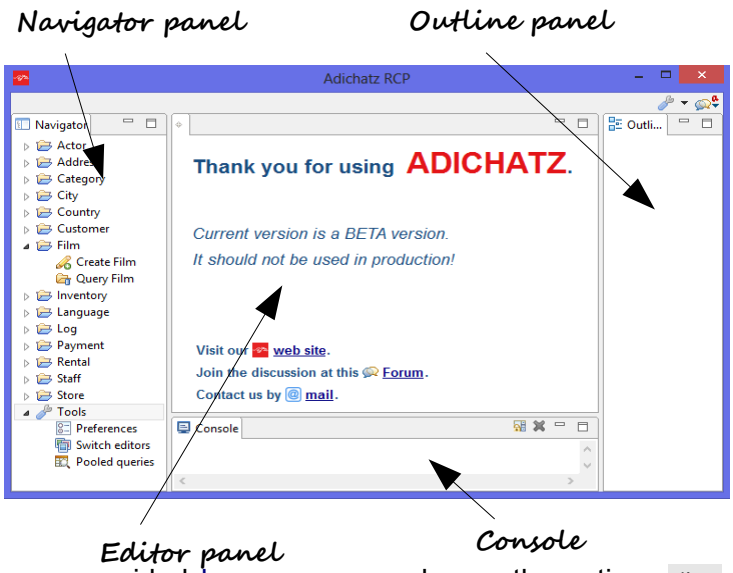
Select the product file (**myproject.product**) in your new project in the package explorer and select option:

- ***Run As / 1 Eclipse Application*** ***Alt+Shift+X, E***



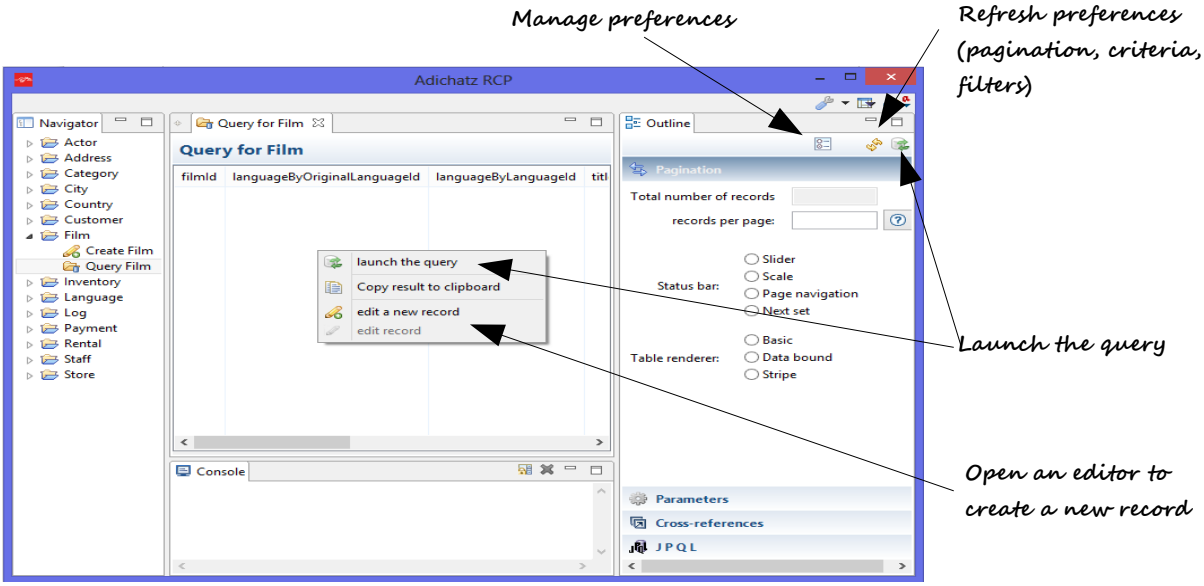
Default Application is divided in 3 vertical panels, the middle is divided in 2 horizontal panels:

- **Navigator panel**: a navigator with two items by object "Create Object" and "Query Object". A menu for specifics tools is added.
- **Editor panel**: Main panel where business data are managed.
- **Outline panel**: This panel shows additionnal data depending on active panel.
- **Console panel**: info, warning, error are displayed in this panel.



2.4.2 Start a query editor

For example, if you are using the imported schema provided here, you can choose the option Film / Query Film, a new editor is opened, it is named Query for Film with only one page named Query (see the bottom of the editor). Right-click on the table to obtain the context menu.

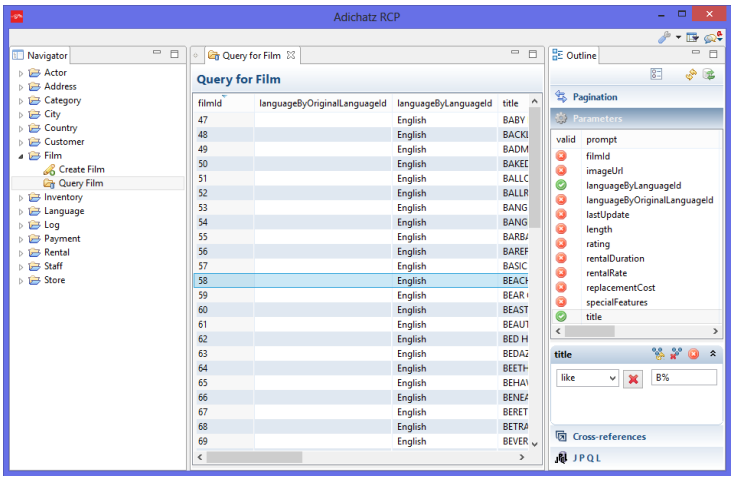


Launching the query, the 200 first films are displayed. 200 is the default maximum number of rows for a query. The value is stored in file 'resources/xml/AdichatzRcpConfig.xml' and could be changed.

Pagination and criteria could be changed thru the right panel.

2.4.3 Manipuling Query editor

Query editor provides an Outline view to manage queries.

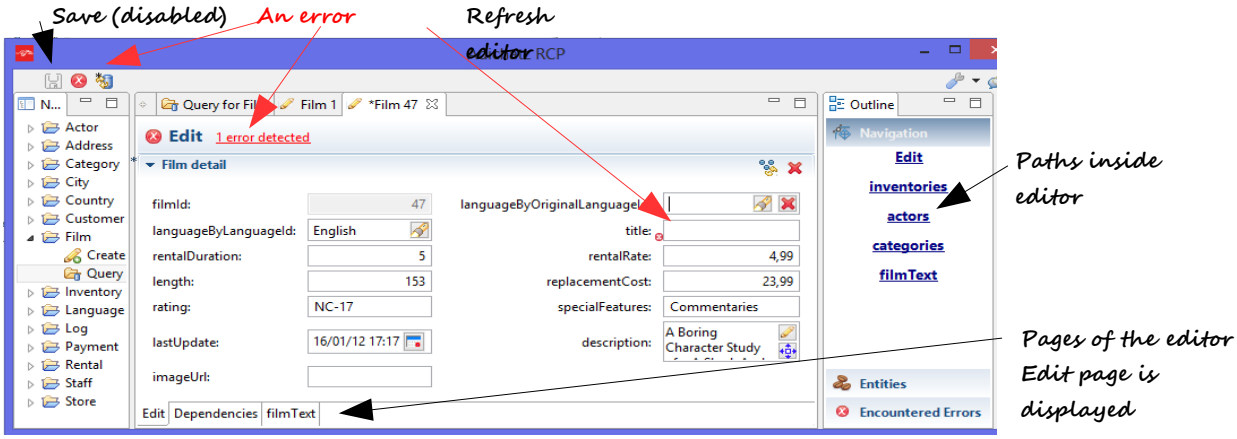


- Define pagination.
- Define criteria, e.g. as here:
  - Title start by “B”
  - Language is english
- Set filters
- Visualize JPQL order.

