

**Tom Schindl**

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**Innsbruck, Austria**

# e4 - The platform of the future

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**DemoCamp Hamburg**  
**Friday, December 4<sup>th</sup>, 2009**

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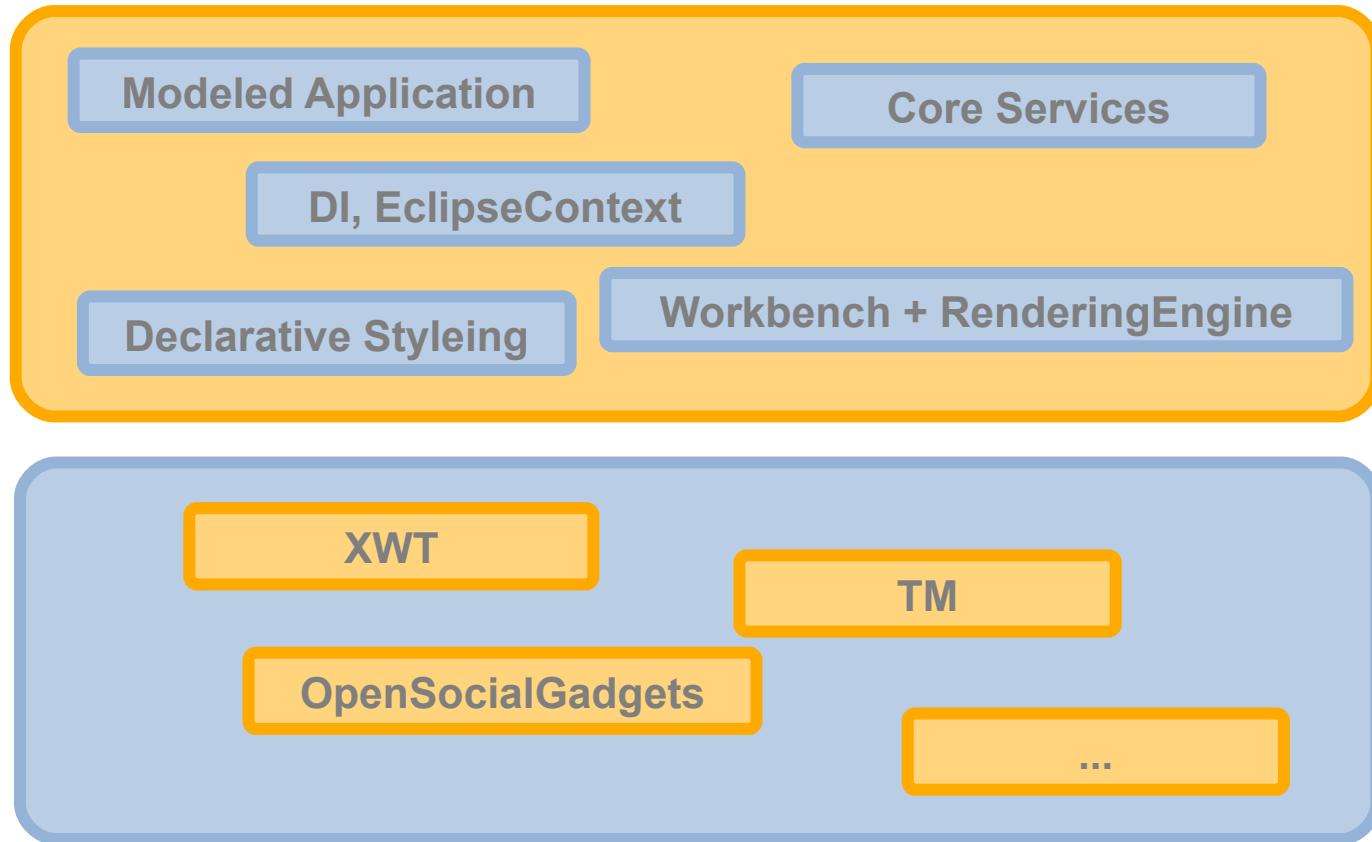
# e4 – About Me

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

# e4 – The model a short history

- **EclipseCon 08**
- **First Prototype**
  - May 20<sup>th</sup> 2008: Mail to e4-dev „A radical approach to explore new paths for e4“
    - Platform designed from Scratch
    - Based upon an EMF-Application-Model
    - No statics, no singletons, usage of DI
    - Based on OSGi-Services

