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e4 - The workbench model and the renderers

Eclipse Summit Europe
Wednesday, October 27, 2009

e4 – About Me

- Founder and Owner of BestSolution.at
- Eclipse Committer
  - Platform UI
  - e4
  - EMF
- Projectlead
  - Nebula
  - UFaceKit

e4 – The model a short history

- **EclipseCon 08**
  - Mock up model based upon HashMaps
  - Mock hosted „hacked“ into 3.x
- **E4-Summit Ottawa (22nd /23rd May)**
  - May 20th: Mail to e4-dev „A radical approach to explore new paths for e4“
    - Platform designed from Scratch
    - No statics, no singletons, usage of DI

e4 – The model

- **EMF? Why oh why?**
  - It's a proven domain model technology so why invent our own?
  - It has tooling (an Editor, …)
  - Integration points for different technologies like EMF-Compare, CDO, …

e4 – The model

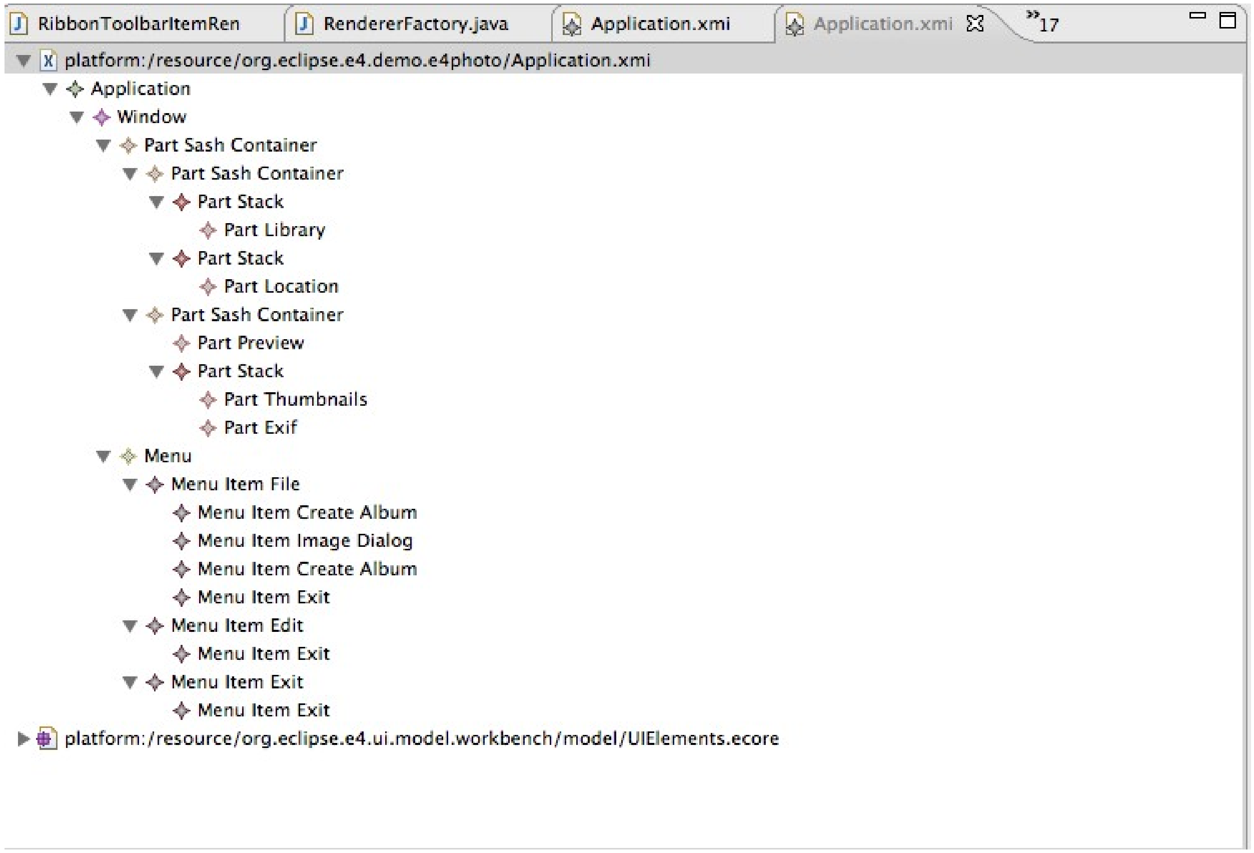
- **EMF but isn't it bloat?**
  - Distinguish between installation and runtime bloat
  - Installation „bloat“ 1.5 MB
  - Runtime size of EMF is highly optimized (e.g. storage of booleans, …)
  - Benefit from upstream changes (Ultra Slim Diet in 3.5)

e4 – Anatomie of an E4-App

- **Main Building Blocks**
  - Application model instance
  - POJO to fill the parts of the UI with content
- **Additional Building Blocks**
  - CSS – Theming your application
  - IEclipseContext – Accessing services, …