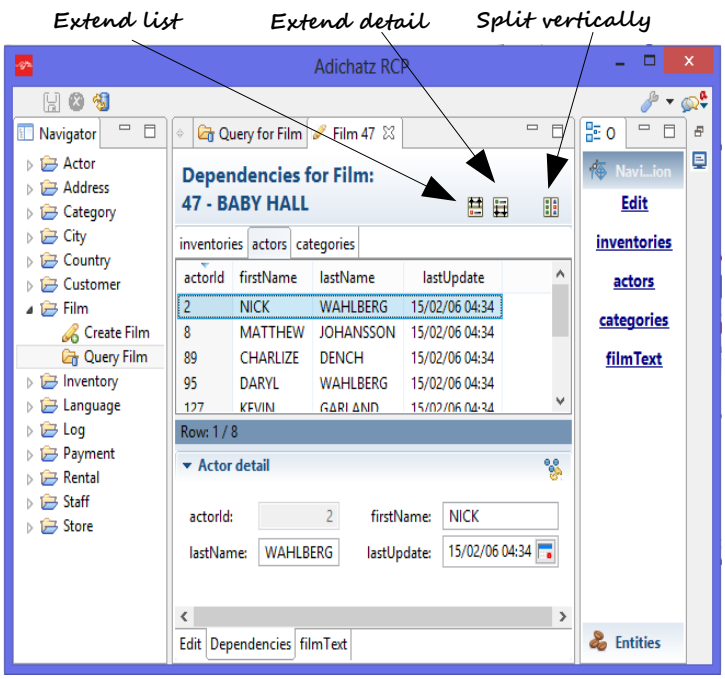
These above data determine query preferences which can be stored and restored.

2.4.4 Start a Detail Editor

Double-click on the first row (filmId=47), you obtain a new interesting editor with trhree pages named `Edit`, `Dependencies` and `FilmText`.Three tabs at the bottom/left of the editor allow you to switch from one page to another. Clear the field “**Title**” then an error occurred.



- Click on path **actors** in the outline panel (page Dependencies is open, tab item actors is selected).
- select actor "2, NICK WAHLBERG" in the list.



2.4.5 Manipulating Detail Editor

Editors provide in standard the abilities to manage standard operations on database objects.

- Create, retrieve, update and delete (CRUD) objects.
- Add and remove relationship between objects.
- Performs validators before saving changes.
- Performs Adichatz listeners on events on life cycle of control or entities.

By default, only mandatory field validators are created when needed. Name for film and first and last name for actor are mandatory. If you erase one of these fields, an error message will appear on the page. Because editor is composed of several pages and several objects could be changed on one page, the error button give the ability to retrieve all errors encountered by validator process on the current editor.

Double-click on actor 1 – Penelope – Guinness.

A new editor is open.

2.4.6 Entity and Application data cache

Entity

For Adichatz, an entity is a composition wrapping the bean (or POJO) received from the JPA framework. Beans compose input of queries but as soon as the editor needs the bean to be managed, it is transformed in an entity.

Application data cache

Moreover, an Application Data Cache, storing entities, supplies central features:

- **Unicity** of entity: An entity is identified by a Primary Key. When looking for an entity, Adichatz asks the cache before requesting the Application Server or the database.
- **Consistency**: an entity could be updated only in one editor at a moment.
- **Databinding** (any change on a field is reflected throughout the application) includes process on persistent sets (ManyToMany and OneToMany relationships).
- **Listeners** allows you to configure buttons, actions and other controls according to the status of the entity (Created, Updated, Deleted, Read).
- Adichatz provides in standard a plain solution for managing **locks** in JEE context. An entity could be updated by only one session.
- By default, every relationship are "**lazy loaded**". However, a «decision tree» of all needed lazy fetches of the entity is managed to optimize access to the server.
- Some query results could be pooled.

2.4.7 Databinding service

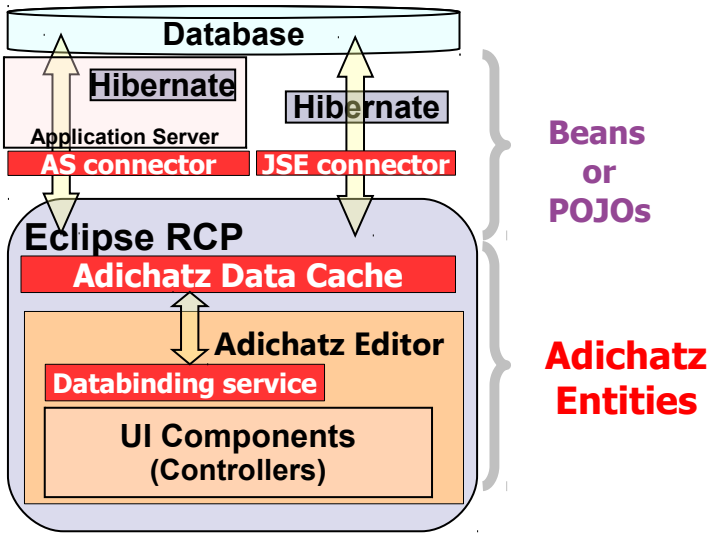
Adichatz databinding service is the environment where data are manipulated. By default, one databinding service is created when opening an editor. This service ensures data consistency of the entities in connection with the application cache and editor:

- Change are broadcast to other editors (*including changes on relationship between objects*).
- Dirty management (*asterisk* *) of editor, section and table is provided.
- Lazy loading: If you decide to display for example the name of the country of the city you do not have to program any query. The service manages all that is necessary.

*The framework provides a default databinding service for JPA environment (data coming from a SQL database). Internally, Adichatz uses an other implementation of databinding to manage XML files using all Adichatz components (see **axml** editor and Scenario editor). In the future, we hope others implementations to be provided.*

2.4.8 Running Architecture

Beans are provided by Hibernate, wrapped in Data Cache to become an Entity capable of managing Data Binding, Lazy loading, Locks, unicity thru Application data cache and Editor databinding service.