# e4 – Component Overview



# 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 – The application model

## ■ Central Of the e4-Application

### Application-Model

#### UI-Structure-Elements

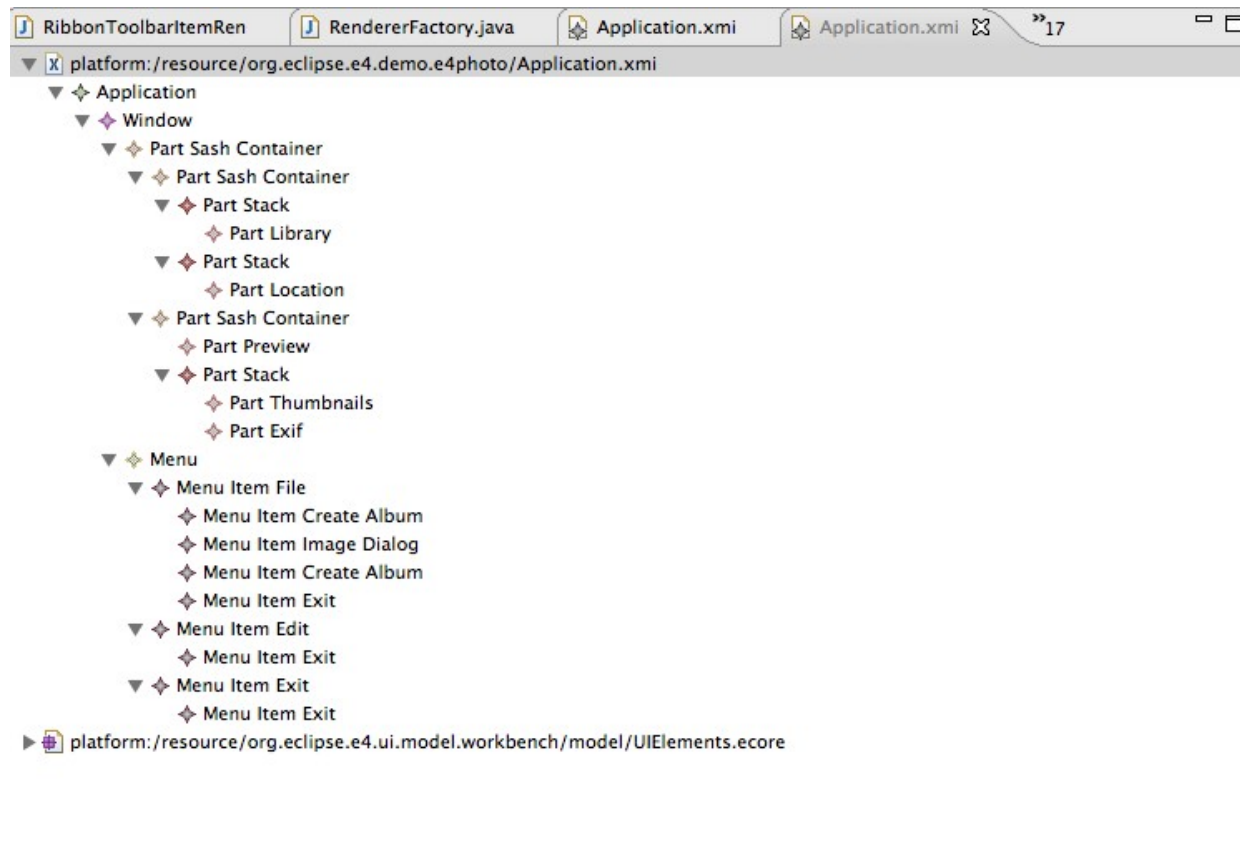
- Window
- StackPart
- SashPart
- CompositePart
- Part
- ...

#### UI-Action-Elements

- Command
- MenuItem
- ToolItem
- ...

# e4 – Anatomie of an E4-App

## ■ Application model



# e4 – Anatomie of an E4-App

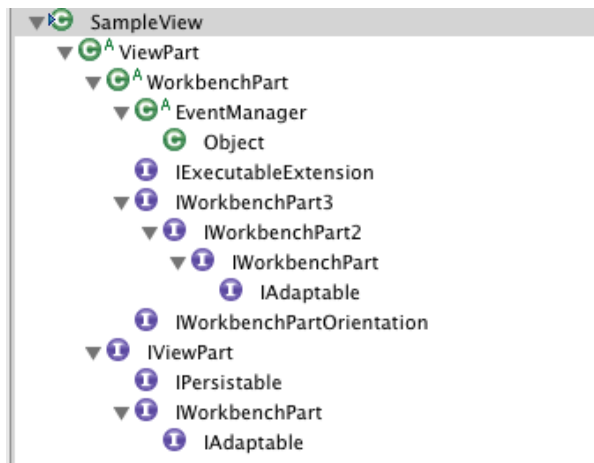
## ■ Application Logic/UI-Code in POJO

```
public class Preview {  
    public Preview(Composite parent, Realm workspace) {  
        // Create UI ...  
    }  
  
    @In  
    public void setSelection(final IFile input) {  
        // React on Selection Changes  
    }  
}
```

