

15.–18. 09. 2008
in Nürnberg



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Außer Konkurrenz II: Organic Programming mit Ercatons

Neue Paradigmen live

Oliver Imbusch, Falk Langhammer

Living Pages Research GmbH

www.living-pages.de

Die Aufgabe

- Registrierung für einen Newsletter
 - Anmeldung im Internet
 - Versand einer Bestätigungsemail
 - Bestätigung der Anmeldung durch Besuch des entsprechenden, mit der Email versendeten, Links
- Zusätzliche Prozesse
 - Batch-Prozess zum versenden des Newsletters
 - GUI-Client zur Anzeige der bestätigten Anmeldungen

Technische Aspekte

- Persistente Datenhaltung
- Einbindung eines Fremdsystems
 - Hier: SMTP-Server
- Realisierung / Anbindung je eines
 - Web-Clients
 - Rich-Clients
 - Batch-Clients

Vorzuführen ist

- Ein kompletter Rundlauf
 - Registrierung
 - Bestätigung
 - Newsletterversand
 - Auflisten der registrierten Empfänger
- Debugging einer Registrierung

Die Konkurrenz im Überblick

- P12 – .Net – Di. 11:20 Uhr
- **P14 – Ercatons – Di. 15:40 Uhr**
- P22 – JEE/EJB – Mi. 11:20 Uhr
- P25 – Ruby on Rails – Mi. 17:20 Uhr
- P32 – Spring – Do. 11:20 Uhr

- P33 – Die Quintessenz – Do. 14:00 Uhr

Vorbereitet ist

- Die Ercato-Engine läuft, sonst nichts ;)
- Alles wird live im Rahmen der Session entwickelt!

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Also Oliver, ran an die Tasten...

Fragen ? ... Gerne :)

Oliver Imbusch, Dr. Falk Langhammer

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**Source code & snapshots ...
(from a test session)**

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The Subscription Ercaton
~newsletter/subscription ...

```
<?xml version="1.0" encoding="UTF-8"?>
<subscription xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
               xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">

    <erc:id>~newsletter/subscription</erc:id>

    <header>
        <div xmlns="http://www.w3.org/1999/xhtml"><h2>Newsletter Bestellung</h2></div>
    </header>
    <profile>
        <name      erx:field-ref="name"/>
        <email     erx:field-ref="email"/>
        <verified  erx:hidden="true"/>
    </profile>
    <status/>

    <erx:actions>
        <erc:action name="edit"   erx:field-name="Profilangaben ändern"
erx:group="toolbar">
            /bin/edit
        </erc:action>

        <erc:action name="remove" erx:field-name="Newsletterbestellung löschen"
erx:group="toolbar">
            /bin/rm!start
        </erc:action>
    </erx:actions>
</subscription>
```



Ok

Cancel |

Newsletter Bestellung

Vollständiger
Name

James Gosling

E-Mail Adresse

james@gosling.java

status

Füllen Sie bitte alle Angaben aus, klicken 'OK' und bestätigen Sie die Bestellung in der E-Mail, die Sie dann erhalten. Vielen Dank.



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The complete subscription workflow...

```

<?xml version="1.0" encoding="UTF-8"?>
<subscription xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
               xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">

    <erc:id>~newsletter/subscription</erc:id>
    <erc:type>prototype</erc:type>
    <erc:prototype-permission name="~any"> rxb </erc:prototype-permission>
    <erc:prototype-permission name="~anonymous"> rxb </erc:prototype-permission>
    <erc:permission name="~newsletter">rwxb</erc:permission>

    <erc:object lang="Java">
        <erc:class>com.livis.newsletter.Subscription</erc:class>
        <erc:archive>/lib/erxlib.jar;~newsletter/lib/newsletter.jar</erc:archive>
    </erc:object>

    <header>
        <div xmlns="http://www.w3.org/1999/xhtml"><h2>Newsletter Bestellung</h2></div>
    </header>
    <profile>
        <name      erx:field-ref="name"/>
        <email     erx:field-ref="email"/>
        <verified  erx:hidden="true"/>
    </profile>
    <status>Füllen Sie bitte alle Angaben aus, klicken 'OK' und bestätigen Sie die Bestellung in der E-Mail, die Sie dann erhalten. Vielen Dank.</status>

    <erx:actions>
        <erc:action name="edit"   erx:field-name="Profilangaben ändern"
erx:group="toolbar">
            /bin/edit
        </erc:action>

        <erc:action name="remove" erx:field-name="Newsletterbestellung löschen"
erx:group="toolbar">
            /bin/rm!start
        </erc:action>

        <erc:action name="confirm">
            <erc:arg name="verified">true</erc:arg>
            <erc:native lang="Java">
                <erc:method>setVerified</erc:method>
                <erc:parameter name="verified" type="boolean"/>
                <erc:returns type="ercaton"/>
            </erc:native>
        </erc:action>

        <erc:action name="send-confirmation-request">
            <erc:arg name="account">travel</erc:arg>
            <erc:native lang="Java">
                <erc:method>sendConfirmationRequest</erc:method>
            </erc:native>
        </erc:action>

        <erc:trigger event="on-change"> !send-confirmation-request </erc:trigger>
    </erx:actions>
</subscription>