2.4.9 Conclusion

In a few minutes, you can obtain editors to query the database and to edit objects of the database. For each object, you can manage CRUD (Create, Read, Update, Delete) operations and also manage dependencies (ManyToOne, OneToMany or ManyToMany relationships).

3 Manipulating generated components

3.1 Generated Files

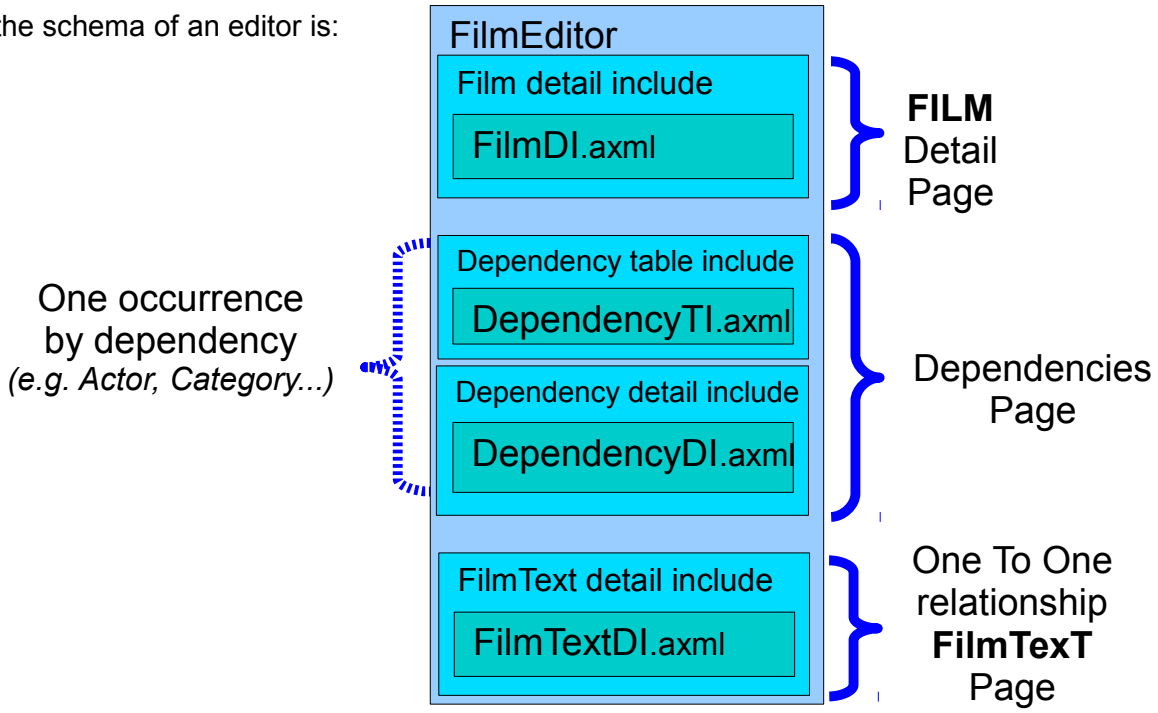
Adichatz generates XML files with **axml** extension from which UI Java classes are generated.

The complete syntax of XML files will be presented later.

The main XML file for the editor is named «Object»Editor, in our case FilmEditor (complete path is $projectDirectory/resources/xml/editor/FilmEditorGENERATED.axml).

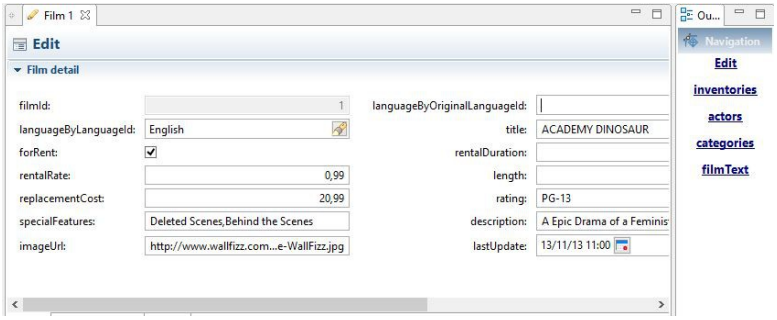
An **axml** file can call others **axml** files by the use of the clause <include>.

So the schema of an editor is:



3.2 Customizing FilmDI

In the Package Explorer, open resource "resources/xml/model/film/FilmDIGENERATED.axml".



You obtain an editor which contains 2 pages:

- FormPage: Propose a tree and an outline view to select and edit element of the **axml** file.
- XML: Propose to edit xml source.

We want to set different changes on the layout of the detail of a film:

- the description field must fill 3 cells.
- the imageURL field makes a reference to an image which much take half of the width of the editor.
- The other half must contains following fields.
- Display of 3 fields depends on forRent value (dynamic block).

Select XML page and change elements:

```
<formattedText editPattern="######" format="Short" column="filmId" enabled="false" id="filmId"/>
<refText column="languageByOriginalLanguageId" style="SWT.BORDER | AdiSWT.FIND_BUTTON | AdiSWT.DELETE_BUTTON" id="languageByOriginalLanguageId">
    <convertModelToTarget>return null==value ? &quot;&quot; : #FV().name;</convertModelToTarget>
</refText>
```

