Kofax Customer Communications Manager

5.0

ITP/OnLine Customization Manual

KOFAX
from Lexmark

Contents

Introduction

CCM ComposerUI Server is integrated in a wide variety of contexts. For this purpose it can be customized in many ways. Currently, the description of these customization options in the CCM ComposerUI Manual is limited. The CCM ComposerUI Customization Manual aims to cover this ground.

The first version of this manual will focus on a description of the new structure of the Xsl-transformation that produces the CCM ComposerUI web Forms. This structure was introduced in CCM ComposerUI Server 3.5.12.

In version 3.5.15 an alternative was introduced for the HTML-output of CCM ComposerUI. This modern, div-oriented output and the underlying JavaScript are described in this manual.

This manual assumes basic knowledge of the concepts of CCM ComposerUI Server and of Xslt.

All documentation can also be found on the Kofax Customer Communications Manager Knowledge Center (http://ccmkc.kofax.com).

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Web forms: XSLT

During interactive document composition the end user is presented with a number of forms. These forms are defined in XForms format by the ITP Model that runs on CCM Core. Such a form definition is transformed to a web form by an Xsl-transformation on CCM ComposerUI.

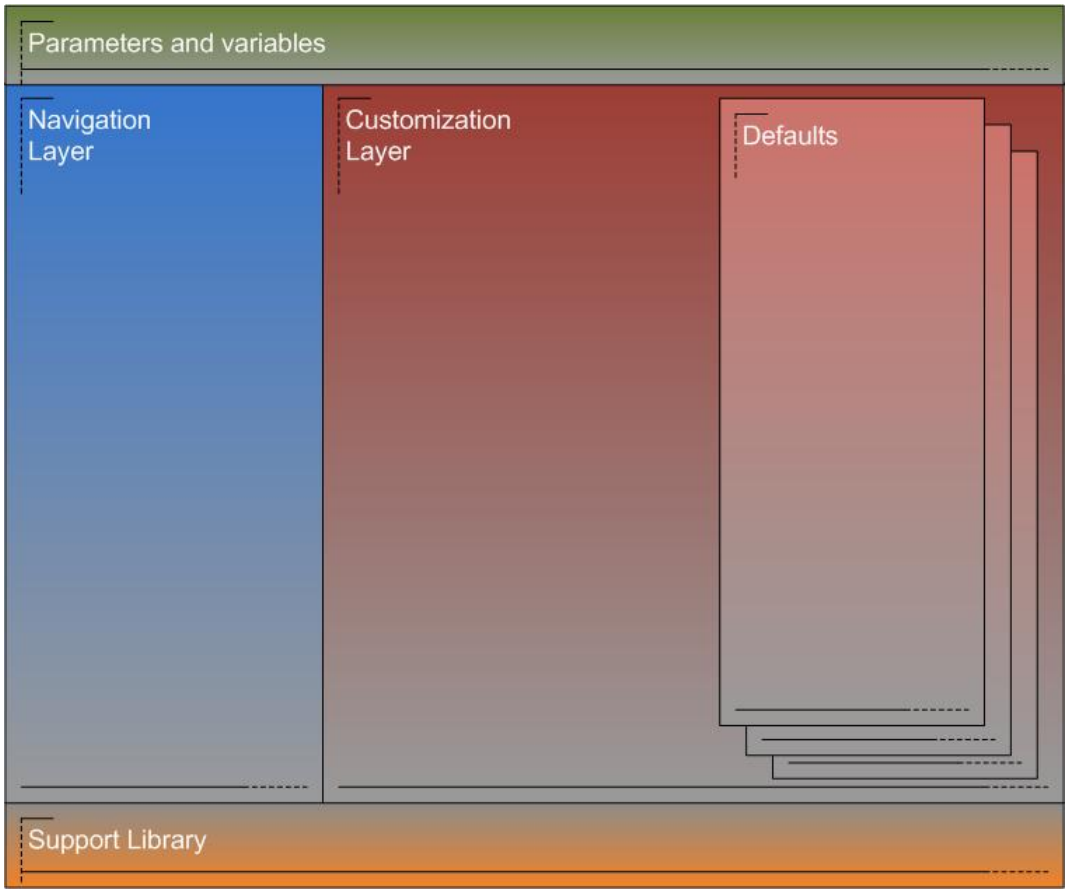
XSLT

The Xsl-transformation that transforms the XForms form definitions to web forms can be overridden. Up to version 3.5.12 of CCM ComposerUI Xsl-transformations were not modular. This meant that the Xsl-transformation could either be overridden as a whole, or not at all. This had an important consequence for updates. If an update of CCM ComposerUI involved new functionality, part of which was implemented in the Xsl-transformation, this functionality would be shielded because of customizations to the Xsl-transformation. This introduced the need for merges with each update.

From version 3.5.12 overrides may be applied to well-defined parts of the Xsl-transformation. This paragraph describes the modular structure of the Xsl-transformation.

> **Note**
> This currently applies to the transformation file interact.xsl, i.e., the transformation that produces the CCM ComposerUI web forms.

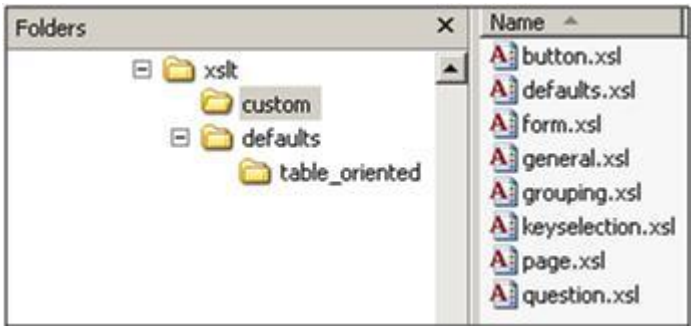
General structure



The general structure of the Xsl-transformation consists of:

- **Parameters** and **variables**, set of well-defined global parameters and variables that can be used as part of the customization.
- **Support library**, a set of well-defined named templates that can be used as part of the customization. These templates cannot be overridden.
- A **navigation layer**, a set of well-defined templates that operate on the XForms. These templates will shield the customizable parts of the Xslt from the details of the XForms format. The templates in the navigation layer will not produce any output and cannot be overridden.
- A **customization layer**, a set of well-defined templates that are called from the navigation layer and have the responsibility to produce an isolated chunk of output. For this purpose, they can use any functionality defined in the other layers. These templates can be overridden.
- **Defaults**, a default implementation for each template from the Customization layer. These defaults are called by the templates in the Customization layer, but can also be called from overrides of these templates. Currently, only one set of defaults exists, producing the classic table-oriented CCM ComposerUI output. These defaults cannot be overridden.

Files



The structure mentioned above has been implemented in a number of files, which reside in the xslt subfolder of the CCM ComposerUI installation. This folder contains the following subfolders:

- **Custom**, this is the only folder with files that may be modified. Declaration (and implementation) of a customizable template in one of these files implies that the template has been overridden. The file defaults.xsl is responsible for selecting an implementation of the defaults from the subfolder Defaults.
- **Defaults**, this folder contains the defaults as described above. These are implemented in the file defaults.xsl, which resides in a further subfolder. Currently, there is one subfolder named table_oriented, which produces the old table-oriented output, and one subfolder named div_oriented, which produces the new output described in the next chapter.

At top level there are four files implementing the layers mentioned above:

- **varsandparams.xsl** for parameters and variables.
- **support.xsl** for the support library.
- **navigation.xsl** for the navigation layer.
- **overridable.xsl** for the customization layer.

The last file is interact.xsl, which is the main xsl-file. This file imports the other templates. It is applied to the XForms by CCM ComposerUI.

The interact.xsl calls templates from navigation.xsl which in turn calls templates implemented in overridable.xsl. These templates can be overridden by simply implementing them in one of the *custom*.xsl* files. The implementation of those templates in one of the *custom*.xsl* files may call the _default templates from the *defaults*.xsl* files. By default the code, which is commented in the *custom*.xsl* files, calls the corresponding templates in *default*.xsl* files.

Appendix B contains an example of the above for the customizations presented in the Example below.

> **Note:**
> One may be tempted to implement overrides by modifying the overridable.xsl. This is **not** the intended use, define overrides in the files in the custom subfolder, instead.

Templates

Appendix A lists all templates that define the guaranteed interfaces between the different layers of the xsl-transformation. There are three categories:

- Templates defined in Navigation Layer. These are templates that can be applied to a given

context in the XForms.

- Templates defined in Customization Layer. These are named templates that are responsible for the production of an isolated bit of output. For each template with name X in the custom layer, there will be a template named X_default in the defaults.
- Templates defined in Support Library. These are named templates that implement some useful support functionality.

Most of the named templates require a given XForms context. They can, in other words, only be called if the current context node is of the right type.

Appendix B presents an example of the flow of control between the different layers. Navigation starts by applying the main template itp:interact in the navigation layer. This will call the template producePage in the Customization layer, which is responsible for producing the page output. This template will contain a trivial call to its equivalent in the defaults, which may call templates in either the Navigation or the Customization layer and uses templates from the Support Library in the process. Templates defined in *custom**.xsl* will override templates in overridable.xsl.

Passing information

Information is passed on the calls between the different templates. This information is bundled in so called node sets. The signature of the different node sets is described in Appendix C.

Along with the node sets a 'custom' parameter is passed on between the templates. The navigation layer will only pass this parameter on, and not interpret it. The parameter can be used to distinguish between different traversals of the XForms structure, if that is required as part of the customization. The Example below illustrates the intended use of the 'custom' parameter.

Example

Part of the installation of CCM ComposerUI is a custom1.zip file. This file contains an example extension to an CCM ComposerUI application. This extension serves to illustrate xslt customization. The customization in the custom1 application adds buttons at the top of the forms, so that the end user doesn't have to scroll down to submit a long form.

The custom1 application is not installed by default. In order to install it, follow these steps:

- Go to the configuration page of your CCM ComposerUI installation. Refer to the Configuration chapter in the general CCM ComposerUI Server Manual for more information on this subject.
- In the field Application Name, `fill out "custom1"` and click `Submit`.
- In the folder OnLine application, a subfolder custom1 will be created. Copy the contents of the subfolder sample2 to this location.
- Unzip the contents of the custom1.zip file to the subfolder. Make sure the unzip does not

introduce an extra level custom1; a subfolder xslt should occur immediately below the existing folder custom1.

- For ITP/OnLine ASP.NET only, go back to the configuration page and click the link **Deploy** next to the application custom1.