```

```

package com.livis.newsletter;

import com.ercato.core.*;
import com.ercato.lib.dom.DOM;

public class Subscription extends ErcatonObject implements Action {

    static void mail (RuntimeSupport rt, String to, String from, String subject, String text) {
        ActionArguments args = new ActionArguments ();
        args.put ("to", to);
        args.put ("from", from);
        args.put ("subject", subject);
        args.put ("body", text);
        rt.delegateAction (XRef.valueOf ("/bin/mail!send"), args);
    }

    public boolean isVerified () {
        return Boolean.valueOf (DOM.text (this, "profile/verified")).booleanValue ();
    }
    public Subscription setVerified (boolean verified) {
        DOM.setText (this, "profile/verified", Boolean.toString (verified));
        DOM.setText (this, "status", verified ? "ok" : "pending...");
        touch ();
        return this;
    }

    public void sendConfirmationRequest () {
        String id = getId ();
        if (isVerified () || id.startsWith ("/session")) return;
        setVerified (false);

        String body =
            "Sehr geehrte(r) " + DOM.text (this, "profile/name") + "\n\n" +
            "Bitte bestätigen Sie den Bezug des Newsletters per Klick auf nachfolgenden Link:\n\n" +
            getRuntime ().getEnv ().getErcatonURL (getXRef ().setAction ("confirm"));

        mail (getRuntime (), DOM.text (this, "profile/email"), "falk@livis.de", "Newsletter Bestätigung", body);
    }
}

```

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Listing verified subscriptions...

```
<?xml version="1.0" encoding="UTF-8"?>
<index-table xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
  xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">
  <erc:type>index</erc:type>
  <erc:id>~newsletter/idx</erc:id>
  <erx:permissions>
    <erc:permission name="~anonymous">rxb</erc:permission>
    <erc:permission name="~any">rxb</erc:permission>
  </erx:permissions>

  <erc:index>
    <erc:name erx:display="Vollständiger Name">name</erc:name>
  </erc:index>
  <erc:index>
    <erc:name erx:display="E-Mail Adresse">email</erc:name>
  </erc:index>
  <erc:index>
    <erc:name erx:display="Bestätigt">verified</erc:name>
    <erc:index-type>boolean</erc:index-type>
  </erc:index>
</index-table>
```

```

<?xml version="1.0" encoding="UTF-8"?>
<subscription xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
               xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">

    <erc:id>~newsletter/subscription</erc:id>
    <erc:type>prototype</erc:type>
    <erc:prototype-permission name="~any"> rxb </erc:prototype-permission>
    <erc:prototype-permission name="~anonymous"> rxb </erc:prototype-permission>
    <erc:permission name="~newsletter">rwxb</erc:permission>

    <erc:object lang="Java">
        <erc:class>com.livis.newsletter.Subscription</erc:class>
        <erc:archive>/lib/erxlib.jar;~newsletter/lib/newsletter.jar</erc:archive>
    </erc:object>

    <header>
        <div xmlns="http://www.w3.org/1999/xhtml"><h2>Newsletter Bestellung</h2></div>
    </header>
    <profile>
        <name      erx:field-ref="name"   erc:index="~newsletter/idx"/>
        <email     erx:field-ref="email"   erc:index="~newsletter/idx"/>
        <verified  erx:hidden="true"     erc:index="~newsletter/idx"/>
    </profile>
    <status>Füllen Sie bitte alle Angaben aus, klicken 'OK' und bestätigen Sie die Bestellung in der E-Mail, die Sie dann erhalten. Vielen Dank.</status>

    <erx:actions>
        <erc:action name="edit"      erx:field-name="Profilangaben ändern"
erx:group="toolbar">
            /bin/edit
        </erc:action>

        <erc:action name="remove"   erx:field-name="Newsletterbestellung löschen"
erx:group="toolbar">
            /bin/rm!start
        </erc:action>

        <erc:action name="confirm">
            <erc:arg name="verified">true</erc:arg>
            <erc:native lang="Java">
                <erc:method>setVerified</erc:method>
                <erc:parameter name="verified" type="boolean"/>
                <erc:returns type="ercaton"/>
            </erc:native>
        </erc:action>

        <erc:action name="send-confirmation-request">
            <erc:arg name="account">travel</erc:arg>
            <erc:native lang="Java">
                <erc:method>sendConfirmationRequest</erc:method>
            </erc:native>
        </erc:action>

        <erc:trigger event="on-change"> !send-confirmation-request </erc:trigger>
    </erx:actions>
</subscription>

