

Frontend Modernization for a Banking Application

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«WebKat» Application

- **Domain** Credit/loan/mortgage application
- **Customer** Large Swiss banking group
- **Users** approx. 8'000 (30 branches)
- **App. Age** > 10 years

Status

- Yes – contains legacy technology
- But – is vital for the business
- And – needs to run for many more years

«WebKat» Pain Points

1. High **maintenance costs**
2. UI is **legacy technology**

What does this mean?

- Just adding a field to the UI takes days
- Dependency to (inhouse) RTK framework based on JSP
- No interest in maintenance/continuation of RTK
- RTK maintenance too expensive
- Desire to move away from JSP

What now?
Modernize!

«WebKat» Modernization Project

Two Goals

1. Replace the proprietary RTK UI framework
2. Reduce maintenance costs

Scope / Requirements

- Focus on Frontend
- No (re)training of users allowed
 - 1:1 dialog layout
 - 1:1 functionality

JSP (Google Trends)



Going away from JSP is ok ...

... but where to go?

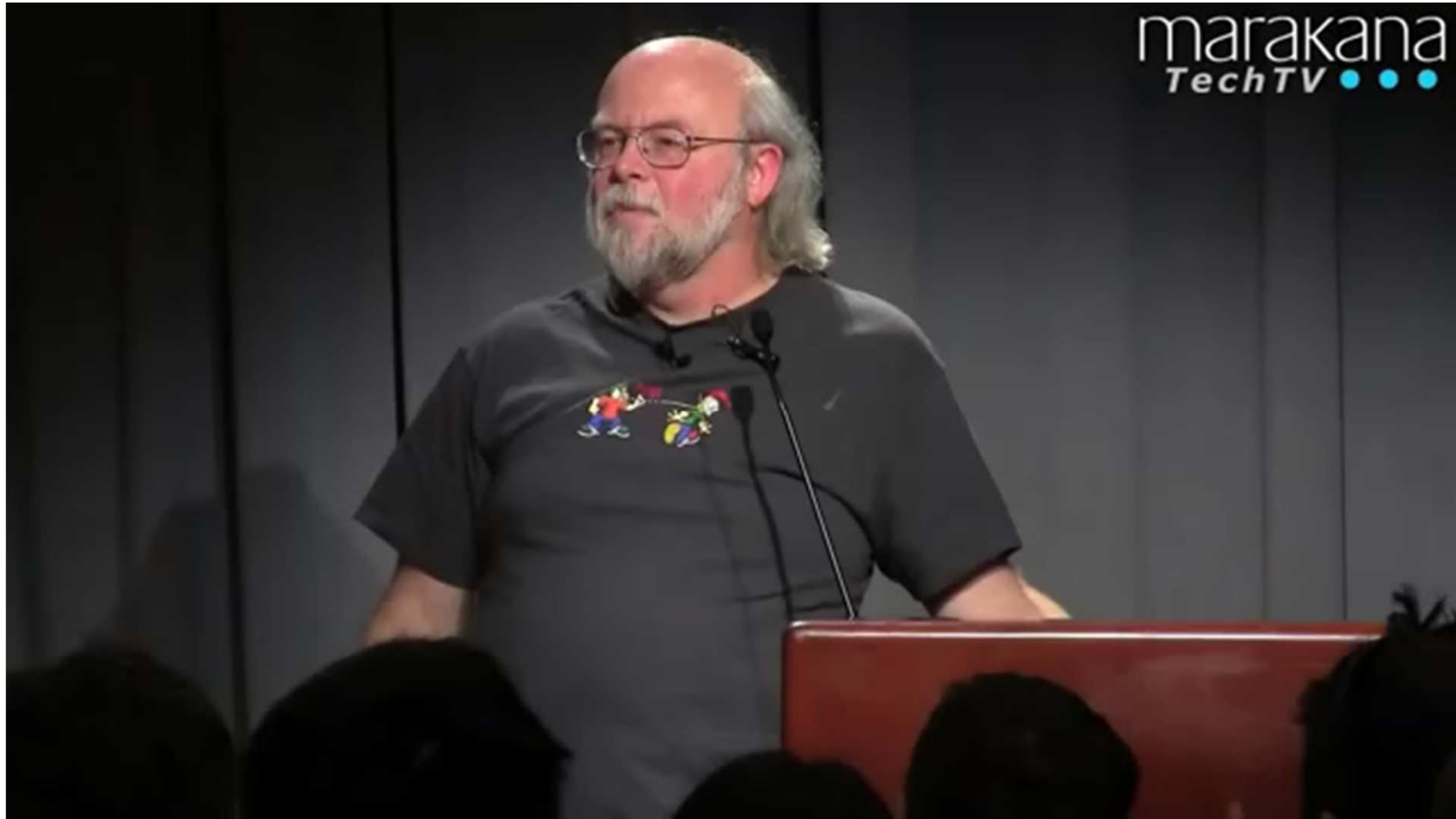
Choosing a UI Frameworks
Not an easy Task