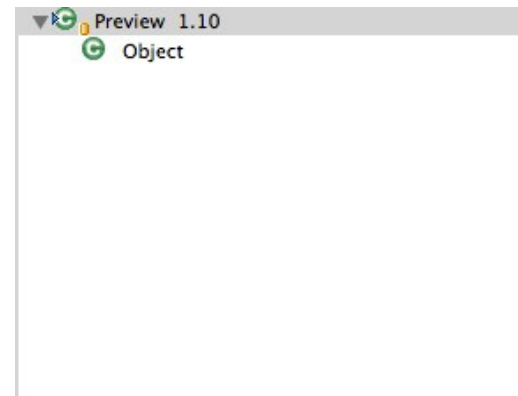
# e4 – Anatomie of an E4-App

- DI to flatten the Hierarchy

3.x

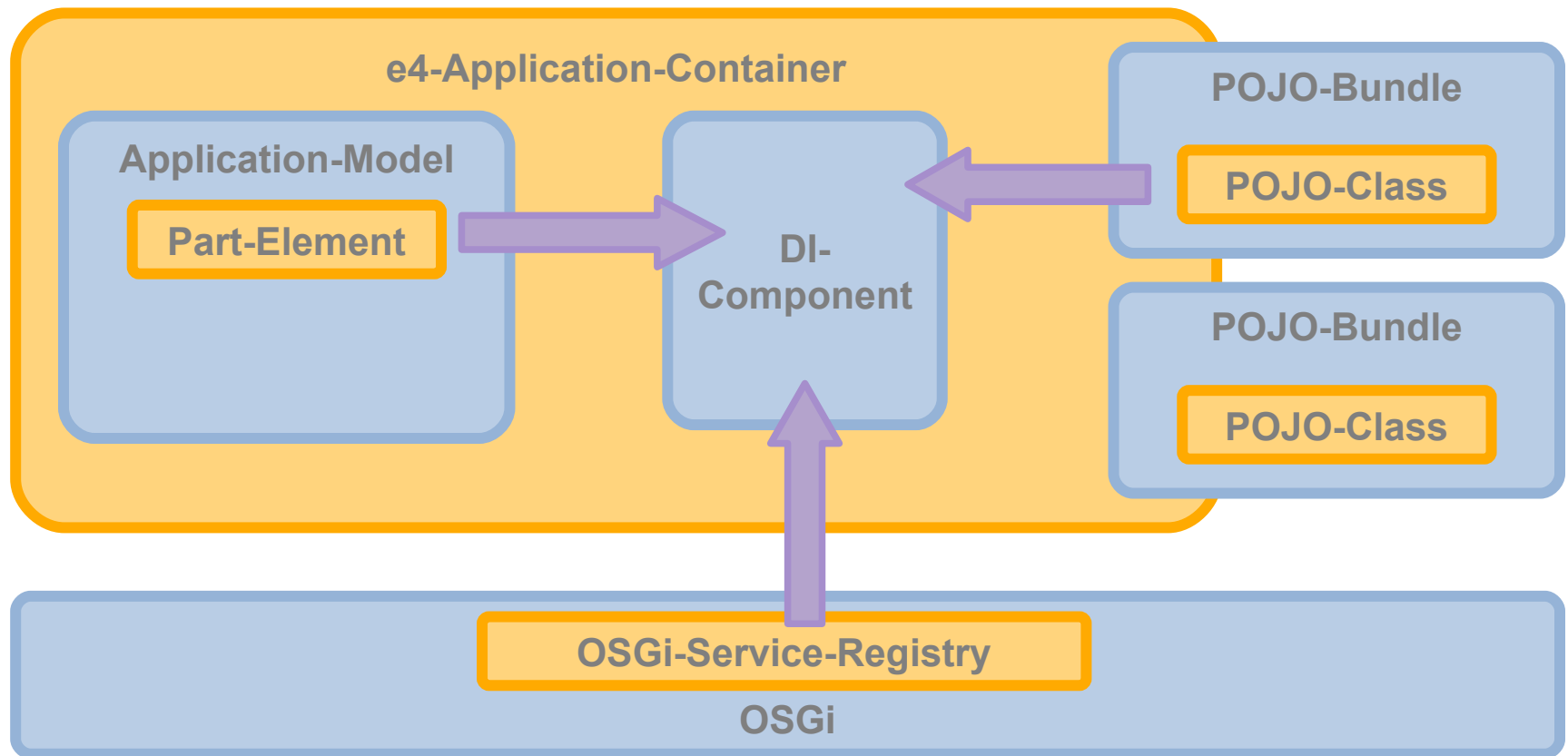


e4



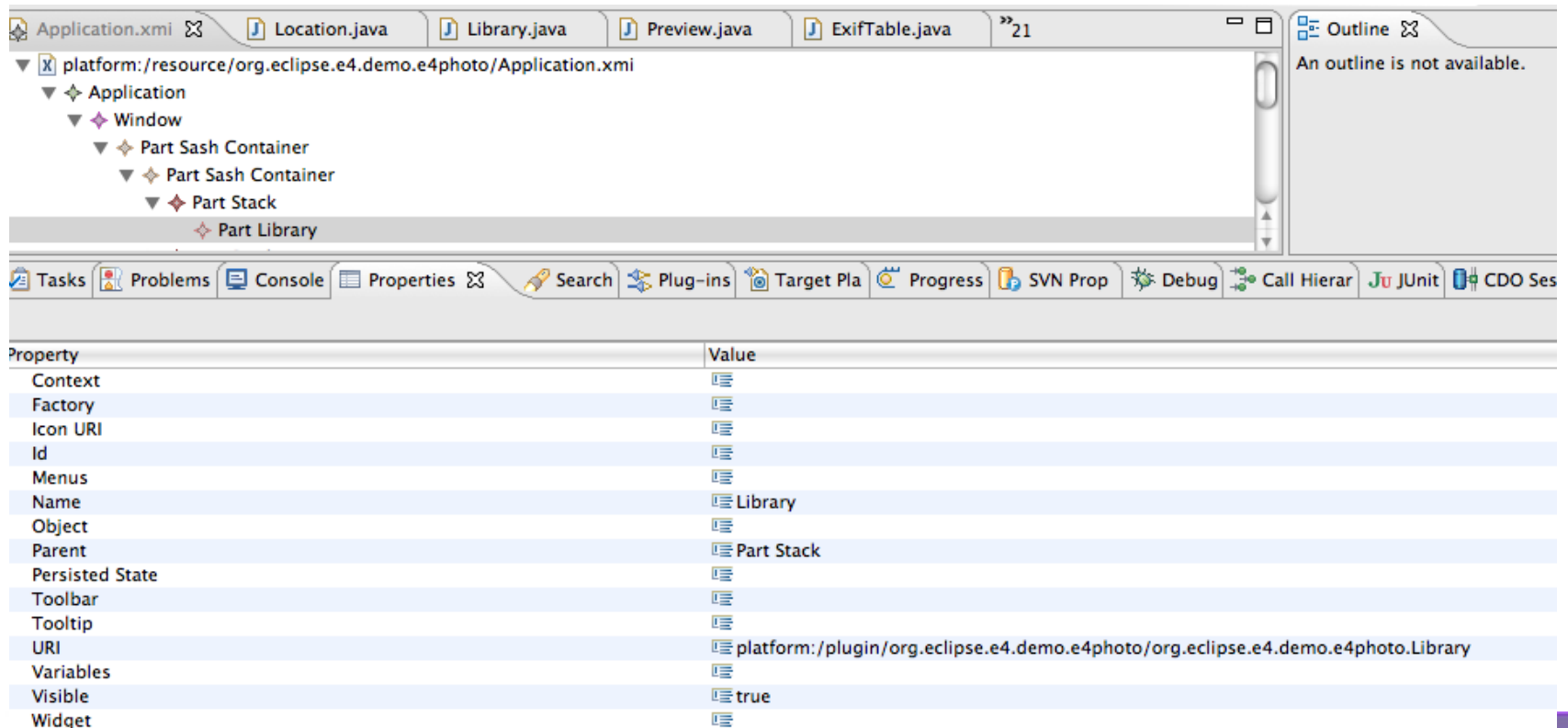
# e4 – Anatomie of an E4-App

## ■ Application-Container



# e4 – Anatomie of an E4-App

## ■ Wiring the part POJO into the Application Model



The screenshot displays the Eclipse IDE interface. The top toolbar includes icons for