```

```
<?xml version="1.0" encoding="UTF-8"?>
<query xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions"
xmlns:erc="http://ercato.com/xmlns/ErcatoCore">
  <erc:clone>/lib/base/query</erc:clone>
  <erc:id>~newsletter/list</erc:id>
  <erc:permission name="~any" erc:inherit="delete"/>
  <name>Verified subscriptions</name>
  <query>
    <index>
      <erc:id-ref>~newsletter/idx</erc:id-ref>
    </index>
    <columns>
      <column>
        <name>name</name>
        <sort>desc</sort>
        <idrefcol>id</idrefcol>
      </column>
      <column>
        <name>email</name>
      </column>
      <column>
        <name>verified</name>
      </column>
    </columns>
    <filters>
      <or>
        <and>
          <column>name</column>
          <firstletter>true</firstletter>
        </and>
        <and>
          <column>verified</column>
          <value>=true</value>
        </and>
      </or>
    </filters>
  </query>
  <catalog>
    <erc:catalog category="/Newsletter"/>
  </catalog>
</query>
```



Verified subscriptions

<< | >> | [Edit Query](#) | [Delete Query](#) | [Save As](#) | [Share](#) | [Query](#) |

<input type="checkbox"/> in die Zwischenablage alle markieren		[tmp]
name (<)	email	verified
<input type="checkbox"/> name: a b c d e f g h i j k l m n o p q r s t u v w x y z * distinct <input type="checkbox"/> 1 - 2 max: 100 Ok		
<input type="checkbox"/> James Gosling	james@gosling.java	false
<input type="checkbox"/> Falk Langhammer	falk@living-pages.de	true

```
package com.livis.newsletter;

import com.ercato.core.*;
import com.ercato.core.query.*;

public class Manager implements Action {

    protected RuntimeSupport rt;

    public void setRuntime (RuntimeSupport rt) { this.rt = rt; }

    protected String mail (String text, String name, String email) {
        try {
            Subscription.mail (rt, email, "falk@livis.de", "Newsletter", "Sehr geehrte(r) " + name + "\n\n"
text);
            return email + ";";
        } catch (Exception ex) {
            return "";
        }
    }

    public String broadcast (String text, ListErcaton list) {
        String result = "";
        TableList table = list.getIndexList ();
        for (int i = 0; i < table.getNRows (); ++i)
            result += mail (text, (String) table.getValue (i, "name"), (String) table.getValue (i, "email"));
        return "{" + result + "}";
    }
}
```

```
<?xml version="1.0" encoding="UTF-8"?>
<manager xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
  xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">
  <erc:id>~newsletter/manager</erc:id>
  <erc:catalog category="/Newsletter" id-ref="~demo/catalog"/>
  <name erc:index="~demo/catalog">Newsletter Management</name>
  <new-subscription      erx:field-ref="idref" erx:lr="idref"
    erx:field-name="Zur Newsletter Bestellung"
  ><erc:id-ref>/bin/new!and-edit?args=~newsletter/subscription</erc:id-ref></new-subscription>
  <list-of-subscriptions erx:field-ref="idref" erx:lr="idref" erx:frame="list"
    erx:field-name="Zur Liste der
    Bestellungen"><erc:id-ref>~newsletter/list!query</erc:id-ref></list-of-subscriptions>
  <erx:actions>
    <erc:action name="broadcast">
      <erc:arg name="args"/>
      <erc:arg name="list">~newsletter/list!query</erc:arg>
      <erc:arg name="account">travel</erc:arg>
      <erc:native lang="Java">
        <erc:class>com.livis.newsletter.Manager</erc:class>
        <erc:archive>/lib/erxlib.jar;~newsletter/lib/newsletter.jar</erc:archive>
        <erc:method>broadcast</erc:method>
        <erc:parameter name="args" type="string"/>
        <erc:parameter name="list" type="list"/>
        <erc:returns type="string"/>
      </erc:native>
    </erc:action>
  </erx:actions>
</manager>
```

```
esh ~newsletter/manager!broadcast -s eclipse "Der DAX wird fallen. Sofort alles verkaufen!"
```