The application custom1 is an addition to the application sample2 that is installed by default. It adds the following files:

- *\css\topbuttons.css*. A css file with a small number of extra style definitions for the new buttons.
- *\xslt\custom\button.xsl*. An xsl-file that overrides the templates produceButtons, produceButton, and produceButtonLabel from the Customization Layer. These templates produce the actual buttons.
- *\xslt\custom\form.xsl*. An xsl-file that overrides the template produceFormBody from the Customization Layer. This template positions the buttons at the top of the form.
- *\xslt\custom\page.xsl*. An xsl-file that overrides the template producePageCSS from the Customization Layer. This template includes the additional topbuttons.css stylesheet.

The other files in the folder *\xslt\custom* are irrelevant. They merely serve as a starting point for other customizations. Uncomment a template in order to override it.

Important general features illustrated by the customization are:

- The use of the custom parameter to distinguish between traversals.
- Reuse of default behavior by calling the _default templates. This avoids unnecessary duplication of code.

The override of the template produceFormBody looks like this:

```
<xsl:template name="produceFormBody">
  <xsl:param name="interactinfo"/>
  <xsl:param name="custom"/>

  <!-- an additional table with a single row of buttons at the top of the
form -->
  <tr>
    <td>
      <xsl:call-template name="produceButtons">
        <xsl:with-param name="interactinfo" select="$interactinfo"/>
        <xsl:with-param name="custom" select="'topbuttons'"/>
      </xsl:call-template>
    </td>
  </tr>
  <xsl:call-template name="produceFormBody_default">
    <xsl:with-param name="interactinfo" select="$interactinfo"/>
    <xsl:with-param name="custom" select="$custom"/>
  </xsl:call-template>
</xsl:template>
```

This introduces an extra row with buttons above the standard content of the form. The content of this row is determined by a call to the template produceButtons. This introduces an extra traversal of the buttons in the XForms. In order to distinguish this traversal from the standard traversal, which produces the standard buttons, the value topbuttons is passed for the 'custom' parameter. This illustrates the intended use of this parameter.

The override of the template produceButtons looks like this:

```
<xsl:template name="produceButtons">
```

```
    <xsl:param name="interactinfo"/>
    <xsl:param name="custom"/>

    <xsl:choose>
      <xsl:when test="$custom='topbuttons'">
        <div class="topbuttons">
          <!-- only produce the ok and the back button (css will order) -->
          <xsl:call-template name="applyNamedButtons">
            <xsl:with-param name="names" select="'ok back1'"/>
            <xsl:with-param name="custom" select="$custom"/>
          </xsl:call-template>
        </div>
      </xsl:when>
      <xsl:otherwise>
        <xsl:call-template name="produceButtons_default">
          <xsl:with-param name="interactinfo" select="$interactinfo"/>
          <xsl:with-param name="custom" select="$custom"/>
        </xsl:call-template>
      </xsl:otherwise>
    </xsl:choose>
  </xsl:template>
```

Based on the value of the custom parameter, the template either produces the new buttons or falls back on default behavior. At the top of the form only the buttons OK and (possibly) the Back are produced inside a div with class "topbuttons". This is done by:

- calling the template applyNamedButtons from the Support Library,
- passing identifications of the buttons to be produced (space separated),
- passing the value topbuttons for the custom parameter.

The template applyNamedButtons will pass this value on to the template produceButton. The order in which the identifiers are passed determines the order in which the corresponding buttons are produced. Buttons are only produced when they are part of the XForms.

Even though we want the Back button to be presented to the left of the OK button, we produce the latter first. This is because we want the OK button to be the default button on the form. The positioning of the buttons on the page will be arranged in the cascading stylesheet.

The override of the template produceButton looks like this:

```
  <xsl:template name="produceButton">
    <xsl:param name="buttoninfo"/>
    <xsl:param name="custom"/>
    <xsl:choose>
      <xsl:when test="$custom='topbuttons'">
        <button id="{$buttoninfo/submission}"
name="{$buttoninfo/submission}" type="submit" class="{$buttonclassbase}">
          <xsl:attribute name="onClick">
            setSubmission('<xsl:value-of
select="$buttoninfo/submission"/>');
          </xsl:attribute>
          <xsl:call-template name="produceButtonLabel">
            <xsl:with-param name="buttoninfo" select="$buttoninfo"/>
            <xsl:with-param name="custom" select="$custom"/>
          </xsl:call-template>
        </button>
      </xsl:when>
      <xsl:otherwise>
```

```
        <xsl:call-template name="produceButton_default">
          <xsl:with-param name="buttoninfo" select="$buttoninfo"/>
          <xsl:with-param name="custom" select="$custom"/>
        </xsl:call-template>
      </xsl:otherwise>
    </xsl:choose>
  </xsl:template>
```

Again, the custom parameter determines whether or not to fall back on default behavior. The new buttons are produced directly below the div that was produced by the template produceButtons. The button label is produced by calling the template produceButtonLabel, again passing the value topbuttons for the custom parameter.

The override of the produceButtonLabel template looks like this:

```
  <xsl:template name="produceButtonLabel">
    <xsl:param name="buttoninfo"/>
    <xsl:param name="custom"/>

    <xsl:choose>
      <xsl:when test="$custom='topbuttons'">
        <xsl:choose>
          <xsl:when test="$buttoninfo/submission='ok'">
            <xsl:text
disable-output-escaping="yes">&amp;gt;&amp;gt;</xsl:text>
          </xsl:when>
          <xsl:when test="$buttoninfo/submission='back1'">
            <xsl:text
disable-output-escaping="yes">&amp;lt;&amp;lt;</xsl:text>
          </xsl:when>
          <xsl:otherwise>
            <xsl:call-template name="produceButtonLabel_default">
              <xsl:with-param name="buttoninfo" select="$buttoninfo"/>
              <xsl:with-param name="custom" select="$custom"/>
            </xsl:call-template>
          </xsl:otherwise>
        </xsl:choose>
      </xsl:when>
      <xsl:otherwise>
        <xsl:call-template name="produceButtonLabel_default">
          <xsl:with-param name="buttoninfo" select="$buttoninfo"/>
          <xsl:with-param name="custom" select="$custom"/>
        </xsl:call-template>
      </xsl:otherwise>
    </xsl:choose>
  </xsl:template>
```

Again, the custom parameter determines whether or not to fall back on default behavior. The buttons OK and Back will respectively be represented by >> and <<.

The override of the template producePageCSS looks like this:

```
  <xsl:template name="producePageCSS">
    <xsl:param name="interactinfo"/>
    <xsl:param name="custom"/>
    <xsl:call-template name="producePageCSS_default">
      <xsl:with-param name="interactinfo" select="$interactinfo"/>
      <xsl:with-param name="custom" select="$custom"/>
    </xsl:call-template>
```

```
    <link rel="stylesheet" type="text/css" href="css\topbuttons.css"/>
  </xsl:template>
```

This template simply adds a reference to the topbuttons.css stylesheet, again using the default behavior to produce the standard set of references. The template topbuttons.css contains a small number of style instructions, making sure that the buttons are rendered a bit smaller and that the OK button is presented to the right of the Back button.

A visual representation of these customizations can be found in Appendix B.

Web Forms: new output

In version 3.5.15 of CCM ComposerUI Server an alternative was introduced for the old, table-oriented HTML output of the CCM ComposerUI forms. This alternative has the following features:

- The output is XHTML-compliant.
- The output is div-oriented, allowing for a more flexible layout through CSS.
- The underlying JavaScript is open and documented, and defines an extensibility model. This means, customization of CCM ComposerUI through JavaScript can be done in a well-defined an maintainable way.
- The underlying JavaScript capitalizes on the power of jQuery (http://www.jquery.com).

This chapter describes the new output, the underlying JavaScript library and the way in which the extensibility model can be used. This description is currently limited to the web forms produced by CCM ComposerUI, i.e. the output produced by the file interact.xsl.

> **Note**
> The alternative div-oriented output does not work using Microsoft Internet Explorer 6.

Switching between the old and the new output

From version 3.5.20, CCM ComposerUI Server produces the new div-oriented output by default. This is, because the file *xslt\custom\defaults.xsl* includes *xslt\defaults\div_oriented\defaults.xsl*, where it contained *xslt\defaults\table_oriented\defaults.xsl* in previous versions. If required, this can be changed by putting a custom file *xslt\custom\defaults.xsl* in your CCM ComposerUI application. In order to activate the old table-oriented output, make sure that it contains:

```
<xsl:import href="..\defaults\table_oriented\defaults.xsl"/>
```

The same goes for the output of the CCM ComposerUI letterbook. The file *xslt\custom\defaults_letterbook.xsl* includes *xslt\defaults\div_oriented\defaults.xsl*, rather than *xslt\defaults\table_oriented\defaults.xsl.* This can be changed by putting a custom file *xslt\custom\defaults_letterbook.xsl* in your CCM ComposerUI application. In order to activate the old table-oriented output, make sure that it contains:

```
<xsl:import href="..\defaults\table_oriented\defaults_letterbook.xsl"/>
```

The newsample.zip file that is part of the CCM ComposerUI installation serves as an example for the new output. It is not installed by default. In order to install it, follow these steps:

1. Go to the configuration page of your CCM ComposerUI installation. Refer to the general CCM ComposerUI Server Manual chapter Configuration for more information on this subject.
2. In the field Application Name, fill out "newsample" and click Submit.
3. In the OnLine application folder, a subfolder newsample will be created.
4. Unzip the contents of the newsample.zip file to the subfolder. Make sure the unzip does not introduce an extra level newsample; subfolders css and xslt should occur immediately below the existing folder newsample.
5. For CCM ComposerUI ASP.NET only, go back to the configuration page and click the link Deploy next to the application newsample.

HTML

The new HTML output is XHTML-compliant. For its layout it uses divs and spans, rather than tables. The XHTML produced by the Xsl-transformation is listed in Appendix D. It produces rather basic structures, which will be lifted by JavaScript manipulation during loading of the page.

CSS

By default, two cascading style sheets are included in the HTML page. A general one, which implements a jQuery theme (by default, this is UI-lightness) and a specific one, which contains layout that is specific to the CCM ComposerUI forms. Appendix D presents the XHTML produced by the new Xsl transformation and therefore also the CSS classes that are attached to the different tags.