e4 – Anatomie of an E4-App

- Application model



```
▼ platform:/resource/org.eclipse.e4.demo.e4photo/Application.xmi
  ▼ Application
    ▼ Window
      ▼ Part Sash Container
        ▼ Part Sash Container
          ▼ Part Stack
              Part Library
          ▼ Part Stack
              Part Location
        ▼ Part Sash Container
            Part Preview
          ▼ Part Stack
              Part Thumbnails
              Part Exif
      ▼ Menu
        ▼ Menu Item File
            Menu Item Create Album
            Menu Item Image Dialog
            Menu Item Create Album
            Menu Item Exit
        ▼ Menu Item Edit
            Menu Item Exit
        ▼ Menu Item Exit
            Menu Item Exit
▶ platform:/resource/org.eclipse.e4.ui.model.workbench/model/UIElements.ecore
```

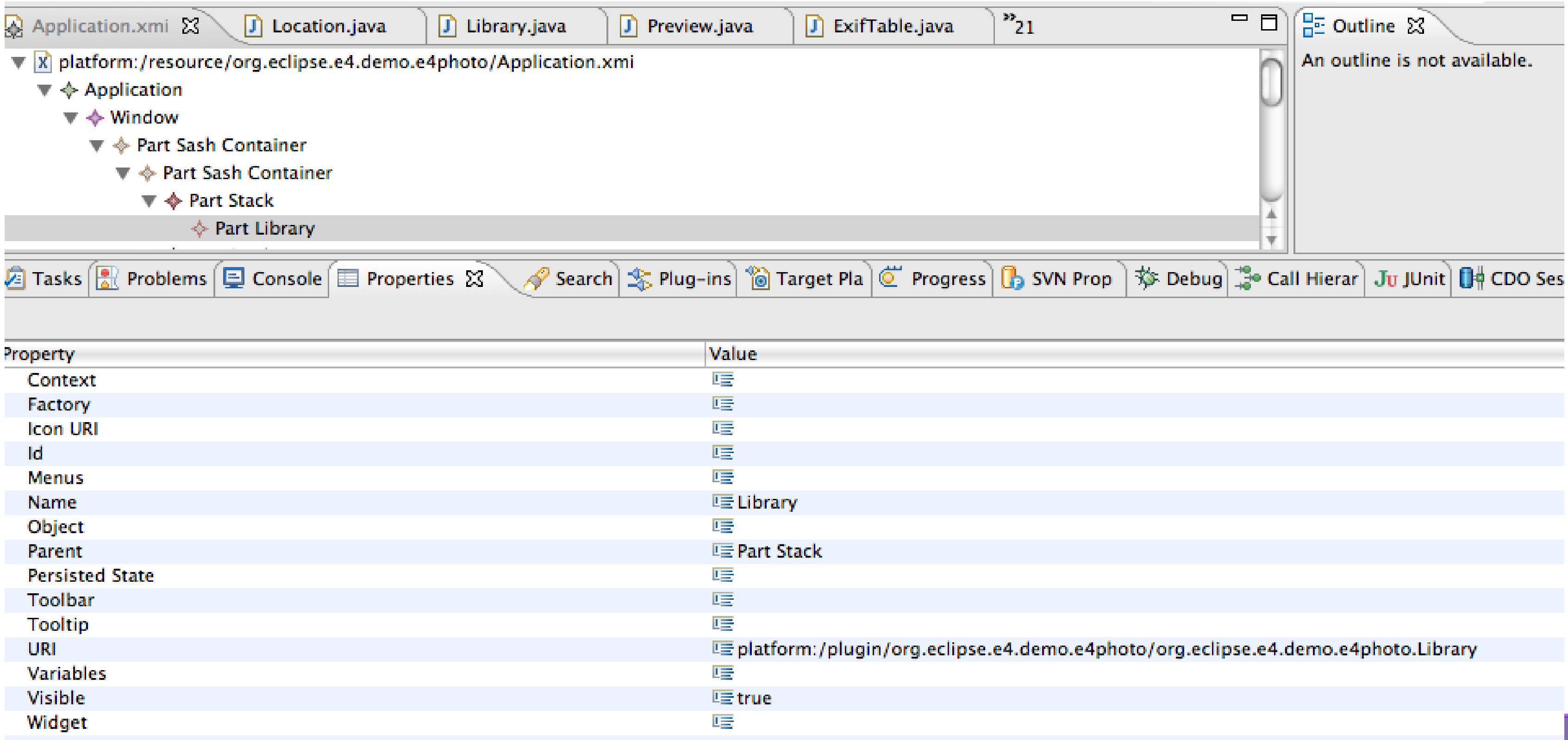
e4 – Anatomie of an E4-App

- Part POJO

```
public class Library implements IDisposable {
  public Library(Composite parent, final IWorkspace workspace) {
      TreeViewer viewer = new TreeViewer(parent,
             SWT.MULTI | SWT.H_SCROLL | SWT.V_SCROLL);
  }
}
```