Replacement Candidates for JSP



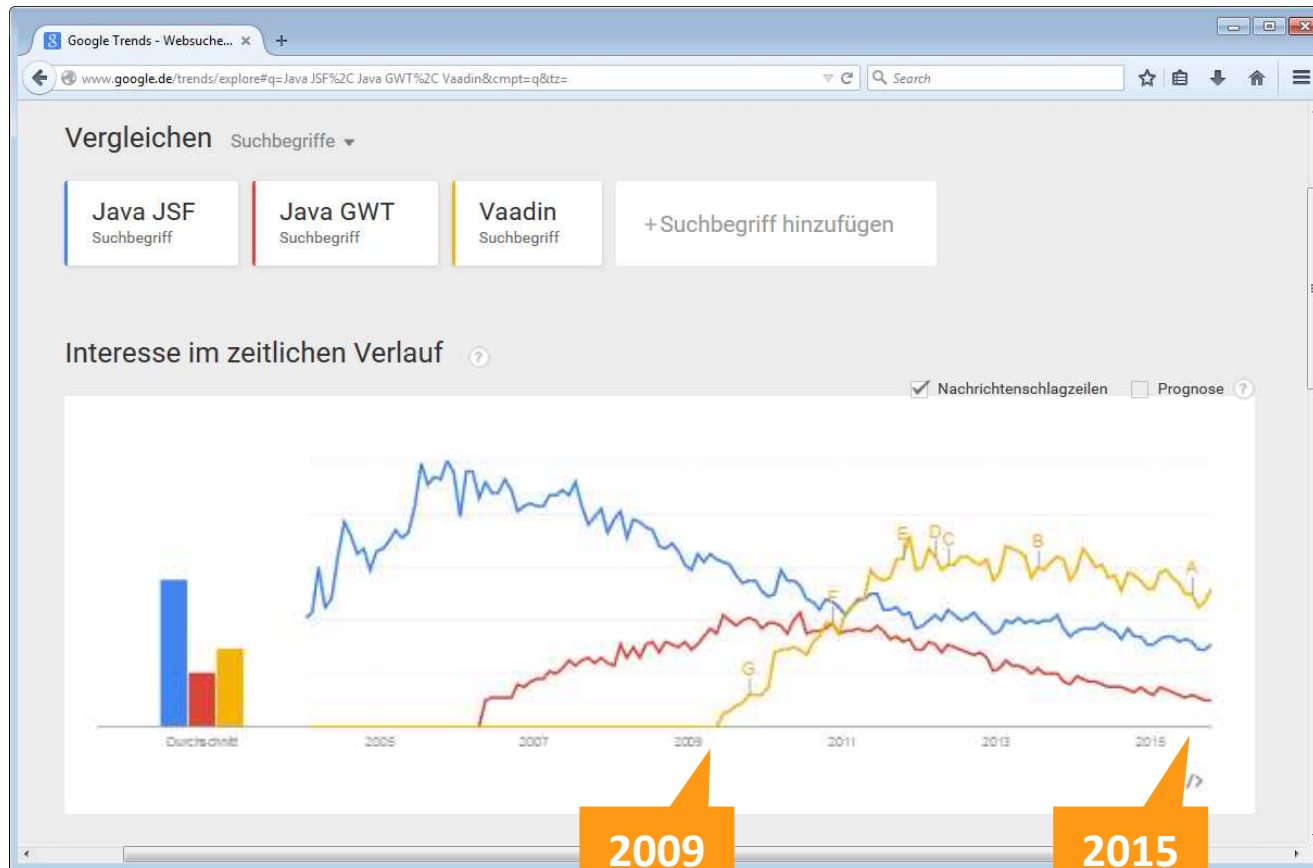
JSF?

James Gosling on JSF



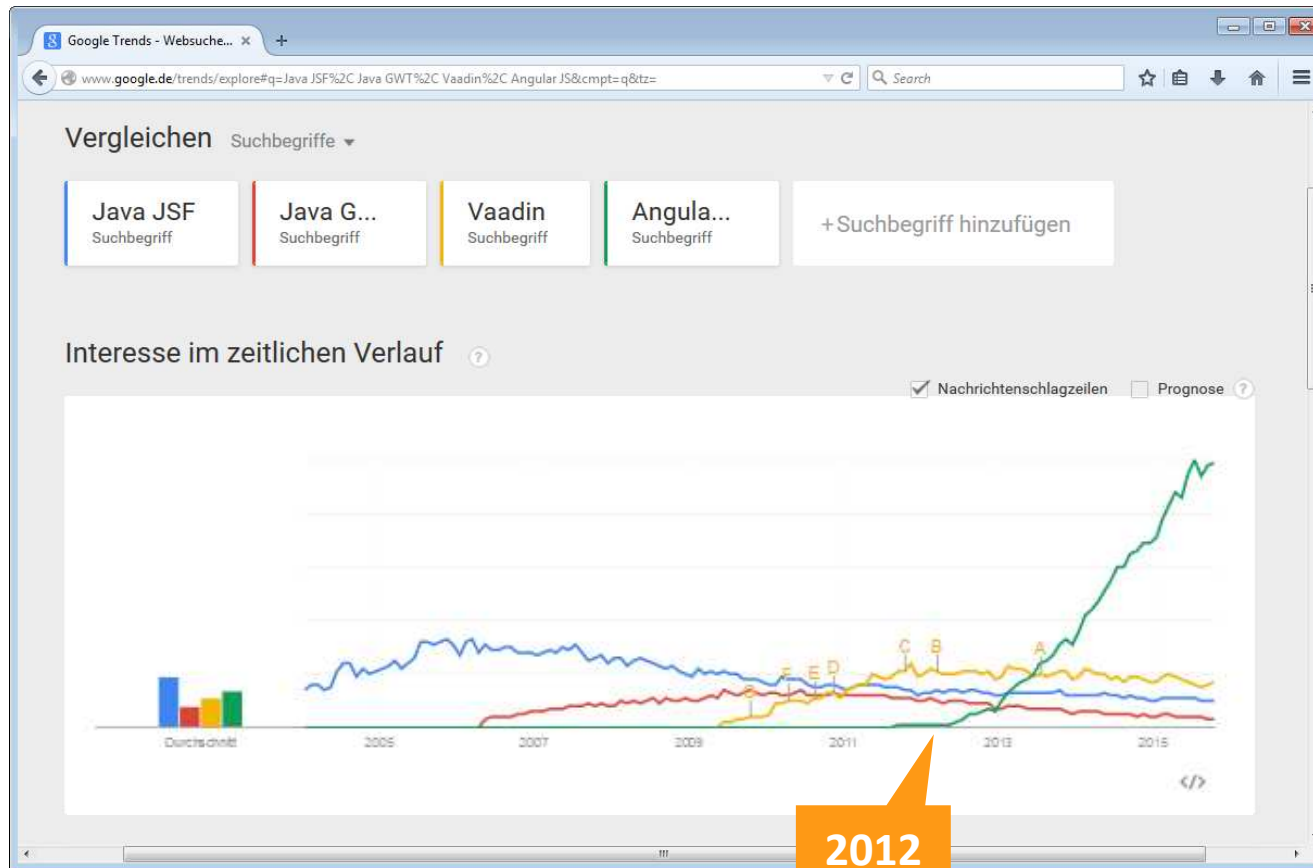
<https://www.youtube.com/watch?v=9ei-rbULWoA> (<http://www.clipconverter.cc/>)
Time: '47:05 – '47:20 (JSF vs the others: they are all awful" ...)

JSF, GWT and Vaadin



... hmm

JavaScript, HTML5?