JavaScript

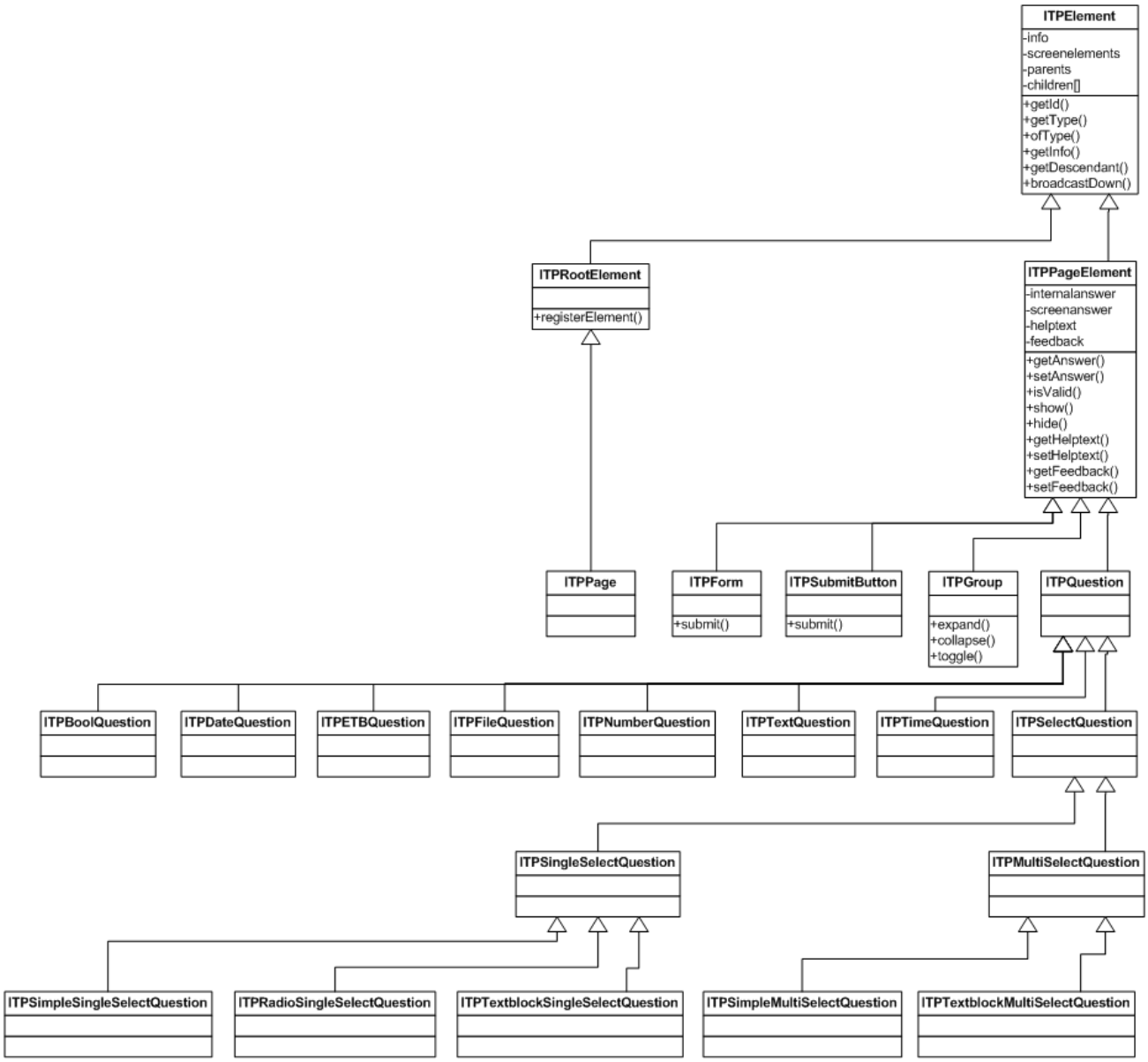
Unlike the JavaScript that underpins the old output of CCM ComposerUI, the new JavaScript library has an open and well-defined structure. This structure is such, that it can be extended as part of customization e.g., to change the behavior of one type of control.

This paragraph describes the JavaScript library by presenting the underlying object model, the object tree that is constructed from it at run time and how this tree is initialized and submitted. It also shortly describes how the implementation capitalizes on jQuery. Finally, an example is presented of how the extensibility of the object model can be used to define custom behavior.

Object model

An CCM ComposerUI web form consists of a hierarchy of groups and questions, presented inside an HTML form on an HTML page. Therefore, an CCM ComposerUI web form can be modeled as a tree of objects, each representing a node in the hierarchy mentioned before. The root node of this tree will represent the HTML page as a whole, whereas each sub node will represent one element on the page, i.e. the HTML form, a group, a question or a (submit) button. Questions can be of many types, e.g. a text question, a number question, a date question or a select question. Select questions may allow for a single or for multiple items to be selected and may or may not present text blocks as selectable items.

The JavaScript object model defines a class for each of the node types described above. The corresponding class hierarchy is presented in the picture below. The details of each class are described in Appendix E. The most important features are described in the following paragraphs.



ITPElement

ITPElement represents a general element in the tree. It is aware of its element type, which will be different for each descendant of ITPElement.

ITPElement holds an info structure, which basically is a JSON collection of information about the particular element. The structure and contents of this collection correspond trivially to the node sets that are passed back and forth between the templates in the Xslt. Refer to paragraph Passing information (page 8) and Appendix C (page 27) for more information.

ITPElement is aware of the hierarchical relations between the objects. It contains a reference to a parent object and to an array of children. It knows how to transfer messages through the system and how to find an element in its subtree.

ITPElement defines the general initialization of an element, which may be asynchronous. The most important part of initialization is the construction of a map of screen elements. At this point the JavaScript may manipulate the content of the screen.

ITPRootElement and ITPPage

ITPRootElement represents the root of the object tree. It offers a method to register an info structure during construction of the HTML page and implements initialization such that:

- it constructs an object for each registered info structure
- it constructs the node tree by applying parent-child relations
- it makes sure that each object initializes itself
- it makes sure that all objects synchronize (by sending messages)

ITPPage derives from ITPRootElement, adding one simple function `isContentWizard`, which indicates whether or not the page shows a Content Wizard.

ITPPageElement

ITPPageElement represents a sub node in the tree, i.e. an element on the page. Each page element may have an answer. ITPPageElement distinguishes between an internally stored answer and a screen answer, which may be visible on the page, e.g., the answer as it is typed in an input element. It defines answer validation, which may result in three possible values:

- the answer is correct
- the answer cannot be accepted upon form submission, but may be shown on the screen. The user will be presented with a visual indication that the answer is not valid.
- the answer cannot be accepted at any time. The previous acceptable answer will be shown on the screen.

An ITPPageElement is associated with a help text, providing additional information, and a feedback text, providing error messages.

An ITPPageElement can be shown or hidden.

ITPPageElement descendants

ITPForm and ITPSubmitButton respectively represent the HTML form and the buttons that submit this form. They both add a submit function, which will submit the form, passing information on the button that was clicked to submit the form.

ITPGroup represents a group on the page. It implements behavior for expanding, collapsing, and toggling of groups. The latter is implemented by processing messages that are sent by question elements.

ITPQuestion represents a question on the form. Its descendants define the specific behavior for different question types. ITPSelectQuestion and its descendants define the behavior for select questions; ITPSingleSelectQuestion for single selects and ITPMultiSelectQuestion for multi selects.

Object tree and messages

With the help of the class ITPMessage, ITPElement implements a messaging mechanism in the tree. As a result of this, elements in the tree can communicate without knowing each other. An element may send a message by calling the function bubbleUp. This sends the message to the parent element, so that it will end up at the root node of the tree. From this point the message will be broadcasted down the tree, allowing each node to react to and modify the message. The latter may

involve attaching of an answer, or marking the message as shouldStop in which case broadcasting will be stopped.

This mechanism is for instance used to notify other nodes of a change in an answer. The class ITPGroup will modify the visibility of a group if there has been a relevant change to the answer of its corresponding toggle question.

Initialization

ITPElement defines the general initialization of an element in the tree. ITPRootElement defines the initialization of the tree as a whole. It is important to be aware of the steps that are part of this process:

- The HTML-page will contain one global instance itppage of the class ITPPage.
- On this instance, the JavaScript in the HTML page will call registerElement for each relevant element on the page, passing the corresponding information structure.
- The onload event of the page will call itppage.initialise.
- During initialization, an object will be constructed for each registered information structure. This is done by calling getITPElement on the global object itpelementfactory. This factory provides an abstraction layer to the actual construction of the objects and thus provides the basis for the extensibility model described below.
- As soon as all objects are constructed, the tree will be constructed from them by applying parent-child relations.
- After this, all objects will be initialized by calling their initialize methods. Initialization of an object may involve asynchrony. As part of the initialization of an object, its initScreenElements will be called. This is the point where the object may manipulate the contents of the page. The call should return a map of references to relevant screen elements, which can be used by other methods later on.
- As soon as all objects have reported back, synchronization will be invoked upon each element in the tree. This will induce the first traffic of messages through the tree.

Form submission

If a submit button is clicked, the corresponding object ITPSubmitButton will send a message notifying this event. This message will be picked up by an instance of the class ITPForm, which will then start the process of submitting the form. This involves a call to the function prepareForSubmission, which is defined by ITPPageElement for each child of the element ITPForm. Once a child has completed its preparation, it will report this by calling the function readyForSubmission on its parent, passing the validity of its answer. This mechanism therefore allows for asynchrony, which is for instance used by the class ITPETBQuestion.

If all answers are valid, the object ITPForm will simply submit the HTML form. It is not responsible for sending any of the answers of its children. During preparation an element should make sure that its answer will be part of the HTML form that is submitted e.g., through a hidden element on the page.

jQuery

The JavaScript library uses jQuery to manipulate the page. jQuery is widely used and recommended by important parties like Google and Microsoft. It introduces a flexible and browser

independent way of querying and manipulating elements on the page and adds powerful features to the end user experience.

Currently, CCM ComposerUI uses version 1.6.2 of the general jQuery library and version 1.8.15 of the jQuery UI library.

Refer to www.jquery.com and www.jqueryui.com for more information.

Extensibility: an example

The extensibility of the object model allows for simple and maintainable JavaScript customization of the CCM ComposerUI web forms. This paragraph presents an example to explain how the extensibility can be used. In this example, number questions are represented with thousands separators.

ITPElementFactory

First, it is important to understand the way in which the class ITPElementFactory, of which the global variable `itpelementfactory` is an instance, constructs an object from a given info structure. The Xslt that produces the new output makes sure that each info structure has an attribute elementtype. Currently, there are 16 element types, one for each leave in the class hierarchy:

Element type	Description
page	The main page.
form	The main form
group	A group
submitbutton	A submit button
question_text	A text question
question_number	A numerical question
question_bool	A check box question
question_date	A date question
question_time	A time question
question_file	A file question
question_etbq	An editable text block question
question_ertb	An editable rich text block question
question_simplesingleselect	A single select question (no text blocks, no radio buttons)
question_radiosingleselect	A single select question (no text blocks, radio buttons)
question_simplemultiselect	A multi select question (no text blocks)
question_textblocksingleselect	A single select question (text blocks)
question_textblockmultiselect	A multi select question (text blocks)

Each class in the class hierarchy has an associated object type. Each class is registered with the global variable `itpelementfactory` by calling its function registerClass. Also, mappings between object types and element types can be registered, by calling the function registerMapping on itpelementfactory. For the general library this is done in the itpelementfactorymappings source. The combination of the two types of registration provides sufficient information for the class ITPElementFactory to construct an object from an info structure.