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The Rich Client...

```

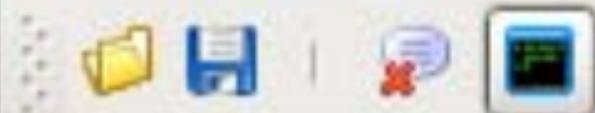
<?xml version="1.0" encoding="UTF-8"?>
<formx version="1.0" xmlns="http://livis.com/xmlns/FormX"
        xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
        xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">

<description>
    <erc:id>newsletter/rc</erc:id>
    <erc:action name="create" default-target="null">
        <erc:permission role="~any">s</erc:permission>
        <erc:permission role="~anonymous">s</erc:permission>
        <erc:arg name="template">this</erc:arg>
        <erc:arg name="data">~newsletter/list!query</erc:arg>
        <erc:arg name="panels">subscriptions</erc:arg>
        <erc:action-ref> /bin/panel </erc:action-ref>
    </erc:action>
</description>
<state>read only</state>
<forms>
    <form name="subscriptions" kind="panel" erx>xpath-root="/erc:list/erc:list">
        <fields>
            <!-- optional field -->
            <field-text kind="html">
                <text><! [CDATA[
                    <h1>Liste der Newsletter Anmeldungen:</h1>
                ]]></text>
                <layout-hints location="field" colspan="2" spec="center,default"/>
            </field-text>

            <for var="%n%" start="/erc:list/erc:list-meta/erc:first-element"
                  end="/erc:list/erc:list-meta/erc:last-element"/>
            <field name="name%n%">
                <value><data/></value>
                <param-name>erc:element[@n='%n%']/erc:entry[@name='name']</param-name>
            </field>
            <field name="email%n%">
                <value><data/></value>
                <param-name>erc:element[@n='%n%']/erc:entry[@name='email']</param-name>
            </field>
            <endfor/>
        </fields>
        <layout>
            <columns>
                <column>200px</column>
                <empty>2px</empty>
                <column>200px</column>
            </columns>
            <layout-hints spec="padding: 1px 0 1px 0" />
        </layout>
    </form>
</forms>
</formx>

```

```
java -jar "%JLIBS%FormsX-1\formsx1rt.jar" --in  
"http://localhost/erc/aton/~newsletter/rc!create"
```



subscriptions

Liste der Newsletter Anmeldungen:

name1: alphanumeric input expected

FormsX Rich Client by Livis

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Integration and browsing...

```

<?xml version="1.0" encoding="UTF-8"?>
<subscription xmlns:erc="http://ercato.com/xmlns/ErcatoCore"
               xmlns:erx="http://ercato.com/xmlns/ErcatoExtensions">

    <erc:id>~newsletter/subscription</erc:id>
    <erc:type>prototype</erc:type>
    <erc:prototype-permission name="~any"> rxb </erc:prototype-permission>
    <erc:prototype-permission name="~anonymous"> rxb </erc:prototype-permission>
    <erc:permission name="~newsletter">rwxb</erc:permission>

    <erc:object lang="Java">
        <erc:class>com.livis.newsletter.Subscription</erc:class>
        <erc:archive>/lib/exrilib.jar;~newsletter/lib/newsletter.jar</erc:archive>
    </erc:object>

    <header>
        <div xmlns="http://www.w3.org/1999/xhtml"><h2>Newsletter Bestellung</h2></div>
    </header>
    <profile>
        <name      erx:field-ref="name"   erc:index="~newsletter/idx"/>
        <email     erx:field-ref="email"  erc:index="~newsletter/idx"/>
        <verified   erx:hidden="true"    erc:index="~newsletter/idx"/>
    </profile>
    <status>Füllen Sie bitte alle Angaben aus, klicken 'OK' und bestätigen Sie die Bestellung in der E-Mail, die Sie dann erhalten. Vielen Dank.</status>

    <!-- optional constraints -->
    <erx:constraints>
        <erx:constraint erc:name="required" mandatory="4"/>
        <erx:constraint erc:name="email"    regex="..*@..*\.\w{2,3}" />
    </erx:constraints>

    <!-- optional fields -->
    <erx:fields>
        <erx:field erc:name="name"  field-name="Vollständiger Name" cr="required"/>
        <erx:field erc:name="email" field-name="E-Mail Adresse" cr="email"/>
    </erx:fields>

    <erx:actions>
        <erc:action name="edit"    erx:field-name="Profilangaben ändern"          erx:group="toolbar">
            /bin/edit
        </erc:action>

        <erc:action name="remove"  erx:field-name="Newsletterbestellung löschen" erx:group="toolbar">
            /bin/rm!start
        </erc:action>

        <erc:action name="confirm">
            <erc:arg name="verified">true</erc:arg>
            <erc:native lang="Java">
                <erc:method>setVerified</erc:method>
                <erc:parameter name="verified" type="boolean"/>
                <erc:returns type="ercaton"/>
            </erc:native>
        </erc:action>

        <erc:action name="send-confirmation-request">
            <erc:arg name="account">travel</erc:arg>
            <erc:native lang="Java">
                <erc:method>sendConfirmationRequest</erc:method>
            </erc:native>
        </erc:action>

        <!-- optional constraints -->
        <erc:trigger event="on-change"> /bin/check </erc:trigger>
        <erc:target name="view" depends-on="std"> /system/applets.xsl </erc:target>
        <erc:target name="std" depends-on="annotate"> /system/std.xsl </erc:target>
        <erc:target name="annotate"> /system/stdann.xsl </erc:target>

        <erc:trigger event="on-change"> !send-confirmation-request </erc:trigger>
    </erx:actions>
</subscription>