Tasks, Problems, Console, Properties, Search, Plug-ins, Target Pla, Progress, SVN Prop, Debug, Call Hierar, JUnit, and CDO Ses. The main editor area shows a tree view of the application model for 'platform:/resource/org.eclipse.e4.demo.e4photo/Application.xmi'. The tree structure is as follows:

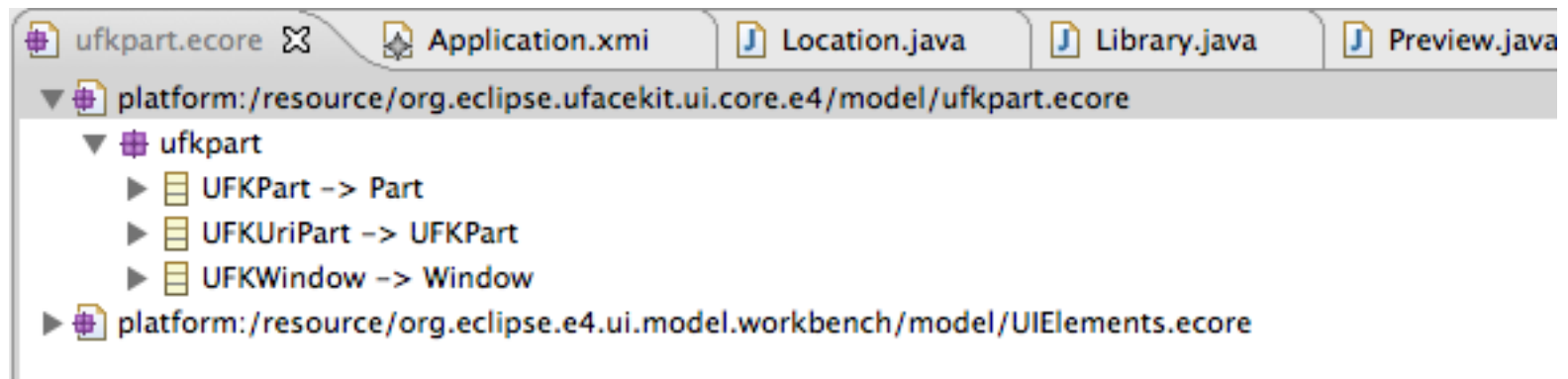
- Application
  - Window
    - Part Sash Container
      - Part Sash Container
        - Part Stack
          - Part Library