Steps

This leaves the following three simple steps to implement custom behavior:

- Implement a new class that descends from ITPElement or one of its descendants, most likely: ITPQuestion.
- Make sure that the source implementing this class also registers the mapping between the class type and the proper element type.
- Redefine the xslt template producePageScript to include the newly created JavaScript source. Make sure that this source is the last one to be included. This is the only way in which the registration can take preference over any other registration for the element type.

Example

Part of the installation of CCM ComposerUI is a custom2.zip file. This file contains an example extension to an CCM ComposerUI application. This extension serves to illustrate JavaScript customization. The customization in the custom2 application adds thousands separators to numerical questions.

The application extension custom2 is not installed by default. In order to install it, follow these steps:

1. Go to the configuration page of your CCM ComposerUI installation. Refer to the general CCM ComposerUI Server Manual chapter Configuration for more information on this subject.
2. In the field Application Name, fill out "custom2" and click Submit.
3. In the OnLine application folder, a subfolder custom2 will be created. Copy the contents of the newsample application to this location (or unzip the newsample.zip file).
4. Unzip the contents of the custom2.zip file to the subfolder. Make sure the unzip does not introduce an extra level custom2; subfolders js and xslt should occur immediately below the existing folder custom2.
5. For CCM ComposerUI ASP.NET only, go back to the configuration page and click the link Deploy next to the application custom2.

The application custom2 is an addition to the newsample application. It adds the following files:

- *\js\customnumberquestion.js*. The custom JavaScript file that implements the custom behavior.
- *\js\jquery.caret.min.js*. A jQuery widget that support caret manipulation.
- *\xslt\custom\page.xsl*. An xsl file that includes the additional JavaScripts in the page.

producePageScript

The custom JavaScript file is included in the output as follows:

```
<xsl:template name="producePageScript">
  <xsl:param name="interactinfo"/>
```

```
  <xsl:param name="custom"/>
  <xsl:call-template name="producePageScript_default">
    <xsl:with-param name="interactinfo" select="$interactinfo"/>
    <xsl:with-param name="custom" select="$custom"/>
  </xsl:call-template>
  <script type="text/javascript" src="js/jquery.caret.min.js">
    <xsl:value-of select="$empty"/>
  </script>
  <script type="text/javascript" src="js/customnumberquestion.js">
    <xsl:value-of select="$empty"/>
  </script>
  </xsl:template>
```

It produces the standard JavaScript by calling the default template producePageScript and adds two script includes after this. This order is important, because otherwise the registration of the new class with the `itpelementfactory` would not prevail.

CustomNumberQuestion

The file customnumberquestion.js implements the class CustomNumberQuestion, which descends from ITPQuestion. It registers this class with the `itpelementfactory` and also registers a mapping between the element type question_number and the class type ITPElement.ITPPageElement.ITPQuestion.CustomNumberQuestion.

CustomNumberQuestion adds four methods; thousands, countseparators, internal2screen and screen2internal, that implement the thousands separator logic. The details of this implementation are not relevant to this example.

More importantly, CustomNumberQuestion overrides the following methods:

- **initScreenElements**, this method builds up a map of screen elements, adding to the list that is produced by the base class ITPQuestion. It finds the standard input element that is produced by the Xslt and hides this. It adds a new input, binding thousands separator logic to it.
- **setInternalAnswer**, this method makes sure that the original hidden input element is synchronized with the answer provided by the end user. The content of the hidden element will be posted when the form is submitted. Because this element is now guaranteed to be in sync with the answer on the screen, no additional work is required in the method prepareForSubmission.
- **getScreenAnswer**, this method return the answer that is currently on the screen, in internal format, by removing all thousands separator characters.
- **setScreenAnswer**, this method puts an answer on the screen, after adding thousands separators add the right locations.
- **validate**, this method returns whether an answer is valid and acceptable. It does not accept values that cannot be interpreted numerically and validates numerical values against the amount of allowed digits. If the answer is invalid, it sets a feedback text, which will be presented to the end user as an error.

The combination of these overrides is sufficient to implement the custom thousands separator behavior. During initialization the custom implementation initScreenElements will manipulate the screen and bind the thousands separator logic. During form entry and submission the other overrides will combine to make sure the answer is interpreted and validated correctly.

Appendix A: Xslt templates

templates defined in the Navigation layer (navigation.xsl)

match	mode	parameters	description
itp:interact		custom	Calls producePage to produce the page content
itp:interact	group	custom	Calls produceGroup to produce the top level group
itp:group		custom	Calls produceGroup to produce a child group
itp:table		custom	Calls produceTable to produce a tabular structure
itp:row		custom	Calls produceTableRow to produce a row in an itp:table
itp:cell		custom	Calls produceTableCell to produce a cell in an itp:table
itp:question		custom	Calls produceSimpleText to produce static text or produceQuestion to produce normal questions
itp:question	keyselection	custom	Calls produceKeyList to produce a key selection list
xforms:submit	keyselection	custom	Calls produceKey to produce a key selection item
xforms:item		questioninfo, custom	Calls produceOption to produce a selection option
itp:textblock		questioninfo, custom	Calls registerFieldSet for each field set and registerField for each field that applies to an editable text block or editable rich text block
itp:button		custom	Calls produceButton to produce a button

templates defined in the Customization layer (overridable.xsl)

name	XForms context	parameters	description
getMaxFeatureLevel	any	-	Returns the feature level that can be handled by the transformation. Currently, the maximum level defined is 9.
producePage	itp:interact	interactinfo, custom	Produces the main page.
producePageHeader	itp:interact	interactinfo, custom	Produces the contents of the page

name	XForms context	parameters	description
			header.
producePageTitle	itp:interact	interactinfo, custom	Produces the title in the page header.
producePageCSS	itp:interact	interactinfo, custom	Produces the css references in the page header.
producePageScript	itp:interact	interactinfo, custom	Produces the script references in the page header.
producePageBody	itp:interact	interactinfo, custom	Produces the contents of the page body.
producePageOnLoad	itp:interact	interactinfo, custom	Produces the contents of the onload attribute of the page body.
produceForm	itp:interact	interactinfo, custom	Produces the html form.
produceFormOn Submit	itp:interact	interactinfo, custom	Produce the javascript code to be executed upon form submission.
produceFormBody	itp:interact	interactinfo, custom	Produce the contents of the html form.
produceGroup	itp:group	groupinfo, custom	Produces a group.
produceGroup Header	itp:group	groupinfo, custom	Produce the header of a group.
produceGroupBody	itp:group	groupinfo, custom	Produce the contents of a group
produceTable	itp:table	tableinfo, custom	Produces a tabular structure.
produceTableRow	itp:row	rowinfo, custom	Produces a row in a tabular structure.
produceTableCell	itp:cell	cellinfo, custom	Produces a cell in a tabular structure.
produceKeyList	itp:question	keylistinfo, custom	Produces a list of key selection entries.
produceKey	xforms:submit	keyinfo, custom	Produces a key selection entry.
produceSimpleText	itp:question	textinfo, custom	Produces a bit of static text.
produceQuestion Structure	itp:question	questioninfo, custom, label, input, structuretype	Produces the general html-structure of a question, given the specific content of the question label and the question input controls. May produce different output, based on the structuretype, which by default may either contains the value "simple" or "extended".
produceQuestion	itp:question	questioninfo, custom	Produces the content of a question. Will transfer to either of the more specific question templates, possibly using the produceQuestionStructure template.

name	XForms context	parameters	description
produceETBQuestion	itp:question	questioninfo, custom	Produces an editable text block question.
produceERTBQuestion	itp:question	questioninfo, custom	produces an editible rich text block question
produceDate Question	itp:question	questioninfo, custom	Produces a date question.
produceTime Question	itp:question	questioninfo, custom	Produces a time question.
produceText Question	itp:question	questioninfo, custom	Produces a text question.
produceNumber Question	itp:question	questioninfo, custom	Produces a number question.
produceFileQuestion	itp:question	questioninfo, custom	Produces a file question.
produceBool Question	itp:question	questioninfo, custom	Produces a check box question.
produceTextBlock MultiSelectQuestion	itp:question	questioninfo, custom	Produces a multi select question for text blocks.
produceSimpleMulti SelectQuestion	itp:question	questioninfo, custom	Produces a multi select question.
produceTextBlock SingleSelect Question	itp:question	questioninfo, custom	Produces a single select question for text blocks.
produceRadioSingle SelectQuestion	itp:question	questioninfo, custom	Produces a single select question rendered as radio buttons.
produceSimple SingleSelect Question	itp:question	questioninfo, custom	Produces a single select question.
produceOption	xforms:item	questioninfo, optioninfo, custom	Produces an option in a select question.
registerFieldSet	itp:fieldset	fieldsetinfo, custom	Registers the availability of a field set for an editable text block question or editable rich text block question.
registerField	itp:field	fieldinfo, custom	Registers the existence of a field inside a field set.
produceButtons	itp:interact	interactinfo, custom	Produce all form submission buttons.
produceButton	itp:button	buttoninfo, custom	Produces a form submission button.
produceButtonLabel	itp:button	buttoninfo, custom	Produce the label to be displayed on a form submission button.

