CSE 510
Web Data Engineering

The Struts Framework

Logon Example

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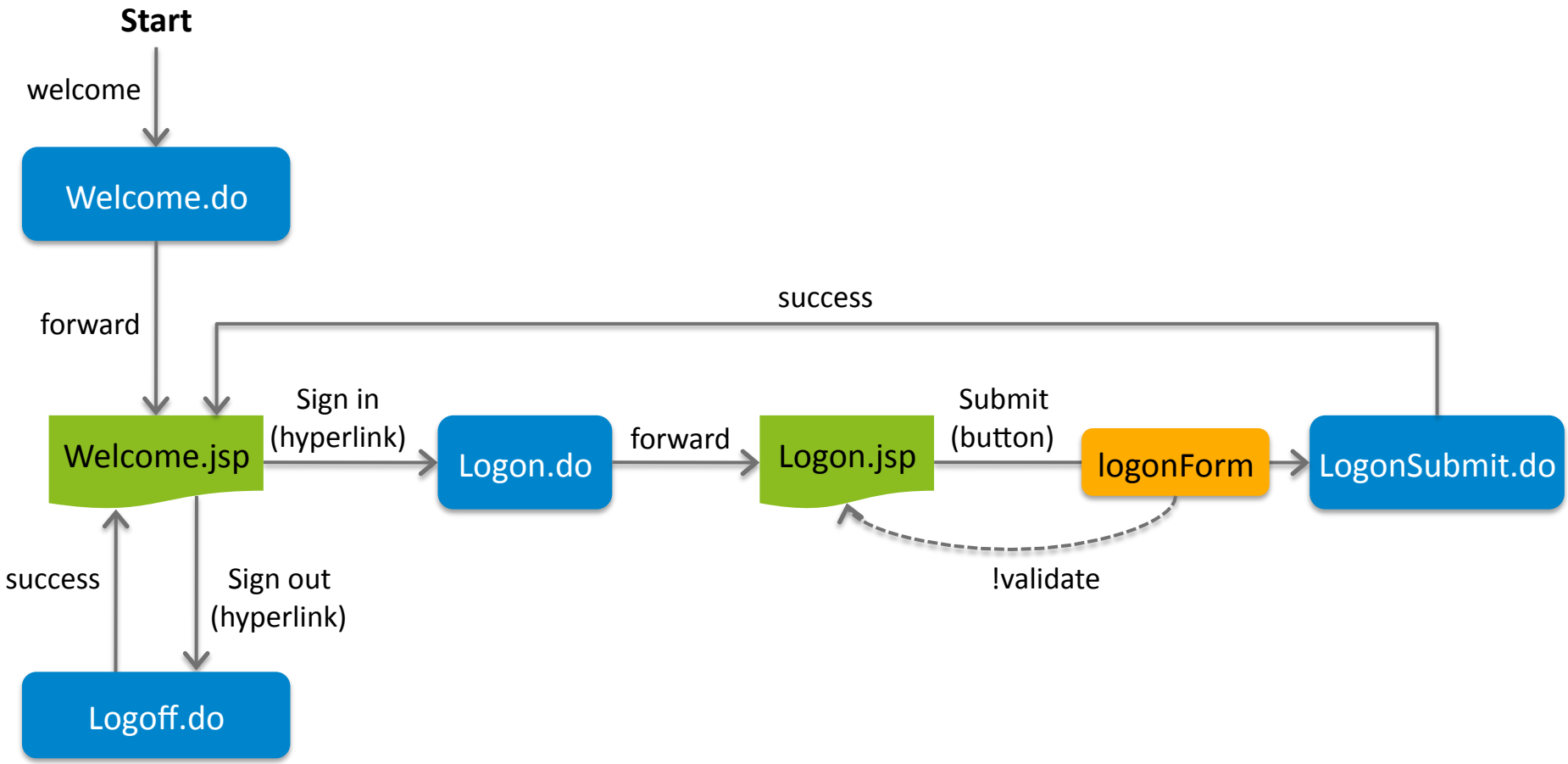
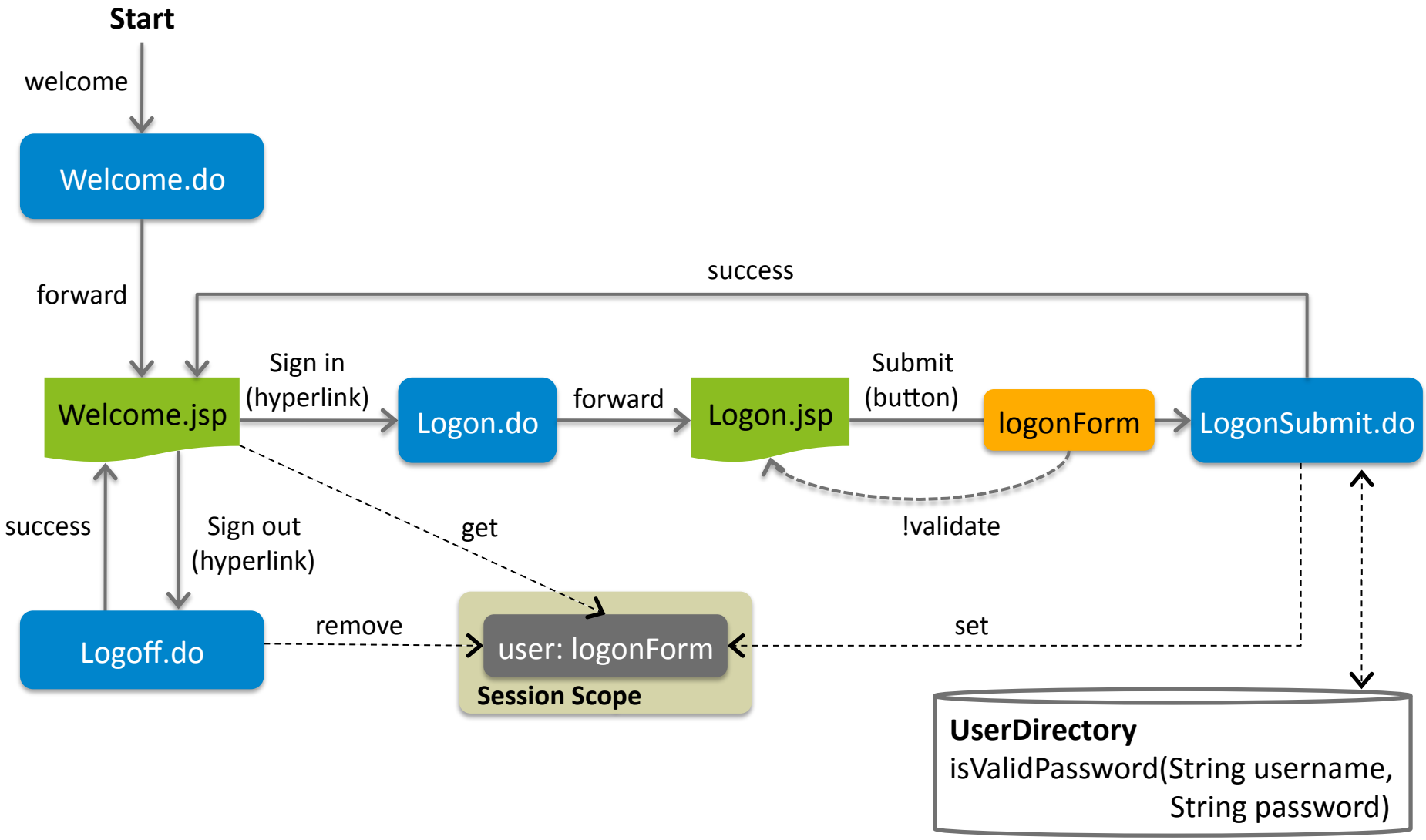
Example