e4 – Anatomie of an E4-App

- **Wiring the part POJO into the Application Model**

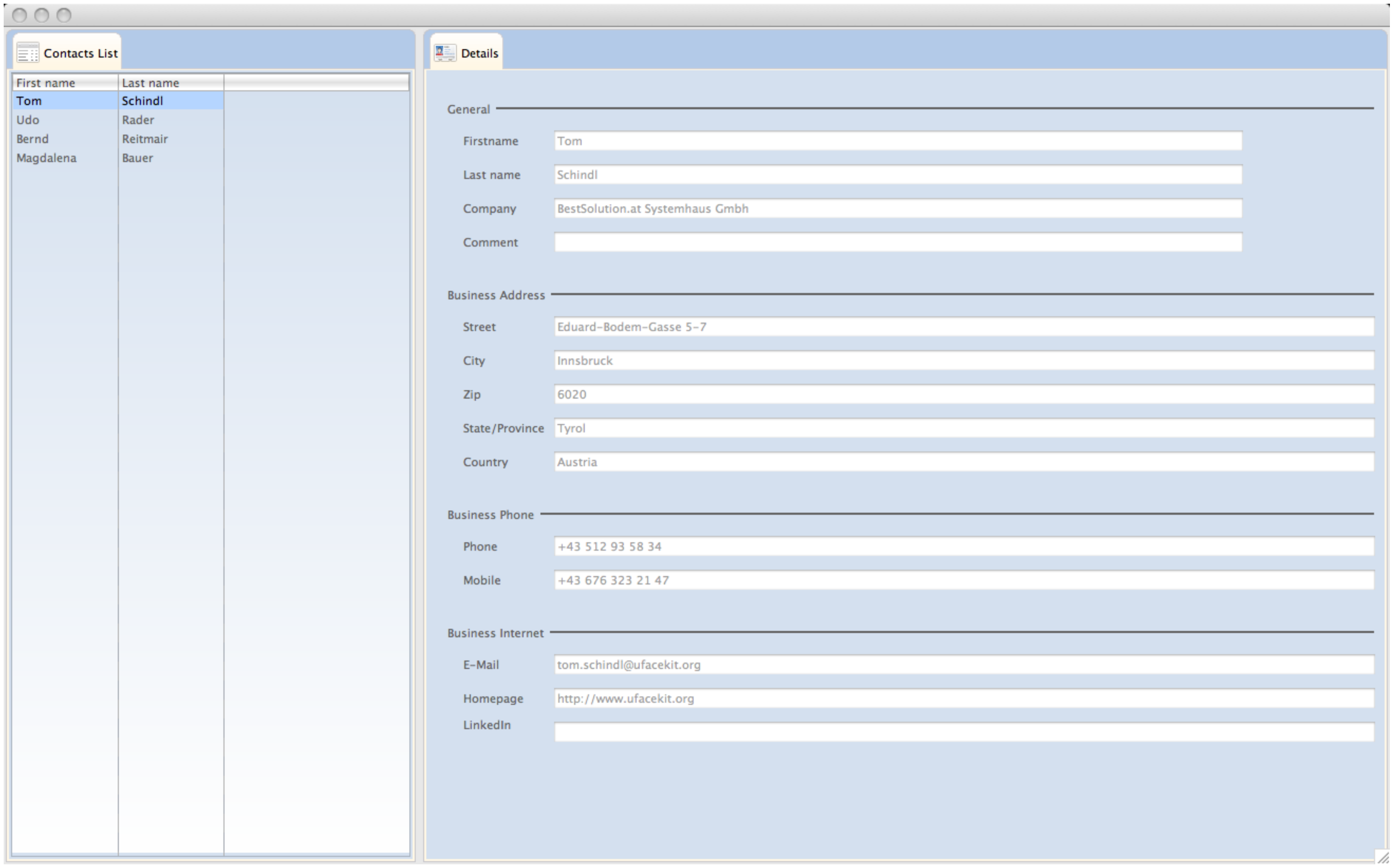


An outline is not available.

```
platform:/resource/org.eclipse.e4.demo.e4photo/Application.xmi
  Application
    Window
      Part Sash Container
        Part Sash Container
          Part Stack
            Part Library
```