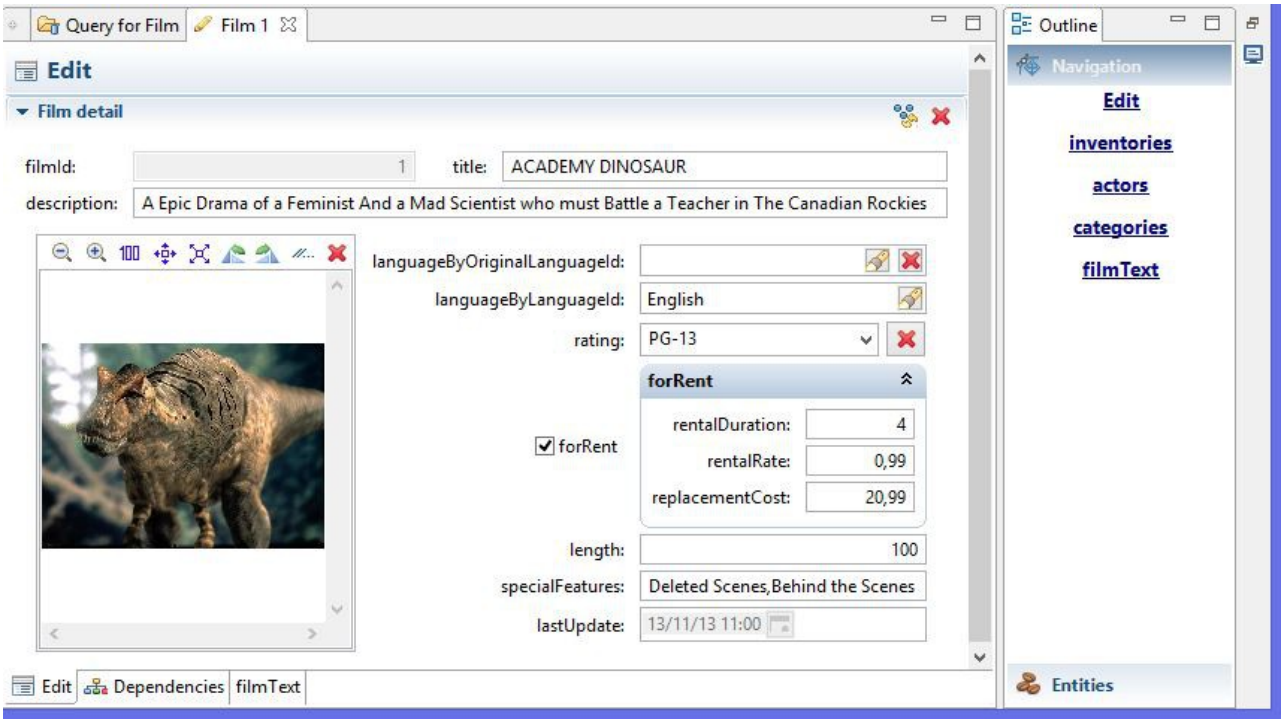
```
<refText column="languageByLanguageId" mandatory="true" style="SWT.BORDER | AdiSWT.FIND_BUTTON" id="languageByLanguageId">
    <convertModelToTarget>return null==value ? &quot;&quot; : #FV().name;</convertModelToTarget>
</refText>
<text textLimit="255" column="title" mandatory="true" id="title"/>
<formattedText editPattern="######" format="Short" column="rentalDuration" mandatory="true" id="rentalDuration"/>
<numericText pattern="##.##" column="rentalRate" mandatory="true" style="SWT.BORDER | SWT.RIGHT" id="rentalRate"/>
<formattedText editPattern="######" format="Short" column="length" id="length"/>
<numericText pattern="###.##" column="replacementCost" mandatory="true" style="SWT.BORDER | SWT.RIGHT" id="replacementCost"/>
<text textLimit="5" column="rating" id="rating"/>
<text textLimit="54" column="specialFeatures" id="specialFeatures"/>
<dateText column="lastUpdate" mandatory="true" style="SWT.BORDER | SWT.TIME" id="lastUpdate"/>
<text textLimit="255" column="description" id="description"/>
<text textLimit="255" column="imageUrl" id="imageUrl"/>
```

by

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<includeTree xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" entityURI="adi://myproject/model.film/FilmMM" generationType="DETAIL"
            xsi:noNamespaceSchemaLocation="http://www.adichatz.org/xsd/v0.8.1/generator/includeTree.xsd">
  <section text="#BUNDLE(film, detailSectionText)" style="Section.TWISTIE | Section.TITLE_BAR | Section.EXPANDED" id="detailSection">
    <layout layoutConstraints="wrap 4" columnConstraints="[fill, align right]10[fill,grow]25[align right]10[fill,grow]"/>
    <include adiResourceURI="#PARAM(TOOL_BAR)" id="detailToolbarMenu">
      <params>
        <param id="CONTROLLER" value="#CONTROLLER(detailSection)"/>
      </params>
    </include>
    <formattedText editPattern="######" format="Short" column="filmId" enabled="false" id="filmId"/>
    <text textLimit="255" column="title" mandatory="true" id="title"/>
    <text textLimit="255" column="description" layoutData="span 3" id="description"/>
    <composite layoutData="newline, grow, push, span 4" id="bottomComposite">
      <layout layoutConstraints="wrap 2" columnConstraints="[fill, grow][fill, grow]" rowConstraints="[fill, grow, al top]"/>
      <imageViewer toolBarStyle="AdiSWT.DELETE_BUTTON  | AdiSWT.EXPANDABLE | AdiSWT.EDITABLE" fitCanvas="true" imageType="Url"
                column="imageUrl" noLabel="true" layoutData="hmax 300" id="imageUrl"/>
      <composite id="fieldComposite">
        <layout layoutConstraints="wrap 2" columnConstraints="[align right]10[fill,grow]"/>
        <refText column="languageByOriginalLanguageId" style="SWT.BORDER | AdiSWT.FIND_BUTTON | AdiSWT.DELETE_BUTTON" id="languageByOriginalLanguageId">
          <convertModelToTarget>return null==value ? &quot;&quot; : #FV().name;</convertModelToTarget>
        </refText>
        <refText column="languageByLanguageId" mandatory="true" style="SWT.BORDER | AdiSWT.FIND_BUTTON" id="languageByLanguageId">
          <convertModelToTarget>return null==value ? &quot;&quot; : #FV().name;</convertModelToTarget>
        </refText>
        <combo values="G, PG, PG-13, R, NC-17" column="rating" id="rating"/>
                                <checkBox text="#BUNDLE(film,forRent)" column="forRent" noLabel="true" style="SWT.CHECK" id="forRent"/>
                                <composite id="forRentComposite">
                                  <layout layoutConstraints="wrap 1, ins 0, hidemode 3" columnConstraints="[fill, grow]"/>
                                  <pgroup text="#BUNDLE(Film,forRent)" id="forRentGroup">
                                    <dynamicClause listenedFieldId="forRent" listenedContainerId="detailSection">
                                      <conditionCode>null!= #BEAN().getForRent() &amp;&amp; #BEAN().getForRent()</conditionCode>
                                      <postCode>#CONTROLLER(fieldComposite).getComposite().layout();
#CONTROLLER(detailSection).reflow();</postCode>
                                    </dynamicClause>
                                    <layout layoutConstraints="wrap 2" columnConstraints="[align right]10[fill,grow]"/>
                                    <formattedText editPattern="######" format="Short" column="rentalDuration" mandatory="true" id="rentalDuration"/>
                                    <numericText pattern="##.##" column="rentalRate" mandatory="true" style="SWT.BORDER | SWT.RIGHT" id="rentalRate"/>
                                    <numericText pattern="###.##" column="replacementCost" mandatory="true" style="SWT.BORDER | SWT.RIGHT" id="replacementCost"/>
                                  </pgroup>
                                </composite>
        <formattedText editPattern="######" format="Short" column="length" id="length"/>
        <text textLimit="54" column="specialFeatures" id="specialFeatures"/>
        <dateText column="lastUpdate" enabled="false" style="SWT.BORDER | SWT.TIME" id="lastUpdate"/>
      </composite>
    </composite>
  </section>
</includeTree>
```

When saving file, changes are reflected to Tree Form page and java classes are automatically regenerated.

If you close and reopen editor Film 1, the layout for detail will change like this:



Adichatz uses Miglayout as main Java Layout manager. Miglayout greatly simplifies layout management and concentrates in only one layout definition most of all the features provides in standard by multiple SWT layouts. Syntax is quite fine explained on the website.

3.3 Customization element

We have seen that a XML file could call another XML file which could call an other XML file... For that feature, <include> tag is used.

To be efficient, the call of a « sub XML file» must be accompanied with the possibility to drive the content of the «sub XML file» or the <sub sub XML file»...

In Package Explorer, open resource "resources/xml/model/film/FilmDIGENERATED.axml". Then click on icon to open the XML editor.

To manage these demands of customization from the parent XML file, use the `<customization>` tag in the `<config>` paragraph.

The syntax is the same as for other **axml** file with the exception of the attribute `id`.