```

Ercato Demo - Windows Internet Explorer

https://localhost/erc/atos~demo/start Google

Ercato Demo Seite Extras

• Ercato Demo • News Letter logout

Catalog

- /
- Address
- Demo News
- DMS Demo
- Doku
- + Elections
- iX-Article
- Newsletter
- Verified subscriptions
- + Queries
- + queries
- + Samples
- System

Verified subscriptions

<< | >> | Edit Query | Delete Query | Save As | Share | Query | [tmp]

<input type="checkbox"/> in die Zwischenablage alle markieren		verified
<input type="checkbox"/> name (<)	email	=false
[+] name: a b c d e f g h i j k l m n o p q r s t u v w x y z *	distinct <input type="checkbox"/> 1 - 1 max: 100	Ok
<input type="checkbox"/> James Gosling	james@gosling.java	false

~anonymous/-instance/James-Goslinghyf9c4

Profilangaben ändern Newsletterbestellung löschen

Newsletter Bestellung

Vollständiger Name	James Gosling
E-Mail Adresse	james@gosling.java
status	pending...

powered by ercations

javascript:doSubmit('remove','_self')

Internet | Geschützter Modus: Inaktiv 100%

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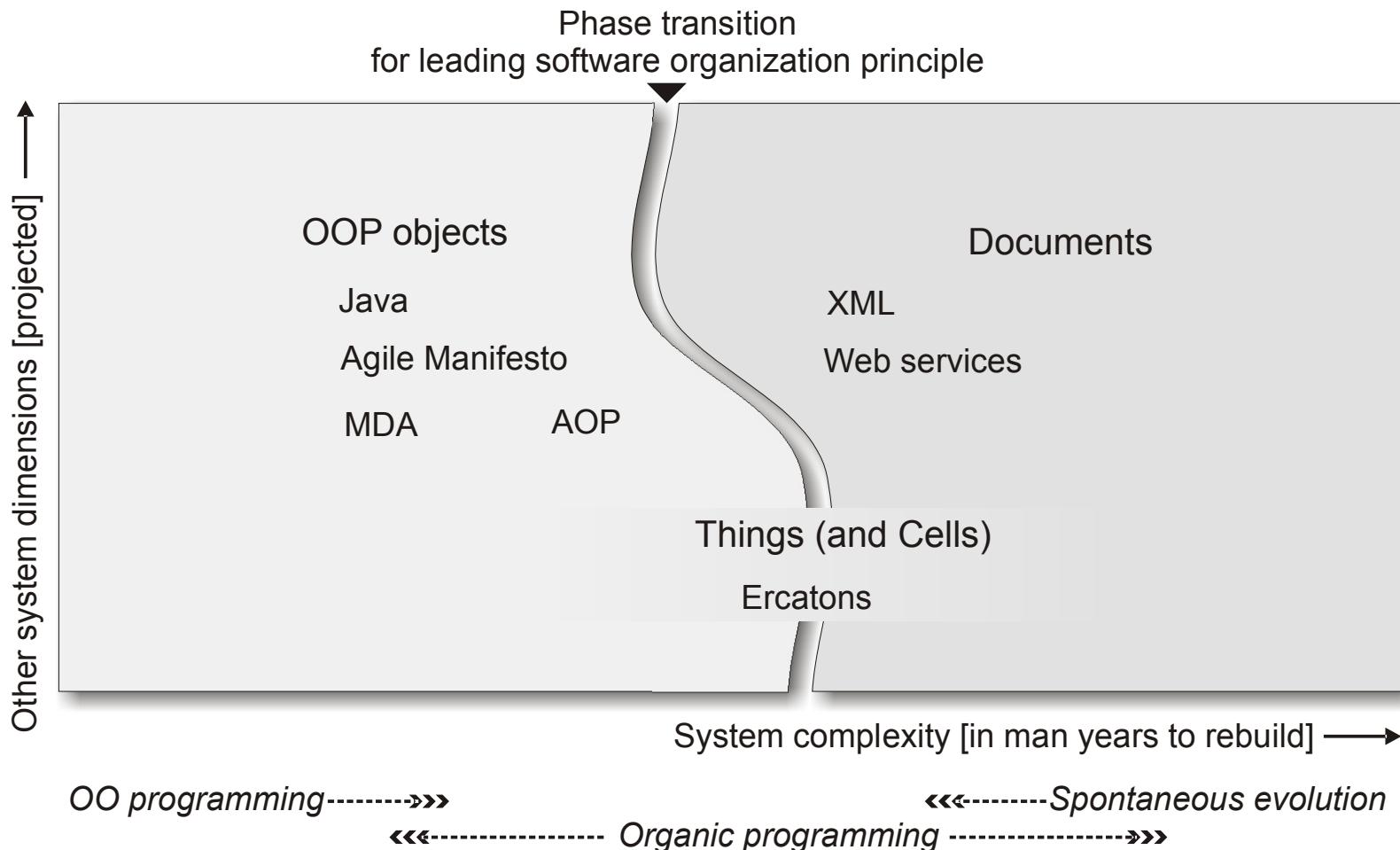
Some info about ercatons...