Property	Value
Context	
Factory	
Icon URI	
Id	
Menus	
Name	Library
Object	
Parent	Part Stack
Persisted State	
Toolbar	
Tooltip	
URI	platform:/plugin/org.eclipse.e4.demo.e4photo/org.eclipse.e4.demo.e4photo.Library
Variables	
Visible	true
Widget	

e4 – Example Application



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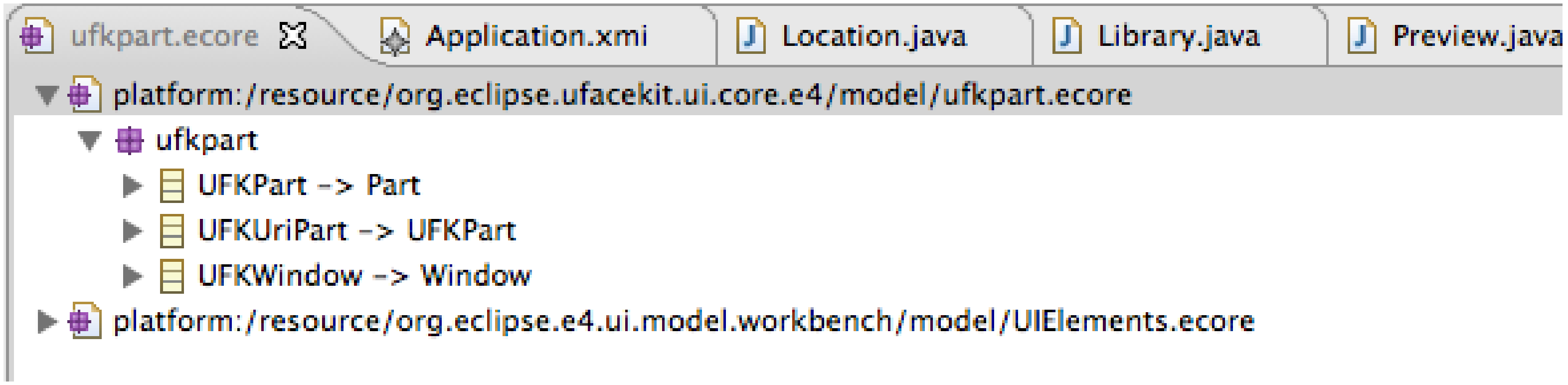
e4 – Extending the App-Model

- One can derive from the base .ecore and add features



```
▼ platform:/resource/org.eclipse.ufacekit.ui.core.e4/model/ufkpart.ecore
    ▼ ufkpart
        ▶ UFKPart -> Part
        ▶ UFKUriPart -> UFKPart
        ▶ UFKWindow -> Window
▶ platform:/resource/org.eclipse.e4.ui.model.workbench/model/UIElements.ecore
```

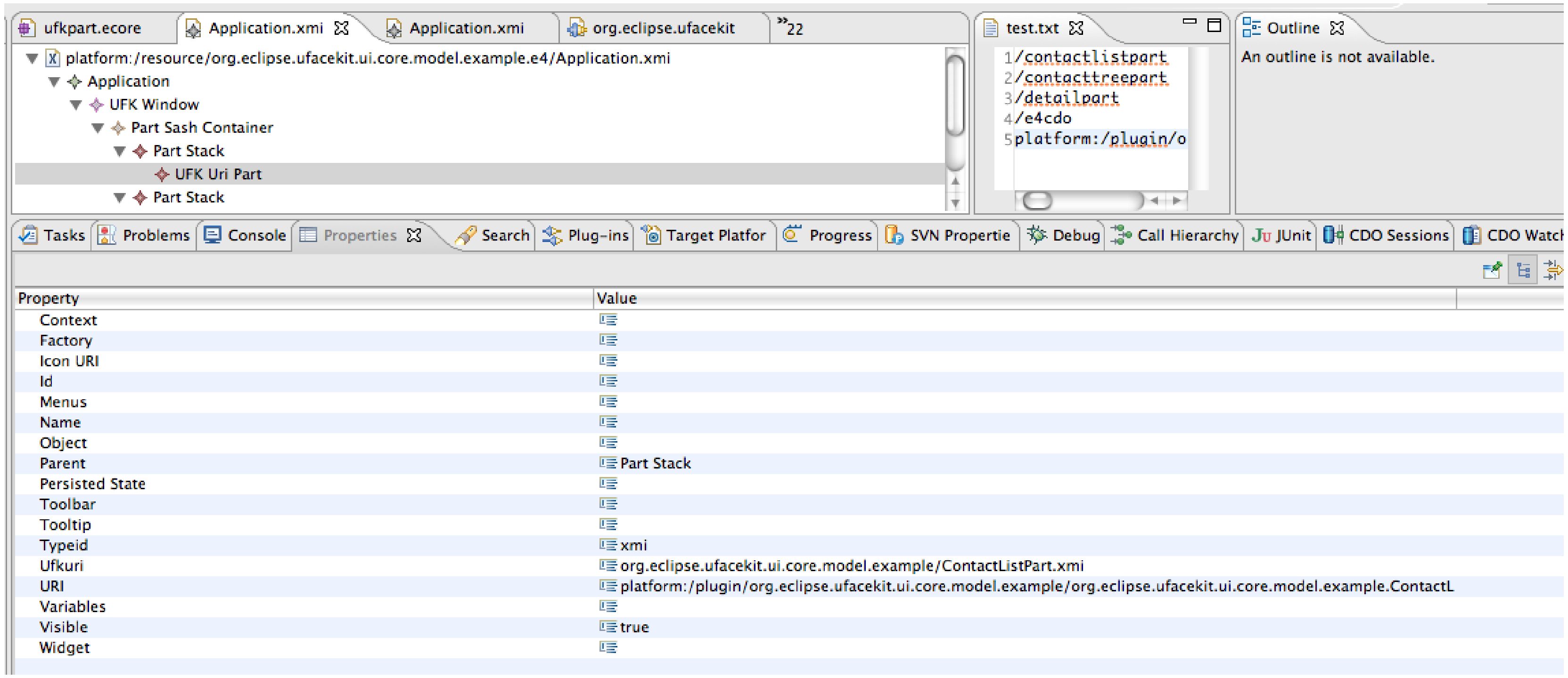
e4 – Extending the App-Model

```
public class DetailPart {
  public DetailPart(UIComposite parent, Resource resource,
    IAddressSelectionBroker addressSelection, Store store) {

  UIFactory<?> factory = parent.getFactory();
  UIDesktop desktop = parent.getDesktop();
  UFaceKitBuilder builder = new UfaceKitBuilder(
    factory,
    new DefaultBindingStrategy(desktop.getRealm(), Type.DOMAIN_TO_UI)
  );
  builder.buildPart(
    parent,
    (IUIComposite) resource.getContents().get(0)
  );

}
```