Adam Biem on HTML5



<https://www.youtube.com/watch?v=KDZ7CdtMTfw> (<http://www.clipconverter.cc/>)
'24:53 – '26:41 (AdamBiem @ DevDay Dresden, 19.06.2015)

Whatever we evaluate ...

2018 (3 years)

- Is the UI framework still relevant?
- What about newcomers?

2025 (10 years)

- Ideas? Anyone?
- What now?

Banks' Decision

- No new UI Framework
- RTK framework replaced by **Eclipse Scout**

Why?

- Scout is independent of UI technology
- Open source benefits
 - Actively maintained (by somebody else)
 - Professional services available
 - Minimal training required

Eclipse Scout

Eclipse Scout

Scout Framework

- Built for **Business Applications**
- **Multi Device** support
- UI technology independent

Framework **Benefits**

- **Future proof** (enterprise apps live > 10 years)
- Boosts **productivity** (producing software in Switzerland ...)
- **Simple** to learn (developers become productive in 1-2 weeks)

Future proof?

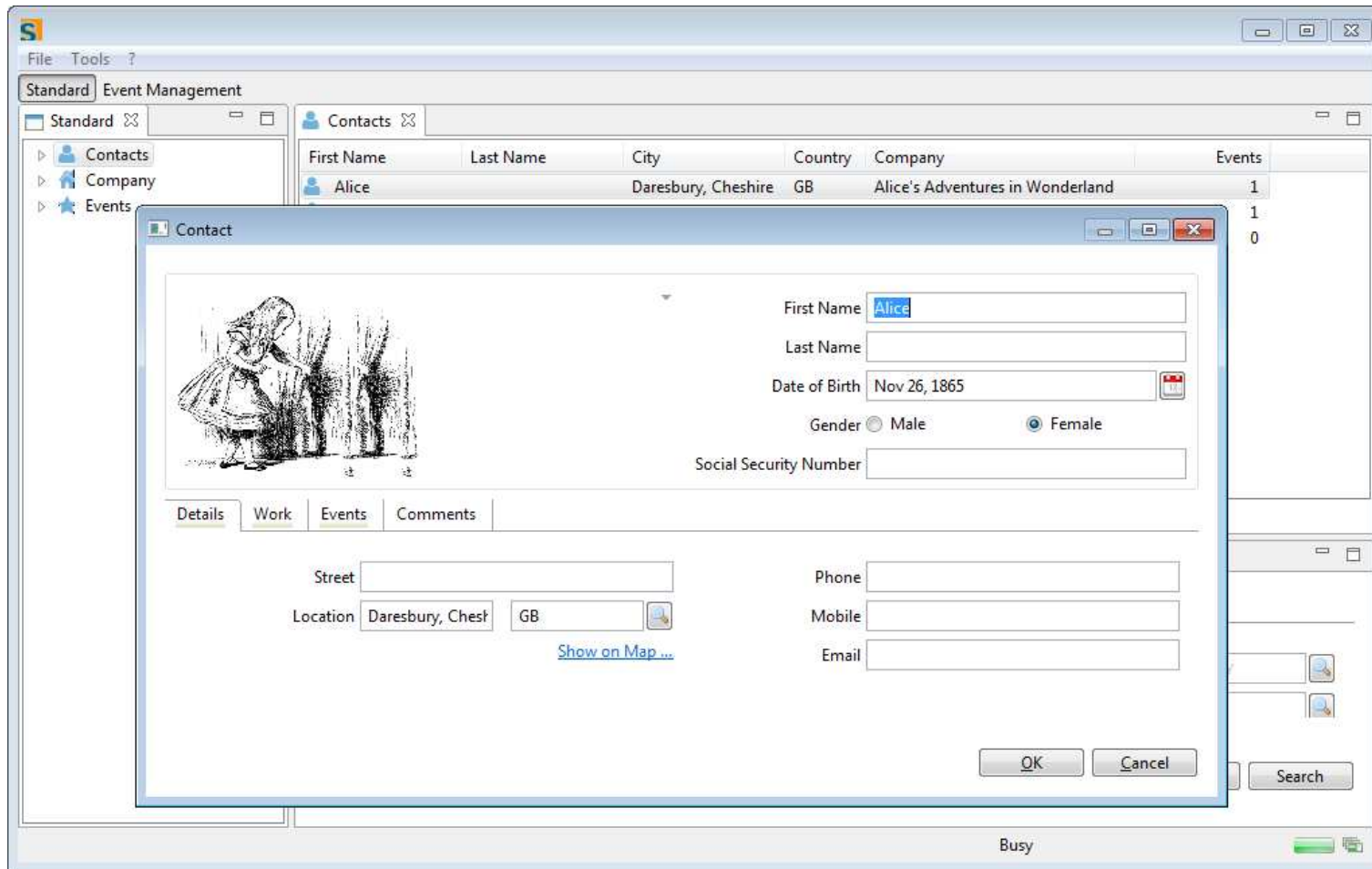
Some Fundamentals

Core Business Applications

- Formally capture process knowledge of organisation
- This knowledge represents the applications value
- It takes years to build such knowledge
- UI technologies are only a means to an end
- UI technologies get «old» soon
- Replacement/modernisation is expensive

«Business rarely willing to spend money on something not considered valuable»

Future proof? Scout Luna/Mars UI



Future proof?