- The example implements a dummy logon functionality
  - Do **not** consider this example to be the best way to implement authorization and access control
  - The example is used only to demonstrate the Struts framework
  - Appropriate authorization and access control will be covered in a separate lecture shortly

WorkFlow


Start
welcome
Welcome.do
forward
success
Welcome.jsp
Sign in
(hyperlink)
Logon.do
forward
Logon.jsp
Submit
(button)
logonForm
LogonSubmit.do
!validate
success
Sign out
(hyperlink)
Logoff.do

WorkFlow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LogonSubmit.do
success
Sign out
(hyperlink)
get
!validate
Logoff.do
remove
user: logonForm
Session Scope
set
UserDirectory
isValidPassword(String username,
String password)

/index.jsp

```
<%@ taglib uri="http://struts.apache.org/tags-logic"
        prefix="logic" %>
<logic:redirect forward="welcome"/>

<%--

Redirect default requests to Welcome global ActionForward.

--%>
```

/pages/Welcome.jsp

```
<%@ taglib uri="http://struts.apache.org/tags-bean" prefix="bean"%>
<%@ taglib uri="http://struts.apache.org/tags-html" prefix="html"%>
<%@ taglib uri="http://struts.apache.org/tags-logic" prefix="logic"%>
<html:html>
<head>
   <title><bean:message key="app.title" /></title>
   <html:base />
</head>
<body>

<logic:present name="user">
   <h3>Welcome <bean:write name="user" property="username" />!</h3>
</logic:present>
…
```

/pages/Welcome.jsp (cont'd)

```
...
<logic:notPresent scope="session" name="user">
   <h3><bean:message key="welcome.heading" /></h3>
</logic:notPresent>

<html:errors />

<ul>
   <li><html:link forward="logon">Sign in</html:link></li>
   <logic:present name="user">
      <li><html:link forward="logoff">Sign out</html:link></li>
   </logic:present>
</ul>
</body>
</html:html>
```

Edge Labels In struts-config.xml

```
<!-- ==========Global Forward Definitions →
   <global-forwards>
      <forward
         name="logoff"
         path="/Logoff.do"/>
      <forward
         name="logon"
         path="/Logon.do"/>
      <forward
         name="welcome"
         path="/Welcome.do"/>
   </global-forwards>
```

/pages/Logon.jsp

```
…
<body>
   <html:errors />
   <h3><bean:message key=”logon.heading" /></h3>
   <html:form action="/LogonSubmit" focus="username">
      <table width="100%">
         <tr><th align="right">Username:</th>
               <td><html:text property="username" /></td></tr>
         <tr><th align="right">Password:</th>
              <td><html:password property="password" /></td></tr>
         <tr><td align="right"><html:submit /></td>
              <td><html:reset /></td></tr>
      </table>
   </html:form>
</body>
…
```

Associating the ActionForm Bean with the HTML Form

```
<action
   path="/LogonSubmit”
   type="app.LogonAction"
   name="logonForm"
   scope="request"
   validate="true"
   input="/pages/Logon.jsp">
   <forward
      name="success"
      path="/pages/Welcome.jsp"/>
</action>
```

Form Beans Also Provide Values

/pages/Logon.jsp

```
…
  <h3><bean:message key=”logon.heading" /></h3>
  <html:form action="/LogonSubmit" focus="username">
    <table width="100%">
      <tr><th align="right">Username:</th>
          <td><html:text property="username" /></td></tr>
      <tr><th align="right">Password:</th>
          <td><html:password property="password" /></td></tr>
      <tr><td align="right"><html:submit /></td>
          <td><html:reset /></td></tr>
    </table>
  </html:form>
…
```