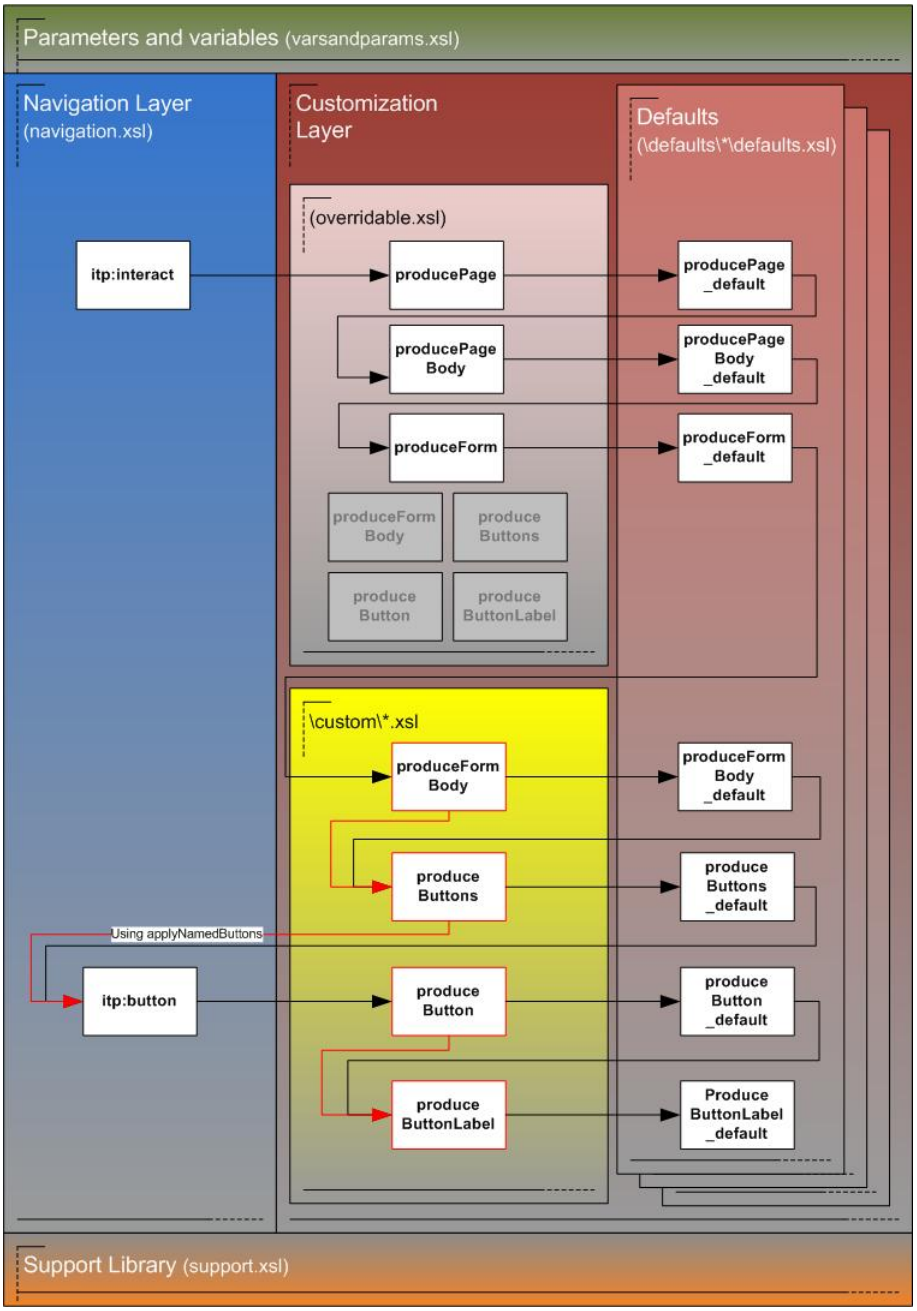
templates defined in the Support Library (support.xsl)

name	XForms context	parameters	description
replace	any	source, tobereplaced,	Replace all occurrences of

name	XForms context	parameters	description
		replacewith	$tobereplaced in $source by $replacewith
escapejavavar	any	javavar	Escape a text value for use in javascript string values
escapeurlparam	any	urlparam	Escape a text value for use in a query string
buildTextBlock PreviewUrl	any	sessionid, rprj, rusr, srv, port, env	Create a url to the text block preview. Appending a text block identifier to this url will result in a url that shows the preview for the corresponding text block.
applySelected Options	itp:question	questioninfo, custom, enforceordering	Drill down to the xforms:item level, only for those items that should be selected by default, possibly enforcing the order in which the items are processed to follow the order in the default
applyUnselected Options	itp:question	questioninfo, custom	Do the same for the items that should not be selected by default
applyAllOptions	itp:question	questioninfo, custom	Do the same for all items (i.e. ignoring the default)
applyNamedButtons	itp:question	names, custom	Drill down to the itp:button level, only for the buttons with a submission attribute named in the $names parameter (space separated list)
applyOtherButtons	itp:question	exclude_names, custom	Do the same for the buttons not in the $exclude_names parameter
buildInteractInfo	itp:interact	-	Build a node set containing interact info
buildGroupInfo	itp:group	-	Build a node set containing group info
buildTableInfo	itp:table	-	Build a node set containing table info
buildTableRowInfo	itp:row	-	Build a node set containing row info
buildTableCellInfo	itp:cell	-	Build a node set containing cell info
buildTextInfo	itp:question	-	Build a node set containing text info
buildQuestionInfo	itp:question	-	Build a node set containing question info
buildKeyListInfo	itp:question	-	Build a node set containing keylist info
buildKeyInfo	xforms:submit	-	Build a node set containing key info

name	XForms context	parameters	description
buildOptionInfo	xforms:item	questioninfo	Build a node set containing option info
buildFieldSetInfo	itp:fieldset	questioninfo	Build a node set containing field set info
buildFieldInfo	itp:field	questioninfo	Build a node set containing field info
buildButtonInfo	itp:button	-	Build a node set containing button info
buildSuspendButtonInfo	any	-	Build a node set containing button info for the suspend button

Appendix B: Example flow



An example of (part of) the flow of control between the different layers with the customization of the Example.

Appendix C: Xslt info structures

InteractInfo

parameter	description
id	A unique identifier for the form.
type	This attribute indicates the type of form that is presented. Currently defined values are: keyselection: The form is a key-selection screen. query: The form is based on a FORM statement. content-wizard: The form is based on a WIZARD statement.
subtype	This attribute distinguishes between different forms with type='content-wizard'. Currently defined values are: main: The main Content Wizard form ETB: The subsequent form, presenting editable (rich) text blocks.
lang	The language currently used by ITP to generate dates, numbers and other language-dependent output.
guilang	The language currently used by ITP to interact with the user. Both itp:lang and itp:gui_lang are presented in the format 'll-CC' where 'll' is the ISO-639 language code and 'CC' is the ISO-3166 country code. For example: The ITP language 'ENG' (English localized for the UK) maps to 'en-GB'. 'NLB' (Dutch localized for Belgium) maps to 'nl-BE'.
version	The version of ITP that generated the interact.xml file.

parameter	description
featurelevel	Indicates the FORM features that actually occur in the form. Currently defined levels are: 0 All features introduced before ITP/OnLine Server, 1 MULTISELECT, ORDER, BEGINGROUP/ENDGROUP 2 VIEW 3 EXPANDABLE, EDITBOX, RADIOBUTTONS, READONLY, TOGGLE 4 BEGINTABLE/ENDTABLE, TIME, RECORDSET, SHOW/SHOWNOT 5 TEXT_BLOCK questions 6 Support for DATE selection. 7 Advanced GROUP TOGGLE behavior. 8 GROUP TOGGLE behavior with multiple conditions. Each level includes the features of the previous levels.
haserrors	This attribute has the value "true" to indicate that the form is a re-send of a previously generated and submitted form, including feedback to the user about the errors in the input. In all other cases, the value is "false".
title	The title of the form as defined on the FORM statement or in the Form editor.
source	Optional attribute indicating the context in which the transformation is executed. In the context of ITP/OnLine, this attribute will be empty. If the transformation is used for the preview of the Form Editor, the value will be "formeditor".

GroupInfo

parameter	description
id	Sequence number that uniquely identifies this group within the form.
title	The heading for the group.

parameter	description
level	Nesting level of the group.
expandable	Indicates whether or not this group can be expanded. If the value is true an interactive client should render this group as an collapsible/expandable element.
expanded	Indicates the original state of the group. If the value is true an interactive client should render this group expanded.
togglesource	Indicates the question that controls whether or not this group should be toggled visible/hidden.
togglevalue	Indicates the value on which the group is shown or hidden.

parameter	description
togglecondition	Indicates the condition on which the group is shown or hidden. Possible conditions are: '=' Show the group only if the current value of the toggle-source question matches the togglevalue. '<>' Show the group only if the current value of the toggle-source question does not match the togglevalue. '<' Show the group only if the current value of the toggle-source question is smaller than the togglevalue (numeric questions only). '>' Show the group only if the current value of the toggle-source question is larger than the togglevalue (numeric questions only). '<=' Show the group only if the current value of the toggle-source question is smaller than or equal to the togglevalue (numeric questions only). '>=' Show the group only if the current value of the toggle-source question is larger than or equal to the togglevalue (numeric questions only). 'CONTAINS' Show the group only if the current value of the toggle-source question contains the togglevalue (select questions only). '!CONTAINS' Show the group only if the current value of the toggle-source question does not contain the togglevalue (select questions only). 'IN' Show the group only if the current value of the toggle-source question equals one of the options in the togglevalue. '!IN' Show the group only if the current value of the toggle-source question equals none of the options in the togglevalue.
parentgroup	Identifier of the parent group.

TableInfo

parameter	description
id	Label that uniquely identifies this table within the form.
row	Declaraction of the number of rows in the table.
columns	Declaration of the number of columns in the table.
label	The heading of the table.

RowInfo

parameter	description
id	Label that uniquely identifies this row within the table.
row	Declaraction of the number of columns in the table.

CellInfo

No content defined for table cell info, yet.

TextInfo

parameter	description
text	The static text to be produced.
renderingcontext	Whether or not the text is produced inside a table ('table' or 'standard').

QuestionInfo

parameter	description
id	A unique identifier of the question, determined by the ID(…) keyword in the ITP model, or the identifier on the advanced tab of the Form editor.

parameter	description	
idhash	An unique identifier of the question that is suitable for use as id attribute on html tags.	
ref	A unique reference identifier that is used to correlate information within the XForms.	
default	The default answer to the question.	
typename	The answer type, which can have the following values:	
	etbq	Editable text block
	ertbq	Editable rich text block
	bool	Boolean
	date	Date
	time	Time
	text	Text
	number	Number
	file	File
	The controltype will give more detailed information about the question type.	
length	The maximum length of a text answer.	
totaldigits	The maximum total amount of digits of a number answer.	
fractiondigits	The maximum amount of fractional digits of a number answer.	
paragraphset	Indicates the view that should be used to select text blocks from.	
textblockserver	A node with information on the ITP/MDK Repository server that can serve text block previews. The buildTextBlockPreviewUrl template in the Support Library will abstract from the intricacies of this information.	
server	The name of the server.	
port	The port on which the server can be accessed.	
environment	The environment to be used when retrieving a text block preview.	

parameter	description	
repositoryuser	The repository user providing the context from which text block revisions should be retrieved.	
repositorystatus	The status (e.g. development or published) determining the text block revisions to be retrieved.	
repositoryproject	The project from which text bock revisions should be retrieved.	
orderresponse	Whether or not the end user should be able to order the selected options of a multi select question.	
readonly	If this element is part of the QuestionInfo structure, the question should be presented for read-only.	
helptext	The help text providing extra information, to be presented along with the question.	
feedback	A message providing an error or warning, to be presented along with the question.	
feedbackreason	The nature of the feedback message.	
nrofoptions	The number of options of a select question.	
renderingcontext	Whether or not the text is produced inside a table ('table' or 'standard').	
controltype	The type of the question control, which can have the following values:	
	etbq	Editable text block
	ertbq	Editable rich text block
	bool	Boolean
	date	Date
	time	Time
	text	Text
	number	Number
	file	File
textblockmultiselect	Text block multi select.	
simplemultiselect	Non-text block multi select.	

parameter	description
textblocksingleselect	Text block single select.
radiosingleselect	Non-text block radio button single select.
simplesingleselect	Non-text block single select.
parentgroup	Identifier of the parent group.
minselect	The minimum number of answers to select for a select question.
maxselect	The maximum number of answers to select for a select question.