The Properties view at the bottom shows the following table:

| Property        | Value                                                                            |
|-----------------|----------------------------------------------------------------------------------|
| Context         |                                                                                  |
| Factory         |                                                                                  |
| Icon URI        |                                                                                  |
| Id              |                                                                                  |
| Menus           |                                                                                  |
| Name            |                                                                                  |
| Object          | Library                                                                          |
| 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 – Extending the App-Model

- **Derive form base and add own features**



# 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

ufkpart.ecore Application.xmi Application.xmi org.eclipse.ufactkit 22

platform:/resource/org.eclipse.ufactkit.ui.core.model.example.e4/Application.xmi

- Application
  - UFK Window
    - Part Sash Container
      - Part Stack
        - UFK Uri Part
          - Part Stack

test.txt

```
1/contactlistpart
2/contacttreepart
3/detailpart
4/e4cdo
5platform:/plugin/o
```

Outline

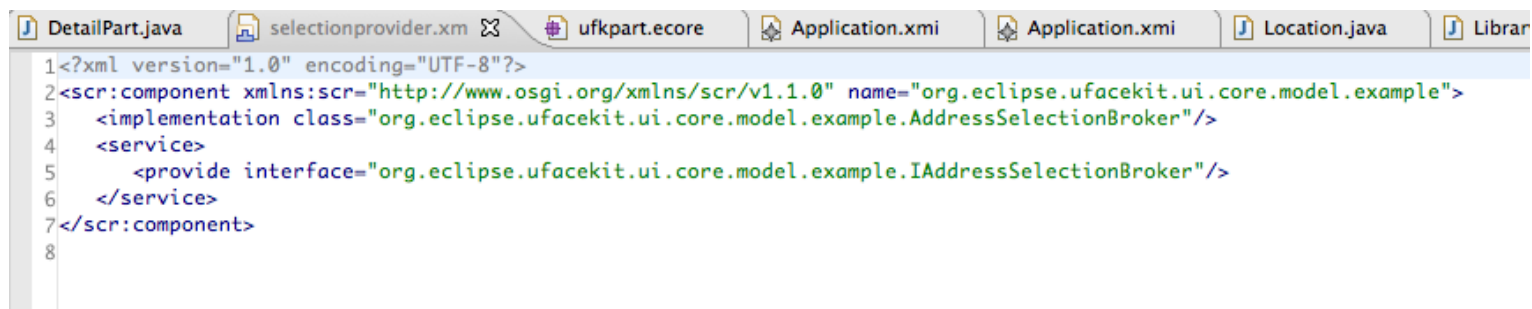
An outline is not available.

Tasks Problems Console Properties Search Plug-ins Target Platform Progress SVN Properties Debug Call Hierarchy JUnit CDO Sessions CDO Watch

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

# e4 – IEclipseContext and OSGi

- IEclipseContext is a hierarchical data structure
- E4 injects services of the local context into your POJO
  - Root of the IEclipseContext is the Equinox Service Registration