Typical Code Of A LogonForm Bean

```
public final class LogonForm extends ActionForm {
   private String password = null;
   private String username = null;

   public String getPassword() { return (this.password); }
   public void setPassword(String password) { this.password = password; }

   public String getUsername() { return (this.username); }
   public void setUsername(String username) { this.username = username; }

   public void reset(ActionMapping mapping, HttpServletRequest request) {
      setPassword(null);
      setUsername(null);
   }
}
```

The Art of Balancing How Many Actions & JSPs to Use

- Consider the "logon" application
- We could have one JSP for each kind of login error
- However, we will see technologies that help consolidate within a few JSPs
  - Form validation features
  - Logic tag library
- Deciding the number of actions and JSPs is an art of design – not a science
  - Examples, practice, then more practice…

Validation

```
public ActionErrors validate(ActionMapping mapping,
                             HttpServletRequest request) {

   ActionErrors errors = new ActionErrors();

   if ((username == null) || (username.length() < 1))
      errors.add("username", new ActionMessage("error.username.required"));

   if ((password == null) || (password.length() < 1))
      errors.add("password", new ActionMessage("error.password.required"));

   return errors;
}
```

Resource File & Internationalization

MessageResources.properties

app.title=Struts Logon Application

welcome.heading=Welcome User!

logon.heading=Sign in, Please!

errors.header=<h3>Validation Error</h3>You must…

errors.prefix=

errors.suffix=

errors.footer=
<hr>

error.username.required=Username is required

error.password.required=Password is required

error.logon.invalid=Username and password provided not found in user…

error.logon.connect=Could not connect to user directory.

…

Action Bean LogonAction.java

```
package app;

import java.io.IOException;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
import org.apache.struts.action.Action;
import org.apache.struts.action.ActionErrors;
import org.apache.struts.action.ActionForm;
import org.apache.struts.action.ActionForward;
import org.apache.struts.action.ActionMapping;
import org.apache.struts.action.ActionMessage;
import org.apache.struts.action.ActionMessages;

public final class LogonAction extends Action {
…
```

Action Bean LogonAction.java

```
…
/**
 * Validate credentials with business tier.
 *
 * @param username The username credential
 * @param password The password credential
 * @returns true if credentials can be validated
 * @exception UserDirectoryException if cannot access directory
 */
public boolean isUserLogon(String username, String password)
            throws UserDirectoryException {

    return (UserDirectory.getInstance().isValidPassword(username, password));
    // return true;
}
…
```