The Manifesto of Organic Programming

The exception is the rule.

- §1 *Our world is rich and complex*
rather than well-structured and simple.
- §2 *Software must cover irregular, changing patterns*
rather than regular patterns.
- §3 *A software system is an organic being*
rather than a set of mathematical algorithms.
- §4 *Software components are an integral part of our rich world*
rather than entities at some meta level.
- §5 *Software systems emerge when evolving from small to large*
rather than from concrete to abstract.

Complex systems cannot be planned!



ercatons are things – based on XML and algorithms, eg. Java –

Def.: A **thing** is a self-contained entity,
with **identity**, **behavior**, with inner **state** and **structure**,
with user[†] and model[‡] **interfaces**, with **ownership** and
with self-determined **lifecycle** and **privacy**, in both *software* and *reality*.

Def.: An **ercaton** is a **thing**, with at least, a model interface to **XML**,
with **inheritance** and **polymorphism**, with a mutable **web** user-interface,
with **database** and **transaction** support and with **autonomous life** (cell).

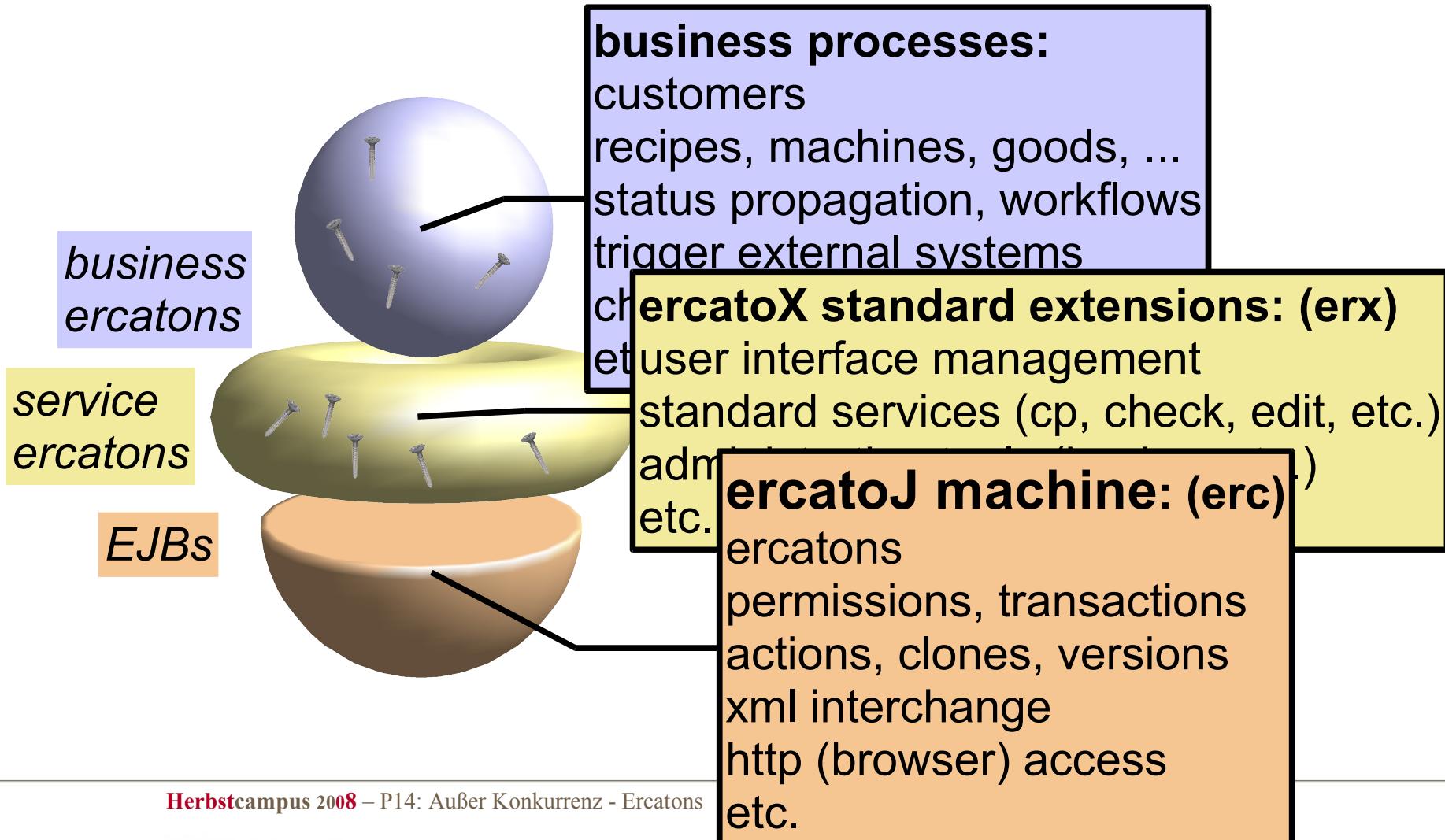
This means that an ercaton stands up for itself, e.g., it does not depend on a class,
that it has a **unique name** and is persistent and protected, and
that each ercaton is an individual entity where no two are equal