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

# e4 – IEclipseContext and OSGi

```
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 – Example Application

Contacts List

| First name | Last name |
|------------|-----------|
| Tom        | Schindl   |
| Udo        | Rader     |
| Bernd      | Reitmair  |
| Magdalena  | Bauer     |

Details

General

Firstname

Tom

Last name

Schindl

Company

BestSolution.at Systemhaus Gmbh

Comment

Business Address

Street

Eduard-Bodem-Gasse 5-7

City

Innsbruck

Zip

6020

State/Province

Tyrol

Country

Austria

Business Phone

Phone

+43 512 93 58 34

Mobile

+43 676 323 21 47

Business Internet

E-Mail

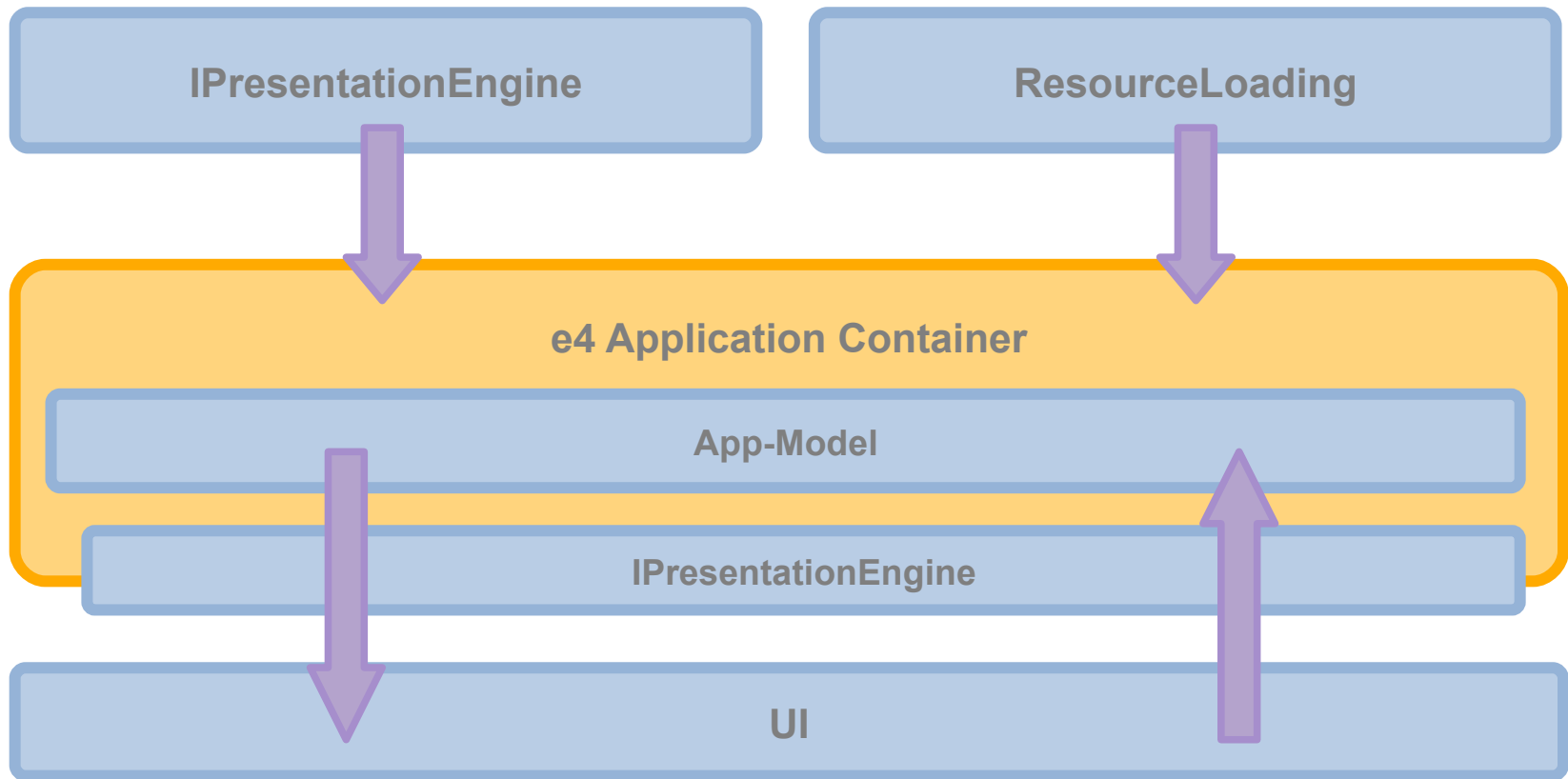
tom.schindl@ufacekit.org

Homepage

http://www.ufacekit.org

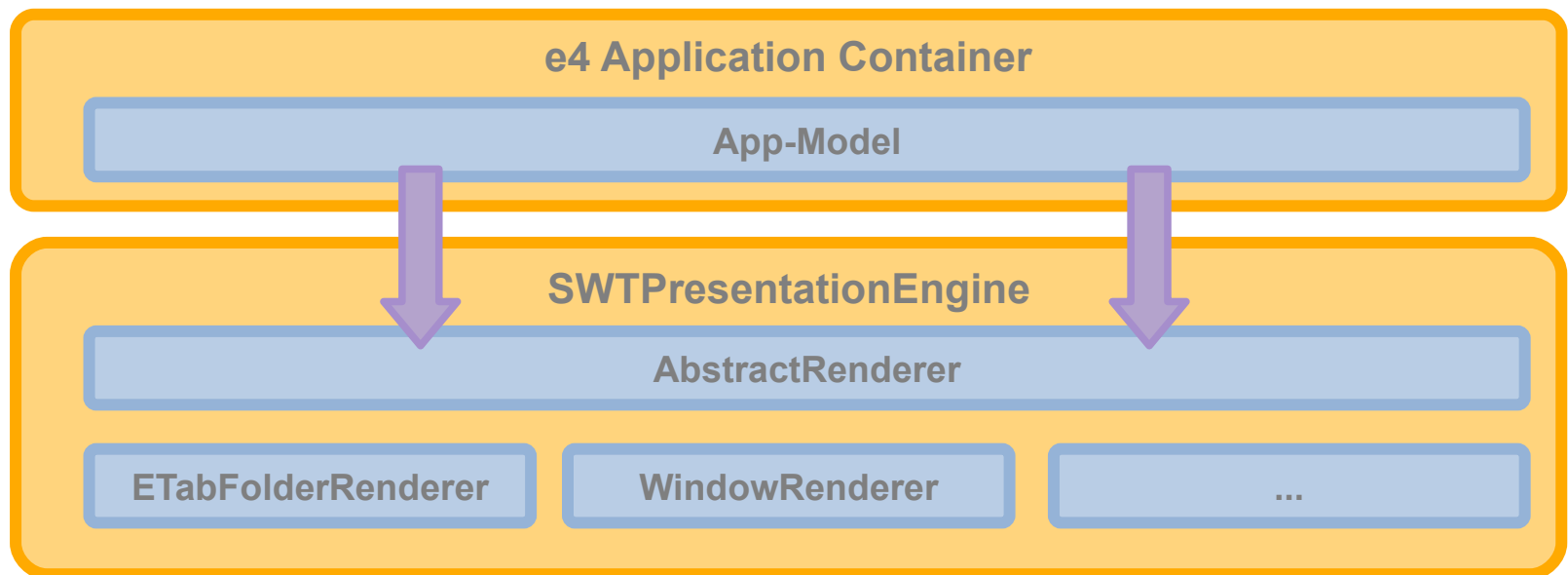
LinkedIn

# e4 – UI as a service



# e4 – UI as a service

- The presentation engine and renderer concept

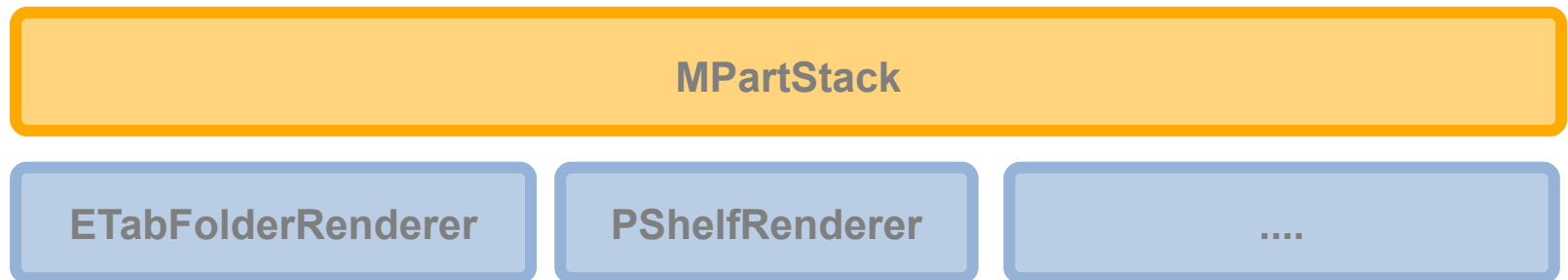


# e4 – UI as a service

- **Tasks of the renderer**
  - Manage Lifecycle of UI-Element
    - Creation
    - Dispose
  - Synchronize attributes between both
    - Value changes
    - Structural changes (add/move/remove of children)

## 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