Scout Luna/Mars Code

```
@Order(1000.0)
public class MainBox extends AbstractGroupBox {

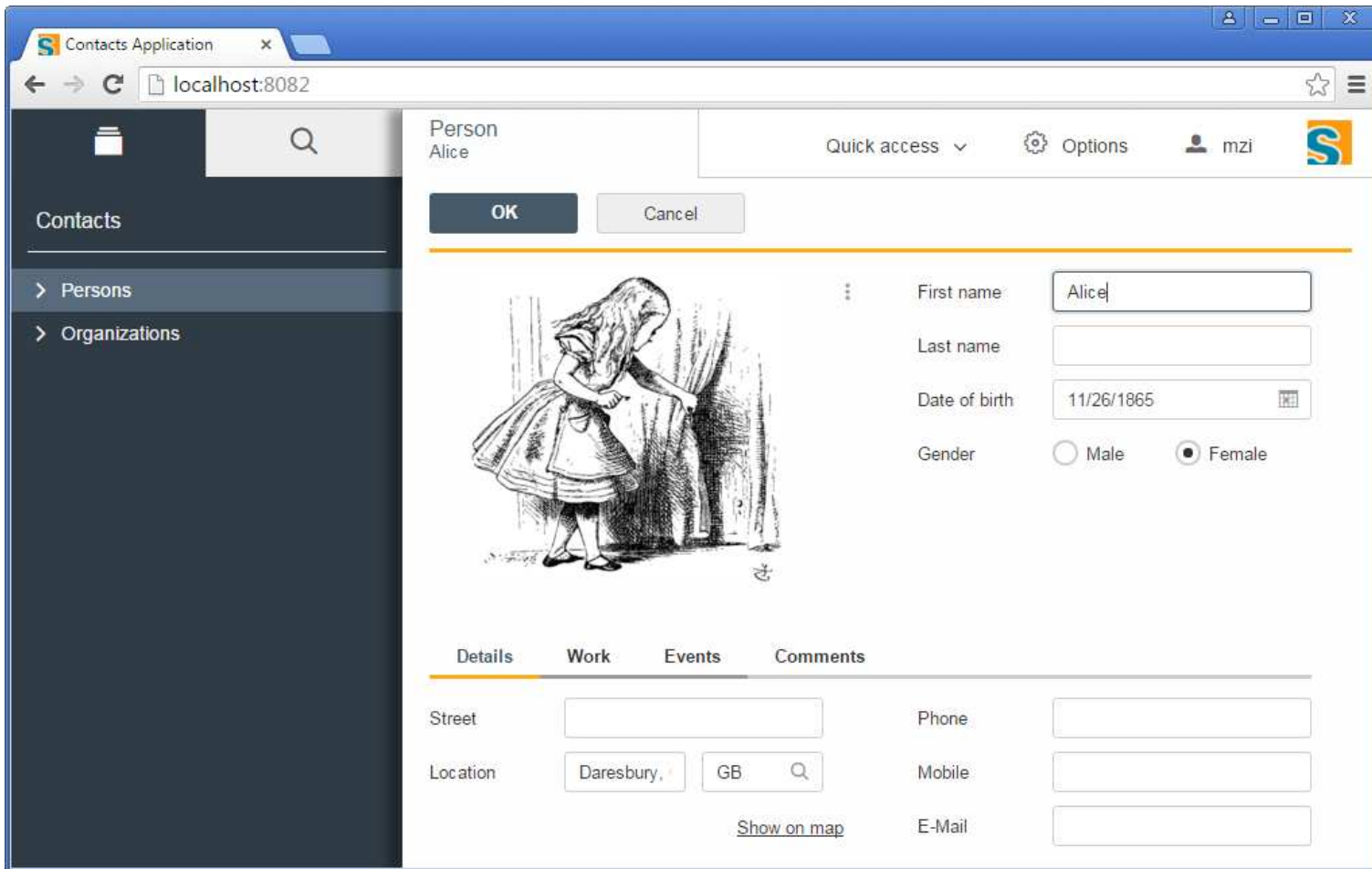
    @Order(1000.0)
    public class GeneralBox extends AbstractGroupBox {

        @Order(0.0)
        public class PictureBox extends AbstractPictureBox {
        }

        @Order(2000.0)
        public class FirstNameField extends AbstractStringField {

            @Override
            protected String getConfiguredLabel() {
                return TEXTS.get("FirstName");
            }
        }
    }
}
```

Future proof? Scout Neon UI



Future proof?

Scout Neon Code

```
@Order(1000.0)
public class MainBox extends AbstractGroupBox {

    @Order(1000.0)
    public class GeneralBox extends AbstractGroupBox {

        @Order(0.0)
        public class PictureBox extends AbstractPictureBox {
        }

        @Order(2000.0)
        public class FirstNameField extends AbstractStringField {

            @Override
            protected String getConfiguredLabel() {
                return TEXTS.get("FirstName");
            }
        }
    }
}
```

Future proof? Protection of Investment

Scout Luna

```
@Order(1000.0)
public class MainBox extends AbstractGroupBox {

    @Order(1000.0)
    public class GeneralBox extends AbstractGroupBox {

        @Order(0.0)
        public class PictureBox extends AbstractPictureBox {
        }

        @Order(2000.0)
        public class FirstNameField extends AbstractStringField {

            @Override
            protected String getConfiguredLabel() {
                return TEXTS.get("FirstName");
            }
        }
    }
}
```

=

Scout Mars

```
@Order(1000.0)
public class MainBox extends AbstractGroupBox {

    @Order(1000.0)
    public class GeneralBox extends AbstractGroupBox {

        @Order(0.0)
        public class PictureBox extends AbstractPictureBox {
        }

        @Order(2000.0)
        public class FirstNameField extends AbstractStringField {

            @Override
            protected String getConfiguredLabel() {
                return TEXTS.get("FirstName");
            }
        }
    }
}
```

... 1999



... 2005

The screenshot displays a software application window titled "ORFIS BSI AG". The interface includes a menu bar (Datei, Extras, Favoriten, Hilfe - Sample Menu), a toolbar, and a main workspace. On the left, a tree view shows a hierarchy of "Firmen" (Companies) with sub-entries like "BA BSI", "BSI BADEN", "BSI USA", and "BSI ZUG", along with "Projekte" (Projects) and "Personen" (Persons). The main workspace shows a table of company data:

Firmenkurzname	Firmenname	Firmen-Nr.	Telefon	PLZ	Ort	Land	Region	Branche
BA BSI	Signalling	257	0046 8 681 5501	12096	Stockholm	Schweden	Europa	Industrie
BSI BADEN	BSI Business Systems Integr...	1	056 484 19 20	5405	Dätwil AG	Schweiz	Europa	Informatik
BSI USA	BSI Business Systems Integr...	583	+1 908 252-0300	NJ 089...	Somerville	U.S.A.	Arnetika	Informatik
BSI ZUG	BSI Business Systems Integr...	2	056 484 19 20	6340	Baar	Schweiz	Europa	Informatik

Overlaid on the interface are several branding elements: the Java logo, the Eclipse IDE logo (eclipse 3.0 THE ECLIPSE PROJECT), and the XML logo (<xml />). A "Firmen suchen" (Search Companies) dialog box is open, showing search criteria for "Firma" (Company) with fields for "Firmenkurzname", "Firmenname", "Firmen-Nr.", "Hauptbetroun", "Region", and "Rating". It also includes a "Sprache" (Language) dropdown, "Konzernstruktur" (Corporate Structure), "Installierte Basis" (Installed Base), and checkboxes for "aktive Firmen" (active companies) and "inaktive Firmen" (inactive companies). Buttons for "Suche" (Search) and "Zurücksetzen" (Reset) are visible at the bottom of the dialog.