KeyListInfo

parameter	description
keylistprompt	Description of the key selection list.

KeyInfo

parameter	description
submission	The value to be submitted as "submission" form field when the key is selected.
label	Short representation of the record in the key selection list.
screenfields	Human readable representation of a record in the key selection list.
rank	The rank number of the record within the key selection list.

OptionInfo

parameter	description

parameter	description
label	Human readable representation of the option. In the case of a text block option, this will contain both the name of the text block and its description.
tbklabel	The name of the text block for this option (if any).
tbkdescription	The description of the text block for this option (if any).
value	The value to be submitted if the option is selected upon form submission.
previewvalue	The value (if any) to be passed to the text block preview page.
defaultselected	If the OptionInfo structure contains this entry, the option should initially be selected.
order	An optional number determining the ordering of the options within the selection.

FieldsetInfo

parameter	description
textblockid	An identifier of the editable (rich) text block to which the field set applies.
fieldsetname	The name of the field set.

FieldInfo

parameter	description
textblockid	An identifier of the editable (rich) text block to which the field set containing the field applies.
fieldsetname	The name of the field set that contains the field.
fieldname	The name of the field.

ButtonInfo

parameter	description
id	A unique identifier for the button in the form.
label	Human readable representation, to be presented on the button.
submission	The value to be submitted as "submission" form field when the button is pressed.

Appendix D: XHTML

This Appendix presents a drill-down into the new output XHTML as it is, before it is manipulated by JavaScript. Items between [brackets] refer to variables or variable content.

[PAGE]

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
  <head>
    <title>[PAGETITLE]</title>
    <link rel="stylesheet" type="text/css"
href="cs/ui/jquery-ui-1.7.2.custom.css" />
    <link rel="stylesheet" type="text/css" href="cs/div_oriented.css" />
    <link rel="stylesheet" type="text/css" href="cs/ui.itppreview.css" />
    <link rel="stylesheet" type="text/css" href="cs/ui.itpselect.css" />
    <script type="text/javascript" src="js/jquery-1.4.1.min.js"></script>
    <script type="text/javascript"
src="js/jquery-ui-1.7.2.custom.min.js"></script>
    <script type="text/javascript" src="js/ui.itppreview.js"></script>
    <script type="text/javascript" src="js/ui.itpselect.js"></script>
    <script type="text/javascript" src="js/itpcommon.js"></script>
    <script type="text/javascript"
src="resources/[LANGUAGE].js"></script>
    <script type="text/javascript"
src="support/javascript/itp_ajax.js"></script>
    <script type="text/javascript"
src="support/javascript/itp_textblocks.js"></script>
    <script type="text/javascript"
src="support/javascript/mktree.js"></script>
    <script type="text/javascript"
src="support/javascript/parse.js"></script>
    <script type="text/javascript" src="js/itpmessage.js"></script>
    <script type="text/javascript"
src="js/itpelementfactory.js"></script>
    <script type="text/javascript"
src="js/itpelementfactorymappings.js"></script>
    <script type="text/javascript" src="js/itpelement.js"></script>
    <script type="text/javascript" src="js/itprootelement.js"></script>
    <script type="text/javascript" src="js/itppage.js"></script>
    <script type="text/javascript" src="js/itppageelement.js"></script>
    <script type="text/javascript" src="js/itpform.js"></script>
    <script type="text/javascript" src="js/itpgroup.js"></script>
    <script type="text/javascript" src="js/itpsubmitbutton.js"></script>
    <script type="text/javascript" src="js/itpquestion.js"></script>
    <script type="text/javascript"
src="js/itpnumberquestion.js"></script>
    <script type="text/javascript" src="js/itpboolquestion.js"></script>
    <script type="text/javascript" src="js/itpdatequestion.js"></script>
    <script type="text/javascript" src="js/itptimequestion.js"></script>
    <script type="text/javascript"
src="js/itpsimplesingleselectquestion.js"></script>
    <script type="text/javascript"
src="js/itpradiosingleselectquestion.js"></script>
```

```
    <script type="text/javascript"
src="js/itpsimplemultiselectquestion.js"></script>
    <script type="text/javascript"
src="js/itptextblocksingleselectquestion.js"></script>
    <script type="text/javascript"
src="js/itptextblockmultiselectquestion.js"></script>
    <script type="text/javascript" src="js/itpetbquestion.js"></script>
    <script type="text/javascript" src="js/itpfilequestion.js"></script>
    <script type="text/javascript" src="js/itptextquestion.js"></script>
    <script type="text/javascript">
      var implementation ='[IMPLEMENTATION]';
      var uploadpath='[UPLOADPATH]';
      var amInSecureMode=true/false;
      var itppage =
itpelementfactory.getITPElement([JSONINFO]);</xsl:text>
    </script>
  </head>
  <body onload="itppage.initialise(function(pObj){});">
    <div class="main [TYPE]">
      <script type="text/javascript">
        itppage.registerElement([JSONINFO]);
      </script>
      <form id="id_form" action="[LINKPAGE]" enctype="multipart/form-data"
accept-charset="UTF-8" method="post">
[GROUP]n
        <div class="buttons">
[BUTTON(ok back1 cancel)]n
[BUTTON(other)]n
        </div>
      </form>
    </div>
    <input class="initmarker" style="display: none;" type="checkbox"/>
  </body>
</html>
```

[GROUP]

```
  <script type="text/javascript">
    itppage.registerElement([JSONINFO]);
  </script>
  <div class="group level[LEVEL]" id="id_[ID]_container">
    <fieldset>
      <legend>
        <span class="groupheader" id="id_[ID]_groupheader">
          <span class="grouptitle">
            [TITLE]
          </span>
        </span>
      </legend>
      <div class="groupbody" id="id_[ID]_groupbody">
[GROUP/TABLE/QUESTION]n
      </div>
    </fieldset>
  </div>
```

[TABLE]

```
  <table class="itptable">
[ROW]n
  </table>
```

[ROW]

```
  <tr>
[CELL]n
  </tr>
```

[CELL]

```
  <td>
[QUESTION]n
  </td>
```

[KEYLIST]

```
  <div class="keylist group level[LEVEL]" id="id_keylist_container">
    <fieldset title="[KEYLISTPROMPT]">
      <legend>
        <span class="groupheader" id="id_keylist_groupheader">
          <span class="grouptitle">
            [KEYLISTPROMPT]
          </span>
        </span>
      </legend>
      <div class="groupbody" id="id_[ID]_groupbody">
[KEY]n
      </div>
    </fieldset>
  </div>
```

[KEY]

```
  <script type="text/javascript">
    itppage.registerElement([JSONINFO]);
  </script>
  <div class="key" id="id_[ID]_container">
    <input type="submit" id="id_[ID]_submit" name="submission"
value="[SUBMISSION]"/>
  </div>
```

[SIMPLETEXT]

```
  <div class="statictext">
    [TEXT]
  </div>
```

[QUESTION]

```
<!-- Note: in a Content Wizard some section questions are suppressed. -->
  <script type="text/javascript">
    itppage.registerElement([JSONINFO]);
  </script>
  <div class="question [STRUCTURETYPE] [CONTROLTYPE] [RENDERINGCONTEXT]
[PARITY] question_[PARITY]" id="id_[IDHASH]_container">
    <div class="label [STRUCTURETYPE] [isempty/haslabel]">
      <span class="annotation">
        <img id="[ID]_help" src="cs/img/helpicon.gif" class="help"
alt="help" title="[HELPTEXT]" [style="visibility:hidden"]/>
        <img id="[ID]_feedback" src="cs/img/feedbackicon.gif"
class="feedback" alt="feedback" title="[FEEDBACK]"
[style="visibility:hidden"]/>
      </span>
      <span class="labelwrap">
        <label for="[REF]">
          [LABEL]
        </label>
      </span>
    </span>
    <div class="input [STRUCTURETYPE]">
[ETBQ/DATE/TIME/TEXT/NUMBER/FILE/BOOL/TEXTBLOCKMULTISELECT/SIMPLEMULTISE
LECT/TEXTBLOCKSINGLESELECT/RADIOSINGLESELECT/SIMPLESINGLESELECT]
    </div>
  </div>
```

[ETBQ]

```
  <script language="javascript">
    online_tbk_manager.registerTextBlock('[REF]', [READONLY?]);
   [online_tbk_manager.registerFieldSet('[REF]', '[FIELDSETNAME]');
     [online_tbk_manager.registerField('[REF]', '[FIELDSETNAME]',
'[FIELDNAME]);]n
   ]n
  </script>
  <input class="ui-widget" type="text" id="id_[REF]" name="[REF]"
value="[DEFAULT]" [disabled="true"]>
  </input>
```

[DATE]

```
  <input class="ui-widget" type="text" id="id_[REF]" name="[REF]" size="10"
maxlength="10" value="[DEFAULT]" [disabled="true"]/>
```

[TIME]

```
  <input class="ui-widget" type="text" id="id_[REF]" name="[REF]" size="8"
maxlength="8" value="[DEFAULT]" [disabled="true"]/>
```

[TEXT length >= 50]

```
  <textarea id="[REF]" name="id_[REF]" cols="40" cols="[10 or less]"
[disabled="true"]>
    [DEFAULT]
  </textarea>
```

[TEXT length < 50]

```
  <input class="ui-widget" type="text" id="id_[REF]" name="[REF]"
value="[DEFAULT]" [maxlength="[LENGTH]" size="[LENGTH]"]
[disabled="true"]/>
```

[NUMBER]

```
  <input class="ui-widget" type="text" id="id_[REF]" name="[REF]"
size="[SIZE]" maxlength="[SIZE]" value="[DEFAULT]" [disabled="true"]/>
```

[FILE]

```
  <input class="ui-widget" type="file" id="id_[REF]" name="[REF]" size="40"
[disabled="true"]/>
```

[BOOL]

```
  <input class="ui-widget" type="checkbox" id="id_[REF]" name="[REF]"
[checked="Y"] [disabled="true"]/>
```

[TEXTBLOCKMULTISELECT]