Named after elementary particle convention (electron)

[†]: we can touch, see and manipulate

[‡]: we can abstract, in order to think about or to code algorithms

The hierarchy of the *ercatoJ* engine



Scientific acknowledgements

- Scientific publications (ACM, LNCS)
- Reviewed talks
(OOPSLA (USA), Net.ObjectDays, Schloß Dagstuhl)
- Founding Member
of Organic Computing Initiative
- Diploma thesis
(Munich, Hamburg)
- Private communications
(e.g. D.Ungar, creator of Self)



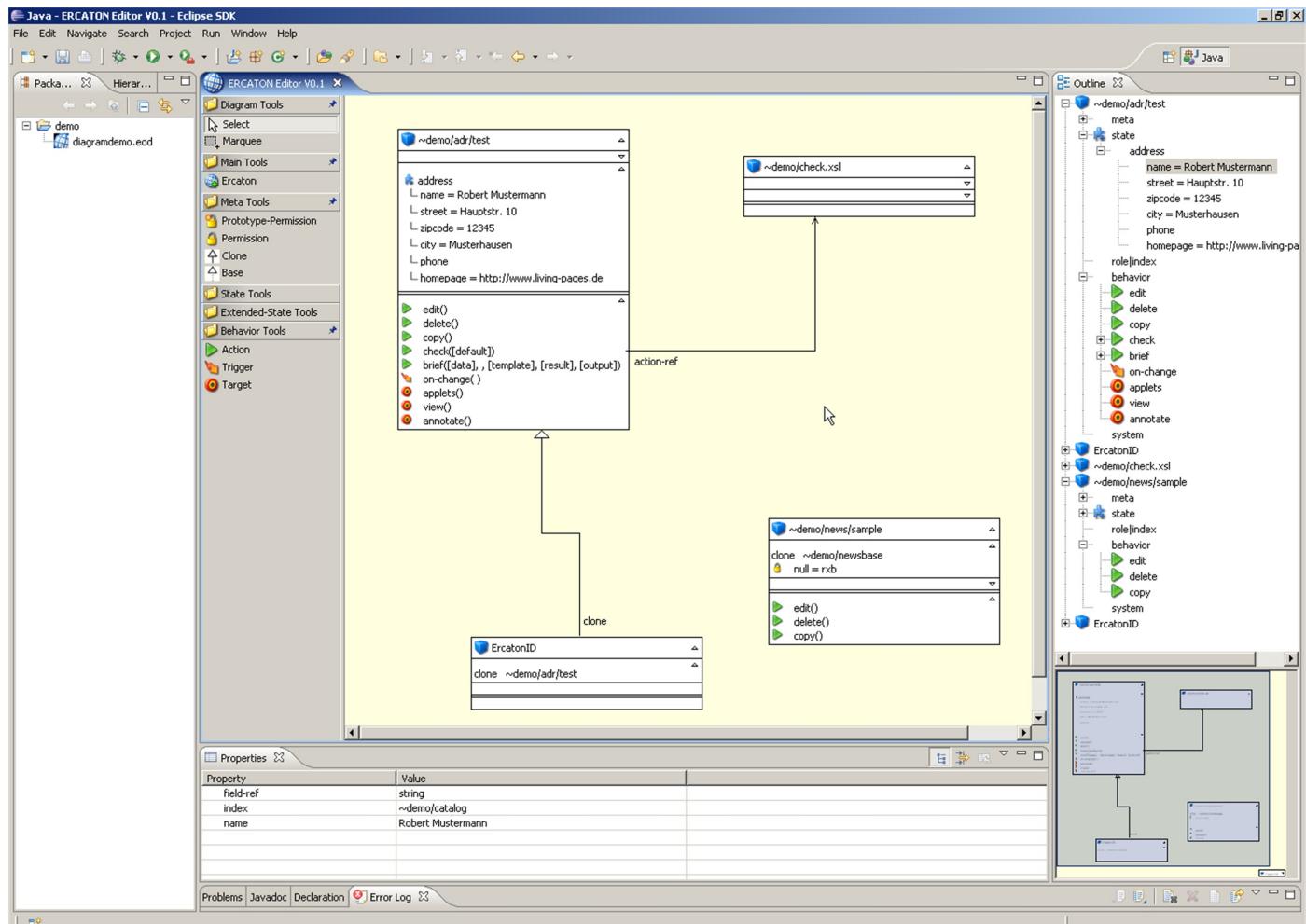
“Maybe someday all large-scale objects will be Ercatonical.”