Eclipse Scout 2011

The screenshot displays the BSI CRM application window. The interface includes a navigation pane on the left with a tree view of entities like Companies, Persons, and Tickets. The main area shows a table of contact persons with columns for Name, Given name, Language, Main account manager, Phone, Mobile phone, and E-mail. Below the table, there are logos for Scout (a stylized 'S' in orange and blue), Java (the red Java logo), and Eclipse (the Eclipse logo).

Name	Given name	Language	Main account manager	Phone	Mobile phone	E-mail
Fleseriu	Gabriel	Deutsch	Pedersen, Morten	+41 (56) 484 1...	+41 (79) 321 ...	gabriel.fleseriu@bsiag.com
Frei	Pascale	Deutsch	Isler, Claudia	+41 (56) 484 1...	+41 (79) 474 ...	pascale.frei@bsiag.com
Funk	Uwe	Deutsch	Pedersen, Morten	+41 (56) 484 1...	+41 (78) 920 ...	uwe.funk@bsiag.com
Geismann	Matthias	Deutsch	Bernold, Martin	+41 (56) 484 1...		matthias.geismann@bsia...
						lavid.gerhard@bsiag.com
						:audio.guglielmo@bsiag.c...
						anders.hansen@bsiag.com
						volger.heymanns@bsiag.c...
						justav.hilpert@bsiag.com
						oger.hitz@bsiag.com
						nuriel.hochuli@bsiag.com
						andreas.hoegger@bsiag.c...
						nark.huber@bsiag.ch
						eno.hug@bsiag.com
						sion.huws@bsiag.com
						:laudia.isler@bsiag.com
						evin.kim@bsiag.com
						runo.koefler@bsiag.com
						sigrid.kristiansen@bsiag.c...
Kristiansen	Ulrik	Deutsch		+11 (56) 484 1...	+41 (79) 433 ...	ulrik.kristiansen@bsiag.com
Leicht	Stephan	Deutsch	Seitel, Peter	+41 (56) 484 1...		stephan.leicht@bsiag.com
Lenz	Alberto	Deutsch	Rusche, Christian		+41 (79) 400 ...	alberto@lenz.net
Meer	Astrid	Deutsch	Schöb, Benjamin	+41 (56) 484 1...		astrid.meer@bsiag.com
Merkli	Stephan	Deutsch	Moser, Samuel	+41 (56) 484 1...	+41 (79) 388 ...	stephan.merkli@bsiag.com
Mittmann	Johannes Max	Deutsch	Nielsen, Jan Klint	+41 (56) 484 1...		max.mittmann@bsiag.com
Mortasawi	Mazda	Deutsch	Moser, Samuel	+41 (56) 484 1...	+41 (76) 435 ...	mazda.mortasawi@bsiag.c...
Moser	Adrian	Deutsch	Reichlin, Benedikt	+41 (41) 766 8...		adrian.moser@bsiag.com
Moser	Samuel	Deutsch	Rusche, Christian	+41 (56) 484 1...		samuel.moser@bsiag.com

85 objects, 1 selected

Eclipse Scout 2015/16

The screenshot displays the BSI CRM software interface. The browser address bar shows the URL <https://services.bsi-software.com/bsicrm/>. The main header includes a search bar, a star icon, and a refresh icon. The breadcrumb trail indicates the current view: **Firma** > ECLIPSE FOUNDATION > Person > Stephan Leicht Vogt (BSI BA...). Action buttons for **Speichern**, **Abbrechen**, and **Prüfung auf Doublette vornehmen** are visible. The user profile for Matthias Zimmermann is shown in the top right.

The left sidebar contains a navigation menu with categories: **Daten**, **Firmen**, **Personen**, **Aufträge**, **Tickets**, **Geschäftsvorfälle**, **Kommunikationen**, **Aufgaben**, and **Dokumente**. The **Personen** section is expanded to show the profile for Stephan Leicht Vogt (BSI BADEN).

The main content area shows the company profile for **ECLIPSE FOUNDATION**. The **Kurzname** is "ECLIPSE FOUNDATION" and **Name 1** is "Eclipse Foundation Inc.". The **Rating** section features logos for Scout (a blue 'S' on an orange square), Java (the red Java logo), and JavaScript (HTML5 and CSS3 logos). The **Segmenti** section has checkboxes for **Bee** (checked), **Firm**, **Key**, and **Kon**.

Below the profile, there are tabs for **Adressen**, **Bemerkungen**, **Informationen**, **Marketing**, **Finanzielle Daten**, **Dokumente**, and **Anderungen**. The **Adressen** tab is active, showing contact information:

Fax Bevorzugt	+1 (613) 224-5172
E-Mail Bevorzugt	info@eclipse.org
Website Bevorzugt	www.eclipse.org
Anschrift Bevorzugt	Eclipse Foundation Inc. 102 Centrepointe Drive Ottawa, Ontario K2G 6B1

The address form also includes fields for **Adresszusatz 1**, **Adresszusatz 2**, **102 Centrepointe Drive**, **Postfachbezeichnung**, **Postfachnummer**, and a dropdown for **CA** with a search icon, **K2G 6B1** with an edit icon, and **Ottawa** with an edit icon.