```
<customizations>
    <tableColumn valid="false" id="actorsTSI:filmsTC"/>
    <table id="actorsTSI:table">
      <listeners>
          <listener type="onDoubleClick" id="onDoubleClick">
              <code>import org.adichatz.engine.action.EditEntityAction
EditEntityAction.openForm(getFromRegister(&quot;actorsTSI:table&quot;));
              </code>
          </listener>
      </listeners>
    </table>
</customizations>
```

The expression ***id="actorsTSI:filmsTC"*** means the controller identified by ***filmsTC*** of the include ***actorsTSI*** (here a table column controller).

The expression ***id="actorsTSI:table"*** means the controller identified by ***table*** of the include ***actorsTSI***(here a table column controller).

So the tableColumn for the column "film" will no be added to the table of actors and when doubleclicking on a row of this table, a new editor opens.

If you want to disable the action “Add Link” of the context menu of the table controller for Actors, use the following syntax:

```
<action id="actorTSI:tableContextMenu:addRelationshipAction" enabled="false"/>
```

3.4 Bundle messages and images.

3.4.1 Bundle messages

Bundle message is a way for internationalize wordings.

To access to the property actors of the message bundle file $project/resources/bunldes/film.properties, use the syntax `#BUNDLE(film, actors)`.

For the property `date` of the message bundle file $project/resources/bunldes/adichatzEngine.properties of plugin org.adichatz.engine, use the syntax `#BUNDLE(adi://org.adichatz.engine/./adichatzEngine, date)`.

3.4.2 Images

To access to the image actor.png in the folder $project/resources/icons, use the syntax `#IMG(actor.png)`.

Image `IMG_JQL.png` in the folder $project/resources/icons, of the plugin org.adichatz.jpa, could be accessed using use the syntax `#IMG(adi:/org.adichatz.jpa/./IMG_JQL.png)`.

To access to image descriptor use the syntax `#IMGDESC(...)`.

3.5 Validation Process

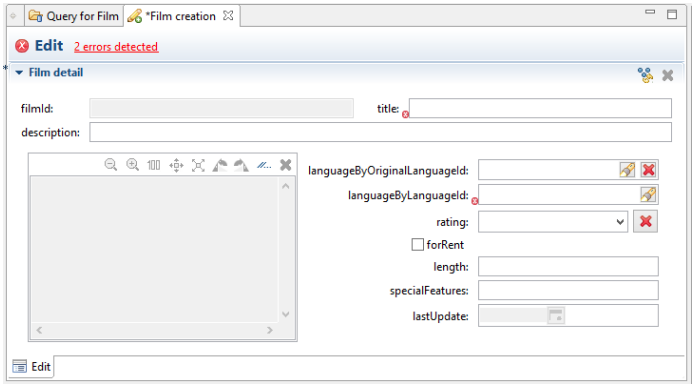
3.5.1 Principles

The validation process is totally integrated to the editor.

- You cannot save an editor when a validation error is encountered..
- When displaying, modifying, saving data, the validation process is triggered.

To illustrate this issue, choose in the menu the option Film / Create Film:

You can see that you obtain five errors corresponding to five mandatory fields. Each time you give a value in a field, an error is removed.



In fact, attributes `mandatory="true"` of fields `title` and `languageByLanguageId`, … are transformed as validators during the generation process of UI classes.

So, 2 errors occur when asking for a new Film record and you must fulfill these fields.

3.5.2 Triggering

The validation process consists to trigger validators following to your choices on three steps:

- After displaying the value of a field: triggered when displaying or refreshing data of an entity.
- When modifying data: triggered when seizing in a field.

3.5.3 Validator Types

Validators is a way to control data when there are displayed or seized.

There are two kinds of Validator:

- XML written Validators. All the code needed for the validator is written in the XML file.
- Validators calling a validator class: Create a Java class which implements interface org.adichatz.engine.validation.IValidator and reference it in the XML file.

3.5.4 Creating a validator in XML File

In editor Film we opened (see #3.5.Customizing FilmDI), change element:

```
<text layoutData="span 3" column="description" id="description"/>
```

by:

```
<text layoutData="span 3" column="description" id="description">
  <validators>
    <validator key="titleLength" warningMessage="Description generally has more than 10 characters."
          errorMessage="Description should not be null">
        <warningWhen>return ((String) getValue()).length() &lt; 11;</warningWhen>
        <errorWhen>return null == getValue() || 0 == ((String) getValue()).length();</errorWhen>
    </validator>
  </validators>
</text>
```

You have created a new Validator that:

- triggers an error if the description field contents only blank characters or is a null string.
- triggers a warning (not blocking) when description text content less than 11 characters.

3.5.5 Using a pre-defined validator class

Some validator could be complex or could be used in several xml files. For that, a better way is to use a predefined validator class. Syntax is:

```
<text layoutData="span 3" column="description" id="description">
    <validators>
    <validator key="titleLength"
            warningWhen="return ((String) getValue()).length() &lt; 11;"
            warningMessage="Description generally has more than 10 characters."
            errorWhen="return null == getValue() || 0 == ((String) getValue()).length();"
            errorMessage="Description should not be null"/>
    </validators>
    <validator key="alphaNumeric" validatorClassName="org.mycompany.myproject.gencode.custom.TitleValidator"/>
  </validators>
</text>
```

The **TitleValidator** class must extends the class org.adichatz.engine.validation.AValidator.

If you create the class in a subpackage of org.adichatz.gencode in source folder resources/gencode/src, you will not have to close and relaunch the application because these classes are dynamically loaded. To create the class, use the Eclipse IDE from which you launched the application.

Code could be like this:

```
package org.mycompany.myproject.gencode.custom;
import java.util.regex.Pattern;
import org.adichatz.engine.controller.IValidableController;
import org.adichatz.engine.controller.field.TextController;
import org.adichatz.engine.validation.AValidator;
import org.eclipse.jface.dialogs.IMessageProvider;
public class TitleValidator extends AValidator {
    public TitleValidator(IValidableController triggeringController, String key) {
            super(triggeringController, key);
    }
    @Override
```