e4 – Extending the App-Model



- platform:/resource/org.eclipse.ufacekit.ui.core.model.example.e4/Application.xmi
  - Application
    - UFK Window
      - Part Sash Container
        - Part Stack
          - UFK Uri Part
        - Part Stack

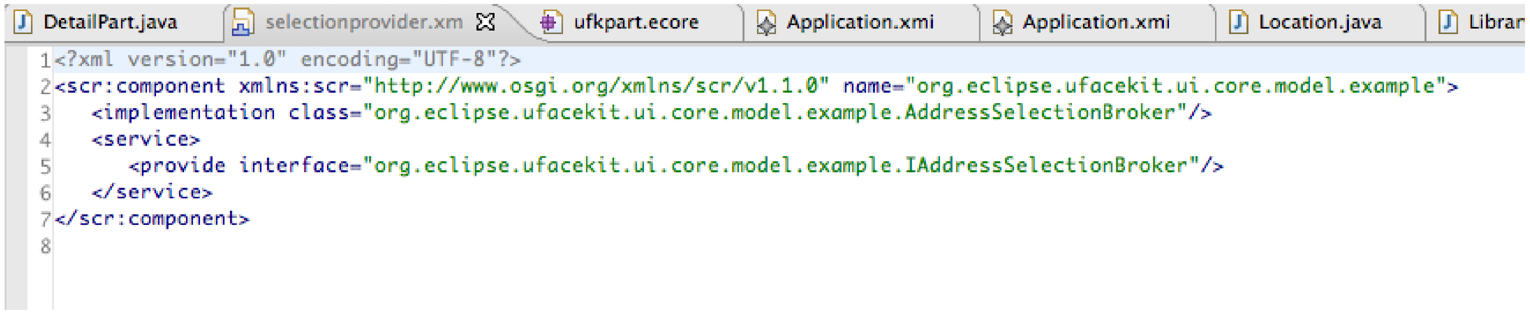
```
/contactlistpart
/contacttreepart
/detailpart
/e4cdo
platform:/plugin/o
```

An outline is not available.

Property	Value
Context	
Factory	
Icon URI	
Id	
Menus	
Name	
Object	
Parent	Part Stack
Persisted State	
Toolbar	
Tooltip	
Typeid	xmi
Ufkuri	org.eclipse.ufacekit.ui.core.model.example/ContactListPart.xmi
URI	platform:/plugin/org.eclipse.ufacekit.ui.core.model.example/org.eclipse.ufacekit.ui.core.model.example.ContactL
Variables	
Visible	true
Widget	

e4 – Accessing services

- **E4 injects services of the local context into your POJO**
  - Root of the IEclipseContext is the Equinox Service Registration



DetailPart.java | selectionprovider.xm | ufkpart.ecore | Application.xmi | Application.xmi | Location.java | Librar

```xml
<?xml version="1.0" encoding="UTF-8"?>
<scr:component xmlns:scr="http://www.osgi.org/xmlns/scr/v1.1.0" name="org.eclipse.ufacekit.ui.core.model.example">
   <implementation class="org.eclipse.ufacekit.ui.core.model.example.AddressSelectionBroker"/>
   <service>
      <provide interface="org.eclipse.ufacekit.ui.core.model.example.IAddressSelectionBroker"/>
   </service>
</scr:component>
```