The «WebKat» Project

«WebKat» Modernization

Different Options

Manual Transformation

→ Manually translate JSP into Scout/Java code

Automatic Transformation

→ Write JSP parser

→ Write transformer to Scout/Java

Mixed approach

→ Automatically transform simple elements

→ Manually translate complex parts

Modernization: **Manual Approach**

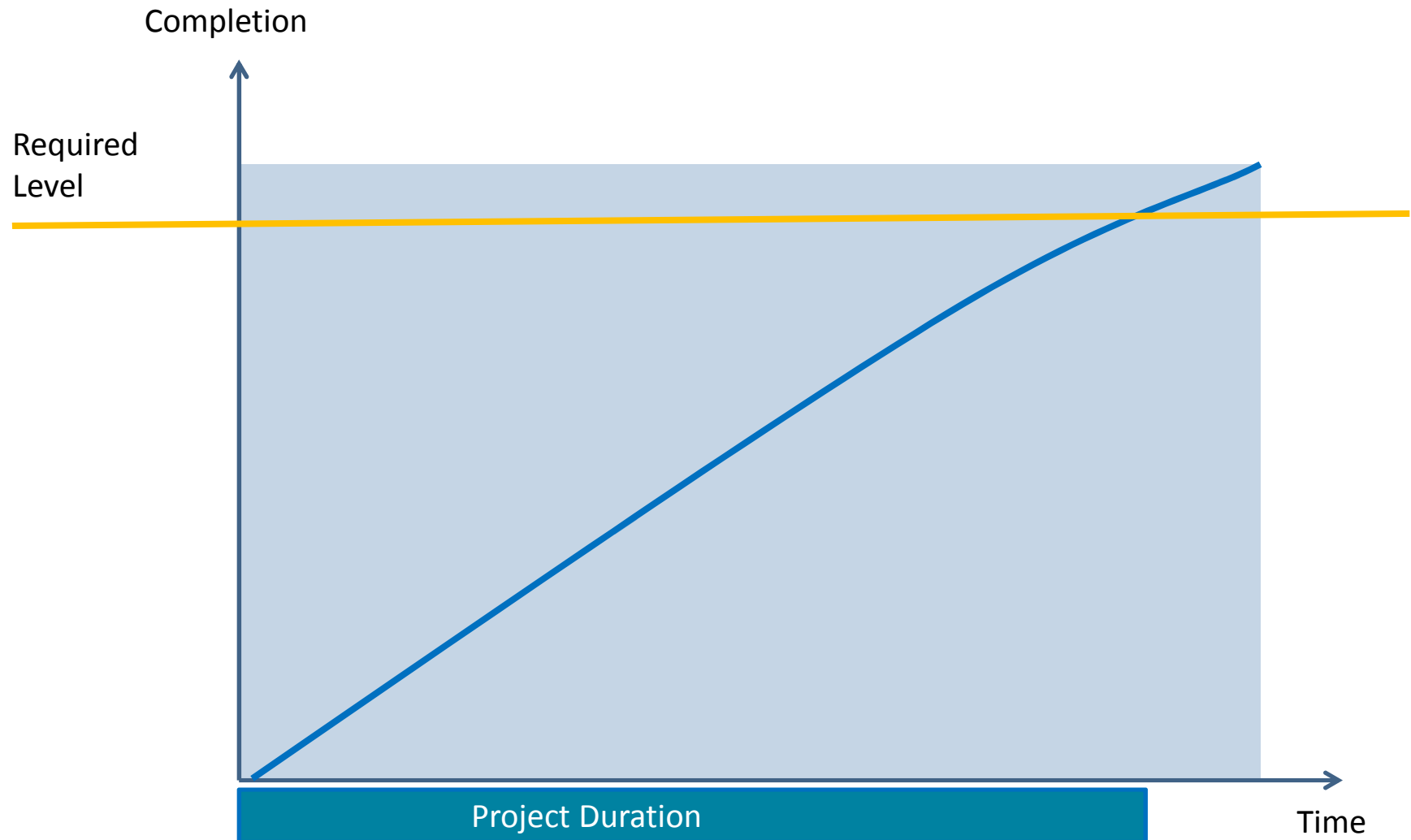
Advantages

- Developers can also handle complex cases
- Managing progress in this setup is «simple»

Issues

- Costly (for simple and repetitive tasks)
- Manual modernization takes time
- Quality of resulting code base
 - Inconsistencies
 - Bugs