```
    <select id="[REF]" name="id_[REF]" size="[NROFOPTIONS]"
multiple="multiple" [disabled="true"]>
[OPTION]n
    </select>
```

[SIMPLEMULTISELECT]

```
    <select id="[REF]" name="id_[REF]" size="[NROFOPTIONS]"
multiple="multiple" [disabled="true"]>
[OPTION]n
    </select>
```

[TEXTBLOCKSINGLESELECT]

```
    <select id="[REF]" name="id_[REF]" size="[NROFOPTIONS]"
[disabled="true"]>
[OPTION]n
    </select>
```

[RADIOSINGLESELECT]

```
    <select id="[REF]" name="[REF]" size="[NROFOPTIONS]"
[disabled="true"]>
[OPTION]n
    </select>
```

[SIMPLESINGLESELECT]

```
    <select id="[REF]" name="[REF]" size="[NROFOPTIONS]"
[disabled="true"]>
[OPTION]n
    </select>
```

[OPTION]

```
  <option value="{$optioninfo/value}" [selected="true"]>
[LABEL]
  </option>
```

[BUTTON]

```
  <script type="text/javascript">
    itppage.registerElement([JSONINFO]);
  </script>
  <span id="id_[ID]_container">
    <input type="submit" id="id_[ID]_submit" name="submission"
value="[SUBMISSION]"/>
  </span>
```

Appendix E: JavaScript library

ITPElement

An ITPElement represents a node in the tree, which knows both its parent and its children. It has a unique id and holds a class type, an info structure and a collection of associated screen elements. It supports asynchronous initialization. It can deal with messages that bubble up and are broadcasted down the tree.

constructor	
ITPElement(pInfo)	Simple initialization of local variables.
public methods	
getId()	Returns the elementid from the info structure.
getType()	Returns the class type. Class types should reflect the class hierarchy, by listing all ancestor classes, separated by a dot e.g., ITPElement.ITPRootElement.ITPPage.
ofType(pType)	Returns whether the object is of the class type pType, or of a descendant type.
getInfo()	Returns the info structure.
initialize(pCallback, pSuppressImmediateCallback)	Initializes the object by calling initScreenElements, registering pCallback as the callback method. For ITPElement, which does not have any asynchronous initialization, the callback method is called immediately, unless pSuppressImmediateCallback equals true.
other methods	
synchronize()	Triggers sending of all messages that may be relevant to other nodes in the tree. To be overridden in descendant classes.
registerParent(pElement)	Associates the node with parent node pElement, which should be a descendant of ITPElement.
registerChild(pElement)	Associates the node with child node pElement, which should be a descendant of ITPElement.
getDescendant(pId, pRequiredType)	Returns a node from the subtrees defined by the children of the current node if it has the object id equal to pId and if it is of type pRequiredType. Returns null if such a node cannot be found.
bubbleUp(pMessage)	Passes the message pMessage on to the parent of the current node, if the current node has been associated with a parent and allowBubbleUp(pMessage) returns true. Calls broadcastDown(pMessage) otherwise.

constructor	
broadcastDown(pMessage)	Calls processMessage(pMessage), before calling broadcastDown(pMessage) for each of the associated children. Note that processMessage may tag the message to "shouldStop()", in which case the broadcasting will be aborted.
allowBubbleUp(pMessage)	Returns whether the message is allowed to be bubbled up. Can be used to limit the range of a message to a subtree. To be overridden in descendant classes.
processMessage(pMessage)	Is called for each message that is broadcasted through the node. Should return pMessage, possibly after modifying it. Can be used to respond to messages. To be overridden in descendant classes.
initScreenElements()	Returns a collection of screen elements, which will be stored in the attribute screenelements of the object. Is called as a first step in the initialization process.

ITPRootElement

Descendant of ITPElement that represents the root of the tree. It allows for the registration of JSON info structures, which will be expanded as an object tree upon initialization.

constructor	
ITPRootElement(pInfo)	Simple initialization of local variables.
public methods	
registerElement(pInfo)	Registers an info structure, which will be expanded to an ITPElement descendant during construction of the tree.
registerErrorElement(pElement)	Registers elements that report errors. Only the first element is stored. This is used to scroll the first error into view after initializing the page.
overrides	
initialise(pCallback)	Constructs an object for each registered info structure, using the global variable `itpelementfactory`. Associates parents and children, thus implicitly constructing the tree. Initializes all objects, passing a callback function that checks whether all constructed object have been initialized. As soon as this is the case, calls synchronize to enforce message synchronization and calls back through its own callback function.
synchronize()	Calls synchronize on each of its elements.
getDescendant(pId, pRequiredType)	Uses the map of registered elements as an index to implement a more optimal search for the descendant.
processMessage(pMessage)	Stops the broadcasting of any messages as long as initialization has not yet been completed.
other methods	

constructor	
-	

ITPPage

Just a specific descendant of ITPRootElement.

constructor	
ITPPage	Trivial.
public methods	
isContentWizard()	Returns whether the current tree represents a Content Wizard form.
overrides	
-	
other methods	
-	

ITPPageElement

Descendant of ITPElement that represent a sub node in the tree. The element may be associated with an answer, consisting of two components: an internal answer and a screen answer. ITPPageElement supports the validation of an answer, which may either be valid, invalid (may not be submitted), or unacceptable (may not be on the screen). The element may be hidden. The element may be associated with a Help text and a feedback text. The element may have its own representation of the empty (null) value.

constructor	
ITPPageElement	Simple initialization of local variables.
public methods	
getAnswer()	Returns the current (internal) answer.
setAnswer(pAnswer)	Attempts to set the answer pAnswer. Returns the validation result. If this is valid, applies the answer.
isValid()	Returns the 'worst' validation result of the internal answers of the sub tree defined by the current object.
show()	Shows the element screenelements.container of the current object.
hide()	Hides the element screenelements.container of the current object.
getHelptext()	Returns the current Help text.

constructor	
setHelptext(pHelptext)	Sets the current Help text to pHelptext.
getFeedback()	Returns the current feedback text.
setFeedback(pFeedback)	Set the current feedback text to pFeedback.
scrollIntoView	Scroll the current element into view.
overrides	
initialize(pCallback, pSuppressImmediateCallback)	Sets the default answer, the Help text and the feedback text.
initScreenElements()	Finds the element with the id "[ID]_container", where [ID] is the object identifier of the object and stores this as result.container. Finds the elements within this container with the id "[ID]_help" and "[ID]_feedback" and stores them as result.helpimage and result.feedbackimage, respectively. Adds the spans result.helpspan and result.feedbackspan with the proper JQuery icon classes associated, making sure all Hep and feedback indications are initially hidden. They may be shown during later steps in the initialization process.
synchronize()	Sends the current internal value of the element as part of a "valuechange" message.
other methods	
scrollIntoView	Make sure the element is part of the visible part of the page.
prepareForSubmission(pCallback)	Will be called before a form is submitted, in order to allow nodes in the tree to prepare for submission e.g., used by editable (rich) text block questions. This method is intended to be called between parents and children in the tree only. Children will have to report back through the readyForSubmission method of their parent.
readyForSubmission(pElement, pValid)	Method to be called from child to parent, once a child has finished preparing for submission, passing themselves as pElement and the current validation status as pValid.
getInternalAnswer	Returns the internal answer.
setInternalAnswer(pAnswer)	Validates pAnswer and sets the internal answer to pAnswer if it is not unacceptable. Makes sure that the null value of the class is never deemed unacceptable. Synchronizes if the internal answer is changed.
applyInternalAnswer()	Makes sure the internal answer is applied to the screen.
getScreenAnswer()	Returns the answer that is currently displayed on the screen. To be overridden by descendant classes.
setScreenAnswer(pAnswer)	Makes sure the answer on the screen is set to pAnswer. To be overridden by descendant classes.
applyScreenAnswer()	Makes sure the screen answer is set as the internal answer. Unless it is unacceptable, in which case the internal answer is applied to the screen answer.
validate(pAnswer)	Simply returns valid. To be overridden by descendant classes.

constructor	
getNullValue()	Simply returns "". To be overridden by descendant classes.

ITPForm

Descendant of ITPPageElement, representing a form. Allows for programmatic submission of the form, making sure that the correct 'submission' is posted.

constructor	
ITPForm	Trivial
public methods	
submit(pCallback)	Attempts to submit the form, which may be an asynchronous process. Calls back prior to the actual submission of the form.
overrides	
initScreenElements()	Finds the form element by looking for an element with an id equal to the current object id. Appends a hidden "submission" input element to the form in order to pass the button through which the form is submitted.
processMessage	Processes "submitpressed" messages by applying their value to the hidden "submission" input element and calling submit().
other methods	
-	

ITPSubmitButton

Descendant of ITPPageElement, representing a submit button or a key selection button on the form. Replaces the standard input button by a button with jQuery-classes.

constructor	
ITPSubmitButton	Trivial
public methods	
submit()	Sends a "submitpressed" message with the submission value of the current button, to be picked up by the ITPForm node in the tree.
overrides	
initScreenElements	Finds the input button as the only "input" child element of the container. Creates a new button element with the proper JQuery classes associated, binding the submit() method to its onclick event. If the button is a key selection button (indicated by the existence of the info.screenfields attribute) its label will be equal to info.screenfields, otherwise it will be equal to info.label. For key selection buttons an additional class is added, indicating whether the selection button has an odd or even rank (in order to allow for

constructor	
	the old alternating representation).
other methods	
\--	

ITPGroup

Descendant of ITPPageElement, representing one group on a form. It adds the functionality of expanding and collapsing of groups. It shows/hides automatically by picking up relevant messages about value changes ("group toggling"). It may be associated with a preview URL and automatically adds icons for e.g., expand/collapse, and preview, if necessary.

constructor	
ITPGroup	Simple initialization of local variables.
public methods	
expand	Makes sure the group, if expandable, is expanded.
collapse	Makes sure the group, if expandable, is collapsed.
toggle	Makes sure the group, if expandable, changes its expand state.
overrides	
initialise	Makes sure the expand state is initialized correctly.
initScreenElements	Lifts the group representation to include group expanders, preview links etc.
show()	Shows the group container by folding it.
hide()	Hides the group container.
processMessage	Processes value change messages in order to implement group toggling. Also used to connect the group to its toggler in the case of a Content Wizard.
other methods	
-	

ITPQuestion

A descendant of ITPPageElement, representing a question on a form, which servers as a base class for all question types.

constructor	
ITPQuestion	Trivial
public methods	

constructor	
-	
overrides	