```
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

The screenshot displays a graphical user interface for a contact management application. It is divided into two main panels. The left panel, titled 'Contacts List', contains a table with two columns: 'First name' and 'Last name'. The table lists four contacts: Tom Schindl, Udo Rader, Bernd Reitmair, and Magdalena Bauer. The contact 'Tom Schindl' is currently selected. The right panel, titled 'Details', shows the form for the selected contact. It is organized into sections: 'General' (with fields for Firstname, Last name, Company, and Comment), 'Business Address' (with fields for Street, City, Zip, State/Province, and Country), 'Business Phone' (with fields for Phone and Mobile), and 'Business Internet' (with fields for E-Mail, Homepage, and LinkedIn). The form fields are populated with the data for Tom Schindl.

| First name | Last name |
|------------|-----------|
| Tom        | Schindl   |
| Udo        | Rader     |
| Bernd      | Reitmair  |
| Magdalena  | Bauer     |

**Details**

**General**

Firstname: Tom  
Last name: Schindl  
Company: BestSolution.at Systemhaus GmbH  
Comment:

**Business Address**

Street: Eduard-Bodem-Gasse 5-7  
City: Innsbruck  
Zip: 6020  
State/Province: Tyrol  
Country: Austria

**Business Phone**

Phone: +43 512 93 58 34  
Mobile: +43 676 323 21 47

**Business Internet**

E-Mail: tom.schindl@ufacekit.org  
Homepage: http://www.ufacekit.org  
LinkedIn:

# e4 – SWT Renderer

## ■ Enhancing the renderers

The screenshot displays the e4 SWT Renderer application window. The interface is divided into three main sections: a menu bar, a toolbar, and a main content area. The menu bar includes 'File' and 'Edit'. The toolbar contains icons for 'New Contact', 'Delete Contact', 'Undo', 'Redo', 'Cut', 'Copy', and 'Paste'. The main content area is split into two panes. The left pane, titled 'Contacts List', shows a table with two columns: 'First name' and 'Last name'. The right pane, titled 'Details', shows a form for editing a contact's information.

| First name | Last name |
|------------|-----------|
| Tom        | Schindl   |
| Udo        | Rader     |
| Bernd      | Reitmair  |
| Magdalena  | Bauer     |