```
	public void validate() {
		String title = (String) ((TextController) triggeringController).getValue();
		Pattern pattern = Pattern.compile("(\\w| )+");
		if (null != title && !pattern.matcher(title).matches()) {
			setLevel(IMessageProvider.ERROR, "Only alphanumeric characters are accepted.");
		} else
			setLevel(IMessageProvider.NONE, null);
	}
}
```

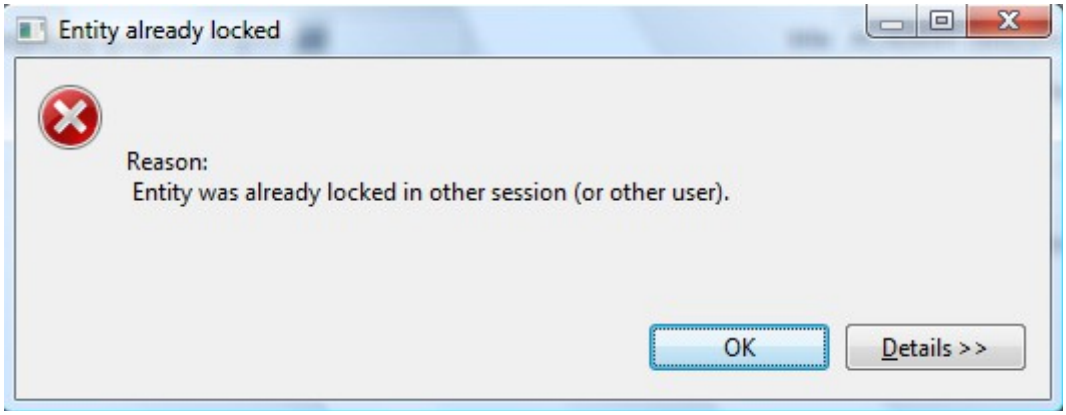
You have just created a validator. The validator triggers an error where the title don't have an alphanumeric value.

4 Other Features

4.1 Lock management in Application server context

Open a new application (see #Run Eclipse Application) and update «Film 1» object.

Go to the first application and try to update «Film 1» object. The following error message occurs and update is cancelled:



4.2 Composite key strategy

Consider that you have an object with a composite key as following:

- Parent key
- Increment

Adichatz proposes to manage directly the incrementation of this kind of key.

4.3 Security

Adichatz provides a simple way to manage authorizations, roles and privilege.

4.4 Callbacks

You can easily add EJB callback to complete process on the server-side.

You can add kind of callback on client side called callfore.

5 Component Architecture

5.1 Controller layer

Adichatz defines a new layer composed of controllers.

A controller is a composition of Rich UI components, as a ManagedForm or simple SWT components as Text.

The controller manages links between UI components and entities to ensure the connection with locks, dirty and lazy fetches management.

5.2 Controller features

Each controller has a parent controller except the Editor controller.

Each collection controller contents a set of child controllers.

With that you can define an «tree of controllers».

5.3 Collection controllers

A collection controller is a controller which can host other controllers.

There are two types of collection controller:

5.3.1 Controllers hosting entity

That means that they can host their own entity which can be different from the entity hosted by the parent controller. This allows an editor to manage several entities:

SectionController	Composition around a Section.
FormPageController	Composition around a ManagedForm for simulating a page of an editor.
SashFormController	Composition around a SashForm.
ScrolledFormController	Composition around a ScrolledForm (Assumes scrolling and message zone).
IncludeController	Specific controller to manage include process (see **axml** Files)
CompositeController	Composition around a Composite. Children available are the same as those of SectionController.
ScrolledCompositeController	Composition around a SharedScrolledComposite.
CompositeBagController	Composition around a specific control called CompositeBag: A bag of composites. Only one composite is displayed.
GroupController	Composition around a Group. Children available are the same as those of SectionController.
CTabItemController	Composition around a CTabItem. Children available are the same as those of SectionController.
ArgTabFolderController	Composition around a CTabFolder. Children should be CtabItemControllers and are defined by a List of values (like a combo) and so is not determined like for CtabFolderController.
PGroupController	Composition around a PGroup (nebula project).
ScrolledPGroupController	Composition around a PGroup (nebula project). Content composite is a scrolled composite.
PShelfItemController	Composition around a PShelfItem (nebula project).
ArgPShelfController	Composition around a PShelf (see nebula project). Children should be PShelftemControllers and are defined by a List of values (like a combo) and so is not determined like for PShelfController.

To know the exhaustive and up to date list of child controller types, consult the xsd files.

5.3.2 Other collection controllers

CTabFolderController	Composition around a CTabFolder. Children should be CTabItemControllers.
TableController	Composition around a Table and a TableViewer.
TreeController	Composition around a Tree and a TreeViewer.
ButtonBarController	Composition around a bar of buttonControllers and separators. You can specify an orientation.
ToolBarController	Composition around a ToolBar. Children should be ToolItemControllers.
MenuBar	For managing context menu.
ManagedToolBarController	Specific toolBar used in section. Children should be ActionControllers.
GridController	Composition around nebula components Grid and GridViewer (nebula project).
PShelfController	Composition around nebula component PShelfFolder. Children should be PShelfItemControllers.

5.4 Field controllers

Field controllers are controllers relating to fields of the bean.

CheckBoxController	Composition of a Button with style SWT.CHECK. Corresponding type in the database is boolean.
ComboController	Composition of a Combo. Style AdiSWT.FIELD_ASSIST was added when Field Assist is demanded.
FormTextController	Composition of a FormText. An easy way to manage URL tag and image in your application.
RichTextController	Composition of a RichText. a rich text is a special widget (see Alonso Dominguez works) that allows you to manage the bold, italic, underline or URLs in the text.
DateTextController	Composition of a DateText. DateText is an UI Adichatz component which allows to manage date in several format (Date, DateTime...).
ImageViewerController	Receive an URL or file path or data and display an image.
LabelController	Composition of a Label.
NumericTextController	Composition of a NumericText. NumericText is a Adichatz UI component. Corresponding types in the database are all numeric types. Format could be specified.
RadioGroupController	Composition of a list of Buttons with style SWT.RADIO.
RefComboController	Similar to a referenced ComboController, but list of values is determined by a persistent set or a query.
RefRadioGroupController	Similar to a referenced RadioGroupController, but list of Buttons is determined by a persistent set or a query.
RefTextController	Composition of a RefText. RefText (referenced text) is an UI Adichatz component which allows to manage Many-To-One relationship. Styles AdiSWT.FIND_BUTTON and AdiSWT.DELETE_BUTTON are added when a find button and a delete button (for clearing value) are demanded.
TextController	Composition of a Text. Corresponding type in the database is varchar.
FileController	Composition of a FileText: a specific control which manage file path.
HyperlinkController	Composition of a Hyperlink.

5.5 Others controllers

TableColumnController	Child controller of TableController, composition of a TableViewerColumn.
ActionController	Child controller of ManagedToolBarController or component of a ButtonController.
ButtonController	Composition of a Button. It could contain, an Action Controller or define its own action.
ToolItemController	Child controller of ToolItemController, composition of a ToolItem.

FormattedTextController	Composition around a FormattedText (nebula project).
GridColumnController	Child controller of GridController (nebula project) corresponding to a column.
GridColumnGroupController	Child controller of GridController (nebula project) corresponding to a group of columns.
PGroupMenuController	Menu of a PGroup (nebula project).
PGroupToolItemController	Tool Item of a PGroup (nebula project).

6 Extending Adichatz

There is different ways to extend Adichatz features. We will explore three of them.

Suppose that you want to change the foreground color of title field when length of the text is greater than 40.

At least four possibilities are provided by Adichatz:

- Add code thru a listener:
  - directly in the XML FilmDIGENERATED.axml file.
  - Using a listener class to
- Create a Green40TextController which extends TextController.
- Create a new Key word Red40Text in the XML syntax.

6.1 Listeners

Listeners provides a very effective and simple way to add behavior to your application.

Mostly two categories of listeners are used: Life cycle listeners and control listeners,

Life cycle listeners: fired at specific times of the life cycle of the controller.

BEFORE_INITIALIZE	Before creating the control (UI Component:/ Text, Section...). The controller and all the children controller were initialized.
AFTER_INITIALIZE	Just after the instantiation of the controller.
BEFORE_SYNCRHONIZE	Before entity is bound to the controller.
AFTER_SYNCRHONIZE	After all controls of the generated UI class and all controls of children controllers have been created.
BEFORE_DISPOSE	Before disposing controller.
AFTER_DISPOSE	After entity is bound.
ENABLED_CONTROLLER	After controller is enabled or disabled.
VISIBLE_CONTROLLER	After controller is set visible or hidden.
VALID_CONTROLLER	After controller is set valid or invalid.

Control listeners: fired when value changes due to user actions

MODIFY_TEXT	Works with all Text controllers and ImageViewerController
WIDGET_SELECTED	Works with controllers having selection action ad Combo, button, group. Controllers.
SELECTION_CHANGED	Works with set controllers (Tree and table controllers).
DOUBLE_CLICK	Works with set controllers (Tree and table controllers).

Entity listeners: fired on event of the life cycle of the entity (composition of a POJO bean).

CHANGE_STATUS	Status of the entity change: e.g. RETRIEVE (read) to MERGE (updated)
LOCK_ENTITY	Entity is locked by user action.
BEFORE_ENTITY_CHANGE	Before a change was sent to the Entity by the databinding process
WHEN_ENTITY_CHANGE	During a change was sent to the Entity by the databinding process
AFTER_ENTITY_CHANGE	After a change was sent to the Entity by the databinding process
PRE_SAVE	Before save action was sent to server.
POST_SAVE	After save action was sent to server.
PRE_REFRESH	Before refresh (cancel updates) action was sent to server.
POST_REFRESH	After refresh (cancel updates) action was sent to server.

Others listeners exists and will be discussed later.

6.1.1 Create a listener adding code in xml file

Listener is a way to add code to generated UI classes by specifying it in the XML file.

Open the XML file FilmDIGENERATED.axml in a XML editor.

Change element:

```
<text layoutData="span 3" column="title" id="title">
```

by:

```
<text layoutData="span 3" column="title" id="title">
   <listeners>
     <listener type="onModifyText">
       <code>import org.eclipse.swt.SWT
if (40 &gt; ((String) getValue()).length())
    getControl().setForeground(#COLOR(SWT.COLOR_RED));
else
    getControl().setForeground(#COLOR(SWT.COLOR_BLUE));
       </code>
     </listener>
   </listeners>
</text>
```

The listener onModifyText will add the code in a ModifyListener added to the text instance included in the TextController.

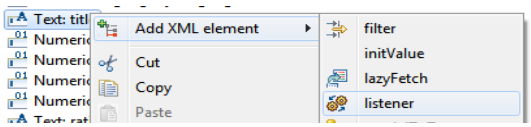
The key word `#COLOR` means the system color red.

Make a test then remove the change you made previously before continuing on next choice.

6.1.2 Create a listener using a class

Instead of add the code in the XML file, you can instantiate a new class listener.

Open file "resources/xml/model/film/FilmDIGENERATED.axml" using adichatz editor,



- Right click on element "Text: title"
- Choose "Add XML element / Listener"
- In the outline view
  - Select MODIFY_TEXT as listener type.
  - Click on hyperlink: listenerClassName.
  - A "New Java class" widow is open with a predefined package.
- Type the class name "TitleListener" and valid.

The java class editor is open for TitleListener.java. Add modifyText method:

```
package org.mycompany.myproject.gencode.custom;

import org.adichatz.engine.controller.AWidgetController;
import org.eclipse.swt.SWT;
import org.eclipse.swt.events. ModifyEvent;
import org.eclipse.swt.events. ModifyListener;
import org.eclipse.swt.widgets.Text;


public class TitleListener implements ModifyListener {

	AWidgetController controller;

	public TitleListener(AWidgetController controller) {
		this.controller = controller;
	}

	@Override
	public void modifyText(ModifyEvent e) {
		Text title = (Text) controller.getControl();
		title.setForeground(//
		title.getText().length() > 40 ? //
		title.getDisplay().getSystemColor(SWT.COLOR_RED)
				: title.getDisplay().getSystemColor(SWT.COLOR_BLUE));
	}
}
```

In the runtime application Close an reopen Film 1 editor.

It is important to create this class in directory $projectDirectory/resources/gencode/src, because classes in this directory are dynamically loaded. So you do not have to relaunch the application.

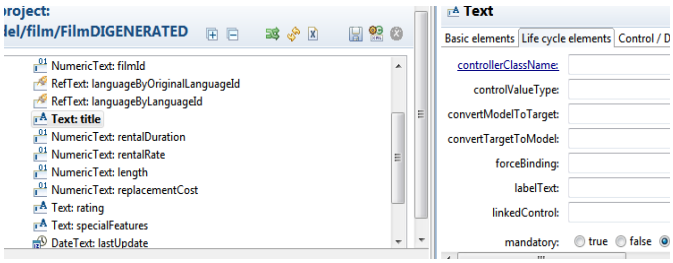
By this way, you can enrich your editor with complex code.

Make a test then, remove the change you made previously (add a combined class) before continuing on next choice.

6.2 Controller extension

By extending class org.adichatz.implementation.controller.field.TextController, you can reach the same result.

Open FilmDIGENERATED.axml file and remove listeners on element "Text: Title" you created in previous chapter. Then in the outline view select "Life cycle elements" tab item.



- Click on the "Text: Title" element of the tree.
- In the outline view select "Life cycle elements" tab item.
- In the outline view, click on hyperlink field "controllerClassName": a new "New Java class" window is open with a predefined package and super class. Give a name (e.g. Green40TextController) to the class.

The java class editor is open for FilmDICC.java. Add method afterCreateControl:

```
package org.mycompany.myproject.gencode.custom;

import org.adichatz.engine.controller.IContainerController;
import org.adichatz.engine.controller.field.TextController;
import org.adichatz.engine.core.ControllerCore;
import org.eclipse.swt.SWT;
import org.eclipse.swt.events.ModifyEvent;
import org.eclipse.swt.events.ModifyListener;
import org.eclipse.swt.graphics.Color;


public class Green40TextController extends TextController {

	public Green40TextController(String id, IContainerController parentController, ControllerCore genCode) {
		super(id, parentController, genCode);
	}
```