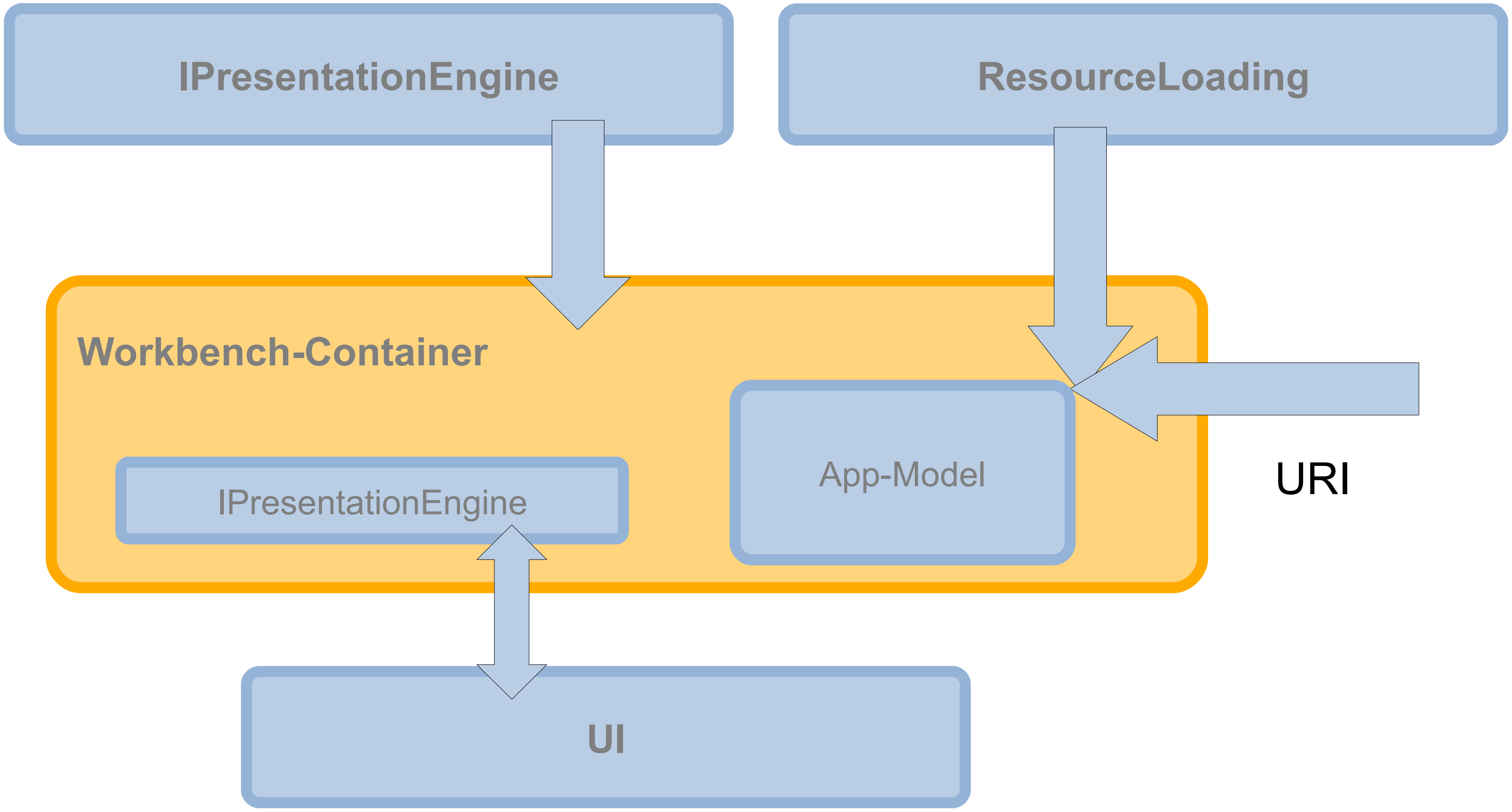
e4 – Extending the App-Model

```
public class DetailPart {
  public DetailPart(UIComposite parent, Resource resource,
    IAddressSelectionBroker addressSelection, Store store) {

  UIFactory<?> factory = parent.getFactory();
  UIDesktop desktop = parent.getDesktop();
  UFaceKitBuilder builder = new UfaceKitBuilder(
    factory,
    new DefaultBindingStrategy(desktop.getRealm(), Type.DOMAIN_TO_UI)
  );
  builder.buildPart(
    parent,
    (IUIComposite) resource.getContents().get(0)
  );

}
```