David Ungar
Principal Investigator
Sun Labs, Mountain View



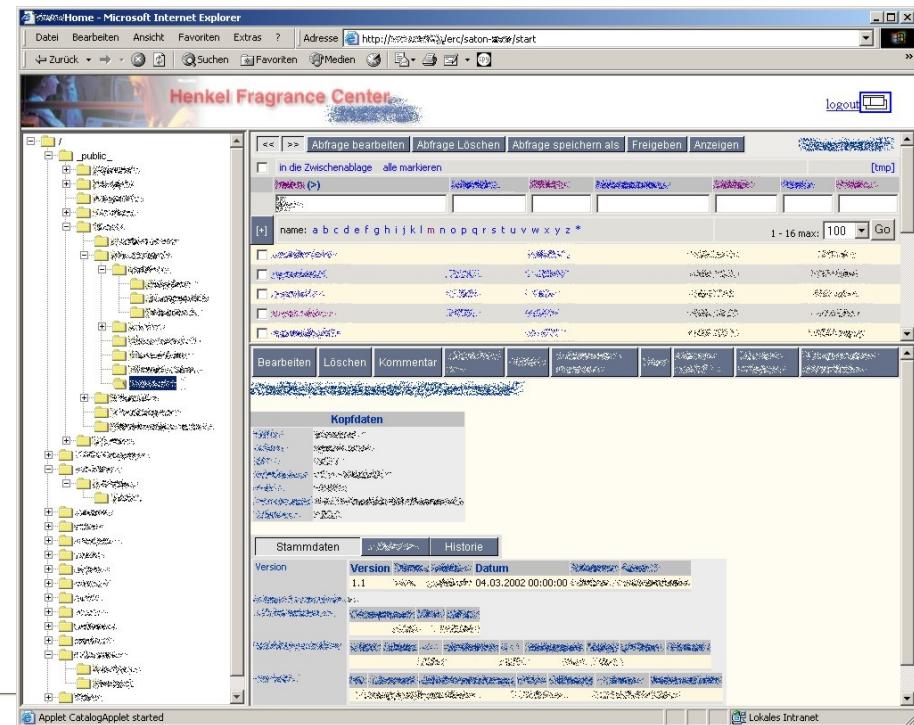
Scientific acknowledgements (contd.)

OBN
 (Organic
 Building
 Notation *UML*)
 Eclipse Plugin
 for visual
 organic
 programming
 Diploma thesis
 LMU Munich
 Erik Ebbe



Commercial acknowledgements

- Satisfied customers
(Henkel, Ekato, ASL, KGAL, Docutec ...)
- E.g., backbone of
Henkel perfume factory
(replaced million l.o.c. hostapp)
- Positive consultancy evaluations
(clavis, Virtual Solutions,
sd&m, ESPRiT ...)
- Magazine coverage
(iX, Computerzeitung,
JavaMagazin 2007/01...)



Further Reading:

- OOPSLA:
<http://portal.acm.org/citation.cfm?id=1094855.1094868>
- iX Magazin 2/2004
- javaMAGAZIN 1/2007
- Living Pages:
<http://www.living-pages.de/de/projects/ercato/index.html>
- ercato.org (*coming soon...*)