```
	@Override
	public void createControl() {
		super.createControl();
		getControl().addModifyListener(new ModifyListener() {
			@Override
			public void modifyText(ModifyEvent e) {
				Color color;
				if (getControl().getText().length() > 40)
					color = getControl().getDisplay().getSystemColor(SWT.COLOR_GREEN);
				else
					color = getControl().getDisplay().getSystemColor(SWT.COLOR_BLUE);
				getControl().setForeground(color);
			}
		});
	}
}
```

Close Adichatz RCP application and relaunch it, `title` field will have a green foreground color when text length is greater than 40.

6.3 Create a new element in the XML syntax

Another possibility would be to create a new element which extend `basicText` element. That is easily possible but you have to made changes in Adichatz plugins. This issue will be explained later.

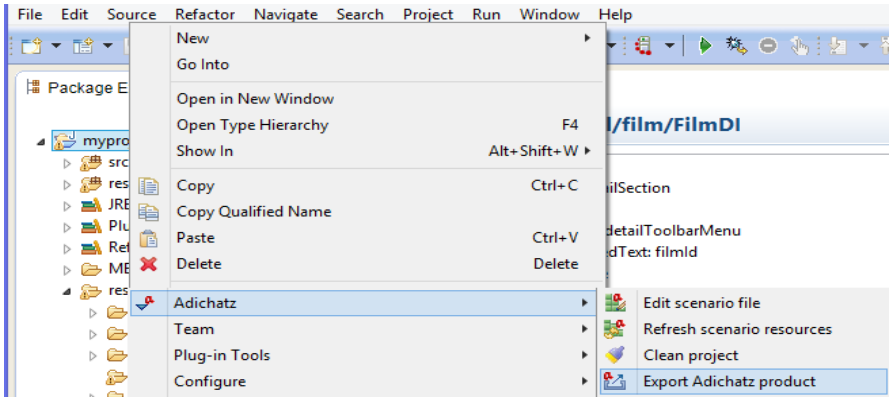
7 Others Features

7.1 Workbench features list

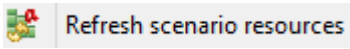
In the Package Explorer, a new option is given when pointing on Adichatz resources, a new options are available in content menu.

7.1.1 Features on Adichatz project:

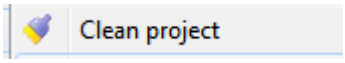
Context menu on an Adichatz project provides this options:



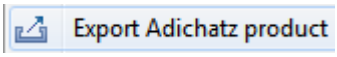
Edit the file "resources/xml/scenario.xml" which drive the generation process.



Refresh project and Scenario resources of the project.



Generate needed Java classes, delete obsolete class java and check for error.



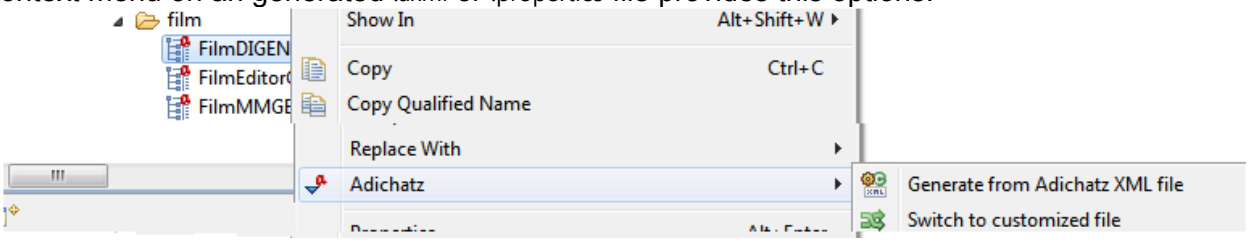
Remove org.adichatz.tool and org.adichatz.generator from item Require-Bundle of Manifest.MF file.

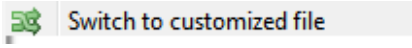
Export project.

Get the project back in running in order to continue developments.

7.1.2 Generated .axml and .properties files:

Context menu on an generated .axml or .properties file provides this options:





Switch generated resources in a new customized file which will not be impacted by new generation process.

7.2 Recursive generation

All generation process can be controlled from “resources/xml/scenario.xml” file.

7.2.1 Contents

One of the main features of Adichatz is the ability to drive generation process at any time.

Scenario.xml file drives the generation process and is composed of 5 sections.

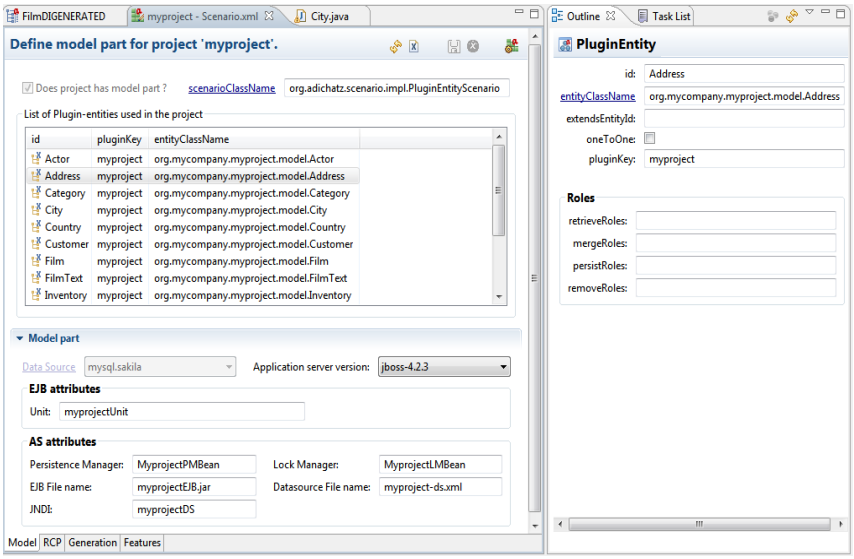
`<params>`	Contains general parameters
`<generatorPaths>`	Paths needed for generation process (plugins, libraries...)
`<generators>`	Mapping between generator and type of XML tree.
`<controllers>`	Mapping between xml elements and Adichatz controllers.
`<generationScenarios>`	In the this main section, the entire generation process is specified: • Do you have a Model Part (EJB) in the project? • Do you have a RCP Part (UI) in the project? • What entities (Pojo) are treated, What Model Plugins hosts these entities (*the same application can handle entities provided by different Model Plugins).*

Have a look on the special editor for file scenario.xml.

One editor containing four pages (*Model, RCP, Generation, Features*) provides a simple way to manage all the generation process.

In changing features, developer can change completely aspects of the generated application.

Note that this editor was built on Adichatz framework. In this case, the datasource is a XML file.



7.2.2 Flexibility

Everyone can create his own generators or controllers or scenarios, maps them in the scenario file.

Moreover, any component proposed by Adichatz, is extensible.

Application can be split in modules following OSGI architecture.

AN example of OSGI example can be seen on youtube.