e4 – Core Design

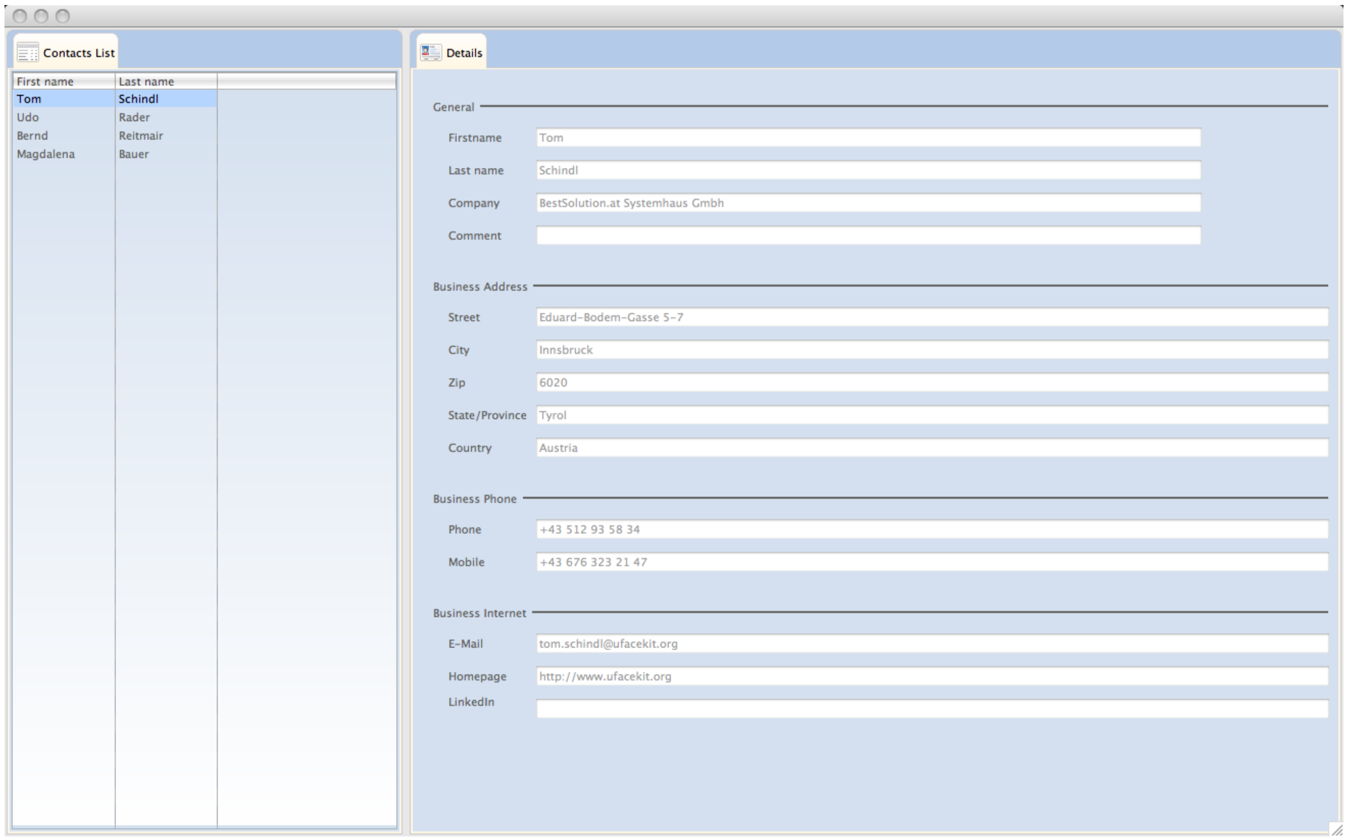


e4 – Sharing the App-Model

- **Exchanging the Resource Loading**
  - E.g. for live application design of an E4-Application
  - Share model using CDO between JVMs

e4 – Sharing the App-Model

- DEMO



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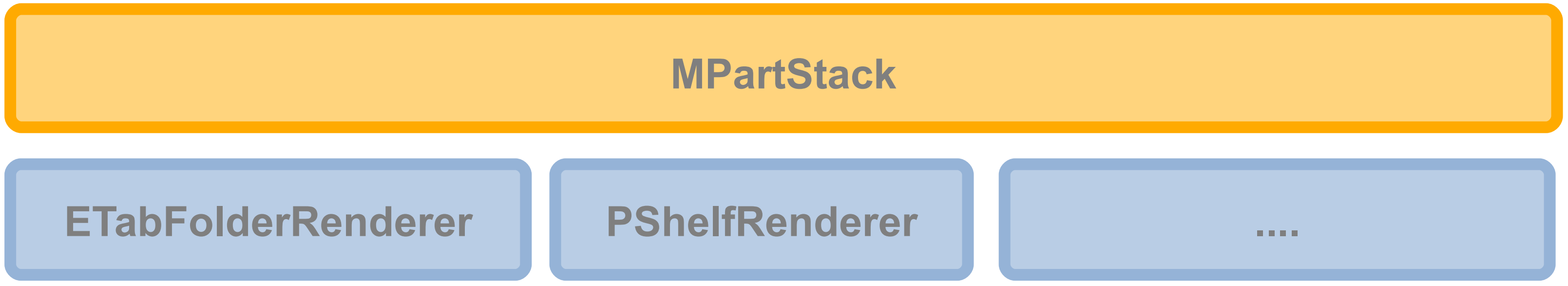
e4 – SWT Renderer