**Details**

General

Firstname: Tom  
Last name: Schindl  
Company: BestSolution.at Systemhaus Gmbh  
Comment:

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Street: Eduard-Bodem-Gasse 5-7  
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# e4 – Open Social Gadgets

## ■ What are OpenSocialGadgets

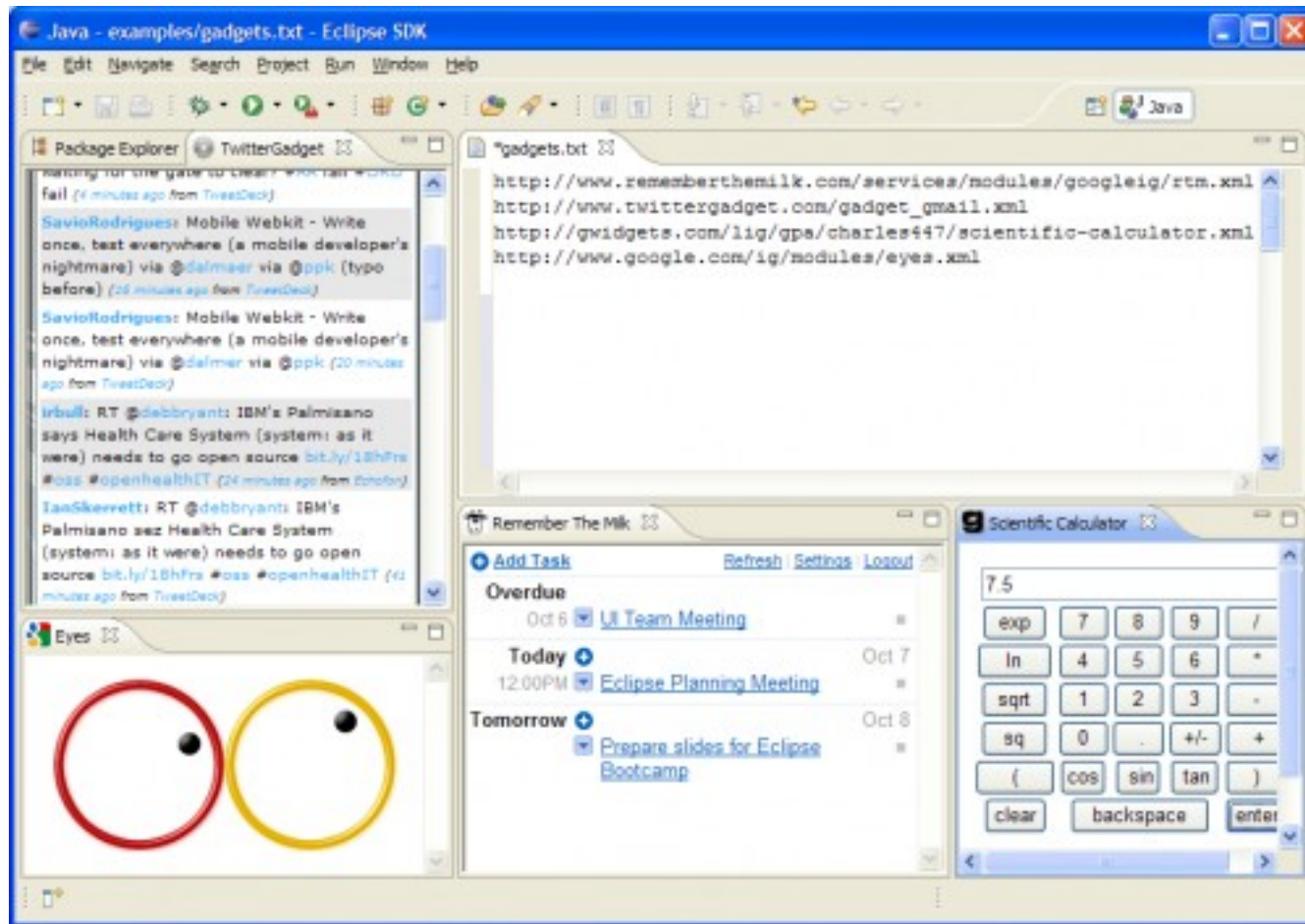
Gadgets are web-based software components based on HTML, CSS, and JavaScript.

## ■ Open Eclipse for a new set of developers

## ■ Examples

- Remember the Milk <http://www.rememberthemilk.com>
- Twitter Gadget
- ...

# e4 – Open Social Gadgets



# e4 – Additional Areas

- **XWT**
  - Based upon XAML concepts
  - Provides Visual Designers
- **TM**
  - Modeled UI exploration
- **Language support**
  - Write bundles e.g. in JavaScript

# e4 – Online Resources

- **e4 wiki**

<http://wiki.eclipse.org/E4>

- **E4 whitepaper**

<http://www.eclipse.org/e4/resources/e4-whitepaper.php>

- **Personal Blog**

<http://tomsondev.bestsolution.at/>



**THE END**