Modernization: Manual Approach



Modernization: **Fully Automatic Approach**

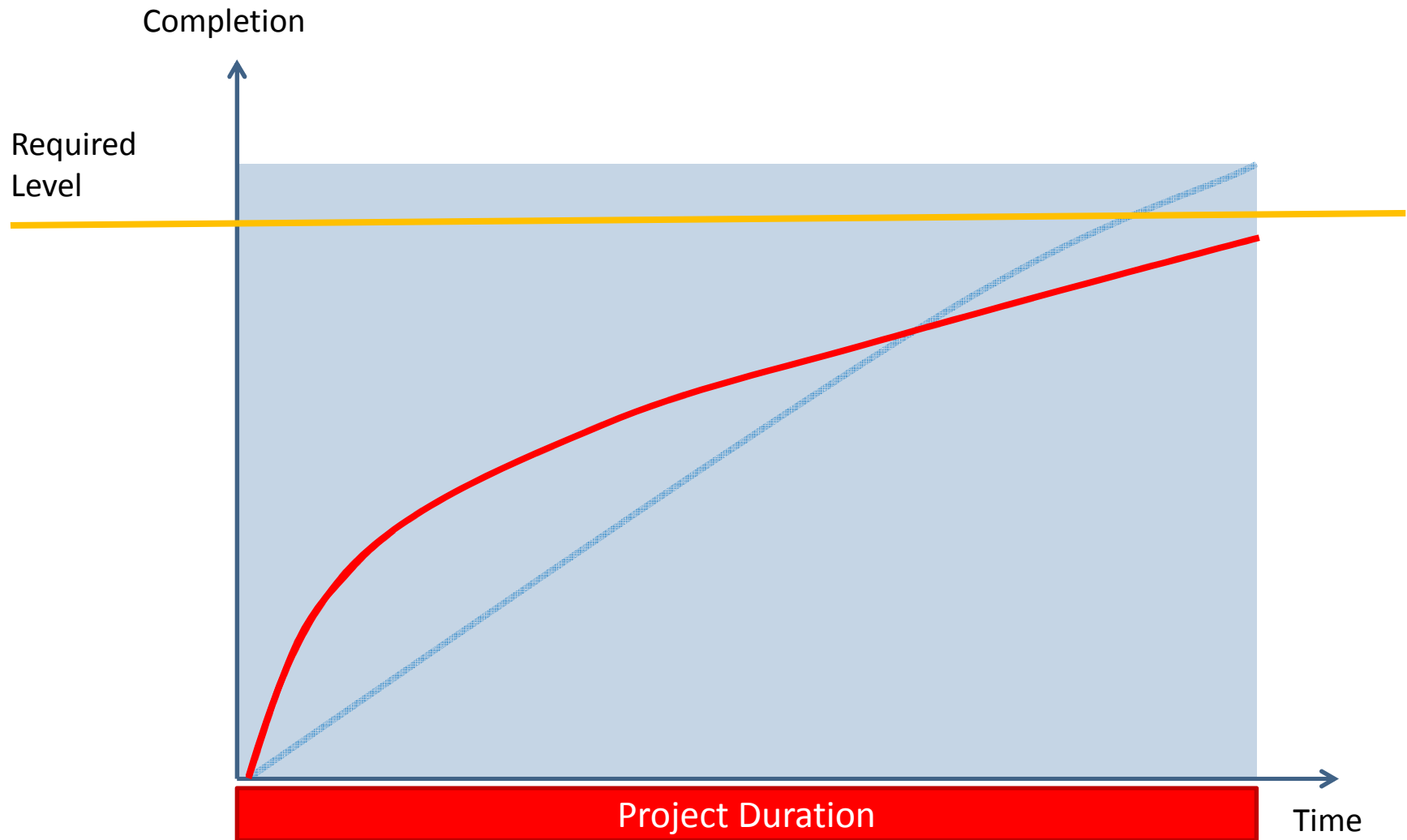
Advantages

- Rapid progress (initially)
- High quality
 - Consistent code base
 - No bugs

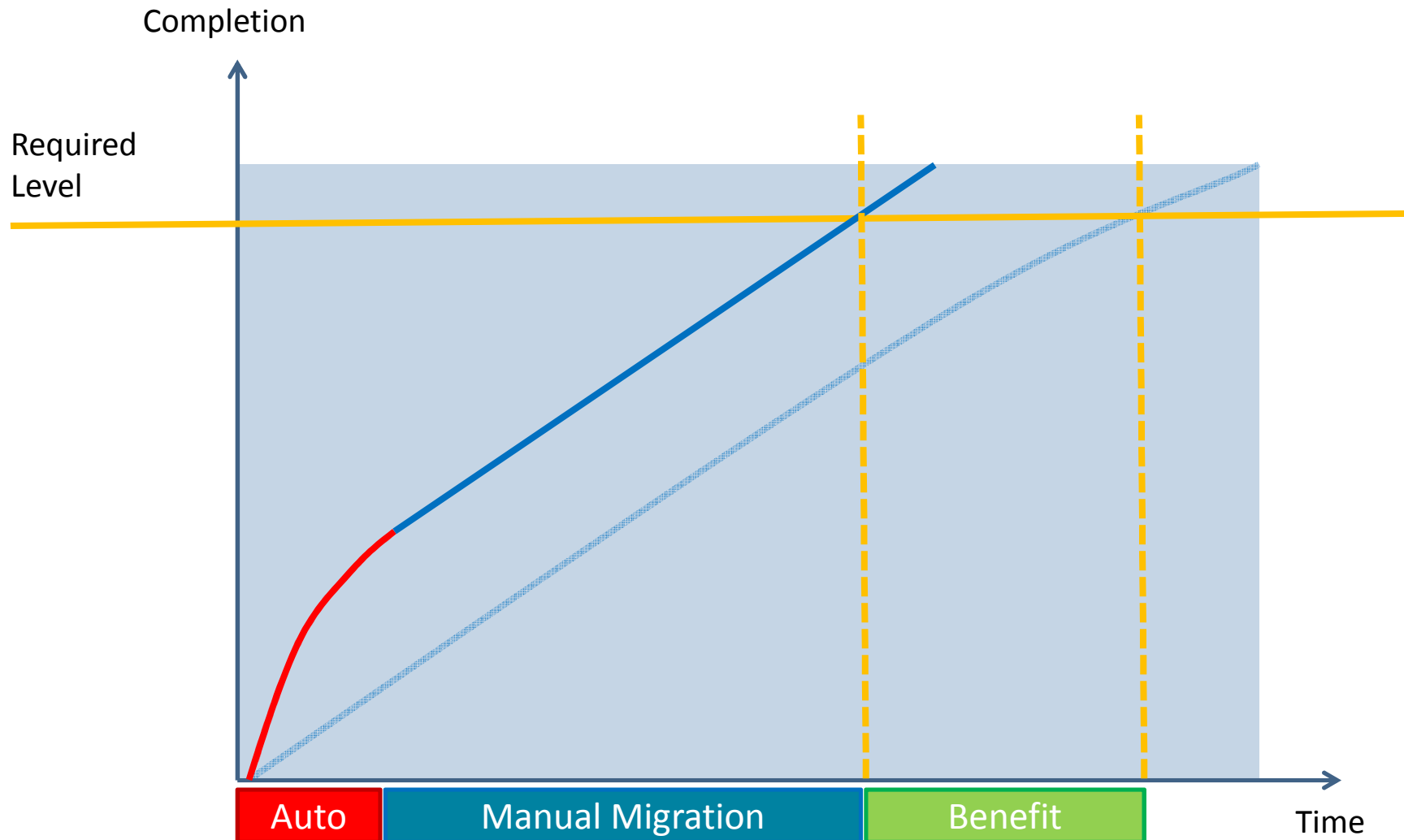
Issues

- Writing a good transformers is hard (too hard?)

Modernization: Fully Automatic Approach



Modernization: Mixed Approach



«WebKat» Mixed Approach

1. Definition of Target Application Stack
2. **Automatic** Transformations of
 - Dialog **Layout**
 - Dialog **Controls and Texts**
 - JSP **Logic as Comments** in Source Code
3. **Manual** Completion of generated Sources
 - Logic of UI Model
 - Mapping with Backend Services
4. Regression Testing to ensure 1:1 Functionality

Fully Automatic Transformation

```
<td>
  <label><%=getString("FLD_V_ZINSSATZABWEICHUNG_GRUND")%></label>
  <select property=... >
    <optionsCollection codeGroup=CDE_GRP_D2K_1074_ZINS_ABWEICHUNG_BEGR />
  </rctl:select>
</td>
```



```
public class ZinssatzAbweichungGrundField extends AbstractSmartField<Long>{
  /**
   * jsp: code type = 'CDE_GRP_D2K_1074_ZINS_ABWEICHUNG_BEGR'
   */
  @Override
  public TextCodeAbs getConfiguredTextCode(){
    return new ZinsAbweichungBegrCodeType();
  }

  @Override
  public String getConfiguredLabel(){
    return TEXTS.get("Grund");
  }
}
```