- **Default Presentation Engine provided by E4**
  - Based on SWT
  - Extensible by plug in your own renderers
- **One Appmodel Element multiple renderers**



e4 – SWT Renderer

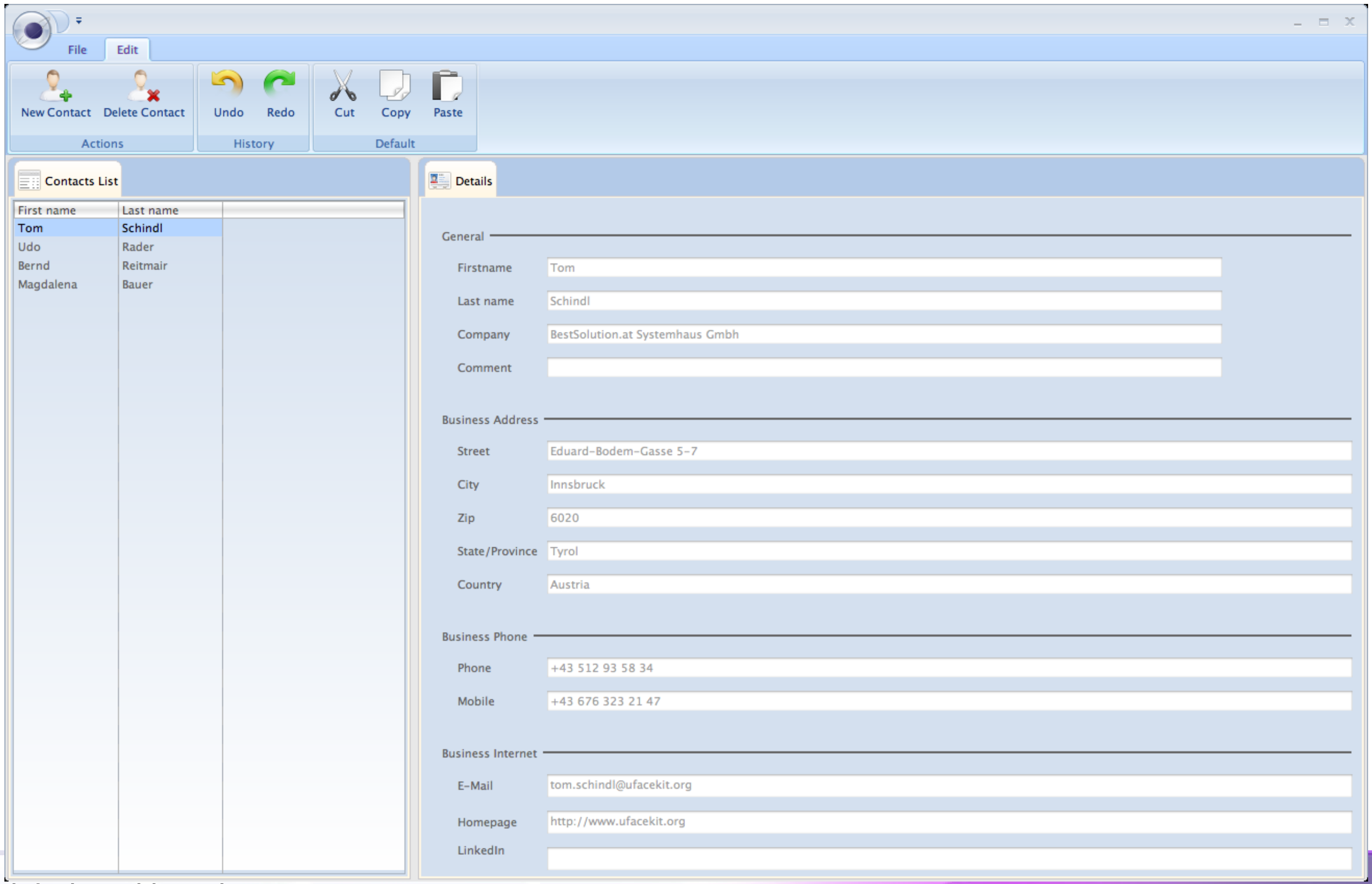
- **Tasks of the renderer**
  - Manage Lifecycle of the UI-Element
    - Creation
    - Dipose
  - Synchronize attributes between both
    - Value changes
    - Structural changes

e4 – SWT Renderer

```
public class RendererFactory extends WorkbenchRendererFactory {

  @Override
  public AbstractPartRenderer getRenderer(MUIElement uiElement,
    Object parent) {

    if (uiElement instanceof MPartStack && usePShelfRenderer() ) {

      if( stackRenderer == null ) {
        stackRenderer = new PShelfStackRenderer();
        initRenderer(stackRenderer);
      }

      return stackRenderer;
    }

    return super.getRenderer(uiElement, parent);
  }

}
```

e4 – SWT Renderer

- **Enhancing the renderers DEMO**



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