Action Bean LogonAction.java

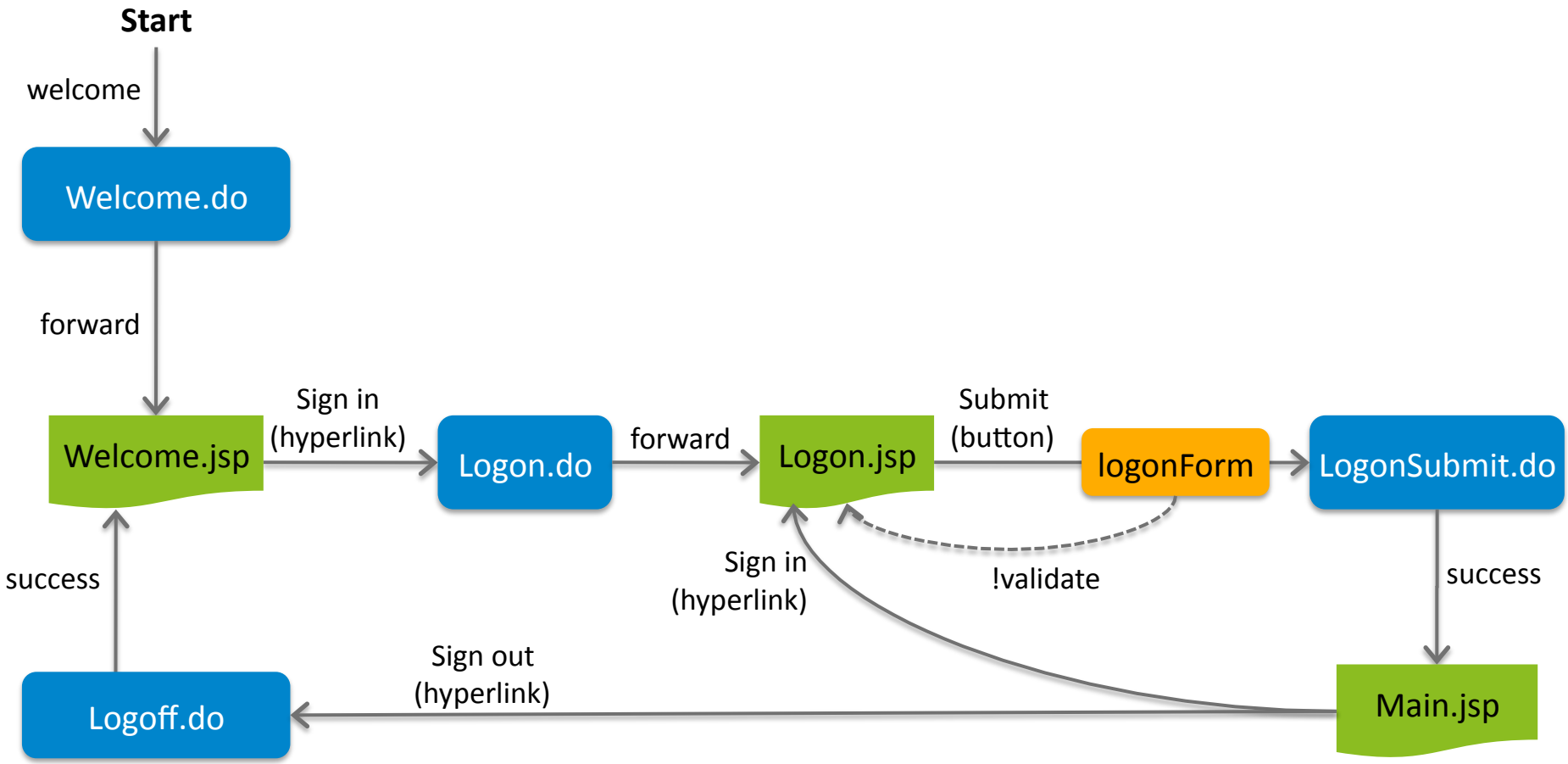
```
…
public ActionForward execute(ActionMapping mapping, ActionForm form,
    HttpServletRequest request, HttpServletResponse response) throws Exception {
    // Obtain username and password from web tier
    String username = ((LogonForm) form).getUsername();
    String password = ((LogonForm) form).getPassword();
    // Validate credentials with business tier
    boolean validated = false;
    try {
            validated = isUserLogon(username, password);
    } catch (UserDirectoryException ude) {
            // couldn't connect to user directory
            ActionErrors errors = new ActionErrors();
            errors.add(…, new ActionMessage("error.logon.connect"));
            saveErrors(request, errors);
            // return to input page
            return (new ActionForward(mapping.getInput()));
    }
    …
```

Action Bean LogonAction.java

```
        …
        if (!validated) {
                // credentials don't match
                ActionErrors errors = new ActionErrors();
                errors.add(…, new ActionMessage("error.logon.invalid"));
                saveErrors(request, errors);
                // return to input page
                return (new ActionForward(mapping.getInput()));
        }
        // Save our logged-in user in the session,
        // because we use it again later.
        HttpSession session = request.getSession();
        session.setAttribute(Constants.USER_KEY, form);

        // Return success
        return mapping.findForward(Constants.SUCCESS);
}
} // End LogonAction
```

WorkFlow Variance



WorkFlow Variance

- The two variances share the same actions
- No modification in Actions source files
- Only need to change “view” (JSPs) and “workflow” (struts-config.xml)