Semi-Automatic Transformation

```
<td>
  <label><%=getString("FLD_V_ZINSSTUFE_BEZEICHNUNG")%></label>
  <select property=... >
    <optionsCollection codeGroup=
      "<%= uiFormLimiten.getProdukteLimiten().getZinsstufeGroup()%>" />
  </select>
</td>
```



```
public class ZinsstufeField extends AbstractSmartField<Long>{
  ...
  /**
   * jsp: <optionsCollection name="WkatDynamicHtmlHelper.DYN_CODE_REQUEST_ID<
   * valid="false"/>
   */
  public TextCodeAbs getConfiguredTextCode(){
    // TODO: code type =
    // 'uiFormLimiten.getProdukteLimiten().getZinsstufeGroup()'
    return null;
  }
  ...
}
```

«WebKat» The Numbers

Project Phase Duration (and Efforts)

- Adapting the **Transformer**
 - 2 Months (2 Man Months)
- **Automatic Transformation** from RTK/JSP to Eclipse Scout
 - 1 Hour
- **Manual Completion**
 - 4 Months (13 Man Months) → Total: 15 Man Months

Comparison with Manual Approach



- 19 Man Months (Estimate)
- **Savings for Mixed Approach:** 4 Man Months (20%)

Hypothekarantrag erstellen

Bearbeiten  

Basiskredit-Nr. / Basiskreditart	2440	Hypothek
Verwendungszweck (intern)	Test	
Antragsteller	Muster Hans	
Branche	Private Haushalte mit Hauspersonal	
Überwachungsart	fristenorientiert	
Überwachungsperiode / Datum nächste PNB	10 Jahre	31.01.2024 ¹

Zu finanzierende Objekte

Objekt-Nr.	Subobjekt-Nr.	Objektart	Eigenheim	Beschreibung	Belehnungsbasis	Belehnungsgrenze in %	Belehnungsgrenze in CHF	
▶ 1251	1	Einfamilienhaus	ja	EFH, Zürich	1'000'000.00	80.00	800'000.00	 

Finanzierungsplan | Finanzierungsplan je Objekt | **Konditionen** | Konditionen je Objekt | Sicherheiten

Plafonierung und Zinsen

	Plafond gemäss GR	Plafond für Berechnung	Zinsen p.a. effektiv	Zinsen p.a. kalkulatorisch
1. Hypothek	500'000.00	500'000.00	12'500.00	25'000.00
2. Hypothek ohne Zusatzsicherheiten	0.00	0.00	0.00	0.00
2. Hypothek mit Zusatzsicherheit	0.00	0.00	0.00	0.00
Überbelehnung	0.00	0.00	0.00	0.00
	500'000.00	500'000.00	12'500.00	25'000.00

Amortisation

Amortisationsart / BVG-Maximum	direkte Amortisation	nein
Betrag p.a. direkt / indirekt	0.00	
Plafond gemäss GR / für Berechnung	0.00	0.00
Erstmals / Nächstmals per	Erstmals	31.12.2014 ¹
Kadenz	halbjährlich	

Hypothekarantrag erstellen

Antrag Allgemein

Basiskredit Nr.	<input type="text" value="509"/>	Basiskreditart	<input type="text" value="Hypothek"/>
Verwendungszweck (intern)	<input type="text" value="Test Tragbarkeit"/>	Antragsteller	<input type="text" value="Tragbarkeit Hans"/>
Branche	<input type="text" value="Private Haushalte mit Hauspersonal"/>	Überwachungsart	<input type="text" value="fristenorientiert"/>
Überwachungsperiode	<input type="text" value=""/>	Datum nächste PNB	<input type="text" value="21.09.2007"/>

Zu finanzierende Objekte

Objekt-Nr.	Subobjekt-Nr.	Objektart	Eigenheim	Beschreibung	Belehnungsbasis	Belehnungsgrenze in %	Belehnungsgrenze in CHF
189	1	Luxus-/Liebhaberob...	nein	MaiensÄpss	360'000.00	65.00	234'000.00

Plafonierung und Zinsen

	Plafond gemäss GR	Plafond für Berechnung	Zinsbetrag p.a. eff.	Zinsbetrag p.a. kalk.
1. Hypothek	<input type="text" value="180'000.00"/>	<input type="text" value="180'000.00"/>	<input type="text" value="5'400.00"/>	<input type="text" value="9'000.00"/>
2. Hypothek ohne Zusatzsicherheit	<input type="text" value="20'000.00"/>	<input type="text" value="20'000.00"/>	<input type="text" value="800.00"/>	<input type="text" value="1'200.00"/>
2. Hypothek mit Zusatzsicherheit	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>
Überbelehnung	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>
	<input type="text" value="200'000.00"/>	<input type="text" value="200'000.00"/>	<input type="text" value="6'200.00"/>	<input type="text" value="10'200.00"/>

Amortisation

Amortisationsart	<input type="text" value="direkte Amortisation"/>	BVG-Maximum	<input type="text" value="nein"/>
Betrag p.a. direkt	<input type="text" value="2'000.00"/>	indirekt	<input type="text" value=""/>
Plafond gemäss GR	<input type="text" value="1'000.00"/>	für Berechnung	<input type="text" value="2'000.00"/>
Erstmals / Nächstmals	<input type="text" value="Erstmals"/>	per	<input type="text" value="31.01.2008"/>
Kadenz	<input type="text" value=""/>		

«WebKat» Learnings

- Mixed modernization approach worked well
- JSP Technology was well suited for mixed approach
- Close collaboration (on-site) with client was vital

«WebKat» Modernization Benefits

- Clean Architecture with Scout Application Model
- Business Code is separated from UI Technology
- JSP Technology removed from Application
- RTK Framework removed

Summary

Modernization

General Observations

- Business Applications live for a long time
- UI Technologies
 - Become legacy quickly
 - Are not considered valuable
 - Can trigger costly modernization projects

Modernization Recommendations

Generally

- Select a small initial Scope
- Go to production as quickly as possible
- Remove legacy technologies one-by-one
- Consider an automatic/manual mixed approach

Specifically

- Be independent of a UI technology
- Check out Eclipse Scout for your modernization project 😊

Thanks

@EclipseScout 

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