initScreenElements()	Retrieves the label elements in order to be able to add error information, if required, later on.
setFeedback(pFeedback)	Writes the error text as part of the question label.
other methods	
-	

ITPBoolQuestion

A descendant of ITPQuestion, representing a check box question on a form. Adds a hidden check box to make sure the value FALSE is posted if the question is left unchecked. No validation.

constructor	
ITPBoolQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Gets the checkbox, assuming it is the only input element within the container. Makes sure its value is set to "TRUE" and binds the applyScreenAnswer method to its onclick and onchange events. Adds an additional hidden checkbox with value "FALSE", in order to make sure that a value is always posted for this question.
setInternalAnswer(pAnswer)	Converts pAnswer to "true()" or "false()" (these values are also used to express toggling in the XForms) and applies it to the internal answer. Synchronizes the hidden value="FALSE" checkbox with the new value.
getScreenAnswer()	Returns "true()" if the checkbox on the screen is checked, "false()" otherwise.
setScreenAnswer(pAnswer)	Sets the checkboxes to the correct checked states, given the answer pAnswer.
other methods	
-	

ITPDateQuestion

A descendant of ITPQuestion, representing a date question on a form. Associates a date picker control with the input field. Implements some simple date validation, to be extended and

improved. Makes sure all screen representation is done in a screen representation format, whereas internal representation remains in the ITP XForms format.

constructor	
ITPDateQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Transforms the simple input field, which will still be used to post the internal answer, to an input with fixed size and associated JQuery classes. Binds the method applyScreenAnswer to the events onkeyup and onblur. Makes sure a correct dateControlMask will be used; array which determines the order in which the elements of the date should be shown. Note that the locale specific masks are defined in the language specific resources \[lan].js files e.g., en.js, nl.js.
setInternalAnswer(pAnswer)	Sets the internal answer, which should be in the XForms format, both in the local variable and in the hidden input control.
getScreenAnswer()	Returns the screen answer in ITP format.
setScreenAnswer(pAnswer)	Converts pAnswer from ITP to screen format and applies it to the screen. Associates a date picker with the control, if this hasn't already been done.
validate(pAnswer)	Validates a date value.
other methods	
ITP_to_screen(pITPAnswer)	Converts an ITP format answer to screen format.
Screen_to_ITP(pScreenAnswer)	Converts an screen format answer to ITP format.
setDateAnswer(dateText, inst)	Callback function for the date picker widget.
getDateFormat(pMask, pSeparator)	Transforms an old array dateControlMask to a date format string.

ITPETBQuestion

A descendant of ITPQuestion, representing an Editable Text Block Question on a form. Adds an iframe in which the editorPage page is loaded and handles callbacks from this page. No validation.

constructor	
ITPETBQuestion	Trivial
public methods	
-	
overrides	
initialise(pCallback,	Call ancestors initialise method, suppressing callbacks.

constructor	
pSuppressImmediateCallback)	
initScreenElements()	Replaces the trivial input element by an iframe in which the editorPage is loaded. Registers the text block with the global text block manager, which is of the class ITPETBManager, defined in the same JavaScript file. Stores a reference to the window in which the editorPage is loaded.
prepareForSubmission(pCallback)	Triggers a save of the text block in the editor window, which will eventually result in a callback to setFinalValue.
other methods	
getInitialValue()	Returns the value of the text block before editing.
setFinalValue(pValue)	Callback function for saving of a text block. Writes its post value to the hidden input element and reports readyForSubmission to its parent.
windowInitialised()	Callback function, which is called from the editorPage as soon as the TinyMCE editor has been initialized. Invokes editing of the text block in the editor.
textblockLoaded()	Callback function, which is called from the text block manager when the text block has been loaded. This means that the question has been fully initialized, and the object will report that by invoking its initialization callback.

ITPERTBQuestion

A descendant of ITPQuestion, representing an Editable Rich Text Block Question on a form. It presents the question as a clickable text with an adjacent button and uses ActiveX to open ITP/Workstation to allow editing the Rich Text Block. Validates whether the Documents is still open for editing.

constructor	
ITPERTBQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Replaces the trivial input element by an input containing the question text and an edit button that triggers editBlock.
prepareForSubmission(pCallback)	Checks that the document is closed and then triggers saveBlock.
axEvent(pEvent)	changes the edit button icon depending on the state (open or closed) of the rich text block document.
other methods	
editBlock()	Uses ActiveX to activate EditDocument for the Rich Text Block

constructor	
	document.
saveBlock()	Uses ActiveX to upload the edited rich text block document to CCM Core.

ITPFileQuestion

A descendant of ITPQuestion, representing a file question on a form. If ActiveX can be used, it transforms the file input to a text input with an adjacent button, using the ActiveX control. No validation, existence of the file checked by ActiveX upon submission.

constructor	
ITPFileQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Turns the HTML-file upload control into an ActiveX-version, if this is possible (IE) and requested (fileEditActiveX variable).
prepareForSubmission	If ActiveX is used, uploads the file to CCM Core and stores the result in a hidden input (for posting).
getScreenAnswer()	If ActiveX is used, returns the selected file path. This is not possible by using the HTML control.
setScreenAnswer(pAnswer)	If ActiveX is used, it sets the selected file path. This is not possible using the HTML control.
other methods	
browse()	Opens the file browser through the ActiveX control.
testActiveX(pScreenElements, pAttemptsLeft)	Checks if the ActiveX control is available. If this it not the case, it will retry for pAttemptsLeft times. If this fails, the question will fall back to the standard HTML file upload control.

ITPNumberQuestion

A descendant of ITPQuestion, representing a number question on a form. Transforms the simple input into multiple inputs, one for decimal and one (optional) for fractional digits. Validates against maximum total and fraction length.

constructor	
ITPNumberQuestion	Trivial
public methods	
-	

constructor	
overrides	
initScreenElements()	Replaces the simple input element by two: one for the decimal digits and one (optional) for the fractional digits. Binds to events and associates jQueryUI classes.
setInternalAnswer(pAnswer)	Applies pAnswer to the internal answer variable and the hidden input element.
getScreenAnswer()	Returns a representation of the values from the decimal and the fractional digit elements, separated by a dot.
setScreenAnswer(pAnswer)	Splits pAnswer based on the dot and applies it to the decimal and fractional digit elements.
validate(pAnswer)	Checks whether pAnswer is numeric and if the number of decimal and fractional digits are within the limitations set by totaldigits and fractiondigits (note that this has always been implemented as "maximum number of decimal digits equals totaldigits minus fractiondigits).
other methods	
-	

ITPTextQuestion

A descendant of ITPQuestion, representing a text question on a form. No manipulation, except for event handling on input. No validation.

constructor	
ITPTextQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Binds to onkeyup and onblur events.
getScreenAnswer()	Returns the answer in the text input.
setScreenAnswer(pAnswer)	Sets the answer in the text input to pAnswer.
other methods	
-	

ITPTimeQuestion

A descendant of ITPQuestion, representing a time question on a form. Tranforms simple input box into two, one for the hours and one for the minutes. Only accepts hours in [0, 23] and minutes in [0, 59].

constructor	
ITPTimeQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Replaces the simple input element by an hour and a minute input element. Binds events and associated JQuery classes.
setInternalAnswer(pAnswer)	Applies pAnswer to the internalanswer variable and to the hidden input box.
getScreenAnswer()	Returns the answer on the screen in the format hh:mm:00
setScreenAnswer(pAnswer)	Splits pAnswer on ":" and applies the first to parts to the hour and minute input elements, respectively.
validate(pAnswer)	Validates the hours and minutes of pAnswer to be numerical and within their proper ranges.
other methods	
-	

ITPSelectQuestion

A descendant of ITPQuestion, representing any select question on a form. Base class for more specific select question representations. Transforms any select element using the ITPSelect widget. Uses the functions IsTextBlockSelect and allowsOrdering to parametrize the widget behavior.

constructor	
ITPSelectQuestion	Trivial
public methods	
-	
overrides	
initScreenElements()	Creates an itpselect widget out of the select element produced by the Xslt. Unless the control is a simple single select, which should result in a simple dropdown box. Sets the attributes textblocks and alloworder, based on the results of the isTextBlockSelect() and allowsOrdering() methods.
setInternalAnswer(pAnswer)	Synchronizes with the hidden input element that represents the internal value.
getScreenAnswer()	Returns the stored screenvalue.
setScreenAnswer(pAnswer)	Sets the stored screenvalue. **TODO**: figure out how to communicate with the widget about this.
synchronize()	If the page is a true Content Wizard form, sends a message and processes the response in order to rearrange the Content Wizard

constructor	
	page.
other methods	
isTextblockSelect()	Simply returns false. To be overridden by descendant classes.
allowsOrdering()	Simply returns false. To be overridden by descendant classes.

ITPSingleSelectQuestion

Descendant of ITPSelectQuestion, representing a single select question. Base class for all single select questions. Does not add any functionality.

constructor	
ITPSingleSelectQuestion	Trivial
public methods	
-	
overrides	
-	
other methods	
-	

ITPSimpleSingleSelectQuestion

Descendant of ITPSingleSelectQuestion, representing a simple single select question i.e., no radio buttons and no text blocks.

constructor	
ITPSimpleSingleSelectQuestion	Trivial
public methods	
-	
overrides	
-	
other methods	
-	

ITPRadioSingleSelectQuestion

Descendant of ITPSingleSelectQuestion, representing a radio single select question.

constructor	
ITPRadioSingleSelectQuestion	Trivial
public methods	
-	
overrides	
-	
other methods	
-	

ITPTextblockSingleSelectQuestion

Descendant of ITPSingleSelectQuestion, representing a text block single select question.

constructor	
ITPTextblockSingleSelectQuestion	Trivial.
public methods	
-	
overrides	
-	
other methods	
isTextblockSelect()	Returns true.

ITPMultiSelectQuestion

Descendant of ITPSelectQuestion, representing a multi select question. Base class for all multi select questions.

constructor	
ITPMultiSelectQuestion	Trivial
public methods	
selectAnswer(pAnswer, pSelect)	Select or unselect one specific answer programmatically.
overrides	
initScreenElements	Add hint that items can be ordered through dragging.

constructor	
other methods	
allowsOrdering()	Returns true if and only if the info structure holds an orderresponse attribute.

ITPSimpleMultiSelectQuestion

Descendant of ITPMultiSelectQuestion, representing a simple multi select question i.e., no radio buttons and no text blocks.

constructor	
ITPSimpleMultiSelectQuestion	Trivial
public methods	
-	
overrides	
-	
other methods	
-	

ITPTextblockMultiSelectQuestion

Descendant of ITPMultiSelectQuestion, representing a text block multi select question.

constructor	
ITPTextblockMultiSelectQuestion	Trivial.
public methods	
-	
overrides	
-	
other methods	
isTextblockSelect()	Returns true.